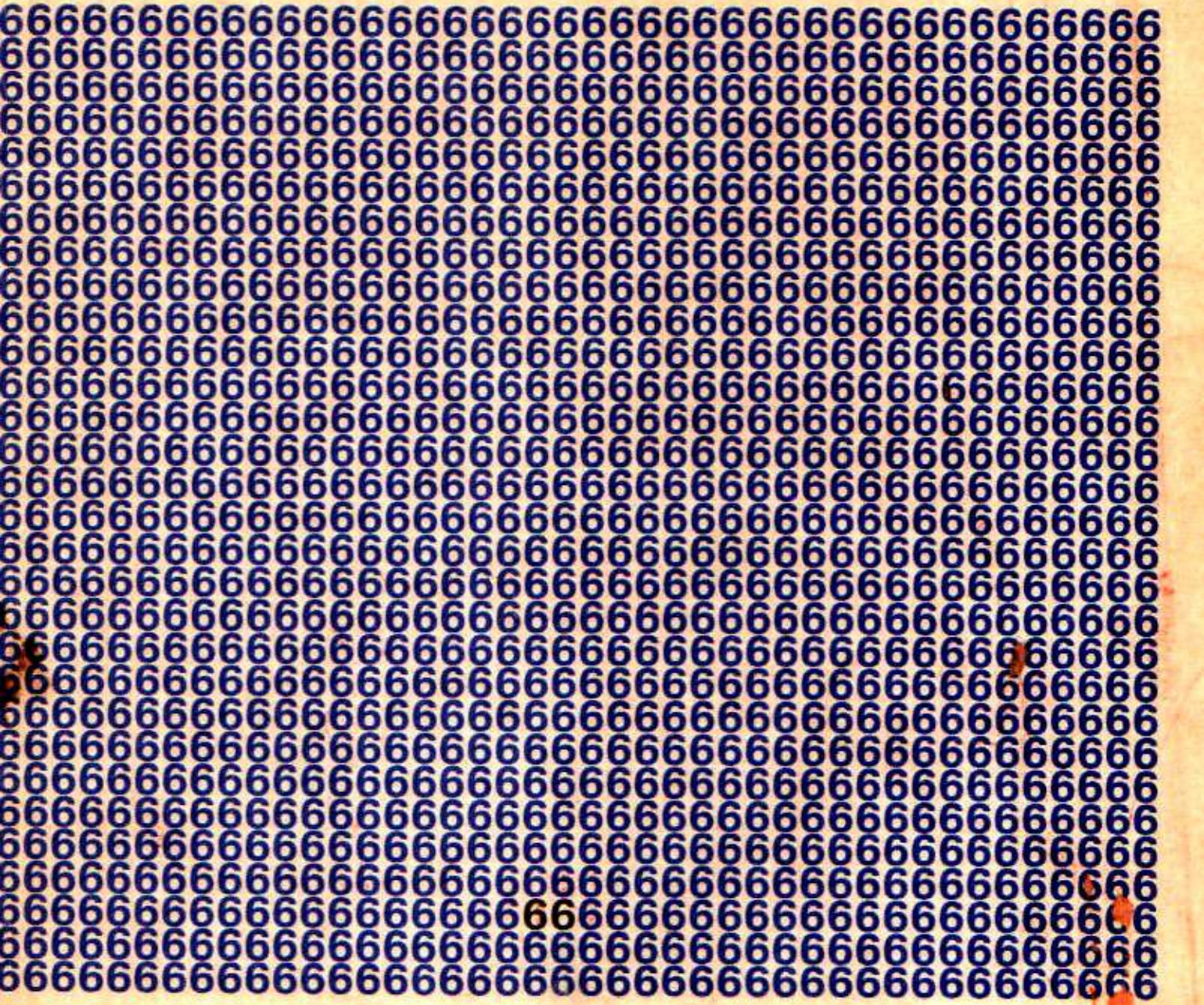
CHRYSLER



IMPERIAL

service manual

IMPERIAL and CHRYSLER

SERVICE MANUAL

FOREWORD

This Chrysler and Imperial Service Manual has been prepared with the latest service information available for use on 1966 models. Diagnosis, disassembly, repair, assembly and installation procedures coupled with complete specifications and tightening references can be found in each group. This publication is one of the most important "tools" available to the service technician. It will prove an invaluable aid in properly performing any phase of service necessary to maintain or restore the fine performance and reliability characteristics designed, engineered, and manufactured into these outstanding automobiles.

CHRYSLER MODELS

1965		1966	
Newport	AC-1	Newport	BC-1
300	AC-2	300	BC-2
New Yorker	AC-3	New Yorker	BC-3
C300-L	AC-2—300L		

IMPERIAL MODELS

1965		1966	
Crown	AY-1	Crown	BY-3
LeBaron	AY-1	LeBaron	BY-3

The service tools referred to in this Manual are available through Kelsey-Hayes Company, Miller Special Tools, 17640 Grand River, Detroit, Michigan 48227, U.S.A. unless otherwise specified.

Extra copies of this Manual are available at $5.00 each under Part Number 81-070-6150. Order from Chrysler-Plymouth Division, Service Department, P.O. Box 1658, Detroit, Michigan 48231.

CHRYSLER - PLYMOUTH DIVISION

CHRYSLER MOTORS CORPORATION

Chrysler Corporation reserves the right to make changes in design or to make additions to or improvements in its products without imposing any obligations upon itself to install them on its products previously manufactured.

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Introduction and General Specifications

0 Lubrication and Maintenance

1 Accessories—(Radios, Heaters, Mirrors)

2 Front Suspension

3 Rear Axle

5 Brakes—Service Parking

6 Clutch

7 Cooling System—Accessory Belt Drives

8 Electrical and Instruments

9 Engine—Engine Oiling

11 Exhaust System

14 Fuel System

16 Propeller Shaft and Universal Joints

17 Springs and Shock Absorbers

19 Steering Gear—Manual Power

21 Transmission—Standard Automatic

22 Wheels, Bearings and Tires

23 Body, Sheet Metal and Frame

24 Air-Conditioning

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81-070-6150



IMPERIAL CROWN 4-DOOR HARDTOP



NEW YORKER 2-DOOR HARDTOP



300 2-DOOR HARDTOP



NEWPORT 2-DOOR HARDTOP NN806

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Fig. 1—1966 Imperial and Chrysler Models

DEALER—FACTORY CONTACT

The following outline of the proper procedure to use in obtaining assistance or advice on any matter applying to Service will insure your inquiries receiving prompt attention and handling. Make certain those members of your organization who might have the occasion to contact either your Regional Office or the factory, are thoroughly familiar with this procedure.

All matters pertaining in any way to Warranty Service Claims, or of a technical nature, should be handled by you direct with your Regional Service Office. When in doubt as to the proper procedure to follow in the handling of a claim or complaint, prompt results can be obtained through a letter, telegram or phone call to your Regional Service Office—making certain to include all necessary information. If the aid of a Service Representative is necessary, the Regional Office will arrange for his contact as promptly as circumstances permit.

Letters or telegrams to the Regional Service Office, should be confined to one subject only and should include the following information:

Car Serial Number
Date of Sale
Owner's Name
Mileage

Complete description of difficulty, corrective action taken, your recommendations as to what should be done and the reason for so doing.

Include Paint and Trim Code Numbers where finish, upholstery, body or sheet metal is involved, and estimate of net cost of repairs.

CHRYSLER-PLYMOUTH DIVISION

With the exception of orders for parts or parts literature, all requests for Imperial, Chrysler, Plymouth Service literature such as Service Bulletins, Service Manuals, Owner Manuals, Time Schedules, W.S.C.'s or other Chrysler—Plymouth Division Service literature, should be addressed to:

(Letters)
Chrysler Corporation
Chrysler—Plymouth Division
Service Department
P. O. Box 1658
Detroit, Michigan 48231

(Telegrams)
Chrysler—Plymouth Division
Attention
(Name of person to whom sent)
WUX
Detroit, Michigan

Phone 822-4700 (Area Code 313)

NOTE: Please make certain to include the Code WUX on all telegrams to the Chrysler-Plymouth Division as this insures delivery direct to our Teleprint Room thus eliminating delay.

PARTS DIVISION

When parts and accessories are not immediately available from your local source of supply and to insure for fastest delivery, please follow the **"IMPORTANT ORDERING INFORMATION"** as outlined in the **"MASTER PARTS PRICE LIST"** published by the Parts Division of Chrysler Motors Corporation.

MASTER TECHNICIANS SERVICE CONFERENCE

All correspondence concerning enrollment in the M.T.S.C. Program, issuance of awards, orders for additional material, the return of reports, or any other matters relating to this program, should be addressed to:

Master Technician Service Conference
Chrysler Corporation Training Center
P.O. Box 2119
Detroit, Michigan 48231
Phone 539-3000—Area Code 313

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1966 MODELS

Chrysler Newport	***BC-1***	***Imperial Crown***	***BY-3***
Chrysler 300	***BC-2***	***Imperial LeBaron***	***BY-3***
Chrysler New Yorker	***BC-3***		

VEHICLE AND ENGINE NUMBERS

VEHICLE NUMBER—The vehicle number (Serial Number) is located on a metal plate attached to the left front door body hinge pillar (Fig. 2).

All vehicle numbers contain thirteen digits. The vehicle number is a code which tells the carline (1st digit), price class (2nd digit), body type (3rd and 4th digit), engine displacement (5th digit), model year (6th digit), assembly plant (7th digit), and vehicle sequence number (last six digits) starting with 100001.

ENGINE NUMBER—The engine number is stamped on the boss on the top side of the cylinder block just back of the water pump (Fig. 3).

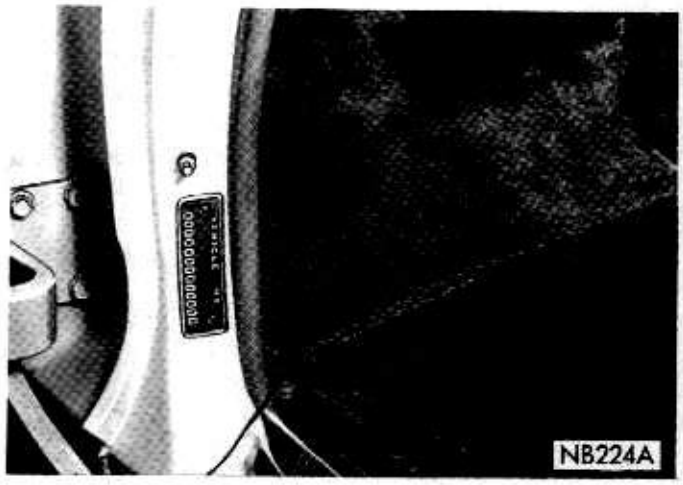


Fig. 2—Vehicle Number Plate

1st Digit Carline	2nd Digit Price Class	3rd & 4th Digits Body Type	5th Digit Eng. Displacement Cu. In.	6th Digit Model Year	7th Digit Assembly Plant
	E-Economy			6-1966	
	L-Low	23-2 Dr. Hardtop			
	M-Medium	27-Convertible			3-Jefferson
	H-High				
	P-Premium	41-4 Dr. Sedan			
		42-4 Dr. Town Sedan	F-383		6-Newark
C-Chrysler		43-4 Dr. Hardtop	G-413		
Y-Imperial		45-2 Seat Station Wagon			8-Export
		46-3 Seat Station Wagon	J-440		

BODY PLATE NUMBER LOCATION

The body number is stamped on a plate which is attached on the engine side of the cowl just above the master cylinder on Imperial Models (Fig. 4). On Chrysler Models the plate is located above the top hinge of the drivers side door. The plate shows the body type, trim code, schedule date, trim code and the paint code.

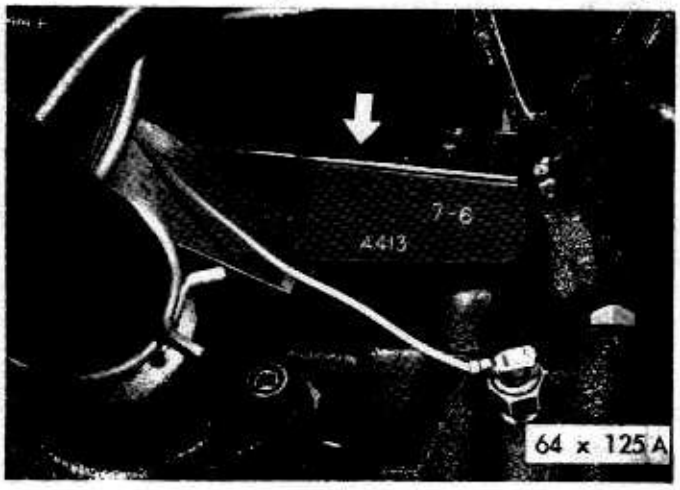


Fig. 3—Engine Number Location

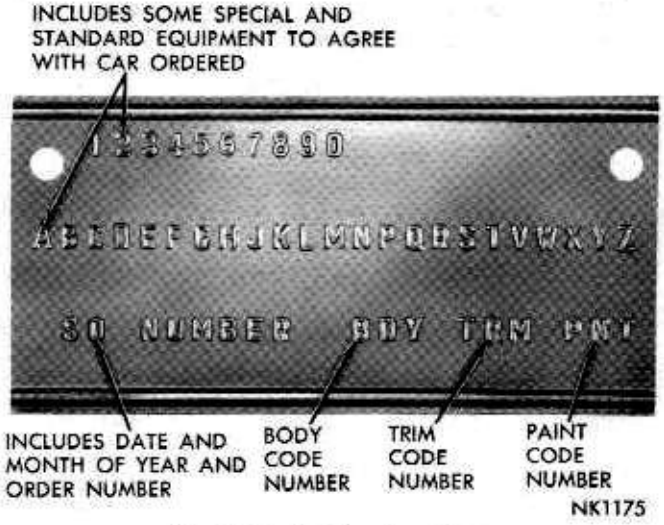


Fig. 4—Body Number Plate

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GENERAL DATA AND SPECIFICATIONS

Body Styles		Chrysler BC-1	Chrysler BC-2 BC-2 300	Chrysler BC-3	Imperial BY-1
4 Dr. Sedan, 4 Dr. Hard Top 2 Dr. Hard Top, Convertible		Newport			
4 Dr. Hard Top, 2 Dr. Hard Top			300		
4 Dr. Sedan, 4 Dr. Hard Top				New Yorker	
2 Dr. Hard Top, Convertible			300		
Station Wagon (Town and Country)		Newport			
Station Wagon (Town and Country) Police Car		Newport			
4 Dr. Hard Top, Convertible					Crown
4 Dr. Hard Top					Le Baron
Wheelbase	All Models Except— Town and Country Town and Country	123.5" 121.5"	123.5" —	123.5" 121.5"	129"
Tread (Front)		62"	62"	62"	61.8"
Tread (Rear)		60.7"	60.7"	60.7"	61.7"
Length with Bumper	All Models Except— Town and Country Town and Country	218.2" 219.0"	218.2" —	218.2" 219.0"	
Width with Bumper		79.5"	79.5"	79.5"	80.0"
Rear Axle with 3-Speed Manual Transmission		3.23	3.23	—	—
Rear Axle with TorqueFlite Transmission		2.76	3.23	2.76 3.23*	2.94

* Models with Dual Exhaust

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LUBRICATION AND MAINTENANCE CHART

NORMAL SERVICE

Engine Oil Filter—Replace every second oil change.

Battery—Check level every 2 months.

PSF **Power Steering Reservoir** — Check level every 6 months. Add fluid, if necessary, to restore to prescribed level.

EO **Oil Filler Pipe Breather Cap** (1)—Wash in kerosene and recoil with SAE 30 engine oil every 6 months.

Engine Oil Dipstick—When refueling, check engine oil level.

EO **Engine Oil**—Drain and refill every 3 months or 4,000 miles, whichever occurs first. See Viscosity Chart below:

Multigrades

SAE 10W-30 or SAE 20W-40 Where temperatures are consistently above 32°F.

SAE 10W-30 Suitable for year-long operation in many parts of the U.S.; may be used where temperatures occasionally drop as low as −10°F.

SAE 5W-20 Recommended where minimum temperatures are consistently below +10°F.

Single Grades

SAE 30 Where temperatures are consistently above 32°F.

SAE 10W Where temperatures range between +32°F. and −10°F.

SGL or MP **Manual Steering Gear**—Check level every 6 months. Add lubricant, if necessary, to cover worm gear.

MML or AMG (2) **Column-Mounted Manual Transmission Gearshift Controls**—If noisy or shifting effort is objectionable, lubricate contact surfaces.

HTF **Brake Master Cylinder**—Check fluid level every 6 months. If below ¼ inch from top of reservoir, add fluid to restore level.

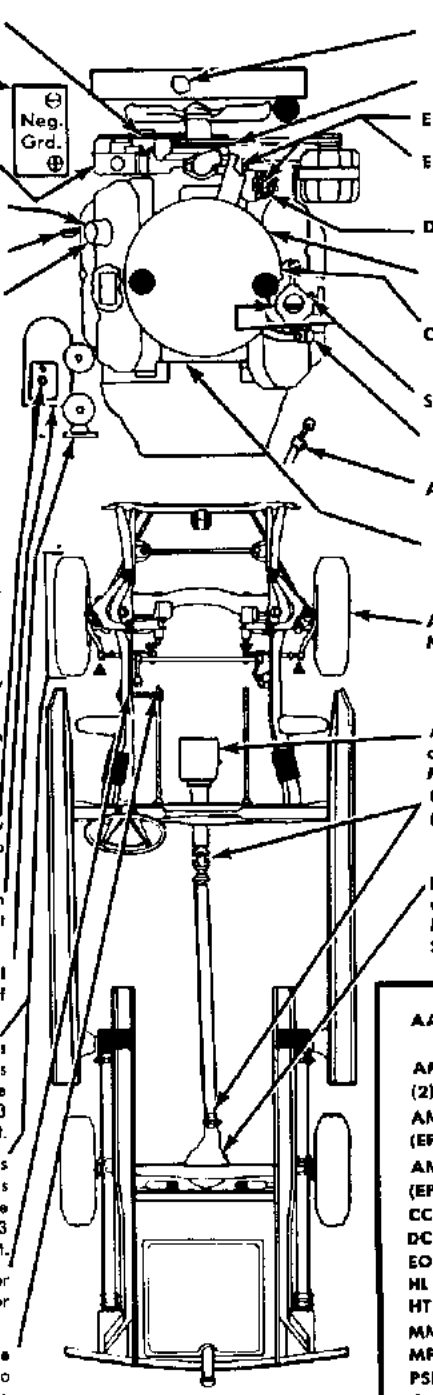
MML **Front Suspension Ball Joints**—Inspect seals and joints every 6 months or whenever car is serviced for any other reason. Replace damaged seals or joints. Relubricate every 3 years or 36,000 miles, whichever occurs first.

MML **Steering Linkage Ball Joints**—Inspect seals and joints every 6 months or whenever car is serviced for any other reason. Replace damaged seals or joints. Relubricate every 3 years or 36,000 miles, whichever occurs first.

MML or AMG (2) **Clutch Torque Shaft Bearings**—Inspect for wear and relubricate every 3 years or 36,000 miles, whichever occurs first.

MML or AMG (2) **Clutch Release Bearing Sleeve, Release Fork and Fork Pivot**—If effort required to depress pedal is excessive or linkage is noisy, lubricate contact surfaces.

(1) See "Crankcase Ventilation System Servicing".



■ Position for lift adapter
▲ Prepacked bearing
● Cooling system drain

Engine Coolant—Check level and/or antifreeze every 2 months.

Carburetor Fuel Filter — Replace every 24,000 miles or every 2 years, whichever occurs first.

Distributor Oil Cup—Apply 5 or 10 drops of light engine oil to cup every 6 months.

Distributor Rotor Felt Wick—When servicing breaker contacts, apply 2 or 3 drops of light engine oil to wick under rotor.

Distributor Cam and Rubbing Block—When servicing breaker contacts, apply thin film of lubricant to cam and block surfaces.

Carburetor Air Cleaner — Clean element every 6 months and replace every 2 years.

Carburetor Choke Shaft—Apply solvent to each end of shaft, where it enters air horn, every 6 months.

Manifold Heat Control Valve—Apply solvent to each end of shaft every 6 months.

Crankcase Ventilation System (1)—Inspect system and service every 6 months.

Automatic Transmission—Check fluid level every 6 months. Add fluid, if necessary, to restore to prescribed level.

Engine Tune-Up—Evaluate engine performance every 12 months or 12,000 miles, whichever occurs first, and tune, if necessary.

AMG (2) MML **Front Brake Assemblies and Wheel Bearings**—Inspect brake linings for wear and wheel bearings for lubricant every 18 months or 18,000 miles, whichever occurs first. Also lubricate pedal bushings.

AA or MP **Manual Transmission**—Check fluid level every 6 months. If below bottom of filler hole, add lubricant to restore to prescribed level.

UJ (0) **Universal Joints**—Inspect seals for external leakage or damage every 6 months. Disassemble and relubricate only if leakage is noted.

HL or MP SGL **Rear Axle and Sure Grip**—Check level every 6 months. If lower than ½ inch below bottom of filler hole, add lubricant to restore level.

Body Mechanisms—See Body Maintenance Section.

KEY TO LUBRICANTS		Part No.*
AA	Automatic Transmission Fluid, AQ-ATF, Suffix "A"	1843314
AMG (2)	Automotive Multi-Purpose Grease—NLGI-Grade 2	
AMG (EP-0)	Automotive Multi-Purpose Grease—EP-NLGI-Grade 0	
AMG (EP-2)	Automotive Multi-Purpose Grease EP-NLGI-Grade 2	
CC	Carburetor Cleaner	1643273
DCL	Cam Lubricant	1473595
EO	Engine Oil	
HL	Hypoid Lubricant	2585317
HTF	High Temperature Brake Fluid	2421352
MML	Multi-Mileage Lubricant	2525035
MP	Multi-Purpose Gear Lubricant	
PSF	Power Steering Fluid	2084329
S	Manifold Heat Control Valve Solvent	1879318
UJ (0)	Universal Joint Grease, NLGI-Grade 0	
SGL	Sure-Grip Lubricant	2585318

*See Alternate Specifications In Individual Paragraphs.

TIRE PRESSURES (PSI) (COLD)

Models	Front	Rear
All models except Station Wagons	24	24
All Station Wagons	24	28

Above pressures for Average Rated Load. See "Tires", Group 22, for tire sizes and additional pressure recommendations.

CAPACITIES

Engine Oil	(Add 1 qt. when replacing filter)	4 qts.
	Cooling System	17 qts.*
	w/Trl. Tow., A/C or CAP	18 qts.*
	Rear Axle	4 pts.
Transmission	TorqueFlite	18.5 pts.
	Manual	6 pts.
Fuel Tank	All exc. Station Wagon	25 gals.
	Station Wagon	22 gals.

*Add 1½ quarts when equipped with rear seat heater.

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Fig. 1—Lubrication Chart (Chrysler Newport, 300 and New Yorker)

LUBRICATION AND MAINTENANCE CHART

NORMAL SERVICE

Engine Oil Filter—Replace every second oil change.

Battery—Check level every 2 months.

PSF **Power Steering Reservoir**—Check level every 6 months. Add fluid, if necessary, to restore to prescribed level.

EO **Oil Filler Pipe Breather Cap (1)**—Wash in kerosene and recoil with SAE 30 engine oil every 6 months.

Engine Oil Dipstick—When refueling, check engine oil level.

EO **Engine Oil**—Drain and refill every 3 months or 4,000 miles, whichever occurs first. See Viscosity Chart below:

Multigrades

SAE 10W-30 or SAE 20W-40 Where Temperatures are consistently above 32°F.

SAE 10W-30 Suitable for year-long operation in many parts of the U.S., may be used where temperatures occasionally drop as low as −10°F.

SAE 5W-30 Recommended where minimum temperatures are consistently below +10°F.

Single Grades

SAE 30 Where temperatures are consistently above 32°F.

SAE 10W Where temperatures range between +32°F. and −10°F.

HTF **Brake Master Cylinder**—Check level every 6 months. If below ¼ inch from top of reservoir, add fluid to restore level.

MML **Front Suspension Ball Joints**—Inspect seals and joints every 6 months, or whenever car is serviced for any other reason. Replace damaged seals or joints. Relubricate every 3 years or 36,000 miles, whichever occurs first.

MML ***Steering Linkage Ball Joints***—Inspect seals and joints every 6 months, or whenever car is serviced for any other reason. Replace damaged seals or joints. Relubricate every 3 years or 36,000 miles, whichever occurs first.

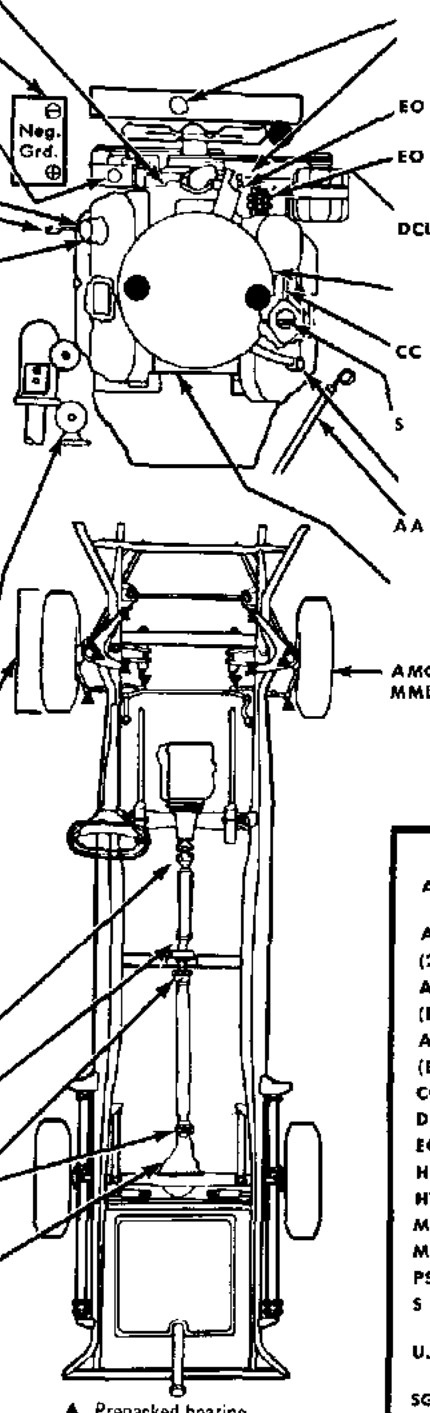
UJ (O) **Front Universal Joint**—Inspect seals for leakage or damage every 6 months.

AMG (EP-0) **Universal Joint Spline**—Inspect seals for leakage and damage every 6 months. Disassemble and relubricate only if necessary.

AMG (EP-2) **Center and Rear Universal Joints**—Inspect seals for leakage and damage every 6 months. Disassemble and relubricate only if necessary.

HL or MP SGL **Rear Axle and Sure-Grip**—Check level every 6 months. If lower than ½ inch below bottom of filler hole, add lubricant to restore level.

(1) See "Crankcase Ventilation System Servicing".



▲ Prepacked bearing

● Cooling system drain

IMPERIAL

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Engine Coolant—Check level and/or anti-freeze every 2 months.

Carburetor Fuel Filter—Replace every 24,000 miles or every 2 years, whichever occurs first.

Distributor Oil Cup—Apply 5 or 10 drops of light engine oil to cup every 6 months.

Distributor Rotor Felt Wick—When servicing breaker contacts, apply 2 or 3 drops of light engine oil to wick under rotor.

Distributor Cam and Rubbing Block—When *servicing breaker contacts*, apply thin film of lubricant to cam and block surfaces.

Carburetor Air Cleaner—Clean element every 6 months and replace every 2 years.

Carburetor Choke Shaft—Apply solvent to each end of shaft, where it enters air horn, every 6 months.

Manifold Heat Control Valve—Apply solvent to each end of shaft every 6 months.

Crankcase Ventilation System (1)—Inspect system and service every 6 months.

Automatic Transmission—Check fluid level every 6 months. Add fluid, if necessary, to restore to prescribed level.

Engine Tune-Up—Evaluate engine performance every 12 months or 12,000 miles whichever occurs first, and tune, if necessary.

AMG (2) MML **Front Brake Assemblies and Wheel Bearings**—Inspect brake linings for wear and wheel bearings for lubrication every 18 months or 18,000 miles, whichever occurs first. Also, lubricate pedal bushings.

Body Mechanisms—See Body Maintenance Section.

KEY TO LUBRICANTS

		Part No.*
AA	Automatic Transmission Fluid, AQ-ATF, Suffix "A"	1843314
AMG (2)	Automotive Multi-Purpose Grease—NLGI-Grade 2	
AMG (EP-0)	Automotive Multi-Purpose Grease—EP-NLGI-Grade 0	
AMG (EP-2)	Automotive Multi-Purpose Grease EP-NLGI-Grade 2	
CC	Carburetor Cleaner	1643273
DCL	Cam Lubricant	1473595
EO	Engine Oil	
HL	Hypoid Lubricant	2585317
HTF	High Temperature Brake Fluid	2421352
MML	Multi-Mileage Lubricant	2525035
MP	Multi-Purpose Gear Lubricant	
PSF	Power Steering Fluid	2084329
S	Manifold Heat Control Valve Solvent	1879318
UJ (O)	Universal *Joint Grease*, NLGI-Grade 0	
SGL	Sure-Grip Lubricant	2585318

*See Alternate Specifications In Individual Paragraphs.

CAPACITIES

Engine Oil (Add 1 qt. when replacing filter)	5 qts.
Cooling System (including heater)	18 qts.
Rear Axle	4 pts.
Transmission	18.5 pts.
Fuel Tank	23 gals.

(See "Fuel" Section for proper cap application *and fuel tank venting.*)

TIRE PRESSURES (PSI) (COLD)

Models	Front	Rear
All models except Convertible Coupe	22	22
Convertible Coupe	24	24

Above pressures for Average Rated Load. See "Tires", Group 22, for tire sizes and additional pressure recommendations.

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Fig. 2—Lubrication Chart—Imperial

LUBRICATION AND MAINTENANCE

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CERTIFIED CAR CARE

Certified Car Care is a thorough servicing program that helps make sure the cars you sell receive the regular attention you know they need.

Certified Car Care helps build business for you in the best way known—through customer satisfaction. Inform your customers that the best approach to trouble-free driving is Certified Car Care.

This is a practical plan to help you build up sales and service volume, by providing regular service customer visits.

SUMMARY OF LUBRICATION AND MAINTENANCE SERVICES

Maintenance and lubrication service recommendations for the 1966 Chrysler Corportion-built vehicles have been compiled to provide maximum protection for the car owner's investment against all reasonable types of driving conditions.

Since these conditions vary with the individual car owner's driving habits, the area in which the car is operated and the type of service to which the car is subjected, it is necessary to prescribe lubrication and maintenance service on a time frequency as well as mileage interval basis.

Vehicles operated under conditions not classified as normal service for passenger cars, such as in trailer towing service; operation at higher than normal loading or police or taxicab operation, require servicing at more frequent intervals. This information is included in each group under appropriate headings.

Information pertaining to Lubrication and Maintenance requirements is shown on charts (Figs. 1 and 2) and on page 5.

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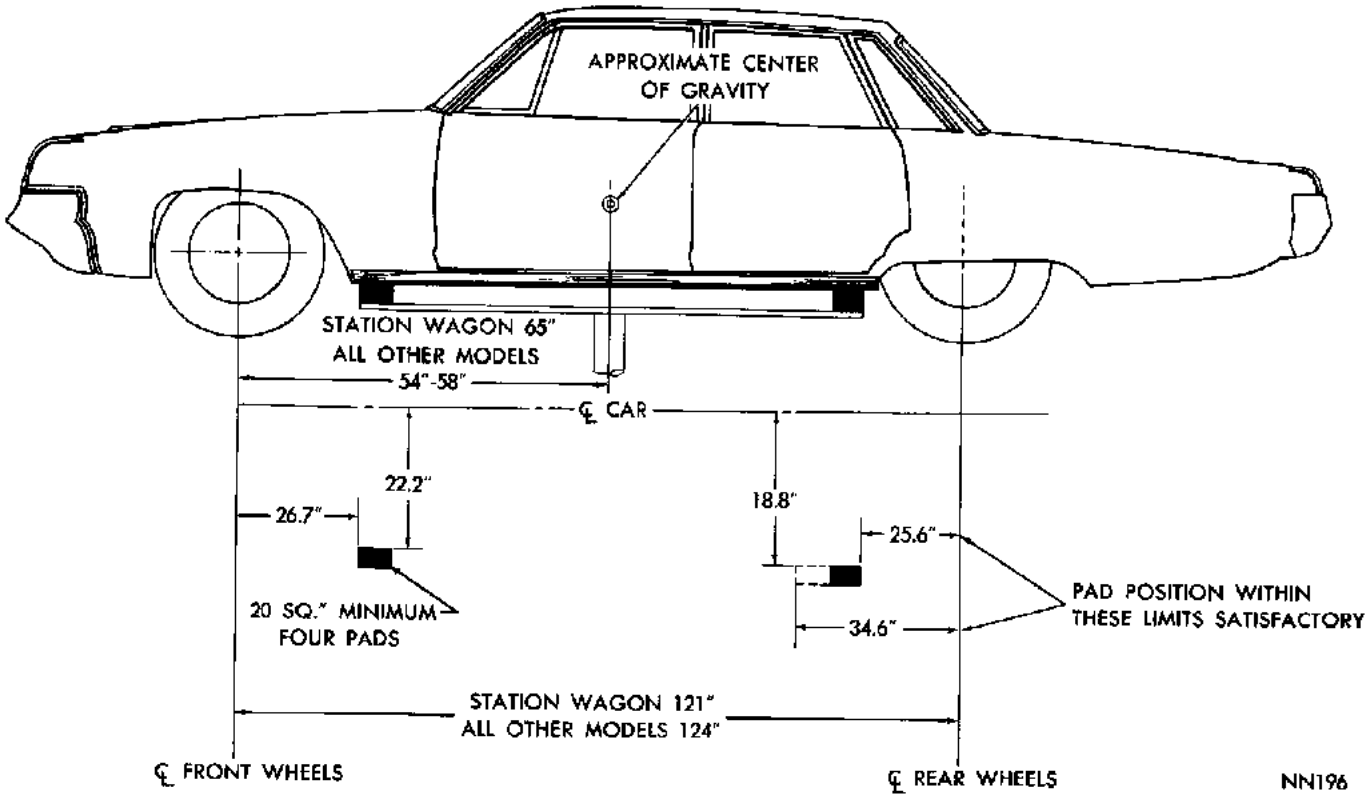


Fig. 3—Support Locations for Frame Contact Hoisting (Chrysler Models)

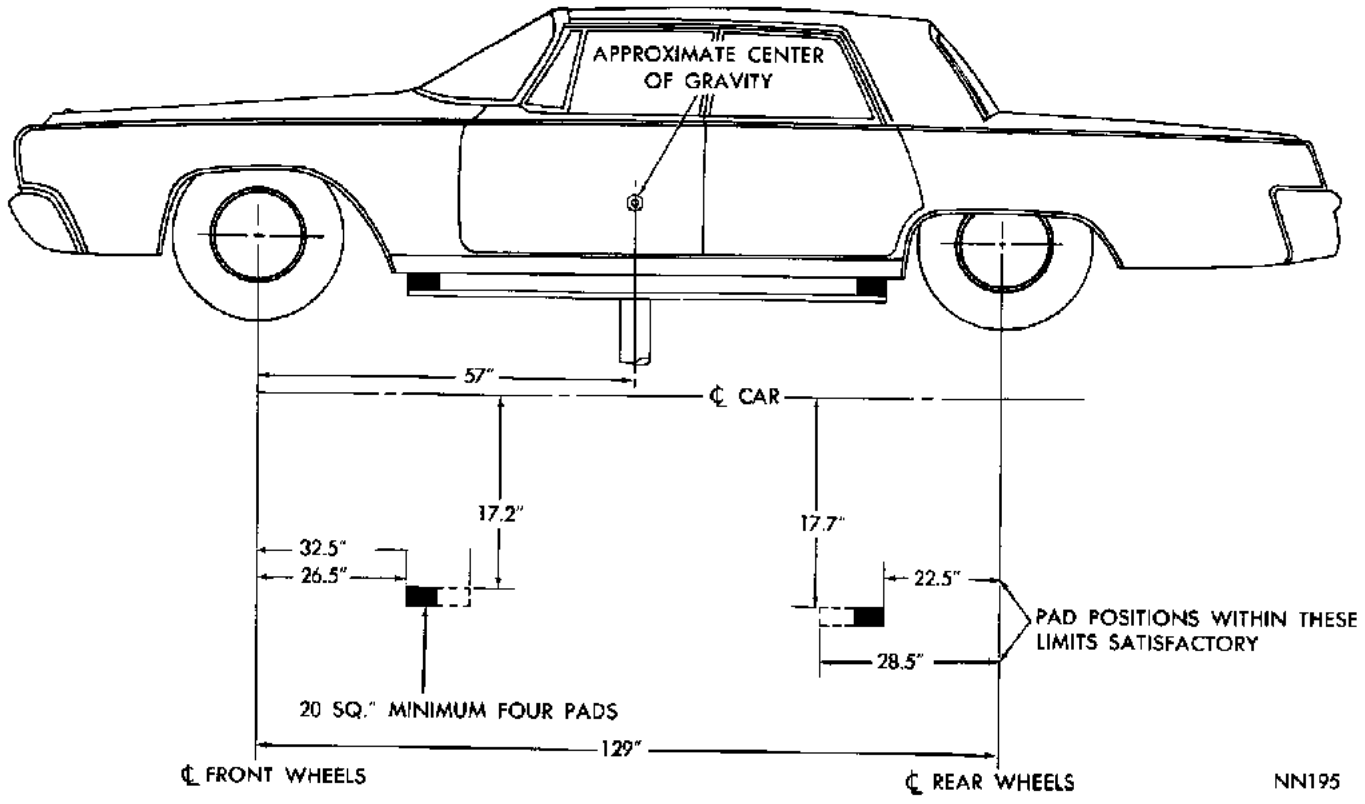


Fig. 4—Support Locations for Frame Contact Hoisting (Imperial Models)

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LUBRICATION AND MAINTENANCE SERVICES

SERVICE INTERVAL	ITEM	PAGE	SERVICE: Replace	Check Fluid Level	Inspect and/or Clean	Lubricate	Service
3 Months or 4,000 Miles, whichever occurs first	Engine Crankcase Oil	10	X				
Every Second Oil Change	Engine Oil Filter	11	X				
	Rotate Tires	19					X
Every 6 Months	Carburetor Air Cleaner	14			X		
	Crankcase Ventilation System	12			X		X
	Carburetor Choke Shaft	14					X
	Oil Filler Pipe Breather Cap	12			X	X	X
	Manifold Heat Control Valve	13					X
	Distributor	9				X	
	Transmission	17 & 18		X			
	Rear Axle	7		X			
	Steering Gear	17		X			
	Steering Linkage	6			X		
	Suspension Ball Joints	6			X		
	Universal Joints	10			X		
	Propeller Shaft Spline (Imperial)	17			X		
	Brake Master Cylinder	8		X			
	Brake Hoses	7			X		
	Body Mechanisms	20			X	X	
	Headlight Aiming	9					X
Every Year	Cooling	9					X
	Crankcase Ventilator Valve (All Systems)	12	X				
Every 12 Months or 12,000 Miles, whichever occurs first	Engine Performance Evaluation	13					X
Every 18 Months or 18,000 Miles, whichever occurs first	Brakes, Brake Linings and Brake Linkage Bushings	7			X	X	
	Front Wheel Bearings	19			X		
Every 2 Years	Carburetor Air Cleaner	14	X				
Every 2 Years or 24,000 Miles, whichever occurs first	Fuel Filter	15	X				
Every 3 Years or 36,000 Miles, whichever occurs first	Front Suspension Ball Joints	6				X	
	Steering Tie Rod Ends	6				X	
	Clutch Torque Shaft	8				X	
When Necessary	Spark Plugs—See Engine Performance Evaluation	13					X
	Speedometer Cable	19				X	
	Clutch Release Bearing Sleeve, Fork Fingers and Pivot	9				X	
	Column-Mounted Gearshift Linkage	18				X	
	Wheel Brakes	7					X
	Parking Brakes	8					X
Points That Should Not Be Lubricated		24					

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CLASSIFICATION OF LUBRICANTS

Oils and lubricants are classified and graded according to standards recommended by the Society of Automotive Engineers (SAE), the American Petroleum Institute (API) and the National Lubricating Grease Institute (NLGI).

Engine Oil

The SAE grade number indicates the viscosity of engine oils, for example SAE 30, which is a single grade oil. Engine oils are also identified by a dual number, for example SAE 10W-30, which indicates a multigrade oil.

The API designation indicates the classification of engine oils for use under certain operating conditions. Only engine oils designated "For Service MS" should be used. These oils contain sufficient chemical additives to provide maximum engine protection. Both the SAE grade and the API designation must be found on the container.

Gear Lubricants

The SAE grade number also indicates the viscosity of Multi-Purpose Gear Lubricants, defined by MIL-L-2105B. An example is SAE 75, which is a light viscosity lubricant.

Lubricants—Greases

Semi-solid grease lubricants, such as specified for propeller shaft universal joints, bear the NLGI designation. They are further classified as grades "0" or "2."

HOISTING

Special care should be taken when raising the vehicle on a frame contact type hoist. The hoist must be equipped with the proper adapters in order that the vehicle will be supported in the correct locations (Figs. 3 and 4).

Conventional hydraulic hoists may be used after determining that the adapter plates will make firm contact with the lower control arms and the rear axle housing.

A regular floor jack may be used under the rear axle housing, or under the front suspension lower control arms, **however, a floor jack must never be used on any parts of the underbody.**

CAUTION: Do not attempt to raise one entire side of the vehicle by placing a jack midway between front and rear wheels. This practice may result in permanent damage to the body.

The bumpers are designed to accept a bumper jack in an emergency, if it becomes necessary to change a tire on the road. Notches are provided in the bumpers for the purpose of raising the vehicle with the bumper jack.

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CHASSIS LUBRICATION

Front Suspension Ball Joints

The front suspension ball joints (Fig. 5) are semi-permanently lubricated with special lubricant at the factory. Relubrication is required every 3 years or 36,000 miles, whichever occurs first. The ball joints, however, should be inspected every six months, or whenever vehicle is serviced for other reasons, for damage to the seals which can result in loss of lubricant. Clean accumulated dirt and lubricant from outside surface of seals to permit thorough inspection. Replace damaged seals or joints immediately to prevent contamination of lubricant or damage to parts. Lubricate ball joints, if necessary.

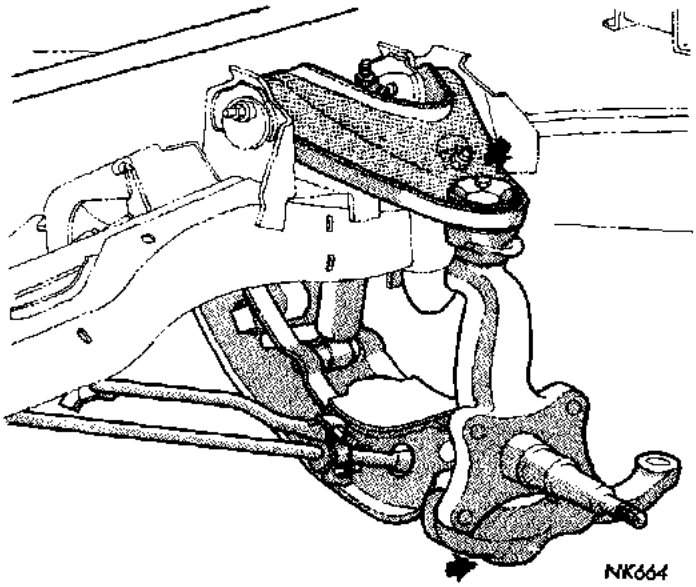


Fig. 5—Upper and Lower Ball Joint Lubrication Points (Newport, 300, New Yorker)

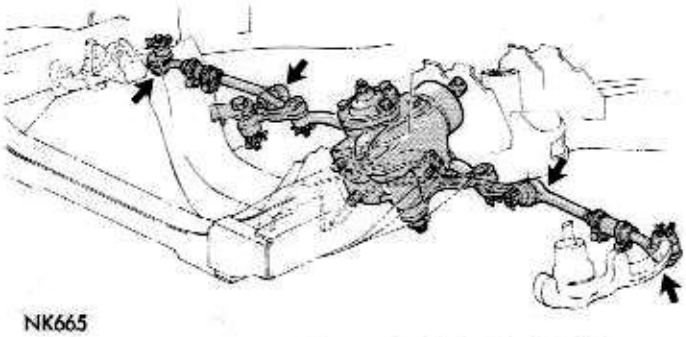
When lubricating control arm ball joints, use only the special long-life chassis greases intended for this purpose. Multi-Mileage Lubricant, Part Number 2525035, is a lubricant of this type recommended for all Chrysler Corporation vehicles. Remove threaded plug from each ball joint and **temporarily** install lubrication fittings. Inject lubricant until it flows freely from seal bleed area at base of seal. Stop when seal begins to balloon. Remove fittings and reinstall threaded plugs.

CAUTION: If high pressure lubrication equipment is used, stop filling when lubricant begins to flow freely from bleed area at base or at the top of the seal, or if the seal begins to balloon.

Steering Linkage Ball Joints

The four tie rod end ball joints and the steering gear arm ball joint (Fig. 6) are semi-permanently lubricated with a special lubricant at the factory.

Relubrication of tie rod ball joints is required every



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Fig. 6—Steering Linkage Lubrication Points

3 years or 36,000 miles, whichever occurs first. The ball joints, however, should be inspected every six months, or whenever vehicle is serviced for other reasons, for damage to seals which can result in loss of lubricant.

When inspecting ball joints, clean accumulated dirt and lubricant from outside surfaces of seals to permit thorough inspection. Replace damaged seals or joints immediately to prevent contamination of lubricant or failure of parts. Lubricate ball joints, if necessary.

When lubricating steering linkage ball joints, use only the special long-life chassis greases intended for this purpose. Multi-Mileage Lubricant Part Number 2525035 is a lubricant of this type recommended for all Chrysler Corporation vehicles. Remove threaded plug from each ball joint and **temporarily** install lubrication fittings. Inject lubricant until it flows freely from seal bleed area at top or base of seal. Stop when seal begins to balloon. Remove fittings and reinstall threaded plugs.

CAUTION: High pressure lubrication equipment may be used if care is taken to use an extremely slow flow rate to allow time to observe the lubricant bleed from the seal base.

REAR AXLE

Standard and Sure-Grip

The lubricant installed in the rear axle at time of assembly is a high quality product and regularly scheduled changes of the lubricant are not recommended in vehicles where operation is classified as normal passenger car service. The only exceptions, however, would be where the lubricant has become contaminated with water, or in the case of the **standard** rear axle, to provide the correct viscosity grade for the anticipated temperature range, as indicated by the accompanying table:

Anticipated Temperature Range		Viscosity Grade
Above	−10°F.	SAE 90
As low as	−30°F.	SAE 80
Below	−30°F.	SAE 75

If necessary to change lubricant, remove old lubricant with a suction pump (Fig. 7).

The fluid level, however, should be checked every six months. When checking the level, vehicle should be in a level position on a wheel or axle-type hoist. The level should be between the bottom of the filler plug hole to one-half inch below.



Fig. 7—Removing Rear Axle Lubricant

To restore level in the standard rear axle, if necessary, add sufficient quantity of multi-purpose gear lubricant, as defined by MIL-L-2105B. Such a lubricant is available under Part Number 2585317, Hypoid Gear Lubricant.

Use the correct viscosity grade for the anticipated temperature ranges previously mentioned.

In Sure-Grip axles, use only the special multi-purpose gear lubricant intended for use in limited-slip differentials. Such a lubricant is available under Part Number 2585318, Special Sure-Grip Lubricant.

Trailer Towing Service

For vehicles equipped for trailer towing service, the rear axle lubricant should be changed periodically. Drain and refill the axle with the specified lubricant every 36,000 miles or 3 years, whichever occurs first.

If the axle is submerged in water, such as on a boat launching ramp where water can enter the axle vent, and contamination is suspected or evident, replace the lubricant immediately to avoid early axle failure.

BRAKES

The brakes on all models equipped with drum brakes, except for some police cars and high-performance models, are equipped with self-adjusting features which make it unnecessary to perform major brake adjustments.

Inspect brake linings for wear every 18 months or 18,000 miles, whichever occurs first. At this time, lubricate contact areas of brake shoe supports with a very thin film of high-temperature, silicone type lubricating compound. Such a lubricant is available

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under Part Number 1881923, Sil-Glide.

To perform this service, remove brake shoes and clean contact areas. Smooth down with sandpaper before applying Sil-Glide.

HYDRAULIC BRAKE SYSTEM

Every six months check fluid level in master cylinder (Fig. 8). The level should be within one-quarter inch of top of reservoir.

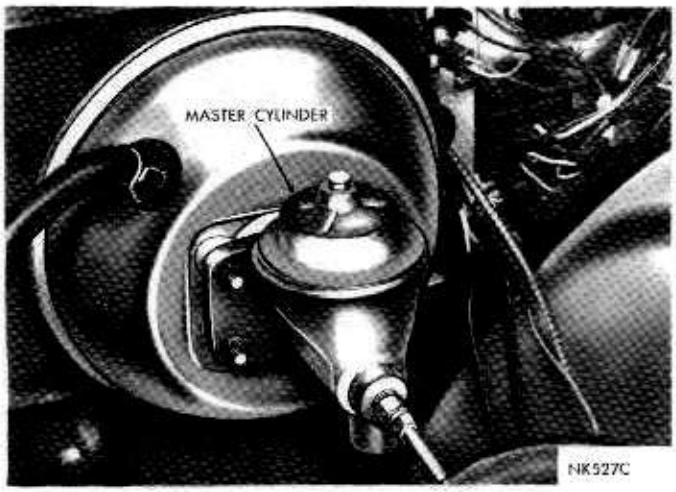


Fig. 8—Master Cylinder

CAUTION: Before removing master cylinder cover and screw, wipe them clean to prevent dirt and other foreign matter from dropping into reservoir.

Replenish fluid, when necessary, with Heavy Duty Hydraulic Brake Fluid, conforming to SAE 70R3 for best brake performance and greater safety. Such a fluid is available under Part Number 2421352, Hi-Temp Brake Fluid.

Inspect brake hoses for cracking, abrasions, cuts or tears in outer covering. Examine all connections for fluid leakage and correct where necessary.

The plastic bushings at the upper end of the brake pedal should be serviced every 18 months or 18,000 miles, whichever occurs first, or at time of major brake service. The bushings, located on the brake pedal pivot on all models, should be removed, thoroughly cleaned and relubricated with an automotive multi-purpose grease such as Multi-Mileage Lubricant, Part Number 2525035.

PARKING BRAKE MECHANISM

All models use a foot-operated lever (Fig. 9). Pivot points indicated should be lubricated occasionally to maintain ease of operation.

Apply a film of smooth, white body hardware lubricant conforming to NLGI, grade 1. Lubriplate, Part Number 1064768, is a type of lubricant recommended for this purpose.

When the foot pedal can be depressed more than four and one half inches, the brake cable should be adjusted. For adjusting procedure, refer to "Parking Brakes," Group 5.

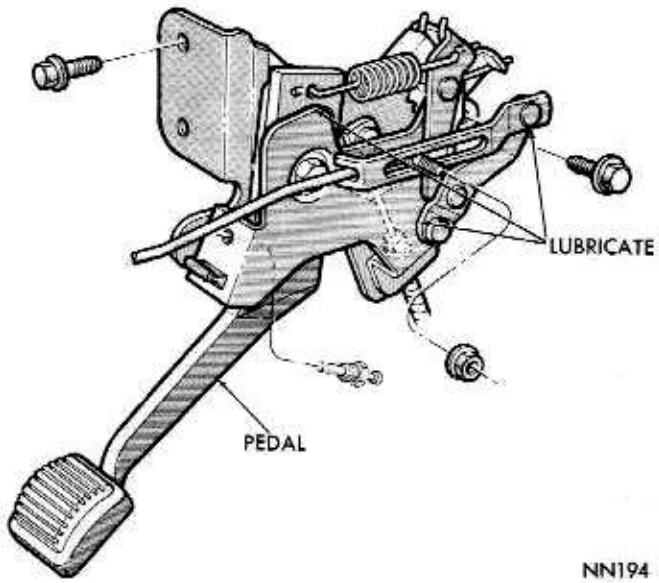


Fig. 9—Foot-Operated Parking Brake

CLUTCH LINKAGE (Manual Transmission)

Clutch Torque Shaft Bearings

Inspect clutch torque shaft bearings (Fig. 10) for wear and relubricate every 3 years or 36,000 miles, whichever occurs first. To perform this service, refer to "Clutch," Group 6. After removing torque shaft assembly, disassemble and thoroughly clean all parts in a suitable solvent and inspect for wear. Damaged bearings and/or ball studs should be replaced.

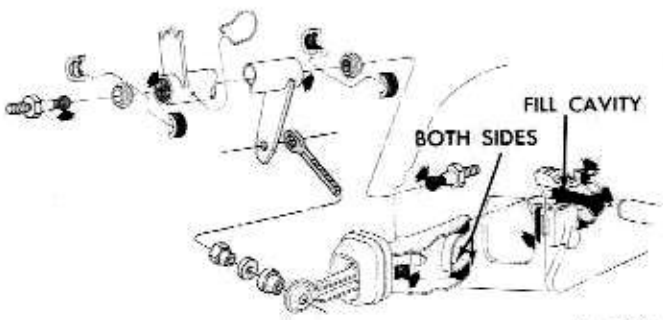


Fig. 10—Clutch Torque Shaft and Linkage Lubrication Points

When reassembling shaft, coat inside surfaces at ends of shaft, inside and outside surfaces of bearings and ball studs (Fig. 10) with Multi-Mileage Lubricant, Part Number 2525035, or Automotive Multi-Purpose Grease, NLGI grade 2.

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Clutch Release Bearing Sleeve, Release Fork and Fork Pivot

Whenever the effort required to depress the clutch pedal becomes excessive, or when servicing clutch torque shaft bearings, lubricate sleeve, fork and pivot (Fig. 10). To gain access to these areas, remove clutch inspection plate at bottom of clutch housing, the fork seal and the fork.

CAUTION: Care must be taken to avoid getting lubricant on clutch disc and/or pressure plate.

Fill cavity in sleeve and coat release fork pads on sleeve (Fig. 10) with Multi-Mileage Lubricant, Part Number 2525035, or Automotive Multi-Purpose Grease, NLGI grade 2. Apply a film of same lubricant on contact areas of fork fingers, pivot contact area of fork and fork pivot.

COOLING SYSTEM

Inspect coolant level every two months and refill as necessary.

Drain, flush and refill cooling system once a year, preferably in the Fall. If the system contains a considerable amount of sediment, clean and flush with a reliable cooling system cleaner. Follow with a thorough rinsing to remove all deposits.

Drain cooling system by removing drain plugs in sides of cylinder block and open drain cock in lower radiator tank.

On Chrysler models equipped with rear seat heater, drain heater by removing hose clamps at rear on underbody panel and disconnect hoses at heater connections. **Discard old solutions.**

All models are equipped with 180 degree thermostats and only permanent type anti-freeze should be used. Alcohol base anti-freeze products should not be used because of their low boiling point. The use of 160 degree thermostats is **not** recommended, especially for vehicles equipped with air-conditioning.

Refill cooling system with water and a suitable high quality, permanent type anti-freeze, in sufficient quantity to protect the system against freezing during cold weather seasons. A suitable high quality permanent type anti-freeze is available under Part Number 1316209.

When vehicle is operated in areas where protection from freezing is not required, and vehicle is not equipped with Air Conditioning, refill cooling system with clean water and add a high quality corrosion inhibitor, such as Chrysler Rust Resistor, Part Number 2421778. This need not be done until the first yearly service.

ALTERNATOR

The alternator is provided with prelubricated bearings, which require no periodic lubrication.

The outside of the alternator should be wiped clean and ventilating holes inspected for an accumulation of dirt which would obstruct the flow of air. Refer to "Electrical," Group 8, for complete servicing of the alternator.

BATTERY

Check fluid level every two months, and more often in hot weather and on long trips. Fill cells, if necessary, using only water of a known low mineral content, until water is ⅜ inch above plates. **Do not overfill.**

Check specific gravity, using a reliable hydrometer, every 12 months or 12,000 miles, whichever occurs first, or more often if there is excessive use of water. Clean battery posts and cable terminals and tighten terminals. Coat connections with light mineral grease or petrolatum.

Refer to "Electrical," Group 8, for complete servicing.

DISTRIBUTOR

Apply 5 to 10 drops of light engine oil into distributor oil cup (Fig. 11) every six months.



Fig. 11—Distributor Lubrication Points

Whenever breaker contacts are serviced, lubricate cam surfaces. Wipe old lubricant from cam and rubbing block (Fig. 11) and apply a thin film of Cam Lubricant, Part Number 1473595, or equivalent. At this time, apply 2 or 3 drops of light engine oil to felt wick under rotor.

CAUTION: Avoid over-oiling and applying an excessive amount of cam lubricant to prevent lubricants from spreading to breaker contacts.

HEADLIGHTS

One of the most important factors in automobile safety, is the correct aiming of the headlights Changes in suspension, such as front suspension height and/or deflection of rear springs due to heavy

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loading, will change the headlight beam pattern and may cause unsafe night time driving conditions. Therefore, it is recommended that headlight aiming be checked every six months.

If a vehicle is abnormally loaded, such as for a vacation trip, or with a salesman's products, the headlight aiming should be checked and adjusted to serve the new conditions. Refer to "Electrical Group," Group 8, for adjusting procedures.

WINDSHIELD WIPER BLADES

Long exposure to heat and road splash tend to harden the rubber wiper blades, thus destroying their efficiency. When blades smear or in general do not satisfactorily clean the windshield, they should be replaced.

To replace, depress release on top of blade bridge and slide out rubber blade. Slide new rubber blade refill into bridge to lock it in place. Refer to Parts List for correct rubber blade refill.

ENGINE OIL—SELECTION OF

For best performance, and to provide for maximum protection of all engine for all types of operation, only those lubricants should be selected which:

(a) Conform to the requirements of the API classification "FOR SERVICE MS."

(b) Have the proper SAE grade number for the expected temperature range.

Oil Viscosity Recommendations

Multigrades

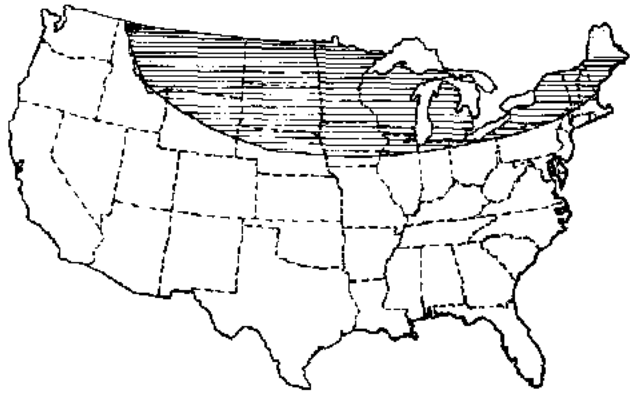
SAE 20W-40 or SAE 10W-30	Where temperatures are consistently above 32°F.
SAE 10W-30	Suitable for year long operation in many parts of the U.S.; may be used where temperatures occasionally drop as low as −10°F.
SAE 5-W20	Recommended where minimum temperatures are consistently below +10°F.

Single Grades

SAE 30	Where temperatures are consistently above 32°F.
SAE 10W	Where temperatures range between + 32°F. and −10°F.

Low viscosity oils make engine starting easier in cold weather. Modern SAE 5W-20 grade oils have been subjected to extensive engineering evaluation and may be safely used as recommended. As stated in the accompanying chart (Fig. 12), when **minimum** temperatures may be consistently below +10°F. during some winter months, oils of the SAE 5W-20 viscosity may be used. If your region is in the shaded area, SAE 5W-20 oil should be used during the winter months.

Lubricants which do not have both an SAE grade number and an MS Service classification on the container **should not** be used.



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Fig. 12—Shaded Area Covers Region where Minimum Temperatures of +10°F. are Consistently Reached During Winter Months

MATERIALS ADDED TO ENGINE OILS

It is not necessary to add any other products to engine oils for most types of driving when MS quality oils are used.

In some instances, such as infrequent operation or short trips only, and during break-in after a major overhaul, addition of special materials containing anti-rust and anti-scuff additives is beneficial. A suitable product for this purpose is available under Part Number 1879406, Engine Oil Supplement.

FREQUENCY OF OIL CHANGES

The engine oil should be changed every three (3) months, or 4,000 miles, whichever occurs first.

During Break-In

Cars should be driven moderately during the first 300 miles. After the initial 50 miles, speeds up to 50 to 60 mph are desirable. While cruising, brief full-throttle acceleration contribute to a good break-in. Wide-open throttle accelerations in low gear can be detrimental and should be avoided for at least 500 miles.

The oil installed in the engine at the factory is a high quality lubricant, classified "For Service MS," and **should be retained** until the first regularly scheduled three-month or 4,000 mile oil change, whichever occurs first. If it becomes necessary to add oil during this initial period, an oil with the "For Service MS" classification and of the proper viscosity grade should be used. **Nondetergent or straight mineral oils must never be used.**

Frequently, a new engine will consume some oil during its first few thousand miles of operation. This should be considered as a normal part of the break-in and not to be interpreted as an indication of difficulty.

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Severe Operating Conditions

Severe operating conditions, such as frequent driving on dusty roads, or in sandy geographic areas, or unusually short trip driving in cold weather may reasonably require oil changes more frequently than every three months. Under these conditions, consult and follow the advice of any Chrysler Motors Corporation Authorized Dealer's Service Manager.

Taxi and Police Operation

Severe service such as taxi and city police driving, which are principally short trip operations including frequent and prolonged idling, require more frequent oil changes on a regular schedule. For this service, it is recommended that engine oil be changed every two months, not to exceed 2,000 miles. Replace filter every second oil change.

ENGINE OIL FILTER

All engines are equipped with full-flow, throw-away oil filters (Fig. 13) to provide efficient filtering of engine oil for maximum engine protection.

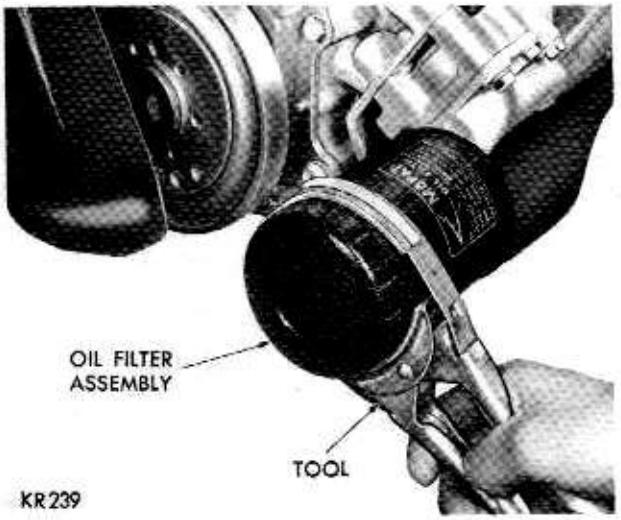


Fig. 13—Removing Engine Oil Filter (383, 440 Cu. In. Engines)

The filter should be replaced every second oil change. Since filters vary widely in quality, it is recommended that a Chrysler Corporation Engine Oil Filter, or equivalent, be used for replacement to assure efficient service.

CRANKCASE VENTILATION SYSTEM

Two types of crankcase ventilation systems will be found on Chrysler and Imperial models. A brief description follows to provide easy identification so that proper service procedures may be applied.

The **Standard Ventilation System** (Fig. 14) consists of a ventilator valve and cap mounted on the right hand rocker cover, a carburetor with drilled passages in the throttle body, a hose leading from the valve cap to the throttle body passages and the oil filler pipe breather cap.

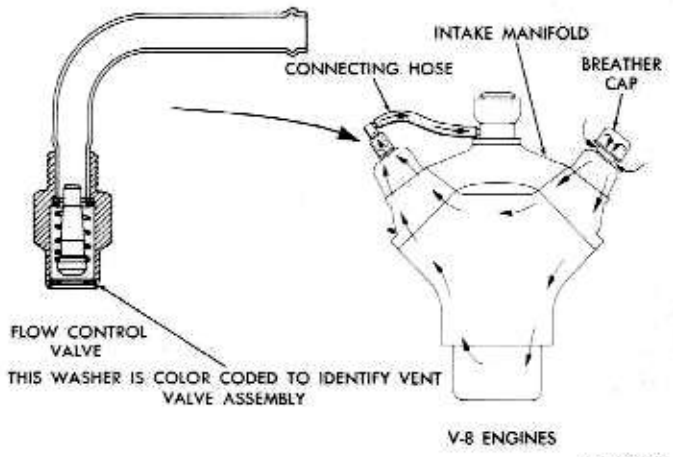


Fig. 14—Standard Crankcase Ventilation System

The **Closed Ventilation System** (Fig. 15) is basically the same as the Standard System except that it contains a **closed** oil filler pipe breather cap (Fig. 16) and a hose connecting the cap to the carburetor air cleaner housing. In addition, the air cleaner filter element is provided with a plastic mesh outer wrapper (Fig. 17).

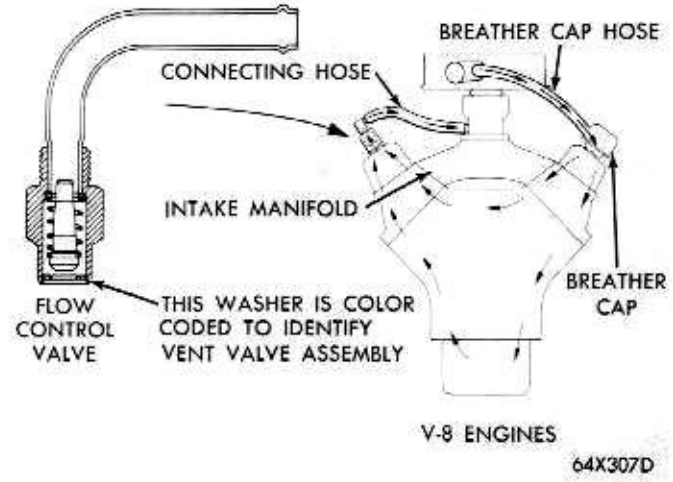


Fig. 15—Closed Crankcase Ventilation System

Cleaner Air Package

The crankcase ventilation system utilizing the Cleaner Air Package (Fig. 18) is basically the Closed Crankcase Ventilation System (Fig. 15) combined with a system of exhaust emission control through timing and carburetion. This is provided through the use of a modified carburetor, an altered distributor and a special vacuum control valve.

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Fig. 16—Closed Type Breather Cap

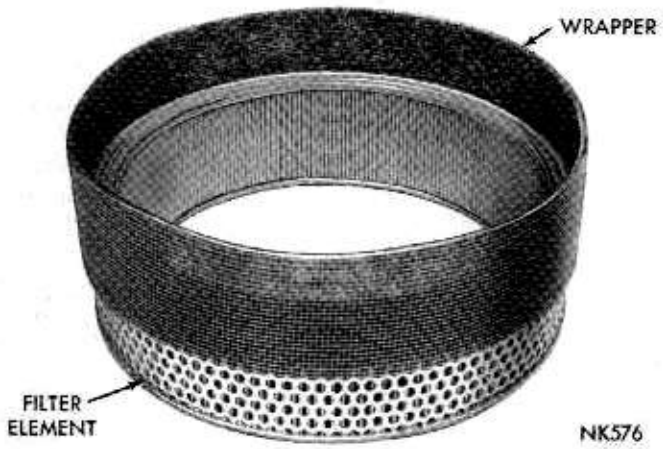


Fig. 17—Carburetor Air Cleaner Element and Wrapper

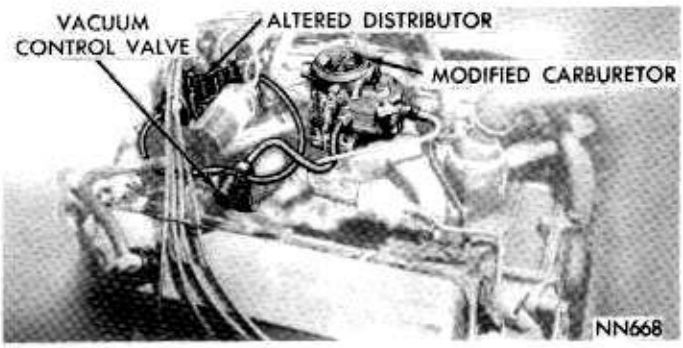


Fig. 18—Cleaner Air Package (Typical)

Servicing Procedures

Periodic servicing of the crankcase ventilation system is required to maintain good engine performance and prevent malfunction of the system because of combustion products deposited in the valve, hose and carburetor passages.

Standard System

Every six months clean and service the system as outlined. Replace valve every year.

In cases of severe service, such as experienced in police, taxicab or other operation involving short trips with prolonged idling, it is recommended that the system be checked for operation with **every oil change** and serviced as required.

With engine idling, remove ventilator valve assembly from right hand rocker cover (Fig. 14). If valve is working freely, a hissing noise will be heard as air passes through the valve, and a strong vacuum should be felt when a finger is placed over the valve inlet.

If valve is working properly, reinstall ventilator valve assembly and remove oil filler pipe breather cap. With engine idling, loosely hold a piece of stiff paper or a parts tag over oil filler pipe. After allowing about a minute for crankcase pressure to reduce, the paper should be drawn against filler pipe with a noticeable force. If this occurs, a final check should be made to be certain valve shuttle is free.

Shut off engine, remove valve and shake it vigorously. A clicking noise should be heard if valve shuttle is free. If noise is heard, valve is satisfactory and no further service is necessary.

If valve does not click when shaken, or the paper is not drawn against filler pipe with a noticeable force, replace valve and recheck system.

Do not attempt to clean valve. Replace it with a new one. Use valves that have a black end washer.

Remove ventilator valve hose (Fig. 14) from cap and carburetor. Inspect it for deposits and clean, if necessary.

Remove breather cap (Fig. 14) and wash it thoroughly in kerosene or other suitable solvent to remove all old oil and dirt. Reoil filter element with SAE 30 engine oil.

Service air cleaner filter element every six months, as outlined on page 14, and replace filter element every two years. Use a Chrysler Corporation filter element or equivalent for replacement.

Remove carburetor. Hand turn a ¼ inch drill through the passages to dislodge solid particles.

CAUTION: Under no circumstances should metal be removed. Use a smaller drill, if necessary. Blow passages clean. It is not necessary to disassemble the carburetor for this service.

Closed Ventilation System

Service system with the wrapper air cleaner every six months, as outlined for the standard system. Replace valve every year. Service air cleaner filter element every six months, as outlined on page 14, and replace filter element and wrapper every two years.

If vehicle is used extensively for short trips with frequently idling, these services will be required more frequently.

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Cleaner Air Package

Service the crankcase ventilation system on vehicles equipped with this package as outlined on page 12.

The carburetor, distributor and vacuum control valve are serviced as outlined in "Fuel System, Group 14 and Ignition System," Group 8.

Taxi and Police Operation

For this type of service, the crankcase ventilation system should be serviced at each oil change. A suggested practice for taxi and police operations is to maintain spare valves, installing a clean valve at each oil change. Valves so removed can be cleaned by soaking overnight in carburetor cleaner, followed by drying with compressed air.

Carburetor Air Cleaner

Remove air cleaner from carburetor and remove filter element from cleaner. Remove gauze wrapper from element (Fig. 17). The wrapper helps prevent oil wetting of the element by collecting condensed oil vapors on its surface. Wash wrapper in kerosene or other suitable solvent to remove dirt and oil. Examine filter element. If it is dry or has only one or two oil-wetted spots, clean by gently blowing out dirt from element with compressed air (Fig. 21). Hold air nozzle about two inches from inner screen.

If element is saturated with oil for more than one-half of its circumference, replace it with a new element. Noticeable quantities of oil on filter indicate a malfunctioning of the ventilation system due to a sticking valve or excessive deposit build-up in ventilation system. Normally, filter element and wrapper should be replaced every two years. Use a Chrysler Corporation filter element or equivalent for replacement.

If vehicle is used extensively for short trips with frequent idling, these services will be required more frequently.

ENGINE PERFORMANCE EVALUATION

Engine operating efficiency depends on correct ignition, carburetor adjustments, and on valve lash where applicable. To obtain best engine performance, Chrysler Corporation recommends that the engine be evaluated every 12 months or 12,000 miles, whichever occurs first, and tuned, if necessary. Services performed during this evaluation should include the following:

1—Spark Plugs—Remove and inspect each spark plug. Most plugs can be cleaned, adjusted, and reinstalled. Rough idle, hard starting, frequent engine miss at high speeds, or apparent physical deterioration are indications that the spark plugs should be replaced.

2—Distributor—Clean and inspect distributor cap and rotor if requred. Check breaker contacts for abnormal pitting, bluing, or misalignment, and adjust. Lubricate cam and wick, (see page 9). Be sure that all distributor secondary wires and tower caps are clean and connected properly. See "Electrical Group" for ignition timing procedures and settings.

3—Carburetor—Remove and clean air filter. Check operation of manifold heat control valve and choke diaphragm; use solvent recommended. Clean crankcase ventilation system, (see page 12). See "Fuel System Group" for carburetor adjustment procedures.

4—Battery—Check specific gravity. Clean and tighten terminals; apply grease to post and terminals. Check circuit voltages as directed in the "Electrical Group."

5—Starting Motor—Test cranking ability as described in "Electrical Group."

6—Valve Lash (where applicable)—Should an engine continue to be noisy and the idle rough after a tune-up, adjust valve lash to specifications. Refer to the "Engine Group" for lash values and instructions.

MANIFOLD HEAT CONTROL VALVE

Freedom of movement of the heat control valve, by removing lead deposits from the valve shaft bearings, is assured by application of suitable solvent. Such a solvent is available under Part Number 1879318, Manifold Heat Control Valve Solvent.

Every six months apply solvent to each end of valve shaft at bushings (Fig. 19). Apply solvent when manifold is **COOL.** Allow solvent to soak a few minutes, then work valve shaft back and forth until it works freely.

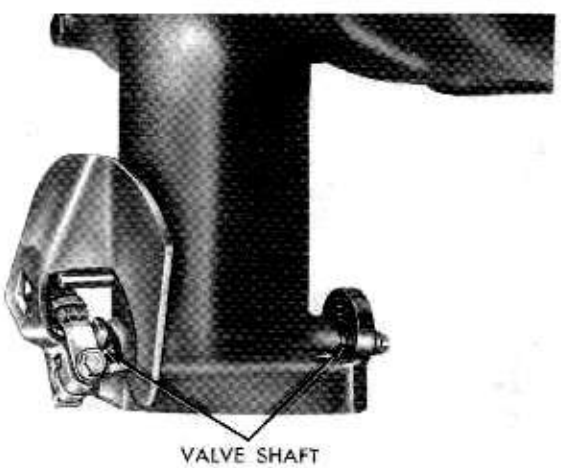


Fig. 19—Manifold Heat Control Valve (383, 440 Cu. In. Engines)

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CARBURETOR AIR CLEANER (Paper Element Type)

The paper filter element (Fig. 20) in the carburetor air cleaner should be cleaned every six months and replaced every two years. Use a Chrysler Corporation filter element or equivalent for replacement.



Fig. 20—Carburetor Air Cleaner

To clean, remove air cleaner from carburetor. Remove cover and filter element and clean cover and housing. Using compressed air, gently clean element by holding air hose nozzle at least two inches from the inside screen (Fig. 21).

CAUTION: Do not use compressed air on outside surface of element as this will embed foreign matter in the element paper.

Examine element for punctures. Discard an element that has small pin-point punctures. Examine soft plastic sealing rings on both sides of element for smoothness and uniformity. Replace if not satisfactory.

At this time, also service the Carburetor Choke Shaft, as outlined below.

CARBURETOR CHOKE SHAFT

Gum deposits on choke shaft bearings may be removed by applying a gum solvent. Such a solvent is available under Part Number 1643273, Carburetor Cleaner. This will assure freedom of movement of choke shaft.

Every six months, with air cleaner removed, apply cleaner to ends of choke shaft where it rotates in the air horn (Fig. 22). At the same time, move choke shaft back and forth until deposits are flushed out.

Run engine at idle to clean out any excess cleaner from carburetor and intake manifold.

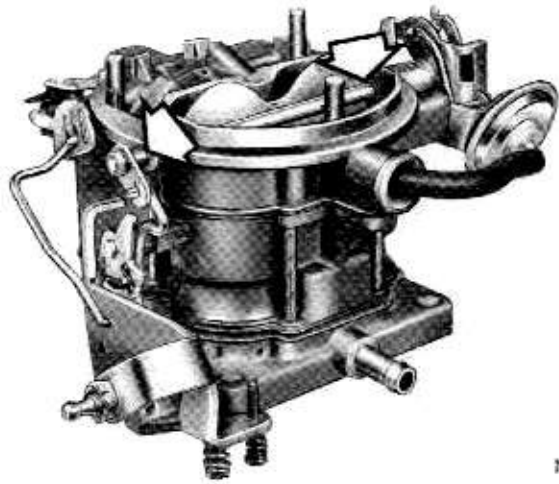


Fig. 22—Apply Solvent to Choke Shaft Ends



Fig. 21—Cleaning Filter Element

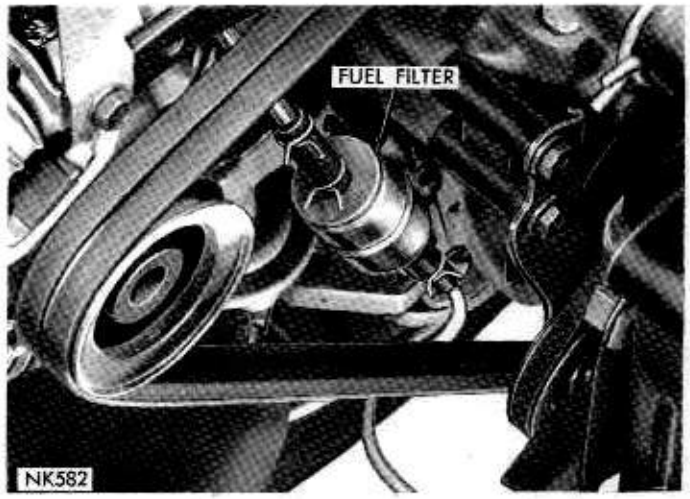


Fig. 23—Fuel Filter (383, 440 Cu. In. Engine)

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FUEL FILTER

The fuel filter (Fig. 23) is of the disposable type. Under average operating conditions, filter should be replaced every 2 years or 24,000 miles, whichever occurs first. Should an excessive amount of foreign matter accumulate in fuel tank, filter may require replacing more frequently.

After installing new filter, run engine for several minutes and check for leaks at connections.

PROPELLER SHAFT AND UNIVERSAL JOINTS

Under normal operating conditions, lubrication of the universal joints is not required. Every six months, however, the bearing seals on front universal joint (Fig. 24) and rear universal joint (Fig. 25) on Newport, 300 and New Yorker models and the front, center and rear universal joints (Figs. 26, 27 and 28) on Imperial models, should be inspected for external leakage or damage. The joints should **not** be disassembled or relubricated unless external leakage or damage is observed.

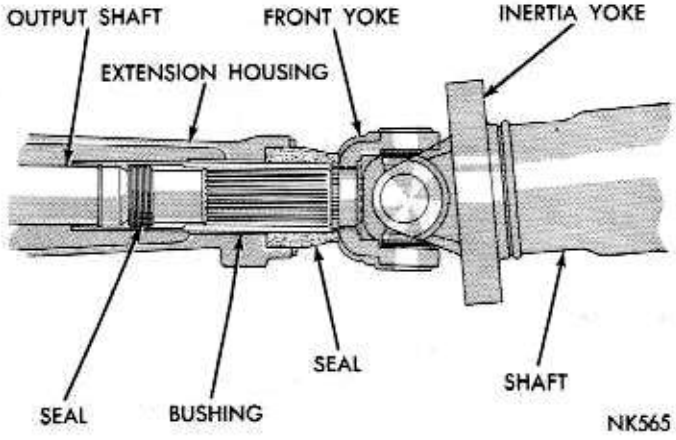


Fig. 24—Front Universal Joint—Cross and Roller Type (Chrysler Newport, 300 and New Yorker Models)



Fig. 25—Rear Universal Joint—Cross and Roller Type (Chrysler Newport, 300 and New Yorker Models)

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Cross and Roller Universal Joints

When necessary to service universal joint bearings (Figs. 25 and 26), disassemble joints as outlined under "Propeller Shaft and Universal Joints," Group 16.

Clean and inspect all parts carefully for serviceability. Replace parts as required. Repack joint bearings using, Universal Joint Grease, NLGI grade 0.

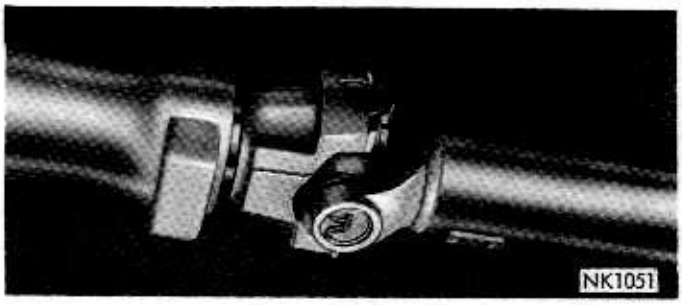


Fig. 26—Front Universal Joint—Single Cross Type (Imperial Models)

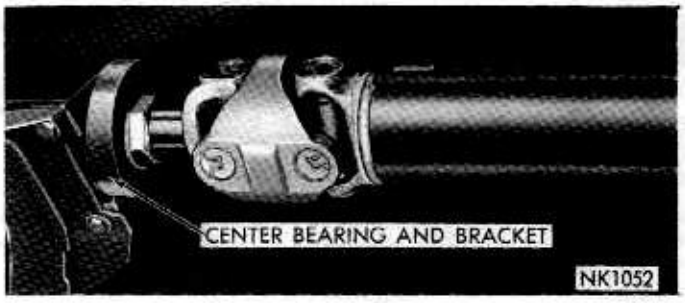


Fig. 27—Center Universal Joint—Constant Velocity Type (Imperial Models)

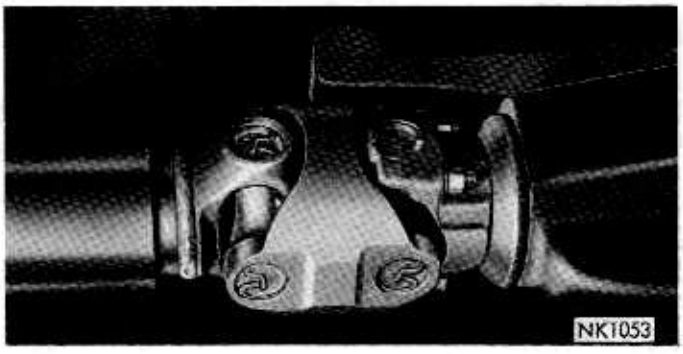


Fig. 28—Rear Universal Joint—Constant Velocity Type (Imperial Models)

Constant Velocity Universal Joints

When necessary to service universal joint bearings and centering pivots (Figs. 29 and 30), disassemble joints as outlined under "Propeller Shaft and Universal Joints," Group 16.

Clean and inspect all parts carefully for serviceability. Replace parts as required. Repack joint bearings and centering pivots, using Automotive Multi-Purpose E.P. Grease, NLGI grade 2.

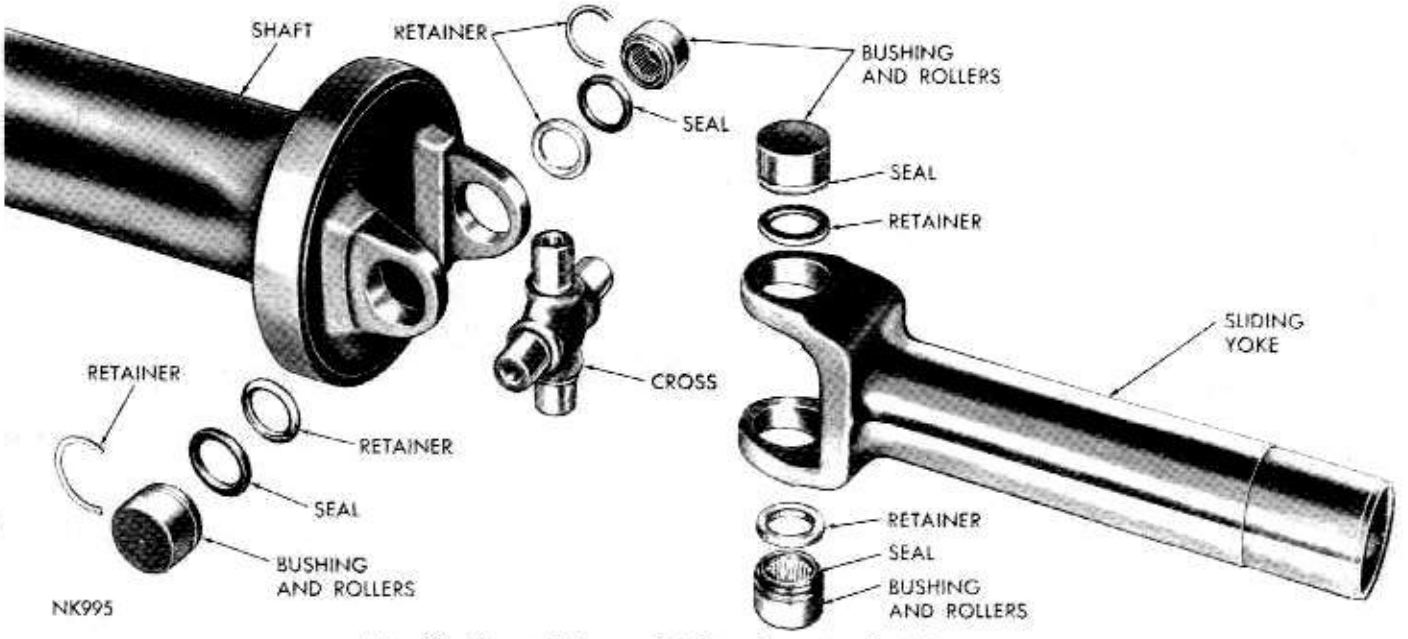


Fig. 29—Front Universal Joint—Cross and Roller Type (Chrysler Newport, 300 and New Yorker Models)

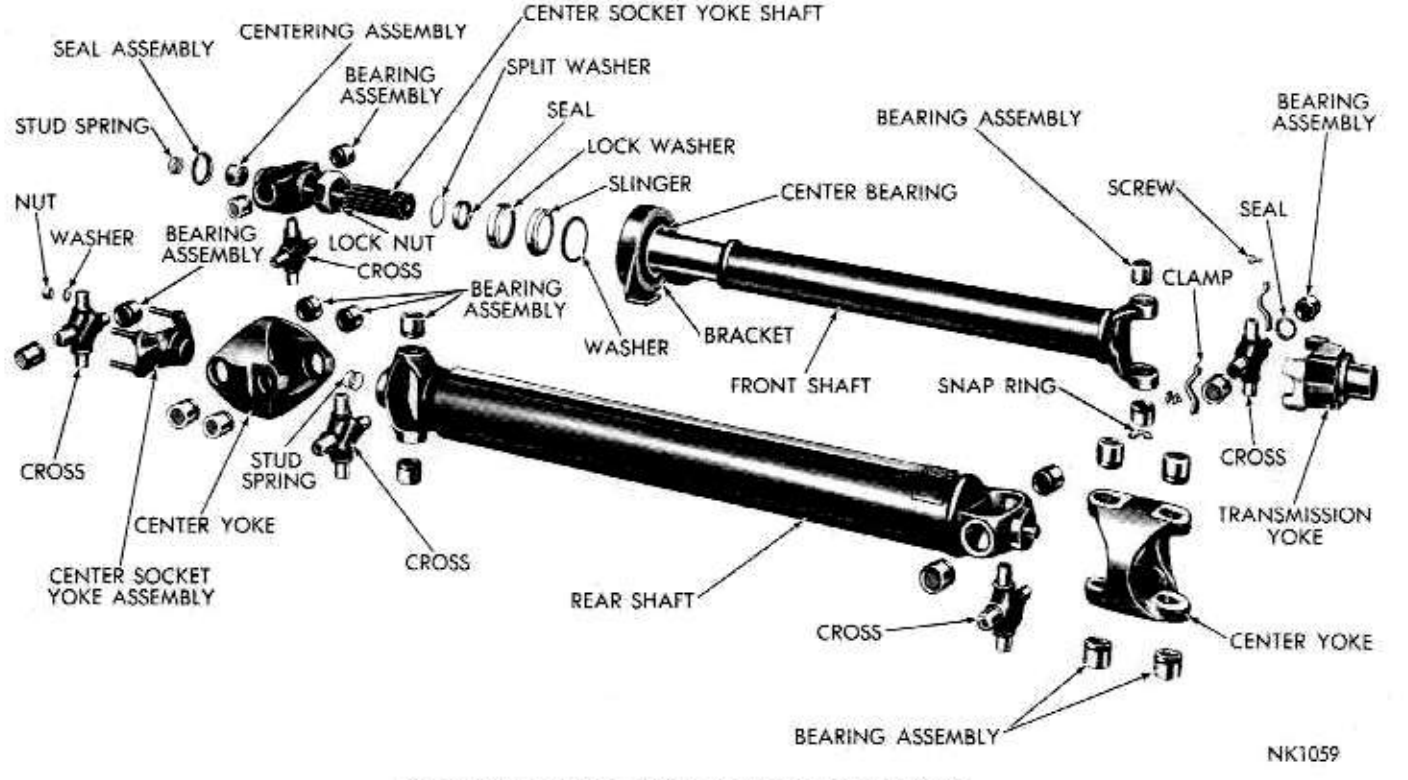


Fig. 30—Propeller Shaft and Universal Joints—Contant Velocity Type (Imperial Models)

Slip Spline Yoke

Relubrication of the slip spline yoke (Fig. 29) is required only when the propeller shaft is removed and disassembled for servicing.

Thoroughly clean old lubricant from splines. Then, coat them with not to exceed 1/3 ounce of an Automotive Multi-Purpose Grease, NLGI grade 2, containing extreme pressure additives and molybdenum disulphide, spread evenly over the entire area of the splines. Multi-Mileage Lubricant, Part Number 2525035, is suitable for this application.

Carefully examine rubber seal before installing it in

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housing extension. If not serviceable, replace it with a new one

Two-Piece Propeller Shaft Spline (Imperial Models)

When relubricating the shaft spline, first thoroughly clean splines on yoke and front shaft. Then, relubricate splines with approximately one ounce of Multi-Purpose E.P. Grease, NLGI grade 0.

STEERING GEAR

Manual

The lubricant installed in the steering gear at the time of assembly is a high quality product and regularly scheduled changes are not required.

The fluid level, however, should be checked every six months, by removing filler plug (Fig. 31) to determine that lubricant completely covers worm gear.

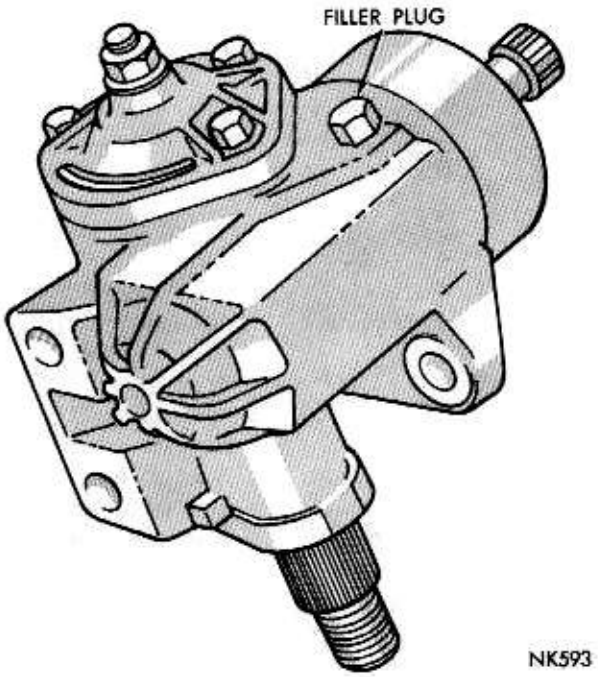


Fig. 31—Manual Steering Gear Lubrication

If additional lubricant is required to restore level, add sufficient quantity of Multi-Purpose Gear Oil SAE 90, as defined by MIL-L-2105B. This is suitable for all temperatures. Special Sure-Grip Lubricant, Part Number 2585318, is a fluid of this type and is recommended.

CAUTION: When filling, do not use a pressure gun as high pressure may damage the seals.

Power Steering

Check fluid level in power steering reservoir every six months. When fluid is **cold,** level should be at base of filler neck (Fig. 32). When fluid is **hot,** level should be halfway up filler neck.

CAUTION: Before removing filler neck cap, wipe it carefully to prevent accumulated dirt from dropping into reservoir.

To restore level, if necessary, add sufficient hydraulic fluid specially formulated for minimum effect on rubber hoses. Such a fluid is available under Part Number 2084329, Power Steering Fluid.

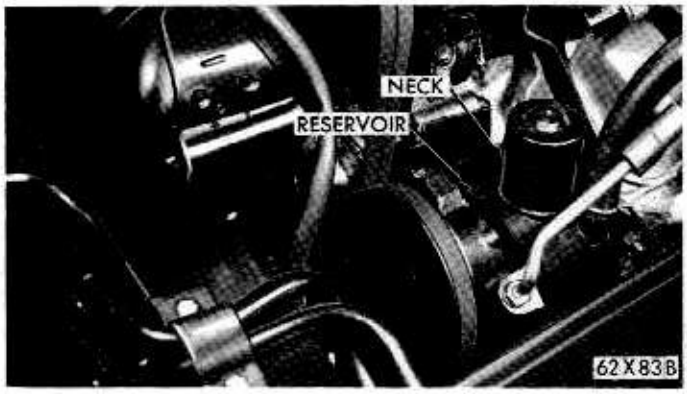


Fig. 32—Power Steering Pump Reservoir

TRANSMISSION

Manual Three-Speed

The lubricant installed in the transmission at the time of assembly is a high quality product and regularly scheduled changes are not required for vehicles whose operation is classified as normal service for passenger cars.

The fluid level, however, should be checked every six months and determined that it is at the bottom of filler plug hole (Fig. 33). When necessary to replenish, refill as required, using only Automatic Transmission Fluid, AQ-ATF, Suffix "A" for all temperature ranges. Included in this group is Automatic Transmission Fluid, AQ-ATF-2351A, available under Part Num-

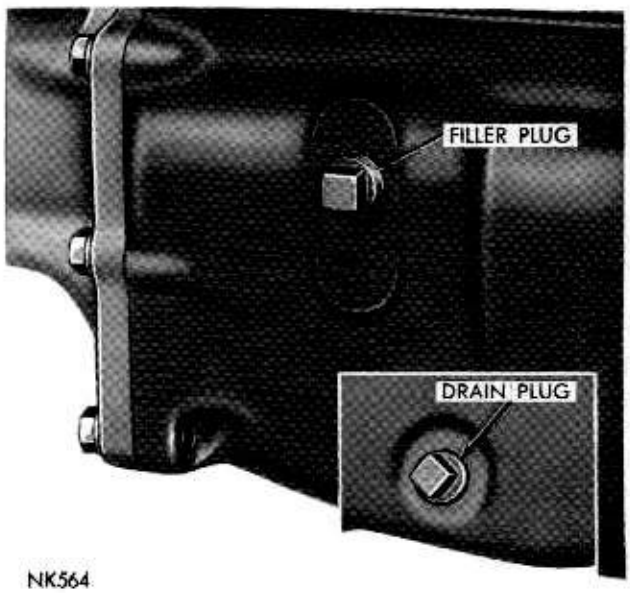


Fig. 33—Transmission Filler and Drain Plugs

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ber 1843314. In warm weather, Multi-Purpose Lubricant SAE 90, as defined by MIL-L-2105B may be used.

When vehicle is used for other than normal service, or for towing trailers, refer to "Trailer Towing Service," below for recommended servicing.

Trailer Towing Service

For vehicles equipped for trailer towing service, or if the regular operation of the vehicle is classified as severe, the transmission lubricant should be changed periodically. Drain and refill with specified lubricant initially after 36,000 miles or 3 years, whichever occurs first and every 12,000 miles or 12 months, whichever occurs first, thereafter.

Column-Mounted Manual Transmission Gearshift Controls (Newport and 300 Models)

If operation of gearshift controls becomes noisy or shift effort becomes objectionable, lubricate linkage at lower end of steering column (Fig. 34).

Apply a film of Multi-Mileage Lubricant, Part Number 2525035, or Automotive Multi-Purpose Grease, NLGI grade 2, to contact surfaces (Fig. 34).

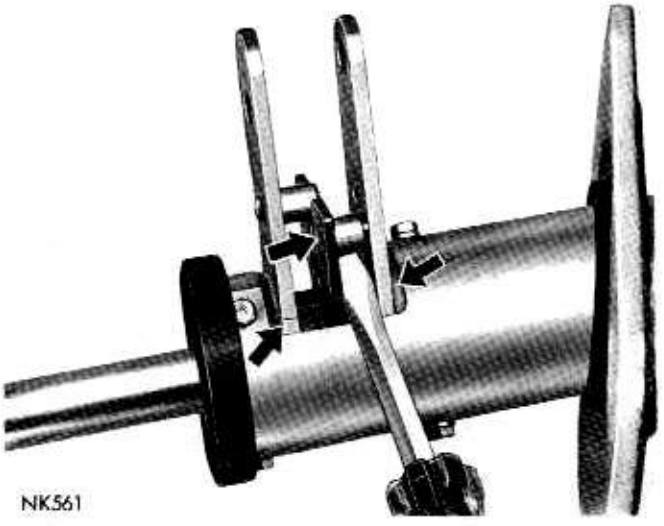


Fig. 34—Column-Mounted Manual Transmission Gearshift Control Lubrication Points

TRANSMISSION

Automatic

The fluid level should be checked every six months. This check should be made when engine temperature gauge indicates a normal warmed-up condition and transmission fluid is heated to its normal operating temperature. While level may be determined when fluid is "cold," the preferred method is with the fluid "hot."

Check level with parking brake applied firmly and engine idling.

CAUTION: Before removing level indicator, wipe off cap and top of filler tube to prevent accumulated dirt from dropping into transmission filler tube.

After engine has idled for about two minutes, move gearshift lever slowly through all gear positions, pausing momentarily in each position and ending with lever in "N" position.

When fluid is "hot," level should be at the "FULL" mark, or slightly below, but **never above** "FULL" mark (Fig. 35) to avoid foaming of the fluid. Fluid should be added or extracted, depending upon the reading, to restore level as prescribed.



Fig. 35—Transmission Dip Stick Markings

If it is necessary to check level when transmission is "cold," fluid level should be at, or slightly below the "ADD ONE PINT" mark. If level is below this mark, add one pint of fluid and recheck level.

Restore level, when necessary, using only Automatic Transmission Fluid AQ-ATF, Suffix "A." Included in this group is Automatic Transmission Fluid AQ-ATF-2351A, available under Part Number 1843314. No other fluids are recommended except fluids from this group. Exception to this is a sealer which introduces a small amount of swelling to reduce fluid leakage resulting from hardening or shrinkage of the seals in high mileage vehicles. Such a product is available under Part Number 2298923, Transmission Sealer.

For vehicles operated under normal service conditions, the transmission fluid and filter will provide satisfactory lubrication and protection to the transmission. Therefore, periodic fluid changes are not required, except for hard usage and trailer towing service as explained as follows.

Trailer Towing Service and Hard Usage

For vehicles equipped for trailer towing service, or if the regular operation of the vehicle is classified as severe, the transmission fluid and filter should be changed periodically. Drain and refill the transmission with the specified fluid and replace the filter

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initially after 36,000 miles or 3 years, whichever occurs first and every 12,000 miles or every 12 months, whichever occurs first, thereafter.

For transmission fluid draining and refilling service and filter replacement, see "TorqueFlite Transmission," Group 21.

FRONT WHEEL BEARINGS

The brake linings and front wheel bearings on cars equipped with either drum or disc brakes should be inspected every 18 months or 18,000 miles, whichever occurs first. The bearings should be cleaned and repacked whenever brake linings are replaced or the brake drums resurfaced.

When an inspection of wheel bearings indicates lubricant is low in quantity, or contaminated with dirt or water to produce a milky appearance, bearings should be cleaned, inspected and relubricated if serviceable.

CAUTION: To avoid possible contamination of lubricant by mixing lubricants that are not compatible, do not add lubricant to bearings.

Thoroughly clean old lubricant from bearings and hubs. Repack bearings and hubs with Automotive Multi-Purpose Grease, NLGI grade 2. When repacking hubs, make sure all surfaces of hub and outer grease cup interiors are covered with grease (Fig. 36) to minimize condensation and grease travel out of bearing. **DO NOT OVERFILL.**

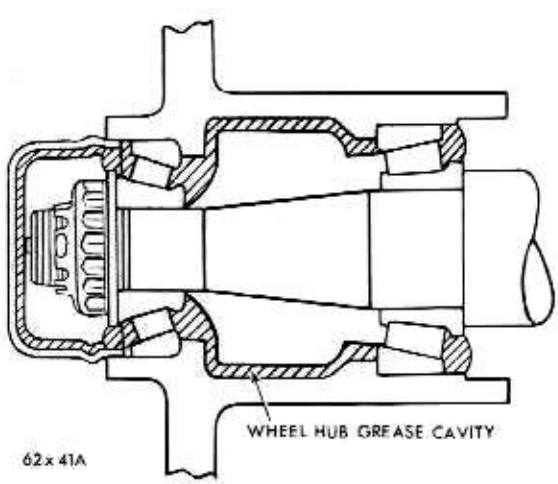


Fig. 36—Front Wheel Bearing Lubrication

Adjust bearings as follows:

(1) Install wheel and drum assemblies and tighten wheel nuts to 65 foot-pounds.

(2) Tighten wheel bearing adjusting nut (Fig. 37) to 90 inch-pounds while rotating wheel.

(3) Position nut lock on adjusting nut so one pair of cotter pin slots align with hole in spindle.

(4) Back off adjusting nut and nut lock to the next slot and install cotter pin.

(5) Install wheel covers.

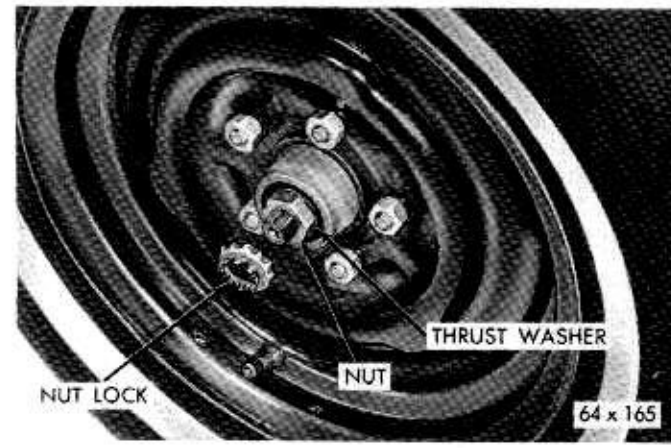


Fig. 37—Front Wheel Bearing Adjustment

TIRES

Tires, including spare, should be rotated every second oil change according to the tire rotation diagram (Fig. 38) to provide uniform wear, long tire life, and to retain comfortable riding qualities.

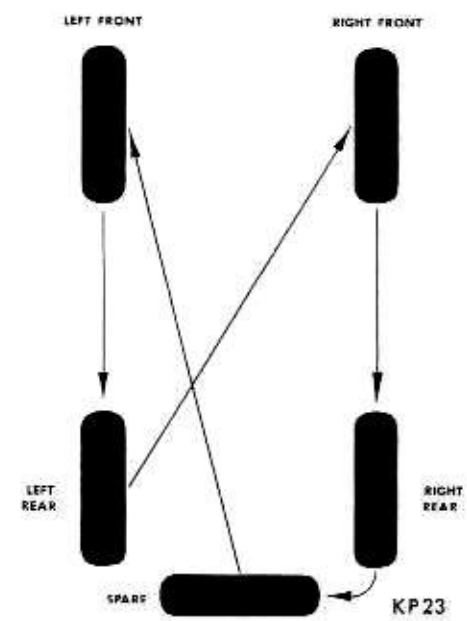


Fig. 38—Tire Rotation Diagram

Tires should be examined for unusual wear patterns, foreign material and proper inflation pressures. Unusual wear conditions may reflect a need for a change in driving habits or indicate that mechanical corrections may be necessary.

Refer to the Lubrication and Maintenance Charts (Figs. 1 and 2), for recommended inflation pressures.

SPEEDOMETER CABLE

To service a noisy speedometer cable, disconnect

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housing at speedometer head. Remove shaft and clean it thoroughly. Apply a very thin film of speedometer cable lubricant on the shaft. Such a lubricant is available under Part Number 1243632, Speedometer Cable Lubricant. Wipe excess lubricant from the top one-foot of the shaft and from the ferrule.

CAUTION: Excessive lubricant may cause malfunction of the speedometer.

HOOD LOCK, RELEASE MECHANISM AND SAFETY CATCH

Lubrication of the hood lock mechanism and safety catch is of vital importance to assure ease of operation and freedom from binding.

Apply Automotive Multi-Purpose Lubricant, NLGI grade 2, sparingly to all link ends and sliding contact areas (Fig. 39). Work lubricant into lock mechanism until all frictional surfaces are covered.

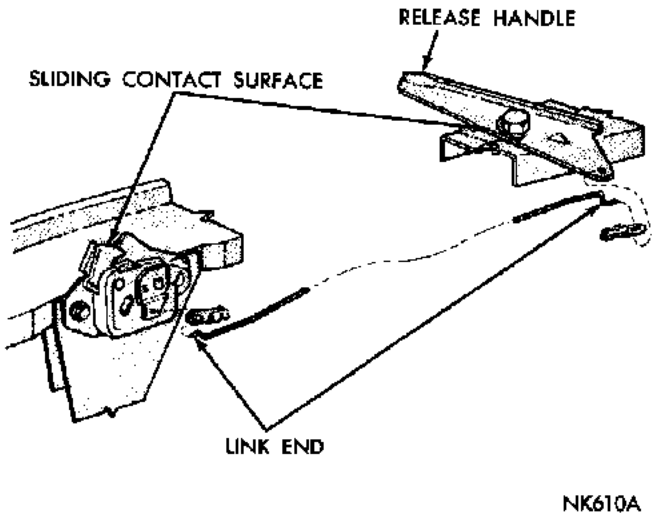


Fig. 39—Hood Lock Lubrication Points (Chrysler Models)

BODY MAINTENANCE

Body and other operating mechanisms, including throttle linkage, should be inspected, cleaned and lubricated every six months. This is necessary to maintain ease of operation and to provide protection against rust and wear.

Prior to applying any lubricants, wipe the parts clean to remove dust and grit. Excess oil or lubricant should be removed.

Relubricate mechanisms as outlined in the following paragraphs.

Where Lubriplate is specified, use a smooth, white body hardware lubricant conforming to NLGI, grade 1. A suitable lubricant is available under Part Number 1064768.

Where Door Ease Lubricant is specified, use a stainless wax type lubricant. Such a lubricant is available under Part Number 1064769.

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Lock Cylinders

When necessary, apply a thin film of Lubriplate directly to key. Insert key into lock and actuate several times. Wipe excess lubricant from key. Particular attention should be given to external lock cylinders during fall and winter months to insure protection from water and ice.

Hood Hinges (Chrysler Models)

Apply Lubriplate, sparingly, to all pivot points and torsion bar contact areas (Fig. 40). **Do not apply lubricant to torsion bar roller to cam surfaces.**

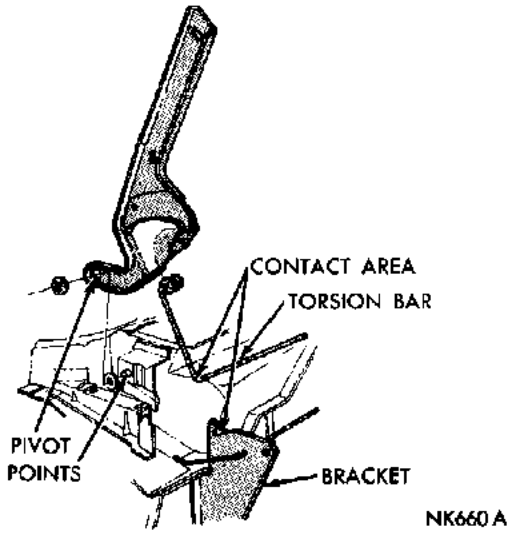


Fig. 40—Hood Hinge Lubrication Points (Chrysler Models)

Hood Hinges (Imperial Models)

Apply Lubriplate, sparingly to all pivot points, spring anchor points and gear teeth (Fig. 41).

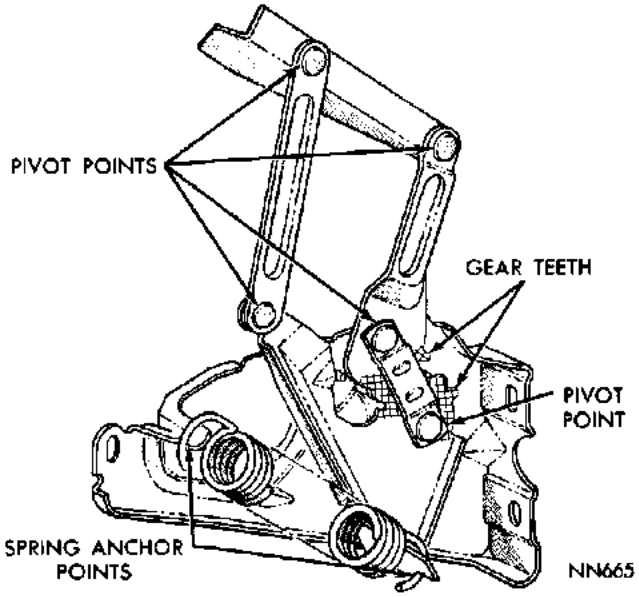


Fig. 41—Hood Hinge Lubrication Points (Imperial Models)

Door Hinges (Chrysler and Imperial)

On all hinges, apply engine oil to hinge pin ends (Fig. 42).

On lower hinges, in addition, apply engine oil to spring ends and contact areas.

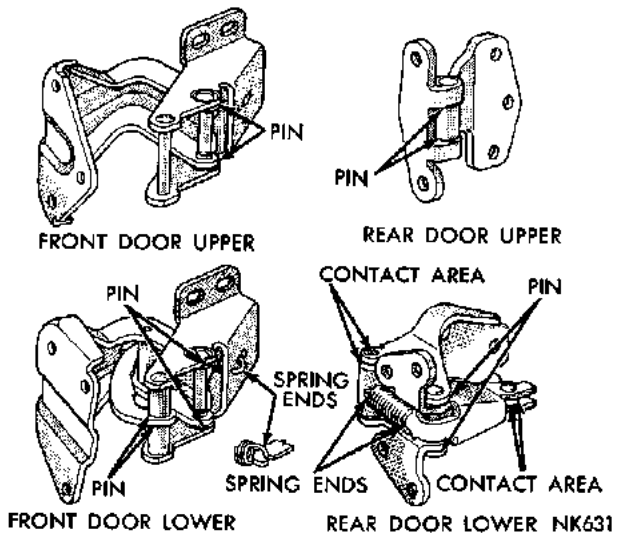


Fig. 42—Door Hinge Lubrication Points (Chrysler Models)

Door Latch Striker Rotor (All Models)

Apply light engine oil, sparingly, to outside and inside rotor bearing surfaces (Fig. 43). Wipe off excess oil.

Door Latch Striker Plate (All Models)

Apply Door Ease Lubricant to striker teeth lock rotor contact surfaces (Fig. 43).

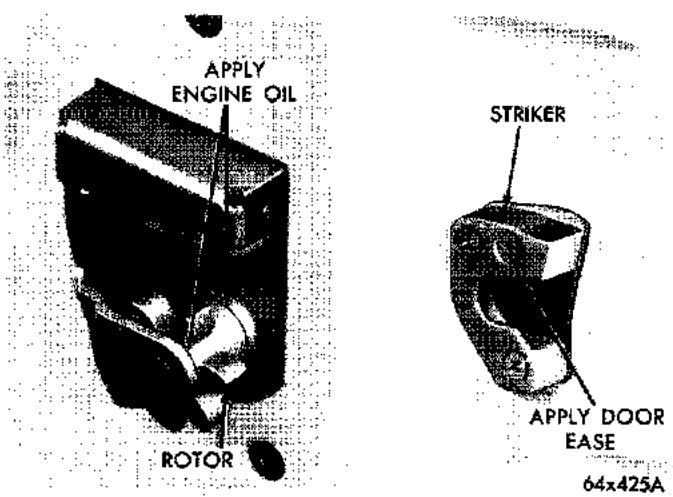


Fig. 43—Door Striker Rotor and Striker Plate Lubrication Points (All Models)

Door Locks and Locking Control Linkage (All Models)

To inspect these parts and relubricate, if necessary, remove door or quarter trim panel. Apply a film of Lubriplate to all pivot and sliding contact areas.

Door Remote Control Mechanism (Imperial Models)

To inspect this mechanism and relubricate, if necessary, remove door or quarter trim panel. Apply a film of Lubriplate to all pivot and sliding contact areas and to coils of spring.

Door Check Arm—Rear Door (Imperial)

Apply Door Ease Lubricant to upper surface of arm.

Deck Lid Latch (All Models)

Apply Lubriplate, sparingly, to inner pivot and sliding contact surfaces (Figs. 44 and 45).

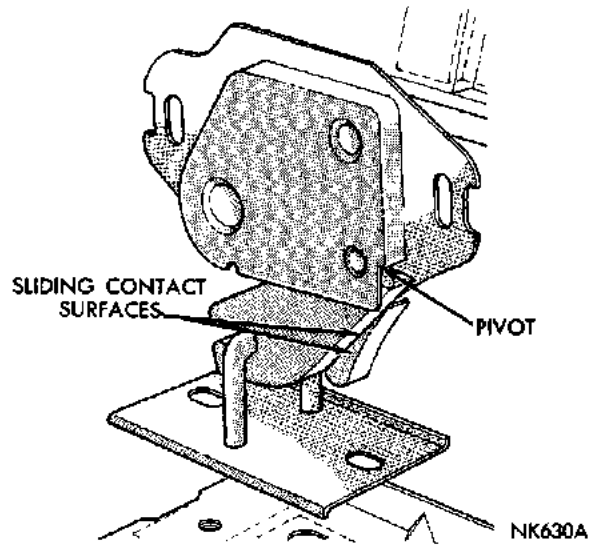


Fig. 44—Deck Lid Latch Lubrication Points (Chrysler Models)

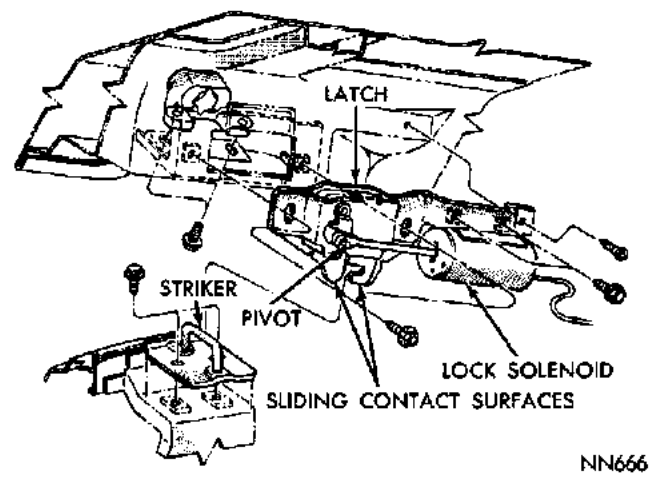


Fig. 45—Deck Lid Latch Lubrication Points (Imperial Models)

Window Regulator, Glass Lower Frame

To inspect these parts and relubricate, if necessary, remove door or quarter trim panel. Apply Lubriplate,

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sparingly, to regulator sector gear teeth, assist spring and pivots. Apply Lubriplate, sparingly, to glass lower frame roller slide tracks and roller and bracket assembly pivot points.

Deck Lid Hinge (Chrysler and Imperial Models)

Apply Lubriplate, sparingly, to all pivot points and torsion bar contact surfaces (Figs. 46 and 47).

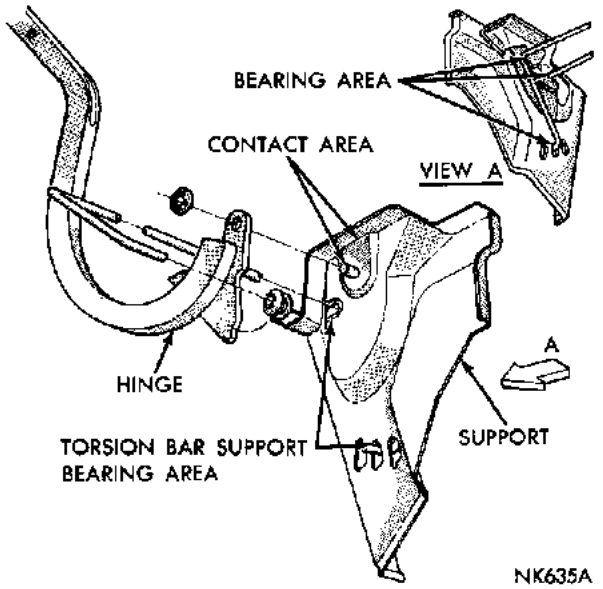


Fig. 46—Deck Lid Hinge Lubrication Points (Chrysler Models)

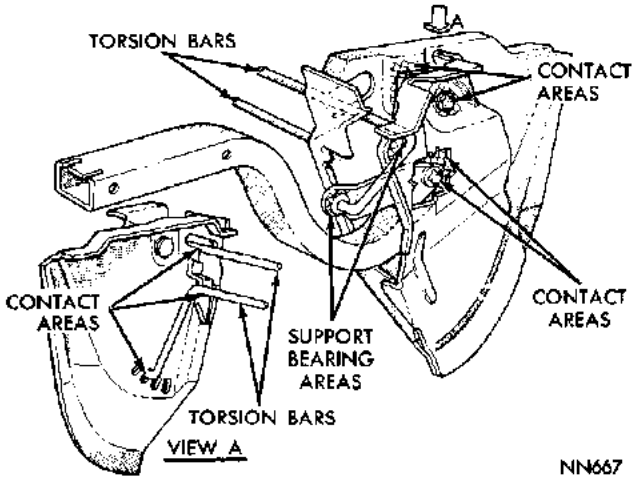


Fig. 47—Deck Lid Hinge Lubrication Points (Imperial Models)

Fuel Tank Access Door Hinge (Chrysler Models)

Apply Automotive Multi-Purpose Lubricant, NLGI grade 2, sparingly, to all pivot areas and to spring end contact areas (Fig. 48).

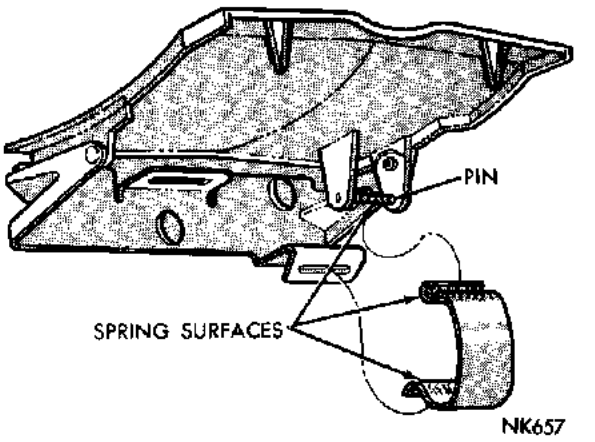


Fig. 48—Fuel Tank Access Door Hinge Lubrication Points (Chrysler Models)

Tail Gate Hinges, Torsion Bar and Check Arm Guide Plate (Newport and New Yorker Models)

(1) Apply engine oil, sparingly, to hinge pivot areas (Fig. 49).

(2) Apply Door Ease Lubricant to tail gate lock striker plates and dovetail surfaces.

(3) Apply Door Ease Lubricant directly to sliding contact surfaces of tail gate torsion bar and support arm guide pillars.

(4) Apply Automotive Multi-Purpose Lubricant, NLGI grade 2, to contact surfaces between torsion bar and tail gate hinge or tail gate end face plate, right side only.

To inspect and lubricate tail gate lock and inside remote control handle linkage and window regulator, if necessary, remove tail gate trim panel. Apply Lubriplate, sparingly, to all pivot and sliding contact surfaces, including window regulator sector gear teeth and assist spring.

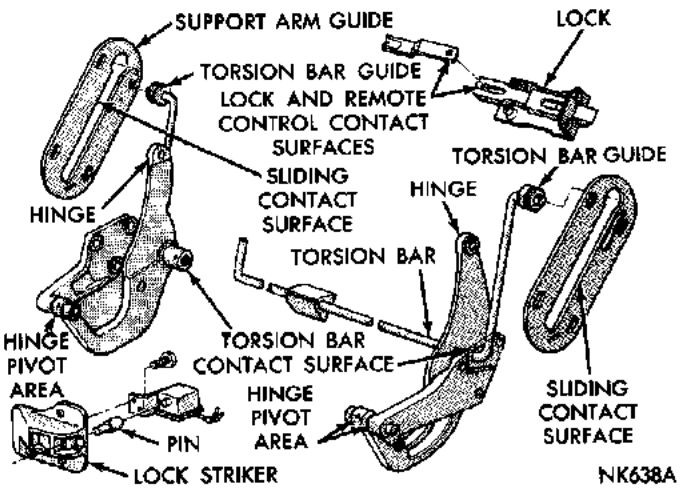


Fig. 49—Tail Gate Torsion Bar and Check Arm Guide Plate Lubrication Points (Chrysler Newport and New Yorker Models)

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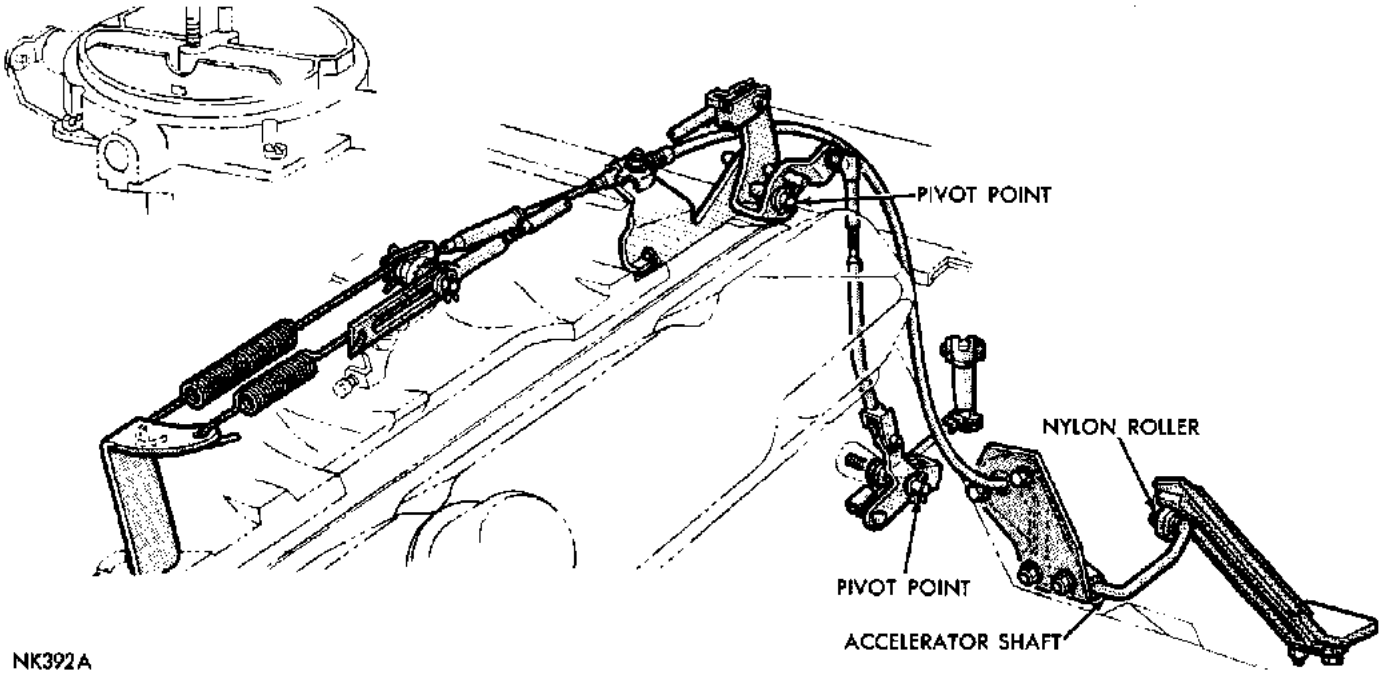


Fig. 50—Throttle Linkage Lubrication Points (Chrysler Models)

Throttle Linkage (Chrysler Models)

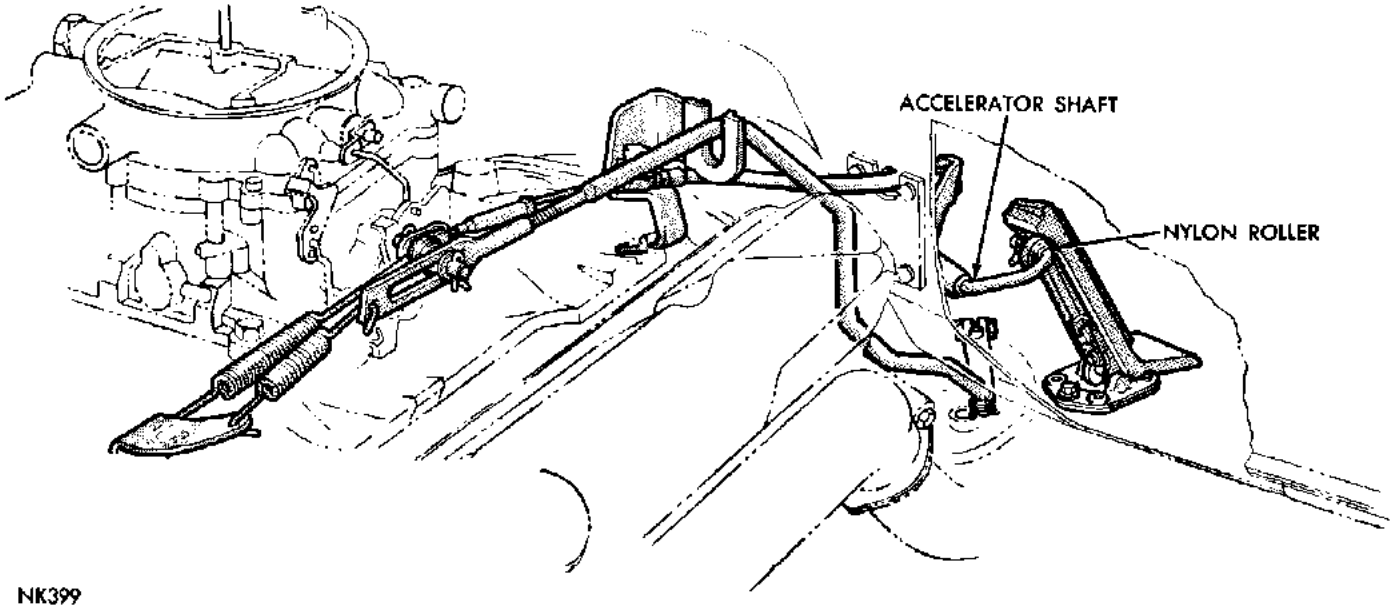
On all models, apply a thin film of Automotive Multi-Purpose Grease, NLGI Grade 2, to both ends of the accelerator shaft where it turns in the bracket (Fig. 50).

On models with **manual transmission,** also, apply a thin film of the same lubricant on the accelerator shaft where the nylon roller rolls on it.

On models with **automatic transmission,** apply a thin film of the same lubricant to the nylon roller where it contacts the pedal and to the pivot points of both upper and lower transmission linkage bellcranks.

Throttle Linkage (Imperial Models)

Apply a thin film of Automotive Multi-Purpose Grease, NLGI Grade 2, to both ends of the accelerator shaft where it turns in the bracket and where the nylon roller rolls on it (Fig. 51).



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Fig. 5—Throttle Linkage Lubrication Points (Imperial Models)

PARTS REQUIRING NO LUBRICATION

There are many points that should not be lubricated, some because they are permanently lubricated, some because lubricants will be detrimental to their operating characteristics, and some because lubricants will cause component failures. In any event, rubber bushings should not be lubricated, not only because lubricants will cause rubber to fail, but also will destroy their necessary friction characteristics. The following parts should not be lubricated:

- Accelerator Pedal Pivot
- All Rubber Bushings
- Alternator Bearings
- Automatic Transmission Controls and Linkage
- Carburetor Air Cleaner (Paper Element Type)
- Clutch Pedal Push Rod Ends
- Clutch Release Bearing
- Drive Belts
- Fan Belt Idler Pulley
- Rear Springs
- Rear Wheel Bearings
- Starting Motor Bushings
- Upper and Lower Control Arm Bushings
- Water Pump Bearings

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ACCESSORIES

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AUTO PILOT

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GENERAL INFORMATION

The auto pilot is a driver operated voluntary speed control. It can be used either as a warning signal to indicate that a pre-set speed has been reached, or as a fully automatic vehicle speed regulator.

The auto pilot instrument panel control is used to set the auto pilot to a desired speed for existing driving conditions. When the pre-set speed is reached, the auto-pilot provides a reaction pressure to the accelerator pedal pressure. Since the reaction pressure is low, five to seven pounds, the driver can over-ride the setting by pressing the accelerator through the reaction pressure.

Operation

The auto pilot is self engaging when the pre-set vehicle speed is reached. Set the instrument panel control to the desired speed and pull the button in the center of the control "OUT." When the desired vehicle speed is reached the reaction pressure is felt in the accelerator pedal. At the point of reaction pressure the driver's accelerator pedal pressure is relaxed and the accelerator is in the auto pilot automatic regulation. The auto-pilot will automatically advance the accelerator on uphill operation and retard on down grade operation. Auto pilot automatic control ceases instantly with the slightest brake pedal movement and the accelerator will revert to manual control. Disengagement of the automatic control may also be accomplished by pushing "IN" the button in the center of the instrument panel control or turning the ignition switch to "OFF."

Lubrication

All internal working parts of the auto pilot are equipped with self-lubricated bearings which have been factory lubricated for the service life of the unit.

The following mechanical and electrical tests will aid in isolating and correcting malfunction conditions for the auto pilot. Service Diagnosis procedures must be followed to make certain the malfunction is in the auto pilot unit and not in some other component of the system.

If the malfunction cannot be definitely isolated, it is recommended that the tests and adjustments be performed in the following sequence:

Accelerator Linkage Adjustment
Control Cable Adjustment
Electrical

SERVICE DIAGNOSIS

Condition	Possible Cause	Correction
It is recommended that the diagnosis be performed in the sequence outlined. If diagnosis shows the trouble to be internal in the Auto Pilot drive mechanism it is recommended that the unit be replaced. Do not attempt any internal service on the drive mechanism.		
AUTO PILOT CONTROL BUTTON DOES NOT REMAIN OUT WITH IGNITION ON	(a) Blown fuse. (b) Poor electrical connections to the control. (c) Faulty control.	(a) Replace the fuse. (b) Check the connections and the instrument panel control for grounding. (c) Replace the control unit if necessary.
NO "SPEED WARNING" PEDAL PRESSURE	(a) Blown fuse or faulty wiring in motor circuit. (Red wire.) (b) Accelerator linkage broken or disconnected.	(a) Test wiring circuits. See "Electrical Tests." (b) Connect or replace the linkage and adjust.

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Condition	Possible Cause	Correction
"SPEED WARNING" PEDAL PRESSURE AT ALL SPEEDS (including below 22 miles per hour)	(a) Faulty electrical circuit.	(a) See "Electrical Tests" (Red Wire).
AUTOMATIC LATCHING DOES NOT ENGAGE WHEN BUTTON IS PULLED OUT. "SPEED WARNING" O.K.	(a) Insufficient brake switch clearance. (b) Brake pedal not returning fully. (c) Faulty electrical circuit.	(a) Adjust auto pilot brake switch. (b) Test brake pedal for full return. Adjust or repair as necessary. (c) See "Electrical Tests" (Blue and Black Wires).
AUTOMATIC LATCH ENGAGES AT SELECTED SPEED WITH CONTROL BUTTON PUSHED IN	(a) No. 3 black wire to the panel control is grounded. (b) Faulty grounding switch in the instrument panel control.	(a) Test the circuit for ground and repair if necessary. (Black Wire.) (b) Test at No. 3 terminal. Replace control unit if necessary.
AUTOMATIC LATCH REMAINS ENGAGED WHEN BRAKE PEDAL IS TOUCHED	(a) Faulty or improperly adjusted brake switch.	(a) Test and adjust the brake switch. Replace if necessary.
UNIT DISENGAGES INTERMITTENTLY ON ROUGH ROADS	(a) Poor electrical connections. (b) Insufficient brake switch clearance.	(a) See "Electrical Tests" (Black and Blue Wires). (b) Adjust brake switch to specifications.
AUTO PILOT WILL NOT FUNCTION AT LOW END OF DIAL	(a) Improper control cable adjustment.	(a) Adjust control cable.
PULSATING ACCELERATOR PEDAL	(a) Speedometer cable or drive cable kinked. (b) Lack of cable lubrication. (c) Improper accelerator linkage adjustment.	(a) Align the cables. Replace if necessary. (b) Lubricate the cables. (c) Adjust the accelerator linkage.
CARBURETOR DOES NOT RETURN TO NORMAL IDLE	(a) Improper auto pilot linkage adjustment. (b) Standard throttle linkage faulty.	(a) Adjust the auto pilot linkage. (b) Repair or replace the linkage.
SPEEDOMETER DOES NOT REGISTER OR UNIT DOES NOT OPERATE	(a) Speedometer drive pinion in transmission is faulty. (b) Faulty speedometer cable. (c) Faulty drive cable from transmission to the auto-pilot drive mechanism. (d) Faulty speedometer.	(a) Replace the speedometer drive pinion. (b) Replace the speedometer cable. (c) Replace the drive cable. (d) Repair or replace the speedometer if necessary.
SPEEDOMETER NOISE	(a) Cables bent or kinked. (b) Lack of cable lubrication. (c) Noisy speedometer head assembly.	(a) Replace the cables. (b) Lubricate the cables. (c) Repair or replace the speedometer as necessary.
UNIT REPEATEDLY BLOWING FUSES	(a) Short circuit in wiring, drive mechanism or switches.	(a) See "Electrical Tests."

ACCELERATOR LINKAGE ADJUSTMENT (Fig. 1)

(1) Make certain automatic choke is "Off" and carburetor is at normal idle position. Operate linkage by moving auto-pilot exterior arm several times and allow linkage to ease into its normal position. Do not force linkage to close throttle.

(2) Loosen lock nut on auto pilot linkage rod and insert locking arm gauge Tool C-3844 over stop stud on auto pilot.

(3) Hold exterior arm against gauge pin and tighten lock nut on linkage. This will provide proper clearance between stop stud and exterior arm with carburetor in idle position.

Control Cable Adjustment

(1) Loosen but do not remove set screw on dust shield. (This screw retains control cable in bottom of dust shield) (Fig. 2).

(2) Rotate instrument panel control dial counterclockwise until it contacts internal stop.

(3) Push in lightly on control cable at dust shield.

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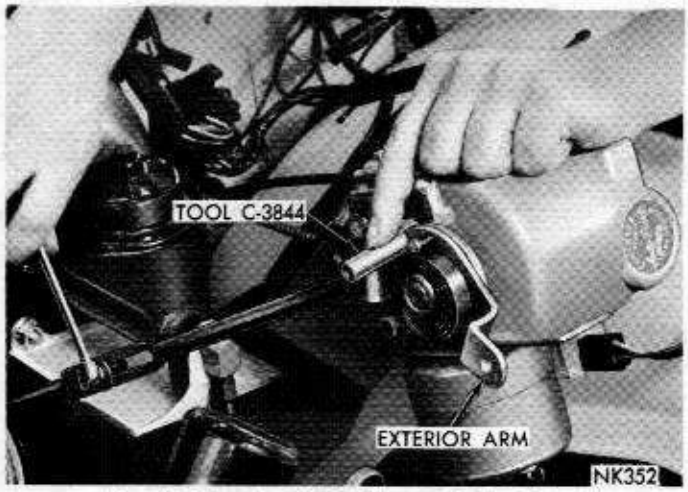


Fig. 1—Accelerator Linkage Adjustment

This will position control rod, to which inner cable attaches, against its upper stop.

CAUTION: Do not force cable beyond this position.

(4) Make certain that instrument panel control dial is still against its extreme counterclockwise stop.

(5) Tighten screw on dust shield securely.

A correctly adjusted control cable will not spring back on full rotation in either direction.

Electrical Tests (Fig. 3)

(1) Turn ignition switch to "On" or "Accessory" position. DO NOT START ENGINE.

(2) Pull out auto pilot control button in center instrument panel control. **Leave button out for all of electrical tests.** If control button will not stay out, test for a blown fuse, feed wire disconnected or poor grounding of control.

(3) **Terminal No. 1 (Red Wire)**—using test lamp, ground one test lamp lead and touch other lead to terminal No. 1 (Fig. 4). The test lamp should light. If light fails to light, test for an "open" circuit in red wire between auto pilot and ignition circuit.

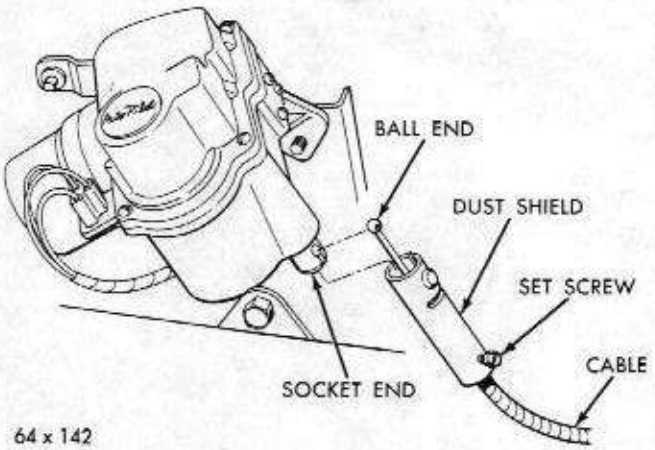


Fig. 2—Auto Pilot Dust Shield

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(4) **Terminal No. 2 (Blue Wire)**—Ground one lead of test lamp and touch other lead to No. 2 terminal (Fig. 4). If light fails to light, test for "open" connections in blue wire between auto-pilot and auto-pilot brake switch. If circuit is "open" at brake switch, test brake switch adjustment.

It is important that this adjustment be carefully performed to insure proper auto-pilot operation.

Adjust brake switch (Fig. 5) until light goes out with approximately ¼ to ½ inch of brake pedal movement.

For convenience in adjusting the brake switch, test light can be connected to "Blue Wire" side of switch.

To replace auto-pilot brake switch, brake pedal and bracket assembly will have to be removed.

(5) **Terminal No. 3 (Black Wire)**—insert one lead of test light in the No. 1 terminal and other lead of test light in No. 3 terminal (Fig. 4). The test light should light. If light fails to light, test for an "open" circuit in black wire circuit between auto-pilot and instrument panel control. If light still fails to light, inspect instrument panel control for proper grounding. When control button is pushed in, light should go out if circuit is wired correctly.

Dial Calibration

(1) On a level stretch of road engage Auto-pilot at full counterclockwise dial position. Carefully increase dial setting to "3" mark on dial, being careful not to overshoot the "3" mark. If "3" mark is overshot repeat setting procedure from below the "3" mark.

(2) Record speedometer reading with dial at the "3" mark.

(3) Move dial to the "4" mark and record speedometer reading again being careful not to over-shoot the "4" mark.

(4) Repeat procedure at higher speeds until normal driving range has been covered.

(5) Repeat procedure as dial position is lowered through normal driving range being careful to avoid downward overshooting of desired mark on dial.

(6) Examine recorded speedometer readings at each dial setting for both "upward" and "downward" indications and adjust dial for best overall correlation between Auto-pilot control dial and speedometer.

On Imperial models turn the control knob until the set screw on the control ring is at the top. Loosen the set screw, using an Allen wrench, and rotate the control the desired amount while preventing the ring from turning with the Allen wrench. Tighten the set screw and recheck calibration.

On Chrysler Models, use a hex wrench and remove the reset button, washer and control knob. Rotate the plastic dial protruding through the bezel the required amount. Install the control knob and push it in all the way so the serrations on the dial and control knob

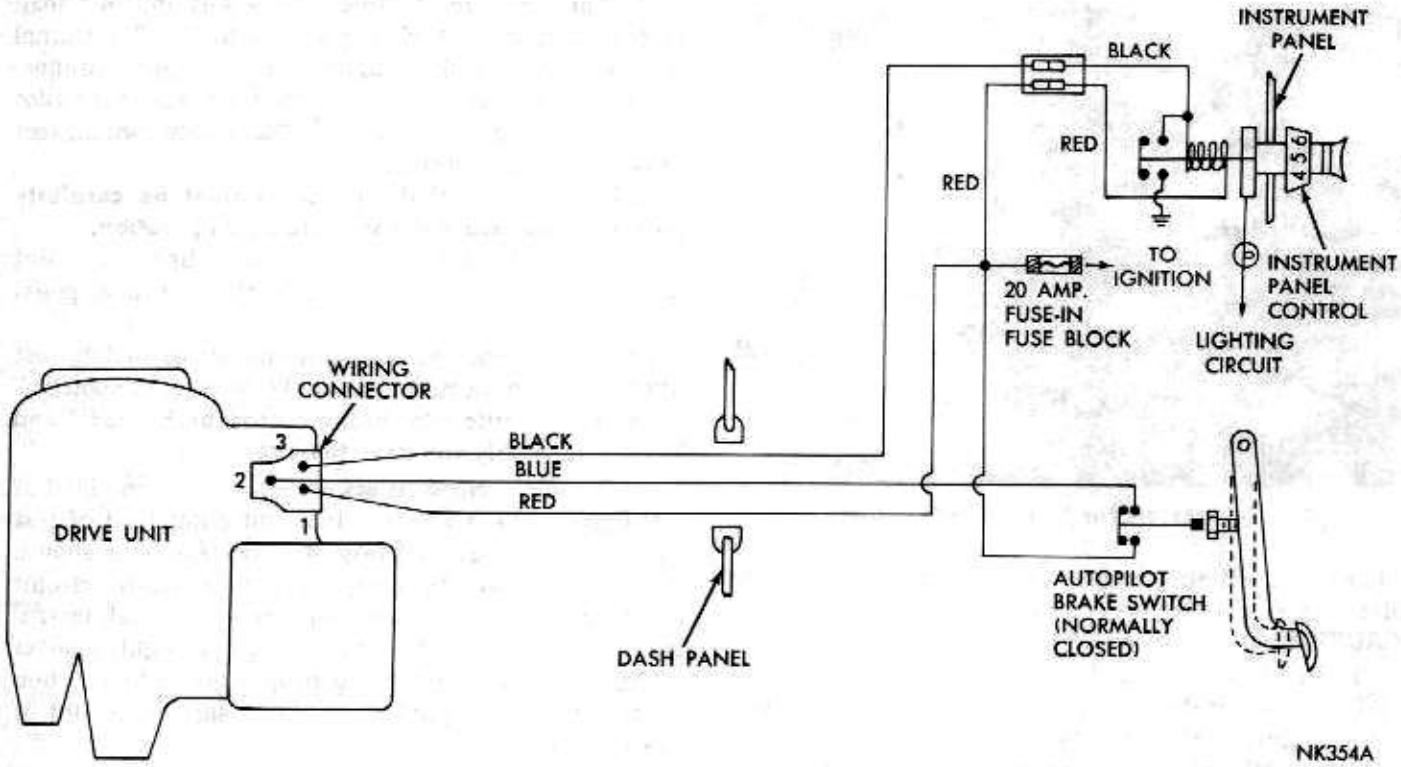


Fig. 3—Auto Pilot Wiring Diagram

mate. Tighten this set screw. Retest the calibration and if satisfactory, install the washer and reset button.

DRIVE MECHANISM

Removal

(1) Disconnect wire connector at drive mechanism.

(2) Disconnect drive cable and speedometer cable at drive unit.

A small piece of tape will prevent ferrule nut on drive cable from falling down the cable.

(3) Loosen set screw at lower end of dust shield. It is not necessary to remove screw.

(4) Turn and pull dust shield from housing and slide dust shield down cable and slip ball end of bowden cable out of socket.

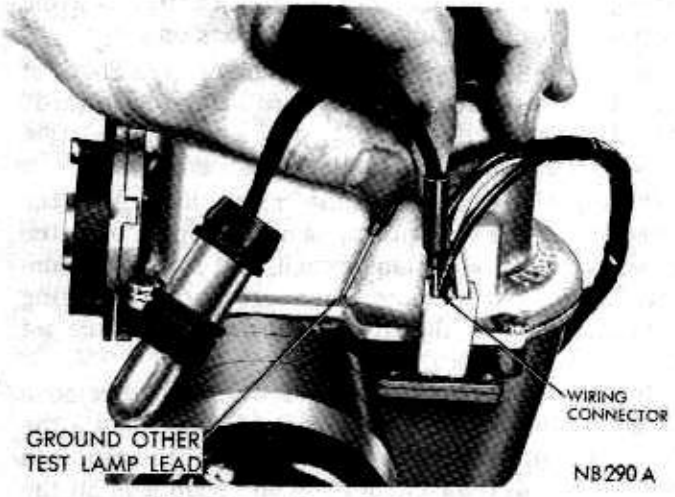


Fig. 4—Testing Wiring Circuits

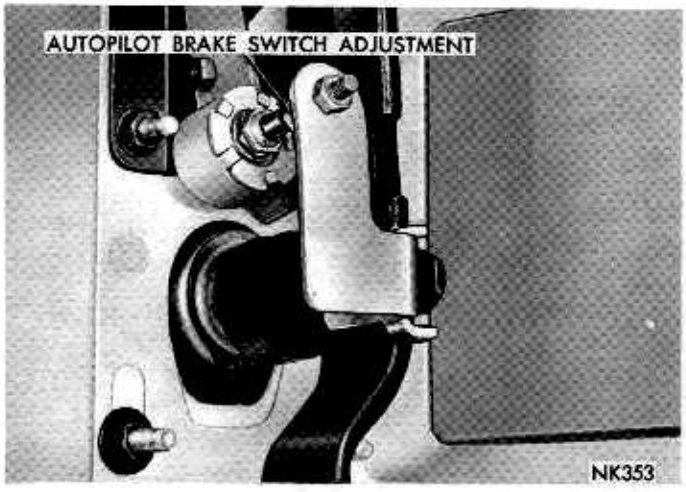


Fig. 5—Auto Pilot Brake Switch

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(5) Disconnect accelerator linkage from exterior arm on drive unit.

(6) Remove bolts and nuts securing drive mechanism to mounting brackets and remove drive mechanism leaving brackets in vehicle.

Installation

(1) Position drive mechanism on mounting brackets and install mounting bolts and nuts.

(2) Connect drive cable and speedometer cable to drive mechanism.

(3) Connect accelerator linkage to exterior arm on drive mechanism. Adjust linkage.

(4) Install ball end of bowden cable in socket on drive mechanism.

(5) Install dust shield on housing. Push in and turn clockwise. Do not tighten set screw on end of dust shield until after control cable is properly adjusted.

(6) Adjust control cable.

(7) Connect wire connector at drive mechanism.

ELECTRIC CLOCK

GENERAL INFORMATION

The electric clock (if so equipped) is a solenoid actuated, self regulating unit. The clock can be regulated by pulling out on the reset knob below the clock face and turning until the correct setting is obtained.

The clock will regulate itself **only** if the correction of setting is greater than five minutes. If the clock is gaining time, set the clock back to the correct time. If the clock is running slow, advance it to the correct time. Regulation will take place during the next rewind cycle of the clock immediately following the regulation setting. One setting will regulate approximately 20 seconds in a 24 hour period.

SERVICE DIAGNOSIS

Condition	Possible Cause	Correction
CLOCK DOES NOT OPERATE	(a) Wire loose or off terminal.	(a) Install connector on terminal.
	(b) Internal short.	(b) Repair or replace the clock as necessary.
	(c) Blown fuse.	(c) Replace fuse.

CHRYSLER MODELS

Removal

(1) Disconnect battery ground cable.

(2) Remove ash receiver, ash receiver housing, upper half of glove box and radio. See "Radio Removal," Group 1.

(3) Disconnect feed wire and remove light bulb. Working through ash receiver housing opening, remove the four self tapping screws retaining clock to back of panel.

(4) Remove clock from upper panel.

Installation

(1) From under panel, position clock in opening and install the four screws.

(2) Connect light bulb and feed wire.

(3) Install radio. See "Radio Installation," Group 1 and ash receiver assembly.

(4) Connect battery ground cable.

IMPERIAL MODELS

Removal

(1) Remove clock reset knob.

(2) Remove the screws that attach instrument cluster bezel to instrument cluster and remove bezel.

(3) Remove screws attaching clock to instrument cluster.

(4) Pull clock forward slightly and disconnect wiring to clock.

(5) Remove clock.

Installation

(1) Position clock in front of opening in instrument cluster and connect wiring to clock.

(2) Place clock in instrument cluster opening and install attaching screws.

(3) Position instrument cluster bezel on instrument cluster and install attaching screws.

(4) Install clock reset knob.

HEATERS

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GENERAL INFORMATION

CHRYSLER MODELS

Chrysler models use a "Blend Air" type heater.

Fresh air enters the heater through the cowl grille and passes through a plenum chamber to the heater core. A temperature control door in the heater plenum chamber directs the fresh air either through or past the heater core. The amount of "blend" is controlled by the setting of the temperature lever on the instrument panel. Direction of the "blended air" is controlled by the "Heat-Defrost" push buttons on the instrument panel (Fig. 1).

Two doors, inside the heater assembly, are controlled by the "Heat" and "Defrost" buttons. When the "Heat" button is pressed the heater defroster door is closed and the heater regulator door, by the action of the vacuum actuator, is opened. When the "Defrost" button is pressed the heater regulator door remains open and the heater defroster door, by the action of the vacuum actuator, is opened to route the heated air up to the windshield.

The "Fan Switch" determines the speed of the heater blower motor.

The "Rear Heat" button will automatically put the heater in a high blower speed condition regardless of the position of the fan switch.

Heating the Vehicle

For best heating results the windows of the vehicle should be closed. When the green temperature indicator light goes "out" move the temperature control lever to the "warm" position. Push the "Heat" button and move the fan switch to "high." The temperature condition inside the vehicle can then be controlled using the "Fan Switch" and the "Temperature Control Lever."

Summer Ventilation

Two air inlets are provided to allow outside air to be brought inside the vehicle in warm weather independent of the heater. The control knobs for the inlets are located on the lower edge of the instrument panel on both sides of the steering column. **Be sure the air inlets are shut during cold weather.**

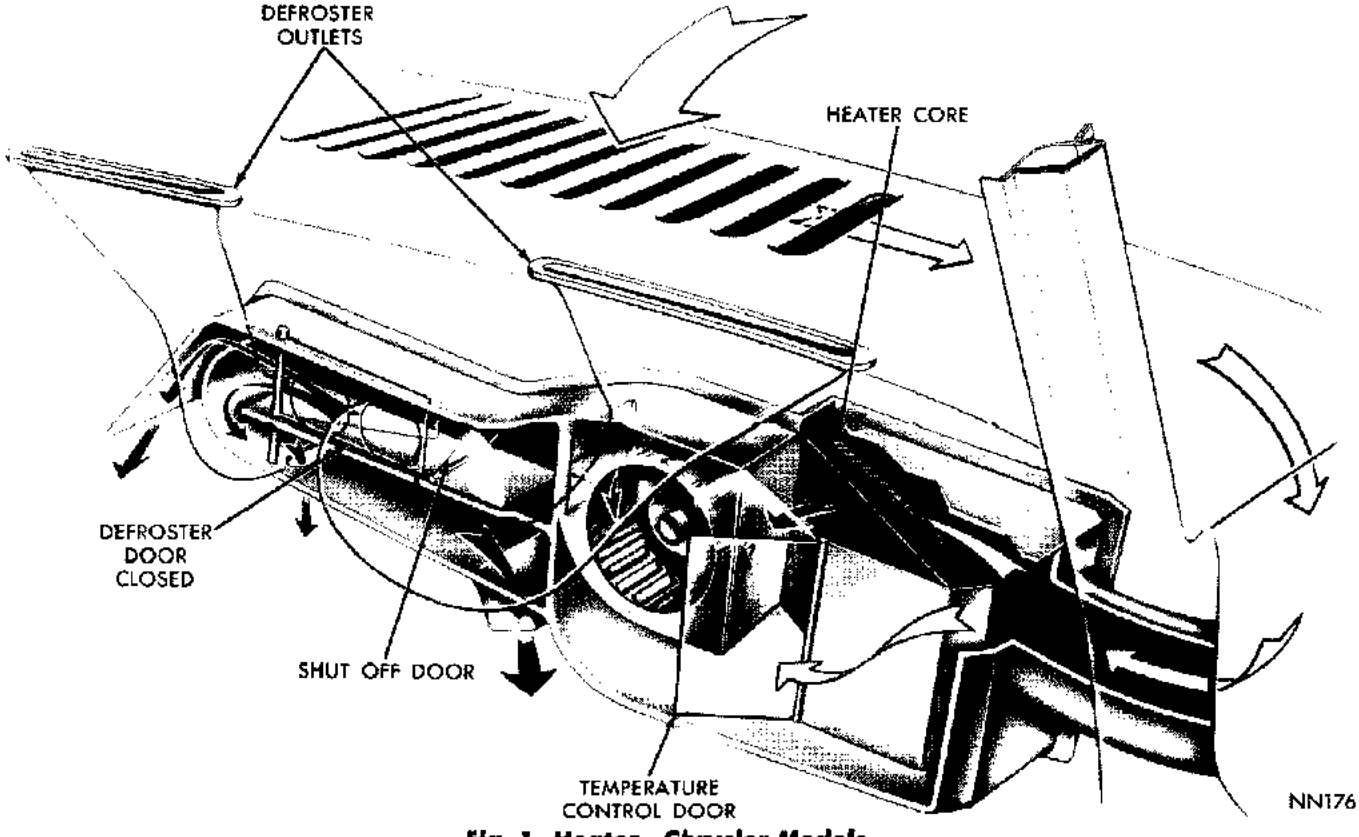


Fig. 1—Heater - Chrysler Models

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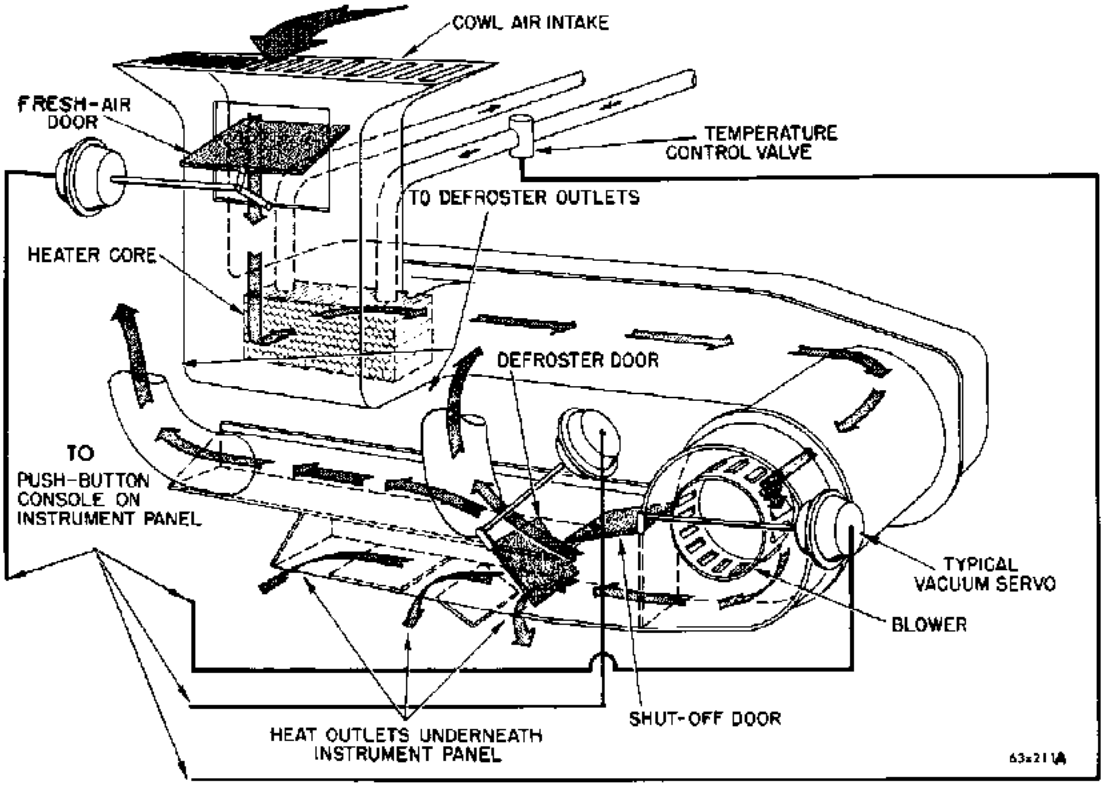


Fig. 2—Push Button Heater (Schematic View)

IMPERIAL MODELS

The hot water heating system (Fig. 2) is controlled by four push buttons and a temperature control lever. A fifth push button independently controls the summer ventilation system

The Temperature Control Lever—operates the water valve through a control cable. It is important that the control cable be adjusted to provide full opening and closing of the water valve for efficient functioning of the system. When the lever is in the far right position, air is not being heated. Air temperature is increased by moving the lever left toward the "WARM" position.

Summer Ventilation—is controlled by the ventilator air damper.

For Heating—air enters through the cowl intake, passes through the heater core into the blower and distribution duct through the opened shut-off damper.

Defrosting—is controlled by the defroster damper. For maximum defrosting or deicing, the temperature control lever must be set in the full warm position.

"OFF" Button—When the "OFF" button is pushed in, the system will not operate. The "OFF" button cuts off the current from the control lever switch and blower motor. The ventilation doors are closed, preventing outside air from entering the vehicle.

"VENT" Button—Opens the ventilation door to allow outside air to enter the vehicle directly. It does not operate the blower.

"DEF" Button—Causes a major portion of the air to be forced onto the windshield through the air outlets on top of the instrument panel for defrosting or defogging.

"HI" Button—Causes a major portion of air to be directed toward the vehicle floor, at a higher blower speed.

"LO" Button—Provides a gentle heat at a low blower speed.

REAR WINDOW DEFROSTER

The rear window defroster is located on and under the rear shelf panel of the vehicle, and consists of a blower, flexible hose and nozzle. A switch, located on the instrument panel, controls the blower for defrosting the rear window. The rear window defroster operates independently from the heater. The air recirculated on the rear window glass is drawn by the defroster blower from air inside the vehicle.

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SERVICE DIAGNOSIS

Condition	Possible Cause	Correction
INSUFFICIENT HEAT	(a) Coolant level too low.	(a) Fill the radiator.
	(b) Engine thermostat stuck open.	(b) Replace thermostat.
	(c) Damaged vacuum line to shut-off damper.	(c) Replace vacuum line.
	(d) Obstructed heater hose.	(d) Replace heater hoses.
	(e) Radiator hoses leaking.	(e) Correct leak and bleed system.
	(f) Fresh air vent doors leaking.	(f) Adjust control cables.
	(g) Temperature valve not opening (Imperial models).	(g) Inspect the valve and repair as needed. Test the Bowden cable adjustment.
	(h) Temperature control door leaking (Chrysler Models).	(h) Adjust control cables.
	(i) Heater door obstructed by carpet.	(i) Reposition carpet.
TOO MUCH HEAT	(a) Disengaged cable.	(a) Connect or replace cable.
	(b) Thermostat stuck in closed position.	(b) Replace thermostat.
BLOWER MOTOR NOT OPERATING	(a) Blown fuse.	(a) Check for excessive resistance in circuit and replace fuse.
	(b) Faulty electrical connection.	(b) Tighten all electrical connections.
	(c) Faulty blower switch.	(c) Replace switch.
	(d) Faulty motor.	(d) Replace motor.

SERVICE AND ADJUSTMENTS-
Chrysler Models

Control Cable

(1) Disconnect battery ground cable.

(2) Remove ash receiver and housing.

(3) Remove vacuum control switch and temperature control bracket and lower assembly to ash receiver housing opening.

(4) Disconnect temperature control cable at heater assembly.

(5) At heater control, position temperature control cable to approximately ¼ inch of cable housing extends beyond edge of cable retaining clip.

(6) Install temperature control bracket and secure vacuum control switch in place on temperature control bracket.

(7) Place temperature control arm in extreme left position and connect cable to temperature control door crank on heater assembly while holding door in extreme right position.

(8) Install ash receiver and housing assembly.

(9) Connect battery ground cable and test operation of heater controls. **For Heater Control and Switch removal, see "Switches in Instruments and Indicators"—Group 8.**

Heater Removal

(1) Disconnect battery ground cable and drain radiator.

(2) In engine compartment disconnect heater hoses at dash panel. Plug hose fittings on heater to prevent any coolant from spilling on inside of vehicle as heater assembly is removed.

(3) From under instrument panel remove bracket from top of heater to dash panel.

(4) Remove defroster hoses at heater and disconnect vacuum lines at heater.

(5) Disconnect wiring at heater blower motor resistor.

(6) Remove glove box.

(7) Disconnect control cable at heater end.

(8) Unclamp flexible connector at right end of heater. **Do Not Remove Connector.**

(9) Pull carpet or mat out from under instrument panel.

(10) From inside engine compartment remove three nuts that mount heater assembly to dash panel.

(11) Pull heater assembly toward rear of vehicle until mounting studs are clear of dash panel. Rotate heater assembly until studs are down and remove heater from under instrument panel.

Heater Installation

(1) Position heater assembly under instrument panel with mounting studs down.

(2) Guide heater toward front of vehicle while rotating heater until mounting studs are in line with mounting holes in dash panel. Push heater until studs protrude through dash panel.

(3) From in engine compartment install three heater assembly mounting nuts.

(4) From under instrument panel install flexible connector at right end of heater.

(5) Connect and adjust control cables at heater assembly. See "Control Cable Adjustment."

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(6) Connect wiring at heater blower motor resistor.
(7) Install defroster hoses and connect heater vacuum lines.
(8) Install heater dash panel bracket.
(9) Install glove box.
(10) Position carpet or mat under instrument panel.
(11) From in engine compartment remove plugs from hose-fittings and connect hoses to heater (Fig. 3).
(12) Connect battery ground cable and fill cooling system.
(13) Start engine, operate heater and bleed air from heater system.

HEATER CORE

Removal

(1) Remove heater as outlined in "Heater Removal."
(2) Remove heater cover plate.
(3) Remove screws that mount heater core to heater and remove core.

Installation

(1) Position core in heater assembly and install mounting screws.
(2) Install heater cover plate.
(3) Install heater as outlined in "Heater Installation."

HEATER BLOWER MOTOR

Removal

(1) Remove heater as outlined in "Heater Removal."
(2) Disconnect wiring from heater assembly to blower motor.
(3) Remove motor cooler tube.
(4) Remove heater backplate (10 screws).
(5) Remove fan from motor shaft.
(6) Remove blower motor from mounting plate.

Installation

(1) Install blower motor on heater mounting plate.
(2) Install fan on motor shaft. Adjust for clearance between motor and fan.
(3) Install heater mounting plate (10 screws).
(4) Install motor cooler tube.
(5) Connect wiring from heater assembly to blower motor.
(6) Install heater as outlined in "Heater Installation."

HEATER DOOR SERVICE

For service of the heater regulator door, heater defroster door or the heater fresh air door the heater must be removed from the vehicle and disassembled. Refer to "Heater Removal and Installation."

BLOWER MOTOR RESISTOR REPLACEMENT

(1) From under instrument panel disconnect wiring at resistor.
(2) Remove two screws that mount resistor to heater and remove resistor.
(3) Position new or repaired resistor into opening in heater assembly and install the mounting screws.
(4) Connect wiring to resistor.

SERVICE AND ADJUSTMENTS—Imperial Models

VENTILATOR DOOR

For efficient heater operation the ventilator door must be properly adjusted. To adjust the ventilator door proceed as follows:
(1) Loosen two vacuum actuator mounting screws.
(2) Push on ventilator door linkage (Fig. 4) to insure linkage is positioned "over-center."
(3) Push on vacuum actuator (Fig. 4), until slack is removed.
(4) Tighten vacuum actuator mounting screws securely.

HEATER CORE

Removal

(1) Disconnect battery ground cable.
(2) Drain radiator.
(3) Disconnect heater hoses at heater.
(4) Remove screws attaching heater core housing to dash panel.

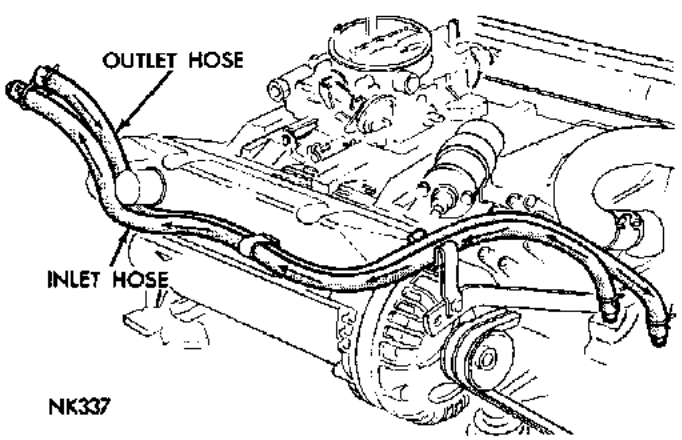


Fig. 3—Heater Hose Connections - Chrysler Models

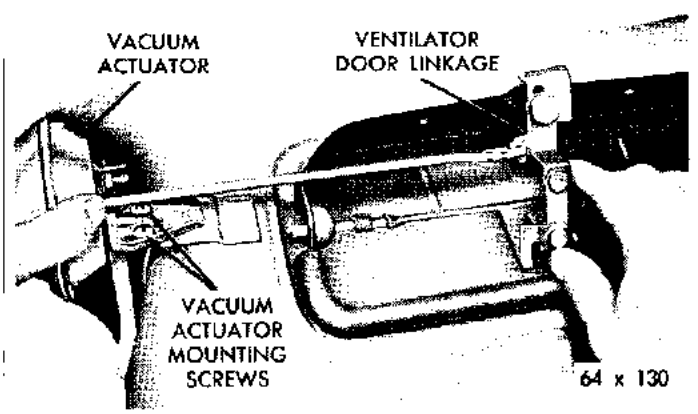


Fig. 4—Adjusting Ventilating Door

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(5) Remove housing and core as an assembly.
(6) Remove mastic to expose core mounting screws.
(7) Remove heater core from outer housing.

Installation

(1) Position heater core in heater outer housing and install screws.
(2) Install new mastic.
(3) Position heater housing and core assembly on dash panel.
(4) Install all screws loosely, to insure proper alignment before tightening
(5) Connect heater hoses at heater. Make certain hoses are connected correctly (Fig. 5).
(6) Fill cooling system.

HEATER BLOWER

Removal

(1) Disconnect battery ground cable.
(2) Disconnect heater ground wire at windshield wiper motor mounting bracket.
(3) Disconnect heater wires from harness connectors.
(4) Disconnect vacuum hoses at each vacuum unit.
(5) Remove hoses from their attaching clips.
(6) Remove heater valve capillary coil from opening in heater housing (driver's compartment, passenger side).
(7) Remove clips from housing.
(8) Remove three screws attaching heater distribution duct to dash panel. (One is located to left of vent door and to right of brake pedal bracket; one below heater at passenger side and one screw located at windshield wiper motor right link pivot).

To facilitate removal, disconnect windshield wiper right link at pivot to expose housing screws.

(9) Remove housing and blower by pulling down and out of driver's compartment.
(10) Remove blower, mounting plate and motor.

Installation

If blower motor was removed from mounting plate be sure mounting grommets are installed at attaching bolts.

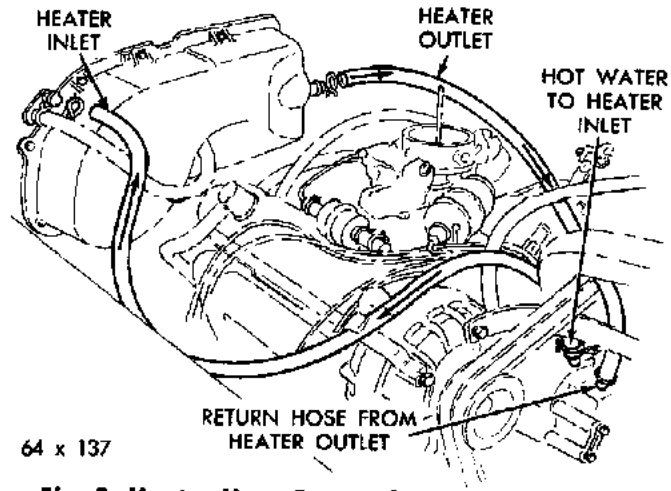


Fig. 5—Heater Hose Connections - Imperial Models

(1) Install blower motor and mounting plate to heater housing. Be sure blower wheel is free and does not rub.
(2) Position housing on dash panel and install three attaching screws. There is a spacer at each attaching screw. Be sure these spacers are installed between heater housing and dash panel when installing housing, otherwise, housing could be damaged when tightening screws.
(3) Reposition heater water valve capillary coil in heater housing and install attaching clips.
(4) Connect vacuum hoses at vacuum unit and install attaching clips.
(5) Connect heater wire at harness connectors and install black ground wire at windshield wiper motor bracket.
(6) Attach windshield wiper motor pivot link (if disconnected).
(7) Connect battery ground cable.

HEATER VACUUM ACTUATOR

Replacement

(1) Disconnect vacuum hoses.
(2) Remove two nuts and lockwashers attaching vacuum unit to housing, and one clip attaching vacuum unit rod to actuator unit.

REAR SEAT HEATER—Chrysler Models

GENERAL INFORMATION

The rear seat heater is a recirculating hot water type heater mounted in the right side of the luggage compartment. A variable speed electric blower draws inside air through a duct mounted in the shelf panel, behind the rear seat back, and forces it through the heater core. From the heater core, warm air can be deflected either to the rear floor through ducts mounted under the rear seat cushion or through a defroster duct which is also mounted in the shelf panel.

The heater core is supplied with warm engine coolant from the front heater hoses by means of "tee" connections. A vacuum actuated valve mounted on the right front fender well controls the supply of coolant routed through steel tubing, under the right side of the floor pan, to the heater core.

Controls consist of two toggle type switches mounted under the front heater controls. The right hand switch controls the heater blower motor speed. The other switch controls a vacuum actuated damper

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which directs the flow of air either to the defroster or floor heater ducts. This switch also controls the valve in the engine compartment.

Heating the Vehicle

When the green temperature control indicator light goes "out" move the left hand toggle switch to either the defroster position or the heat position. The right hand switch controls the blower speed.

Defogging the Rear Windows

To defog the rear glass, place the left hand switch in the "Defog" position. This will close the vacuum actuated water valve and cool air will flow to the rear glass. The blower switch will control the volume of air.

For summer operation, the heater control switch should be kept on "Defog" position. This shuts off the coolant supply to the heater core and stops the natural flow of warm air through the heater ducts. With the control in the "Heat" or "Defrost" position, the coolant valve is open and coolant flows through the heater unit.

HEATER

Removal

(1) From under the car, remove two heater hose clamps and tubing support clamp at rear of floor pan and drain system (Fig. 1).

(2) Remove rear seat cushion and seat back.

(3) From inside car, remove two heater hose clamps and hoses from the heater.

(4) Remove spare tire from luggage compartment and heater shield.

(5) Disconnect motor feed wire, fresh air intake hose, defroster hose and floor air duct hoses from heater.

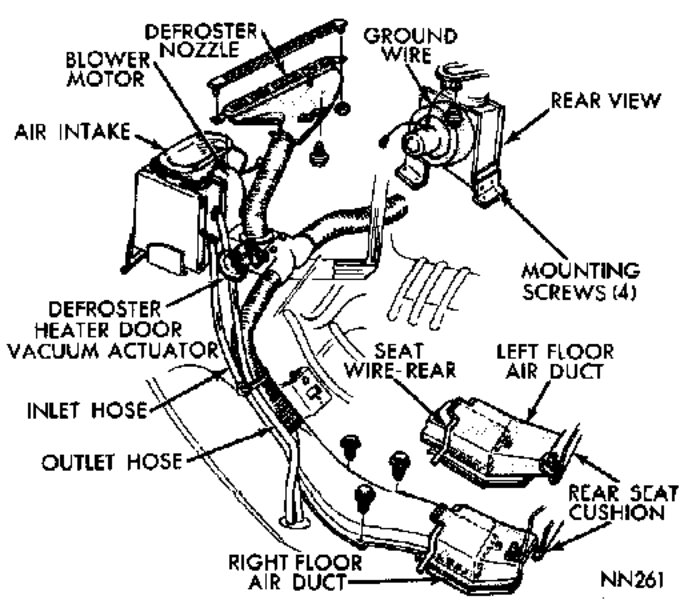


Fig. 1—Rear Seat Heater - Chrysler Models

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(6) Remove the three metal screws from mounting brackets and remove heater to the bench for servicing (Fig. 1).

Installation

(1) Position heater assembly in luggage compartment and install the three mounting screws in mounting bracket.

Be sure to install motor ground wire terminal to the mounting screw under blower motor.

(2) Install floor air hoses, defroster duct hose and air intake hose.

(3) Inside car, install two heater hoses and clamps to heater.

(4) Install spare tire.

(5) Install two heater hoses and tubing support clamp under floor pan.

(6) Fill cooling system, start engine, bleed heater system of air and check for leaks.

(7) Install seat back and rear seat cushion and heat shield.

CAUTION: Carefully align the seat cushion so outlet nozzles mounted under cushion, mate with floor mounted air ducts before locking seat in place. Misalignment will crush air ducts.

HEATER CORE

Removal

(1) Remove heater from vehicle as outlined in "Heater Removal."

(2) Remove the 11 metal screws from end plate and remove plate.

(3) Remove the four screws retaining heater core to heater body and remove the core.

Installation

(1) Position heater core in heater body and install the four retaining screws.

(2) Install end plate and 11 metal screws.

(3) Install heater as outlined in "Heater Installation."

HEATER BLOWER MOTOR REPLACEMENT

The heater blower motor can be replaced without removing heater from vehicle as follows:

(1) Remove spare tire from luggage compartment and heater shield from mounting bracket.

(2) Disconnect motor feed wire and ground wire from end mounting bracket screw.

(3) Remove the four motor mounting plate nuts and remove motor assembly from the heater.

(4) Loosen set screw mounting fan to shaft and slide fan from shaft.

(5) Remove the two nuts from plate and separate motor from plate.

Installation

(1) Install back plate on end of motor and secure

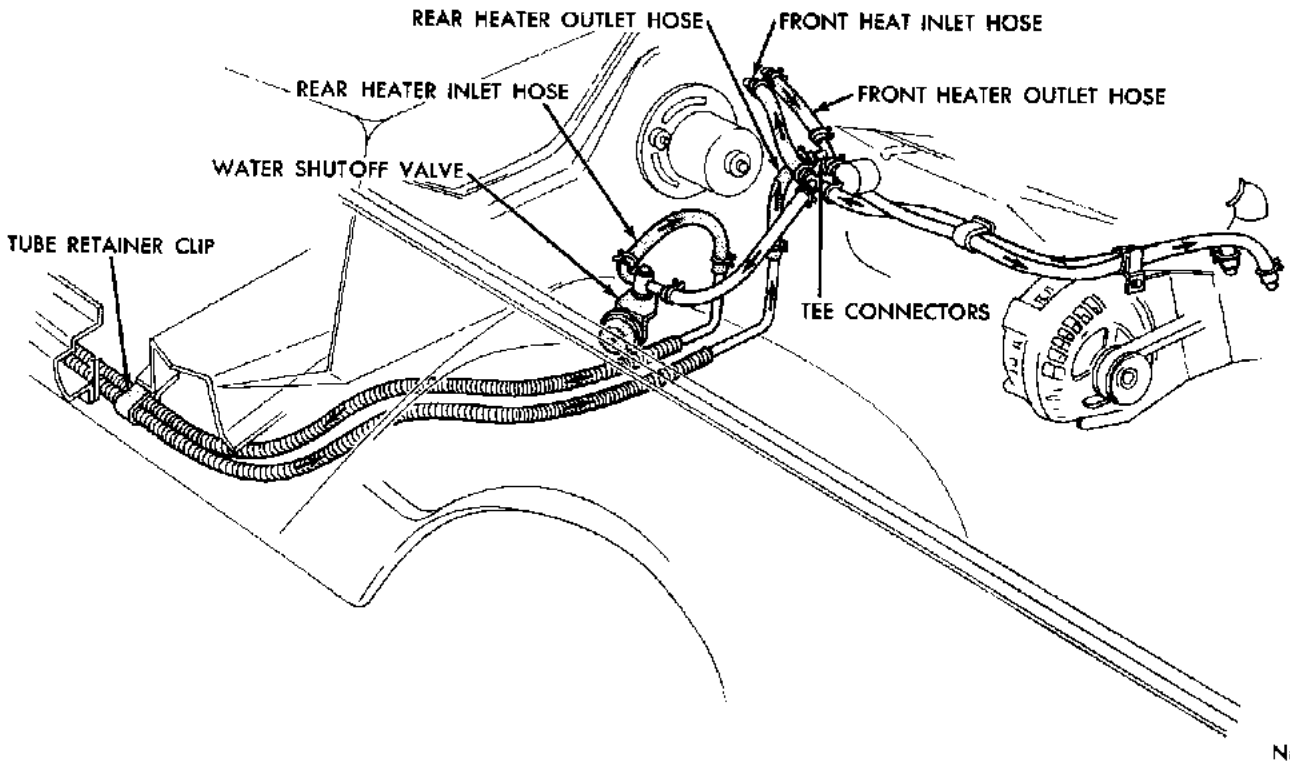


Fig. 2—Rear Seat Heater Hose Connections

with the two nuts.

(2) Install fan on the motor shaft. Adjust for clearance of fan and heater chamber.

(3) Install motor assembly in heater and the four mounting nuts.

(4) Connect motor feed wire and ground wire

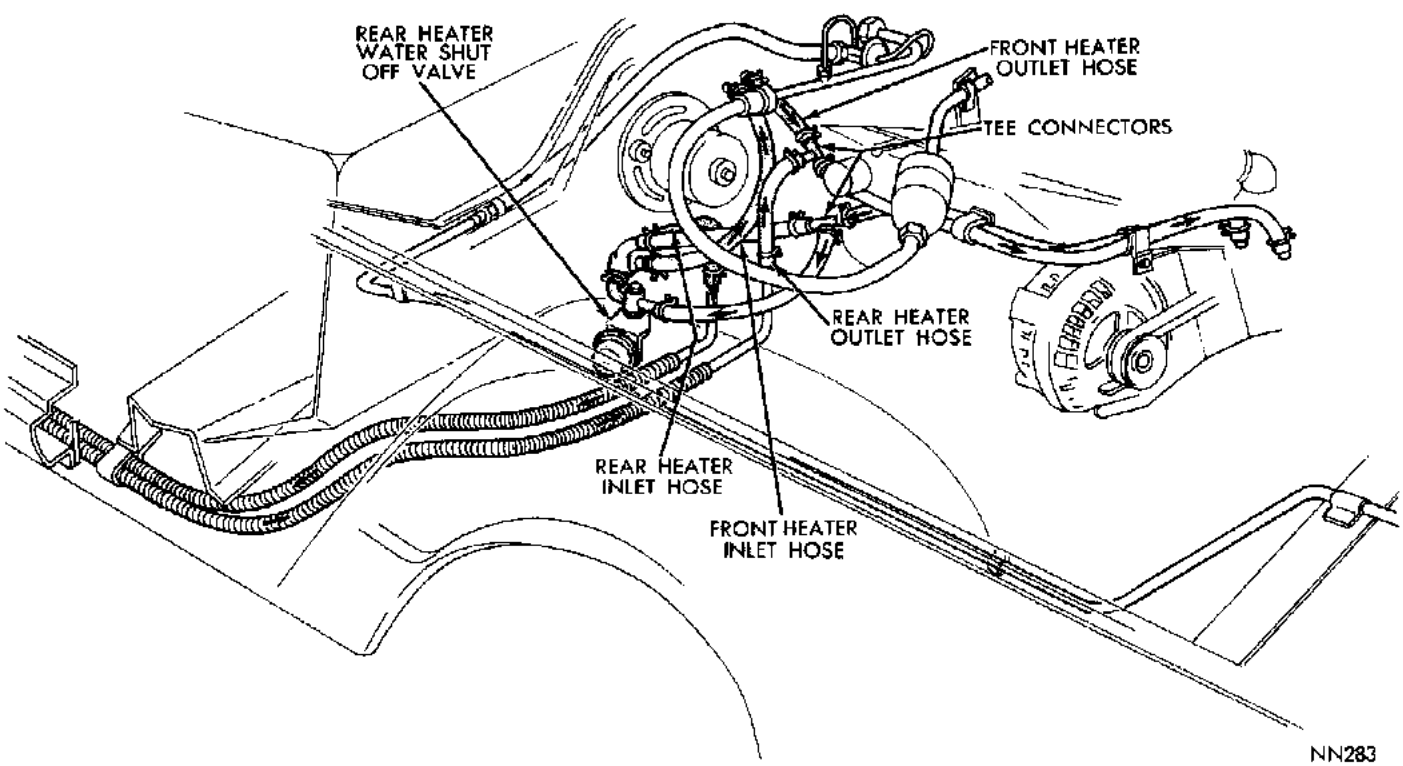


Fig. 3—Rear Seat Heater Hose Connections with Front Air Conditioning

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terminal under end mounting bracket screw.

(5) Install heater shield and spare tire in luggage compartment.

FLOOR AIR DUCTS

Replacement of the floor air ducts is accomplished by removing the seat back and seat cushion. The ducts are fastened to the floor pan with sheet metal screws. The floor air nozzles are metal screwed to the front underside lip of the rear seat cushion (Fig. 1).

CAUTION: When installing the seat cushion, carefully align the seat cushion so the outlet nozzles mate with the floor air ducts before locking seat cushion in place. Misalignment will crush the air ducts.

HEATER SHUT OFF VALVE

Removal

(1) Drain radiator.

(2) Remove two heater hose clamps and heater hoses from valve.

(3) Remove the two vacuum hoses and two valve bracket mounting screws.

Installation

(1) Position vacuum actuator and valve assembly on fender well and secure with the two metal screws.

(2) Install vacuum hoses on actuator. The hose with red tracer to valve side and hose with white tracer to fender side of actuator.

(3) Connect hose leading under car to valve connection facing engine. Connect hose from front heater hose "tee" connection to valve connection facing front of car and install hose clamps (Figs. 2 and 3).

(4) Fill radiator and bleed system.

RADIO AND ANTENNA

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GENERAL INFORMATION

Radio

The radios available for Chrysler models are the AM Model 365S, the AM-FM Model 366 and the AM Search Tuner Model 416B. The radios available for Imperial Models are the Search Tuner, Model 419 and the AM-FM Model 418. All radios are fully transistorized.

Tuning is controlled by five push buttons and the manual tuning knob on the right of the radio. On models 416B and 419 search-tuning is controlled by a three position sensitivity control plus the search-tune bar and a foot switch.

The volume, tone and the on-off switch are controlled by the dual knob on the left of the radio. The rear speaker fader control, if so equipped, is located on the bottom of the instrument panel.

AM-FM Radios

The AM-FM radio allows reception of both AM-FM broadcast frequencies. To select AM or FM reception rotate the selector control, located behind the manual tuning control, to the desired position. The tuning knob and the On-Off and Volume control knob operate in the same manner as the standard AM radio.

The following items should be noted for proper AM-FM radio operation:

(1) If antenna trimming is required, place the band selector control in the AM position and proceed with the antenna trimming procedure as outlined in "Antenna Trimming."

(2) The antenna should be extended to a height of 31 inches for maximum FM reception.

(3) The radio push button adjustment is the same as the standard AM radio. It should be noted that a push button adjustment is only good for one station (either AM or FM) not both at the same time.

(4) Should a malfunction occur, the trouble shooting procedures are the same as for the standard AM radio.

Local, Mid and Distant Settings (Models 416 and 419)

Local setting will tune the receiver to only strong signal stations. Distant setting will tune the receiver to most of the stations within range of the radio. For weak stations, manual control should be used for precise tuning.

Fader Control

This control is used only when the vehicle is equipped with a rear seat speaker. Full counterclockwise position allows operation of the front speaker. Full clockwise position allows operation of the rear seat speaker. Rotation between either position provides the desired blend of the two speakers.

If the vehicle is equipped with a reverberator, the reverberator control on the instrument panel replaces the fader control. Pull the reverberator control

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"OUT" to turn "ON" the reverberator unit and push "IN" to turn "OFF." In the "OFF" position, the reverberator control provides normal fader control.

Radio Reverberator

The radio may be equipped, as optional equipment, with a rear seat speaker. A radio reverberator which operates in conjunction with the rear seat speaker is also available as an option.

The radio reverberator is used to produce a time delay of .025 to .030 seconds in the radio output to the rear seat speaker. The "echo" produced gives the effect of "concert hall" reproduction in the vehicle.

The reverberator package consists of the reverberator unit, the instrument panel switch and the wiring from the switch to the reverberator unit. The reverberator is an independently powered unit and has its voltage supply separate from the voltage supply to the radio.

The manufacturers of the radios and reverberators make repair service available through their authorized service depots. If a schematic wiring diagram is desired, it should be obtained from the manufacturer of the particular unit.

Antennas

The power operated radio antenna (Fig. 1) is a telescoping type antenna, extended and retracted by a coiled nylon cord actuated by a two direction electric motor. The main components of the power antenna are the motor and drive assembly, the mast assembly and the support tube assembly. The antenna is serviced as a mast assembly, motor and the drive assembly, connector, pad and pin assembly, lead-in assembly and the necessary switches.

Many antenna problems may be avoided by frequent cleaning of the antenna mast telescoping sections. This may be performed when the vehicle is being washed by cleaning the antenna mast sections with a clean soft cloth. In the winter, wipe the clean antenna sections with a cloth moistened with light oil.

Before an antenna is removed, the antenna performance should be tested to determine whether it is a reception problem or an operational problem.

Foot Switch For Search Tuning

The foot switch for search tuning, on Model 416 and 419, is located on the left forward end of the floor panel. By depressing the foot switch, it will select a station on the radio.

SERVICE DIAGNOSIS

Condition	Possible Cause	Correction
RADIO RADIO IS INOPERATIVE	(a) Blown fuse.	(a) Replace the fuse.
	(b) Broken, loose or shorted antenna lead-in.	(b) Test with an auxiliary antenna and replace lead-in if necessary.
	(c) Loose battery cable.	(c) Test the voltage at the fuse and tighten all connections.
	(d) Faulty radio.	(d) Send radio to authorized radio service station for repair.
	(e) Faulty speaker.	(e) Replace the speaker.
	(f) Faulty antenna.	(f) Test the antenna and repair.
RADIO RECEPTION IS WEAK	(a) Unbalanced antenna trimmer.	(a) Adjust the antenna trimmer.
	(b) Loose antenna lead-in.	(b) Tighten the antenna lead-in.
	(c) Shorted antenna lead-in.	(c) Test with an auxiliary antenna and replace lead-in if necessary.
	(d) Faulty radio.	(d) Send radio to authorized radio service station for repair.
	(e) Faulty antenna.	(e) Test the antenna and correct.
RADIO RECEPTION IS NOISY (Engine Running)	(a) Outside electrical interferences.	(a) Move the car or eliminate interference.
	(b) Insufficient or faulty radio capacitors.	(b) Install capacitors in ignition systm.
RADIO RECEPTION IS NOISY (Vehicle in Motion)	(a) Static build up in tires.	(a) Ground the tires to the wheels with powdered graphite.
	(b) Loose antenna or lead-in wire.	(b) Tighten the antenna attaching nut. Inspect the fit of the antenna lead-in plug in the socket.
RADIO IS NOISY WHEN EQUIPMENT IS OPERATED	(a) Loose antenna ground.	(a) Clean and tighten the antenna connections.
RADIO RECEPTION IS DISTORTED	(a) Speaker coil rubbing on voice cone.	(a) Install an auxiliary speaker and compare. Replace if improved.

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Condition	Possible Cause	Correction
	(b) Torn speaker cone.	(b) Replace the speaker.
	(c) Faulty radio.	(c) Send radio to authorized radio service station for repair.
	(d) Foreign material in speaker.	(d) Clean or replace speaker.
INTERMITTENT RECEPTION	(a) Broken or shorted antenna lead-in wire.	(a) Test with a substitute antenna. Repair or replace lead-in wire.
	(b) Ground lead-in wire.	(b) Test with a substitute antenna. Repair the lead-in wire or replace.
	(c) Faulty radio.	(c) Send radio to authorized radio service station for repair.

ADJUSTMENTS

Antenna Trimming

All radios are trimmed at the factory and should require no further trimmer adjustment. However, whenever a radio is being installed after repair, or if verification of trimmer adjustment is desired, proceed as follows:

(1) Operate radio for 15 minutes.
(2) Extend antenna to 40 inches.
(3) Manually tune radio to noise or a weak signal between 1400 and 1600 K.C. For AM-FM radio tune to noise below 1000 K.C.
(4) Increase radio volume to full volume and tone control to maximum treble (fully clockwise).
(5) Remove right radio control knobs for access to trimmer control (Figs. 2 and 3).
(6) Adjust antenna trimmer by carefully tuning back and forth until position is found that gives a peak response in volume. Maximum output indicates proper point of antenna trimmer adjustment.

Push Buttons

(1) Extend antenna fully and turn radio on for fifteen minutes.
(2) Unlock push button by pulling it out and manually tune in desired station.
(3) Push button back into position to lock adjustment.
(4) Repeat operation on the other push buttons.

The radio push button adjustment is the same as the standard FM radio. It should be noted that a push button adjustment is only good for one station either (AM or FM) not both at the same time.

Interference Elimination

When installing suppression items, make certain that all paint and dirt have been removed from the grounding area between the capacitors and the engine or body components. Tighten all nuts and bolts securely.

The high tension portion of the engine ignition system uses radio resistance wire as standard equipment.

Install the ignition coil capacitor (Fig. 4).

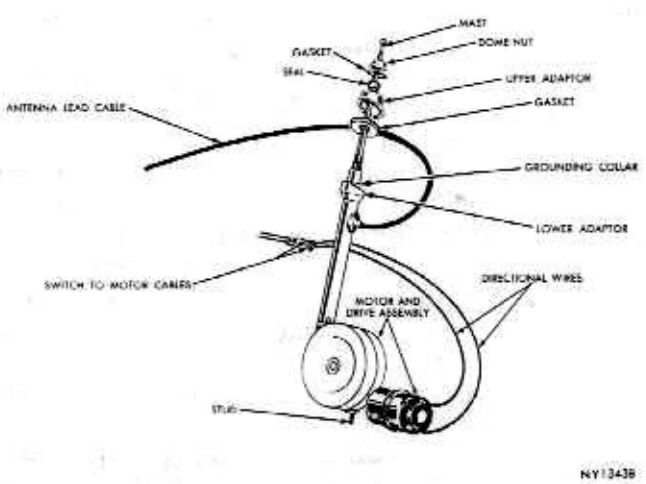


Fig. 1—Power Antenna



Fig. 2—Antenna Trimmer—Chrysler Models



Fig. 3—Antenna Trimmer—Imperial Models

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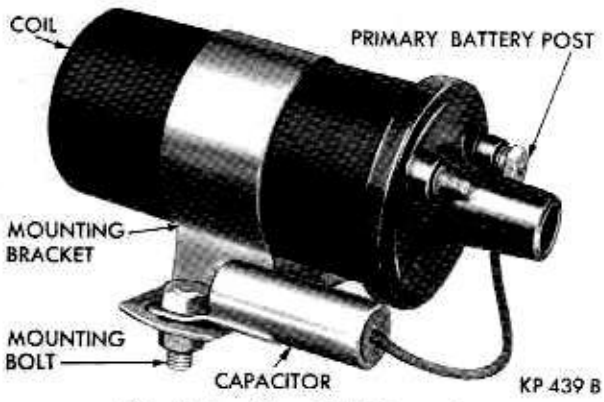


Fig. 4—Ignition Coil Capacitor

The alternator is equipped with an internal interference capacitor which is integral with the output stud.

A capacitor is installed on the back of the instrument panel with a self tapping metal screw. The lead wire is connected to the input terminal of the voltage limiter on Chrysler models. On Imperial models equipped with the voltage limiter integral with the fuel gauge, the lead wire is connected to the input terminal of the fuel gauge.

ANTENNA

Power Antenna

Clean the antenna and drive assembly before test or disassembly.

(1) With a source of 12 volt (D.C.) power, test the operation of the drive mechanism by grounding the negative (—) lead to the drive housing and with the positive (+) lead, contact the "yellow" (up) lead terminal to extend the antenna, and contact the "brown" (down) lead terminal to retract the antenna.

If the motor will not operate, replace the motor and drive assembly. If the motor runs freely and the antenna does not extend or retract, mast or drive assembly is at fault and should be replaced by either a new mast or motor and drive assembly. If the motor labors and the antenna extends and retracts very slowly, it may be caused by excessive dirt on the telescoping sections or bent telescoping mast rods. Clean and straighten the telescoping mast rods.

(2) Occasionally poor reception can be corrected by proper adjustment of radio antenna trimmer. If this fails to produce desired results, a substitute antenna known to be satisfactory may be plugged into radio with extended mast held out of car window. (Do not ground mast.)

Upon establishing that the fault is in antenna assembly, it may be traced to one or more of the following conditions:

(a) Broken lead-in wire or shielding.

(b) Grounded lead-in wire or mast assembly.

(c) Moisture in support tube or lead-in assembly.

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(3) Poor connection (antenna lead-in assembly or shielding ground).

The preliminary test may indicate that removing antenna from vehicle is necessary for further testing, repairs or parts replacement. In this event, follow procedure for antenna removal.

Removal

(1) Fully lower antenna.

(2) For front mounted power antenna remove fender shield for access. For rear mounted power antenna open luggage compartment for access to antenna assembly.

(3) Disconnect motor leads at connectors.

(4) Disconnect antenna lead at antenna.

(5) Remove nut attaching drive housing to antenna lower mounting bracket.

(6) For front mounted power antenna loosen collar tightening screw under fender. For rear mounted power antenna remove cap nut, upper adapter and gasket.

(7) Remove antenna assembly, being careful not to bend mast rod.

Installation

(1) Position antenna lead and antenna in mounting hole.

(2) For front mounted power antenna, tighten collar screw under fender. For rear mounted antenna, install gasket, upper adapter and cap nut.

(3) Install nut attaching drive housing to antenna lower mounting bracket.

(4) Connect antenna lead at antenna.

(5) Connect motor leads to connector.

(6) For front mounted antenna, install fender shield.

Bench Test for Reception Malfunction

(1) With test lamp and battery in circuit attach one test lead to concentric pin on "lead-in" connector and other test lead to mast sections. The lamp should "light" indicating continuity.

(2) Keeping one lead on connector pin, clip other lead on antenna support tube assembly. The lamp should "not light." If it does, look for a ground between mast and support tube or inner conductor from pin and pad.

(3) Remove clip lead from connector pin and clip on outer shell of connector. Connect other clip lead to antenna support tube assembly. The lamp should "light" again. If it does not "light," antenna shielding has an open circuit.

(4) Locate ground or open circuit and repair or replace component parts as required.

DO NOT attempt to service the details of the Motor and Drive Assembly. This sub-assembly must be serviced as a complete unit.

Disassembly

(1) Remove the (2) two screws holding "lead-in" receptacle.

(2) Unsolder pin from wire.

(3) Remove the (3) screws which hold support tube to motor and drive assembly.

(4) Holding motor and drive assembly in one hand and support tube in other hand, pull (applying back and forth rotary motion at same time) until support tube assembly is removed from antenna.

(5) Holding motor and drive assembly in one hand and mast assembly in other hand (grasp near bottom of mast assembly), rock the mast assembly back and forth and pull at the same time. This will remove insulator bushing from tubular fitting and outer mast section from remainder of antenna assembly.

(6) Apply 12 volts D.C. to "yellow" (up) power lead and ground, until entire length of nylon cord has been expelled from the drive. To prevent a kink or bend in nylon cord, keep it taut by pulling on mast.

CAUTION: DO NOT DISASSEMBLE MOTOR AND DRIVE ASSEMBLY FOR ANY PURPOSE.

In order to remove nylon cord from disabled motor and drive assembly, place assembly in a vise so that normal plane of nylon cord is parallel with floor, then using both hands pull on nylon cord until completely expelled from drive.

(7) Remove bottom insulator and water seal washer (Fig. 5) from tubular fitting using a wire hook and long nose pliers.

Assembly

(1) If original mast assembly is reused, thread nylon cord through bottom insulator with tubular projection down (Fig. 6). Then thread nylon cord through water seal washers.

The bottom insulator and water seal washer are included on service replacement mast assembly.

(2) Apply 12 volts D.C. to "brown" (down) power lead and ground. Feed approximately 12 inches of nylon cord into the drive. Push water seal washer and bottom insulator all the way down into the tubular fitting. Apply 12 volts D.C. power until nylon cord disappears.

(3) Push outer mast section down into tubular fitting. Make sure upper edge of flange on insulator bushing is below center of the 3 holes in tubular fitting.

(4) Install support tube assembly in proper position making sure hook-up wire is extended through large hole in body (Fig. 7).

(5) Install the (3) screws to attach support tube assembly to motor and drive assembly.

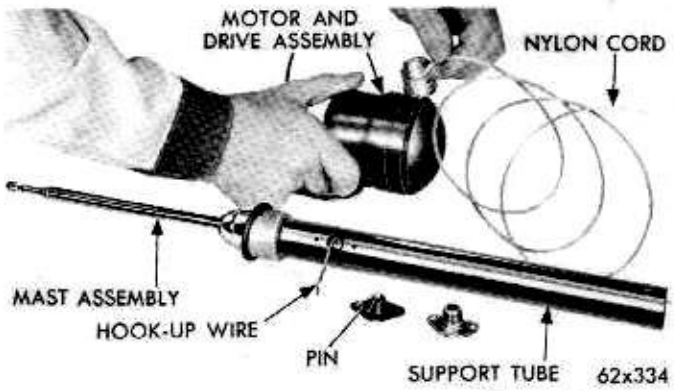


Fig. 6—Assembling Power Antenna

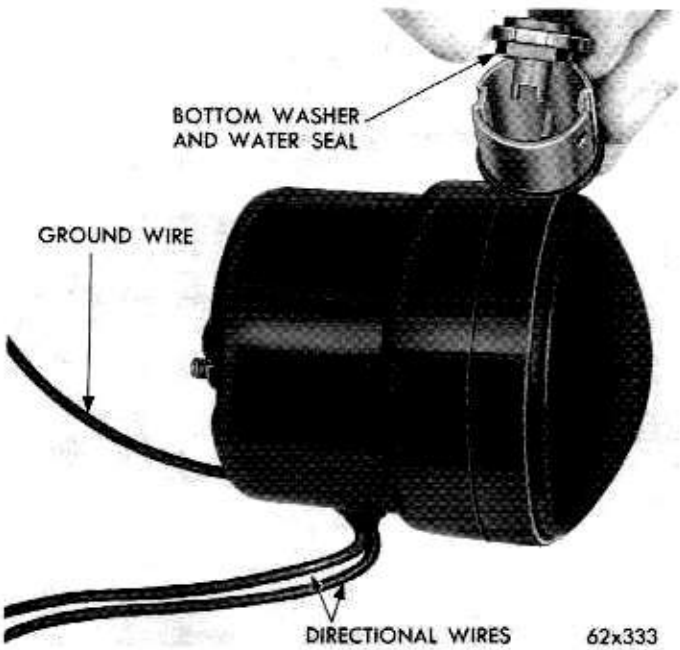


Fig. 5—Removing Bottom Insulator and Water Seal Washer



Fig. 7—Installing Mast Support

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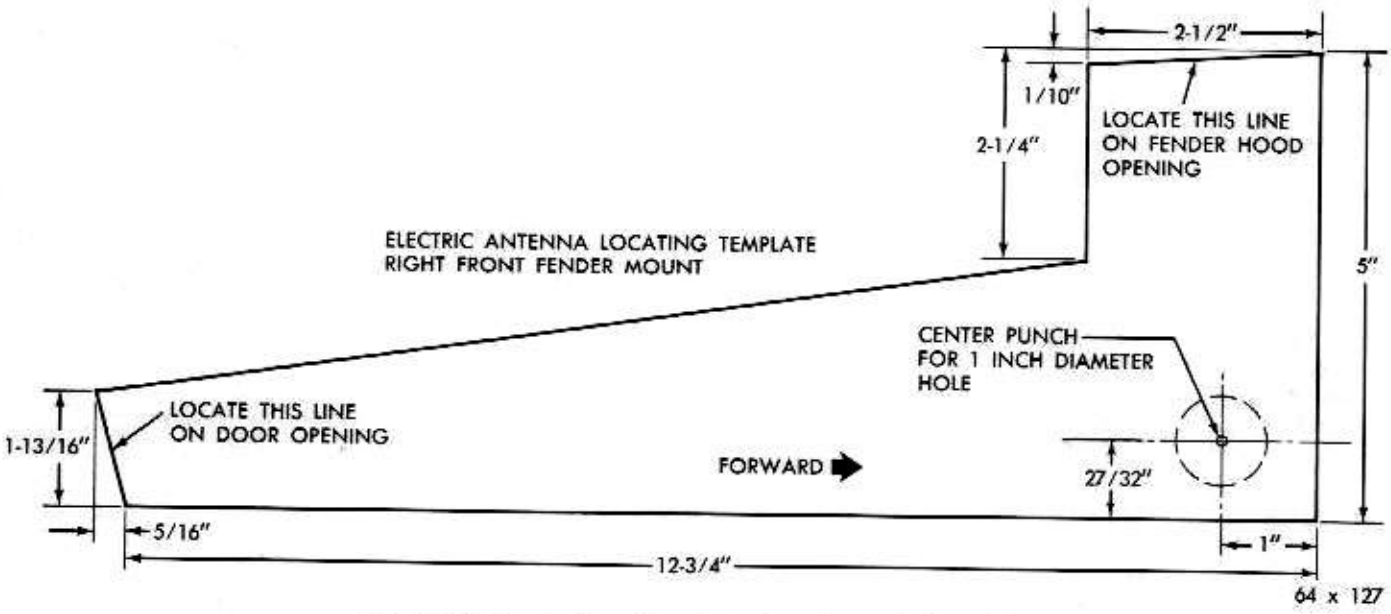


Fig. 8—Antenna Mounting Location—Imperial Models

(6) Solder hook-up wire to pin.

(7) Assemble lead-in receptacle with the (2) screws.

(8) Apply 12 volt power to "yellow" and "brown" antenna leads and test for up and down operation.

Power Antenna Location—Imperial Models

The electric antenna is offered as a factory installed accessory only. Should replacement of the fender, due to damage be necessary, see Fig. 8 for proper location of the antenna.

MANUAL ANTENNA

Removal—Chrysler Models

(1) Disconnect antenna lead from radio receiver and from engine compartment carefully pull out of passenger compartment.

(2) Use Tool C-3977 to remove cap nut, upper adapter and gasket (Fig. 9).

(3) Reaching under fender from engine compartment, tip lower adapter and lift antenna assembly out through top of fender.

Installation

(1) Position spacer and lower adapter on antenna mast and insert the assembly in fender mounting hole by tipping adapter.

(2) Position lower adapter on tangs of spacer (Fig. 9).

(3) Install gasket, upper adapter and cap nut over top of antenna. Index upper adapter locating pins in two small holes in fender. Lubricate cap nut threads and tighten with Tool C-3977 (Fig. 9).

(4) Insert antenna lead through hole in floor pan and snap grommet in place (Fig. 10).

(5) Disconnect alligator clip on heater fresh air flexible hose and separate from duct far enough to position antenna lead through opening and behind hose.

(6) Route cable lead over fresh air duct and connect to radio receiver.

Initial Antenna Installation

(1) See Figure 11 for proper location of antenna

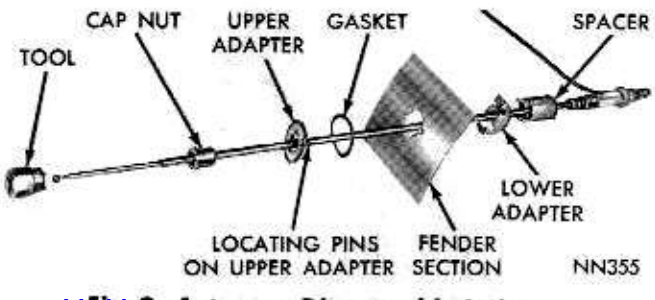


Fig. 9—Antenna—Disassembled View—Chrysler Models

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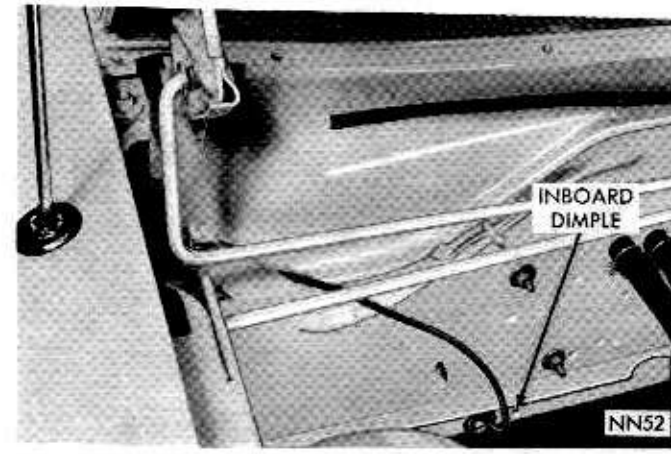


Fig. 10—Antenna Lead Cable Routing—Chrysler Models

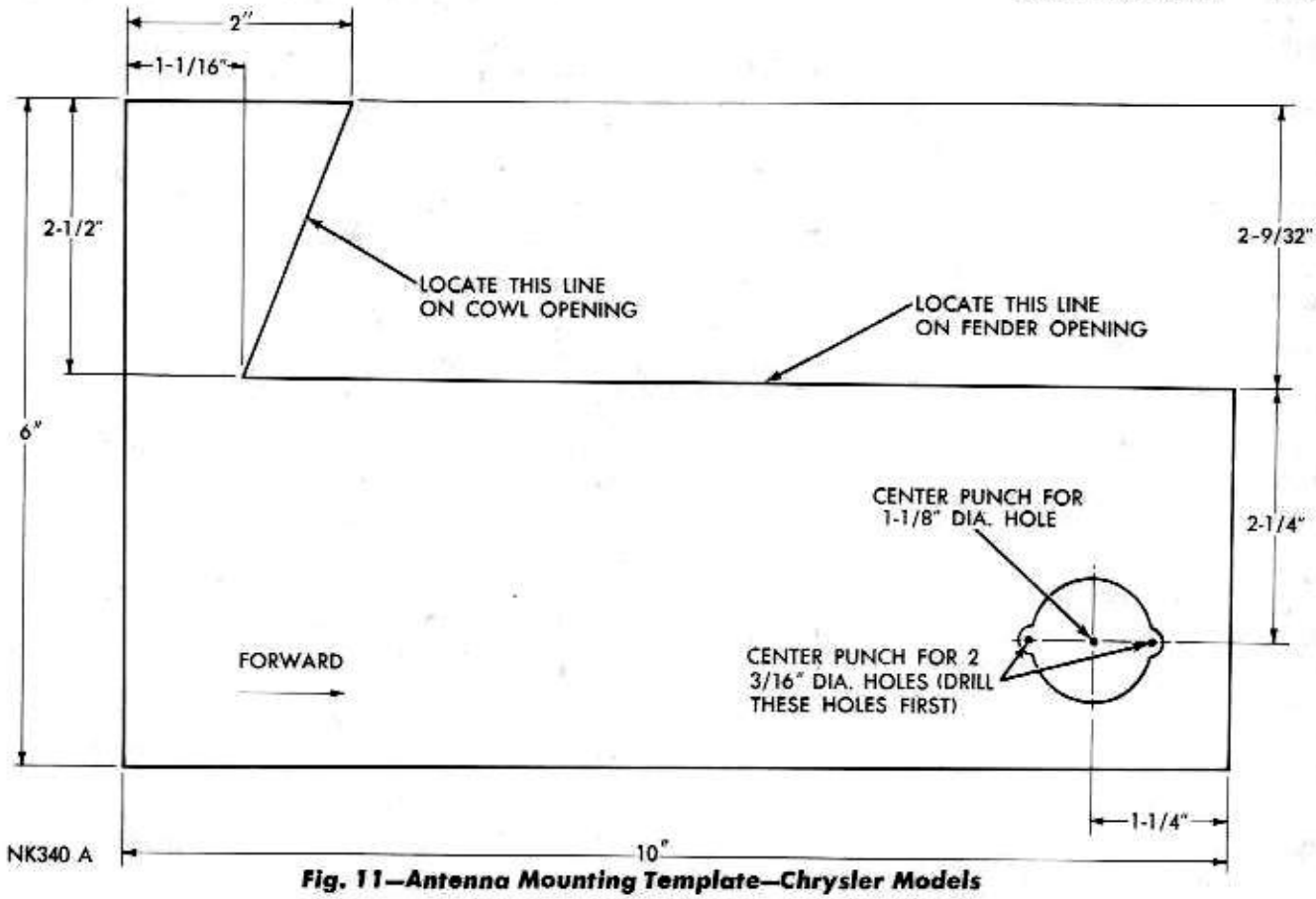


Fig. 11—Antenna Mounting Template—Chrysler Models

mounting holes. Make template of heavy paper.

(2) After locating template on fender, center punch and drill the 3/16" holes **first** and the 1⅛" holes last.

(3) Raise carpet inside car and drill a ¾" hole in outboard dimple on floor pan. This dimple can easily be located from inside engine compartment. There are two dimples on the floor pan below the flange and to the right of engine. Use outboard dimple for antenna lead (Fig. 10).

(4) Slide spacer and lower adapter over top of antenna mast and insert antenna lead and antenna into hole from top side of fender. Tip lower adapter on mast to permit adapter to slide through mounting hole.

(5) Position lower adapter on tangs of spacer and install gasket and upper adapter over top of antenna. Index upper adapter locating pins in two 3/16" holes in fender. Lubricate cap nut threads and tighten with Tool C-3977 (Fig. 12).

(6) Insert antenna lead through ¾" hole in floor pan and snap grommet in place. Route antenna lead over fresh air duct. This can be done by disconnecting alligator clip on hose, pushing hose to right and leading antenna through opening.

(7) Connect antenna lead to radio receiver.

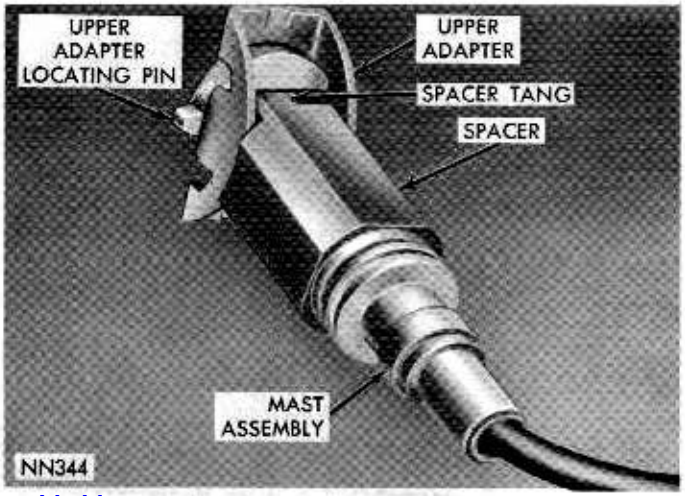


Fig. 12—Antenna Assembled—Underside View

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RADIOS

CAUTION: Do not operate the radio with the speaker detached since damage to the transistors may result.

Removal—Imperial Models

(1) Disconnect battery ground cable.

(2) Remove the four screws that attach ash receiver assembly to instrument panel.

(3) Lower ash receiver assembly and disconnect turn signal flasher and ash receiver light wiring.

(4) Remove ash receiver assembly.

(5) From under instrument panel remove the two screws from radio to instrument panel lower reinforcement mounting bracket and remove bracket.

(6) Disconnect antenna lead, speaker leads and

radio feed wire.

(7) Remove pencil brace from instrument panel lower reinforcement to dash panel. This brace is located just left of radio.

(8) Remove radio control knobs and mounting nuts from front of radio.

(9) Pull radio out of panel opening and rotate 90 degrees so face of radio is to the right of vehicle, then carefully remove radio from under instrument panel.

Installation—Imperial Models

(1) Position radio into instrument panel opening from under instrument panel.

(2) Install mounting nuts and radio control knobs from front of radio.

(3) Install pencil brace from instrument panel lower reinforcement to dash panel.

(4) Connect antenna lead, speaker and feed wires.

(5) From under instrument panel install radio to instrument panel lower reinforcement mounting bracket.

(6) Position ash receiver in front of instrument panel opening and connect turn signal flasher and ash receiver lamp wiring. Install ash receiver assembly.

(7) Connect battery ground cable.

Removal—Chrysler Models

On vehicles with air conditioning, it is necessary to remove the center air conditioning outlet hose.

(1) Disconnect battery ground cable.

(2) Remove ash receiver and housing assembly.

(3) Remove radio control knobs.

(4) Remove radio mounting nuts.

(5) Working through ash receiver opening, disconnect speaker leads, radio feed wire and antenna lead cable.

(6) Remove radio to instrument panel mounting bracket.

(7) Remove radio out through ash receiver opening in instrument panel.

Installation—Chrysler Models

(1) Install radio in instrument panel opening by inserting radio up through ash receiver opening in instrument panel.

(2) Install radio to instrument panel mounting bracket.

(3) Connect speaker leads, radio feed wire and antenna lead cable.

(4) Install radio mounting nuts.

(5) Install radio control knobs.

(6) Install center air conditioning outlet hose, if so equipped. Install ash receiver and housing assembly.

(7) Connect battery ground cable.

RADIO SPEAKERS

Front Speaker Removal—Imperial Models

(1) Disconnect battery ground cable.

(2) From top of instrument panel remove six screws that attach radio speaker and defroster outlet grille assembly to instrument panel and remove grille assembly.

(3) From top of instrument panel remove the four screws that attach radio speaker to instrument panel.

(4) Remove radio speaker.

Installation

(1) Position speaker in speaker opening in instrument panel.

(2) From top of instrument install the four screws that attach radio speaker to instrument panel.

(3) Position radio speaker and defroster outlet grille on top of instrument panel and install six attaching screws.

(4) Connect battery ground cable.

Front Speaker Removal—Chrysler Models

(1) Disconnect battery ground cable.

(2) Remove radio as outlined in "Radio Removal."

(3) Remove upper section of glove box.

(4) Reach through glove box opening and remove speaker mounting plate attaching screw nearest glove box opening.

(5) Reach through ash receiver opening and remove remaining speaker mounting plate attaching screw.

(6) Remove speaker and mounting plate out

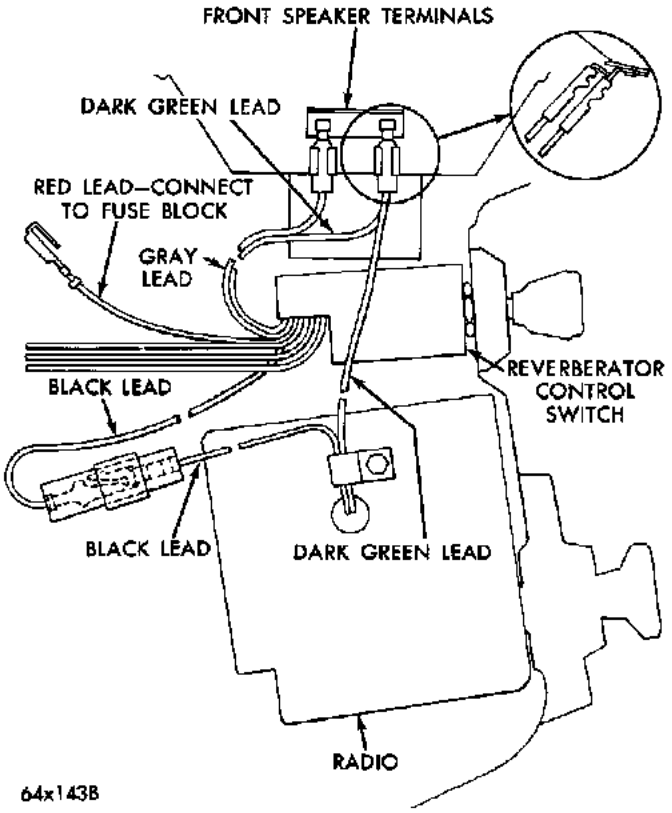


Fig. 13—Reverberator Wire Harness (at Instrument Panel)

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through ash receiver opening in a rotating motion.

Installation

(1) Install speaker and mounting plate through ash receiver opening and install mounting plate attaching screw on left end of the mounting plate.

(2) Working through glove box opening install remaining speaker mounting plate attaching screw.

(3) Install upper section of glove box.

(4) Install radio as outlined in "Radio Installation."

(5) Connect battery ground cable.

Rear Seat Speaker

Removal

(1) Remove spare tire (Chrysler Models only).

(2) Disconnect speaker leads.

(3) Remove the 4 sheet metal screws holding speaker to shelf panel.

Installation

(1) Position speaker under shelf panel and install 4 mounting screws.

(2) Connect speaker leads.

(3) Install spare tire (Chrysler Models only) and test operation of speaker.

Radio Reverberator

Figure 13 shows the switch and wiring installation at the radio.

The radio reverberator is suspended from the left side of the shelf panel in the luggage compartment in Chrysler models. On Imperial models the radio reverberator is mounted in the luggage compartment on the left side below the deck lid opening and behind the carpet liner. It is necessary to remove the spare tire in both Chrysler and Imperial models for access to the unit.

On Imperial models, pull the floor carpet back from the deck lid opening and remove the luggage compartment lining to gain access to the unit.

Two metal screws fasten the reverberator to the luggage compartment floor (Imperial models) or to the shelf panel (Chrysler models).

SAFEGUARD SENTINEL LIGHTING SYSTEM

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GENERAL INFORMATION

The Safeguard Sentinel Lighting System is a light sensing device that automatically controls the use of the driving lights after the ignition key is turned on. The system automatically activates the taillights and the headlights when the light intensity outside the car requires road illumination. If light intensity reaches a point (selected by the driver with the sensitivity control), when the lights are no longer needed, the Safeguard turns them off. In periods of darkness, the headlights, taillights and back-up lights will remain on for a period of from one to three minutes after the ignition key is turned off depending on the desired setting of the Time Delay Control Switch. The system can be disconnected at anytime by pulling the control switch knob out. Use of the driving lights is then controlled by the headlight switch.

Three units control the system. The time control switch is mounted on the lower part of the instrument panel to the left of the steering column. Pushing the knob in, activates the system. The headlight switch remains turned off. Rotating the control knob clockwise increases the period of time the driving lights remain on after the ignition key is turned off.

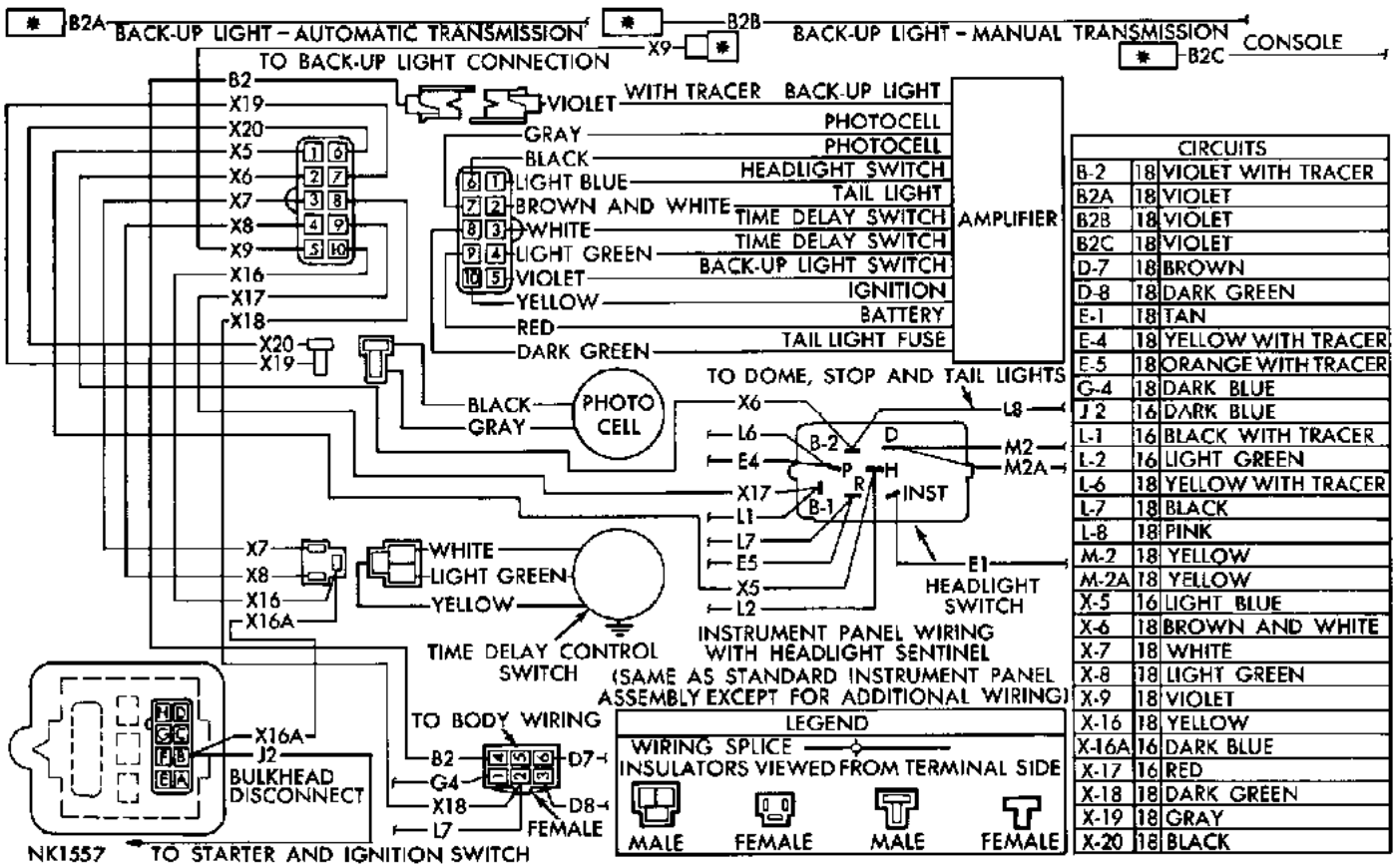
The Photocell, mounted on the top left side of the instrument panel cowl pad, is adjustable by the driver to determine when the degree of light outside of the car will require the use of the driving lights. Turning the control clockwise decreases the sensitivity of the cell to light. Rotating the knob counterclockwise increases the sensitivity and will turn the lights on earlier.

The Amplifier is mounted under the right side of the instrument panel on the heater plenum chamber flange. This unit receives the signals from the photocell and control knob and activates the headlight circuit accordingly. **The entire Safeguard circuit is grounded through the manual ON-OFF switch. When the switch is in the off position, a malfunction of any of the components cannot keep the headlights on Fig. 1).**

The backup lights will light regardless of the position of the time control switch when the headlight switch is turned on with the ignition key off. They will go out when the ignition key is turned on.

The circuit breaker in the headlight switch protects the headlight circuit during normal manual operation. When the Safeguard time control switch is pushed in to the automatic position, the headlight switch is bypassed. Therefore a second circuit breaker, mounted in the amplifier, protects the headlight circuit.

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CIRCUITS		
B-2	18	VIOLET WITH TRACER
B2A	18	VIOLET
B2B	18	VIOLET
B2C	18	VIOLET
D-7	18	BROWN
D-8	18	DARK GREEN
E-1	18	TAN
E-4	18	YELLOW WITH TRACER
E-5	18	ORANGE WITH TRACER
G-4	18	DARK BLUE
J 2	16	DARK BLUE
L-1	16	BLACK WITH TRACER
L-2	16	LIGHT GREEN
L-6	18	YELLOW WITH TRACER
L-7	18	BLACK
L-8	18	PINK
M-2	18	YELLOW
M-2A	18	YELLOW
X-5	16	LIGHT BLUE
X-6	18	BROWN AND WHITE
X-7	18	WHITE
X-8	18	LIGHT GREEN
X-9	18	VIOLET
X-16	18	YELLOW
X-16A	16	DARK BLUE
X-17	16	RED
X-18	18	DARK GREEN
X-19	18	GRAY
X-20	18	BLACK

Fig. 1—Safeguard Sentinel Wiring Diagram

SERVICE DIAGNOSIS

Before any tests are made, it should be determined that all driving lights are operating manually first. It is important that the steps in the service diagnosis be performed in the sequence shown for each condition.

Condition	Possible Cause	Correction
LIGHTS FAIL TO LIGHT AUTOMATICALLY IN PERIODS OF DARKNESS	(a) Loose connections.	(a) Test continuity of all circuits and repair as necessary.
	(b) Poorly grounded time control switch.	(b) Remove switch bezel and clean paint from instrument panel under bezel.
	(c) Faulty time control switch.	(c) Jump white wire (X-7) at switch to a good ground. If lights light, replace switch.
	(d) Faulty photocell.	(d) Place jumper wire from (X-19) from amplifier connector. If lights light, replace photocell.
	(e) Faulty amplifier.	(e) Disconnect multiple connector at amplifier and jump from red (X-17) to blue (X-5) in body wiring side of connector. If lights light, replace amplifier.
LIGHTS FAIL TO TURN OFF AUTOMATICALLY IN PERIODS OF LIGHT	(a) Photocell covered up.	(a) Instruct owner in the proper use of system.
	(b) Loose connections in photocell circuit.	(b) Test continuity of gray wire (X-19) and black wire (X-20) and repair as necessary.
	(c) Faulty photocell.	(c) Test photocell by jumping gray (X-19) and black (X-20) wires at amplifier multiple connector. Replace photocell if lights go off.
	(d) Faulty amplifier.	(d) Disconnect multiple connector at

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Condition	Possible Cause	Correction
		amplifier. If lights go out, replace amplifier.
LIGHTS TURN OFF IMMEDIATELY AFTER IGNITION SWITCH IS TURNED OFF	(a) Taillight fuse blown.	(a) Test circuit for short and replace fuse.
	(b) Faulty time control switch.	(b) Test with switch known to be good. (Be sure to ground switch.) Replace if necessary.
	c) Faulty amplifier.	(c) Test with amplifier known to be good. Replace if necessary.
LIGHTS REMAIN ON TOO LONG AFTER IGNITION SWITCH IS TURNED OFF	(a) Loose connection in yellow wire (X-16) or light green wire (X-8).	(a) Repair as necessary.
	(b) Faulty time control switch.	(b) Test with switch known to be good. (Be sure to ground switch.) Replace if necessary.
	(c) Faulty amplifier.	(c) Test with amplifier known to be good. Replace if necessary.
BACKUP LIGHTS FAIL TO LIGHT	(a) Loose wire connections.	(a) Test continuity of violet wire (X-9) and violet wire with white tracer B-2). Repair as necessary.
	(b) Open windshield wiper circuit breaker.	(b) Test operation of windshield wipers. If inoperable, test for short in circuit and repair as necessary.
	(c) Faulty amplifier	(c) Jump violet wire (X-9) to violet wire with white tracer (B-2) at amplifier. If backup lights light, replace amplifier.
BACKUP LIGHTS LIGHT MANUALLY BUT NOT DURING TIME DELAY	(a) Faulty amplifier.	(a) Disconnect violet wire with white tracer (B-2) at amplifier. If lights turn off, replace amplifier.

Tests and Adjustments

Before testing any part of the Safeguard Sentinel Lighting System, it should first be determined that the exterior lighting system of the vehicle is operating properly. Turn on the headlights, and visually test the operation of the lights. The backup lights should light regardless of the position of the time control switch or the gear selector and go out when the ignition key is turned on.

After testing the manual operation of the lighting system, inspect the multiple connectors at the amplifier, the photocell and the time control switch to be sure they are tight and making good contact. If connections are tight, continuity of the entire wire harness should be tested with an ohmmeter.

Should the automatic operation fail, test the time control switch for a good ground. Place a jumper wire from the switch bezel or knob to a good body ground and test the operation of the system. If the system operates properly, remove the switch bezel and clean the paint from the instrument panel, under the bezel, and reinstall the bezel.

The photocell, amplifier and control switch are not to be serviced. If one or the other is defective, it should be replaced.

Photocell (Fig. 2).

If the lights fail to light automatically after dark, test the photocell by covering with a dark cloth. Start the engine, push the time control switch in and turn off the headlight switch. If the headlights and taillights do not light within a few seconds, uncouple the multiple connector at the amplifier (Fig. 3). Remove the gray wire (X-19) from the connector leading to the body wiring and recouple the connector (Fig. 1). If the lights light, replace the photocell and reinstall the gray wire (X-19) in the connector.

Should the lights fail to automatically turn off at day break, shine a bright light into the photocell. Rotate the cap to the centered position between the "Early" and "Late" position. If the lights light, the cap was rotated too far blocking off light to the cell through the window in the cap (Fig. 2). Instruct the

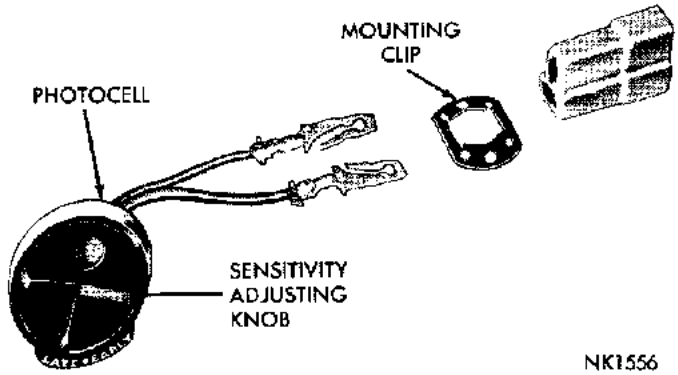


Fig. 2—Photocell

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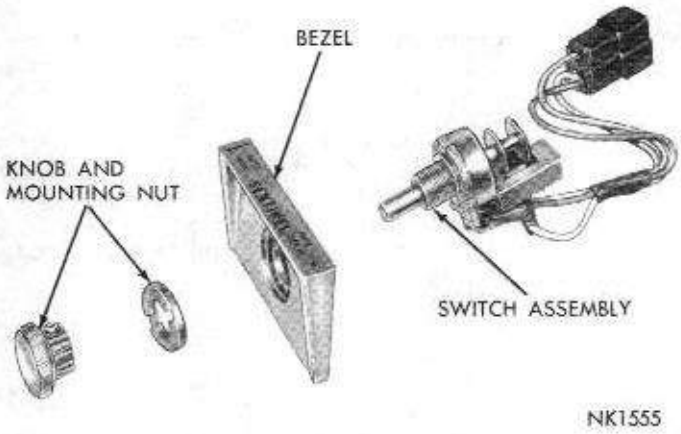


Fig. 3—Time Delay Control Switch

owner in the proper use of the Safeguard Lighting System.

If the sensitivity adjustment of the cap still fails to correct the operation, test the photocell by placing a jumper wire from the gray wire (X-19) to the black wire (X-20) at the amplifier (Fig. 1). This will close the photocell circuit and the lights should turn off. If they do, replace the photocell.

Time Control Switch (Fig. 3)

Always test the time control switch for a good ground to the instrument panel before condemning the switch.

Ground the switch by connecting a jumper wire from the knob of the switch to a good body ground. Test the operation of the system. If the system operates properly, remove the switch bezel and clean the paint from the panel so a good contact will be made when the bezel is installed.

If the lights fail to turn off automatically after the ignition is turned off and the photocell test is positive, test the switch by jumping the yellow wire (X-16) to the light green wire (X-8) at the switch. If the lights turn off, replace the switch.

Should the lights turn off immediately after the ignition key is turned off, (no time delay) regardless of the time control setting, inspect the taillight fuse. If the fuse is not blown; test for short in switch.

Amplifier (Fig. 4)

Should the lights fail to light automatically, and the photocell and switch tests are positive, the amplifier should be tested as follows:

Remove the amplifier from the heater plenum chamber flange and disconnect the multiple connector (Fig. 4). Place a jumper wire from the red wire (X-17) to the light blue wire (X-5) in the connector on the body wiring side (Fig. 1). If the lights light, replace the amplifier.

Should the lights fail to turn off automatically at day time, the photocell and time delay switch



Fig. 4—Amplifier

tests are positive, disconnect the multiple connector at the amplifier. If the lights go out, replace the amplifier.

Failure of the lights to turn off automatically when the ignition key is turned off or the lights turn off immediately regardless of time control setting of the switch, test with an amplifier known to be good. If lights operate properly, replace the amplifier.

PHOTOCELL

Removal

(1) Disconnect battery ground cable.

(2) Remove steering column cover and left spot cooler hose from distribution duct if air conditioning equipped.

(3) From under panel, disconnect photocell connector (black and gray wires, Fig. 2), and remove tinerman clip from photocell base with a small screw driver. Pull photocell up through mounting hole, cut wires and remove.

Installation

(1) From top of instrument panel, feed photocell wires through mounting hole.

(2) Hold photocell in place on panel, press tinerman clip on photocell base from under panel (Fig. 2).

(3) Install connector insulator on wire terminals. **(Color codes do not have to be followed.)**

(4) Couple connectors and install steering column cover.

(5) Install left spot cooler hose to distribution duct if air conditioning equipped.

(6) Connect battery ground cable and test operation of light system.

TIME DELAY CONTROL SWITCH

Removal

(1) Disconnect battery ground cable.

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(2) Remove steering column cover.

(3) Remove switch control knob and mounting nut.

(4) Disconnect connector from switch and remove from under panel.

Installation

(1) Install connector to switch and from under panel, position switch in bezel.

(2) Install mounting nut and control knob.

(3) Install steering column cover.

(4) Connect battery ground cable and test operation of system.

AMPLIFIER

Removal

Remove the two nuts retaining the amplifier bracket to the right fresh air vent flange and lower assembly far enough to disconnect multiple connector. Remove two self tapping screws from bracket to separate from amplifier.

Installation

Assemble the bracket to the amplifier with the two self tapping screws and bolt the assembly to the right fresh air vent flange. Connect the multiple connector and the battery ground cable. Test the operation of the Sentinel.

WINDSHIELD WASHERS

GENERAL INFORMATION

The windshield washers are operated by an electric motor driven pump to which fluid is gravity fed from a plastic reservoir (Fig. 1). The motor is operated by depressing the windshield wiper knob, or a button located on the instrument panel.

The pump assembly is located in the engine compartment below the plastic reservoir. A permanently lubricated sealed motor is coupled to a gear type pump. Jets mounted in the fresh air intake grille of the cowl ventilator distribute fluid, routed through rubber hoses, to the windshield. A self resetting circuit breaker mounted inside the pump will reset after a period of two minutes in the event of a frozen pump. The circuit breaker is a serviceable item but the pump and motor are serviced as an assembly only.

SERVICE DIAGNOSIS

Condition	Possible Cause	Correction
INTERMITTENT OPERATION OF SYSTEM	(a) Faulty circuit breaker. (b) Loose wiring connections.	(a) Replace circuit breaker. (b) Repair as necessary.
PUMP INOPERATIVE MOTOR RUNS	(a) Nozzle jets plugged. (b) Broken or loose hose. (c) Broken coupling. (d) Faulty pump. (e) Nozzle jet under air intake grille.	(a) Clean nozzle jets. (b) Replace Hose. (c) Replace motor and pump assembly. (d) Replace motor and pump assembly. (e) Adjust nozzles.
PUMP ASSEMBLY INOPERATIVE	(a) Loose wiring terminals. (b) Corroded terminals. (c) Broken wires. (d) Faulty switch. (e) Faulty motor. (f) Poor ground. (g) Faulty circuit breaker.	(a) Tighten the terminals. (b) Clean and tighten the terminals. (c) Repair or replace the wires. (d) Replace the wiper switch assembly. (e) Replace the motor and pump assembly. (f) Clean the pump housing and tighten the mounting screws. (g) Replace the circuit breakers.

TESTS AND ADJUSTMENTS

Nozzle Adjustments—Chrysler Models

A slot is provided in the nozzle mounting bracket to compensate for lateral adjustment. Loosen the mounting screw and slide nozzle for proper clearance between the grille louvres. Vertical nozzle adjustment is made by inserting a small screwdriver into the cowl grille opening and bending the nozzle.

Adjust the nozzles so that the centers of the streams contact the windshield glass as shown in Figure 2. **The oval pattern formed by the stream striking the windshield glass is not "centered" on the center of the stream. The stream center is toward the bottom of the oval pattern.**

Imperial Models

Adjustment of the nozzle may be made by using a screwdriver to rotate the nozzle jets "up" and "down."

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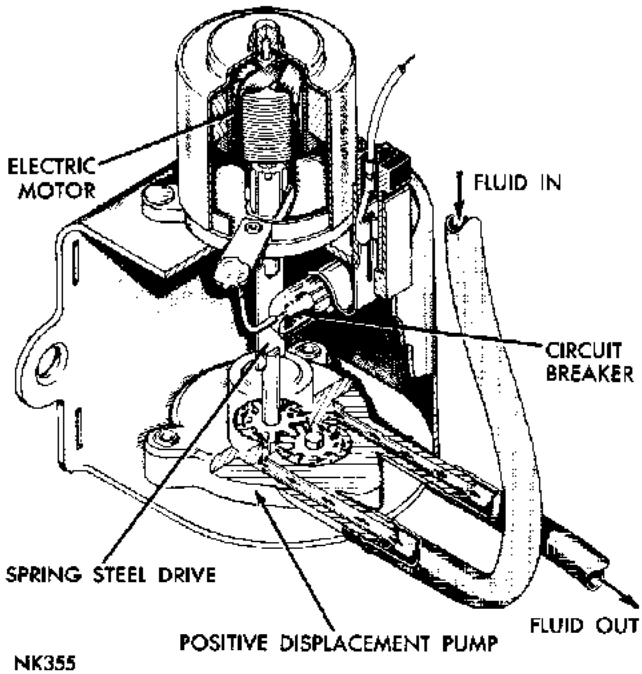


Fig. 1—Washer Motor and Pump Assembly

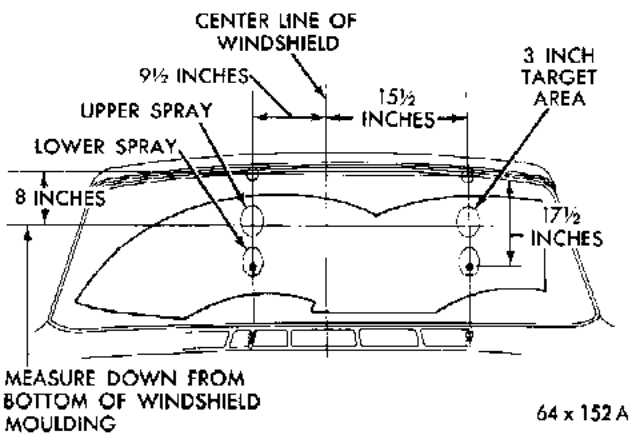


Fig. 2—Washer Aiming Diagram—Chrysler Models

Adjust nozzles so that centers of the streams contact the windshield glass. (Fig. 3).

NOTE: The oval pattern formed by the stream striking the windshield glass is not "centered" on the center of the stream. The stream center is toward the bottom of the oval pattern.

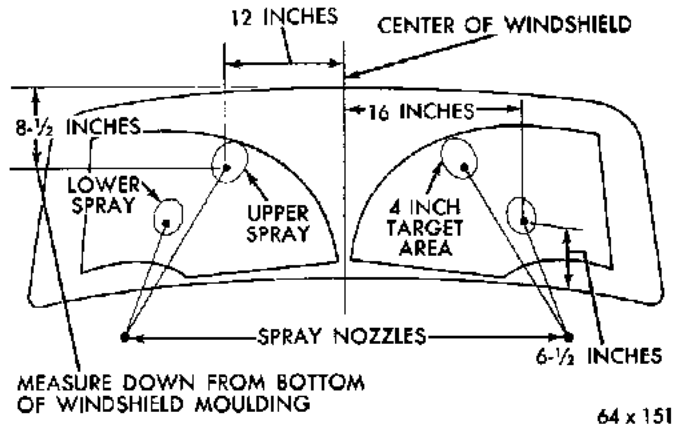


Fig. 3—Washer Aiming Diagram—Imperial Models

Pump Circuit Breaker Replacement

(1) Empty reservoir.
(2) Disconnect hoses from pump.
(3) Disconnect wire terminal.
(4) Remove pump assembly from vehicle.
(5) Lift up pump cover retaining tabs and remove cover.
(6) Unsolder circuit breaker lead from motor terminal.
(7) Remove circuit breaker and terminal from pump and motor bracket.
(8) Install new circuit breaker and terminal in slot in bracket. Press insulator firmly in place.
(9) Solder bare end of circuit breaker lead to motor terminal using rosin core solder.
(10) Install pump cover. Carefully bend retaining tabs in place.
(11) Install pump.
(12) Connect hoses to pump.
(13) Connect wiring terminal.
(14) Fill reservoir and test operation of washer system.

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FRONT SUSPENSION AND STEERING LINKAGE

CONTENTS

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GENERAL INFORMATION

The torsion bar rear anchors are integral with the engine rear support member. The front anchors are part of the lower control arms and provide the means of adjusting the vehicle front height. Compression type lower ball joints are integral with the steering arms.

All ball joints and the torsion bars at the front of the rear anchors are effectively sealed against road splash by tightly fitted balloon type flexible seals.

The ball joints are of the semi-permanent lubricated type. When lubrication of the ball joints and tie rod end assemblies is required, remove the plugs and install a lubrication fitting. After lubricating, reinstall the plugs.

Service replacement ball joints are equipped with a "Knock-Off" type lubrication fitting. After lubricating, knock off that portion of the fitting over which the lubrication gun was installed. A ball check installed in the remaining portion of the fitting prevents foreign materials from passing through the fitting.

The tie rod end seals and protectors should be inspected for damage at all oil change periods.

Lower ball joints (steering arm assembly) should not be replaced for looseness if the axial end play (Up and Down movement) is under .050 inch. Looseness of this nature is not detrimental and will not affect front wheel alignment or car stability in any way.

Rubber bushings should not be lubricated at any time.

On models equipped with disc brakes, refer to Group 5 for brake drum removal and installation procedures.

SERVICE DIAGNOSIS

Condition	Possible Cause	Correction
FRONT END NOISE	(a) Ball joint needs lubrication.	(a) Lubricate ball joint.
	(b) Shock absorber and bushings worn or	(b) Replace bushings.
	(c) Worn strut bushings.	(c) Replace bushing.
	(d) Loose struts—Lower control arm bolts and nuts, (Imperial Only).	(d) Tighten all bolts and nuts.
	(e) Loose steering gear on frame.	(e) Tighten the steering gear mounting bolts.
	(f) Worn upper control arm bushings.	(f) Replace worn bushings.
	(g) Worn lower control arm shaft bushings.	(g) Replace worn bushings.
	(h) Worn upper or lower ball joint.	(h) Replace ball joint.
	(i) Worn tire rod ends.	(i) Replace tie rod end.
	(j) Loose or worn front wheel bearings. loose.	(j) Adjust or replace bearings as necessary.
	(k) Steering knuckle arm contacting the lower control arm or strut.	(k) Smooth off the contacting area and lubricate with a water resistant grease.
INSTABILITY	(a) Low or uneven tire pressure.	(a) Inflate tires to correct pressure.
	(b) Loose wheel bearings.	(b) Adjust wheel bearing.
	(c) Improper steering cross shaft adjustment.	(c) Adjust steering cross shaft.
	(d) Steering gear not centered.	(d) Adjust steering gear.
	(e) Worn idler arm bushing.	(e) Replace bushing.

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Condition	Possible Cause	Correction
	(f) Loose or excessively worn front strut bushings.	(f) Replace bushings.
	(g) Weak or broken rear spring.	(g) Replace spring.
	(h) Incorrect front wheel alignment.	(h) Measure and adjust front wheel alignment.
	(i) Shock absorber inoperative.	(i) Replace shock absorber.
HARD STEERING	(a) Ball joints—require lubrication.	(a) Lubricate ball joints.
	(b) Low or uneven tire pressure.	(b) Inflate tires to recommended pressures.
	(c) Low power steering fluid level.	(c) Fill pump reservoir to correct level.
	(d) Lack of assist of power steering system.	(d) Inspect, test, and service the power steering pump and gear as required.
	(e) Incorrect front wheel alignment (particularly caster) resulting from a bent control arm, steering knuckle or steering knuckle arm.	(e) Replace bent parts and adjust the front wheel alignment.
	(f) Steering gear low on lubricant.	(f) Fill gear to correct level.
	(g) Steering gear not adjusted.	(g) Adjust steering gear.
	(h) Idler arm binding.	(h) Free-up idler arm.
CAR PULLS TO ONE SIDE	(a) Low or uneven tire pressure.	(a) Inflate tires to recommended pressure.
	(b) Front brake dragging.	(b) Adjust brakes.
	(c) Grease, lubricant or brake fluid leaking onto brake lining.	(c) Replace brake shoe and lining as necessary and stop all leaks.
	(d) Loose or excessively worn strut bushings.	(d) Tighten or replace strut bushings.
	(e) Power steering control valve out of adjustment.	(e) Adjust steering gear control valve.
	(f) Incorrect front wheel alignment (particularly camber).	(f) Adjust front wheel alignment.
	(g) Broken or weak rear spring.	(g) Replace spring.
EXCESSIVE PLAY IN STEERING	(a) Worn or loose front wheel bearings.	(a) Adjust or replace wheel bearings as necessary.
	(b) Incorrect steering gear adjustment.	(b) Adjust steering gear.
	(c) Loose steering gear to frame mounting bolts.	(c) Tighten steering gear to frame bolts.
	(d) Worn ball joints or tie rod.	(d) Replace ball joints or tie rods as necessary.
	(e) Worn steering gear parts.	(e) Replace worn steering gear parts and adjust as necessary.
	(f) Worn upper or lower ball joints.	(f) Replace ball joints.
FRONT WHEEL SHIMMY	(a) Tire, wheel out of balance.	(a) Balance wheel and tire assembly.
	(b) Uneven tire wear, or excessively worn tires.	(b) Rotate or replace tires as necessary.
	(c) Worn or loose wheel bearings.	(c) Replace or adjust wheel bearings as necessary.
	(d) Worn tie rod ends.	(d) Replace tie rod ends.
	(e) Strut mounting bushings loose or worn.	(e) Replace strut mounting bushings.
	(f) Incorrect front wheel alignment (particularly caster).	(f) Adjust front wheel alignment.
	(g) Worn or loose upper control arm ball joints.	(g) Inspect ball joints and replace where required.

SERVICE PROCEDURES

PREPARATION FOR MEASURING WHEEL ALIGNMENT

The method of measuring alignment will vary depending on the type of equipment being used. The instructions furnished by the manufacturer of the equipment should always be followed, however, the specifications as recommended by Chrysler Corporation should always be followed.

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All measurements and adjustments should be made in the following order:

Front Suspension Height
Caster and Camber
Toe-In
Steering Axis Inclination
Toe-Out on Turns

The measurement of steering axis inclination and toe-out on turns is valuable in determining if parts are bent, or damaged. **Bent or damaged suspension and steering linkage parts must be replaced. Do not attempt to modify any of these parts by heating and bending.** When replacements of this kind are made, it is important that other front end parts are inspected and front wheels aligned.

Before any attempt is made to measure or correct caster, camber and toe-in, the following preliminary inspections and necessary corrections must be made on those parts which influence the steering of the vehicle.

(1) Inflate tires to recommended pressure. All tires should be the same size, in good condition and have equal wear. Note the type of wear to aid in diagnosing (Group 22).

(2) Inspect suspension and steering linkage pivot points for excessive looseness; rear springs for proper tightness of "U" bolts and height differential between left and right sides of vehicle. The vehicle should be on a level floor or alignment rack and should have a full fuel tank with no luggage or passenger load.

(3) Adjust front wheel bearings (Group 22). Measure front wheel and tire assembly runout (Follow Equipment Manufacturers Instructions).

(4) To obtain accurate readings, vehicle should be jounced in following manner just prior to taking **each** measurement (Height—Caster—Camber and Toe-In): Grasp bumpers at center (rear bumper first) and jounce vehicle up and down several times. Release bumpers on down cycle after jouncing both rear and front of car an equal number of times.

HEIGHT ADJUSTMENT

Front suspension heights must be held to specifications for a satisfactory ride, correct appearance, proper front wheel alignment and reduced tire wear.

The heights should only be measured when vehicle has the recommended tire pressures, a full tank of fuel, no passenger load and is on a level floor.

(1) Clean all foreign material from bottom of lower ball joint assemblies and from bottom of lower control arm bushing housings between flanges of the arms.

(2) Jounce vehicle several times releasing it on downward motion.

(3) **On Imperial Models,** measure distance from lowest point of one of the lower control arm bushing housings to floor (measurement A) and from lowest point of flat portion on bottom of lower ball joint on same side (measurement B) to floor (Fig. 1). **Measure only one side at a time.**

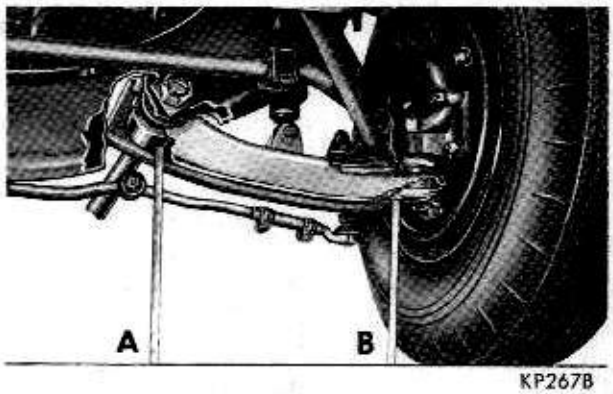


Fig. 1—Measuring Front Suspension Heights (Imperial)

(4) **On Chrysler Models,** measure distance from lowest point of one of the adjusting blades to floor (measurement A) and from lowest point of one of the steering knuckle arm to floor (measurement B) (Fig. 2).

(5) Refer to specifications for differential between measurement A and B.

(6) Measure other side in same manner. The difference from side to side should be no more than ⅛ inch.

(7) Adjust if necessary by turning in torsion bar adjusting bolt to increase height and backing off bolt to decrease height.

(8) After each adjustment, jounce vehicle before remeasuring. Both sides should be measured even though only one side has been adjusted.

FRONT WHEEL ALIGNMENT

Front suspension alignment settings must be held to specifications to hold tire wear to a minimum and to maintain steering ease and handling of vehicle.

Any parts of front suspension system should be replaced if they are found to be bent. **Do not attempt to straighten any bent part.**

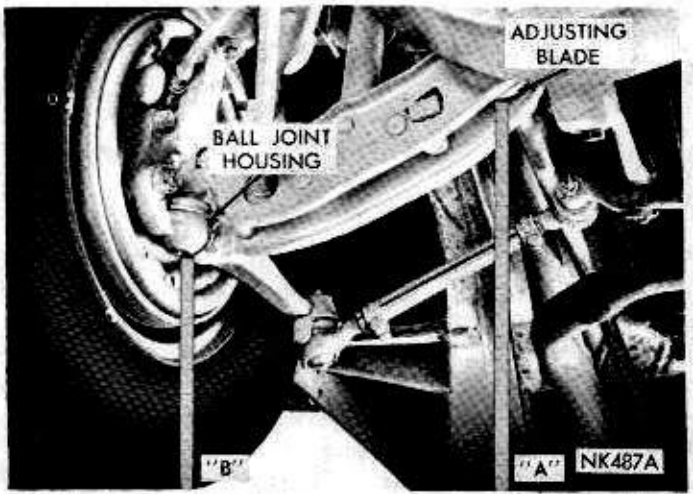


Fig. 2—Measuring Front Suspension Heights (Chrysler)

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Camber and Caster

(1) Prepare vehicle for measuring wheel alignment.

(2) Remove all foreign material from exposed threads of cam adjusting bolts.

(3) Record initial camber and caster readings before loosening cam bolt nuts.

(4) Camber settings should be held as close as possible to "preferred" setting. Caster should be held as nearly equal as possible on both wheels. Tighten cam bolt nuts 65 foot-pounds after adjusting wheel alignment.

Toe-In

The toe setting should be the final operation of the front wheel alignment adjustments. The front wheels must be in a straight ahead position. Follow the equipment manufacturers procedure. The steering wheel should be centered during this operation.

Turning both tie rod sleeves will "center" the steering wheel. If the steering wheel was centered, make the toe-in adjustment by turning both sleeves an equal amount. Tighten clamp bolt nuts 15 foot-pounds with the clamp rotated so bolts are on bottom, otherwise interference with torsion bars in jounce may result.

TORSION BARS

The torsion bars are not interchangeable, side for side. The bars are marked either right or left by an "R" or an "L" stamped on one end of the bar.

Removal

(1) Remove upper control arm rebound bumper.

(2) If vehicle is to be raised on a hoist, make sure it is lifted on body only so front suspension is in full rebound (under no load).

(3) Release all load from torsion bar by turning anchor adjusting bolt (Fig. 3) counterclockwise.

(4) Slide rear anchor balloon seal off of rear anchor and remove lock ring and plug from anchor.

In some instances it may be necessary to use Tool C-3728 to aid in removing torsion bar.

(5) **On Imperial Models** slide torsion bar toward rear of vehicle sufficiently to disengage forward end from lower control arm. Slide torsion bar forward and down, disengaging it from anchor.

(6) **On Chrysler Models** slide torsion bar (Fig. 4) out through rear of anchor.

Inspection

(1) Inspect balloon seal for damage and replace if necessary.

(2) Inspect torsion bar for scores and nicks. Dress down all scratches and nicks to remove sharp edges, then paint repaired area with a rust preventative.

(3) Remove all foreign material from hex openings in anchors and from hex ends of torsion bars.

(4) Inspect torsion bar adjusting bolt and swivel for corrosion or other damage and if necessary replace. Lubricate for easy operation.

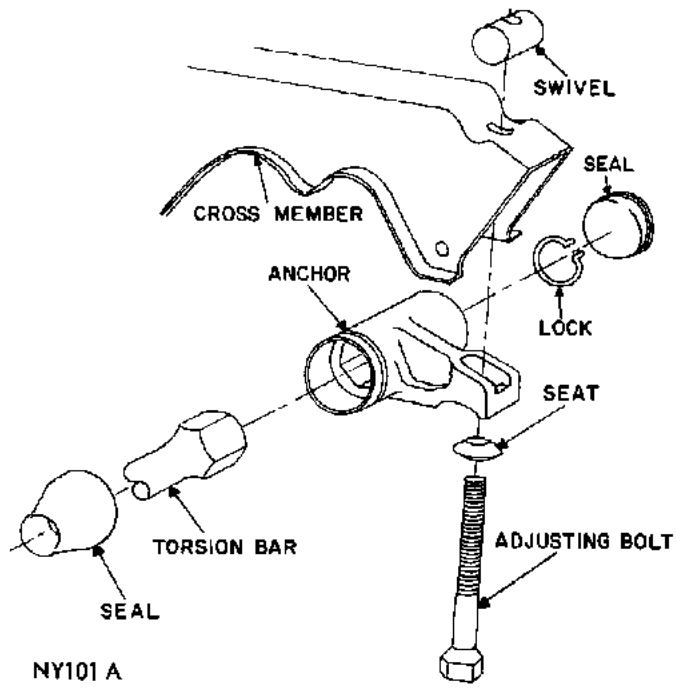


Fig. 3—Torsion Bar Rear Support (Imperial)

Installation

(1) Insert torsion bar through rear anchor.

(2) Slide balloon seal over torsion bar (cupped end toward rear of bar).

(3) Coat both hex ends of torsion bar with multi-mileage lubricant.

(4) **On Imperial Models** turn torsion bar until anchor end is positioned approximately 120 degrees (eight o'clock or four o'clock position) down from frame and engage front end of bar in hex opening of lower control arm. If anchor end is not in position just described when installing torsion bar, it will be impossible to adjust front suspension to correct height.

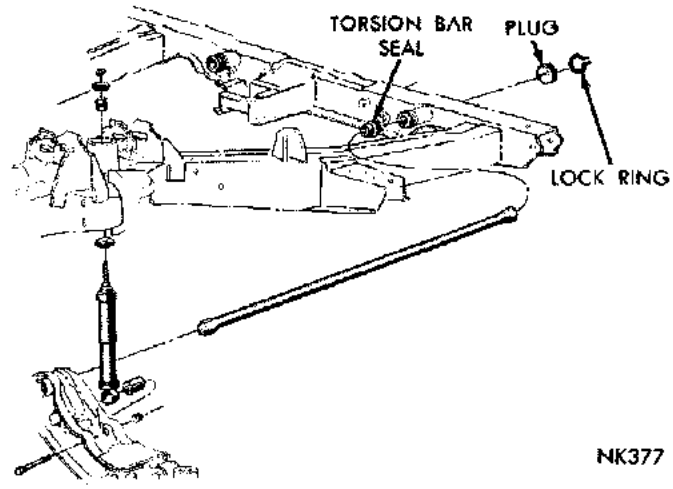


Fig. 4—Torsion Bar (Chrysler)

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(5) **On Chrysler Models,** slide torsion bar into hex opening in control arm.

(6) Install lock ring, making sure it is seated in its groove.

(7) Pack annular opening in rear anchor completely full of multi-mileage lubricant. Position lip of balloon seal in the groove in anchor hub. Install plastic seal into rear anchor.

(8) Install adjusting bolt, seat and swivel.

(9) **On Imperial Models,** turn adjusting bolt clockwise until approximately 1 inch of threads are showing out of swivel. This is an approximate setting and is to be used only as a starting point when adjusting for correct height. This setting is also necessary to place a load on torsion bar before lowering vehicle to floor.

(10) **On Chrysler Models,** place a load on torsion bar by turning adjusting bolt clockwise.

(11) Lower vehicle to floor, then measure and adjust height as required.

STEERING LINKAGE (Figs. 5, 6 and 7)

The tie rod end seals and covers should be inspected at all oil change periods. **Removal of tie rod ends from the steering knuckle arm or center link by methods other than using the recommended tools may damage tie rod end seal.**

Damaged seals require removal of the seals and inspection of the tie rod assembly end at the throat opening. If the parts have not lost all the lubricant and are not contaminated, worn or rusted, use new seals and reinstall, otherwise, a new complete tie rod end assembly should be installed. Lubricate the tie rod end assembly.

Removal

(1) Remove tie rod ends from steering knuckle arms using Tool C-3742 (Chrysler), Tool C-3894 (Imperial (Fig. 8). **Use care not to damage seals.**

(2) Using Tool C-3742 remove inner tie rod ends from center link.

(3) Remove idler arm stud from center link and from crossmember using Tool C-3894.

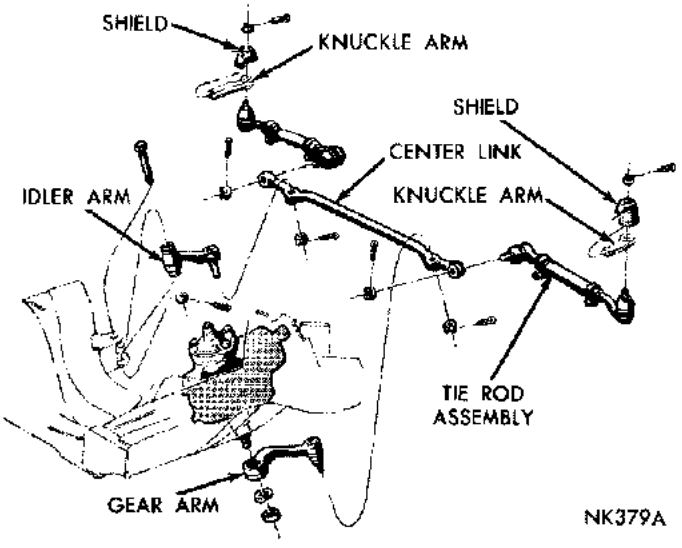


Fig. 5—Steering Linkage (Chrysler)

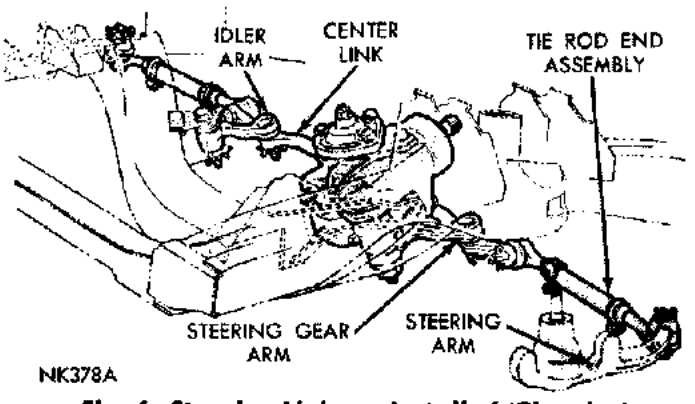


Fig. 6—Steering Linkage Installed (Chrysler)

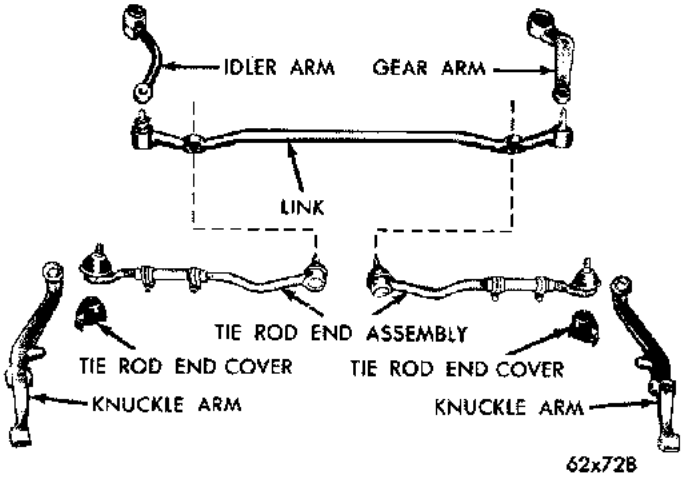


Fig. 7—Steering Linkage (Imperial)

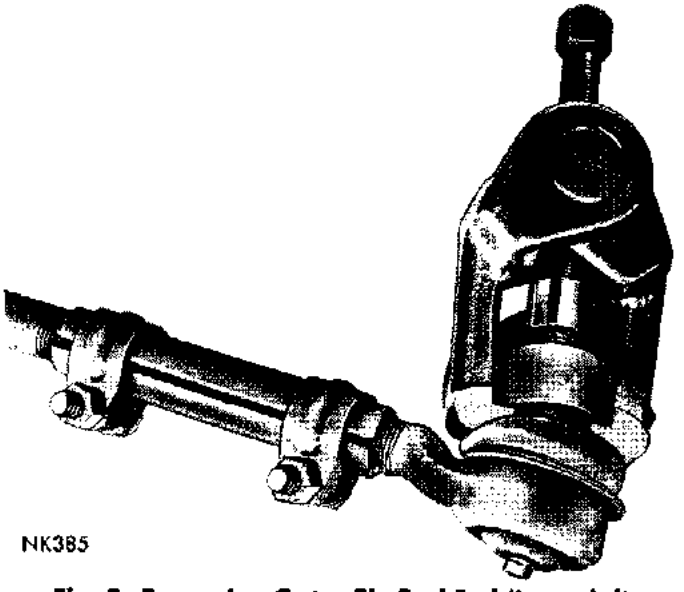


Fig. 8—Removing Outer Tie Rod End (Imperial)

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(4) Remove steering gear arm stud from center link, using Tool C-3894.

Installation

Replace all tie rod and steering arm assemblies that are damaged or excessively worn. Damaged seals are replaceable.

(1) Insert idler arm and bushings assembly into bracket (**Imperial Models**) using care not to damage bushing. Insert bolt and tighten to 80 foot-pounds. On **Chrysler Models,** install idler arm stud in crossmember bracket and tighten nut 45 foot-pounds.

(2) Insert center link over idler arm and steering arm studs and tighten nuts to 40 foot-pounds. Insert cotter pins.

(3) Connect tie rod ends to steering knuckle arms. Tighten nuts to 40 foot-pounds. Slide stone protectors into position and install cotter pins.

(4) Measure and adjust front wheel toe-in.

STEERING KNUCKLES

On models equipped with disc brakes, refer to Group 5 for brake drum removal and installation procedures.

Removal

(1) Remove upper control arm rebound bumper.

(2) Raise vehicle so front suspension is in full rebound (under no load).

(3) Remove wheel, tire and drum as an assembly.

(4) Remove all load from torsion bar by turning the adjusting bolt counterclockwise.

(5) Remove upper ball joint stud from steering knuckle using Tool C-3964. On **Imperial Models,** remove lower ball joint stud.

(6) Remove two upper bolts securing steering knuckle to brake support.

(7) Remove two lower bolts attaching steering arm to steering knuckle and remove steering knuckle. **Support the brake assembly during this operation to prevent damage to brake hose when lower bolts are removed.**

Installation

(1) Position steering knuckle on brake support and install upper mounting bolts and nuts finger tight only.

(2) Position steering knuckle arm (Chrysler only) on steering knuckle and install mounting bolts and nuts finger tight only.

(3) Install upper and lower ball joint studs in steering knuckle and tighten the ball joint stud nut 100 foot-pounds, (Imperial lower stud nut 115 foot-pounds). Install cotter pins.

(4) Tighten steering knuckle upper bolt nuts 55 foot-pounds. Tighten lower bolt nuts 80 foot-pounds and install cotter pin.

(5) Place a load on torsion bar by turning adjusting bolt clockwise.

(6) Install wheel tire and drum assembly and adjust front wheel bearing (Group 22).

(7) Lower vehicle to floor and install upper control arm rebound bumper. Tighten nut 200 inch-pounds.

(8) Adjust front wheel alignment as necessary.

SWAY BAR (Fig. 9)

Removal

(1) Remove two sway bar link retaining nuts and concave retainers.

(2) Remove two sway bar cushion retaining nuts, lockwashers, straps, and bolts, (one to each strut). Slide sway bar out through control arm struts and away from vehicle. **The sway bar cushions are not serviced separately. If replacement is necessary, install a new sway bar assembly. Remove lower concave retainers.**

(3) Remove sway bar link insulating bushings from frame bracket. If bushings are worn or deteriorated, install new bushings as required.

Installation

(1) Dip sway bar link bushings in water and install opening in frame bracket, using a twisting motion. When installed properly, groove in bushing will index with opening in frame bracket.

(2) Thread sway bar into position over top of lower control arm struts.

(3) Engage sway bar cushion housing with struts and install straps, bolts, lockwashers and nuts. Tighten to 30 foot-pounds.

(4) Install retainers over ends of links (concave side up), then slide links up through bushings. Install retainers (concave side down) over ends of links and

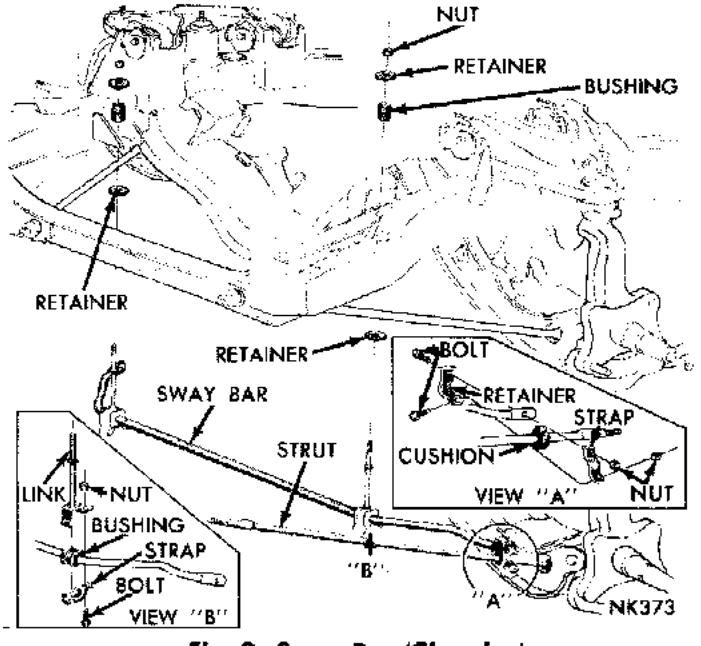


Fig. 9—Sway Bar (Chrysler)

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down on bushings. Install nuts and tighten to 100 inch-pounds.

LOWER CONTROL ARM AND SHAFT

On models equipped with disc brakes, refer to Group 5 for brake drum removal and installation procedures.

Removal (Imperial Models)

(1) Remove torsion bar.

(2) Remove wheel, tire and drum assembly. Remove brake support assembly.

(3) Disconnect shock absorber at lower control arm bracket then push shock absorber up into frame out of way.

(4) Remove nuts, lockwashers and bolts attaching strut to lower control arm.

(5) Remove upper and lower ball joint stud nuts. Slide Tool C-3564 over upper stud until tool rests on steering knuckle. Turn threaded portion of tool locking it securely against lower stud (Fig. 10). Spread tool enough to place lower stud under pressure, then strike steering knuckle sharply with a hammer to loosen stud. **Do not attempt to force stud out of knuckle with tool alone.**

(6) Remove tool, and disengage ball joint from knuckle.

(7) Remove cotter pin, nut and washer attaching lower control arm pivot shaft to frame.

(8) Tap end of shaft (a tapered fit in front crossmember) with a "soft end" hammer to aid in removal of shaft from crossmember.

(9) Remove lower control arm and shaft as an assembly.

Disassembly (Imperial Models)

(1) Place lower control arm in an arbor press (with torsion bar hex opening up). Press shaft and bushing out of control arm, using a brass drift.

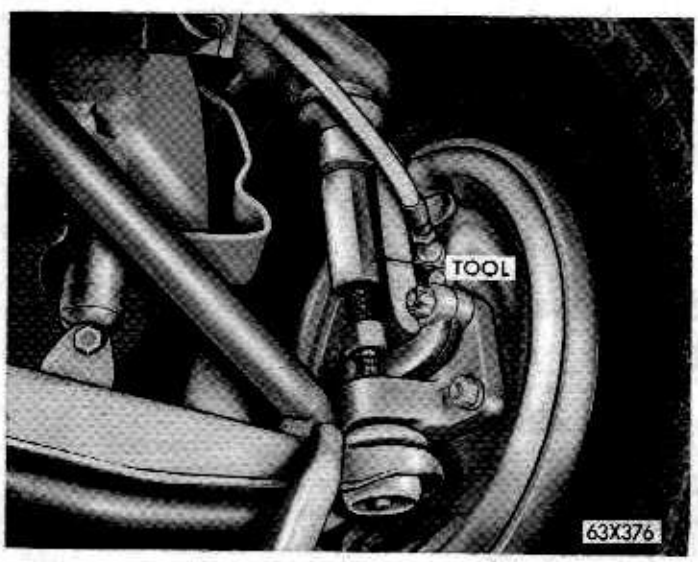


Fig. 10—Removing Lower Ball Joint Stud (Imperial)

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(2) Remove cotter pin, nut and washer from end of shaft, and remove bushing from shaft.

(3) Using Tool C-3561 unscrew ball joint from lower control arm. The ball joint balloon type seal will come off as ball joint is removed.

Assembly (Imperial Models)

(1) Position new bushing over shaft (flange end first) and seat on shoulder of shaft. Install washer and nut and tighten to 100 foot-pounds. (Hold shaft securely in a vise with protector jaws). Install cotter pin.

(2) Press lower control arm shaft and bushing into lower control arm with an arbor press, or drive into place using Tool C-3557 and a hammer.

(3) Press until flanged position of bushing is seated beyond locking groove.

(4) Install ball joint into new arm using Tool C-3561.

(5) Tighten to a minimum of 150 foot-pounds until ball joint is seated (the ball joint will cut threads into new arm during tightening operation).

Installation (Imperial Models)

(1) Position control arm assembly in frame crossmember in approximate operating position. Install washer and nut. DO NOT TIGHTEN nut until full weight of vehicle is on wheels.

(2) Position new ball joint balloon type seal on ball joint body and using Tool C-3867 install seals. **To facilitate installation of seal the ball joint stud should be perpendicular to ball joint body.** Lubricate ball joint.

(3) Install brake support assembly. Tighten brake support bolts 55 foot-pounds and knuckle arm bolts 80 foot-pounds.

(4) Position stud in steering knuckle. Install washer and nut. Tighten to 135 foot-pounds and install cotter pin.

(5) Connect shock absorber to control arm and tighten nut 55 foot-pounds.

(6) Position strut on lower control arm, install bolts, washers and nuts and tighten to 100 foot-pounds. Install sway bar on strut. Tighten nuts 50 foot-pounds.

(7) Install wheel, tire and drum assembly and adjust front wheel bearing (Group 22).

(8) Install torsion bar.

(9) Tighten lower control arm shaft nut 200 foot-pounds and install cotter pin.

(10) Lower vehicle to floor, then measure and adjust suspension heights and wheel alignment as necessary.

Removal (Chrysler Models)

(1) Remove torsion bar from lower control arm.

(2) Remove cotter pin and slide tie rod end seal protector up steering knuckle arm. Remove tie rod end from steering knuckle arm using Tool C-3964 or Tool C-3742. **Use care not to damage seal.**

(3) Remove sway bar to strut attaching straps.

(4) Remove steering knuckle arm to brake support bolts and remove steering knuckle arm. Move brake support assembly out of the way. **Do not allow brake support to hang by brake hose.**

(5) Remove ball joint stud from lower control arm using Tool C-3964 (Fig. 11). The bottom portion of tool must be positioned between seal and control arm to avoid seal damage.

(6) Remove strut front nut and bushing retainer.

(7) Remove cotter pin, nut and washer from lower control arm pivot shaft.

(8) Tap end of lower control arm shaft with a "soft end" hammer, to aid in removal of shaft from crossmember, and remove lower control arm, shaft and strut as an assembly.

(9) Remove strut bushings (Fig. 12) from crossmember.

(10) Remove strut bushing inner retainer from strut.

Disassembly (Chrysler Models)

(1) Place strut portion of control arm assembly in a vise and remove nut from strut.

(2) Remove strut from control arm.

(3) Remove jounce bumper, torsion bar adjusting bolt and swivel from control arm.

(4) Place control arm assembly in an arbor press with torsion bar hex opening up and with a support under outer edge of control arm (Fig. 13).

(5) Place a brass drift into hex opening and press shaft out of control arm (Fig. 13). The bushing inner shell will remain on shaft.

(6) Remove bushing inner shell from pivot shaft.

(7) Remove rubber portion of bushing from control arm.

(8) Remove bushing outer shell by cutting with a chisel. **Use care not to cut into control arm.**

Assembly (Chrysler Models)

(1) Position new bushing on shaft, flange end of bushing first, and seat the bushing on shoulder of shaft.

(2) Press shaft and bushing assembly into control arm using Tool C-3556 and an arbor press. **In some instances, it may be necessary to reduce shoulder diameter of shaft to facilitate use of Tool C-3556.**

(3) Install torsion bar adjusting bolt and swivel.

(4) Install jounce bumper on control arm and tighten nut 200 inch-pounds.

(5) Position strut in control arm and tighten nut 110 foot-pounds.

Installation (Chrysler Models)

(1) Install strut inner bushing half (Fig. 12) in crossmember.

(2) Place strut bushing inner retainer on strut and position control arm, shaft and strut assembly into crossmember.

(3) Install outer strut bushing half, sleeve and retainer. Install nut finger tight only.

(4) Install control arm pivot shaft washer and nut finger tight only.

(5) Position lower ball joint stud into control arm. Tighten nut 115 foot-pounds and install cotter pin.

(6) Position brake support on steering knuckle and install two upper bolts and nuts finger tight only.

(7) Position steering knuckle arm on steering knuckle and install two lower bolts and nuts finger

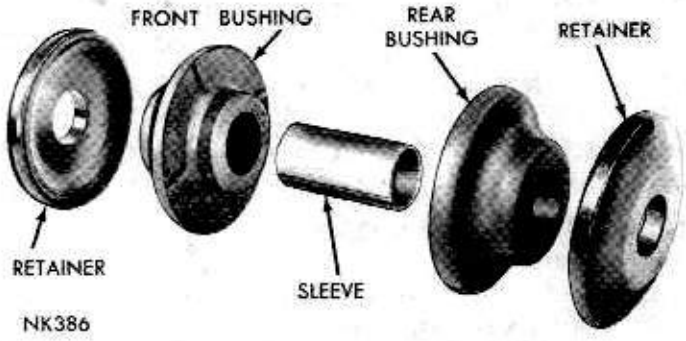


Fig. 12—Strut Bushing (Chrysler)

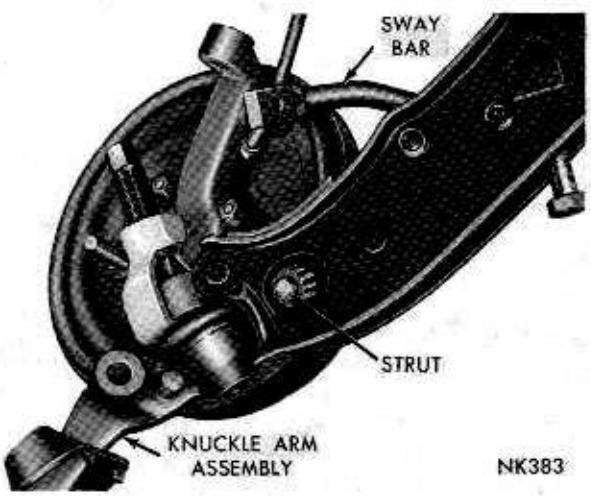


Fig. 11—Removing Lower Ball Joint Stud (Chrysler)

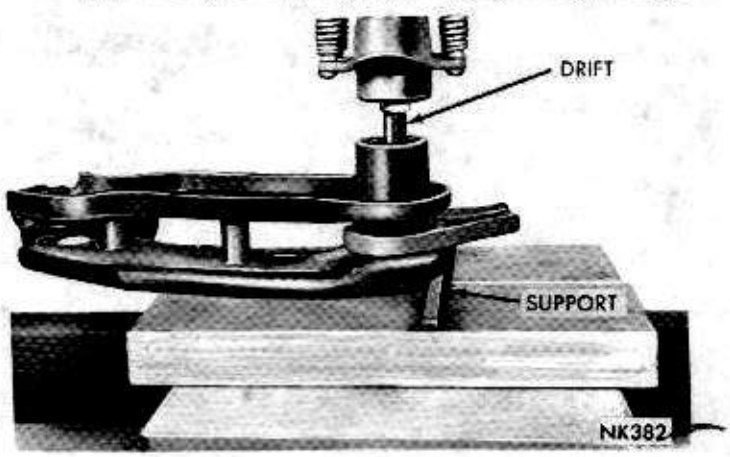


Fig. 13—Removing Pivot Shaft (Chrysler)

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tight only.

(8) Tighten upper bolt nuts 55 foot-pounds and lower bolt nuts 100 foot-pounds.

(9) Inspect tie rod for damage. Connect tie rod end to steering knuckle arm and tighten nut 40 foot-pounds. Slide tie rod end seal protector over tie rod end and install cotter pin.

(10) Connect shock absorber to control arm and tighten nut 55 foot-pounds.

(11) Install torsion bar.

(12) Install wheel, tire and drum assembly and adjust front wheel bearings (Group 22).

(13) Lower vehicle to floor and tighten strut nut, at crossmember, 40 foot-pounds.

(14) Tighten lower control arm shaft nut 180 foot-pounds and install cotter pin.

(15) Measure and adjust front suspension height and wheel alignment as necessary.

LOWER CONTROL ARM STRUT

Removal (Chrysler Models)

(1) Remove lower control arm, shaft and strut as an assembly.

(2) Remove nut holding strut to control arm and remove strut from control arm.

(3) Inspect strut bushings (Fig. 12).

Installation (Chrysler Models)

(1) Install new strut bushings if necessary.

(2) Position strut into control arm and tighten retaining nut 100 foot-pounds.

(3) Install control arm, shaft and strut assembly.

Removal (Imperial Models)

(1) Remove nuts, lockwashers, and bolts that attach sway bar bushing housings to struts, disconnect sway bar from struts.

(2) Remove strut to lower control arm mounting bolts and nuts.

(3) Remove nut and bushing retainer (Fig. 14) from forward end of strut at crossmember.

(4) Slide strut and inner bushing retainer from bushing in frame.

(5) Using a screwdriver, pry bushing out of the front of frame.

Installation (Imperial Models)

(1) Dip new bushing in water and with tapered portion toward rear of vehicle, install bushing in opening in frame using a twisting motion (and/or hammer) until groove in bushing indexes properly with frame.

(2) With cupped side out, slide washer over threaded end of strut. Push strut through bushing in frame, position outer washer over end of strut (cupped side in) and install nut.

(3) Tighten nut sufficiently to install strut to lower control arm mounting bolts. Install bolts, lockwashers and nuts, and tighten to 100 foot-pounds.

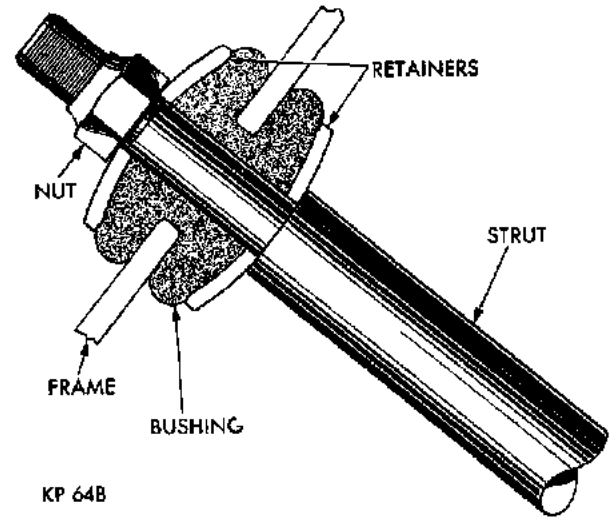


Fig. 14—Strut Bushing (Imperial)

(4) Tighten nut on forward end of strut to 40 foot-pounds with full weight of vehicle on wheels.

(5) Install sway bar.

(6) Adjust front wheel alignment.

LOWER BALL JOINTS

On models equipped with disc brakes, refer to Group 5 for brake drum removal and installation procedures.

The lower ball joints should not be replaced for looseness if the axial end play (up and down movement) is under .050 inch. Looseness of this nature is normal and will not affect front wheel alignment or vehicle stability. The lower ball joints on Chrysler Models are integral with the steering knuckle arms.

Removal (Imperial Models)

(1) Place a jack under lower control arm and raise vehicle.

(2) Remove wheel, tire and drum assembly and brake support assembly.

(3) Remove upper and lower ball joint and nuts. Slide Tool C-3564 over upper stud until tool rests on steering knuckle. Turn threaded portion of tool locking it securely against lower stud (Fig. 10). Spread tool enough to place lower stud under pressure, then strike steering knuckle sharply with a hammer to loosen stud. Do not attempt to force stud out of knuckle with tool alone.

(4) Remove tool, then disengage ball joint from knuckle.

(5) Using Tool C-3561 remove ball joint from lower control arm.

The ball joint balloon type seal will come off as ball joint is removed.

Installation (Imperial Models)

(1) **When installing new ball joint, it is very important that ball joint threads properly engage those of control arm.** Screw the ball joint into control arm as

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far as possible by hand.

(2) Using Tool C-3561, tighten ball joint assembly to a minimum of 150 foot-pounds until seated in control arm.

(3) Position new ball joint seal on ball joint body and using Tool C-3867 install seals. **To facilitate installation of seal, the ball joint stud should be perpendicular to ball joint body.**

(4) Install brake support assembly. Tighten brake support bolts to 55 foot-pounds and knuckle arm bolts to 80 foot-pounds.

(5) Position stud in steering knuckle, and install washer and nut. Tighten to 135 foot-pounds and install cotter pin.

(6) Lubricate ball joint with specified lubricant.

(7) Install wheel, tire and drum assembly and adjust front wheel bearing (Group 22).

Removal (Chrysler Models)

(1) Remove upper control arm rebound bumper.

(2) Raise vehicle so front suspension is in full rebound. Remove all load from torsion bar by turning adjusting bolt counterclockwise.

(3) Remove wheel, tire and drum as an assembly.

(4) Remove two lower bolts from brake support attaching steering arm and ball joint assembly to steering knuckle.

(5) Remove tie rod end from steering knuckle arm using Tool C-3742. **Use care not to damage seal.**

(6) Using Tool C-3964 remove ball joint stud from lower control arm (Fig. 11) and remove steering arm and ball joint assembly.

Installation (Chrysler Models)

(1) Place a new seal over ball joint stud (if necessary) and press seal fully down on ball joint housing until it is securely locked into position.

(2) Position steering arm and ball joint assembly on steering knuckle and install two mounting bolts. Tighten nuts 80 foot-pounds.

(3) Insert ball joint stud into lower control arm.

(4) Install stud retaining nut and tighten to 115 foot-pounds. Install cotter pin and lubricate ball joint.

(5) Inspect tie rod end seal for damage and replace if damaged. Connect tie rod end to steering knuckle arm and tighten nut 40 foot-pounds. Slide tie rod end seal protector over nut and install cotter pin.

(6) Place a load on torsion bar by turning adjusting bolt clockwise.

(7) Install wheel, tire and drum assembly and adjust front wheel bearing (Group 22).

(8) Lower vehicle to floor and install upper control arm rebound bumper. Tighten to 200 inch-pounds.

(9) Measure front suspension height and adjust if necessary.

(10) Measure front wheel alignment and adjust if necessary.

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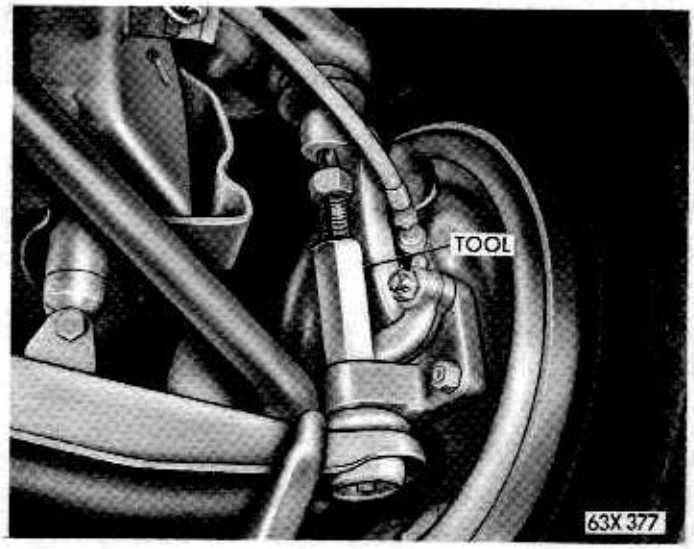


Fig. 15—Removing Upper Ball Joint Stud (Imperial)

UPPER CONTROL ARM

Removal

(1) Place a jack under lower control arm as close to wheel as possible and raise vehicle until front wheel clears floor.

(2) Remove wheel and tire assembly.

(3) **On Imperial Models,** remove upper and lower ball joint stud nuts. Slide Tool C-3564 down over lower stud until tool rests on steering knuckle. Turn threaded portion of tool locking it securely against upper stud (Fig. 15). Spread tool enough to place upper stud under pressure then strike knuckle sharply with a hammer to loosen stud. **Do not attempt to force stud out of knuckle with tool alone.** Remove tool, then disengage ball joint from knuckle.

(4) **On Chrysler Models,** remove upper ball joint stud using Tool C-3964 (Fig. 16).

(5) Remove nuts, lockwashers, cams and cam bolts attaching upper control arm bushings to front and

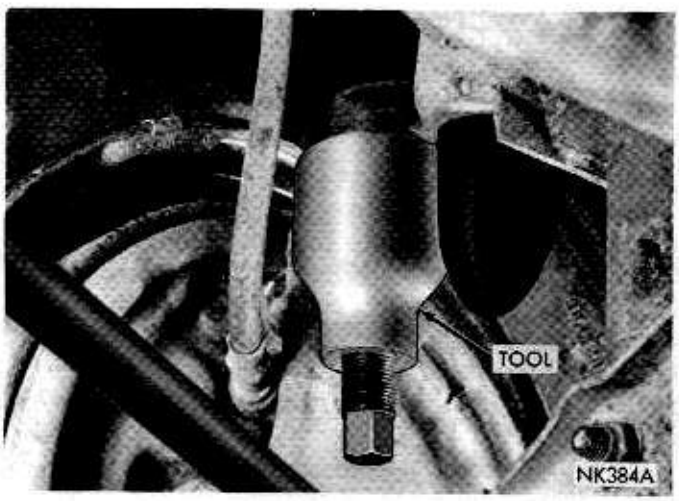


Fig. 16—Removing Upper Ball Joint Stud (Chrysler)

rear support. Lift upper control arm up and away from support.

Disassembly

(1) Remove ball joint using Tool C-3560 for Chrysler Models or Tool C-3561 for Imperial Models. The ball joint balloon type seal will come off as ball joint is removed.

(2) Assemble Tool C-3962, using adapter SP-3953 (Chrysler Models) Tool C-3710, using adapter SP-3088 (Imperial Models) over bushing and press bushing out of arm (from inside out) (Fig. 17). **Be sure control arm is firmly supported if a hammer and drift is used in place of tool.**

Assembly

When installing new bushings, be sure control arm is supported squarely at the point where bushing is being pressed in. Do not use oil or grease to aid in installation.

(1) Position flange end of new bushing in Tool C-3962 (Chrysler Models), Tool C-3710 (Imperial Models).

(2) Support control arm squarely and press bushings into control arm (from outside) until tapered portion of bushing seats on arm (Fig. 18).

(3) Thread ball joint into arm using Tool C-3560 for Chrysler Models or Tool C-3561 for Imperial Models.

(4) Tighten to a minimum of 125 foot-pounds on Chrysler Models and 150 foot-pounds on Imperial Models until seated. The ball joint will cut threads into a new arm during tightening operation.

Installation

(1) Slide upper control arm into position. Install cam bolts, cams, washers and nuts. Tighten nuts 65 foot-pounds after adjusting front wheel alignment.

(2) Position new ball joint seal on ball joint body, and using Tool C-3867 for Imperial Models, install seal. On Chrysler Models press seal on by hand

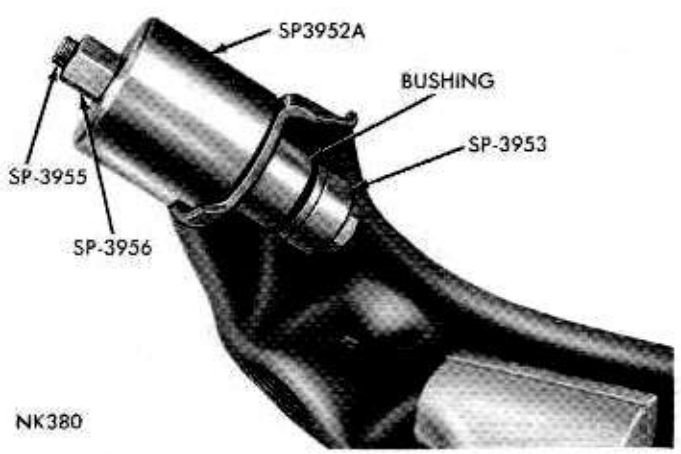


Fig. 17—Removing Upper Control Arm Bushing (Chrysler)

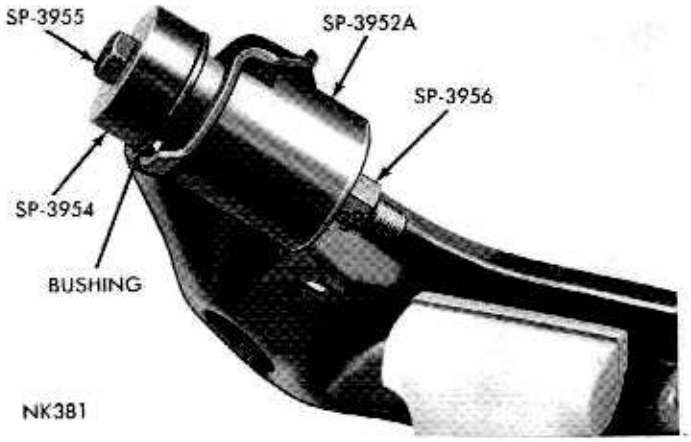


Fig. 18—Installing Upper Control Arm Bushing (Chrysler)

making sure it is seated fully down on housing. **To facilitate installation of seal the ball joint stud should be perpendicular to ball joint body.** Lubricate ball joint.

(3) Position stud in steering knuckle and install washer and nut. Tighten nut 100 foot-pounds on Chrysler Models and 135 foot-pounds on Imperial Models. Install cotter pin.

(4) Install wheel and tire and adjust the front wheel bearing (Group 22).

(5) Adjust front wheel alignment and suspension height.

UPPER BALL JOINTS

Removal

(1) Place a jack under the lower control arm as close to wheel as possible. Raise wheel off floor.

(2) Remove wheel and tire assembly.

(3) **On Imperial Models,** remove upper and lower ball joint stud nuts. Slide Tool C-3564 down over lower stud until tool rests on steering knuckle. Turn threaded portion of tool locking it securely against upper stud (Fig. 15). Spread tool enough to place upper stud under pressure, then strike steering knuckle sharply with a hammer to loosen stud. **Do not attempt to force stud out of the knuckle with tool alone.**

(4) Remove tool, then disengage ball joint from knuckle.

(5) **On Chrysler Models,** when removing upper ball joint stud from steering knuckle using Tool C-3964 (Fig. 12) make sure bottom portion of tool is positioned between steering knuckle and seal, otherwise damage to seal will result.

(6) Using Tool C-3560 for Chrysler Models and Tool C-3561 for Imperial Models (Fig. 19) unscrew ball joint from upper control arm.

The ball joint balloon type seal will come off as ball joint is removed.

Installation

When installing a new ball joint, it is very impor-

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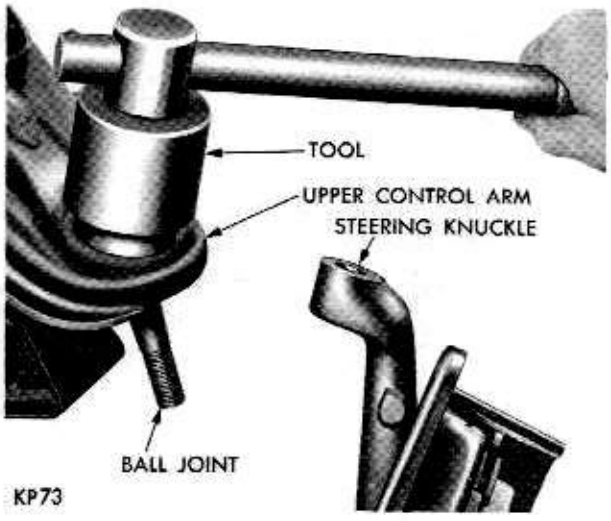


Fig. 19—Removing Ball Joint (Imperial)

tant that ball joint threads properly engage those of control arm.

(1) Screw ball joint squarely into control arm as far as possible by hand.

(2) Using Tool C-3560 (Chrysler Models) or C-3561 (Imperial Models) tighten until ball joint housing is seated on control arm. Tighten to a minimum of 125 foot-pounds on Chrysler Models and 150 foot-pounds on Imperial Models.

(3) Position new ball joint seal on ball joint body using Tool C-3867 on Imperial Models and install seal. **On Chrysler Models,** install seal on ball joint by hand, making sure it is fully seated on housing. **To facilitate installation of seal the ball joint stud should be perpendicular to ball joint body.**

(4) Position stud in steering knuckle. Install washer and nut. Tighten nut on Chrysler Models 100 foot-pounds and on Imperial Models 135 foot-pounds. Install cotter pin and lubricate ball joint.

(5) Install wheel and tire and adjust front wheel bearing (Group 22).

SPECIFICATIONS

MODEL	CHRYSLER	IMPERIAL
CAMBER—Left	+¼° to +¾° (Preferred +½°)	
Right	0° to +½° (Preferred +¼°)	
CASTER—Manual Steering	0° to −1°	
Power Steering	+¼° to +1¼°	
HEIGHT (Inches)—Standard Suspension	1⅛ ± ⅛	2 ± ⅛
Heavy Duty Suspension	1⅛ ± ⅛	2⅜ ± ⅛
Limousine Suspension		2⅜ ± ⅛
Side to Side Difference (Maximum)	⅛	
STEERING AXIS INCLINATION	7½°	6½°
TOE-IN	3/32 inch to 5/32 inch (Preferred ⅛ inch)	
TOE-OUT ON TURNS (When inner wheel is 20°) Outer Wheel Is	18.8°	18.5°
THREAD (Inches) Front	62.0*	61.7
Rear	60.7	62.2
TORSION BAR		
Length (inches)	**47**	**48.6**
Diameter (inches)	0.96	1.11
With Air Conditioning	0.98	1.11
WHEEL BASE (Inches)	123.5	129

*New Yorker Models 62.25

TIGHTENING REFERENCE

	POUNDS FOOT INCH
BALL JOINT (Chrysler)	125 (Min.)
(Imperial)	150 (Min.)
Stud Nut—Lower	115
—Upper (Chrysler)	100
(Imperial)	135
CONTROL ARMS	
Bumper Nut	200
Pivot Shaft Nut—Outer (Chrysler)	180
(Imperial)	200
—Inner (Imperial)	100
Cam Bolt Nut	65
IDLER ARM to Bracket Bolt Nut	45
to Center Link Nut	40
SHOCK ABSORBER—Front	
Lower Nut	55
Upper Nut	25
STEERING ARM to Center Link Nut	40
STEERING KNUCKLE	
Lower Bolt Nut	80
Upper Bolt Nut	55
STRUT	
Ball Nut (Imperial)	100
Front Bushing Nut	40
Rear Nut (Chrysler)	100
SWAY ELIMINATOR SHAFT	
Link to Frame Nut	100
Link Cushion Strap Bolt Nut	30
Shaft to Strut Strap Nut	30

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REAR AXLE

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SERVICE DIAGNOSIS

Condition	Possible Cause	Correction
REAR WHEEL NOISE	(a) Wheel loose.	(a) Tighten loose wheel nut.
	(b) Scored wheel bearing cup or cone.	(b) Check rear wheel bearings. If scored or worn, replace.
	(c) Defective, brinelled wheel bearing.	(c) Defective or brinelled bearings must be replaced. Check rear axle shaft end play.
	(d) Excessive axle shaft end play.	(d) Readjust axle shaft end play.
	(e) Bent or sprung axle shaft. Flange.	(e) Replace bent or sprung axle shaft.
SCORING OF DIFFERENTIAL GEARS AND PINIONS	(a) Insufficient lubrication.	(a) Replace scored gears. Scoring marks on the pressure face of gear teeth or in the bore are caused by instantaneous fusing of the mating surfaces. Scored gears should be replaced. Fill rear axle to required capacity with proper lubricant. See Specification section.
	(b) Improper grade of lubricant.	(b) Replace scored gears. Inspect all gears and bearings for possible damage. Clean out and refill axle to required capacity with proper lubricant. See Lubrication section.
	(c) Excessive spinning of one wheel.	(c) Replace scored gears. Inspect all gears, pinion bores and shaft for scoring, or bearings for possible damage. Service as necessary.
TOOTH BREAKAGE (RING GEAR AND PINION)	(a) Overloading.	(a) Replace gears. Examine other gears and bearings for possible damage. Replace parts as needed. Avoid overloading.
	(b) Erratic clutch operation.	(b) Replace gears, and examine remaining parts for possible damage. Avoid erratic clutch operation.
	(c) Ice-spotted pavements.	(c) Replace gears. Examine remaining parts for possible damage. Replace parts as required.
	(d) Normal fatigue.	(d) Replace gears. Examine broken parts to determine cause of normal fatigue.
	(e) Improper adjustment.	(e) Replace gears. Examine other parts for possible damage. Make sure ring gear and pinion backlash is correct.
REAR AXLE NOISE	(a) Insufficient lubricant.	(a) Refill rear axle with correct amount of the proper lubricant. See Specification section. Also check for leaks and correct as necessary.
	(b) Improper ring gear and pinion adjustment.	(b) Check ring gear and pinion tooth contact.
	(c) Unmatched ring gear and pinion.	(c) Remove unmatched ring gear and pinion. Replace with a new matched gear and pinion set.

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Condition	Possible Cause	Correction
	(d) Worn teeth on ring gear or pinion.	(d) Check teeth on ring gear and pinion for contact. If necessary, replace with new matched set.
	(e) Loose drive pinion bearings.	(e) Adjust drive pinion bearings.
	(f) Loose differential gear bearings.	(f) Adjust differential gear bearings.
	(g) Misaligned or sprung ring gear.	(g) Check ring gear for runout.
	(h) Loose carrier housing bolts.	(h) Tighten carrier housing nuts to required torque. See Service Standards. Also, check for oil leaks and correct as necessary.
	(i) Loose drive pinion companion flange nut.	(i) Tighten drive pinion flange nut to torque specified under, "Axle Tightening References."
LOSS OF LUBRICANT	(a) Lubricant level too high.	(a) Drain excess lubricant by removing filler plug and allow lubricant to level at lower edge of filler plug hole.
	(b) Worn axle shaft oil seals.	(b) Replace worn oil seals with new ones. Prepare new seals before replacement.
	(c) Cracked rear axle housing.	(c) Repair or replace housing as required.
	(d) Worn drive pinion oil seal.	(d) Replace worn drive pinion oil seal with a new one.
	(e) Scored and worn companion flange.	(e) Replace worn or scored companion flange and oil seal.
	(f) Clogged breather.	(f) Clean breather thoroughly.
OVERHEATING OF UNIT	(a) Lubricant level too low.	(a) Refill rear axle.
	(b) Incorrect grade of lubricant.	(b) Drain, flush and refill rear axle with correct amount of the proper lubricant. See Specification Section.
	(c) Bearings adjusted too tightly.	(c) Readjust bearings.
	(d) Excessive wear in gears.	(d) Check gears for excessive wear or scoring. Replace as necessary.
	(e) Insufficient ring gear to pinion clearance.	(e) Readjust ring gear and pinion backlash and check gears for possible scoring.

REAR AXLE ASSEMBLY 8¾" RING GEAR

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GENERAL INFORMATION

The 8¾" Rear Axle Assembly (Fig. 1), is a semi-floating type and may be divided into four subassemblies; flanged axle drive shafts with related parts, (Fig. 2) differential with drive gear, drive pinion with carrier, and the axle housing. Servicing of the above mentioned subassemblies, with exception of the axle housing may be performed without removing the complete rear axle assembly from the vehicle.

Gear ratio identification numbers will be stamped on a metal tag and attached by means of the rear axle housing-to-carrier bolt.

A Sure Grip Differential is available in the 8¾" Axle Assembly. Refer to the "Sure Grip Differential" Section of the Axle Group for the Servicing procedure.

SHOULD THE REAR AXLE BECOME SUBMERGED IN WATER, THE LUBRICANT MUST BE CHANGED IMMEDIATELY TO AVOID THE POSSIBILITY OF EARLY AXLE FAILURE RESULTING FROM CONTAMINATION OF THE LUBRICANT BY WATER DRAWN INTO THE VENT.

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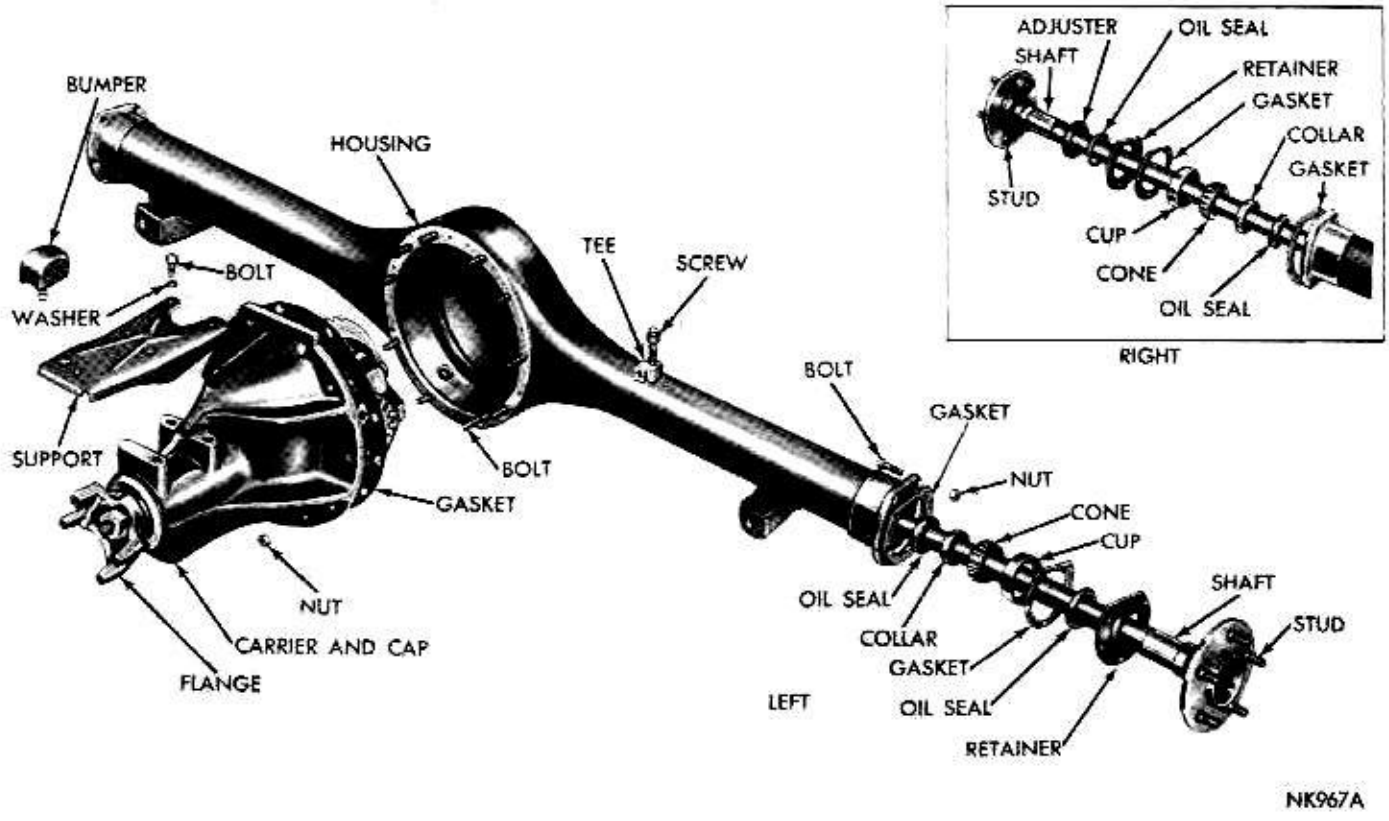


Fig. 1—8¾" Rear Axle Assembly (Disassembled)

SERVICE PROCEDURES

AXLE SHAFTS AND BEARINGS

Removal

(1) With wheels removed, remove clips holding brake drum on axle shaft studs and remove brake drum.

(2) Using access hole in axle shaft flange, remove retainer nuts, the right shaft with threaded adjuster in retainer plate will have a lock under one of the studs that should be removed at this time.

(3) Remove parking brake strut.

(4) Attach axle shaft remover Tool C-3971 (Fig. 3) to axle shaft flange and remove axle shaft. Remove brake assembly and foam gaskets.

(5) Remove axle shaft oil seal from axle housing using Tool C-637 (Fig. 4).

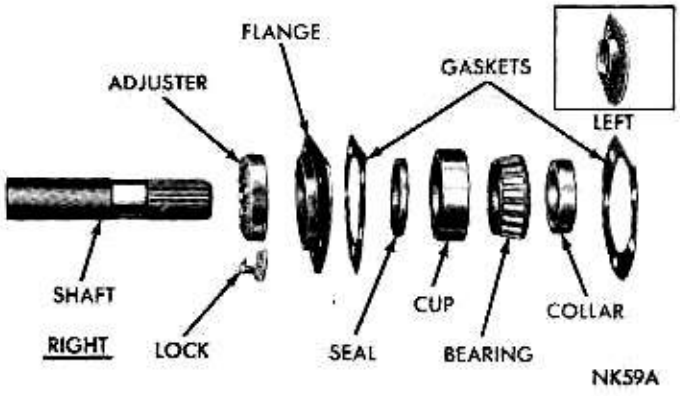


Fig. 2—Axle Shaft Disassembled

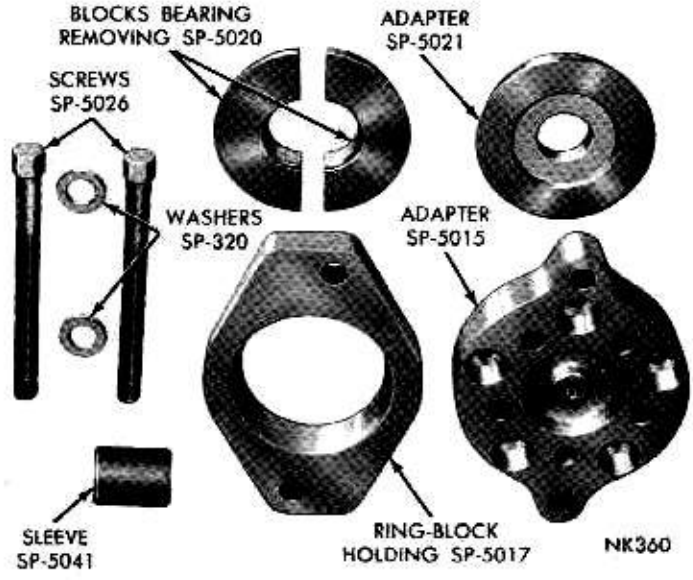


Fig. 3—Tool Set C-3971

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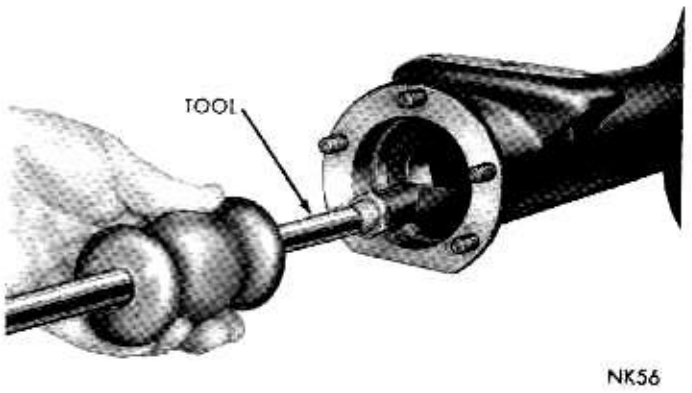


Fig. 4—Removing Inner Seal



Fig. 5—Installing Inner Seal

(6) Wipe axle housing seal bore clean and install a new axle shaft oil seal using Tool C-839 (Fig. 5).

Disassembly

CAUTION: To prevent the possibility of damaging axle shaft seal surface, slide protective sleeve SP5041 over the seal surface next to bearing collar.

(1) Position axle shaft bearing retaining collar on a heavy vise or anvil and using a chisel, cut deep grooves into retaining collar at 90° intervals (Fig. 6). This will enlarge bore of collar and permit it to be driven off of axle shaft.

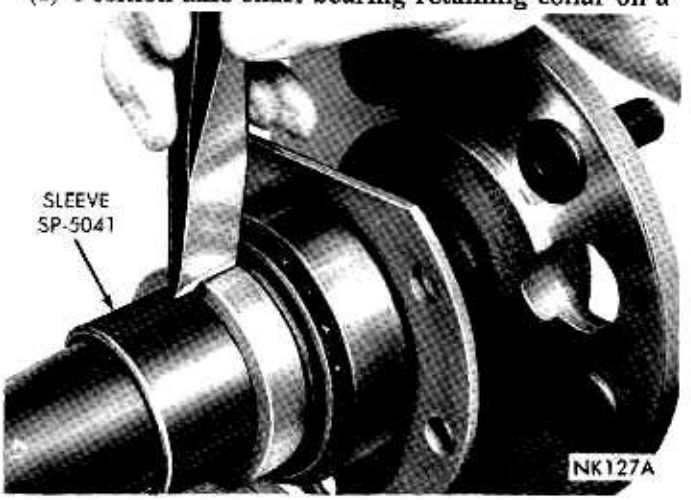


Fig. 6—Notching Bearing Retainer Collar

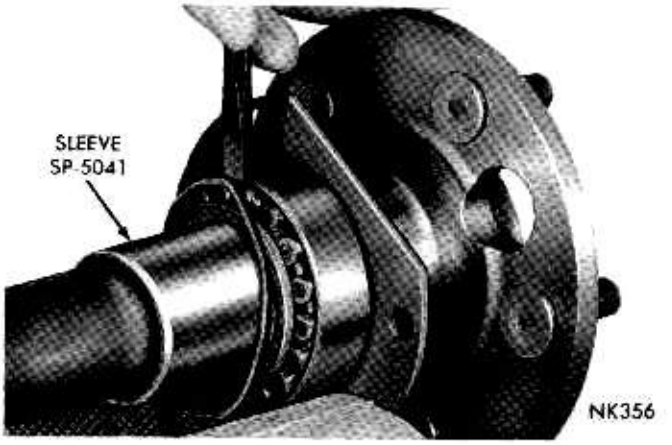


Fig. 7—Removing the Roller Retainer

(2) Remove bearing roller retainer flange by cutting off lower edge with a chisel (Fig. 7).

(3) Grind a section off flange of inner bearing cone (Fig. 8) and remove bearing rollers (Fig. 9).

(4) Pull bearing roller retainer down as far as possible and cut with a pair of side cutters and remove (Fig. 10).

(5) Remove roller bearing cup and protective sleeve SP5041 from axle shaft.

CAUTION: Sleeve SP5041 should not be used as a protector for the seal journal when pressing off the bearing cone, as it was not designed for this purpose.

(6) To avoid scuffing seal journal when bearing cone is being removed, it should be protected by single wrap of .002 thickness shimstock held in place by a rubber band (Fig. 11).

(7) Remove the bearing cone using Tool C-3971 (Fig. 3). Tighten bolts of tool alternately until cone is removed (Fig. 12).

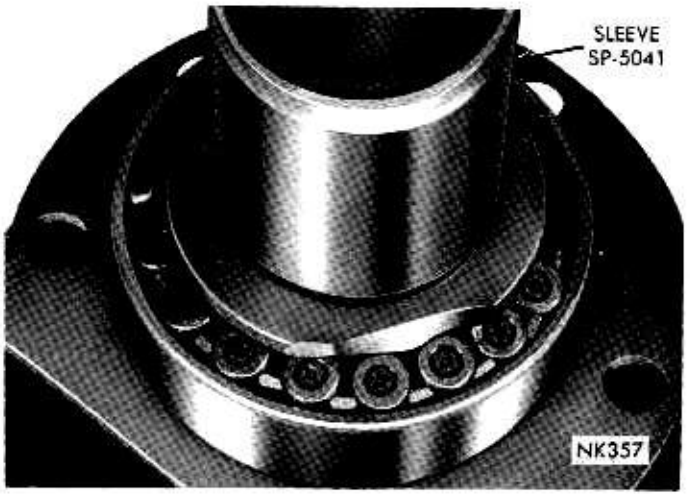


Fig. 8—Flange Ground Off the Inner Cone

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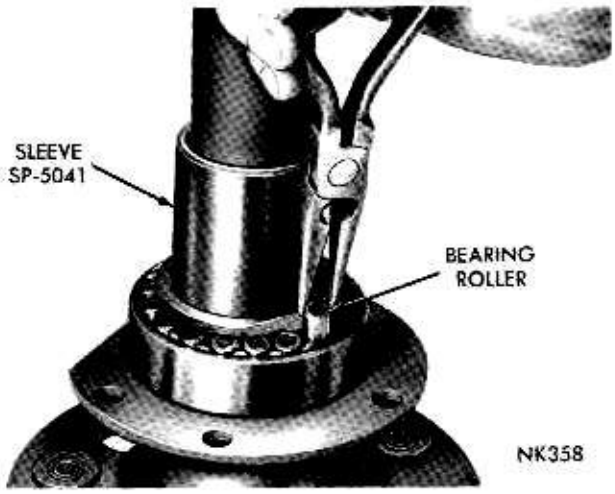


Fig. 9—Removing the Bearing Rollers

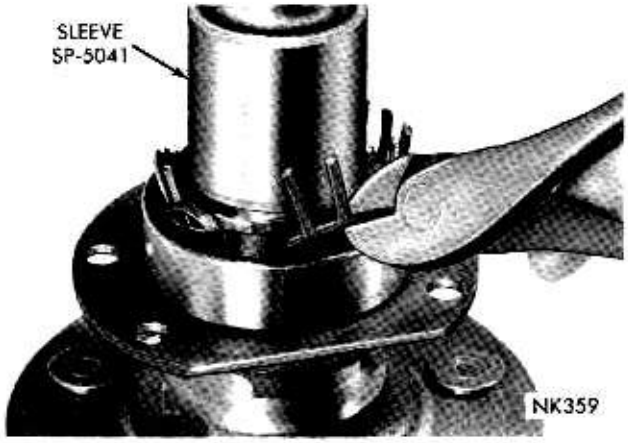


Fig. 10—Cutting Out the Roller Bearing Retainer

(8) Remove seal in bearing retainer plate and replace with new seal.

Assembly

(1) Install retainer plate and seal assembly on axle shaft.



Fig. 11—Seal Journal Protection

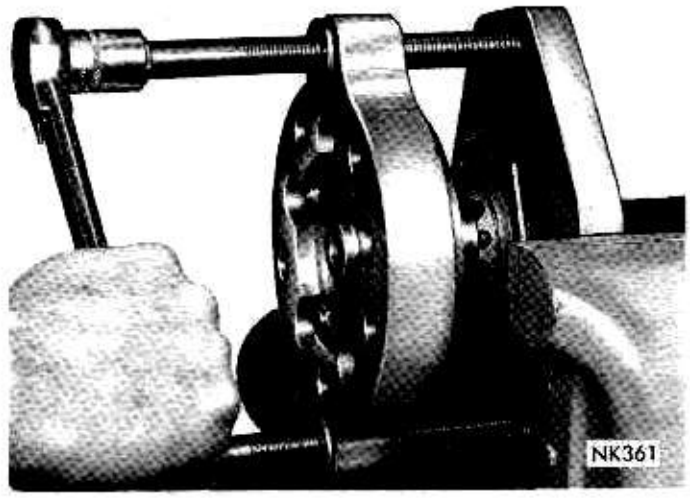


Fig. 12—Removing the Bearing Cone with Tool C-3971

(2) Install a new axle shaft bearing cup, cone and collar on shaft using Tool C-3971 (Fig. 13) and tighten bolts of tool alternately until bearing and collar are seated properly.

(3) Inspect axle shaft seal journal for scratches and polish with #600 crocus cloth if necessary.

(4) Lubricate wheel bearings with Automotive Multi-Purpose Grease NLGI, grade 2 or equivalent.

Installation

(1) Clean axle housing flange face thoroughly and install new gasket followed by brake support plate assembly on left side of axle housing.

(2) Install foam gasket on the studs of axle housing and carefully slide axle shaft assembly through oil seal and engage splines in differential side gear.

(3) Tap end of axle shaft lightly with a non-metallic mallet to position axle shaft bearing in housing bearing bore. Position retainer plate over axle housing studs. Install retainer nuts and tighten 30-35 foot-pounds. Start by tightening bottom nut.

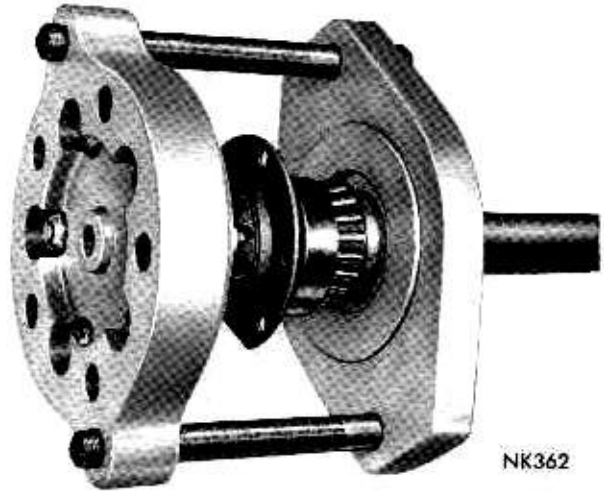


Fig. 13—Installing New Bearing and Collar

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(4) Repeat step (1) for right side of axle housing.

(5) Back off threaded adjuster of right axle shaft assembly until inner face of adjuster is flush with inner face of retainer plate. Carefully slide axle shaft assembly through oil seal and engage splines in differential side gears.

(6) Repeat step (3).

Axle Shaft End Play

CAUTION: When setting axle shaft end play, both rear wheels must be off the ground, otherwise a false end play setting will occur.

(1) Using a dial indicator mounted on the left brake support (Fig. 14), TURN THE ADJUSTER CLOCKWISE UNTIL BOTH WHEEL BEARINGS ARE SEATED AND THERE IS ZERO END PLAY IN THE AXLE SHAFTS. BACK OFF THE ADJUSTER COUNTERCLOCKWISE APPROXIMATELY FOUR NOTCHES TO ESTABLISH AN AXLE SHAFT END PLAY OF .013—.023 INCH.

(2) Tap end of left axle shaft lightly with a non-metallic mallet to seat right wheel bearing cup against adjuster, and rotate axle shaft several revolutions so that a true end play reading is indicated.

(3) Remove one retainer plate nut, install adjuster lock. If tab on lock does not mate with notch in adjuster, turn adjuster slightly until it does. Install nut and tighten 30—35 foot-pounds.

(4) Recheck axle shaft end play. If it is not within the tolerance of .013—.023 inch, then repeat adjustment procedure.

(5) Remove dial indicator and install brake drum, drum retaining clips and wheel.

REAR AXLE HOUSING

Removal

Should it become necessary to remove rear axle assembly for repair proceed as follows:

(1) Raise vehicle and support body at front of rear springs.

(2) Block brake pedal in the up position using a wooden block

(3) Remove rear wheels.

(4) Disconnect hydraulic brake hose at connection on left side of underbody.

(5) Disconnect parking brake cable.

(6) Disconnect propeller shaft at differential yoke and secure in an upright position to prevent damage to front universal joint.

(7) Remove shock absorber from spring plate studs and loosen rear spring "U" bolt nuts and remove "U" bolts.

(8) Remove the assembly from vehicle.

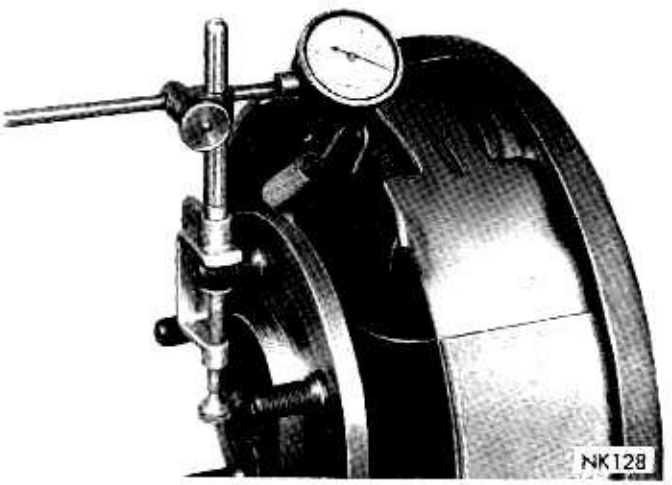


Fig. 14—Measuring Axle Shaft End Play

Installation

(1) With body of vehicle supported at front of rear springs, position the rear axle assembly spring seats over the spring center bolts.

(2) Install spring "U" bolts and tighten nuts to 45 foot-pounds and install shock absorbers on spring plate studs. (DO NOT OVER TIGHTEN "U" BOLT NUTS.)

(3) Connect propeller shaft at differential yoke and tighten rear clamp screws to 15 foot-pounds.

(4) Connect parking brake cable.

(5) Connect hydraulic brake hose, bleed and adjust brakes.

(6) Install rear wheels.

(7) If carrier was removed from axle housing during the removal operation, fill axle with proper amount and type of lubricant; see "Specifications" in rear of "Axle" Group.

Welding Rear Axle Housing

The axle housing should be completely disassembled if it is to be welded with arc welding equipment. It is also possible to weld the assembled housing with gas welding equipment, if precaution is taken to protect gaskets and heat treated parts.

DIFFERENTIAL AND CARRIER

Removal

(1) Remove flanged axle drive shafts.

(2) Disconnect rear universal joint and support propeller up and out of the way to prevent damage to the front universal joint.

(3) Remove the rear axle lubricant.

(4) Loosen and remove the carrier-to-housing attaching nuts and lift the carrier assembly from axle housing.

Disassembly

Side play and runout check taken during disassembly will be very useful in reassembly.

(1) Mount carrier in Stand DD-1014 and attach dial indicator Tool C-430 or Tool C-3339 to differential carrier flange in a position so pointer of indicator

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squarely contacts back face of ring gear (Fig. 15). With a screw driver positioned between bearing cap and differential case flange, then using a prying motion determine if side play is present. If side play is evident, remove adjuster lock and loosen adjuster slightly and retighten adjuster sufficiently to eliminate side play.

(2) Rotate drive gear several complete revolutions while noting total indicator reading. Mark drive gear and differential case at point of maximum runout. The marking of differential case will be very useful later in checking differential case runout. Total indicator reading should be no more than .005 inch. If runout exceeds .005 inch the differential case may be damaged, and a second reading will be required after drive gear has been removed. This operation is covered during "Differential Disassembly." Remove dial indicator.

(3) With Tool C-3281 hold companion flange and remove drive pinion nut and Belleville washer.

(4) Install companion flange remover Tool C-452 and remove flange (Fig. 16).

(5) Using a screwdriver and hammer, remove the drive pinion oil seal from the carrier.

(6) While holding one hand over nose end of carrier, invert carrier in stand. The front pinion bearing cone, shim pack and bearing spacer (where used) will drop from carrier.

(7) Apply identifying punch marks on differential bearing pedestels of carrier, differential bearing caps and bearing adjusters for reassembly purposes (Fig. 17).

(8) Remove both differential bearing adjuster lock screws and locks.

(9) With a ¾ inch socket, loosen bearing cap bolts (one on each side) and back off bearing adjusters slightly using spanner wrench Tool C-406A; to remove differential bearing preload. Remove bearing cap bolts, caps and bearing adjusters.

(10) Remove differential and ring gear assembly

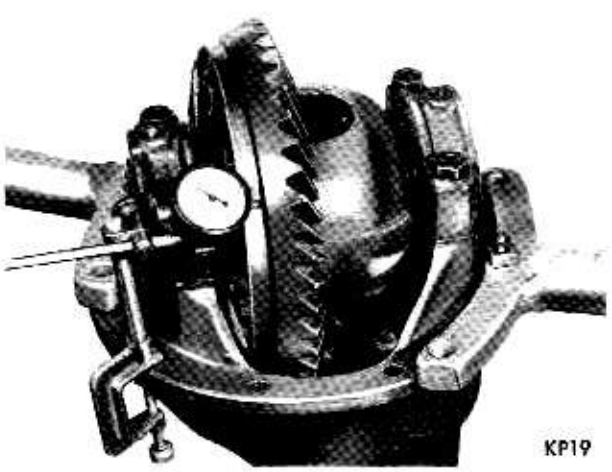


Fig. 15—Checking for Runout and Zero End Play

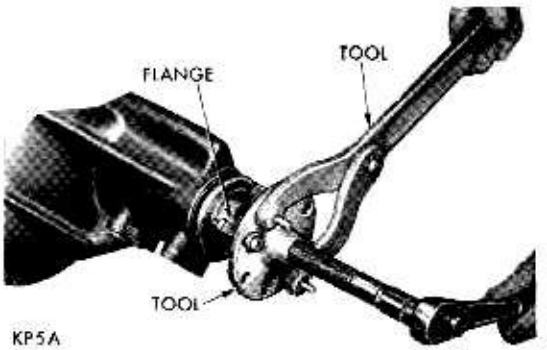


Fig. 16—Removing Companion Flange

with bearing cups. Differential bearing cups must be kept with respective bearing cones.

(11) Remove drive pinion and rear bearing assembly from carrier.

Rear Pinion Bearing Removal

(1) Remove drive pinion rear bearing from pinion with spacer (where used) with Tool C-293 and four (4) No. 36 plates, or four (4) No. 37 plates on pinion without the spacer (Fig. 18).

(2) Using a flat end brass drift, remove front and rear pinion bearing cups.

DIFFERENTIAL CASE

Disassembly

(1) Mount differential case and ring gear assembly in a vise equipped with soft jaws (brass).

(2) Remove drive gear bolts. BOLTS ARE LEFT HAND THREAD. With a non-metallic hammer, tap drive gear loose from differential case pilot and remove.

(3) If drive gear runout exceeded .005 inch in step 2 (under "Carrier Disassembly"), recheck the case as follows: Install differential case and respective bearing cups in carrier.

(4) Install bearing caps, cap bolts and bearing ad-

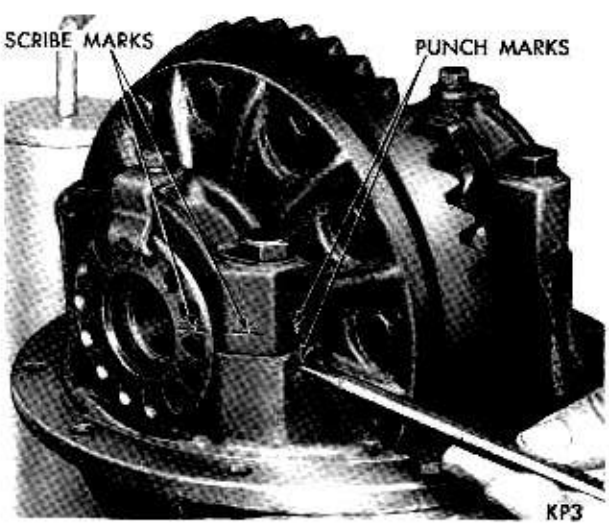


Fig. 17—Marking Bearing Caps and Adjusters

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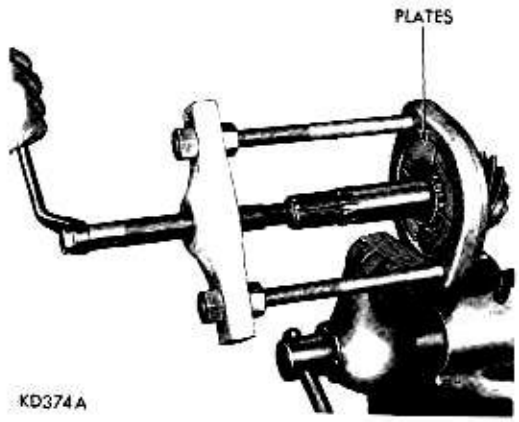


Fig. 18—Removing Drive Pinion Rear Bearing

justers. Tighten bearing cap bolts down lightly and screw in both adjusters with spanner wrench Tool C-406A.

(5) Tighten cap bolts and adjusters sufficiently to prevent any side play in bearings.

(6) Attach a dial indicator Tool C-430 or Tool C-3339 to carrier flange so pointer of indicator squarely contacts drive gear surface of differential case flange between outer edge flange and drive gear bolt holes (Fig. 19).

(7) Rotate differential case several complete revolutions while noting total indicator reading. This reading must not exceed .003 inch runout. If runout is in excess of .003 inch, differential case must be replaced. **In a case where the runout does not exceed .003 inch it is often possible to reduce the runout by positioning the drive gear 180° from point of maximum runout when reassembling drive gear on differential case.**

(8) Using two feeler gauges of equal thickness, insert between the differential case and side gear (Fig. 20). If clearance exceeds .012 inch, install new thrust washers.

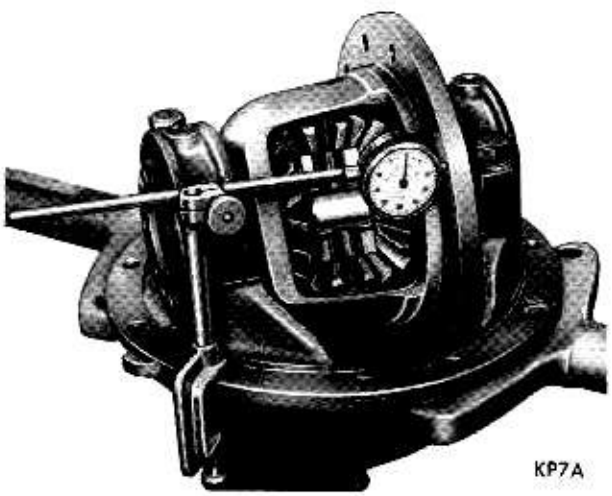


Fig. 19—Checking Drive Gear Mounting Flange Runout

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Fig. 20—Measuring Differential Gear Clearance

(9) With a flat nose drift and hammer, remove differential pinion shaft lock pin from back side of drive gear flange. (The hole is reamed only part way through, making it necessary to remove lock pin from one direction.)

(10) With a brass drift and hammer, remove differential pinion shaft and axle drive shaft thrust block.

(11) Rotate differential side gears until each differential pinion appears at large opening of case. Remove each pinion and thrust washer at that time.

(12) Remove both differential side gears and thrust washers.

Cleaning and Inspection (Figs. 21 or 22)

(1) Clean all parts in a fast evaporating mineral spirits or a dry cleaning solvent and with the exception of bearings, dry with compressed air.

(2) Inspect differential bearing cones, cups and rollers for pitting, spalling or other visible damage. If replacement is necessary, remove bearing cones from differential case with Tool C-293 and adapter plates No. 18 (Fig. 23).

(3) Inspect differential case for elongated or enlarged pinion shaft hole. The machined thrust washer surface areas and counterbores must be smooth and without metal deposits or surface imperfections. If any of the above conditions exist, satisfactory correction must be made or the case replaced. Inspect case for cracks or other visible damage which might render it unfit for further service.

(4) Inspect differential pinion shaft for excessive wear in contact area of differential pinions. Shaft should be smooth and round with no scoring or metal pickup.

(6) Inspect axle shaft thrust block for excessive wear or visible damage. The wear surface on the opposite ends of the block, must be smooth.

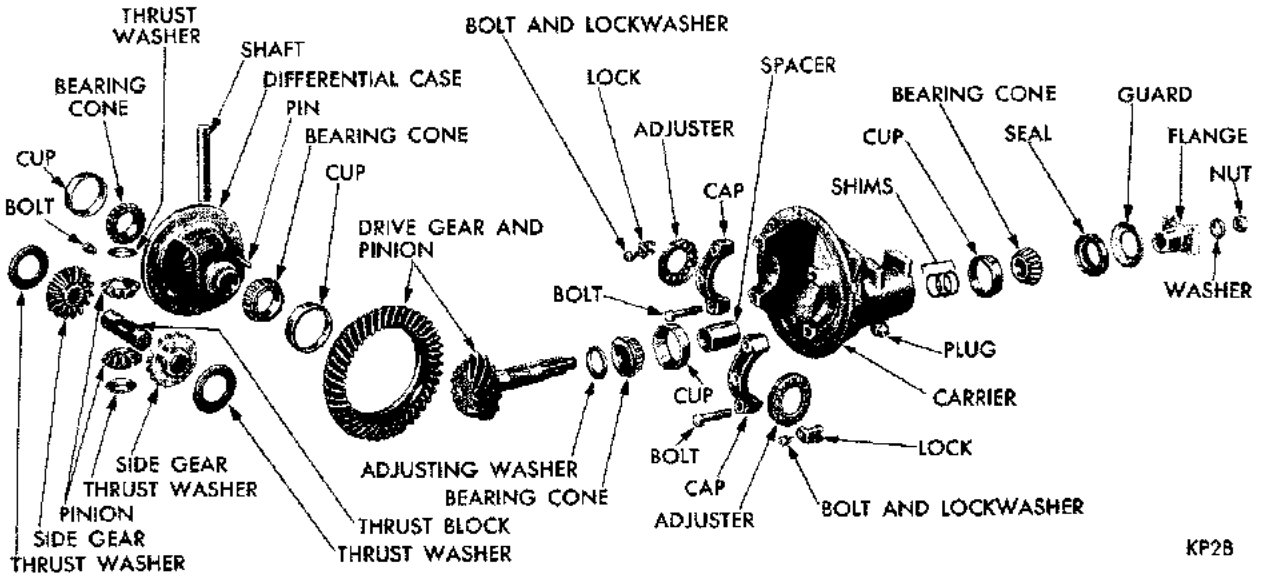


Fig. 21—Differential Carrier Assembly (Small Pinion Disassembled)

(7) Inspect differential pinion shaft lock pin for damage or looseness in case. Replace pin or case as necessary.

(8) Inspect drive gear and pinion for worn or chipped teeth or damaged attaching bolt threads. If replacement is necessary, replace both the drive gear and drive pinion as they are available in matched sets only.

(9) Inspect drive pinion bearing cones, cups and rollers for pitting, spalling, excessive wear, or other visible damage. If inspection reveals that either are unfit for further service, replace both cup and cone.

(10) Inspect differential carrier for cracks or other visible damage which would render it unfit for further service. Raised metal on the shoulder of bearing cup bores incurred in removing pinion cups should be flattened by use of a flat nose punch.

(11) Inspect drive pinion for damaged bearings journals and mounting shim surface on excessively worn splines. If replacement is necessary, replace both the drive pinion and drive gear as they are available in matched sets only.

(12) Inspect companion flange for cracks, worn splines, pitted, rough or corroded oil seal contacting surface. Repair or replace companion flange as necessary.

(13) Inspect drive pinion bearing shim pack for broken, damaged or distorted shims. Replace if necessary during establishment of pinion bearing preload.

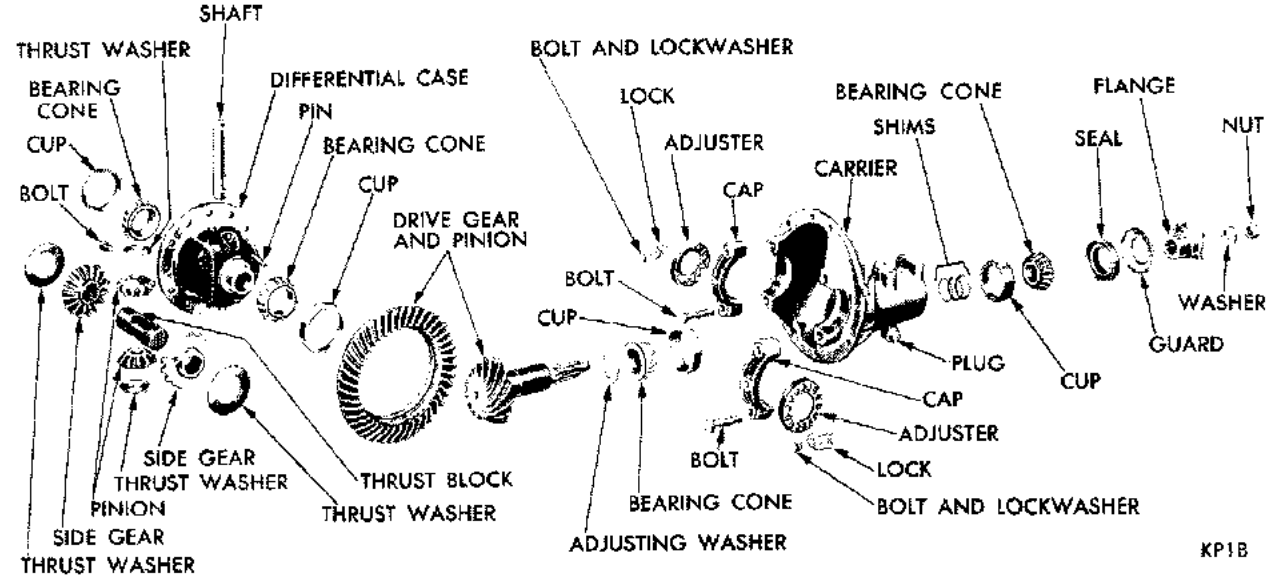


Fig. 22—Differential Carrier Assembly (Large Pinion Disassembled)

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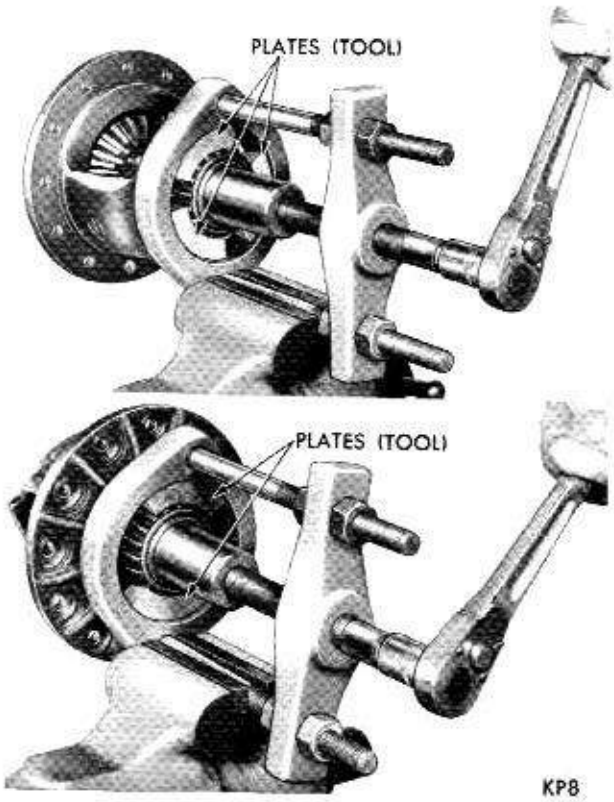


Fig. 23—Removing Differential Bearings

Assembly

NOTE: Lubricate all parts before assembly.

(1) Install thrust washers on differential side gears and position gears in case.

(2) Place thrust washers on both differential pinions and through large window of differential case, mesh the pinion gears with the side gears, having pinions exactly 180 degrees opposite each other.

(3) Rotate side gears 90 degrees to align pinions and thrust washers with differential pinion shaft holes in case.

(4) From pinion shaft lock pin hole side of case, insert slotted end of pinion shaft through case, and the conical thrust washer, and just through one of the pinion gears.

(5) Install thrust block through side gear hub, so that slot is centered between the side gears.

(6) While keeping all of these parts in proper alignment, push pinion shaft into case until locking pin hole in pinion shaft is in exact alignment with its respective hole in case. Install pinion shaft lock pin through hole in case from pinion shaft side of drive gear flange. **The contacting surfaces of the drive gear and differential case flange must be clean and free of all burrs.**

(7) Position drive gear on differential case pilot, aligning threaded holes of drive gear with those in differential case flange.

(8) Insert drive gear screws (LEFT HAND THREADS) through case flange and into drive gear. After all cap screws are properly started, tap drive gear against differential case flange with a non-metallic mallet.

(9) Position unit between brass jaws of a vise and alternately tighten each cap screw to 55 foot-pounds.

(10) Position each differential bearing cone on hub of differential case (taper away from drive gear) and with installing Tool DD-1005, install bearing cones. An arbor press may be used in conjunction with installing tool.

CAUTION: Never exert pressure against the bearing cage, since this would damage the bearing.

Pinion Bearing Cup Installation

(1) Position pinion bearing cups squarely in bores of carrier. Assemble Tool C-758-D4 (Fig. 24) by placing spacer SP2919 followed by rear pinion bearing cone over main screw of tool and inserting it into carrier from gear side.

(2) Place front pinion bearing cone over main screw of tool followed by compression sleeve SP535, centralizing washer SP534, and main screw nut SP533. Hold compression sleeve with the companion flange holding Tool C-3281 and tighten nut (Fig. 25) allowing tool to rotate as nut is being tightened in order not to brinnel bearing cone or cups. **Do not remove tool after installing cups.**

PINION BEARING PRELOAD AND DEPTH OF MESH SETTING USING TOOL C-758-D4

The 8¾" axle incorporates two types of drive pinions. The method of determining pinion depth of mesh and bearing preload are the same for both pinions; however, the sequence of making the two adjustments change. Pinions without a bearing spacer (large pinion) require the depth of mesh adjustment

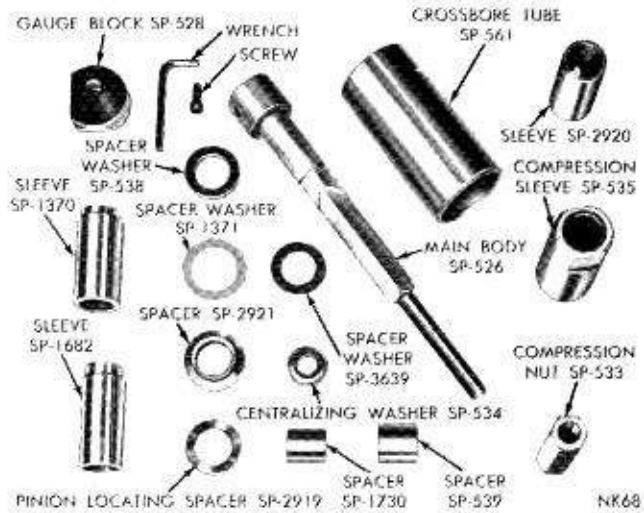


Fig. 24—Rear Axle Setting Gauge Tool C-758-D4

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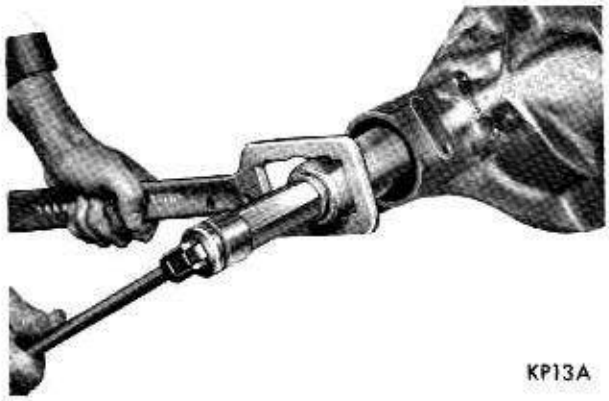


Fig. 25—Seating the Bearing Cups in Carrier Housing

first, while pinions with a separate bearing spacer (small pinion) require the bearing preload adjustment first.

The position of the drive pinion with respect to the drive gear (depth of mesh) is determined by the location of the bearing cup shoulders in the carrier and by the portion of the pinion in back of the rear bearing. The thickness of the rear pinion bearing mounting shim suitable for the carrier can be determined by using Tool C-758-D4.

PINION BEARING PRELOAD WITH BEARING SPACER (Small Stem Pinion)

Bearing Preload

(1) With tool installed in carrier, remove main screw nut, centralizing washer, compression sleeve and front pinion bearing cone.

(2) Install the pinion bearing spacer, larger bore of spacer next to rear bearing.

(3) Position sleeve (SP1730) in front bearing cone making sure sleeve is flush with rear of bearing.

(4) Position original shims, previously removed from drive pinion stem, over the sleeve and slide the sleeve, bearing and shims over main screw of tool until shims rest against spacer (Fig. 26).

(5) Install tool compression sleeve (SP535) (square end out), centralizing washer (SP534) and main screw nut (SP533). Turn carrier in stand to bring nut on top.

(6) Tighten tool nut to 240 foot-pounds with a torque wrench, using holding Tool C-3281 on the compression sleeve to hold the assembly in several positions to make a complete revolution while tightening. Remove holding tool and rotate the pinion several revolutions in both directions to align the bearing rollers. Recheck torque to 240 foot-pounds (torque may have diminished as bearing rollers were aligned by rotating). **Correct bearing preload reading can only be obtained with nose of carrier up.**

(7) Using inch-pound torque wrench C-685, measure pinion bearing preload by rotating pinion with handle of wrench floating, read the torque while wrench is moving through several complete revolutions. Correct preload setting is 20-30 inch-pounds for a new bearing and 0-15 inch-pounds for original bearing. Bearing preload should be uniform during complete revolution. A reading that varies considerably during rotation of pinion indicates a binding condition which requires correction. **Use a thinner shim pack to increase preload and a thicker shim pack to decrease preload.** Preload shims are available in two thousandths of an inch increments from .014-.026 inch.

After correct pinion bearing preload is set, **DO NOT REMOVE THE TOOL.**

Depth of Mesh

(1) Reverse carrier in stand and install gauge block SP528 on end of tool and securing it to tool with Allen screw. The flat portion of gauge block should be facing differential bearing pedestals (Fig. 27). Tighten screw with Allen wrench.

(2) Position arbor SP561 (part of Tool C-758-D4) in differential bearing pedestals of carrier (Fig. 28). Center the arbor so that an approximate equal distance is maintained at both ends. Position differential bearing

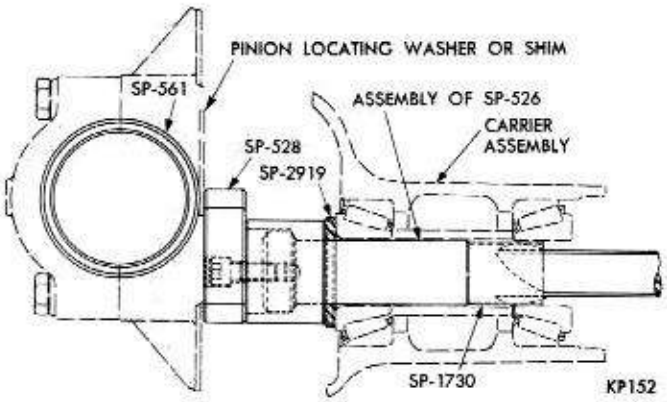


Fig. 26—Pinion Preload with Spacer (8¾" Ring Gear)

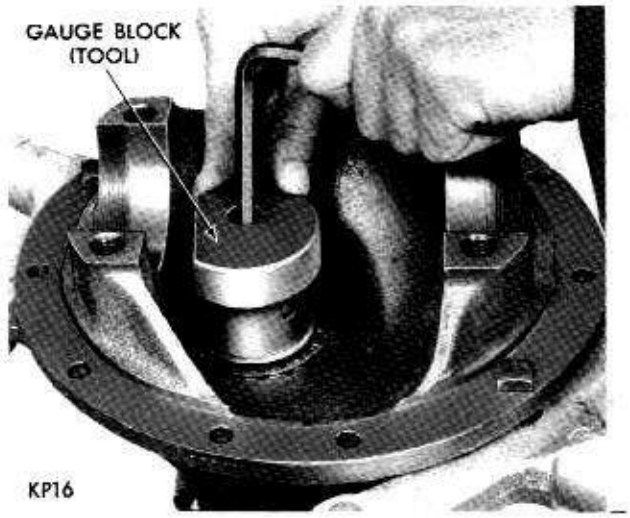


Fig. 27—Installing Gauge Block on Tool

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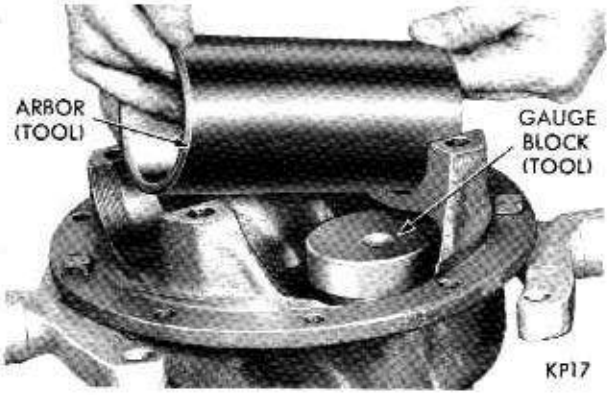


Fig. 28—Installing Arbor In Carrier

caps and attaching bolts on carrier pedestals, and insert a piece of .002 inch shim stock between arbor and each cap. Tighten cap bolts to 10 foot-pounds.

(3) Select a rear pinion bearing mounting shim which will fit between cross arbor and gauge block. This fit must be snug but not too tight (similar to the pull of a feeler gauge) (Fig. 29). This shim is then used in determining the correct thickness shim for installation.

(4) To select a shim for installation, read the marking on end of pinion head (−0, −1, −2, +1, +2 etc.). When marking is − (minus), add that amount to the thickness of shim selected in step (3). When the marking is + (plus), subtract that amount. Example: With a shim .086 inch thick and a pinion marked −2, install a shim .088 inch thick. (.086 + .002 = .088). Example: With a shim .086 inch thick and a pinion marked +2, install a washer .084 inch thick, (.086 − .002 = .084) or when a shim .086 inch thick is too loose and .088 inch too tight, use .086 inch shim. Treat other pinion markings in a similar manner. Shims are available in two thousandths of an inch increments. Mounting shims differ in diameter, depending on which pinion they are used on.

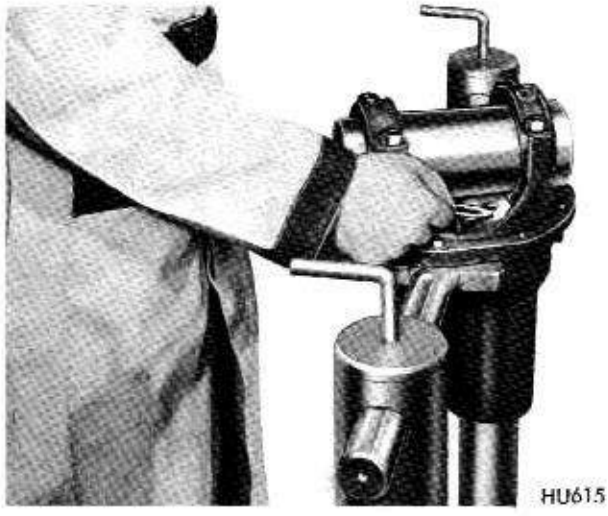


Fig. 29—Determining Spacer Thickness

(5) Remove tool arbor from carrier.

(6) Remove tool and bearings out of carrier.

(7) Remove shims, spacer, tool sleeve and rear bearing cone from tool main screw.

(8) With stem of pinion facing up, install correct shim on pinion stem. **Shims are chamfered on one side and must be installed on the pinion stem with chamfered side toward pinion head.**

(9) Position rear bearing cone on pinion stem (small side away from pinion head). Make certain that the contacting surfaces of correct shim, pinion head shim contact surface and rear bearing cone are perfectly clean and free of any foreign particles.

(10) Using installing Tool DD-996 press bearing on pinion stem. An arbor press may be used in conjunction with tool.

(11) Install bearing tubular spacer on pinion stem (large bore facing rear bearing cone).

(12) Install selected shim pack.

(13) Lubricate front and rear pinion bearing cones with Multi-Purpose Gear Lubricant.

(14) Position front pinion bearing cone in its cup in carrier.

(15) Install drive pinion oil seal into carrier using Tool 3980. Lip of seal must face front bearing. Tool 3980 **MUST BE USED** in order to position the seal the proper depth into the carrier.

(16) Insert drive pinion and bearing assembly up through carrier. While supporting pinion in carrier, install companion flange with installing Tool C-496 or DD-999 and holding Tool C-3281.

(17) Remove tools and install Belleville washer (convex side of washer up) and pinion nut.

(18) Hold companion flange with holding Tool C-3281 and tighten pinion nut to 240 foot-pounds. Rotate pinion several revolutions in both directions to align bearing rollers. Recheck torque to 240 foot-pounds (torque may have diminished as bearing rollers were aligned by rotating).

PINION BEARING PRELOAD WITHOUT BEARING SPACER (Large Stem Pinion)

Inspect bearing cups and carrier for grit and dirt or other foreign material. Clean all parts in a fast evaporating mineral spirits or a dry cleaning solvent and with the exception of bearing cones, dry with compressed air.

(1) Assemble spacer SP2921 to main section of tool followed by spacer SP1730. Install rear pinion bearing cone over spacer SP1730 and against spacer SP2921 (Fig. 30).

(2) Insert assembly into carrier and install front pinion bearing cone over tool shaft and in its proper position in bearing cup. Install tool spacer, tool thrust washer and tool nut on shaft.

(3) With nose of carrier up, place flange holding Tool C-3281 on compression sleeve. Allow assembly

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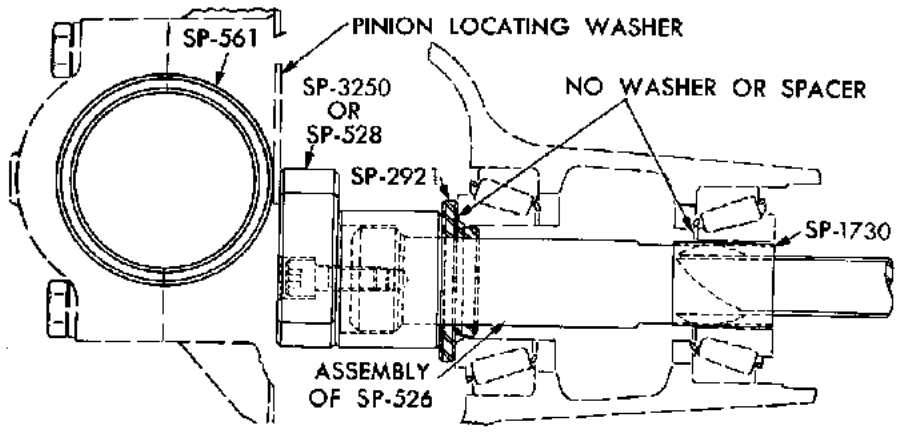


Fig. 30—Tool C-758-D4 Installing in Housing (8¾" Large Pinion)

to rotate while tightening nut to not more than 25-50 foot-pounds. **Always make sure bearing cones are lubricated with hypoid gear lubricant.**

(4) Turn tool several complete revolutions in both directions to permit bearing roller to seat. After bearing rollers are properly seated, check bearing preload by rotating tool with an inch-pound torque wrench. The correct bearing preload should be from 20-30 inch-pounds for new bearings and 0-15 inch-pounds for the original bearings.

(5) With proper bearing preload set, invert carrier in stand and install gauge block SP528 or SP3250 to the main screw attaching it with Allen screw securely (Fig. 27). The flat portion of gauge block should be facing differential bearing pedestals.

(6) Position tool arbor SP561 in differential bearing pedestals of carrier (Fig. 28). Center the arbor so that an approximate equal distance is maintained at both ends. Position differential bearing caps and attaching bolts on carrier pedestals, and insert a piece of .002 inch shim stock between arbor and each cap. Tighten cap bolts to 10 foot-pounds.

(7) Select a rear pinion bearing mounting shim which will fit between cross arbor and gauge block. This fit must be snug but not too tight (similar to the pull of a feeler gauge (Fig. 29). This shim is then used in determining the correct thickness shim for installation.

(8) To select a shim for installation, read the marking on end of pinion head (−0, −1, −22, +1, +2, etc.). When marking is −, (minus) add that amount to the thickness of shim selected in step (7). When the marking is + (plus), subtract that amount. Example: With a shim .086 inch thick and a pinion marked −2, install a shim .088 inch thick (.086 + .002 = .088). Example: With a shim .086 inch thick and a pinion marked +2, install a washer .084 inch thick, (.086 − .002 = .084) or when a shim .086 inch thick is too loose and .088 inch too thick, use .086 inch shim. Treat other pinion markings in a similar manner. Shims are available in two thousandths of an inch increments. Mounting shims differ in diameter, depending on which pinion they are used on.

(9) Remove differential bearing caps and remove tool arbor from carrier.

(10) Reverse carrier in stand so nut of tool is in up right position. Loosen compression nut, and support lower portion of tool in carrier with one hand, remove tool nut, centering washer and compression sleeve. Lower tool down and out of carrier.

(11) Remove front pinion bearing cone from carrier

(12) Add rear pinion bearing shim you selected on tool between spacer SP2921 and rear pinion bearing cone. Install spacer SP1730 and insert tool in carrier.

(13) Install original preload shim pack and front pinion bearing cone and position in carrier bearing cup. Install tool compression sleeve SP535 and tool nut washer and tool nut on shaft.

(14) Using holding tool C-3281 on compression sleeve and tighten tool nut to 240 foot-pounds. Hold the assembly in several positions to make a complete revolution while tightening.

(15) Remove holding tool and rotate tool several revolutions in both directions to permit bearing rollers to seat. Recheck torque to 240 foot-pounds (torque may have diminished as bearing roller seated).

(16) Measure pinion bearing preload by rotating tool using an inch-pound torque wrench. The correct preload specifications are 20-30 inch-pounds for new bearings and 0-15 for original bearings. Correct bearing preload readings can only be obtained with nose of carrier in up right position. Bearing preload should be uniform during complete revolution. A reading that varies during rotation indicates a binding condition which should be corrected. **Use a thinner shim pack to increase preload and a thicker shim pack to decrease preload.** Preload shims are available in two

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thousandths of an inch increments from .014-.026 inch.

(17) Remove tool with shim pack, bearing cone, pinion mounting shim, and spacer from carrier and tool.

(18) With stem of pinion facing up, install correct shim on pinion stem. **Shims are chamfered on one side and must be installed on the pinion stem with chamfered side toward pinion head.**

(19) Position rear bearing cone on pinion stem (small side away from pinion head). Make certain that the contacting surfaces of correct shim, pinion head shim contact surface and rear bearing cone are perfectly clean and free of any foreign particles.

(20) Lubricate front and rear pinion bearing cones with hypoid gear lubricant. Install rear bearing cone onto pinion stem, and using Tool DD-996, press bearing cone into place. An arbor press may be used in conjunction with tool.

(21) Insert pinion and bearing assembly up through carrier and install the selected front pinion bearing preload shim pack followed by the bearing cone.

(22) Apply a light coat of sealer in seal bore of carrier and install drive pinion oil seal into carrier using Tool 3980. Lip of seal must face front bearing. Tool 3980 **MUST BE USED** in order to position the seal the proper depth into carrier.

(23) While supporting pinion in carrier, install companion flange with installing Tool C-496 or DD-999 and holding Tool C-3281.

(24) Remove tools and install Belleville washer (convex side of washer up) and pinion nut.

(25) Hold universal joint flange with holding Tool C-3281 and tighten pinion nut to 240 foot-pounds. Rotate pinion several revolutions in both directions to align bearing rollers. Recheck torque to 240 foot-pounds (torque may have diminished as bearing rollers were aligned by rotating).

PINION BEARING PRELOAD AND PINION SETTING (Without Using Tool C-758-D4)

If the differential assembly was satisfactorily quiet before being disassembled, the drive pinion may be assembled with the original mounting shim and preload shim pack. If replacement parts are installed, a complete readjustment is necessary; the proper thickness shim must be installed between the pinion and rear bearing. The drive gear and pinion are manufactured and lapped in matching sets and are available in matched sets only. The adjustment position in which the best tooth contact is obtained is marked on the end of the pinion head.

To obtain the proper pinion setting in relation to the drive gear, the correct thickness mounting shim must be selected before the drive pinion is installed in the carrier. The pinion bearing mounting shims are available in two thousandths increments from .084 to .100 inch. To select the proper thickness shim, proceed as follows: It will be noted that the head of the drive pinion is marked with a plus (+) or minus (−) sign followed by a number ranging from 1 to 4, or zero (0) marking.

Depth of Mesh

If the old and new pinion have the same marking and if the original bearing is being reused, use a mounting shim of the same thickness. But if the old pinion is marked zero (0) and the new pinion is marked +2, try a .002 inch thinner shim. If the new pinion is marked −2, try a .002 inch thicker shim.

Pinion Bearing Preload

If the bearings are being replaced, place the new bearing cup in position in the carrier and drive the cups in place with a suitable drift. After properly positioning the bearing cups in the carrier, assemble the drive pinion mounting shim (chamfered side down toward gear) on the drive pinion stem. Install the tubular spacer (if so equipped) and the preload shims on the pinion stem. Insert the pinion assembly into the carrier. Install the front pinion bearing cone, universal joint flange, Belleville washer (convex side of washer up) and nut. DO NOT INSTALL THE OIL SEAL. Rotate the drive pinion after tightening the flange nut to 240 foot-pounds, to properly seat the bearing rollers in the bearing cups. The preload torque required to rotate the pinion with the bearings oiled should be 20-30 inch-pounds for new bearings and 0 to 15 inch-pounds for used bearings. **Use a thinner shim pack to increase preload and a thicker shim pack to decrease preload.** After the correct pinion depth of mesh has been established and correct bearing preload obtained, remove the drive pinion flange. Install the oil seal with Tool 3980. Install the pinion flange, washer and nut and tighten the nut to 240 foot-pounds.

Installation of Differential and Ring Gear in Carrier

(1) Holding differential and ring gear assembly with bearing cups on respective bearing cones, carefully install the assembly into carrier.

(2) Install differential bearing caps, on respective sides, making certain that identification marks on caps correspond with those on carrier. Install cap bolts and tighten bolts of each cap by hand.

(3) Install differential bearing adjusters, on respective sides, making certain that identification marks correspond. Screw adjuster in by hand. No attempt should be made to apply any excessive pressure at this time.

(4) Using spanner wrenches Tool C-406A to square bearing cups with bearing cone, turn adjusters "IN" until cups are properly squared with bearings and

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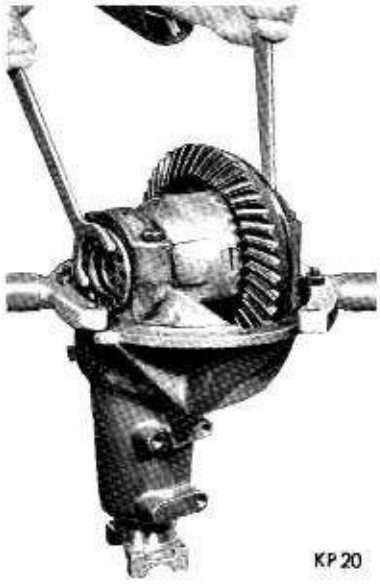


Fig. 31—Adjusting Differential Bearings

end play is eliminated with some backlash existing between the drive gear and pinion (Fig. 31).

(5) Tighten one differential bearing cap bolt on each side to 85-90 foot-pounds.

DRIVE GEAR AND PINION BACKLASH

Correct drive gear and pinion backlash when properly set is .006 to .008 inch at point of minimum backlash.

(1) Attach a dial indicator Tool C-340 or C3339 to carrier flange so pointer of indicator is squarely contacting one drive gear tooth (drive side) (Fig. 32).

(2) Measure backlash between drive gear and pinion at four positions, approximately 90 degrees apart. After point of least backlash has been determined, mark drive gear. **Do not rotate drive gear from point of least backlash until all adjustments have been completed.**

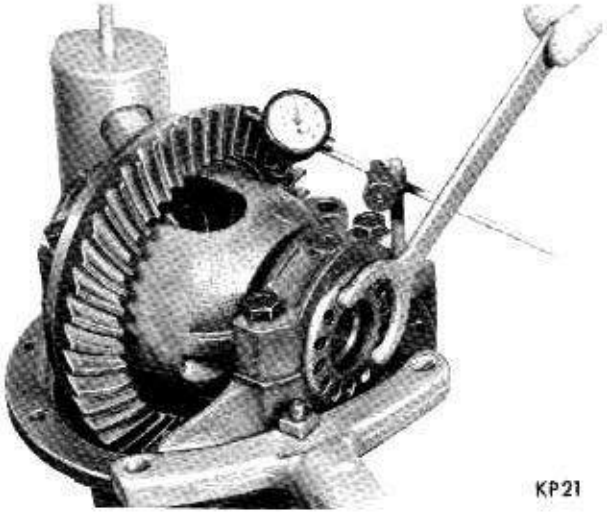


Fig. 32—Measuring Backlash Between Drive Gear and Pinion

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(3) Using Tool C-406A (spanner wrench) turn both bearing adjusters equally (in same direction) until backlash between drive gear and pinion is .0005 to .0015 inch. **This backlash variation is given to permit alignment and installation of the bearing and adjuster lock, lockwasher and attaching screw. The adjuster must only be turned in a clockwise direction and under no circumstances should be backed off.**

(4) Install adjuster lock on bearing cap, back-face side of drive gear. Tighten lock screw to 15 to 20 foot-pounds.

Differential Bearing Preload

(1) Turn bearing adjuster (tooth side of drive gear) (Fig. 32) in a notch at a time (notch referred to is the adjuster lock holes) until backlash between drive gear and pinion is a minimum of .006 to .008 inch. This will preload differential bearings and establish correct backlash.

(2) Tighten the remaining two differential bearing cap bolts to 85-90 foot-pounds.

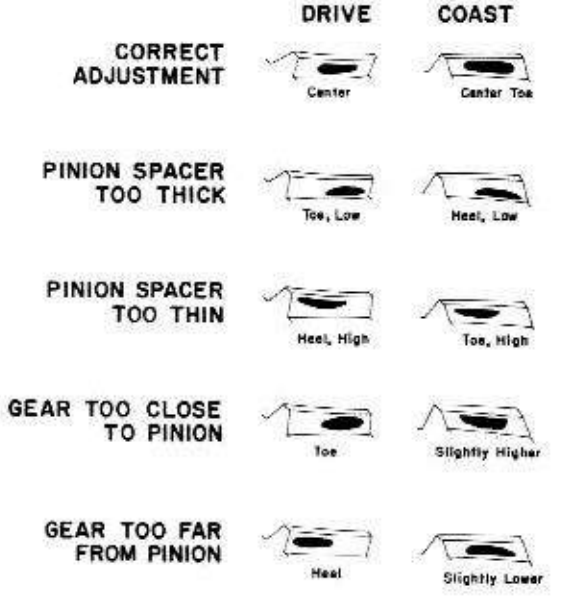
(3) Install remaining adjuster lock, lockwasher and attaching screw. Tighten to 15-20 foot-pounds.

GEAR TOOTH CONTACT PATTERN

The gear tooth contact pattern (Fig. 33) will disclose whether the correct rear pinion bearing mounting shim has been installed and the drive gear backlash set properly.

Obtaining Tooth Contact Pattern

Apply a thin film of red lead on drive and coast



1. PINION SPACER CHANGES AFFECT THE COAST SIDE CONTACT FASTER THAN THE DRIVE SIDE
2. BACKLASH ADJUSTMENTS AFFECT THE DRIVE SIDE CONTACT MUCH FASTER THAN THE COAST SIDE
3. ALL BACKLASH MEASUREMENTS SHOULD BE MADE AT THE POINT OF MINIMUM BACKLASH

NY1022A

Fig. 33—Gear Tooth Contact Pattern

side of drive gear teeth. Using a round bar apply a load against the back of the drive gear. As this load is being applied to the drive gear, rotate the pinion several revolutions in both directions. This action will leave a distinct contact pattern on both the drive and coast side of the drive gear teeth. Compare the patterns on the drive gear teeth with those in (Fig. 33) to determine if all adjustments have been properly made.

Correct Adjustment - Proper Tooth Contact

With all the adjustments properly made, correct tooth contact (Fig. 33) will result. Notice that the correct contact pattern is well centered on both drive and coast sides of the teeth. When tooth contact patterns are obtained by hand, they are apt to be rather small. Under the actual operating load, however, the contact area increases.

If improper tooth contact is evident, the pinion must be readjusted by either increasing or decreasing the thickness of the rear pinion bearing mounting shim. Backlash between the drive gear and pinion must be maintained within the specified limits until correct tooth contact pattern is obtained.

Heavy Face Contact

If the tooth pattern is across the length of the tooth face, narrow and near the top, the teeth will wear thin and roll over or score, resulting in excessive gear lash and noise. This condition is corrected by installing a thicker shim behind the rear pinion bearing.

Heavy Flank Contact

If the tooth pattern is across the length of the tooth and is narrow and low on the flank, the pinion teeth will score and also result in noise. This condition is corrected by installing a thinner shim behind the rear pinion bearing.

Heavy Toe Contact

If the tooth pattern is heavy on the toe of the tooth, the edges of the teeth may chip resulting in excessive damage of the entire assembly. This condition is corrected by moving the drive gear away from the pinion. This will increase the backlash making it again necessary to insert a thinner shim behind the rear pinion bearing.

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Heavy Heel Contact

If the tooth pattern is heavy on the heel of the teeth, the edges of the teeth may chip resulting in excessive damage to the entire assembly. This condition is corrected by moving the drive gear toward the pinion. This would result in decreasing the backlash making it again necessary to insert a thinner shim behind the rear pinion bearing.

DIFFERENTIAL AND CARRIER

Installation

(1) Thoroughly clean the gasket surfaces of the carrier and rear axle housing.

(2) Using a new gasket, install the carrier assembly into the axle housing. Tighten the carrier to axle housing nuts to 45 foot-pounds.

(3) Refer to "Installation of Rear Axle Shaft," when installing and setting axle shaft end play.

(4) Install rear universal joint of propeller shaft and tighten clamp screws to 15 foot-pounds (Imperial to 25 foot-pounds).

(5) Remove wooden block from under brake pedal and bleed and adjust brakes.

(6) Install rear wheels and tighten to 55 foot-pounds.

LUBRICATION

Refill axle housing and carrier assembly with multi-purpose gear lubricant as defined by MIL-L-2105B on all rear axles except those with a Sure-Grip differential; such a lubricant is available under Part Number 2585317, Hypoid Gear Lubricant.

In Sure-Grip differentials, use only the special multi-purpose gear lubricant intended for use in limited-slip differentials. Such a lubricant is available under Part Number 2585318, Special Sure-Grip Lubricant.

Anticipated Temperature	Viscosity	Grade
Above —10°F.	SAE	90
As low as —30°F.	SAE	80
Below —30°F.	SAE	75

"SHOULD THE REAR AXLE BECOME SUBMERGED IN WATER, THE LUBRICANT MUST BE CHANGED IMMEDIATELY TO AVOID THE POSSIBILITY OF EARLY AXLE FAILURE RESULTING FROM CONTAMINATION OF THE LUBRICANT BY WATER DRAWN INTO THE VENT HOLE."

SURE GRIP DIFFERENTIAL

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GENERAL INFORMATION

The sure-grip differential (Figs. 1, 2, 3 and 4) is similar to the conventional differential except for the addition of friction plates and Belleville plates and discs for clutching the differential case to the differential gears and a means for engaging these plates. The Belleville plates and discs accomplish a positive engagement of the clutch discs and plates at all times by placing a preload on the plates and discs. It has four pinion gears, positioned in the case by two pinion shafts which are at right angles to each other and loose fitting at their inter-section. Both ends of each shaft have two flat surfaces, or ramps, which mate with identical ramps in the differential case. There is additional clearance in the case to permit a slight peripheral movement of the ends of the pinion shafts within the case.

SURE-GRIP DIFFERENTIAL IDENTIFICATION

Identification of sure-grip type differential assembly can be made by lifting the rear wheels off the ground and turning them. If they both turn in the same direction, the vehicle is equipped with a Sure Grip Differential. Another means of identification is a metal tag reading, "Use Sure-Grip Lube" attached by means of the rear axle housing-to-carrier bolt, below the carrier filler plugs. If the tag is not apparent, remove the filler plug and use a flashlight to look up through the filler plug hole to identify the type of differential case. The sure-grip type differential case (two-piece construction) has attaching bolts. The conventional type differential case (one-piece construction) has a dome-like shape with no case cap attaching bolts.

Whenever the rear axle shafts have been removed from the "Sure Grip" axle assembly, always determine that the thrust spacers have not fallen out of the pinion shaft (Fig. 12). The spacers may be observed through the axle shaft opening of the axle housing. This may be done with the aid of a small flashlight. If the spacers are out of place, it will be necessary to disassemble the "Sure-Grip" differential to reinstall them.

SERVICE PROCEDURES

SURE-GRIP DIFFERENTIAL

Removal

Follow the same procedure outlined under removal and installation of the conventional rear axle differential.

Disassembly

(1) Remove axle drive gear. Measure runout of the drive gear mounting flange. Replace both case halves if runout exceeds .003 inch.

(2) Before disassembling case halves, place scribe marks on each half to aid in aligning the case when reassembling, (Fig. 5). Remove case cap attaching bolts and remove case cap (Fig. 6). Remove clutch plates (Fig. 7).

(3) Remove side gear retainer (Fig. 8), and side gear (Fig. 9).

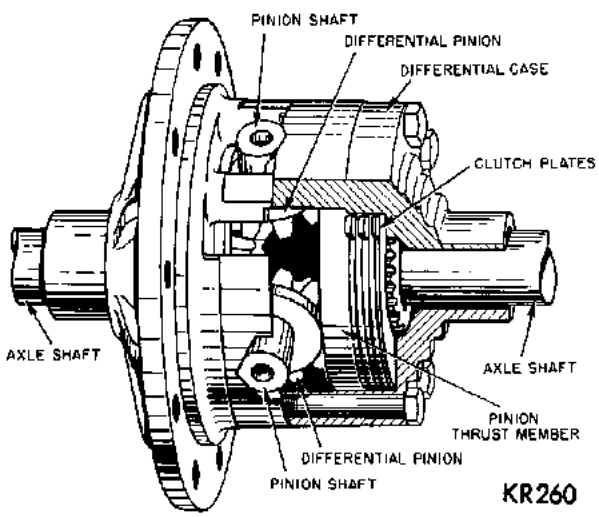


Fig. 1—Sure Grip Differential (Schematic)

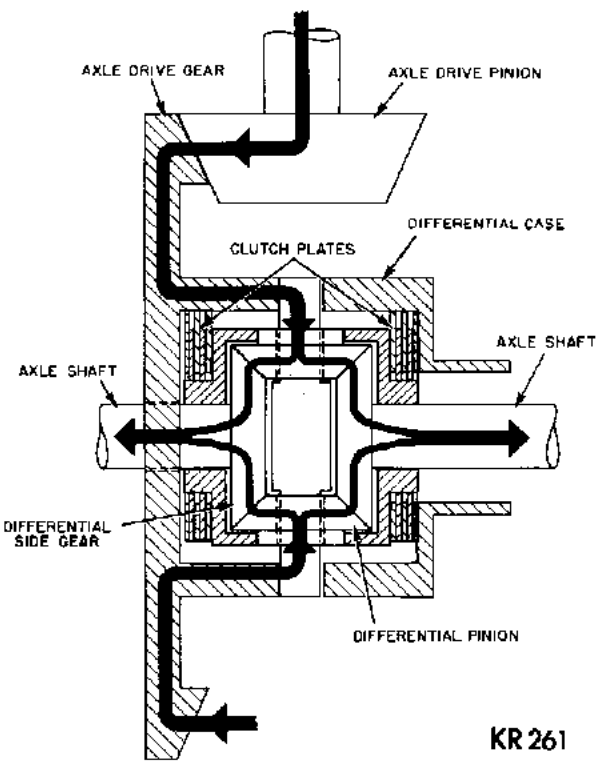


Fig. 2—Power Flow Axle Shafts Turning at Same Speed

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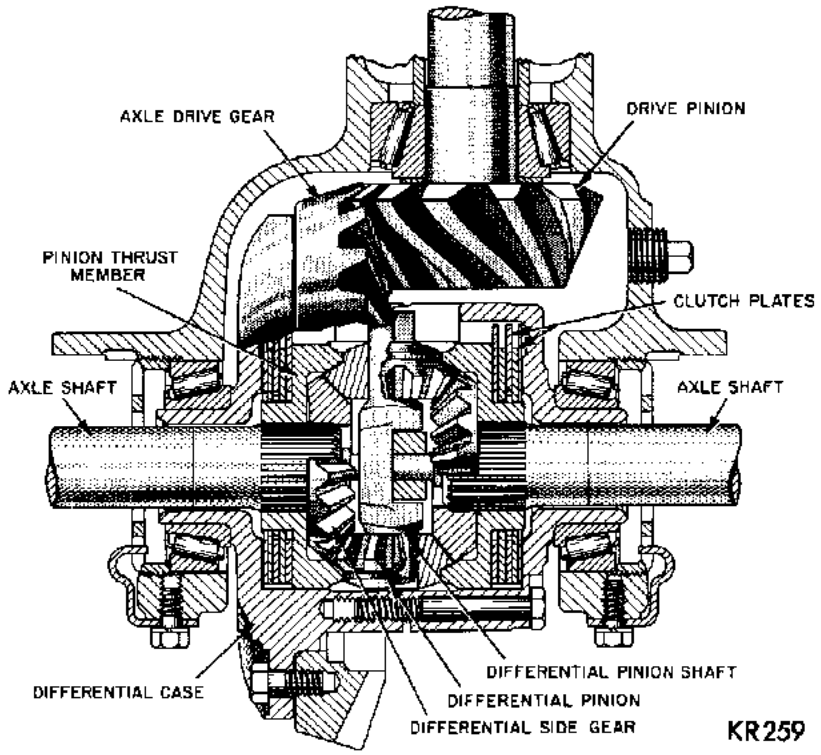


Fig. 3—Sure Grip Differential (Cross Section View)

(4) Remove pinion shafts with pinion gears (Fig. 10).

(5) Remove remaining side gear (Fig. 11), side gear retainer (Fig. 13) and clutch plates (Fig. 14).

(6) Remove axle shaft thrust spacer by pressing out lock pin (Fig. 12).

Cleaning and Inspection

Clean all parts thoroughly and inspect parts for wear, nicks and burrs. The inner and outer flat clutch plates and outer flat clutch disc should be replaced if they are worn or distorted. If either case half is worn, it will be necessary to replace both halves.

Assembly

(1) Position clutch plates and discs in their proper

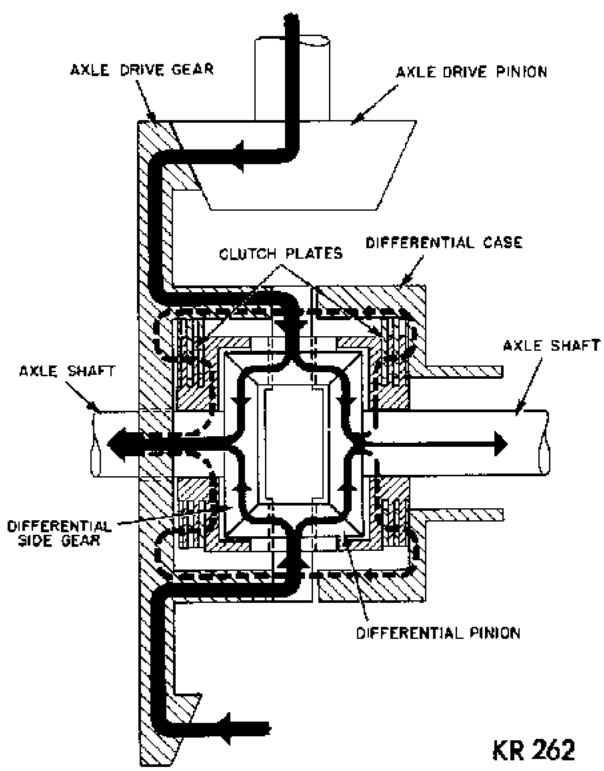


Fig. 4—Power Flow Axle Shafts Turning at Different Speeds

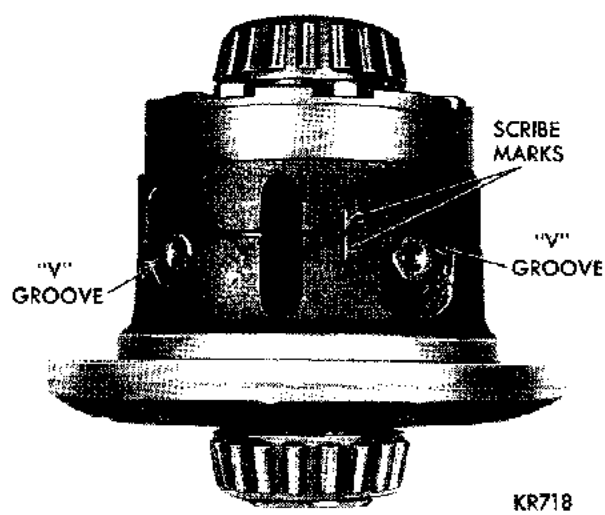


Fig. 5—Case Halves Scribed for Proper Reassembly

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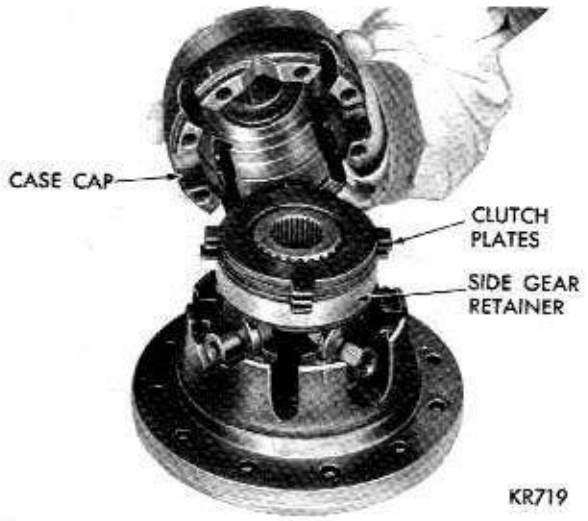


Fig. 6—Removing or Installing Differential Case Cap

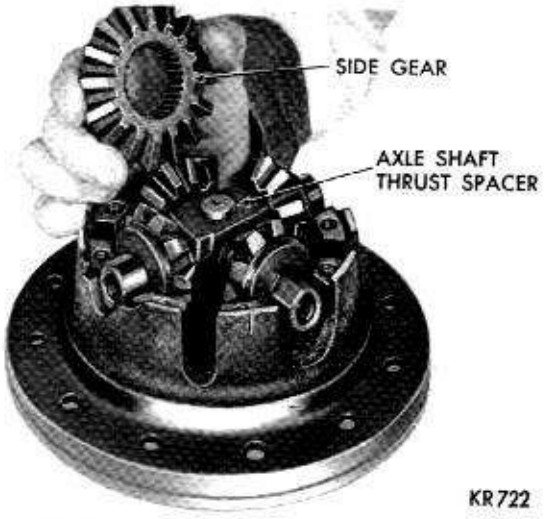


Fig. 9—Removing Side Gear (Cap Side)

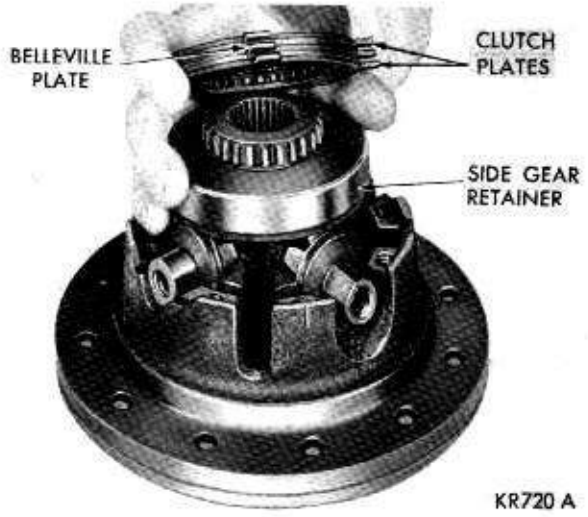


Fig. 7—Removing or Installing Clutch Plates (Cap Side)

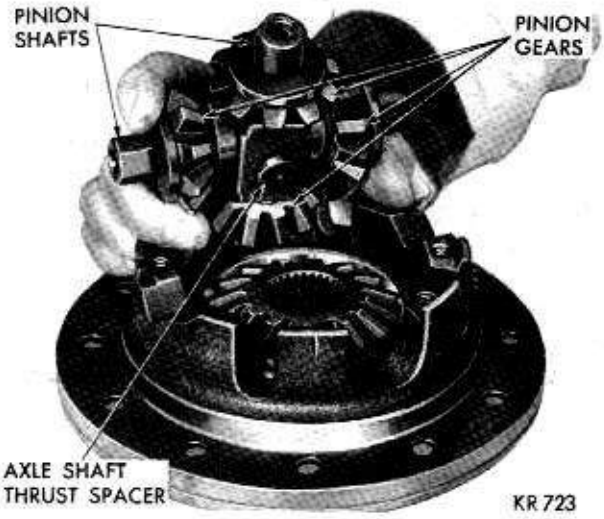


Fig. 10—Removing or Installing Pinion Shafts and Gears

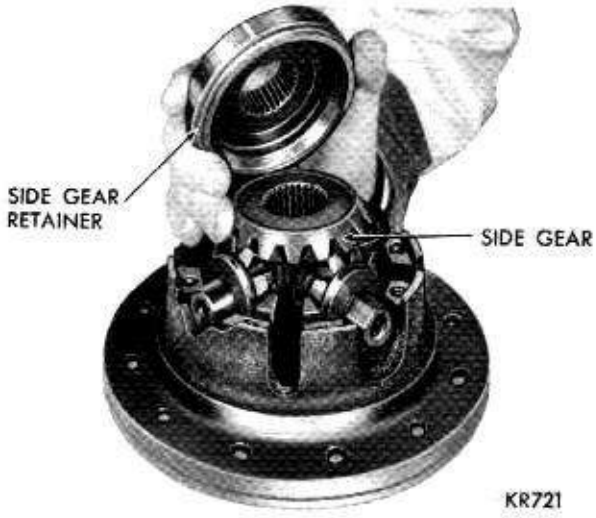


Fig. 8—Removing or Installing Side Gear Retainer (Cap Side)

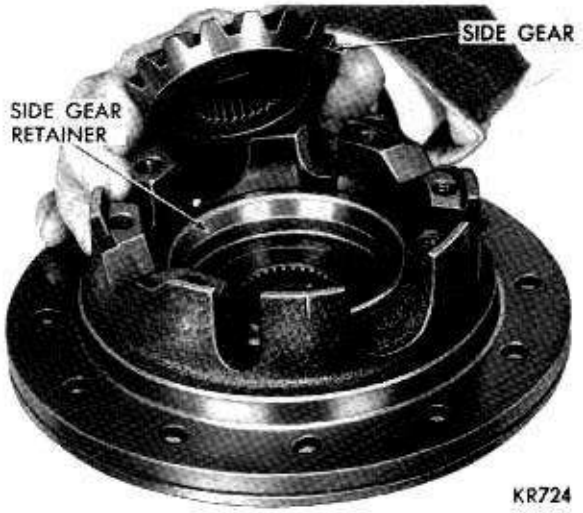


Fig. 11—Removing or Installing Side Gear From Differential Case

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Fig. 12—Removing or Installing Axle Shaft Thrust Spacers

location in each half of the case (Fig. 15).

(2) Place side gears in their retainers. Insert splines of retainers through the splines of clutch discs.

(3) Place aligning pin through one axle shaft thrust spacer. Assemble pinion shafts on aligning pin.

(4) Place pinion gears on shafts and install assembly in drive gear half of case. Insert the thrust spacer in pinion shaft (Fig. 12).

(5) Slide cap half of case over the edge of bench far enough to insert one finger up through the assembly to hold it together. Place the assembly on drive gear half, matching scribe marks.

(6) Make sure markings on each differential case half coincide. Install the differential case bolts and turn in a few threads.

IMPORTANT: Insert the axle shafts from the vehicle to align the splines. Make sure the axle shafts engage the side gear splines.

(7) With shafts installed, center the cross shafts between the two ramp surfaces in differential case. Tighten differential case bolts evenly by alternately turning opposite bolts until all are tightened to 45 foot-pounds. To keep splines of side gear and clutch plates in exact alignment during the tightening procedure, move axle shafts back and forth as bolts are being tightened. After assembly, slight misalignments of the splines can be corrected by moving axle shafts back and forth until free. Remove axle shafts.

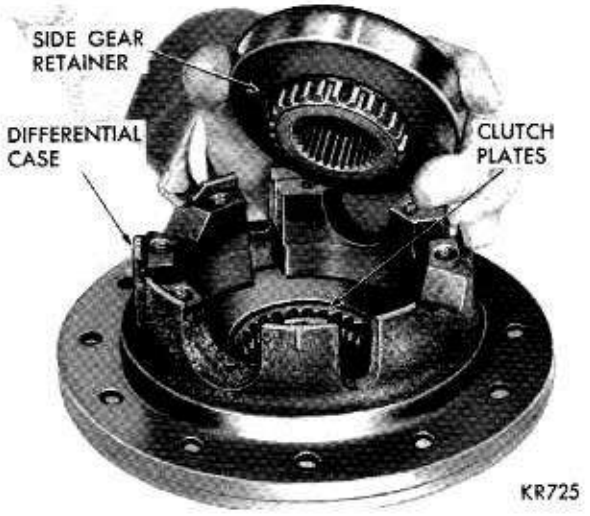


Fig. 13—Removing or Installing Side Gear Retainer from Differential Case

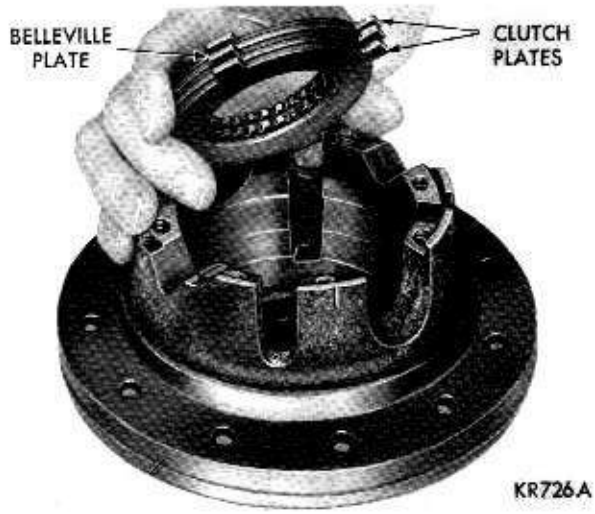


Fig. 14—Removing or Installing Clutch Plates from Differential Case

Since the sure-grip clutches are preloaded by the dished plates and discs, clearance should not exist between the pinion shafts and ramps.

(9) Follow procedures outlined in conventional axle assembly for pinion setting, drive gear backlash adjustment and bearing pre-load adjustment.

Installation

(1) Using a new gasket, install carrier assembly in axle housing. Tighten mounting nuts to 45 foot-pounds.

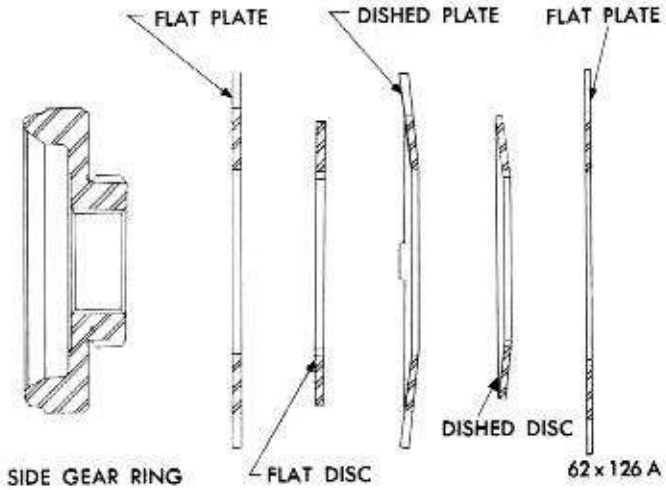


Fig. 15—Arrangement of Plates and Discs (8¾" Differential)

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(2) Refer to "Installation of Rear Axle Shaft," when installing axle shafts.

(3) Connect the rear universal joint.

(4) Before lowering the rear wheels of the vehicle to the floor, adjust rear brakes.

CAUTION: Both rear wheels must be raised off the floor when adjusting brakes.

LUBRICATION

In Sure-Grip Differentials, use only the special multi-purpose gear lubricant intended for use in limited-slip differentials. Such a lubricant is available under Part Number 2585318, Special Sure-Grip Lubricant.

Anticipated Temperature	Viscosity Grade
Above −10°F.	SAE 90
As low as −30°F.	SAE 80
Below −30°F.	SAE 75

SPECIFICATIONS

	CHRYSLER — IMPERIAL
Type	Semi-Floating
Gear Type	Hypoid
Ring Gear Diameter	8.75 inch
Pinion Bearing	Tapered Roller (2)
Drive Pinion Bearing Pre-Load	20-30 in. lbs. without oil seal
Adjustment	Shim Pack
Differential Bearings	Tapered Roller (2)
Differential Bearing Adjustment	Threaded Adjuster
Drive Gear and Pinion	Serviced in Matched Sets Only
Drive Gear Runout	.005 inch (Maximum)
Drive Gear and Pinion Adjustment	
Drive Gear and Pinion Backlash	.005 to .008 inch
Differential Side Gear Clearance	.001 to .012 inch
Differential Lubricant Capacity	4 pints

Type ..... Multi-Purpose Gear Lubricant as defined by MIL-L-2105B is used on all rear axles except Sure-Grip Differential; such a lubricant is available under Part No. 2585317, Hypoid Gear Lubricant.

Sure-Grip Differentials use only the special Multi-Purpose Gear Lubricant intended for use in limited slip differentials. Such a lubricant is available under Part No. 2585318, Special Sure-Grip Lubricant.

Anticipated Temperature Range	Viscosity Grade
Above −10°F.	SAE 90
As low as −30°F.	SAE 80
Below −30°F.	SAE 75

Wheel Bearing Axle Shaft and Play ..... .013 to .023 inch

AXLE RATIOS

MODEL APPLICATION	*Newport 383 Cu. In. Engine (2 BBL)	**Newport 383 Cu. In. Engine (2 BBL)	Newport 383 Cu. In. Engine (4 BBL)	Newport 440 Cu. In. Engine (4 BBL)	Chrysler 300 383 Cu. In. Engine (4 BBL)	Chrysler 300 440 Cu. In. Engine (4 BBL)
Manual Transmission	3.23	—	—	—	3.23	—
Optional	—	—	—	—	—	—
Automatic Transmission	2.76	2.76	2.76	3.23	3.23	3.23
Optional	3.23	3.23	3.23	—	2.76	—
Trailer Towing	3.23	3.23	3.23	3.23	3.23	3.23
Sure-Grip	2.76 3.23	2.76 3.23	2.76 3.23	3.23	2.76 3.23	3.23

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MODEL APPLICATION	New Yorker 440 Cu. In. Engine (4 BBL) Single Exhaust	New Yorker 440 Cu. In. Engine (4 BBL) Dual Exhaust	Imperial 440 Cu. In. Engine (4 BBL)
Manual Transmission	—	—	—
Optional	—	—	—
Automatic Transmission	2.76	3.23	2.94
Optional	3.23	—	—
Trailer Towing	3.23	3.23	—
Sure-Grip	2.76 3.23	3.23	2.94

* Except Station Wagon

** Station Wagon
Axle ratio not limited on vehicles equipped with air conditioning

TIGHTENING REFERENCE

	FOOT POUNDS
Brake Support Plate to Housing Mounting Bolt Nuts	30 to 35
Differential Bearing Cap Bolts	90
Differential Carrier to Axle Housing Bolt Nuts	45
Rear Axle Drive Gear to Case Bolts	55
Rear Axle Drive Pinion Companion Flange Nut	240 (Min.)
Spring Clip (U-Bolts) Nuts	50
Propeller Shaft Bolts Rear .. Newport (Manual)	14
300 (Manual)	14
Newport (Automatic)	14
300 (Automatic)	14
New Yorker (Automatic)	14
Imperial (Automatic)	25

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BRAKES

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GENERAL INFORMATION

The 1966 Models have a self-adjusting servo contact, two shoe, internal expanding brake. The lower ends of the brake shoes are connected by a tubular star wheel adjusting screw, (Fig. 1). Police cars with heavy duty brakes are not self-adjusting.

SERVICE BRAKES

SERVICE DIAGNOSIS

Condition	Possible Cause	Correction
PEDAL GOES TO THE FLOOR	(a) Fluid low in reservoir.	(a) Fill and bleed the master cylinder.
	(b) Excessively worn brake lining.	(b) Reline and adjust the brakes.
	(c) Improperly adjusted brake.	(c) Repair or replace self-adjuster as required.
	(d) Leaking wheel cylinders.	(d) Recondition or replace the wheel cylinder and replace both brake shoes.
	(e) Loose or broken brake lines.	(e) Tighten all brake fittings or replace the brake line.
	(f) Air in hydraulic brake system.	(f) Fill and bleed the hydraulic brake system.
	(g) Leaking or worn master cylinder.	(g) Recondition or replace the master cylinder and bleed the hydraulic system.
SPONGY BRAKE PEDAL	(a) Air in hydraulic system.	(a) Fill the master cylinder and bleed the hydraulic system.
	(b) Improper brake fluid (low boiling point).	(b) Drain, flush and refill with brake fluid.
	(c) Excessively worn or cracked brake drums.	(c) Replace all faulty brake drums.
	(d) Broken pedal pivot bushing.	(d) Replace nylon pivot bushing.
BRAKES PULLING	(a) Incorrect brake adjustment.	(a) Adjust the brakes and check the fluid.
	(b) Brake drums out of round.	(b) Grind or replace the brake drums.
	(c) Brake shoes distorted.	(c) Replace the faulty brake shoes.
	(d) Contaminated lining.	(d) Replace the contaminated brake lining.
	(e) Unmatched brake lining.	(e) Match the primary, secondary with the same type of lining on all wheels.
	(f) Restricted brake hose or line.	(f) Replace the plugged hose or brake line.
	(g) Front end out of alignment.	(g) Align the front end.
	(h) Broken rear spring.	(h) Replace the broken spring.
SQUEALING BRAKES	(a) Incorrect brake lining.	(a) Install matched brake lining.
	(b) Dust in brakes or scored brake drums.	(b) Blow out the brake assembly with compressed air and grind the brake drums.
	(c) Distorted brake shoes.	(c) Replace the brake shoes.
	(d) Bent Support Plate.	(d) Replace the support plate.
	(e) Broken or weak brake shoe return spring.	(e) Replace the return spring.
	(f) Weak or broken brake shoe retaining spring.	(f) Replace the retaining spring.

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SERVICE DIAGNOSIS

Condition	Possible Cause	Correction
	(g) Glazed brake lining.	(g) Cam grind or replace the brake lining.
	(h) Saturated brake lining.	(h) Replace the saturated lining.
DRAGGING BRAKES	(a) Incorrect wheel or parking brake adjustment.	(a) Adjust the brakes and check the fluid.
	(b) Parking brakes engaged.	(b) Release the parking brakes.
	(c) Weak or broken brake shoe return spring.	(c) Replace the brake shoe return spring.
	(d) Brake pedal binding.	(d) Free up and lubricate the brake pedal and linkage.
	(e) Master cylinder cup sticking.	(e) Recondition the master cylinder.
	(f) Obstructed master cylinder relief port.	(f) Use compressed air and blow out the relief port.
	(g) Saturated brake lining.	(g) Replace the brake lining.
	(h) Bent or out of round brake drum.	(h) Grind or replace the faulty brake drum.
HARD PEDAL	(a) Incorrect brake lining.	(a) Install matched brake lining.
	(b) Frozen brake pedal linkage.	(b) Free up and lubricate the brake linkage.
	(c) Restricted brake line or hose.	(c) Clean out or replace the brake line or hose.
	(d) Brake booster inoperative.	(d) Recondition or replace the brake booster.
WHEEL LOCKS	(a) Loose or torn brake lining.	(a) Replace the brake lining.
	(b) Incorrect wheel bearing adjustment.	(b) Clean, pack and adjust the wheel bearings.
	(c) Wheel cylinder cups sticking.	(c) Recondition or replace the wheel cylinder.
	(d) Contaminated brake lining.	(d) Reline both front or rears of all four brakes.
BRAKES FADE (HIGH SPEED)	(a) Incorrect lining.	(a) Replace lining.
	(b) Distorted or out of round brake drums.	(b) Grind or replace the drums.
	(c) Overheated brake drums.	(c) Inspect for dragging brakes.
	(d) Incorrect brake fluid (low boiling temperature).	(d) Drain, flush, refill and bleed the hydraulic brake system.
	(e) Saturated brake lining.	(e) Reline both front or rear or all four brakes.
PEDAL PULSATES	(a) Bent or out of round brake drum.	(a) Grind or replace the brake drums.
BRAKE CHATTER	(a) Out of round brake drum.	(a) Grind or replace the brake drum.
	(b) Loose support plate.	(b) Tighten the support plate bolts to the proper specifications.
	(c) Bent support plate.	(c) Replace the support plate.
	(d) Distorted brake shoes.	(d) Replace the brake shoes.
	(e) Machine grooves in the contact face of the brake drum.	(e) Grind or replace the brake drum.
	(f) Contaminated brake lining.	(f) Replace either front or rear or all four linings.
BRAKES DO NOT SELF ADJUST	(a) Adjuster screw frozen in the thread.	(a) Clean and free-up all thread areas.
	(b) Adjuster screw corroded at the thrust washer.	(b) Clean the threads and replace the thrust washer if necessary.
	(c) Adjuster lever does not engage star wheel.	(c) Repair, free up or replace adjuster as required.

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SERVICE PROCEDURES

ADJUSTING THE SERVICE BRAKES

Normally self adjusting brakes will not require manual adjustment but in the event of a brake reline it may be advisable to make the initial adjustment manually to speed up the adjusting time.

(1) Jack up the vehicle so all wheels are free to turn.

(2) Remove the rear adjusting hole cover from the backing plate on all of the brake supports of the vehicle.

(3) Be sure the parking brake lever is fully released, then back off the parking brake cable adjustment so there is slack in the cable.

(4) Insert the adjusting tool C-3784, into the star wheel of the adjusting screw. Move the handle of the tool downward until a slight drag is felt when the road wheel is rotated.

(5) Insert a thin screwdriver into the brake adjusting hole and push the adjusting lever out of engagement with the star wheel. **(Care should be taken so as not to bend the adjusting lever** (Fig. 1). While holding the adjusting lever out of engagement, back off the star wheel 10 to 12 notches to insure a free wheel with no brake shoe drag.

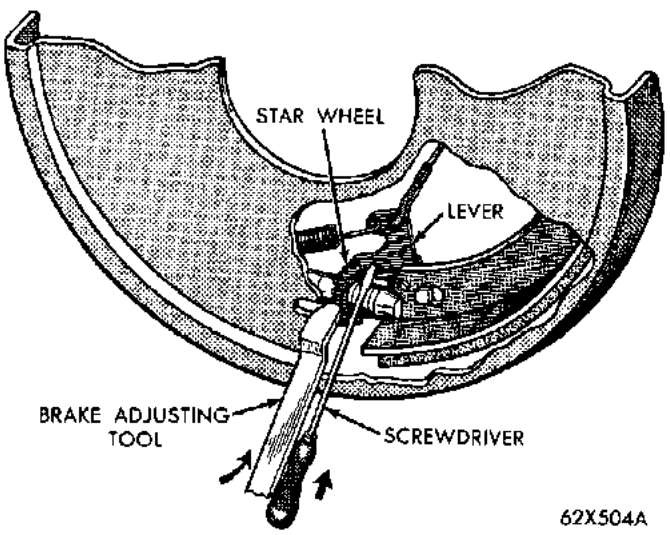


Fig. 1—Adjusting Brakes

(6) Repeat the above adjustment at each wheel. The adjustment must be equal at all wheels. Install the adjusting hole covers in the brake supports.

TESTING AUTOMATIC ADJUSTER OPERATION

Place the vehicle on a hoist, with a helper in the driver's seat to apply the brakes. Remove the plug from the rear adjustment slot in each brake support plate to observe the adjuster star wheel. Then, to exclude the possibility of maximum adjustment, that is, the adjuster refuses to operate because the closest possible adjustment has been reached, the star wheel should be backed off approximately 30 notches. It will be necessary to hold the adjuster lever away from the star wheel to allow backing off of the adjustment.

Spin the wheel and brake drum in the reverse direction and apply the brakes vigorously. This will provide the necessary inertia to cause the secondary brake shoe to leave the anchor. The wrap up effect will move the secondary shoe, and the cable will pull the adjuster lever up. Upon release of the brake pedal, the lever should snap downward, turning the star wheel. Thus, a definite rotation of the adjuster star wheel can be observed if the automatic adjuster is working properly. If by the described procedure one or more automatic adjusters do not function properly, the respective drum must be removed for adjuster servicing.

BLEEDING THE BRAKE SYSTEM

Clean all dirt and foreign material from the cover of the master cylinder to prevent any dirt from falling into the master cylinder reservoir when the cover is removed.

Using the one man bleeder tank C-3406 (with adaptor C-3494A) provides a convenient means of keeping the master cylinder full while pressurizing the hydraulic system for bleeding. **The brakes may also be bled manually by having an assistant slowly pump the brake pedal while the brakes are being bled. Be certain to refill the master cylinder after bleeding each wheel.**

Tighten the brakes of each wheel until the brakes are locked. (This reduces the movement of the wheel cylinder cups and assists in bleeding.)

Starting with the right rear wheel clean all dirt from the bleeder valve. Place bleeder hose C-650 on the bleeder valve and insert the other end of the bleeder hose into a clean jar half filled with clean brake fluid. (This will permit the observation of air bubbles as they are being expelled from the hydraulic system and also prevent air from being drawn back in to the system as the brake pedal is released on manual bleeding.) Follow the manufacturers instructions in the use of the bleeder tools.

When manually bleeding the hydraulic system, push the brake pedal down and let it return slowly, to avoid air being drawn into the system. Bleed intermittently by opening and closing the valve about every four seconds. This causes a swirling action in the cylinder and assists in expelling the air. Continue the action until the brake fluid is expelled in a solid stream, without any bubbles.

Continue this bleeding operation on the other wheels, starting with the left rear wheel, then the right front and finishing with the left front wheel.

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If necessary, repeat this bleeding operation if there is any indication (a low, soft or spongy brake pedal) of air remaining in the hydraulic system. Readjust the brakes as described previously.

TEST FOR FLUID CONTAMINATION

To determine if contamination exists in the brake fluid (as indicated by swollen or deteriorated rubber cups), the following test can be made.

Place a small amount of the drained brake fluid into a small clear glass bottle. Separation of the fluid into distinct layers will indicate mineral oil content. **Be safe and discard old brake fluid that has been bled from the system. Fluid drained from the bleeding operation may contain dirt particles or other contaminants and should not be reused.**

WHEEL STUD TIGHTENING

The tightening sequence and tightening of the wheel stud nuts is of great importance to insure efficient brake operation. The use of an impact or long handled wrench may distort the drum.

A criss-cross tightening sequence should be used (Fig. 2). Tighten all the stud nuts to one-half the specified tightening first (30 ft. lbs.) and then repeat the sequence tightening to the specified 55 foot-pound (65 foot pounds on 11 inch brakes).

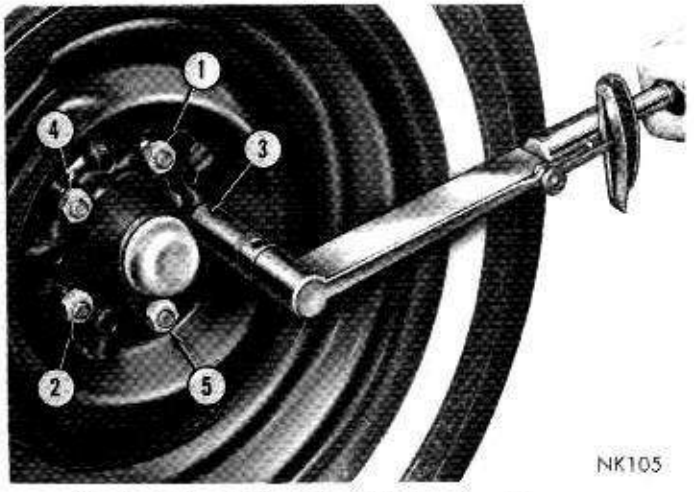


Fig. 2—Wheel Stud Nut Tightening Sequence

BRAKE HOSE AND TUBING

The flexible hydraulic brake hose should always be installed in the vehicle by first tightening the male end of the hose in the wheel cylinder or rear axle housing tee. The hose is then clipped to the hose bracket in a manner to give minimum twist. Excessive twist can result in hose interference problems with possible hydraulic system failure.

Inspection of brake hose and tubing should be included in all brake service operations. The hoses should be checked for:

(1) Correct length, severe surface cracking, pulling, scuffing or worn spots. (Should the cotton fabric casing of the hose be exposed to weather by cracks or abrasions in the rubber hose cover, eventual deterioration of the hose can take place with possible burst failure.)

(2) Faulty installation to cause twisting, wheel, tire or chassis interference.

Always use factory recommended hose to insure quality, correct length and superior fatigue life. Care should be taken to make sure that the tube and hose mating surfaces are clean and free from nicks and burrs. New copper seal washers should be used and the tube nuts and connections should be properly made and tightened. Double wall steel tubing should always be used to insure superior fatigue life. Care should be taken when replacing brake tubing, to use the proper bending and flaring tools and to avoid routing the tubes against sharp edges, moving components or in hot areas. All tubes should be properly attached with recommended retaining clips.

Steel tubing is used to conduct hydraulic pressure to the front and rear brakes. Flexible rubber hose is used at both front brakes and at a rear axle junction block. Steel tubing is used from the junction block to both rear wheel cylinders. All fittings, tubing and hoses should be inspected for rusted, damaged or faulty flaring seats. The steel tubing is equipped with a double flare or inverted seat to insure more positive seating in the fitting. To repair or reflare tubing proceed as follows:

(1) Using Tool C-3478, cut off the damaged seat or damaged tubing (Fig. 3).

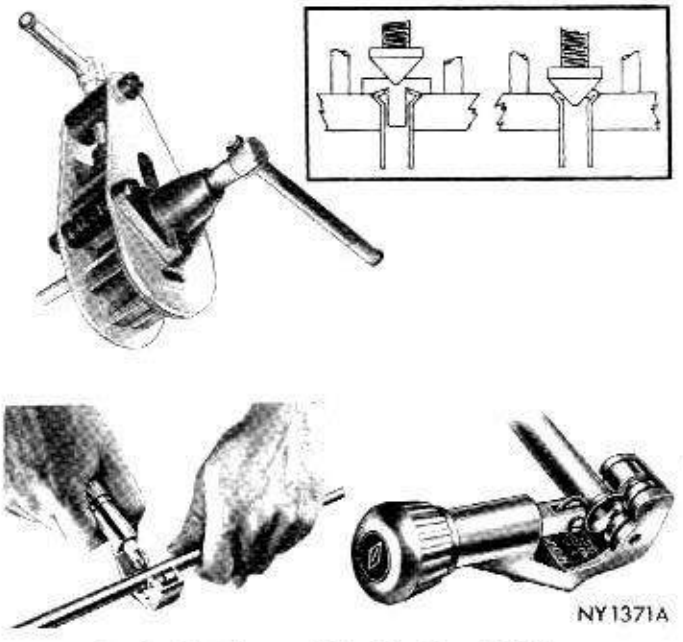


Fig. 3—Cutting and Flaring Steel Tubing

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(2) Ream out any burred or rough edges showing on inside edges of tubing. This will make the ends of the tubing square and insure better seating of the flared end of the tubing. **Place compression nut on tubing prior to flaring tubing.**

(3) To flare tubing, open handles of flaring Tool C-3838 and rotate jaws of tool until the mating jaws of tubing size are centered in the area between vertical posts.

(4) Slowly close handles with tubing inserted in jaws but do not apply heavy pressure to handle as this will lock tubing in place.

(5) Place gauge "Form A" on edge over end of tubing and push tubing through jaws until end of tubing contacts the recessed notch of gauge matching the size of tubing (Fig. 3).

(6) Squeeze handles of flaring tool and lock tubing in place.

(7) Place proper sized plug of gauge "A" down in end of tubing. Swing compression disc over gauge and center tapered flaring screw in recess of disc.

(8) Lubricate taper of flaring screw and screw in until plug gauge has seated on jaws of flaring tool. This action has started to invert the extended end of the tubing.

(9) Remove gauge and apply lubricant to tapered end of flaring screw and continue to screw down until tool is firmly seated in tubing.

(10) Remove tubing from flaring tool and inspect seat.

SERVICE BRAKES

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SERVICE PROCEDURES

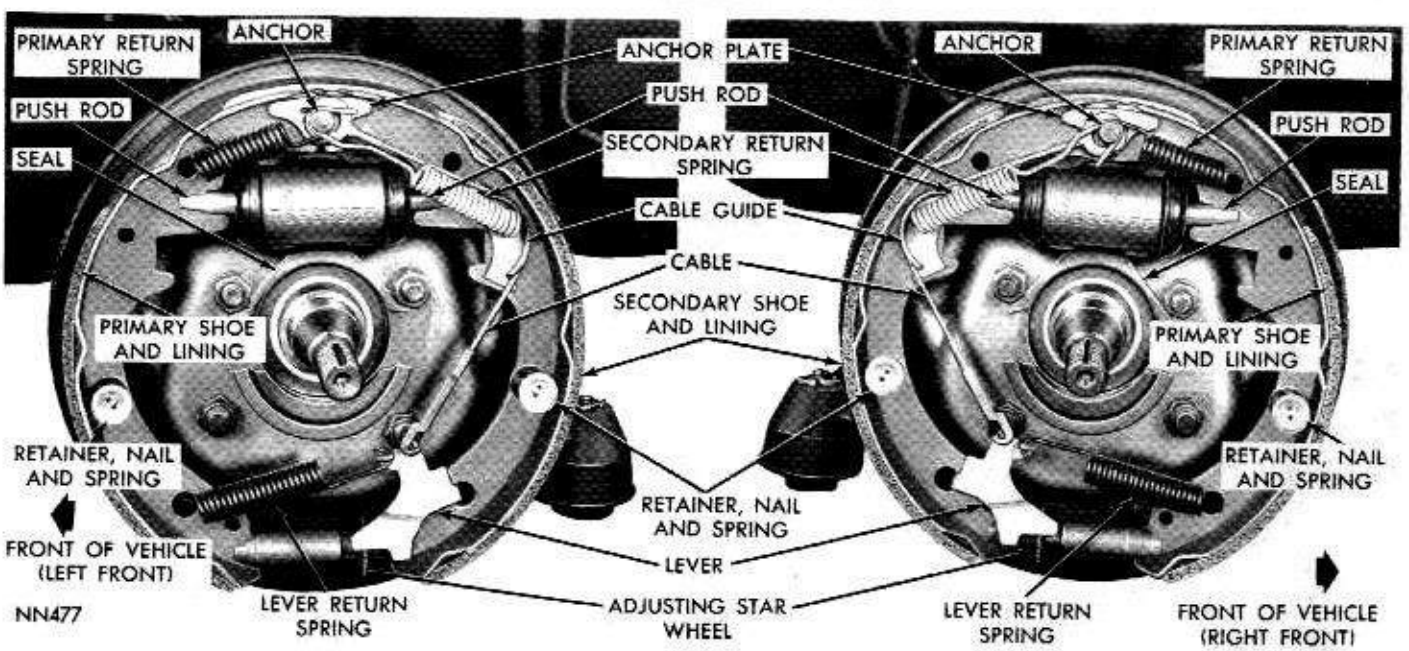


Fig. 1—Brake Assemblies (Front)

BRAKE DRUM REMOVAL

Removing the Front Brake Drums

To aid in the brake drum removal loosen the brake star adjusting wheel as follows:

(1) With vehicle on a hoist, jack or suitable stands remove rear plug from the brake adjusting access hole.

(2) Insert a thin screwdriver into brake adjusting hole and push adjusting lever away from star adjusting wheel. **Care should be taken not to bend adjusting lever.**

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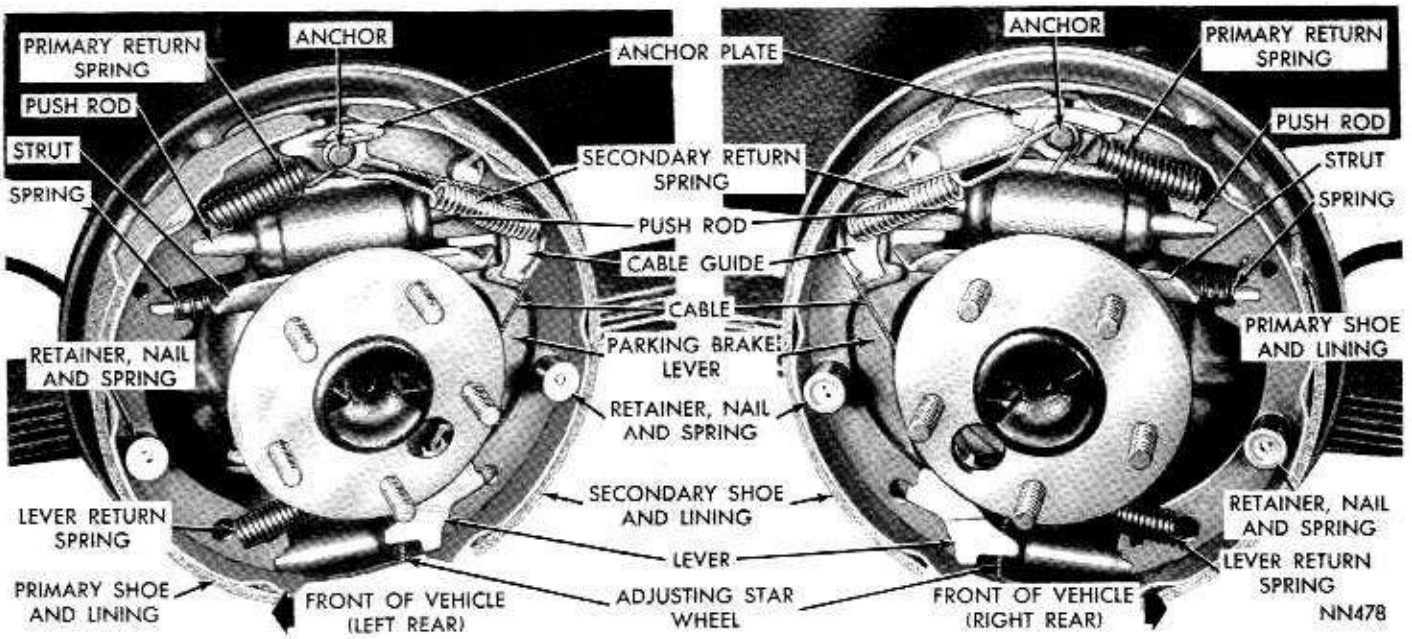


Fig. 2—Brake Assemblies (Rear)

(3) Insert Tool C-3784 into brake adjusting hole and engage notches of the brake adjusting star wheel. Release brake adjustment by prying up with adjusting tool.

(4) Remove wheel cover, grease cap, cotter pin, lock, adjusting nut, outer wheel bearing and remove wheel and drum assembly from the spindle to expose the brake linings (Fig. 1).

(5) Inspect brake lining for wear, shoe alignment, or contamination from grease or brake fluid.

Removing the Rear Brake Drums

(1) With vehicle on a hoist, jack, or suitable stands, remove rear plug from the brake adjusting access hole.

(2) Insert a thin screw driver into brake adjusting hole and hold adjusting lever away from notches of the adjusting screw.

(3) Insert Tool C-3782 into the brake adjusting hole and engage notches of brake adjusting screw. Release the brake by prying up with the adjusting tool.

(4) Remove the rear wheel and clips from wheel studs that hold the drum on the axle. Remove drum.

(5) Inspect brake lining for wear, shoe alignment or contamination from grease or brake fluid.

BRAKE SHOE REMOVAL

Install cylinder piston clamps Tool C-416 to prevent fluid leakage or air entering the hydraulic system during brake shoe removal.

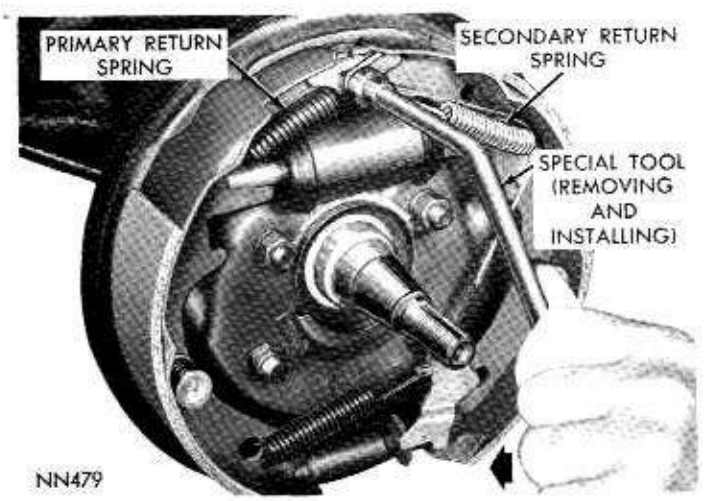


Fig. 3—Removing or Installing Brake Shoe Return Springs (Left Front)

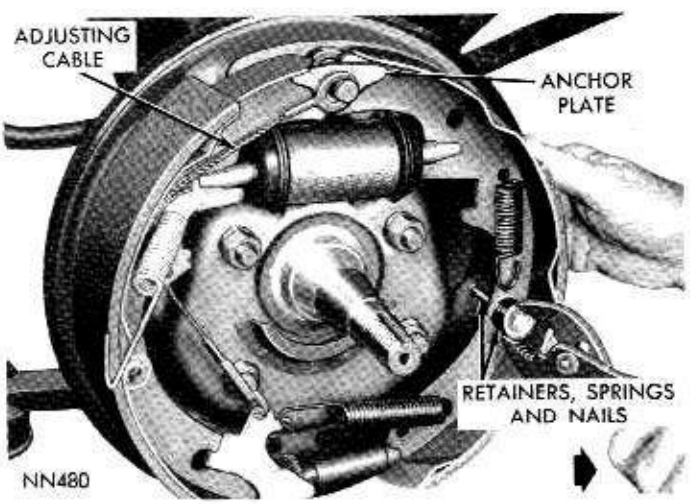


Fig. 4—Removing Brake Shoe Retainers, Springs and Nails (Right Front)

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Removing the Front Brake Shoes

With vehicle elevated on a hoist, jack or suitable stands, remove front wheels and drums.

(1) Using Tool C-3785 remove the brake shoe return springs (Fig. 3). (Note how secondary spring overlaps primary spring.) (Fig. 1.)

(2) Remove brake shoe retainer, spring and nails (Fig. 4).

(3) Slide the eye of the automatic adjuster cable off anchor and unhook from lever. Remove cable, cable guide and anchor plate.

(4) Disconnect the lever spring from the lever and disengage from shoe web. Remove spring and lever.

(5) Remove primary and secondary brake shoe assemblies and the adjusting star wheel from support. Install the wheel cylinder clamps (Tool C-416) to hold pistons in cylinders.

Removing the Rear Brake Shoes

(1) With the vehicle elevated on a hoist, jack or suitable stand, remove rear wheel, and drum retaining clips. Remove drum.

(2) Using Tool C-3785 remove the brake shoe return springs (Fig. 5). (Note how secondary spring overlaps primary spring.) (Fig. 2.)

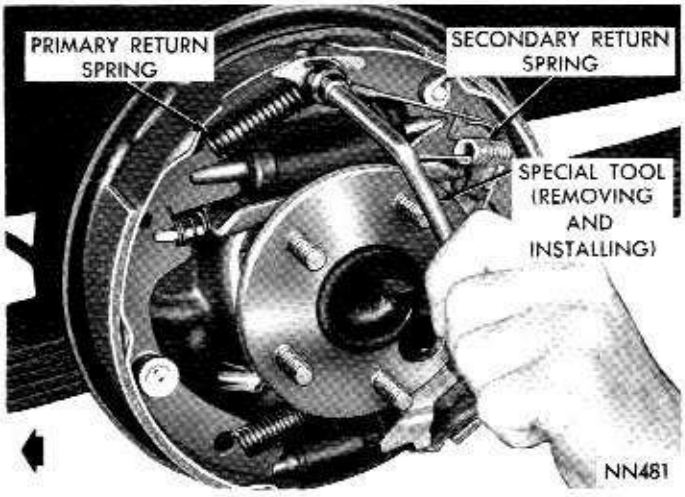


Fig. 5—Removing or Installing Brake Shoe Return Springs (Left Rear)

(3) Remove the brake shoe retainer, springs and nails, refer to (Fig. 6).

(4) Slide eye of the automatic adjuster cable off anchor and then unhook from the lever. Remove cable, cable guide and anchor plate.

(5) Disconnect the lever spring from lever and disengage from shoe web. Remove the spring and lever.

(6) Spread the anchor ends of primary and secondary shoes and remove parking brake strut and spring (Fig. 7).

(7) Disengage the parking brake cable from parking brake lever and remove brake assembly.

(8) Remove the primary and secondary brake shoe assemblies and adjusting star wheel from support. Install wheel cylinder clamps Tool C-416 to hold the pistons in cylinders.

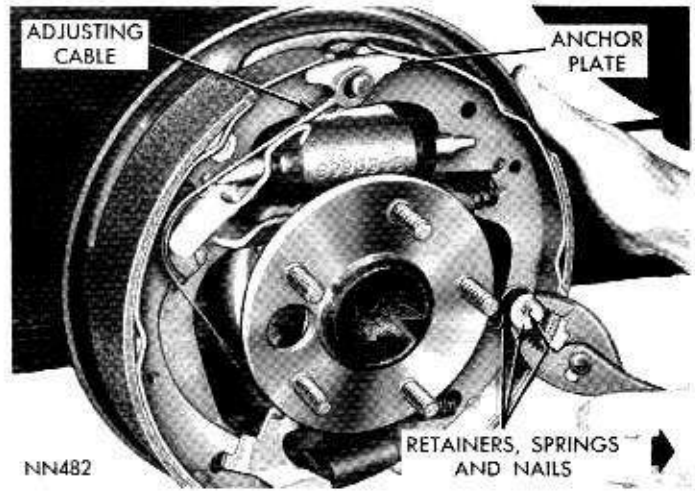


Fig. 6—Removing or Installing Brake Shoe Retainers, Springs and Nails (Right Rear)

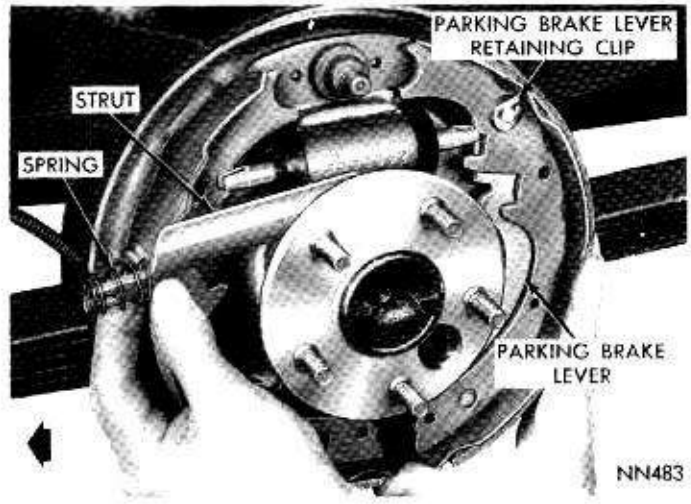


Fig. 7—Removing or Installing Parking Brake Strut and Spring (Left Rear)

CLEANING AND INSPECTION

Wipe or brush clean (dry) the metal portions of the brake shoes. Examine the lining contact pattern to determine if the shoes are bent. The lining should show contact across the entire width, extending from heel to toe. Shoes showing contact only on one side should be replaced. Shoes having sufficient lining but lack of contact at toe and heel should be measured for proper grind.

Clean the support, using a suitable solvent, then inspect for burrs. Remove if necessary. Clean and lubricate threads of the adjusting screws, then inspect for pulled or stripped threads.

GRINDING RECOMMENDATIONS

Brake Shoe Lining—New lining should be meas-

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ured and ground .060 to .080 (maximum) under the drum diameter.

Drum Refacing—Measure the drum runout with an accurate gauge. Drum runout should not exceed .006 inch out of round. If the drum runout is in excess of .006 inch, (total indicator run-out) the drum should be refaced. Remove only as much material as is necessary to clean up the drum. **Do not reface more than .060 inch over the standard drum diameter.**

BRAKE SHOE INSTALLATION

Installing the Front Shoes

To install the front brake shoes, refer to (Fig. 1) and proceed as follows:

(1) Match a primary with a secondary brake shoe and place them in their relative position on a work bench.

(2) Lubricate the threads of adjusting screw and install it between primary and secondary shoes with the star wheel next to secondary shoe. Refer to (Fig. 1). The star adjusting wheels are stamped "R" (Right side) and "L" (left side), and indicate their location on vehicle. Lubricate shoe contact area on support plate with lubriplate.

(3) Overlap anchor ends of the primary and secondary brake shoes and install adjusting spring and lever.

(4) Spread the anchor ends of brake shoes to maintain the adjusting lever and spring in position.

(5) Holding the brake shoes in their relative position, place brake shoe assembly on support and over anchor pin (Fig. 8). Remove Tool C-416.

(6) Install nails, cups, springs and retainers.

(7) Install the anchor pin plate.

(8) Install the cable guide in secondary shoe and place "eye" of adjusting cable over the anchor pin.

(9) Install return spring in the primary shoe. Using Tool C-3785, slide spring over anchor.

(10) Install return spring in secondary shoe and slide over anchor, using Tool C-3785. (Be sure the secondary spring overlaps primary, refer to (Fig. 1). (Be sure cable guide remains flat against shoe web.)

(11) Place the adjusting cable over guide and engage hook of cable into the adjusting lever.

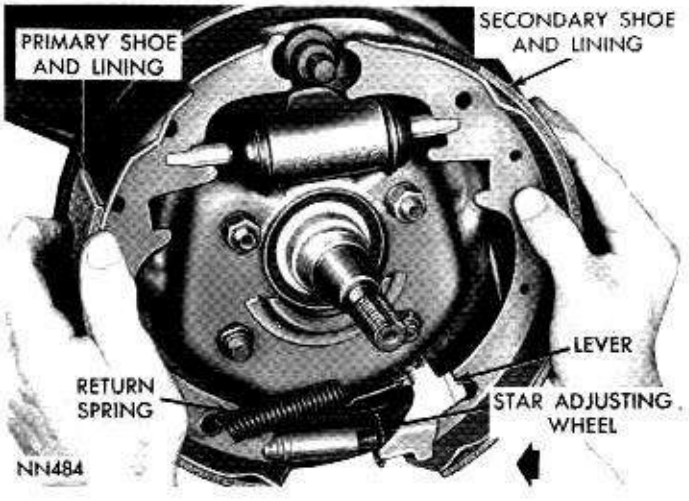


Fig. 8—Installing Brake Shoes (Left Front)

Installing the Brake Drums

(1) Lubricate the wheel bearings and install brake drum and adjust wheel bearing to proper preload.

(2) Adjust brakes as described under "Adjusting the Service Brakes" of this section.

Installing the Rear Shoes

(1) Inspect the platforms of support for nicks or burrs. Apply a thin coat of lubricant to the support platforms. (Shoe contact area.)

(2) Attach the parking brake lever to back side of secondary shoe, refer to (Fig. 9).

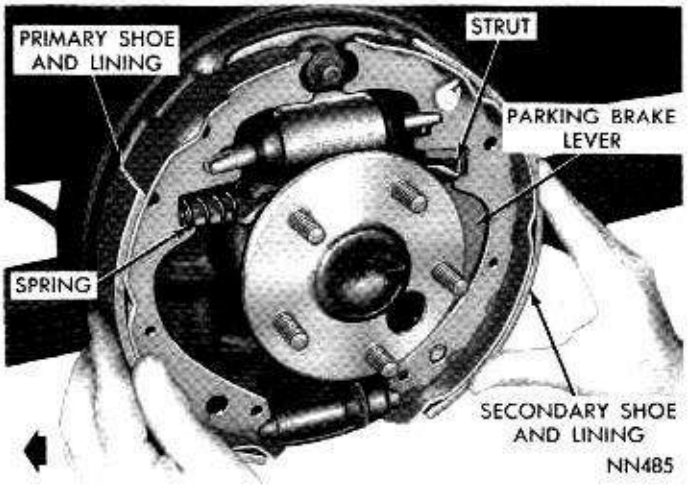


Fig. 9—Installing Brake Shoes (Left Rear)

(3) Place the secondary and primary shoes in their relative position on a work bench.

(4) Lubricate threads of the adjusting screw and install it between primary and secondary shoes with star wheel next to secondary shoe. The star adjusting wheels are stamped "R" (right side) and "L" (left side), and indicate their location on vehicle.

(5) Overlap the anchor ends of the primary and secondary brake shoes and install adjusting spring and lever.

(6) Hold the brake shoes in their relative position and engage parking brake cable into parking brake lever.

(7) Install the parking brake strut and spring between parking brake lever and primary shoe, refer to (Fig. 7). Remove Tool C-416.

(8) Place the brake shoes on support and install retainer nails, springs and retainers (Fig. 9).

(9) Install anchor pin plate.

(10) Install "eye" of the adjusting cable over anchor pin and install the return spring between the primary shoe and the anchor pin.

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(11) Install the cable guide in secondary shoe then install secondary return spring. (Be sure secondary spring overlaps primary (Fig. 2) and return spring does not slip between anchor pin and eye of cable.)

(12) Place the adjusting cable in groove of cable guide and engage hook of cable into the adjusting lever. (Be sure cable guide is flat against shoe web.)

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Installing the Brake Drums

(1) Install brake drum and retaining clips. Install wheel and tire assembly.

(2) Adjust the brakes as described under "Adjusting the Service Brakes" of this section.

MASTER CYLINDER

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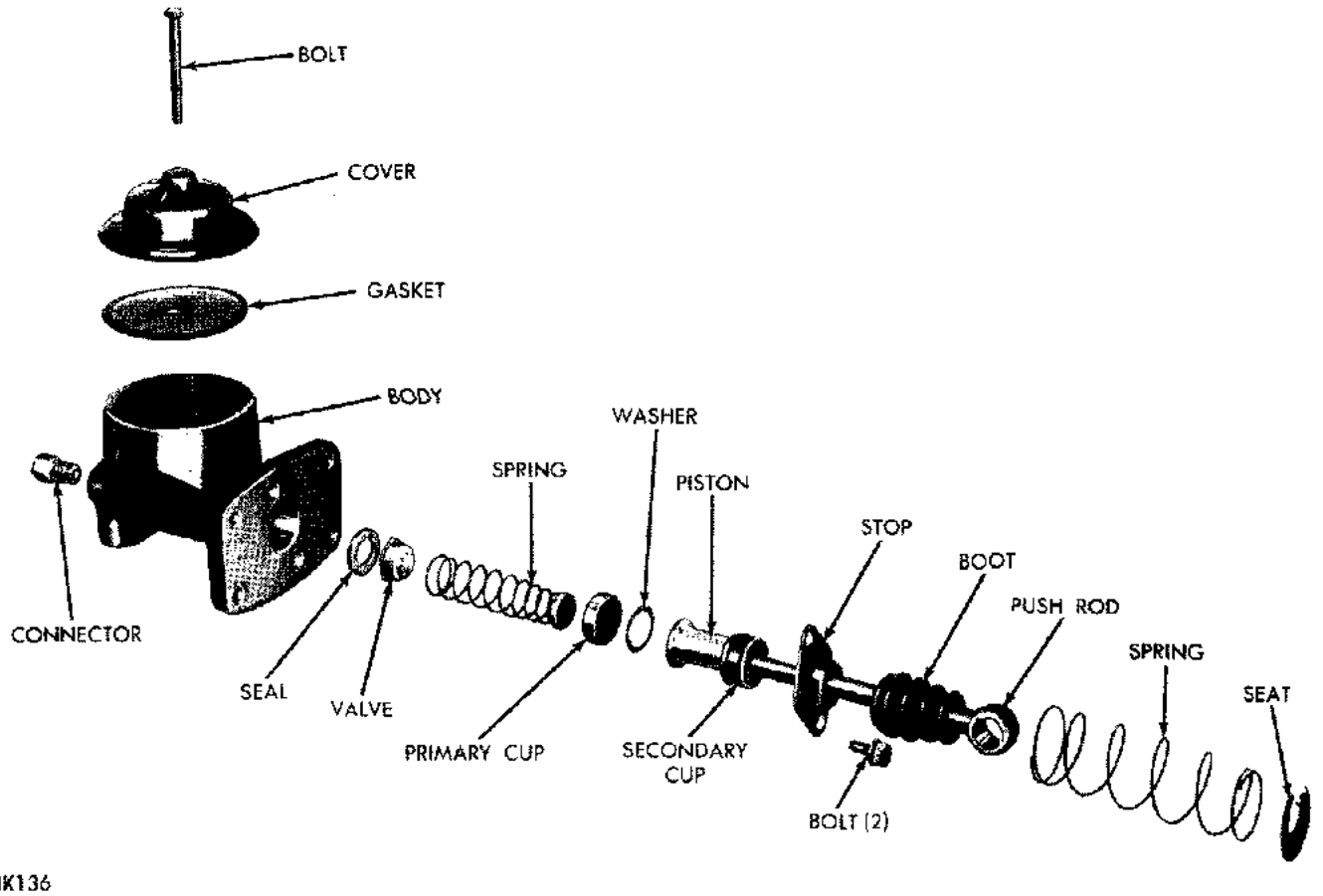


Fig. 1—Master Cylinder Assembly

REMOVING THE MASTER CYLINDER

Should it become necessary to remove the master cylinder for repair or overhaul, proceed as follows:

(1) Disconnect the push rod from pedal.

(2) Disconnect the brake tube at master cylinder outlet.

(3) Remove the nuts and bolts that attach master cylinder to dash panel. Slide master cylinder straight out and away from dash panel.

(4) Remove the push rod return spring.

DISASSEMBLING THE MASTER CYLINDER

To disassemble the master cylinder, refer to (Fig. 1), then proceed as follows:

Clean outside of master cylinder thoroughly, then drain all the brake fluid.

(1) Remove the piston stop flange attaching bolts and remove dust boot, push rod and piston assembly. (Do not remove push rod from piston.)

(2) Remove the brass washer between piston and cup. Remove the master cylinder primary cup, spring valve and seal from master cylinder.

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(3) Wash master cylinder bore with clean brake fluid and inspect for scoring or pitting.

If master cylinder piston is badly scored or corroded, replace it with a new one. The primary and secondary cups and valve assembly should be replaced when reconditioning master cylinder.

Master cylinder walls that have light scratches or show signs of corrosion, can usually be cleaned with crocus cloth. However, cylinders that have deep scratches or scoring may be honed, providing the diameter of the cylinder bore is not increased more than .002 inch. A master cylinder bore that does not clean up at .002 inch should be discarded and a new cylinder installed. (Black stains on the cylinder wall are caused by the piston cups and will do no harm.) **Use extreme care in cleaning the master cylinder after reconditioning. Remove all dust or grit by flushing the cylinder with alcohol; wipe dry with a clean lintless cloth and clean a second time with alcohol. Dry the master cylinder with compressed air then flush with clean brake fluid. (Be sure the .028 inch diameter hole compensator port in the master cylinder bore is open.)**

ASSEMBLING THE MASTER CYLINDER

Before assembling, the piston, cups and valve assembly should be dipped in clean brake fluid. To reassemble the master cylinder, refer to (Fig. 1), then proceed as follows:

(1) Install seal check valve and spring in the cylinder with valve toward outlet of cylinder.

(2) Install the master cylinder cup in cylinder with open end of cup over closed end of return spring.

(3) Install the secondary cup on master cylinder piston and install piston and push rod assembly in cylinder with flat brass washer between the piston and primary cup.

(4) Install the dust boot on push rod and install stop flange bolts.

INSTALLING THE MASTER CYLINDER

(1) Reinstall the master cylinder on dash panel and fill with brake fluid. Tighten nuts to 100 inch-pounds.

(2) Attach brake line and pedal to push rod.

(3) Bleed the brake system as described under "Bleeding the Brake System" of this section.

WHEEL CYLINDERS

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REMOVING THE WHEEL CYLINDERS

Front or Rear

With all the brake drums removed inspect the wheel cylinder boots for evidence of a brake fluid leak. (A slight amount of fluid on the boot may not indicate a leak, but may be preservative oil used on the assembly.)

(1) In the case of a leak, remove brake shoes (replace if soaked with grease or brake fluid), boots, pistons, wheel cylinder cups and wheel cylinder cup expansion spring.

(2) Wash the wheel cylinder bore with clean brake fluid and inspect for scoring or pitting.

Use extreme care in cleaning wheel cylinder after reconditioning. Remove all dust or grit by flushing the cylinder with alcohol; wipe dry with a clean lintless cloth and clean a second time with alcohol. Dry the wheel cylinder with air pressure, then flush with clean brake fluid. (Be sure bleeder screw port and the bleeder screw are clean and open.)

Wheel cylinder bores or pistons that are badly scored or corroded should be replaced. The old piston cups should be discarded when reconditioning the wheel cylinders.

Cylinder walls that have light scratches, or show signs of corrosion, can usually be cleaned with crocus cloth, using a circular motion. However, cylinders that have deep scratches or scoring may be honed, using Tool C-3080, providing the diameter of the cylinder bore is not increased more than .002 inch. **A cylinder that does not clean up at .002 inch should be discarded and a new cylinder installed. (Black stains on the cylinder walls are caused by the piston cups and will do no harm.)**

Should inspection reveal the necessity of installing a new wheel cylinder (front or rear), proceed as follows:

(1) Disconnect brake hose from brake tube at frame bracket (front wheels) or, disconnect brake tube from the wheel cylinder (rear wheels).

(2) Disconnect the brake hose from wheel cylinder (front wheels only) and remove wheel cylinder attaching bolts, then slide wheel cylinder out of support.

DISASSEMBLING THE WHEEL CYLINDERS

(Front or Rear)

If the wheel cylinders were not disassembled before removal, refer to (Fig. 1) then proceed as follows:

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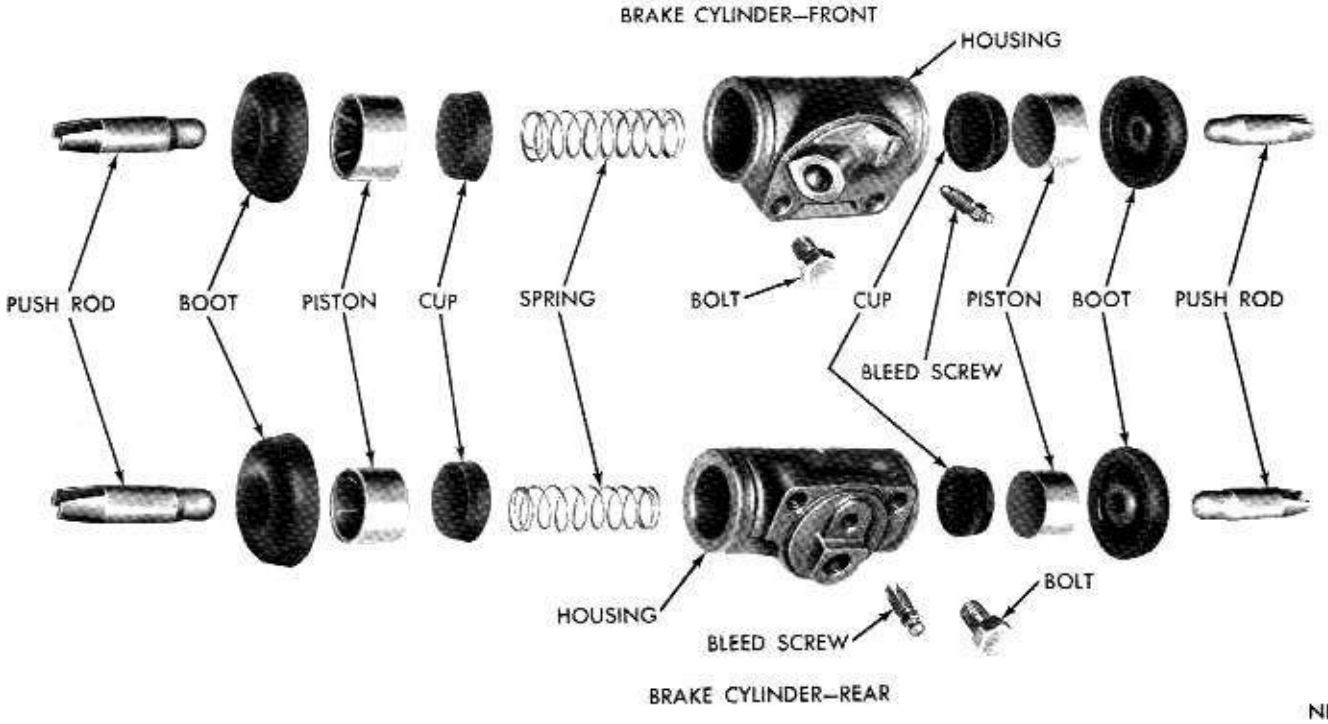


Fig. 1—Wheel Cylinders (Front and Rear)

(1) Remove boots and push rods.

(2) Press in on one end of cylinder and force out piston, cup, piston spring, cup and piston.

ASSEMBLING THE WHEEL CYLINDERS

(Front or Rear)

To assemble the wheel cylinder, refer to (Fig. 1) then proceed as follows:

Before assembling the pistons and new cups in wheel cylinder, dip them in brake fluid. If the boots are deteriorated, cracked or do not fit tightly on the brake shoe push rod, as well as the wheel cylinder casting, new boots should be installed.

(1) Wash wheel cylinder with alcohol and blow dry with air.

(2) Install expansion spring in cylinder. Install the wheel cylinder cups in each end of cylinder with the open end of cups facing each other.

(3) Install the wheel cylinder pistons in each end of cylinder with recessed end of the pistons facing open ends of cylinder.

(4) Install boots over ends of cylinder. Keep the assembly compressed with aid of a brake cylinder clamp until brake shoes are assembled.

INSTALLING THE WHEEL CYLINDERS

(Front or Rear)

(1) Slide the wheel cylinder into position in support. Install attaching bolts and tighten securely (17 to 20 foot-pounds).

(2) Apply sealing putty around the wheel cylinder to prevent any water or dirt from entering brake assembly.

(3) Connect brake tube to wheel cylinder and tighten to 95 inch-pounds (rear wheels) or connect brake hose to wheel cylinder (front wheels), and tighten to 25 foot-pounds, before connecting brake hose to frame bracket. **Should hose be connected to wheel cylinder last, the tightening of hose into wheel cylinder will twist hose, which can result in suspension or tire interference.**

REMOVING THE BRAKE SUPPORT

(Front)

(1) Disconnect the brake line from brake hose at frame bracket.

(2) With wheel and brake drum removed, remove four support attaching nuts and washers.

(3) Remove support and brake assembly from spindle.

(Rear)

(1) With the wheel and brake drum removed, remove support attaching nuts and washers.

(2) Remove rear axle shaft and retainer.

(3) Disconnect hydraulic brake line from wheel cylinder.

(4) Disengage brake cable from parking brake lever.

(5) Using a suitable tool compress the three flared legs of cable retainer and pull brake cable out of support (Fig. 2).

(6) Remove the brake support from rear axle housing.

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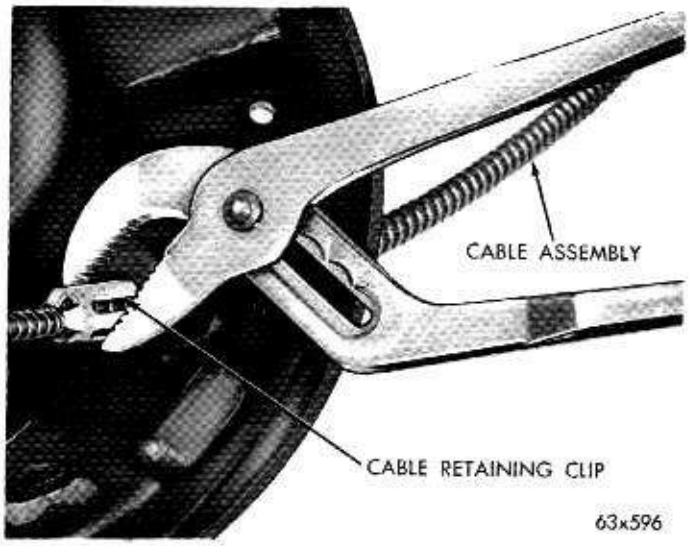


Fig. 2—Removing Brake Cable from Support

INSTALLING THE BRAKE SUPPORT

(Front)

(1) Install the brake shoes on support.

(2) Place the support on spindle support and install attaching bolts, nuts and washers. Tighten attaching nuts to 55 foot-pounds.

(3) Connect the brake hose to wheel cylinder and tighten to 25 foot-pounds, before connecting brake hose to frame bracket. **Should hose be connected to wheel cylinder last, tightening of hose into wheel cylinder will twist the hose, which can result in suspension of tire interference problems.**

(4) Install brake drum and wheel bearings. Adjust the bearings. Bleed and adjust the brakes.

(Rear)

(1) Install brake shoes on the support.

(2) Install support onto rear axle housing.

(3) Insert rear axle shaft and retainer into housing and install axle retainer nuts and washers. Tighten retainer nuts to 35 foot-pounds.

(4) Attach brake line to wheel cylinder and tighten to 95 inch-pounds.

(5) Insert parking brake cable into support plate and attach the cable to parking brake lever.

(6) Install the brake drum and wheel. Bleed and adjust the brakes.

PARKING BRAKES

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GENERAL INFORMATION

The rear wheel service brakes also act as parking brakes. The brake shoes are mechanically operated by a lever and strut connected to a flexible steel cable. The wheel brake cables are joined together by a forward brake cable and equalizer extending to the parking brake pedal or release handle (Figs. 1 and 2).

The parking brake pedal assembly used (Fig. 3) on Imperial models is pedal applied but is released by a vacuum valve. When the engine is started and vacuum is developed, energy is then available to release the parking brake. This is controlled by the transmission shift lever. When the transmission is in neutral or "Park" position, the lever attached to the gearshift tube slide, closes the valve which is mounted on the steering column, (passenger compartment). This stops the vacuum to the vacuum release cannister and allows the parking brake to be applied.

When the shift lever is moved (forward or reverse) the valve is opened to actuate the vacuum release. In the event of engine failure and no vacuum, the brake may be released by a manual release lever mounted on the left side of the parking brake pedal assembly. This system prevents the vehicle from being driven with the parking brake in the applied position (Fig. 3).

SERVICE DIAGNOSIS

Condition	Possible Cause	Correction
DRAGGING BRAKE	(a) Improper cable or brake shoe adjustment.	(a) Properly adjust the service brakes then adjust the parking brake cable.
	(b) Broken brake shoe return spring.	(b) Replace any broken return spring.
	(c) Broken brake shoe retainer spring.	(c) Replace the broken retainer spring.
	(d) Grease or brake fluid soaked lining.	(d) Replace the grease seal or recondition the wheel cylinders and replace both brake shoes.

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Condition	Possible Cause	Correction
	(e) Sticking or frozen brake cable.	(e) Replace the cables.
	(f) Broken rear spring.	(f) Replace the broken rear spring.
	(g) Bent or rusted cable equalizer.	(g) Straighten, or replace and lubricate the equalizer.
BRAKE WILL NOT HOLD	(a) Broken or rusted brake cable.	(a) Replace or clean and lubricate the brake cable.
	(b) Improperly adjusted brake or cable.	(b) Adjust brakes and cable as necessary.
	(c) Soaked brake lining.	(c) Replace the brake lining.
	(d) Ratchet or pedal mechanism worn.	(d) Replace pedal assembly.

SERVICE PROCEDURES

ADJUSTING THE PARKING BRAKES

The service brakes must be properly adjusted before adjusting the parking brake.

(1) Release the parking brake lever and loosen cable adjusting nut to insure cable is slack, refer to (Figs. 1 or 2). Before loosening the cable adjusting nut, clean threads with wire brush and lubricate with grease.

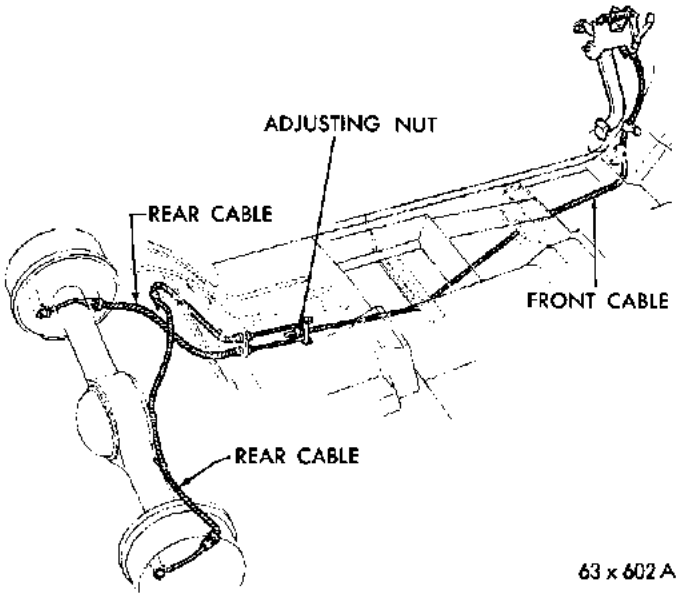


Fig. 1—Parking Brake Cable Routing (Chrysler)

(2) Tighten the cable adjusting nut until a slight drag is felt while rotating wheel, loosen cable adjusting nut until both rear wheels can be rotated freely, then back off the cable adjusting nut two full turns.

(3) Apply parking brake several times, then release and test to see that rear wheels rotate freely without dragging.

The independent rear brake cables are attached to an equalizer (Fig. 1). The front cable is adjusted at the equalizer.

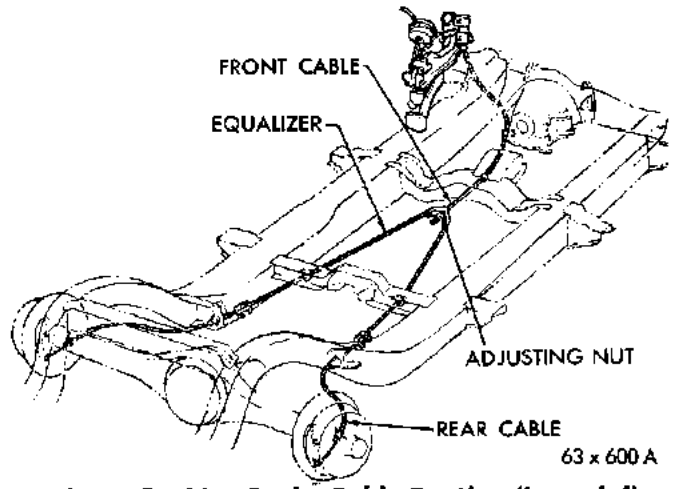


Fig. 2—Parking Brake Cable Routing (Imperial)

REMOVING THE REAR PARKING BRAKE CABLE

Should it become necessary to remove the parking brake cable (rear) for installation of a new cable, refer to (Fig. 2), under "Wheel Cylinders."

(1) With vehicle jacked up or on a suitable hoist, remove rear wheels.

(2) Disconnect brake cable from the equalizer.

(3) Remove retaining clip from brake cable bracket.

(4) Remove brake drum from the rear axle.

(5) Remove brake shoe return springs.

(6) Remove brake shoe retaining springs.

(7) Remove brake shoe strut and spring from brake support plate and disconnect brake cable from the operating arm.

(8) Compress retainers on the end of brake cable housing and remove cable from brake support plate. Refer to (Fig. 2), under "Wheel Cylinders."

INSTALLING THE REAR PARKING BRAKE CABLE

When installing a new brake cable, lubricate the cable with short fibre grease at the contact points.

(1) Insert brake cable and housing into brake support plate making certain that housing retainers lock

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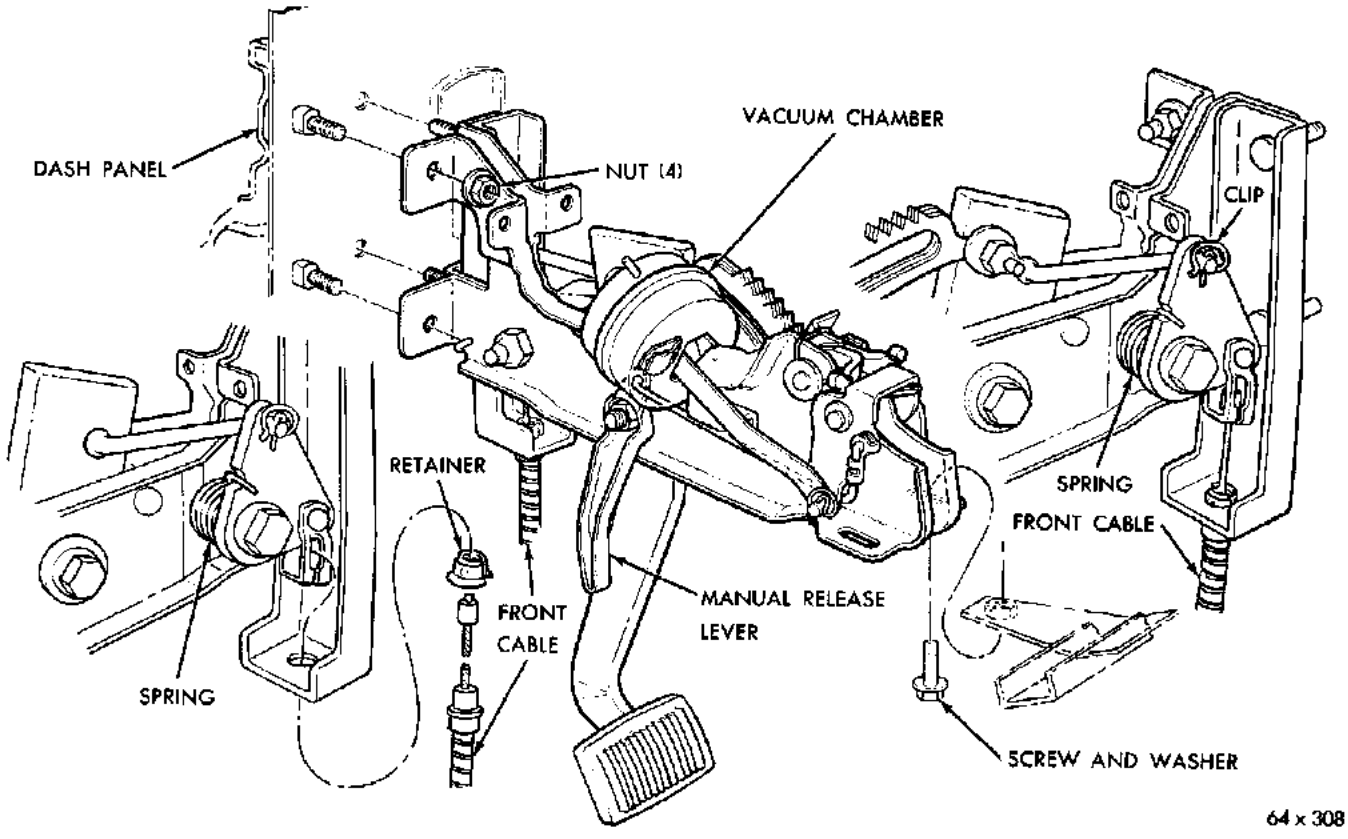


Fig. 3—Parking Brake Pedal (Imperial)

the housing firmly into place.

(2) Holding brake shoes in place on support plate, engage brake cable into brake shoe operating lever.

(3) Install the brake shoe retaining springs, and brake shoe return springs.

(4) Install brake drum and the wheel.

(5) Insert brake cable and the housing into the cable bracket and install retaining clip.

(6) Insert brake cable into the equalizer. Note different size slot for corresponding cable end fitting.

REMOVING THE FRONT PARKING BRAKE CABLE

(1) Disengage front cable from the equalizer and using a screwdriver force cable housing and retaining clip out of frame crossmember.

(2) Disengage cable housing from underbody mounting bracket (Figs. 3 and 4).

(3) Raise floor mat or carpet and remove rubber grommet holding the cable housing into floor pan.

(4) Depress the parking brake pedal, pulling cable through housing so that when pedal is released, cable may be disengaged from clevis.

(5) Using a screwdriver pry housing out of mounting bracket and retaining clip.

(6) Pull the parking brake cable and housing up out of floor pan.

INSTALLING THE FRONT PARKING BRAKE CABLE

(1) Insert the parking brake cable down through floor pan.

(2) Install cable housing into underbody mounting bracket.

(3) Insert the end fitting of cable into parking

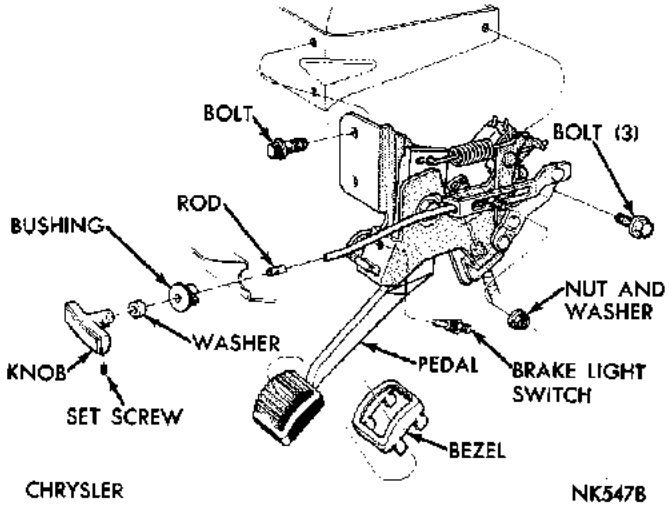


Fig. 4—Parking Brake Pedal (Chrysler)

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brake clevis and force housing and retaining clip into pedal bracket assembly (Figs. 3 and 4).

(4) Insert cable through crossmember and force housing and retaining clip into crossmember.

(5) Attach the cable to equalizer and adjust parking brake cable.

(6) Apply the brakes several times and test for free wheel rotation.

(7) Test the operation of the vacuum release valve (Imperial only).

PARKING BRAKE VACUUM VALVE (IMPERIAL)

To remove the parking brake vacuum valve for service or to install a new unit, proceed as follows:

(1) Place the transmission shift selector lever in "Drive" (engine off).

(2) Remove vacuum hoses from unit (Fig. 5).

(3) Remove screws that attach vacuum unit to steering column jacket, then remove vacuum valve.

To install vacuum valve unit, refer to (Fig. 5), then proceed as follows:

(1) Move actuating arm on valve against spring to extreme position, or until locating holes line up. Install a number 42 drill in hole to properly position valve for installation (Fig. 5).

(2) Move transmission shift selector lever into "Park" position.

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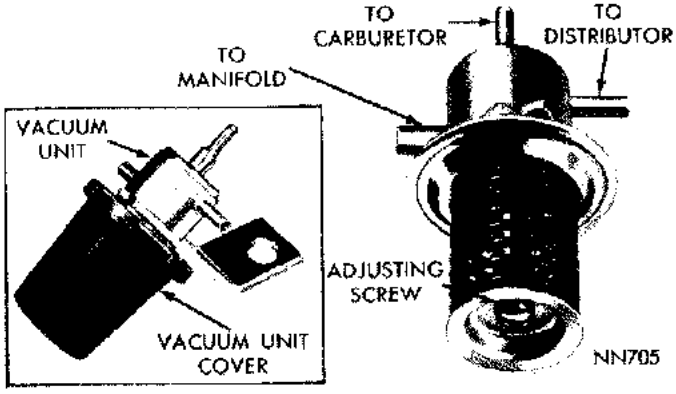


Fig. 5—Parking Brake Vacuum Valve (Imperial)

(3) Place valve in position on steering column jacket and install attaching screws. (Do not tighten.) Rotate valve clockwise (viewed from drivers position) until actuating arm contacts tab inside steering column jacket. Tighten screws securely.

(4) Remove drill from locating hole.

(5) Install vacuum hoses. (Be sure hose from engine manifold is attached to center fitting on valve (Fig. 5).

(6) Start engine and check to see that parking brake can be set in neutral and park position, and will release in reverse and drive positions.

MIDLAND ROSS POWER BRAKE

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GENERAL INFORMATION

The Midland Ross power brake (Fig. 1) is located on the engine side of the dash panel. The forward cover of the vacuum cylinder supports the master cylinder. The power brake derives its power from the intake manifold vacuum and atmospheric pressure. It does not require a vacuum reservoir.

SERVICE DIAGNOSIS

Condition	Possible Cause	Correction
DRAGGING BRAKES (ALL WHEELS)	(a) Brake shoes improperly adjusted.	(a) Adjust the brakes.
	(b) Brake pedal linkage binding.	(b) Free up the linkage.
	(c) Excessive hydraulic seal friction.	(c) Lubricate the seal.
	(d) Compensator port plugged.	(d) Clean out the master cylinder.
	(e) Sticking valve plunger.	(e) Free up and lubricate the valve plunger.
	(f) Improper booster push rod length adjustment.	(f) Adjust the push rod.
	(g) Fluid cannot return to master cylinder.	(g) Inspect the pedal return and push rod adjustment.
	(h) Parking brake not returning.	(h) Free up as required.
	(i) Improperly staked valve sleeve.	(i) Replace valve assembly.

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Condition	Possible Cause	Correction
GRABBING BRAKES	(a) Grease or brake fluid on linings.	(a) Inspect for a leak and replace the lining as required.
	(b) Sticking actuating valve.	(b) Free up the valve.
PEDAL GOES TO FLOOR (OR ALMOST TO FLOOR)	(a) Self-adjusters not operating.	(a) Inspect the self-adjuster operations.
	(b) Air in hydraulic system.	(b) Bleed the brakes.
	(c) Hydraulic leak.	(c) Locate and correct the leak.
	(d) Fluid low in master cylinder.	(d) Add brake fluid.
	(e) Shoe hanging up on rough platform.	(e) Smooth and lubricate the platforms.
	(f) Broken plunger stem.	(f) Replace valve plunger assembly.
HARD PEDAL (POWER UNIT TROUBLE)	(a) Faulty vacuum check valve.	(a) Replace the check valve.
	(b) Collapsed or leaking vacuum hose.	(b) Replace the hose.
	(c) Plugged vacuum fittings.	(c) Clean out the fittings.
	(d) Leaking vacuum chamber.	(d) Locate and correct the leak.
	(e) Diaphragm assembly out of place in housing.	(e) Position the diaphragm.
	(f) Vacuum leak in forward vacuum housing.	(f) Locate and correct the leak.

SERVICE PROCEDURES

REMOVING THE POWER BRAKE

Should it become necessary to remove the power brake for repair or overhaul, refer to (Fig. 1) and proceed as follows:

(1) With engine turned off, apply brakes several times to balance internal pressure of the brake.

(2) Disconnect the hydraulic brake line from master cylinder.

(3) Disconnect vacuum hose from power brake.

(4) From under instrument panel, remove nut and attaching bolt from power brake push rod and brake pedal linkage.

(5) Remove four power brake attaching nuts and washers.

(6) Remove power brake and master cylinder from vehicle and place on a service bench for further disassembly.

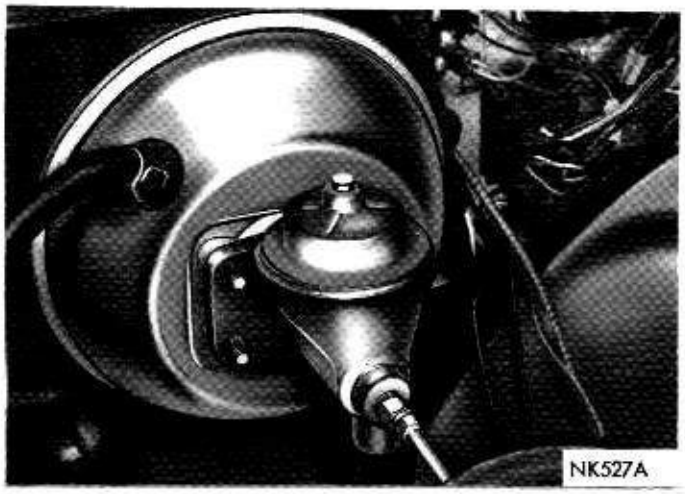


Fig. 1—Power Brake and Master Cylinder

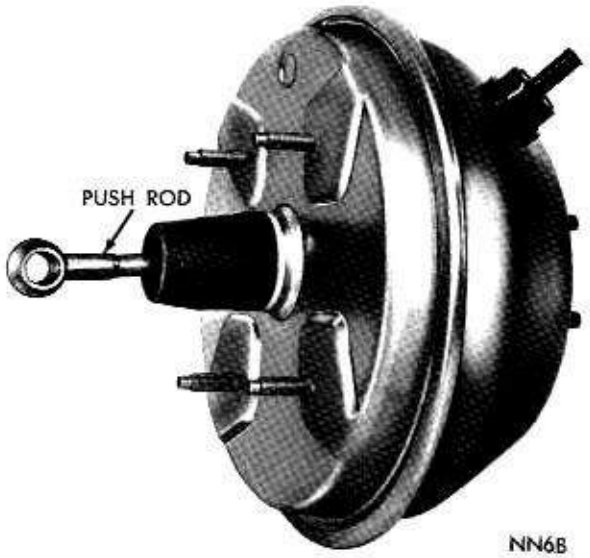


Fig. 2—Power Brake Assembly

DISASSEMBLING THE POWER BRAKE

To disassemble the power brake unit for repair or overhaul refer to (Fig. 2) then proceed as follows:

(1) Remove four nuts that attach master cylinder to power brake unit. Remove master cylinder.

(2) Remove air filter cover assembly from power brake unit, separate the cover and retainer, then remove air filter (Fig. 3).

(3) Remove check valve and rubber grommet from power brake unit.

(4) Remove rubber boot from operating rod.

(5) Scribe a line across front cover, clamp band and rear cover (Fig. 4).

(6) Push the bellows lip into vacuum chamber to separate bellows, control valve and diaphragm assembly from front and rear covers (Fig. 5).

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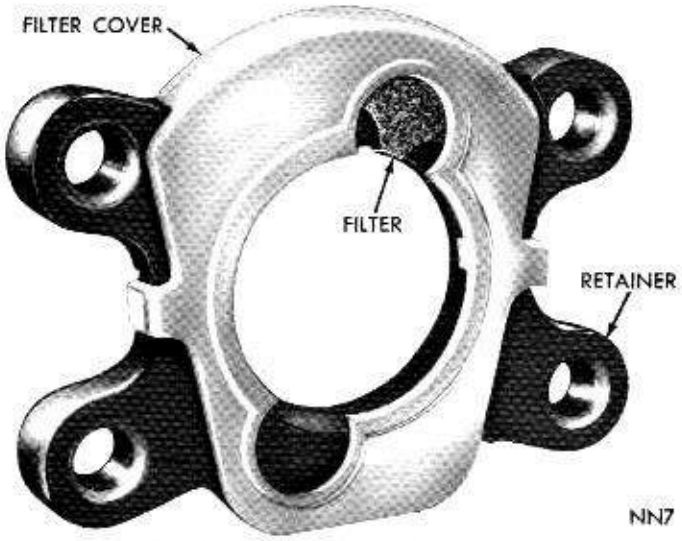


Fig. 3—Filter, Retainer and Cover Assembly

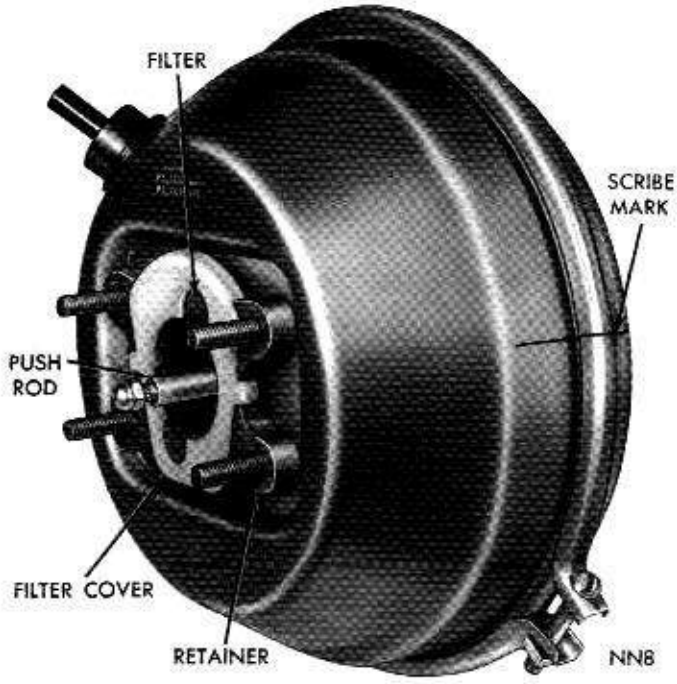


Fig. 4—Scribe Marks on Front Cover, Clamp Band and Rear Cover

(7) Remove clamp band screw and nut and remove clamp band. Separate front and rear covers.

(8) Remove rear seal from rear cover (Fig. 6).

(9) Remove bellows clamp and the support rings from bellows (Fig. 7).

(10) Remove the bellows from control hub (Fig. 8).

(11) Remove push rod and reaction lever assemblies (Fig. 9) from control hub.

(12) Remove two plastic push rod guides, cone retainer and reaction cone from push rod (Fig. 10).

(13) Remove operating rod from plunger, by holding rod firmly and forcing plunger off rod; shearing plastic retaining ring. (If the plunger is to be used again, remove all broken pieces of plastic retaining ring from groove in the plunger.)



Fig. 5—Separating the Bellows from the Front Cover

(14) Using Tool C-3984, turn control hub clockwise while holding power piston (Fig. 11). Separate the tail stock and the "O" ring from diaphragm.

(15) Using snap ring pliers, remove retainer that holds plunger to control hub (Fig. 12). Separate control hub and plunger assembly (Fig. 13). **It may be**

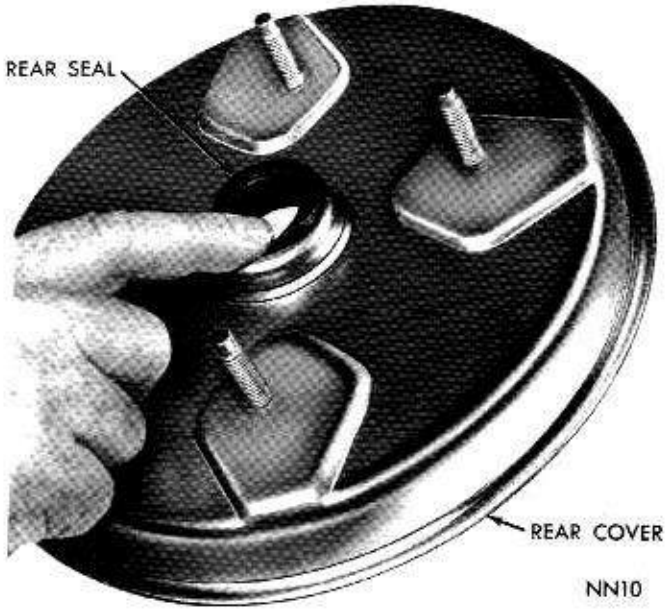


Fig. 6—Removing the Seal from the Rear Cover

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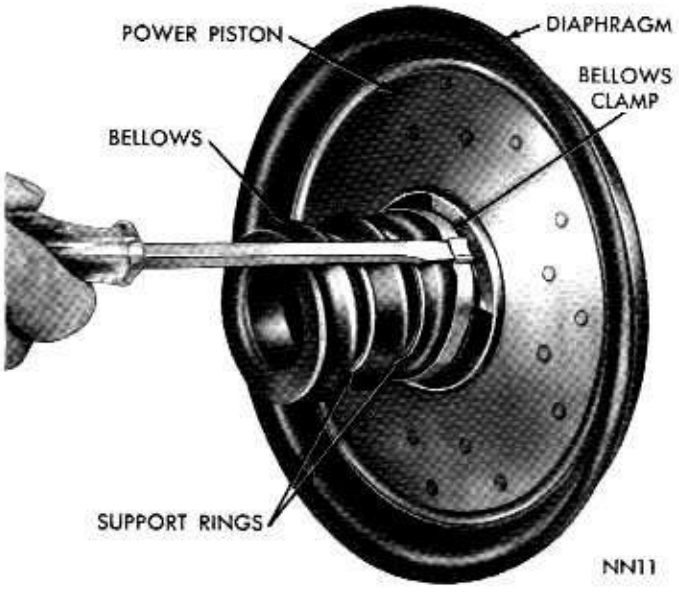


Fig. 7—Removing the Bellows Clamp

necessary to file any burrs that protrude from the end of plunger before it is removed from control hub. A score in this area can cause a leak.

(16) Using a screwdriver, compress spring toward rubber valve, then remove spring retainer (Fig. 14).

(17) Disassemble plunger by removing spring, washer, rubber valve, "O" ring, spring seat and fibre washer (Fig. 15).

CLEANING AND INSPECTION

Thoroughly wash all the metal parts in a suitable solvent and dry with compressed air. The power piston diaphragm, control hub and all plastic parts should be washed in a mild soap solution and water.



Fig. 8—Removing or Installing the Bellows

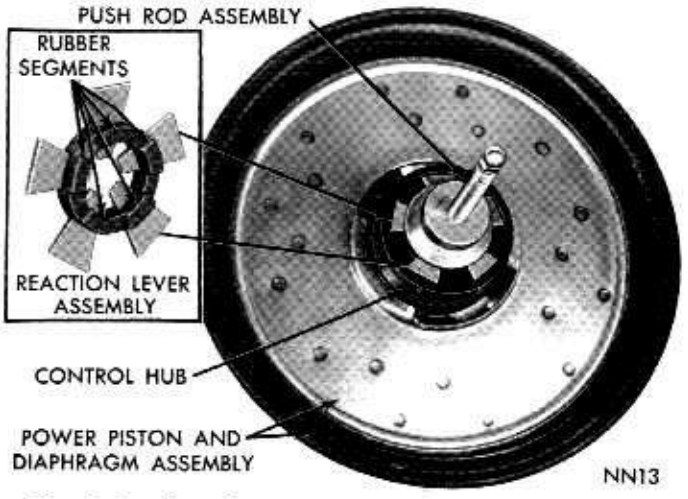


Fig. 9—Push Rods, Reaction Lever and Control Hub

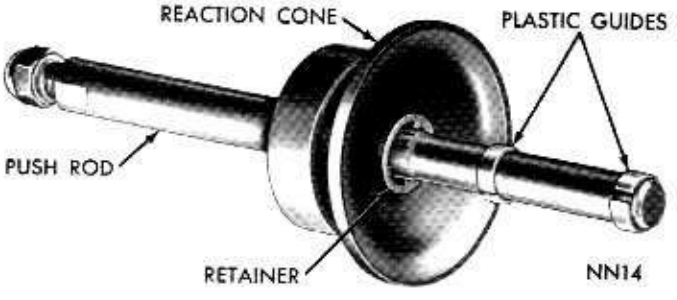


Fig. 10—Push Rod Assembly

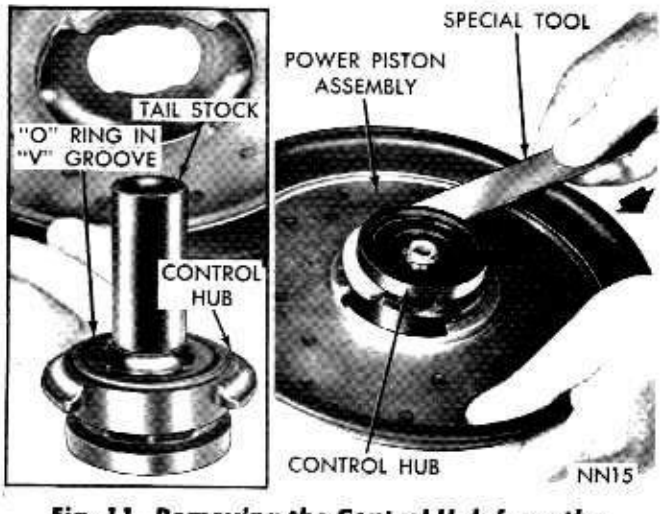


Fig. 11—Removing the Control Hub from the Power Piston Assembly

Using air pressure, blow out all internal passages. All rubber parts should be replaced regardless of condition. Install new air filter at reassembly.

Inspect all parts for scoring, pitting, dents or nicks. Small imperfections can be smoothed out, using crocus cloth. Replace all parts that are badly scored, nicked or damaged.

At reassembly, coat all rubber parts (including the diaphragm with silicone grease.

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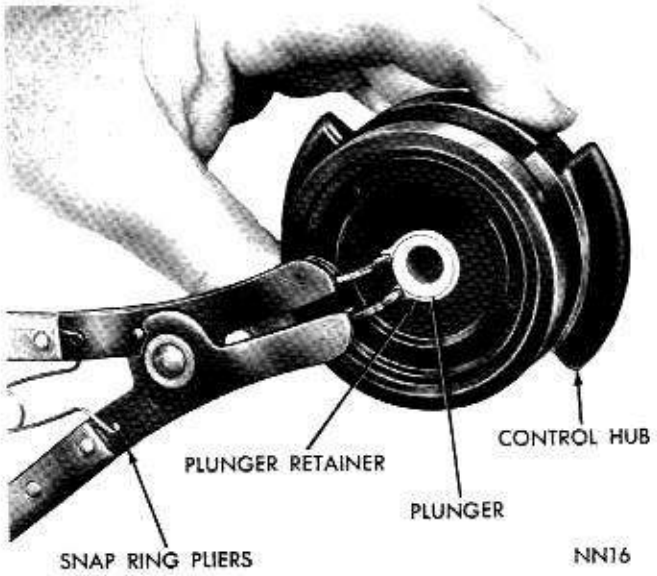


Fig. 12—Removing or Installing the Plunger Retainer

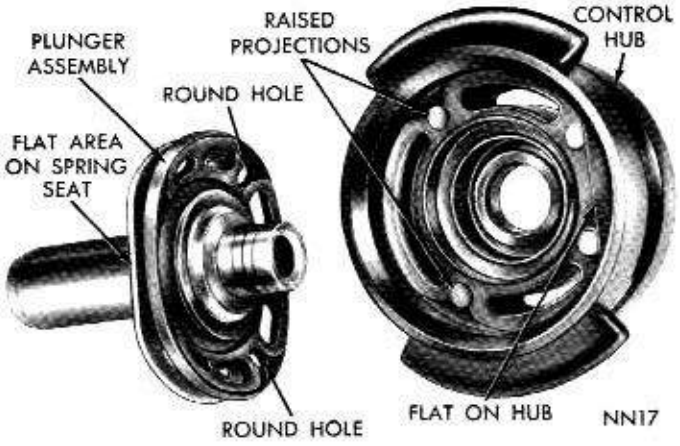


Fig. 13—Control Housing and Plunger Assembly

ASSEMBLING THE POWER BRAKE

To reassemble the power brake after cleaning and inspection, proceed as follows:

(1) Install rubber valve, spring seat, spring, "O" ring and fibre washer on plunger (Fig. 15).

(2) Using a screwdriver, compress spring towards rubber valve then install the spring retainer on plunger, with the flange toward spring (Fig. 14).

(3) Install the control valve plunger into control hub (Fig. 13) so that round holes in rubber valve index with raised projections on hub and flat side on spring seat mates with flat projection on hub.

(4) Compress the valve spring and install retainer in plunger groove, using snap ring pliers (Fig. 12), thus securing control valve plunger in control hub.

(5) Install tail stock over the plunger, with flat on tail stock mating with flat surface on hub.

(6) Install the "O" ring over tail stock and into "V" groove formed by tail stock and hub (Fig. 11 insert).

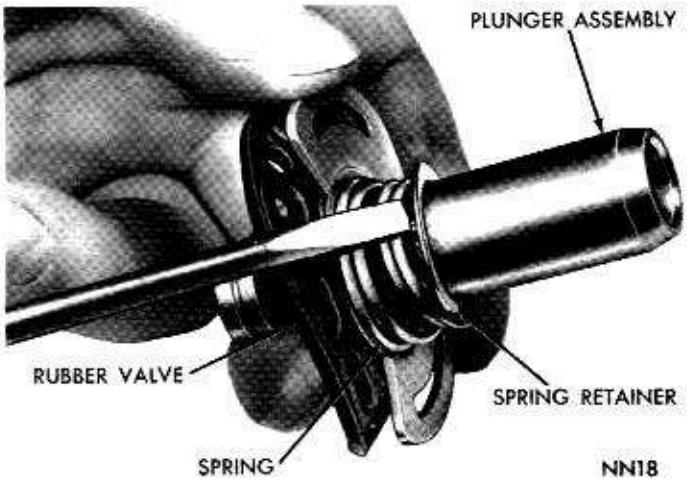


Fig. 14—Removing or Installing the Spring Retainer

(7) Lower power piston assembly over tail stock and control hub and seat. Using Tool C-3984, turn control hub counterclockwise to lock in place (Fig. 16).

(8) Install lever assembly in the control hub with rubber segments toward control hub.

(9) Slide the reaction cone over push rod (Fig. 10), then install retainer. Install two plastic guides on push rod. Install push rod assembly in valve hub so that push rod indexes in valve plunger (Fig. 9).

(10) Slide two bellows support rings over bellows and down into position in two larger folds (Fig. 17).

(11) Slide bellows over control hub until the lip of the bellows slides into recess of the hub (Fig. 8). Secure bellows on hub by using a new clamp on the diaphragm end of bellows (Fig. 17).

(12) Slide the rear seal into rear cover (Fig. 6) and position diaphragm, control valve components, and bellows as an assembly into rear cover (Fig. 17).

(13) Install rubber grommet in front cover with larger diameter side on outside of unit. Install check valve assembly through grommet.

(14) Assemble the front cover to rear cover. (Make sure the lip of diaphragm is evenly positioned on retaining radius of front and rear covers.) Now, pull front lip of bellows through front cover and position evenly around diameter of hole (Fig. 5).

(15) Install clamp band over lips of front cover and rear cover. Align scribe lines, compress the assembly together, and secure with clamp band bolt (Fig. 4). Tap clamp band with a fibre hammer around its circumference as bolt is being tightened. Tighten to 10 inch-pounds (Min.).

(16) Install the rubber boot to operating rod and assemble plastic retainer to end of the rod. Insert rod into plunger so that retainer engages groove in plunger. Install lip of boot in groove of rear seal.

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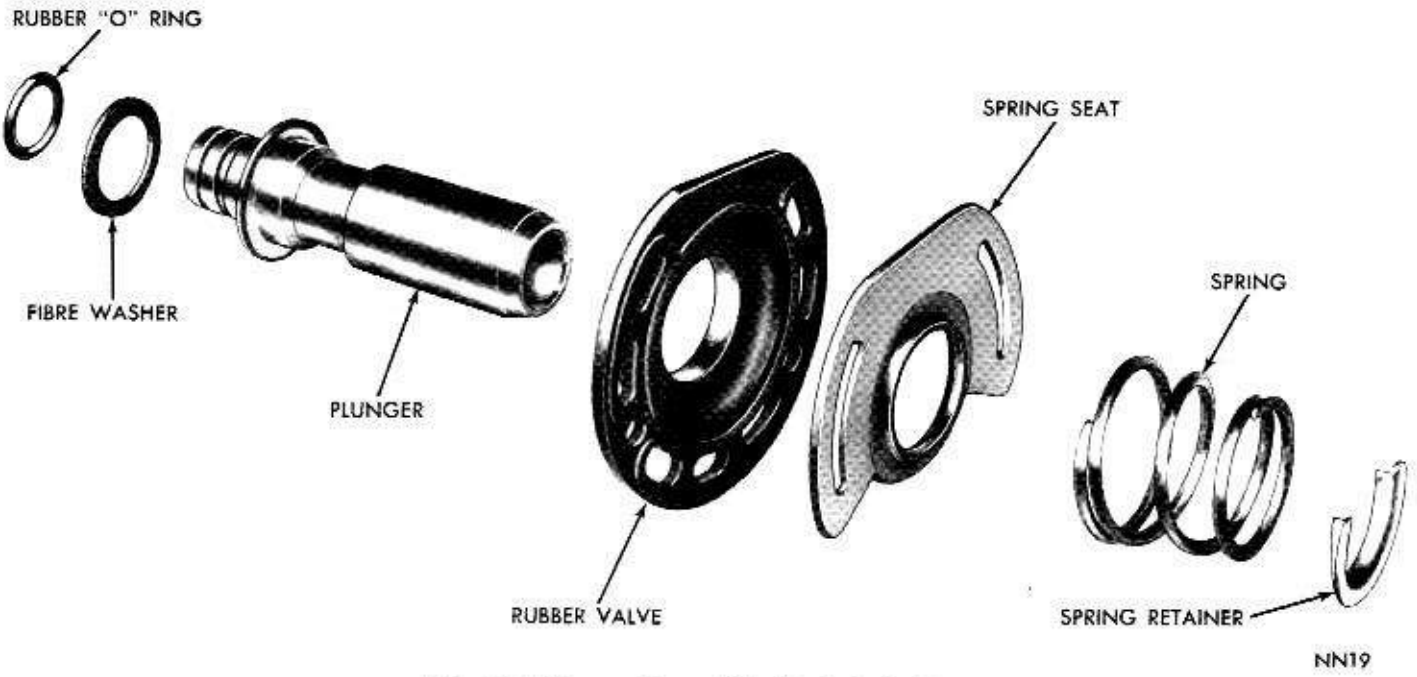


Fig. 15—Plunger Assembly (Exploded View)

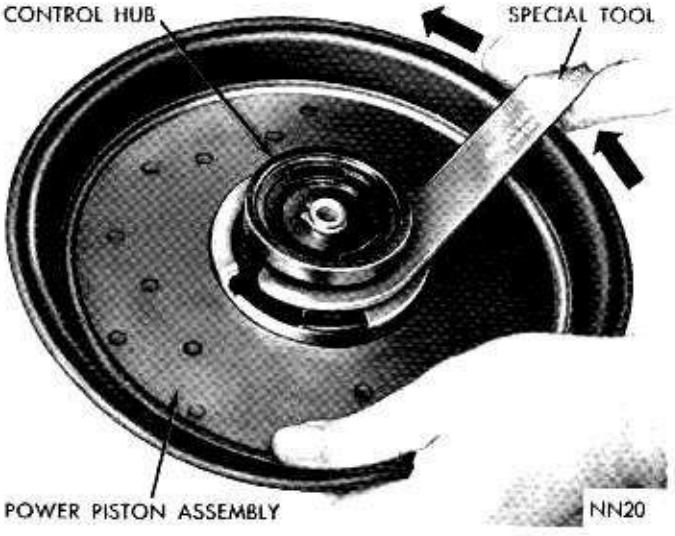


Fig. 16—Installing the Control Hub to the Power Piston

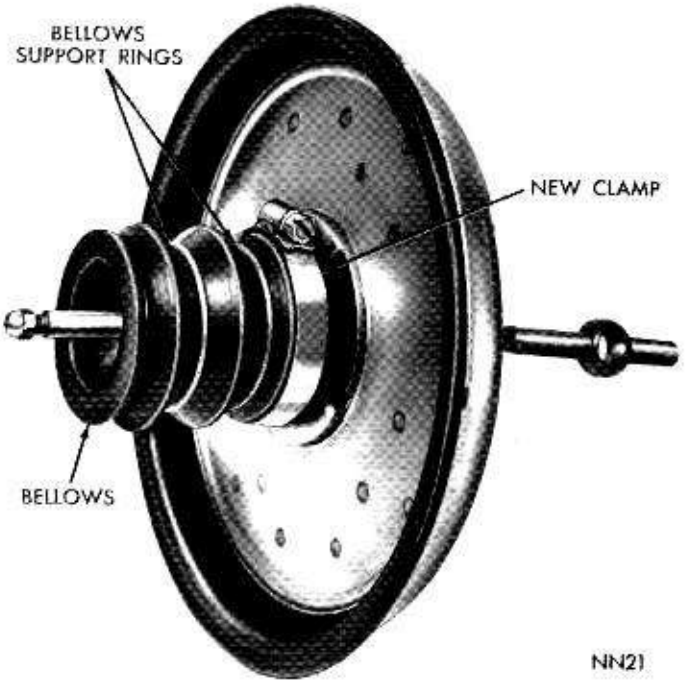


Fig. 17—Bellows Installed on the Power Piston

(17) Position air filter in plastic filter cover then snap cover and filter on metal hub with filter between (Fig. 3).

(18) Assembly cover, filter, and retainer assembly to unit with metal retainer against cover.

(19) Install master cylinder on power brake. Tighten mounting nuts to 100 inch-pounds.

INSTALLING THE POWER BRAKE

(1) Install power brake assembly on dash and tighten attaching nuts 200 inch-pounds.

(2) Connect brake line and vacuum hose.

(3) Install push rod to brake pedal attaching bolt and nut, and tighten to 30 foot-pounds.

(4) Refill master cylinder and bleed the brakes.

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KELSEY-HAYES POWER BRAKE

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GENERAL INFORMATION

The power brake, (Fig. 1), is a combined vacuum and hydraulic unit which utilized engine intake manifold vacuum and atmospheric pressure to provide power assisted application of the vehicle brakes. The power unit provides lighter pedal pressure.

This lighter pressure is obtained in combination with a reduced pedal travel, which makes it possible to bring the pedal down to the approximate height of the accelerator pedal when at closed throttle condition. Thus the driver, after closing the throttle, can shift his toe from one pedal to the other without lifting his heel from the floor.

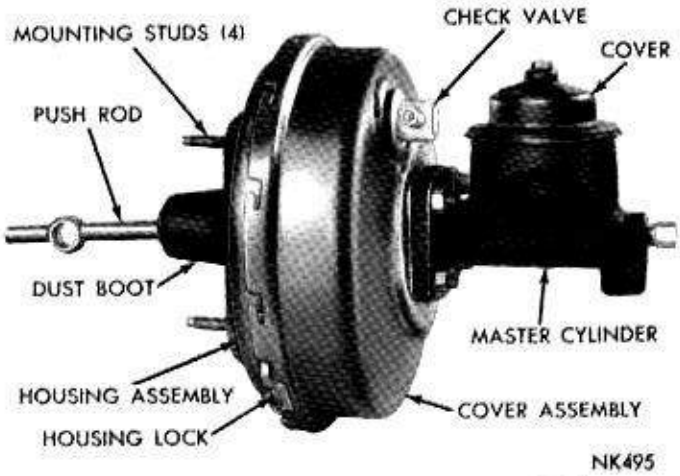


Fig. 1—Power Brake and Master Cylinder

The power brake, which is a self contained unit, eliminates all external rods and levers, and mounts on the engine side of the dash panel.

The power brake is externally connected to the brake system at three points. The unit is connected by a pedal push rod to the brake pedal, by a vacuum line to the intake manifold (through a vacuum check valve) and a hydraulic tube from the master cylinder to the wheel units.

Power Brake Checks

(1) Vacuum leak in the released position.

With the transmission in neutral or park position, stop the engine and wait 1 minute. Apply the brake several times. Each application should provide less and less pedal travel, following normal depletion of reserve vacuum.

The number of applications on reserve vacuum assist will depend on how hard the pedal is pressed and how far the pedal moves. If vacuum assist is not present, an air leak is indicated.

(2) Unit operation.

After depleting the reserve vacuum, place light foot pressure on the pedal and start the engine. If the power system is functioning properly, the pedal will fall away slightly.

(3) Vacuum leak in the Holding Position.

With the transmission in neutral or park position, stop the engine while holding a moderately heavy load steadily on the brake pedal. After 1 minute, release and apply the pedal several times. If there is no vacuum assist during this test, but the system was normal during test number 1 above, there is an air leak within the unit. Some units on this test will leak air internally if the pedal load is light. This is a normal condition.

(4) Hydraulic Leak.

Depress the brake pedal with light effort while the engine is running, maintaining constant pressure. If the pedal falls noticeably in one minute, the hydraulic system is leaking.

If the pedal has a spongy feel when applying the brakes, air may be present in the hydraulic system.

Road test the brakes by making a brake application at about 40 m.p.h. to determine if the vehicle stops evenly and quickly.

If the system checks are satisfactory and the brake pedal travels to within 1 inch of the floor pan, the brake shoes will require an adjustment or replacement.

Actuation System Checks

(1) Check for free operation and return of the brake pedal. If binding exists, check all pivot points for binding and lubricate or free up as required.

(2) Check the stoplight switch for proper setting and operation.

(3) Check the fluid level in the master cylinder reservoir.

(4) Check the vacuum line and connections at the intake manifold and the vacuum check valve for possible vacuum leaks.

(5) Check the engine for good stall free idle and make necessary carburetor adjustments.

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SERVICE PROCEDURES

REMOVING THE POWER BRAKE

Should it become necessary to remove the power brake for repair or overhaul, refer to (Fig. 1) and proceed as follows:

(1) With engine turned off, apply brakes several times to balance internal pressure of brake.

(2) Disconnect hydraulic brake line from master cylinder.

(3) Disconnect vacuum hose from power brake check valve.

(4) Remove nut and bolt that attach power brake push rod from pedal linkage. (Under instrument panel.)

(5) Remove nuts and washers that attach power brake unit to dash panel.

(6) Remove power brake and master cylinder from vehicle and place on a service bench for further disassembly. Remove plastic mounting gasket.

DISASSEMBLING THE POWER BRAKE

To disassemble power brake, refer to (Figs. 2 and 12), then proceed as follows:

(1) Remove master cylinder from power brake (Fig. 3).

(2) Remove master cylinder push rod and air cleaner plate (Fig. 4).

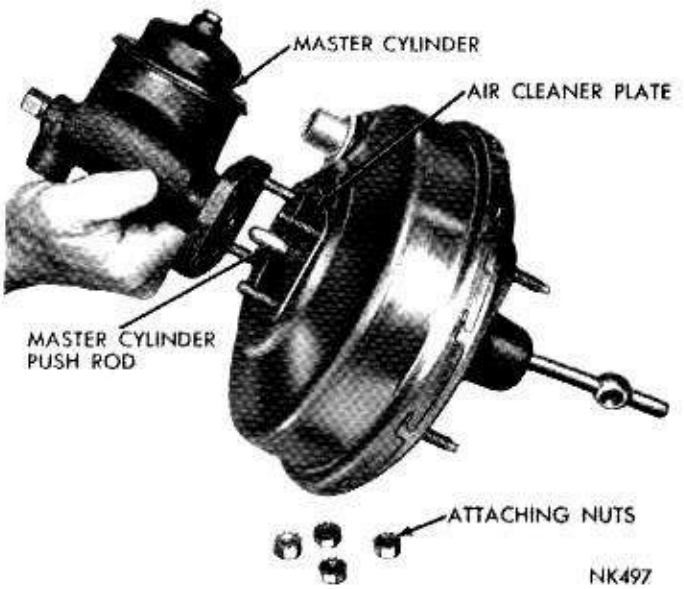


Fig. 3—Removing or Installing the Master Cylinder

(3) Install engine lifting fixture C-3804 on two of unit mounting studs. Install flat washers and nuts to hold in position.

(4) Install fixture in a vise, then **inscribe a line on both housing and cover.** (To be used at reassembly.)

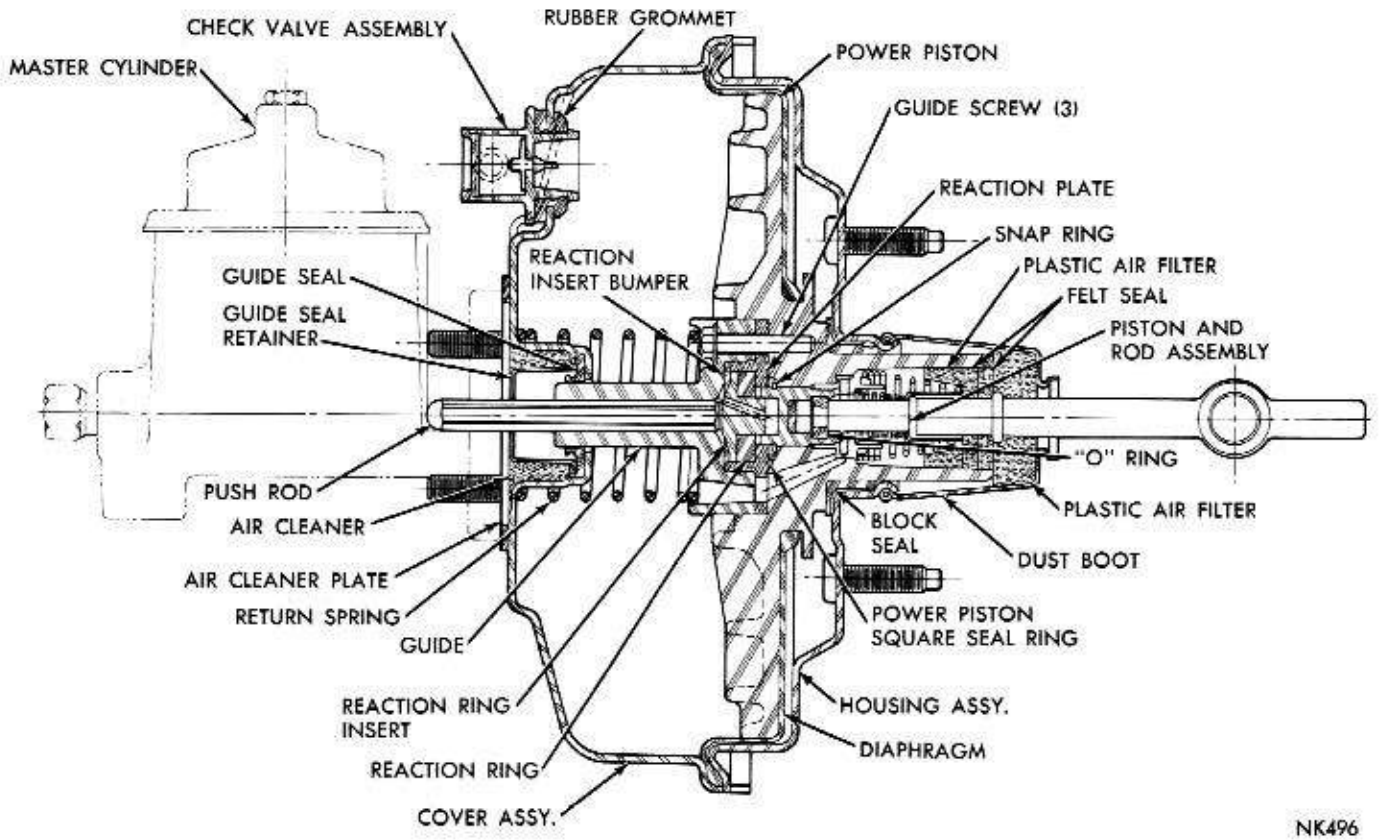


Fig. 2—Power Brake (Sectional View)

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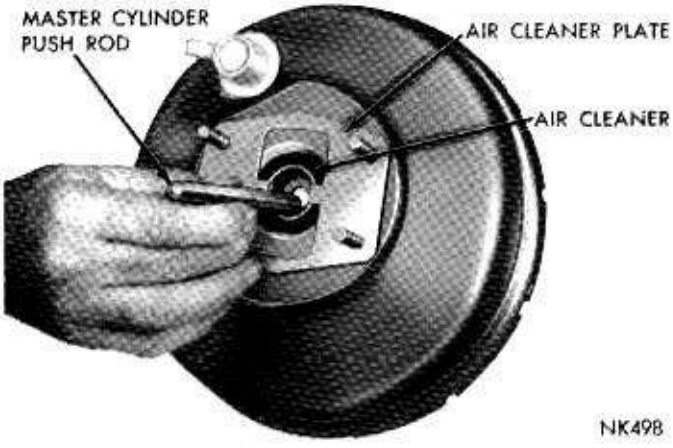


Fig. 4—Removing or Installing the Master Cylinder Push Rod

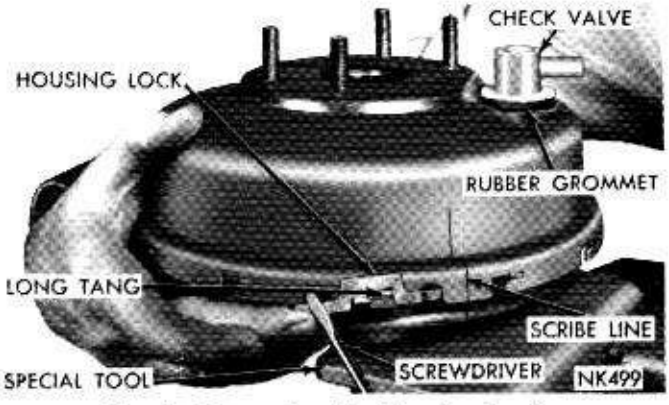


Fig. 5—Removing the Housing Lock

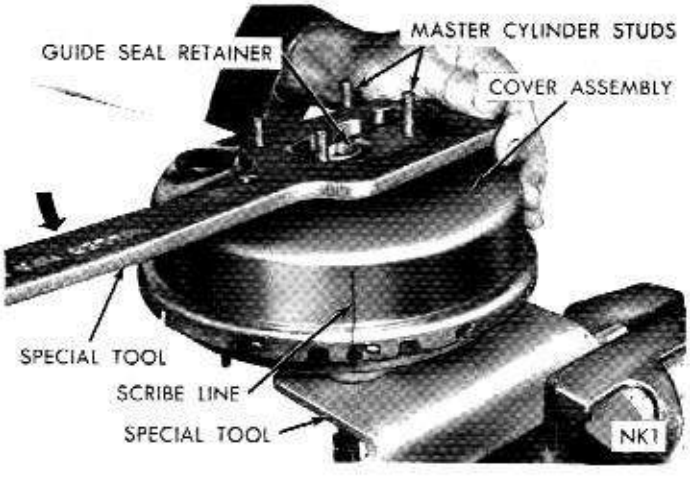


Fig. 6—Removing or Installing the Cover

(5) Pry out housing lock, using a screwdriver (Fig. 5). The lock location is on one of two long tangs on housing. **Don ot bend the lock at removal, as it must be reinstalled at assembly.**

(6) Remove check valve from cover, by prying out of rubber grommet.

(7) Place Tool C-3281 over master cylinder mounting studs (Fig. 6).

(8) Rotate tool slowly when removing cover as it is under spring pressure. Separate housing and cover to expose power piston return spring and diaphragm Fig. 7).

(9) Remove cover and lift out power piston return spring.

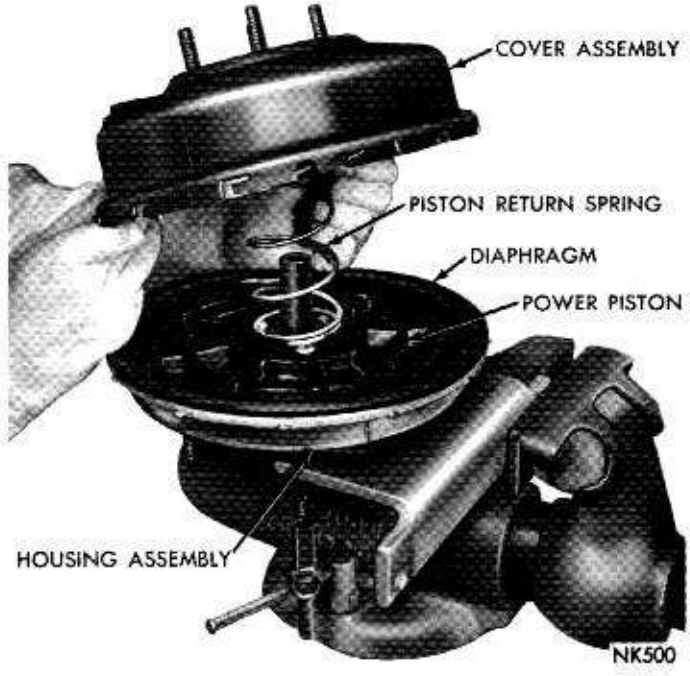


Fig. 7—Piston Return Spring, Diaphragm and Piston

(10) Remove power piston assembly by slowly lifting straight up (Fig. 8), then lay aside on a smooth clean surface. Remove brake unit from engine lifting fixture C-3804.

(11) Remove air cleaner, guide seal and guide seal retainer from cover (Fig. 9).

(12) Remove block seal located in center hole of

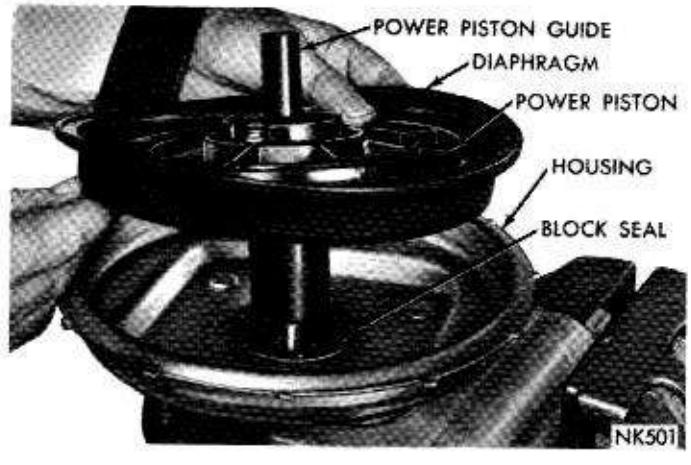


Fig. 8—Removing or Installing the Power Piston

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housing, using a blunt drift. **Care should be used so as not to scratch bore of housing, which could cause a vacuum leak.**

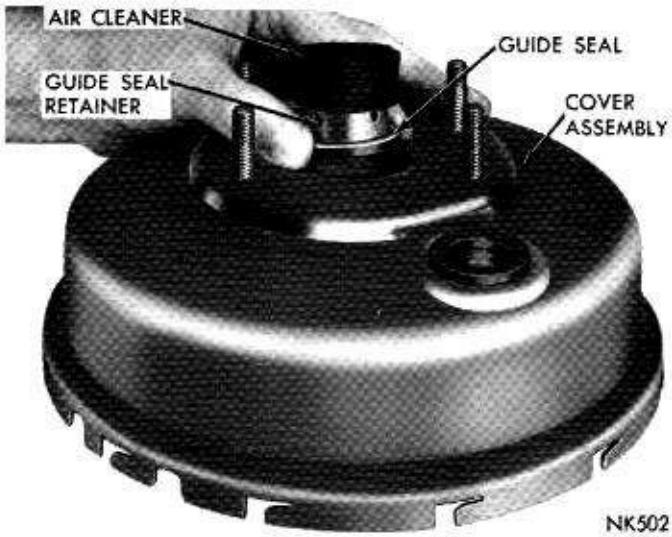


Fig. 9—Removing or Installing the Air Cleaner, Seal and Retainer

Disassembling the Power Piston

Extreme care should be used when handling the power piston diaphragm and metal parts. The diaphragm should be kept clean. Grease, oil and foreign matter can cause a deterioration of diaphragm. Protect diaphragm from nicks, or cuts that might be caused by rough surfaces, damaged tools or by dropping piston.

(1) Remove power piston diaphragm from power piston and lay it aside on a clean shop towel.

(2) Remove screws that attach plastic guide to plastic power piston (Fig. 10). Remove guide and place to one side.

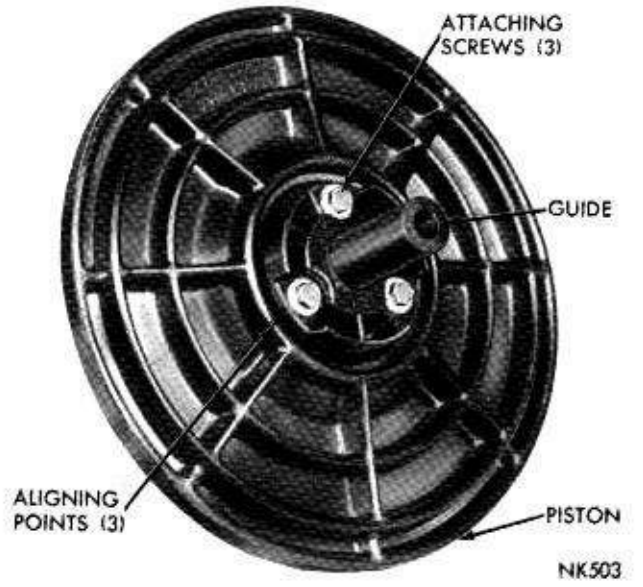


Fig. 10—Power Piston Guide Attaching Screws

(3) Remove power piston square seal ring, reaction ring insert, reaction ring and reaction plate. **If reaction plate sticks in power piston, it may be removed by pushing on operating rod. Do not push too far, as damage to floating valve can result.**

(4) Depress operating rod slightly, then remove truarc snap ring, using snap ring pliers (Fig. 11).

(5) Remove control piston by pulling operating rod straight out of power piston.

(6) Remove "O" ring seal from end of control piston.

(7) Remove filter elements and dust felt from control piston rod.

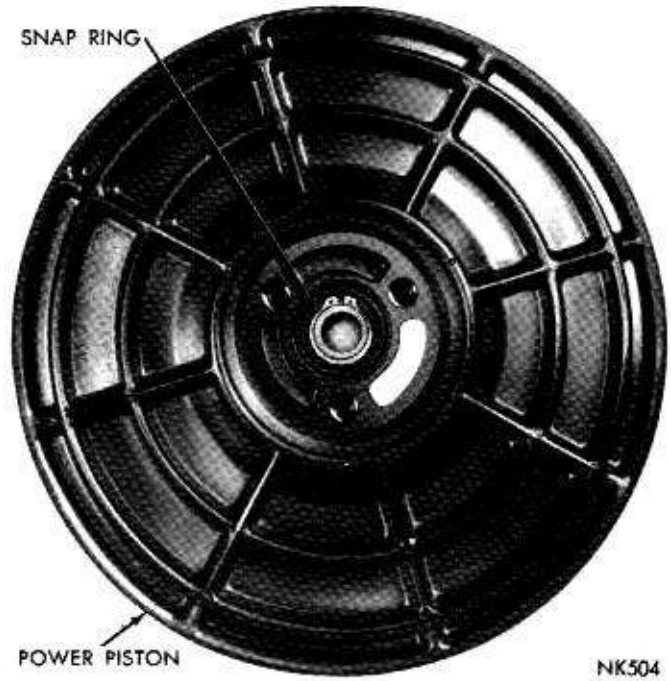


Fig. 11—Control Piston Snap Ring

CLEANING AND INSPECTION

Thoroughly wash all metal parts in a suitable solvent and blow dry with compressed air. The power diaphragm, plastic power piston and guide, should be washed in a mild soap solution and water. Blow dust and cleaning fluid out of all internal passages. All rubber parts should be replaced, regardless of condition. Install new air filters at reassembly. Inspect all parts for scoring, pitting, dents or nicks. Small imperfections can be smoothed out, using crocus cloth. Replace all parts that are badly scored, nicked or damaged. When reassembling, be sure that all rubber parts are well lubricated with silicone grease, except the diaphragm and the reaction ring.

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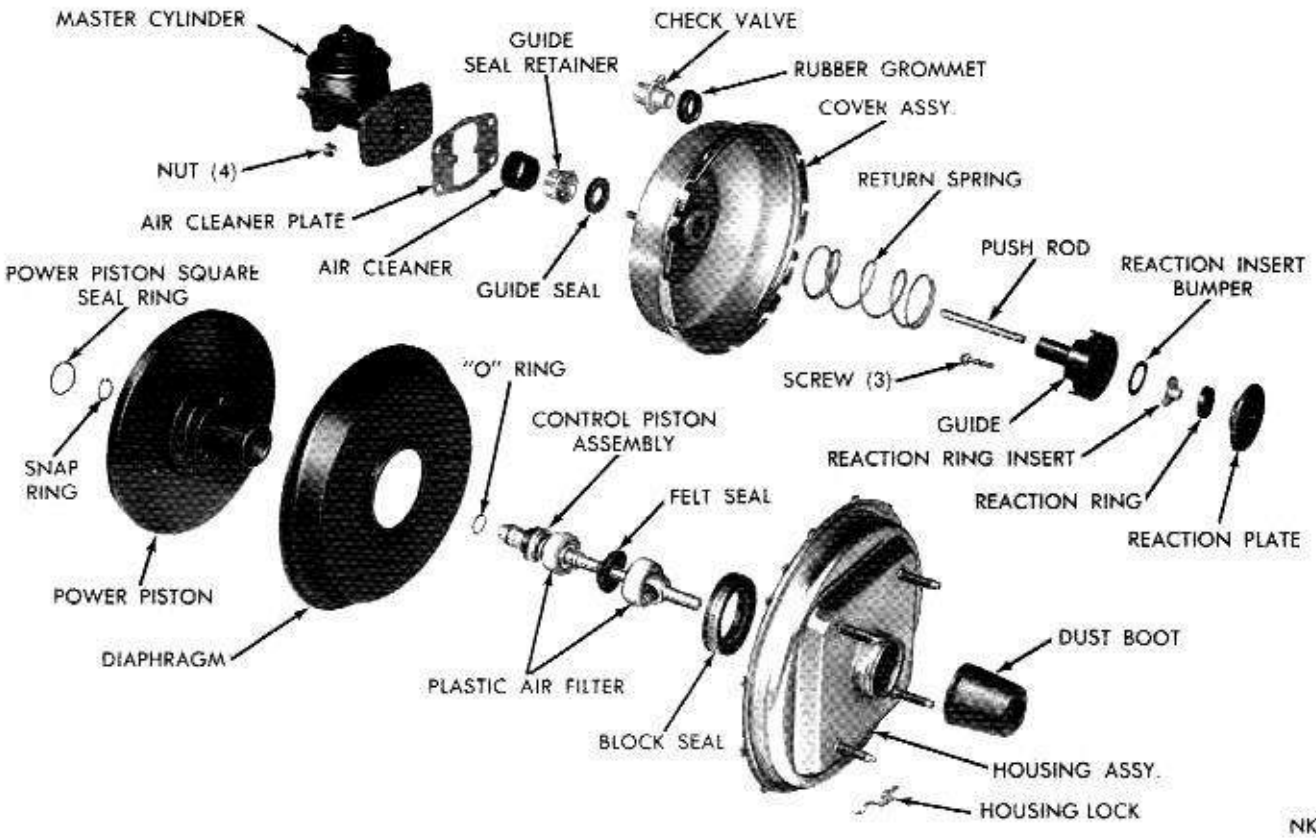


Fig. 12—Power Brake Assembly

ASSEMBLING THE POWER BRAKE

To assemble the power brake, refer to (Fig. 12), then proceed as follows:

(1) Install control piston "O" ring on control piston and lubricate with silicone grease.

(2) Lubricate control piston assembly with silicone grease and insert into power piston. Install truarc snap ring in its groove, using snap ring pliers. Refer to (Fig. 11). Wipe all lubricant off end of control piston.

(3) Slide air filter elements and felt seal over push rod and down past retaining shoulder on the rod. Install power piston square seal ring in its groove.

(4) Install reaction plate in power piston, aligning three holes with those in power piston, refer to (Fig. 10).

(5) Place rubber reaction ring in reaction plate. **Do not lubricate this ring.**

(6) Lubricate outer diameter of reaction insert with silicone grease and install in reaction ring.

(7) Install reaction insert bumper into guide. **Several small spots of silicone grease will hold bumper in position while guide is being installed into power piston.**

(8) Place guide on power piston, aligning holes with aligning points on power piston. Refer to (Fig. 10). Install retaining screws and tighten from 80 to 100 inch-pounds. (Remove any resulting chips.)

(9) Install diaphragm on power piston, making sure that diaphragm is seated in power piston.

ASSEMBLING THE POWER BRAKE COMPONENTS

(1) **With housing blocked** to prevent bending, drive block seal into housing, using Tool C-3205 (Fig. 13).

(2) Install a new cover seal on retainer and lubricate thoroughly inside and out with silicone grease, then install in cover bore. Refer to (Fig. 9). Install a new air filter.

(3) Install check valve in a well lubricated grommet in the cover. Refer to (Fig. 5).

(4) Reinstall engine lifting bracket Tool C-3804 and clamp in a vise.

(5) Apply silicone grease to both sides of bead (outer edge) of power piston diaphragm.

(6) Insert power piston assembly into housing with operating rod **down.** Refer to (Fig. 8).

(7) Install power piston return spring in flange of guide.

(8) Place cover over return spring and press down on the cover, and at the same time lead guide through seal. **(Be sure scribe lines marked on housing and**

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cover are aligned when parts are locked together.)

(9) Rotate cover to lock it to housing. Refer to (Fig. 6). **Be sure diaphragm is not pinched during assembly of unit.**

(10) Install housing lock on one of the long tangs of housing. Refer to (Fig. 5). **The lock will not be satisfactory if installed incorrectly. If installed on one of short tangs, unit could become unlocked with use.**

(11) Remove unit from vise and remove Tool C-3804 lifting fixture.

(12) Install master cylinder push rod and air cleaner plate, then install master cylinder on studs. Install attaching nuts and washers. Tighten to 200 inch-pounds.

INSTALLING THE POWER BRAKE ON THE VEHICLE

(1) Reinstall dash panel to power brake seal.

(2) Position power brake unit on the dash panel, then install attaching nuts and washers and tighten to 200 inch-pounds.

(3) Install bolt that connects power brake push rod with brake pedal linkage. Install nut and tighten to 30 foot-pounds.

(4) Connect vacuum hose to unit and connect hydraulic brake tube. Tighten securely.

(5) Refill master cylinder reservoir and bleed brakes.

(6) Readjust stoplight switch if necessary.

(7) Test power brake unit, (refer to General information).

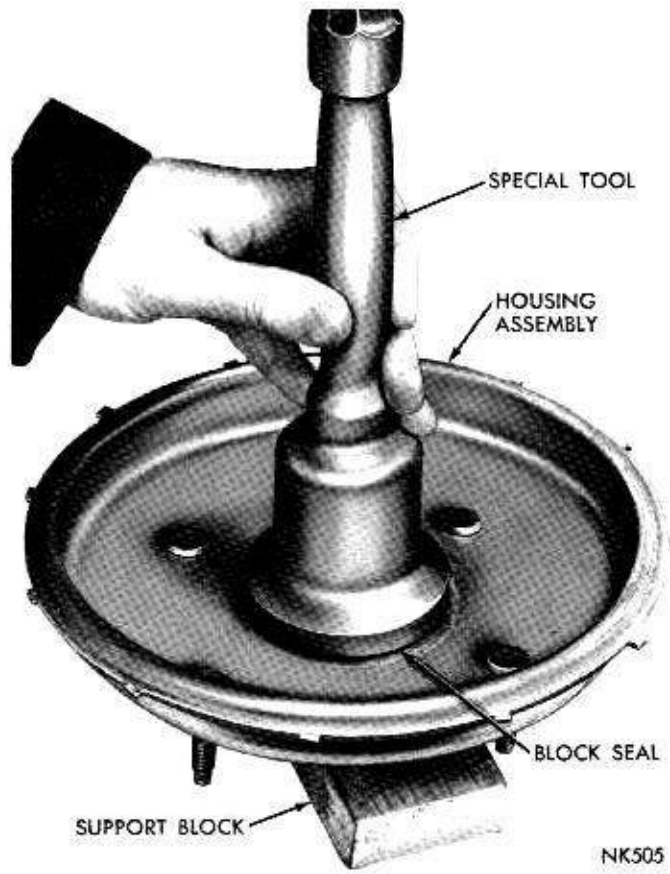


Fig. 13—Installing the Block Seal in the Housing

POWER BRAKE—BENDIX

GENERAL INFORMATION

The tandem diaphragm type power brake used on Imperial Models (Fig. 1) is a self contained vacuum hydraulic power braking unit. It is of the vacuum suspended type which utilizes engine intake manifold vacuum and atmospheric pressure for its power. This type of units does not require a vacuum reservoir.

The Bendix Power Brake Unit can be identified by the crimped edge method of attaching the housing and cover together.

The basic elements of the vacuum unit are as follows:

(a) The vacuum power chamber consists of a front and rear shell, a center plate, front and rear diaphragm, hydraulic push-rod and a vacuum diaphragm return spring (Fig. 1).

(b) A mechanically actuated control valve integral with the vacuum power diaphragms, controls the degree of power brake application or release in accordance with the foot pressure applied to the valve operating rod through the brake pedal linkage.

The control valve is of a single poppet type valve with the atmospheric port and a vacuum port. The vacuum port seat is a part of the valve body attached to the diaphragm assembly. The atmospheric port is a part of the valve plunger which moves within the valve housing and vacuum power diaphragm assembly.

(c) A hydraulic master cylinder which contains all of the elements of the standard brake master cylinder except for the special hydraulic push rod which is a part of the power brake.

CAUTION: Do not attempt to adjust the hydraulic push rod.

SERVICE PROCEDURES

REMOVING THE POWER BRAKE

(1) Disconnect brake line from master cylinder.

(2) Disconnect vacuum line from check valve.

(3) From under instrument panel, remove push rod nut and bolt from power brake and brake pedal.

(4) From under instrument panel remove four brake unit attaching nuts and washers.

(5) Withdraw brake unit and master cylinder assembly from brake support bracket.

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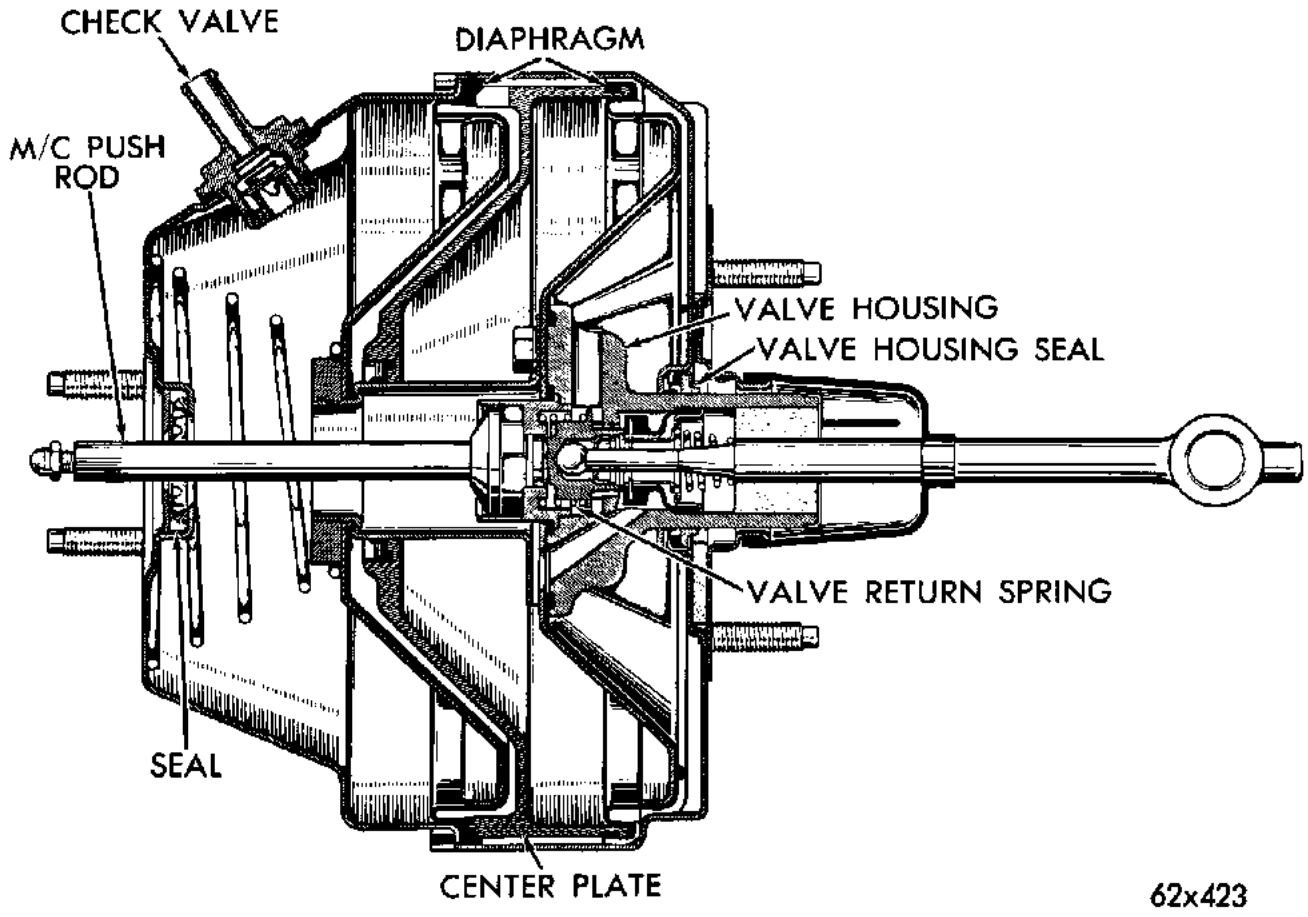


Fig. 1—Power Brake Assembly (Bendix)

INSTALLING THE POWER BRAKE

(1) Install master cylinder on power brake.

(2) Insert brake push rod through brake support and install four attaching washers and nuts.

(3) Install push rod attaching bolt and nut through push rod and brake pedal.

(4) Attach vacuum hose to check valve.

(5) Attach brake line to master cylinder.

(6) Fill master cylinder and bleed brakes.

(7) Inspect adjustment of stop light switch.

(6) Remove four master cylinder attaching nuts and washers and remove master cylinder from power brake.

CAUTION: Do not attempt to disassemble brake booster as this unit will be serviced by Manufacturer's Service Station.

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BUDD DISC BRAKES

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DISC BRAKE SERVICE DIAGNOSIS

Condition	Possible Cause	Correction
EXCESSIVE PEDAL TRAVEL	(a) Excessive disc runout.	(a) Check disc for runout with dial indicator. Install new disc.
	(b) Air, leak, or insufficient fluid in system or caliper.	(b) Check system for leaks.
	(c) Improper brake fluid (boil).	(c) Drain and install correct fluid.
	(d) Rear brake adjustment required.	(d) Check and adjust rear brakes.
	(e) Warped or excessively tapered shoe and lining assembly.	(e) Install new shoe and linings.
	(f) Loose wheel bearing adjustment.	(f) Readjust wheel bearings to specifications.
	(g) Damaged caliper piston seal.	(g) Install new piston seal.
	(h) Power brake malfunction.	(h) Check and correct power unit.
BRAKE ROUGHNESS OR CHATTER (PEDAL PUMPING)	(a) Excessive lateral runout of braking disc.	(a) Check disc for lateral runout with dial indicator. Install new disc.
	(b) Excessive thickness variation of braking disc.	(b) Check disc for runout with dial indicator.
	(c) Excessive front bearing clearance.	(c) Readjust wheel bearings to specifications.
	(d) Rear brake drums out-of-round.	(d) Check for out-of-round and regrind rear drums.
EXCESSIVE PEDAL EFFORT	(a) Power brake malfunction.	(a) Check and correct power unit.
	(b) Brake fluid, oil or grease on linings.	(b) Install new shoe linings as required.
	(c) Incorrect lining.	(c) Remove lining and install correct lining.
	(d) Frozen or seized pistons.	(d) Disassemble caliper and free up pistons.
PULL	(a) Brake fluid, oil or grease on linings.	(a) Install new shoe and linings.
	(b) Caliper not in the proper alignment to the braking disc.	(b) Remove caliper and reinstall. Check alignment.
	(c) Frozen or seized pistons.	(c) Disasssemble caliper and free up pistons.
	(d) Incorrect tire pressure.	(d) Inflate tires to recommended pressures.
	(e) Out-of-round rear drums.	(e) Regrind rear drums and check.
	(f) Distorted brake shoes.	(f) Install new brake shoes.
	(g) Front end out of alignment.	(g) Check and align front end.
	(h) Broken rear spring.	(h) Install new rear spring.
	(i) Rear brake pistons sticking.	(i) Free up rear brake pistons.
	(j) Rear brakes out of adjustment.	(j) Adjust rear brakes.
	(k) Restricted hose or line.	(k) Check hoses and lines and correct as necessary.
	(l) Unmatched linings.	(l) Install correct lining.
NOISE		
Groan—Brake noise emanating when slowly releasing brakes (creep—groan).		
	(a) Not detrimental to function of disc brakes—no corrective action required. (Indicate to operator this noise may be eliminated by slightly increasing or decreasing brake pedal efforts.)	
Rattle—Brake noise or rattle emanating at low speeds on rough roads (front wheels only).		
	(a) Excessive clearance between the shoe and the caliper.	(a) Install new shoe and lining assemblies.
	(b) Shoe anti-rattle spring missing or not properly positioned.	(b) Install new anti-rattle spring or position properly.
Scraping—(a) Mounting bolts too long.		(a) Install mounting bolts of correct length.
	(b) Loose wheel bearings.	(b) Readjust wheel bearings to correct specifications.

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Condition	Possible Cause	Correction
FRONT BRAKES HEAT UP DURING DRIVING AND FAIL TO RELEASE	(a) Power brake malfunction.	(a) Check and correct power unit.
	(b) Sticking pedal linkage.	(b) Free up sticking pedal linkage.
	(c) Operator riding brake pedal.	(c) Instruct owner how to drive with disc brakes.
	(d) Frozen or seized piston.	(d) Disassemble caliper and free up piston.
	(e) Residual pressure valve in master cylinder.	(e) Remove valve. (See Fig. 17)
LEAKY WHEEL CYLINDER	(a) Damaged or worn caliper piston seal.	(a) Disassemble caliper and install new seal.
	(b) Scores or corrosion on surface of cylinder bore.	(b) Disassemble caliper and hone cylinder bore. Install new seal.
GRABBING OR UNEVEN BRAKING ACTION	(a) Power brake malfunction.	(a) Check and correct power unit.
	(b) Causes listed under "Pull."	(b) Corrections listed under "Pull."
BRAKE PEDAL CAN BE DEPRESSED WITHOUT BRAKING EFFECT	(a) Pistons pushed back in cylinder bores during servicing of caliper (shoe and lining not properly positioned).	(a) Reposition the brake shoe and lining assemblies. Depress pedal a second time and if condition persists, check the following causes:
	(b) Leak in system or caliper.	(b) Check for leak and repair as required.
	(c) Damaged piston seal in one or more of the cylinders.	(c) Disassemble caliper and replace piston seals as required.
	(d) Air in hydraulic system or improper bleeding procedure.	(d) Bleed the system.
	(e) Bleeder screw open.	(e) Close bleeder screw and bleed the entire system.
	(f) Leak past primary cup in master cylinder.	(f) Recondition the master cylinder.
	(g) Leak in rear brake cylinder.	(g) Hone cylinder bore. Install new piston cylinder cups.
	(h) Rear brakes out of adjustment.	(h) Adjust rear brakes.

GENERAL INFORMATION

The front wheel disc brake shown in (Fig. 1) consists of a fixed caliper (inner and outer housing), two friction pads (brake lining) bonded to steel shoes, four pistons, piston return springs, piston seals, dust boots and retainers. The brake disc is made from high grade cast iron and has a series of air vent louvres to provide cooling for the brake assembly. The splash shield has a series of stamped vents so designed as to supply additional air for cooling.

The brake disc is mounted on the front wheel hub by five bolts and is straddled by the caliper which is attached to the steering knuckle and steering knuckle arm by two bolts. The caliper assembly is composed of two housings. In each housing, there are two cylinder bores each containing a piston, piston seal, piston return spring; protected by a dust boot and retainer. Attached to the outer end of the piston is a heat resistant pad which contacts the shoe and acts as a heat insulator. Inserted between the pistons and the disc is the segmented lining and shoe assembly which are held in position by the brake shoe anti-rattle spring (Fig. 2).

Operation

As the brake pedal is depressed, the hydraulic pressure exerted in the system loads the pistons, clamping the disc between the brake shoe pads with equal and opposite force. When the brake pedal is released, the hydraulic pressure is reduced and the pistons relax. The compressed piston return spring positions the brake shoes lightly against the disc, ready for the next application.

The disc brake, having small friction segments operates on a small area of the braking disc surface, leaving a large proportion of the disc exposed to the atmosphere which allows a maximum dissipation of heat. The disc brake provides consistent performance even on frequent stops from high speed (Fig. 3).

The disc brake automatically compensates for normal wear, since the brake shoe lining brushes lightly against the disc when the brakes are not in use. Thus no adjustments are required. However, periodical inspection should be made to insure that the lining does not wear too thin. The shoes and lining should be replaced when the groove is no longer visible on the lining pad (.030 inch). The rate and type of wear will vary considerably with driving conditions.

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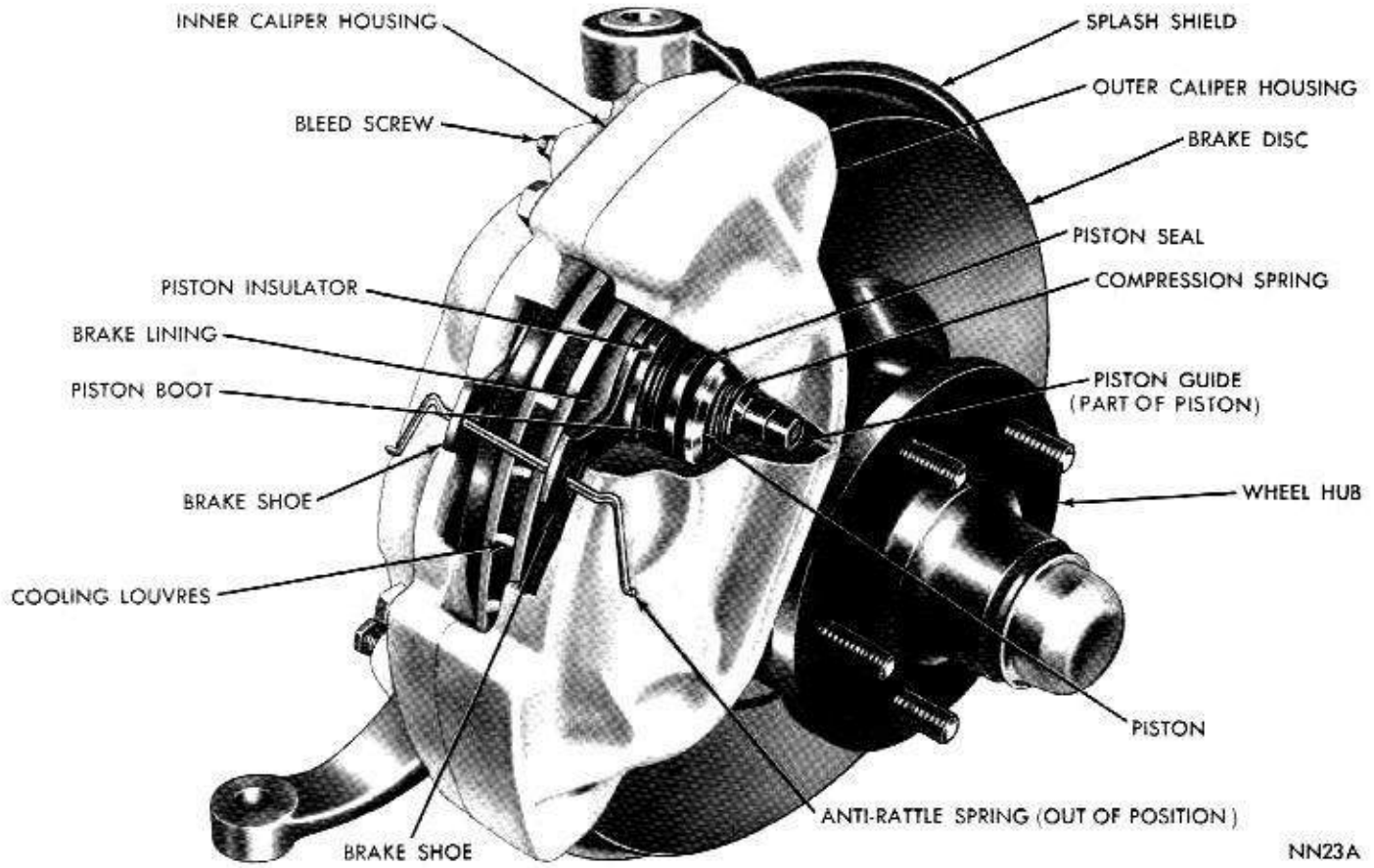


Fig. 1—Disc Brake Assembly (Cut-Away View)

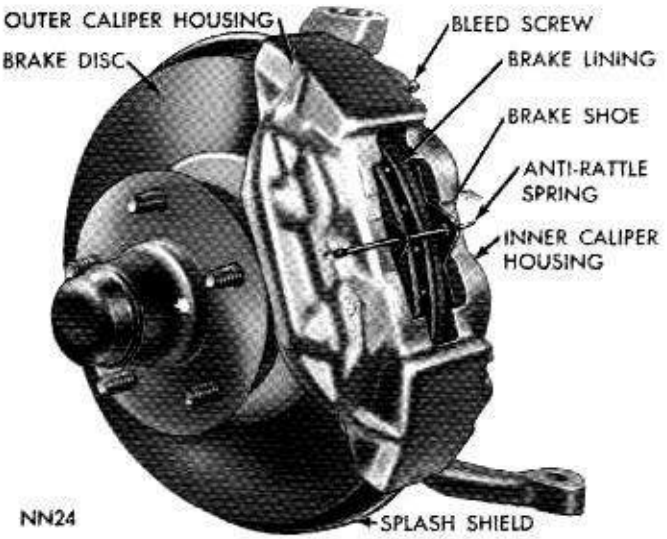


Fig. 2—Disc Brake Assembly

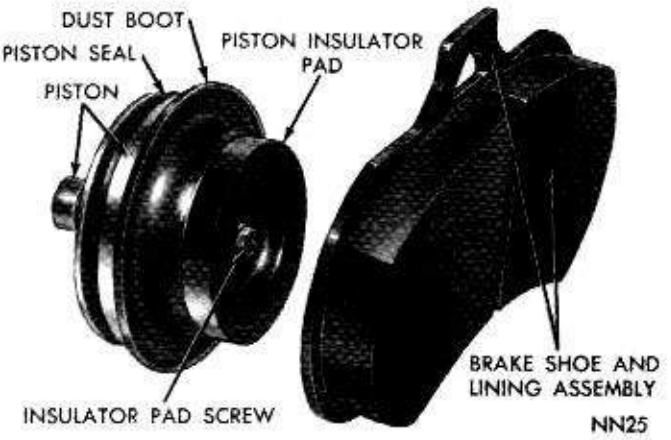


Fig. 3—Disc Brake Piston and Shoe and Lining Assembly

The pistons in the caliper assembly are of large capacity and as the pistons move out to compensate for lining wear, the fluid level in the master cylinder falls. The fluid level in the master cylinder should be checked at regular intervals (Fig. 15).

The master cylinder is of the dual reservoir type to compensate for the greater volume of brake fluid used in the system (Fig. 15). Special 14 x 4½ inch wheels are used on disc brake equipped vehicles.

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SERVICE PROCEDURES

BRAKE SHOE REMOVAL

Removing the Lining

To remove the disc brake shoe and lining assembly, refer to (Fig. 1) and proceed as follows:

(1) Raise car on hoist or jackstands.

(2) Remove wheel covers and wheel and tire assemblies.

(3) Remove brake shoe anti-rattle spring.

(4) Remove bolts that attach caliper assembly to steering knuckle and steering knuckle arm.

(5) Remove caliper from disc by slowly sliding caliper assembly up and away from braking disc.

(6) Carefully remove brake shoe and lining assembly (one at a time through top opening).

(7) Insert piston compression Tool C-3992 between piston insulator pads and turn knob on tool until pistons are fully compressed (Fig. 4).



Fig. 4—Piston Compression Tool Installed

CLEANING AND INSPECTION

Check for piston seal leaks (evident by fluid moisture around the cavity) and for any ruptures of the piston boot. Wipe the cavity clean (between the inner and outer caliper housings) with a shop towel. Check piston boot for proper seating in the piston groove and under the coiled retainer in the caliper groove

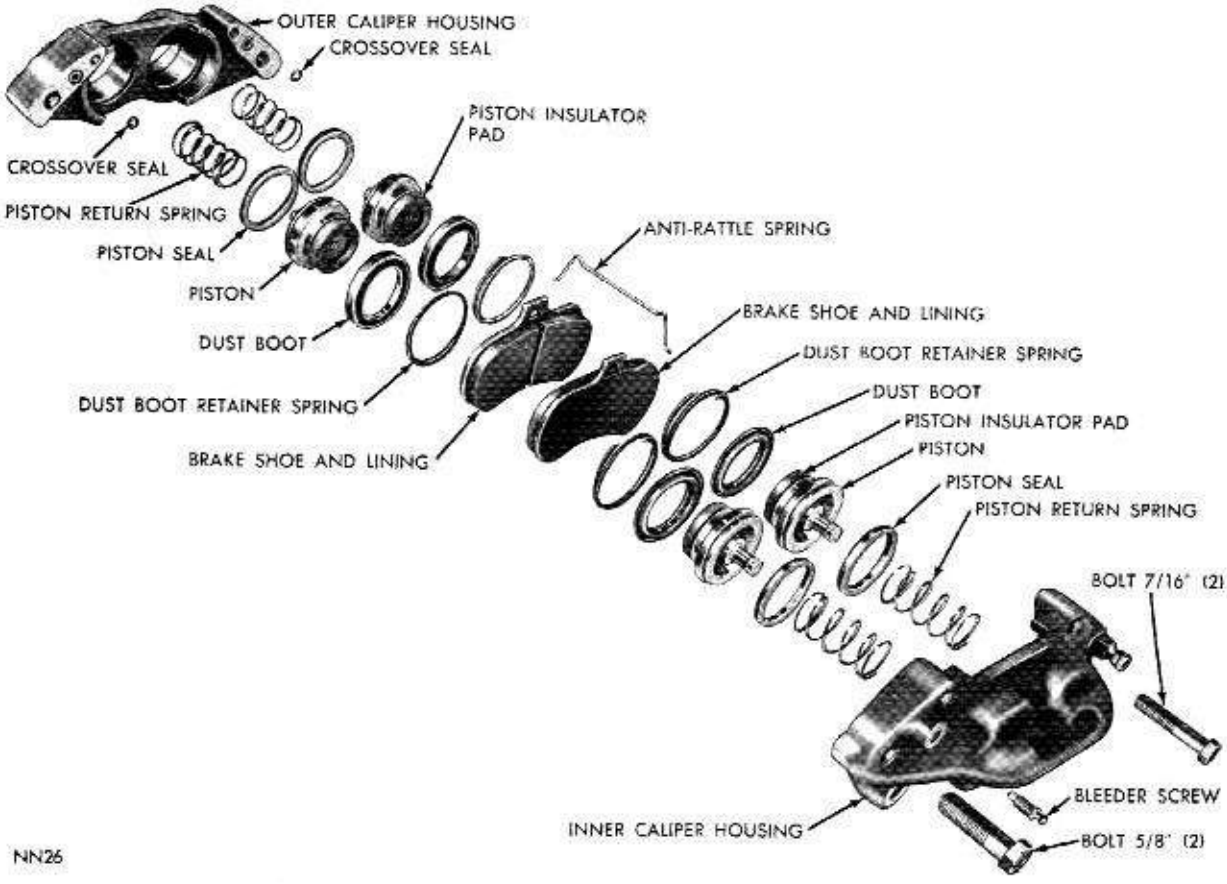


Fig. 5—Disc Brake Caliper Assembly (Exploded View)

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(Fig. 12). If fluid moisture is evident, it will be necessary to disassemble the caliper assembly and install new piston seals and boots. (Refer to "Disassembling the Caliper" Paragraph.)

BRAKE SHOE INSTALLATION

To install the disc brake shoe and lining assemblies refer to (Fig. 1) and proceed as follows:

(1) Slide disc brake shoe and lining assemblies into position in caliper assembly (one at a time).

(2) Position shoes, then install Tool C-3992 between shoes. Adjust tool so that it holds shoes apart but is not exerting a large force against lining surface so that tool will slip easily when contacted by disc.

(3) Slide caliper assembly down into position over brake disc and align mounting holes. (As caliper is being lowered, disc will force tool out of caliper.)

(4) Install caliper mounting bolts and tighten from 70 to 80 foot-pounds.

(5) Install wheel and tire assemblies and wheel covers.

(6) Remove jackstands or lower hoist.

CAUTION: Road test vehicle and make several heavy 40 m.p.h. stops to wear off any foreign material on brakes and to seat units. The vehicle may pull to one side or other if this is not done.

REMOVING THE CALIPER

Should it become necessary to remove caliper for installation of new parts, proceed as follows:

(1) Raise car on hoist or jackstands.

(2) Remove wheel covers, wheel and tire assemblies and anti-rattle springs. Disconnect brake line at caliper housing and install a ⅜-24 plug.

(3) Remove bolts that attach caliper assembly to steering knuckle and steering knuckle arm.

(4) Remove caliper from disc by slowly sliding caliper assembly up and away from braking disc.

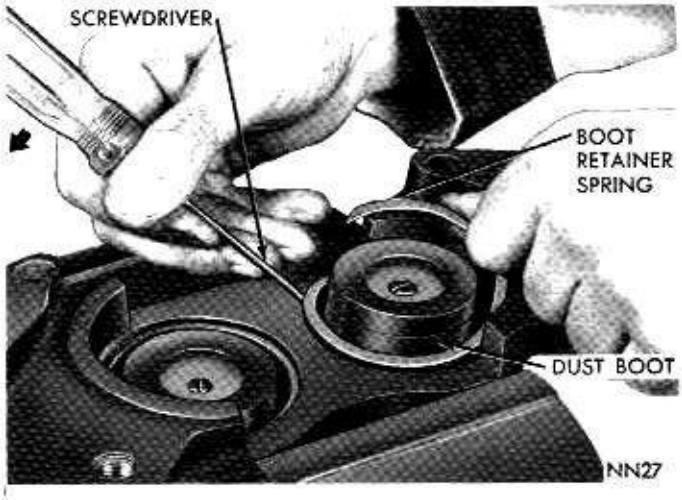


Fig. 6—Removing the Piston Dust Boot Retainer Spring

(5) Remove lining pads. Insert piston compression Tool C-3992 between piston insulator pads and turn knob on tool until pistons are fully compressed (Fig. 4). Remove to bench for disassembly.

DISASSEMBLING THE CALIPER

To disassemble the caliper, refer to (Fig. 5) then proceed as follows:

(1) Drain caliper, then place caliper assembly in a vise. Remove piston compression Tool C-3992 and four bolts that hold two halves of caliper together.

(2) Separate halves and remove two cross-over seals.

(3) Using a small screwdriver, pry out exposed end of piston dust boot retainer spring and uncoil from its groove to release dust boot (Fig. 6).

(4) Using same screwdriver, carefully work dust boot out of groove (Fig. 7). Be sure and hold piston compressed during this operation.

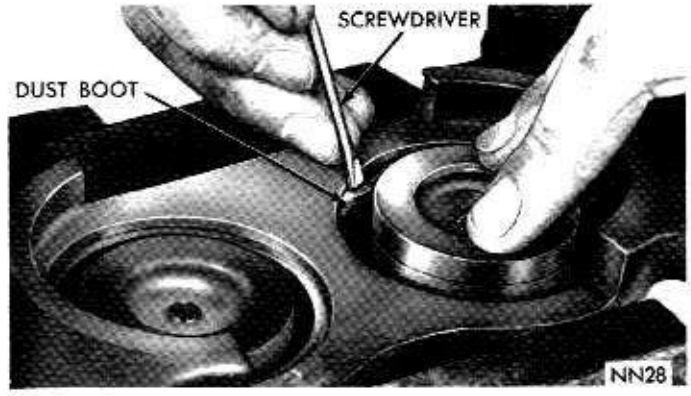


Fig. 7—Removing the Piston Dust Boot from Caliper

(5) Remove piston, piston seal and dust boot from caliper (Fig. 8). Remove piston return spring.

(6) Remove piston dust boot by grasping edge and pulling out of its groove (Fig. 9).

(7) Using fingers, roll piston seal out of its groove in piston (Fig. 10). Discard the seal.

(8) Remove the remaining three pistons in the

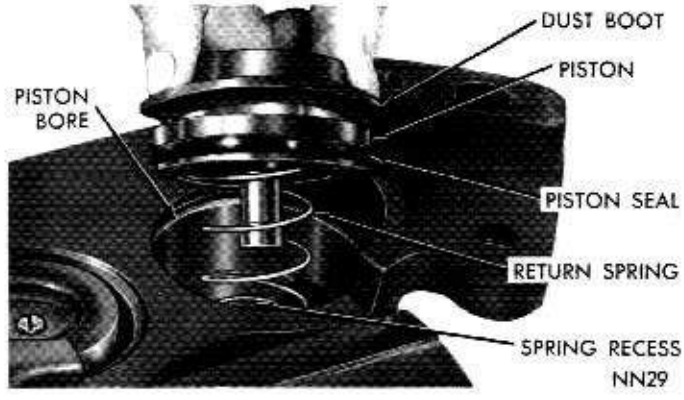


Fig. 8—Removing or Installing Piston and Piston Return Spring

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same manner.

(9) Remove the bleeder screw from the inner caliper housing.

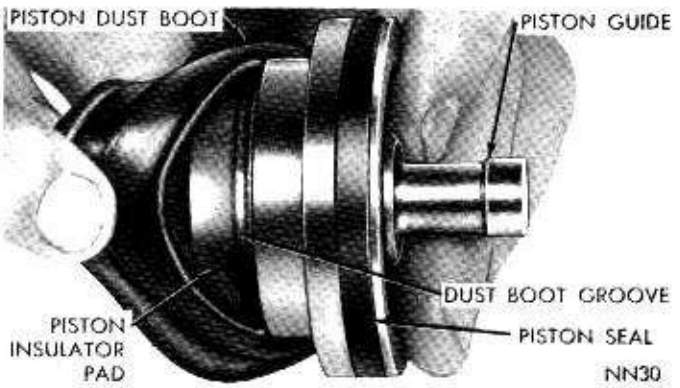


Fig. 9—Removing the Piston Dust Boot from Piston

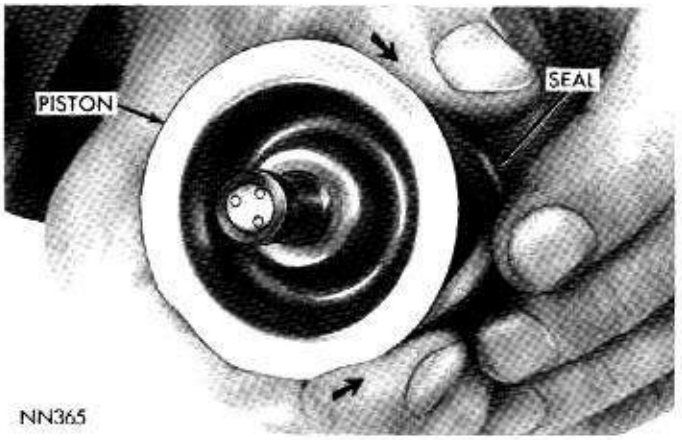


Fig. 10—Removing the Piston Seal

CLEANING AND INSPECTION

Clean all parts in alcohol; wipe dry, using clean lint free shop towels. Using an air hose, blow out the drilled passages and bores. Check the dust boots for punctures or tears. If punctures or tears are evident, new boots should be installed at reassembly. Inspect the piston bores in both housings for scoring or pitting. Bores that show light scratches or corrosion, can usually be cleaned with crocus cloth. However, bores that have deep scratches or scoring may be honed, using Tool C-3993, providing the diameter of the bore is not increased more than .002 inch. If the bore does not clean up within this specification, a new caliper housing should be installed. (Black stains on the bore walls are caused by the piston seals and will do no harm.)

When using hone C-3993 (Fig. 11) be sure and install the hone baffle before honing bore. The baffle is used to protect the hone stones from damage.

Use extreme care in cleaning the caliper after honing. Remove all dust and grit by flushing the caliper with alcohol; wipe dry with a clean lintless cloth and then clean a second time in the same manner.

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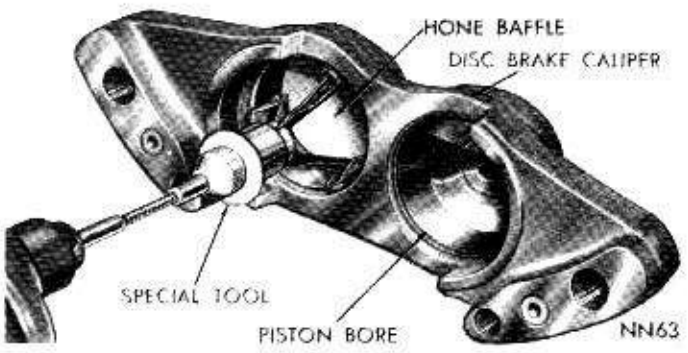


Fig. 11—Honing Piston Bore

ASSEMBLING THE CALIPER

To reassemble the disc brake caliper, refer to (Fig. 5), then proceed as follows:

(1) Clamp caliper housing in a vise, and coat cylinder bores with #55 Dow-Corning Pneumatic Silicone Grease (or equivalent) then install piston return spring. (Be sure spring is seated in the recess at bottom of the bore.) (Fig. 8).

(2) Coat outside diameter and fill inner diameter of a new piston seal with #55 Dow-Corning Pneumatic Silicone Grease (or equivalent) and work over piston land and down into position in groove, using fingers only.

(3) Install dust boot on piston with lip of seat toward piston pad. (Refer to Fig. 3.)

(4) Install piston assembly over return spring and press down until piston bottoms in bore.

(5) Using a small blunt screwdriver, work lip of boot into groove, around diameter of bore (Fig. 7). **Use care so as not to puncture boot during this operation, or a new boot will have to be installed.**

(6) Install coil retainer spring by inserting one end in position over boot in groove and continue to install around diameter of bore until retainer is fully seated. **Be sure that boot is completely locked in position by retainer and that retainer is fully seated in groove over boot (Fig. 12).**

(7) Install remaining pistons in same manner, then

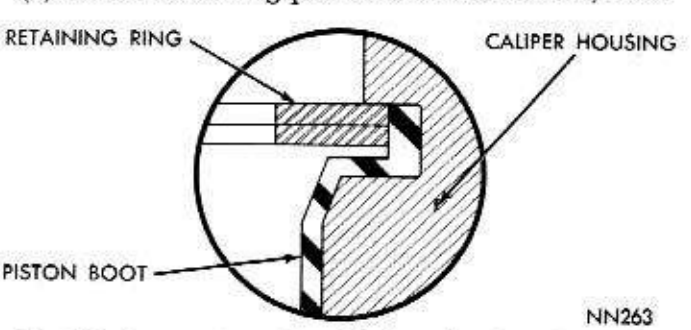


Fig. 12—Correct Boot Installation (Sectional View)

test pistons for smooth operation in their bores by depressing with fingers.

(8) Clamp outer caliper half in vise and install new crossover passage seals in position in recess of caliper mating surface.

(9) Place mating caliper half over one clamped in vise and install attaching bolts. Tighten to 55 foot-pounds (7/16 inch) and 150 foot-pounds (⅝ inch).

(10) Install brake shoes in caliper assembly and insert piston compression Tool C-3992 between lining pads. Turn knob on Tool until pistons are compressed. Adjust Tool so that it will slip easily when contacted by disc.

(11) Install the bleeder screw and tighten lightly.

INSTALLING THE CALIPER

Before installing the caliper assembly over the brake disc, check the disc for runout. Mount a dial indicator (Fig. 13) and check the lateral runout. Runout should not exceed .005 inch.

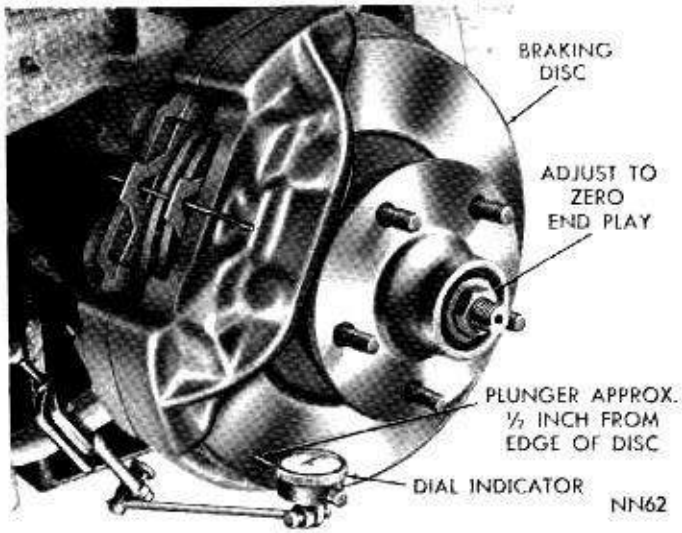


Fig. 13—Checking Braking Disc for Runout

(1) Install caliper assembly over disc and align mounting holes. Install mounting bolts and tighten from 70 to 80 foot-pounds. (As caliper is being lowered into place, disc will force the tool out of caliper.)

(2) Reconnect brake line at the caliper housing then follow normal bleeding procedure. (Be sure all air bubbles have escaped.) Replenish brake fluid in master cylinder.

(3) Install wheel and tire assembly and wheel covers.

(4) Remove jackstands or lower hoist.

CAUTION: Road test vehicle and make several heavy 40 MPH stops to wear off any foreign material on brakes and to seat units. The vehicle may pull to one side or other if this is not done. This condition will be more noticeable if only one brake was serviced.

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REMOVING THE BRAKING DISC AND HUB

Should it become necessary to remove the braking disc for installation of a wheel stud proceed as follows:

(1) Remove wheel cover and wheel and tire assembly.

(2) Remove caliper assembly as described under "Brake Shoe Removal."

(3) Remove grease cup, cotter pin, nut lock, nut, thrust washer and outer wheel bearing.

(4) Pull disc and hub off wheel spindle.

Removing the Braking Disc from the Hub

Should it become necessary to remove or install a wheel stud because of damage, refer to (Fig. 14) then proceed as follows:

Using a prick punch, mark both disc and hub so that balance will be assured at reassembly.

(1) Clamp wheel hub in a vise with disc attaching bolts facing up.

(2) Remove bolts that attach the disc to hub.

(3) Lift disc from hub to remove.

(4) Remove damaged stud, using an arbor press.

(5) Install new stud in position and press into place.

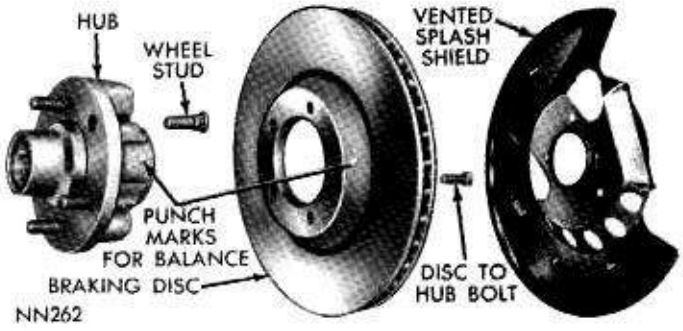


Fig. 14—Braking Disc and Hub (Exploded View)

Installing the Braking Disc on the Hub

After stud has been installed, wipe hub and disc mating surfaces to remove any loose foreign material and mount the disc on the hub as follows:

(1) Place disc on hub in vise and align bolt holes and prick punch marks.

(2) Install attaching bolts and tighten from 55 to 60 foot-pounds.

Refacing the Braking Disc

The surface of the disc should be smooth. The light scoring and grooving which appear after normal use are not detrimental to the operation of the brake. A heavily scored disc will impair efficiency and increase the lining pad wear, and should be replaced with a new disc and hub assembly.

Do not attempt to reface or grind the braking disc due to the close tolerances required. THIS IS IMPORTANT.

INSTALLING THE BRAKING DISC AND HUB

(1) Slide braking disc and hub assembly on spindle.
(2) Install outer bearing, thrust washer, and nut.
(3) Tighten wheel bearing adjusting nut to 90 inch-pounds while rotating hub and disc.
(4) Position lock nut on nut with one pair of slots in line with cotter pin hole.
(5) Back off adjusting nut and lock assembly one slot then install cotter pin. The resulting adjustment should be zero (no preload) to .003 inch end play. (This is very important, when checking disc runout.)
(6) Install a dial indicator C-3339 (Fig. 13) and check runout of disc outer surface. The runout should not exceed .005 inch.
(7) Clean grease cap, coating inside with wheel bearing grease (do not fill) and install cap.
(8) Install caliper assembly as described in "Brake Shoe Installation."
(9) Install wheel and tire assembly and wheel cover.
(10) Remove jackstands or lower hoist.
(11) Road test vehicle as described in "Installing the Caliper."

REMOVING THE MASTER CYLINDER

Should it become necessary to remove the master cylinder for repair or overhaul, proceed as follows:
(1) Remove nuts that attach master cylinder to power brake unit.
(2) Disconnect brake tube at master cylinder outlet, then plug hole.
(3) Slide master cylinder straight out and away from power brake unit and remove from vehicle.

DISASSEMBLING THE MASTER CYLINDER

To disassemble the master cylinder, refer to (Figs. 15 and 16), then proceed as follows:

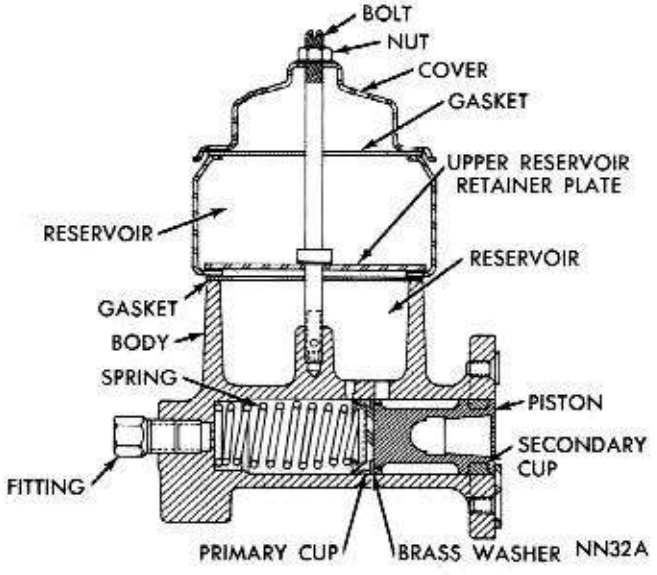


Fig. 15—Disc Brake Master Cylinder (Sectional View)



Fig. 16—Master Cylinder (Exploded View)

(1) Clean outside of master cylinder thoroughly.
(2) Remove master cylinder cover retaining nut; remove cover and gasket, then drain brake fluid.
(3) Remove piston stop flange attaching screw and remove piston assembly.
It should be noted at this time, that check valve usually located in master cylinder bore is not used. The residual check valve (Fig. 17) is located in brake line, after brake line tee. There is no hydraulic pressure to disc brake caliper when brakes are not applied, because fluid source at master cylinder bypasses residual check valve.
(4) Remove brass washer between piston and cup. Remove primary cup and spring.
(5) Using a wrench, loosen and remove center stud and lift off upper reservoir and gasket. Remove plate from inside reservoir.

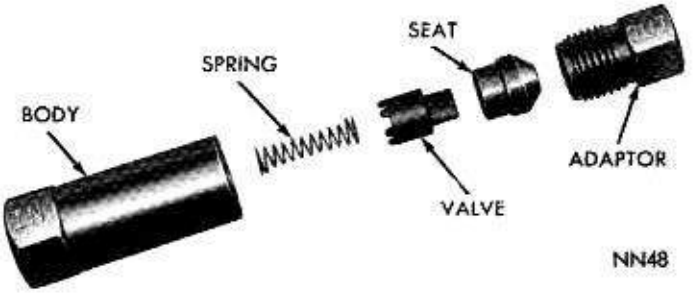


Fig. 17—Residual Pressure Check Valve

Cleaning and Inspection

Clean the master cylinder reservoir and main body,

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using a suitable solvent and blow dry with compressed air. Wash the master cylinder bore with clean brake fluid and inspect for scoring or pitting.

If the master cylinder piston is badly scored, or corroded, replace it with a new one. The primary and secondary cups should be replaced when reconditioning the master cylinder.

Master cylinder walls that have light scratches or show signs of corrosion, can usually be cleaned up with crocus cloth. However, cylinders that have deep scratches or scoring may be honed, providing the diameter of the cylinder bore is not increased more than .002 inch. A bore that does not clean up at .002 inch should be discarded and a new master cylinder installed. (Black stains on the cylinder wall are caused by the piston cups and will do no harm.) **Use extreme care in cleaning the master cylinder after reconditioning. Remove all dust or grit by flushing the cylinder bore with alcohol; wipe dry with a clean lintless cloth and clean a second time with alcohol. Dry the master cylinder bore with compressed air then flush with clean brake fluid. (Be sure the .028 inch diameter hole compensator port in the master cylinder bore is open.)**

ASSEMBLING THE MASTER CYLINDER

Before assembling, the piston and cups should be dipped in clean brake fluid. To reassemble the master cylinder, refer to (Figs. 15 and 16) then proceed as follows:

(1) Install piston return spring in cylinder bore with closed end outward.

(2) Install primary cup in cylinder bore with open end of cup over closed end of return spring.

(3) Install secondary cup on master cylinder piston and install piston assembly in bore with flat brass washer between piston and primary cup.

(4) Install piston retainer and screw to retain piston assembly.

(5) Place reservoir gasket in position on lower reservoir, then install retaining plate in upper reservoir.

(6) Place upper reservoir in position on reservoir gasket then install center stud. Tighten to 50 inch-pounds. (Be sure upper reservoir is centered on lower casting.)

INSTALLING THE MASTER CYLINDER

(1) Slide master cylinder over mounting studs on power brake unit, being sure brake push rod engages piston. Install attaching nuts and tighten to 200 inch-pounds.

(2) Attach brake line to master cylinder and tighten securely.

(3) Refill master cylinder reservoirs and bleed brakes as described previously.

(4) Install reservoir cover and gasket. Install attaching nut and tighten snugly.

Balancing the Front Wheels (Disc Brake Equipped Vehicles)

To balance the front wheels on a disc brake equipped vehicle, the normal procedure for static balancing as described under "Wheel Balance" in the Wheels, Bearings and Tires Section of this manual should be followed. Dynamic balancing of the front wheels can be accomplished by the normal procedure when the wheels are removed from the vehicle, but the Manufacturer's recommendations should be followed closely when attempting to balance the wheels while on the vehicle.

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SPECIFICATIONS

BUDD DISC BRAKE

Type of Brake	Fixed Caliper Disc
Location	Front Wheels Only
Master Cylinder Reservoir	Vertical Dual
Residual Valve Location	On Rear Brake Line
Brake Adjustment	None (Automatic)

Caliper Assembly

Shoe and Lining Removal	From either top or bottom (Caliper Removed)
Number of Pistons	4 (Each Assembly)
Piston Diameter	2.368/2.369"
Piston Bore Diameter	2.374/2.376"
Maximum Allowable (After Honing)	.002" O.S.
Piston Seals	Moulded Rubber (1 Per Piston)
Piston Dust Boots	External Moulded Rubber (1 Per Piston)
Dust Boot Retainers	Flat Coiled Steel (1 Per Piston)
Piston Return Springs	1 Per Piston
Bleeder Screw Location	On Inner Housing
Cross Over Passage Seals	Rubber (2 Per Caliber)

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Braking Disc	
Type	Ventilated Cast Iron
Diameter Outside	11.87/11.89"
Inside	7.23/7.25"
Disc Runout (Max. Allowable)	.005"
Disc Surface Finish	30-60 Micro Inches
Disc Thickness	.8725/.8775"
Minimum Thickness allowable for wear before replacement	.812"
Disc thickness variation not to exceed .0005" at any diameter.	
Disc Mounting (To Hub)	5 Bolts
Brake Shoe and Lining	
Type	Organic Lining
Thickness	1/2" Nom.
Width	2-3/16"
Length	5-3/16"
Braking Area (Per Shoe)	Approx. 10 Sq. Inches
Maximum Wear Limit	Not less than 1/32" at any point
Braking Disc Hub	
Type	Malleable Cast Iron
Master Cylinder	
Piston Bore Diameter	1-1/8"
Maximum Allowable (After Honing)	.002" O.S.
Residual Pressure Valve	None
Disc Splash Shield	
Type	Vented Stamped Steel
Mounting	3 Bolts to Knuckle
Wheels	
Type	Drop Center
Diameter	15 x 6K
Rear Brake Specifications (Budd Disc Brake Equipped Vehicles)	
Brakes: Type	Duo-Servo Single Anchor
Drum Diameter	11"
Number of Shoes	4
Width	2-1/2"
Lining Type	2-1/2"
Length-Rear Primary	9-1/4"
Rear Secondary	12-1/8"
Thickness	1/4"

BRAKES

MODEL APPLICATION	Newport	300 and New Yorker	Imperial
TYPE		Duo-Servo Single Anchor	
DRUM DIAMETER	11 in.	11 in.	11 in.
(Police & Heavy Duty)	11 in.		
NUMBER OF BRAKE SHOES	8	8	8
WIDTH			
Front	2¾ in.	3 in.	3 in.
Rear	2½ in.	3 in.	3 in.
(Police & Heavy Duty)			
Front	3 in.		
Rear	3 in.		
Station Wagon (Front & Rear)	3 in.	3 in.	
BRAKE LINING		Bonded Moulded Asbestos	
LENGTH & COLOR CODE MARKINGS			
Front Primary		9¼" 1 black and 1 orange mark	
Front Secondary		12⅛" 2 red marks	
Rear Primary		9¼" 1 black and 1 orange mark	
Rear Secondary		12⅛" 2 red marks	
(Police Special)			
Front Primary	9¼" 3 black marks		
Front Secondary	12⅛" 2 black and 1 white marks		

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Rear Primary	9¼" 3 black marks
Rear Secondary	12⅛" 2 black and 1 white marks
Thickness (all)	3/16 in.
WHEEL CYLINDER	
Front Wheel Cylinder Bore (all)	1⅛ In.
Rear Wheel Cylinder Bore	15/16 in.
Rear Wheel Cylinder Bore (Disc Brake Equipped Vehicles)	7/8 in.
MASTER CYLINDER BORE	
Disc Brake Equipped Vehicles	1⅛ in.
Standard Vehicles	1 in.

TIGHTENING REFERENCE

	FOOT-POUNDS
Caliper Mounting Bolts	70-80
Caliper Assembly Bolt 7/16"	50-60
5/8"	140-160 (Very Important)
Braking Disc to Hub Bolts	50-60
Splash Shield Bolts	17

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CLUTCH

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GENERAL INFORMATION

The Semi-Centrifugal, single dry disc clutch (Fig. 1) combines the feature of low pedal effort with that of a clutch capable of transmitting the full torque of the engine.

Six cylindrical rollers, located in the pressure plate, are free to move outward under centrifugal force until they contact the cover. As the engine speed increases, the rollers act as wedges between the cover and the pressure plate. The faster the clutch revolves, the greater the pressure on the plate. The greater pressure increases the normal load on the disc assembly.

The clutch size used in all models is 10½ inches.

No adjustment should be attempted on the three pressure plate release levers. The three levers are pre-set during manufacture and should never be disturbed.

The clutch pedal is connected to the torque shaft through a vertically positioned rod (Fig. 2). A non-adjustable over-center spring is provided between the pedal and the pedal bracket to allow easy clutch pedal operation.

The upper end of the clutch pedal pivots in the pedal bracket on two needle bearings. These bearings do not require periodic lubrication.

SERVICE DIAGNOSIS

Condition	Possible Cause	Correction
CLUTCH CHATTER	(a) Worn or damaged disc assembly.	(a) Replace disc assembly.
	(b) Grease or oil on disc facings.	(b) Replace disc assembly.
	(c) Improperly adjusted cover assembly.	(c) Replace clutch assembly.
CLUTCH SLIPPING	(a) Burned, worn, or oil soaked facings.	(a) Replace disc assembly.
	(b) Insufficient pedal free play.	(b) Adjust release fork rod.
	(c) Weak or broken pressure springs.	(c) Replace clutch assembly.
DIFFICULT GEAR SHIFTING	(a) Excessive pedal free play.	(a) Adjust release fork rod.
	(b) Worn or damaged disc assembly.	(b) Replace disc assembly.
	(c) Improperly adjusted cover assembly.	(c) Replace clutch assembly.
	(d) Clutch disc splines sticking.	(d) Remove disc assembly and free up splines or replace disc.
CLUTCH NOISY	(a) Dry clutch linkage.	(a) Lubricate where necessary.
	(b) Worn release bearing.	(b) Replace release bearing.
	(c) Worn disc assembly.	(c) Replace disc assembly.
	(d) Worn release levers.	(d) Replace clutch assembly.
	(e) Worn or dry pilot bushing.	(e) Lubricate or replace bushing.
	(f) Dry contact-pressure plate lugs in cover.	(f) Lubricate very lightly.

SERVICE PROCEDURES

CLUTCH PEDAL FREE PLAY

The only adjustment required for the clutch is the clutch pedal linkage adjustment to provide the prescribed clutch pedal free play. This is the pedal movement required to close the clearance between the release bearing and the clutch release levers when releasing the clutch. The adjustment is necessary to restore pedal free play reduced by normal clutch wear

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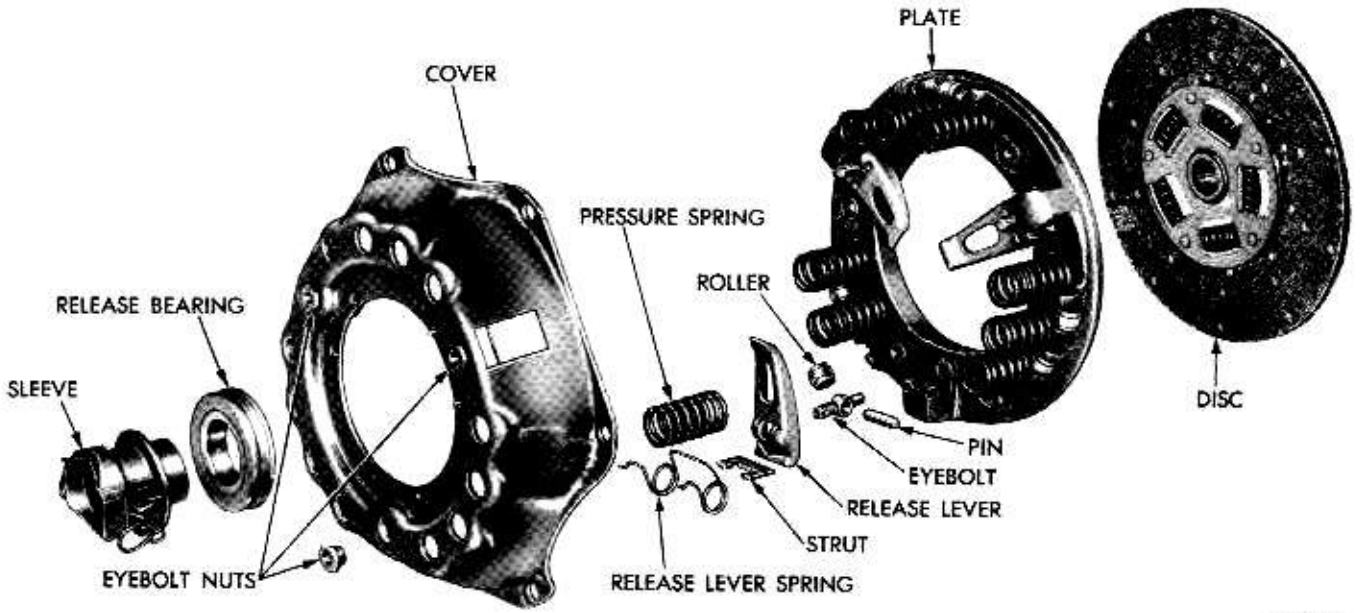


Fig. 1—Semi-Centrifugal Clutch

Adjusting Clutch Pedal Free Play

(1) Inspect condition of clutch pedal rubber stop (Fig. 2). If the stop is damaged, install a new one.

(2) On models using A-745 transmission, first disconnect interlock clutch rod at transmission end.

(3) Adjust linkage by turning the self-locking nut (Fig. 3) to provide 5/32 inch free movement at outer end of fork. This movement will provide the prescribed one-inch free play at the pedal (Fig. 2).

(4) Assemble interlock clutch rod, if used, to transmission pawl. If necessary to adjust, refer to "Transmission," Group 21.

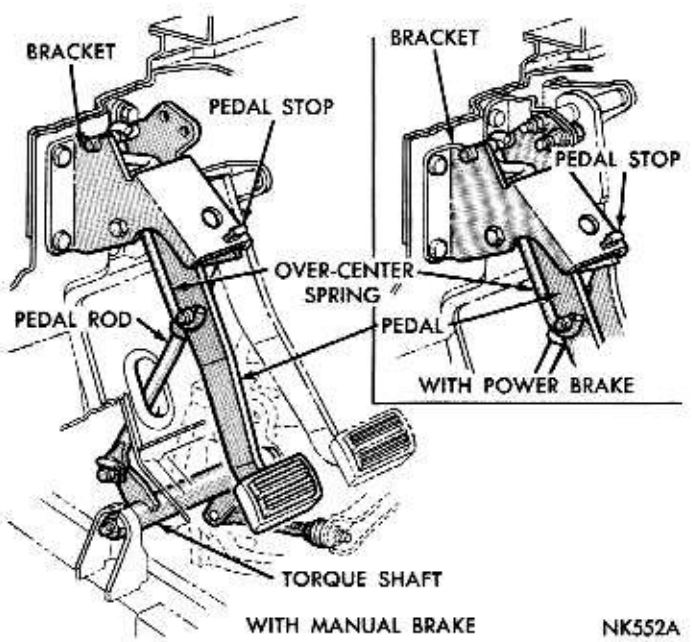


Fig. 2—Clutch Pedal and Linkage

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CLUTCH

Improper operation or excessive wear may impair the clutch function to a point where it may be necessary to remove and replace the disc and/or clutch assembly. Should this become necessary, proceed as follows.

Removal

(1) Remove transmission. See "Manual Transmission" Group 21 for detailed procedure.

(2) Remove clutch housing pan.

(3) Disconnect clutch linkage and return spring at clutch release fork (Fig. 3).

(4) Remove clutch release bearing and sleeve assembly from clutch release fork (Fig. 4).

(5) Mark clutch cover and flywheel (Fig. 5) to maintain their same relative positions during installation of clutch assembly.

(6) Loosen and back off clutch cover attaching bolts, one or two turns at a time, in succession, to avoid bending the cover flange.

(7) Remove clutch assembly and disc from clutch housing.

CAUTION: Handle clutch and disc carefully to avoid contaminating the friction surfaces.

Cleaning and Inspection

(1) Use compressed air to clean dust out of the clutch housing. Inspect for leakage through the engine rear main bearing oil seal. If leakage is noted, it should be corrected at this time.

(2) The friction face of flywheel should have a uniform appearance throughout the entire clutch contact area. If there is evidence of heavy contact on one

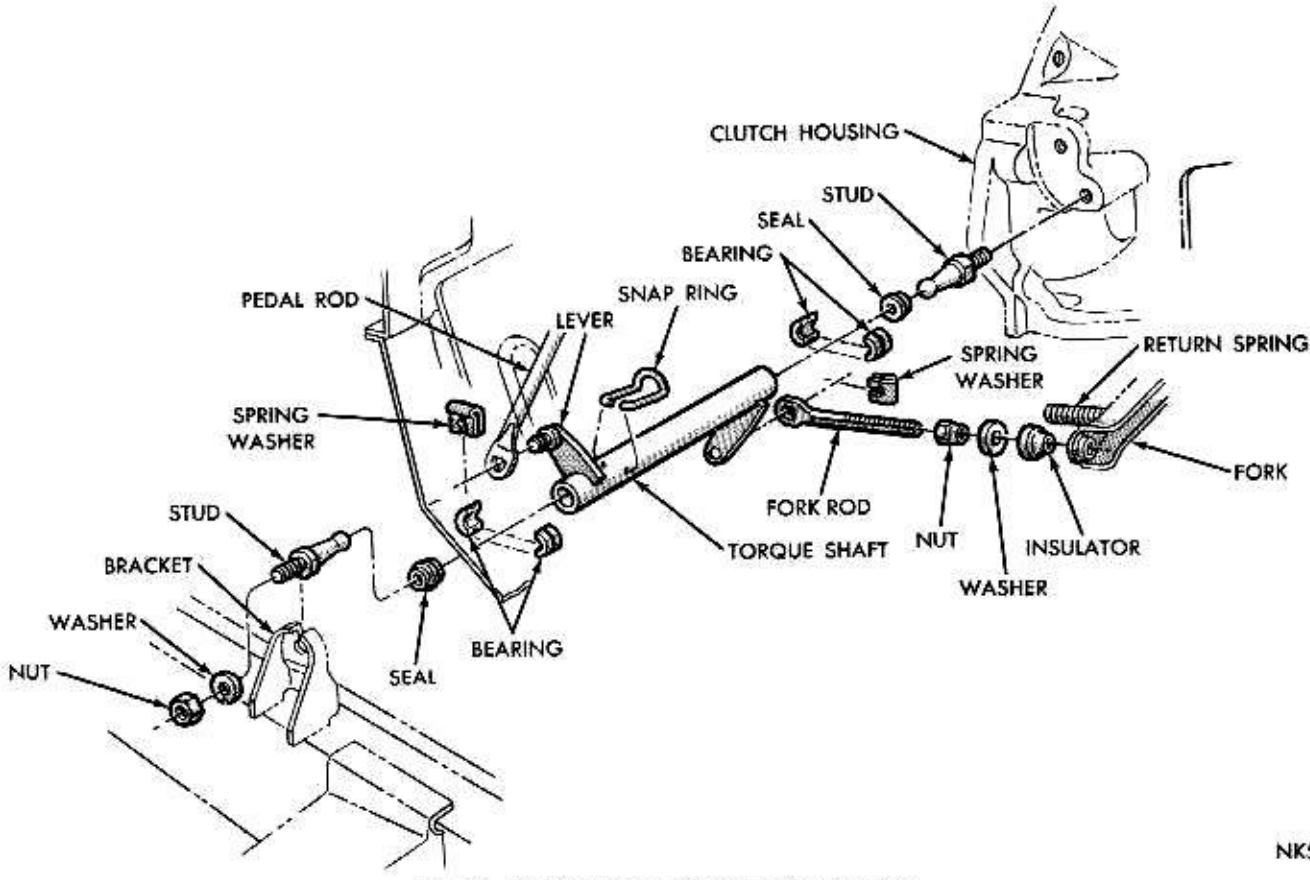


Fig. 3—Clutch Torque Shaft and Linkage

portion of the wear circle and a very light contact 180° from that portion, the flywheel may be improperly mounted or sprung. In such cases, a dial indicator, mounted on clutch housing with plunger in contact with the wear circle, should show **no more** than .003 inch runout throughout a complete rotation of flywheel.

(3) The friction face of the flywheel should also be free from discolored, burned areas, small cracks and excessive grooves or ridges.

(4) The bushing in end of crankshaft should be smooth and show no excessive wear. A new transmission main drive pinion or C-3181 Bushing Installing and Burnishing Tool, can be used to gauge the size of the bushing. The tool should have a snug fit in bushing.

If necessary to replace the bushing, proceed as detailed under "Crankshaft Transmission Drive Pinion Bushing," page 4.

(5) The end of the transmission main drive pinion should be smooth and bright, without grooves and ridges.

(6) The disc assembly should be handled without

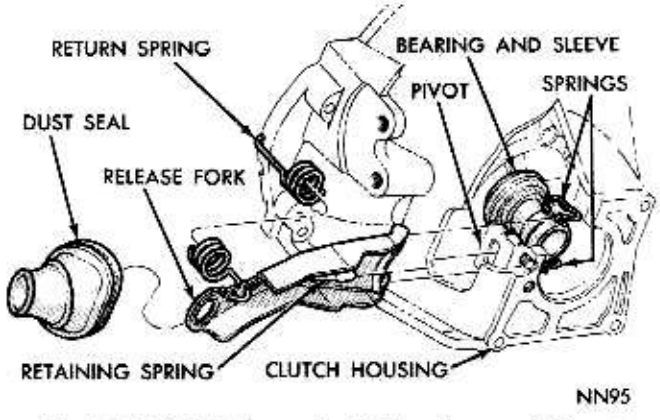


Fig. 4—Clutch Release Fork, Bearing and Sleeve

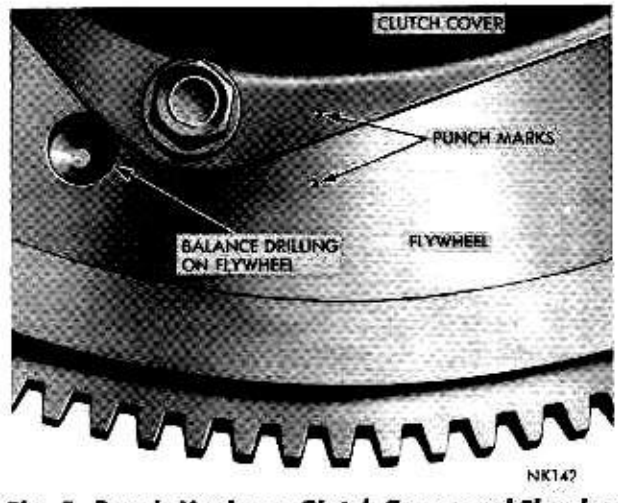


Fig. 5—Punch Marks on Clutch Cover and Flywheel

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touching the facings. Replace disc if facings show evidence of grease or oil soakage or wear to within less then 1/32 inch of the rivet heads. The hub splines and splines on transmission main drive pinion should be a snug fit without signs of excessive wear. The metallic portions of the assembly should be dry and clean and should show no evidence of having been hot. Each of the arched springs between facings should be unbroken and all rivets should be tight.

(7) Wipe friction surface of pressure plate with kerosene, mineral spirits or other similar solvent.

(8) Using a surface plate, test cover for flatness. All sections around attaching bolt holes should be in contact with surface plate within .015 inch.

The cover should be a snug fit on the pressure plate lugs, in the marked location.

The pressure plate friction area should be flat within .005 inch and should be free from discolored burned areas, cracks, grooves or ridges.

(9) Inner ends of release levers should have a uniform wear pattern.

If the clutch assembly does not meet these requirements, it should be replaced.

(10) Examine condition of clutch release bearing.

CAUTION: The clutch release bearing is a prelubricated sealed thrust bearing and should not be immersed in solvent.

The bearing should turn freely when held in the hands, under light thrust load, with no evidence of roughness.

(11) If bearing is noisy, rough or dry, replace it on the sleeve as detailed under "Clutch Release Bearing," page 5.

Installation

(1) Lubricate drive pinion bushing in end of crankshaft with about a half teaspoon of special long-life chassis grease or Multi-Mileage Lubricant, Part Number 2525035. Place the lubricant in the radius at the back of the bushing.

(2) Clean the surfaces of the flywheel and the pressure plate thoroughly, with fine sandpaper or crocus cloth, making certain that all oil or lubricant has been removed.

(3) Hold clutch disc, pressure plate and cover in mounting position, with the springs on the disc damper facing away from the flywheel. **Do not touch disc facing, as clutch chatter may result.** Insert C-360 Clutch Disc Aligning Arbor Tool through hub of disc and into the bushing (Fig. 6). If Tool C-360 is not available, use a spare transmission drive pinion.

(4) Insert clutch cover attaching bolts (after aligning balance punch marks) but do not draw down (Fig. 5).

(5) To avoid distortion of the clutch cover, the bolts should be tightened a few turns at a time (alternately) until they are all tight. Tighten bolts to 30 foot-pounds. Remove Tool C-360 (or drive pinion if used).

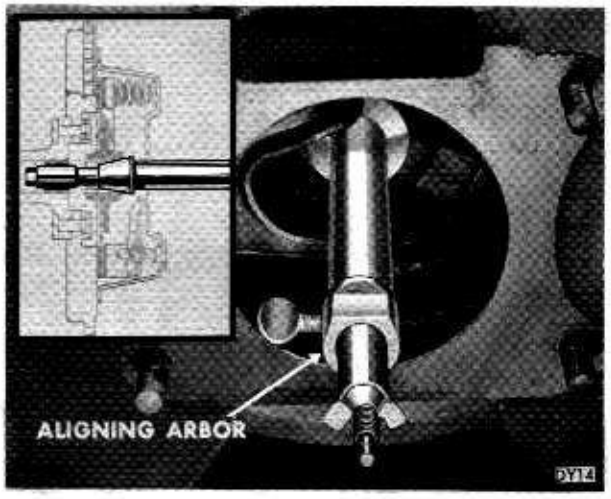


Fig. 6—Clutch Disc Aligning Arbor

(6) Fill cavity of bearing sleeve with Multi-Mileage Lubricant, Part Number 2525035, or Automotive Multi-Purpose Grease, NLGI grade 2. Also, apply a film of this same lubricant to the lugs of the sleeve.

(7) Position release bearing and sleeve in the clutch housing as far forward as it will go.

(8) Lubricate release fork fingers and retaining spring at the pivot contact area with a film of Multi-Mileage Lubricant, Part Number 2525035, or Automotive Multi-Purpose Grease, NLGI grade 2 (Fig. 4).

(9) Engage release fork fingers under clutch sleeve retaining springs. **Be sure the retaining springs on the sleeve have lateral freedom** (Fig. 4).

(10) Be sure groove in dust seal is engaged on seal opening flange in clutch housing.

(11) Assemble end of clutch release rod in fork (Fig. 3).

(12) Install release fork return spring.

CAUTION: When installing transmission, do not lubricate splines or pilot end of transmission drive pinion. These areas must be kept dry.

(13) Install C-730 Pilot Studs in clutch housing and install transmission as detailed in "Transmission Installation," group 21.

(14) Adjust clutch linkage as detailed under "Adjusting Clutch Pedal Free Play," page 1.

CRANKSHAFT TRANSMISSION DRIVE PINION BUSHING

See Paragraph "Clutch Cleaning and Inspection," page 2, for testing the size of the pilot bushing.

Removal

(1) Position outer portion of C-3185 Bushing Remover Tool in contact with the button on the end of the center screw.

(2) Thread outer portion of tool tightly into bushing.

(3) Turn center screw in through the outer portion

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to remove bushing.

Installation

(1) Soak a new bushing in engine oil prior to installation.

(2) Remove nut and cup from C-3181 Installing and Burnishing Tool.

(3) Place the new bushing on the tool shaft and drive bushing flush with the end of the crankshaft. **Use a soft hammer to prevent damage to the tool.**

(4) To remove installer, install cup and nut. As nut is tightened, tool will burnish the bushing.

(5) Insert ½ teaspoon of special long-life chassis grease or Multi-Mileage Lubricant, Part Number 2525035, ahead of the bushing.

CLUTCH RELEASE FORK

Removal

(1) Disconnect clutch fork return spring (Fig. 4).

(2) Disconnect clutch release fork rod from clutch fork (Fig. 3).

(3) Pry dust seal out of clutch housing and remove from clutch fork (Fig. 4).

(4) Grasp outer end of clutch fork and pull fork out and free of the retaining springs and off knife edge pivot (Fig. 4). **The clutch fork has a riveted flat retaining spring that is engaged in a hole of the pivot. The clutch release fork pivot is an "L" shaped bracket bolted inside the clutch housing.**

(5) Remove clutch fork from clutch housing.

Installation

(1) Apply Multi-Mileage Lubricant, Part Number 2525035 or Automotive Multi-Purpose Grease, NLGI, grade 2, to the pivot edge and hole of pivot (Fig. 4).

(2) Lubricate contact areas at end of clutch fork with Multi-Mileage Lubricant or Automotive Multi-Purpose Grease, NLGI, grade 2.

(3) Install clutch release fork in housing, being careful to engage the flat retaining spring in the hole of the pivot and under retaining springs of bearing sleeve.

(4) Install dust seal over release fork and engage the groove of the seal in the clutch housing.

(5) Attach clutch release rod and install return spring.

(6) Adjust clutch linkage as described under Paragraph "Adjusting Clutch Pedal Free Play," page 2.

CLUTCH RELEASE BEARING (Removed From Clutch)

Removal

(1) Examine condition of bearing. If noisy, rough or dry, under light thrust load, remove bearing from sleeve.

(2) Support bearing in a vise or press and carefully press out sleeve.

(3) Clean sleeve in solvent and remove all old lubricant.

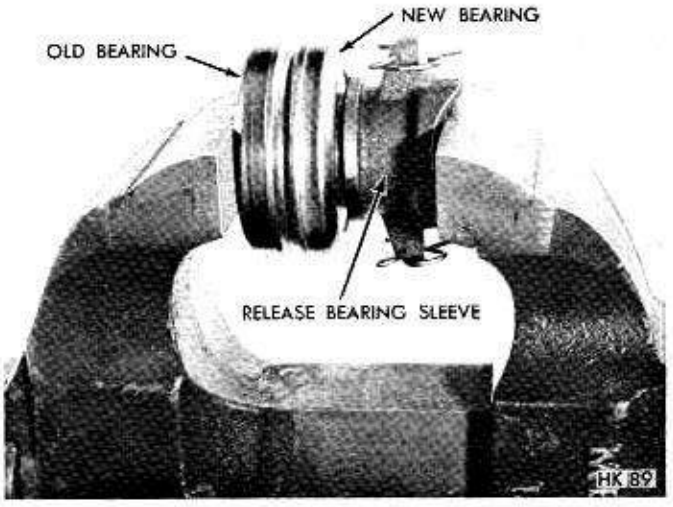


Fig. 7—Installing Clutch Release Bearing on Sleeve

Assembly

CAUTION: Exercise care when installing a new clutch release bearing to avoid damaging the bearing race. Never drive the bearing on the sleeve with a hammer. Use either of the following two methods.

Vise Method

(1) Position new bearing on sleeve and place old bearing against face of new bearing.

(2) Support parts in a vise and carefully press new bearing on sleeve (Fig. 7). **Make certain bearing is seated on shoulder of bearing sleeve. Rotate bearings as they are pressed together.**

Press Method

(1) Support sleeve on press bed.

(2) Position new bearing on sleeve and place old bearing on new one.

(3) Bring press ram into contact with old bearing and apply sufficient pressure to **seat new bearing on shoulder of sleeve. Rotate bearings as they are pressed together.**

Lubrication

(1) Fill cavity of bearing sleeve with Multi-Mileage Lubricant, Part Number 2525035, or Automotive Multi-Purpose Grease, NLGI grade 2.

(2) Also, apply a film of this same lubricant to the fork lugs of the sleeve.

(3) Apply a film of Multi-Mileage Lubricant, Part Number 2525035, or Automotive Multi-Purpose Grease, NLGI grade 2, to pivot contact area of fork retaining spring.

Installation

(1) Install bearing and sleeve into position, engaging the fork under the sleeve springs (Fig. 4).

NOTE: Be sure springs have lateral freedom.

CAUTION: When installing transmission, do not lubri-

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cate splines or pilot end of transmission drive pinion. These areas must be kept dry.

(2) Install C-730 Pilot Studs in clutch housing and install transmission as detailed in "Transmission Installation," Group 21.

(3) Adjust clutch linkage as detailed in "Adjusting Clutch Pedal Free Play," Page 2.

TORQUE SHAFT AND BEARINGS

Removal

(1) Remove pedal rod spring washer and pedal rod from torque shaft lever (Fig. 3).

(2) Remove clutch fork return spring (Fig. 4).

(3) Remove spring washer and clutch release fork rod from torque shaft lever (Fig. 3).

(4) Remove torque shaft stud nut and washer at the frame end.

(5) Remove torque shaft stud from clutch housing.

(6) Lift frame end of torque shaft to free stud from the slotted bracket.

(7) Remove torque shaft assembly from vehicle.

Cleaning and Inspection

(1) Clean all parts in kerosene, mineral spirits or other suitable solvent. Remove all grease from inside of torque shaft.

(2) The two ball studs should be bright and without scratches, ridges, or other surface imperfections.

(3) The inner surfaces of the bearings should also be smooth, without surface scratches or embedded foreign material. The wear pattern should be uniform over the entire surface.

(4) Replace worn or cracked rubber seals.

Installation

(1) Install new seals on ball studs (Fig. 3).

(2) Coat counterbored-ends of torque shaft, torque shaft bearings and ball studs with Multi-Mileage Lubricant, Part Number 2525035, or Automotive Multi-Purpose Grease, NLGI grade 2.

(3) Install ball stud in clutch housing (Fig. 3) and tighten to 40 foot-pounds.

(4) Install the bearings on frame end ball stud and force bearings into torque shaft far enough to install the snap ring (Fig. 3).

(5) Install the bearings on the engine side ball stud and force torque shaft over bearings.

(6) Position frame end torque shaft ball stud in slotted bracket (Fig. 3).

(7) Install frame end ball stud nut and washer, and tighten securely.

(8) Install clutch release rod in end of fork (Fig. 3).

(9) Connect opposite end of release rod to torque shaft and secure with spring washer.

(10) Connect pedal rod to torque shaft and secure with spring washer (Fig. 3).

(11) Install fork return spring.

(12) Adjust clutch linkage as detailed on page 2.

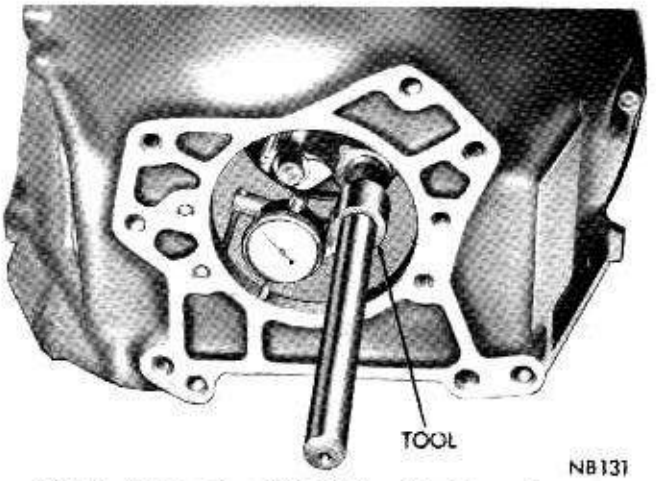


Fig. 8—Measuring Clutch Housing Bore Runout

CLUTCH HOUSING ALIGNMENT

When performing adjustments or repairs that involve removing the clutch housing, it will be necessary to align the face of the housing parallel with that of the cylinder block when assembling.

Bore Runout

(1) Mount C-870 Aligning Bar Tool with C-435 Dial Indicator on flywheel (Fig. 8).

(2) With C-771 Turning Tool turn the flywheel while noting dial indicator needle deflection. Out-of-round of bore must not exceed .008 inch maximum total indicator reading (Fig. 8).

If bore runout is in excess of .008 inch total indicator reading, proceed with correction as follows:

To illustrate the recommended correction procedure, assume that the total indicator reading is .020 inch, in a direction which approximates 2 o'clock on engine block (Fig. 9).

In this case, the housing is off crankshaft centerline .010 inch (one-half total indicator reading) which is .006 inch greater than the allowable limit of .004

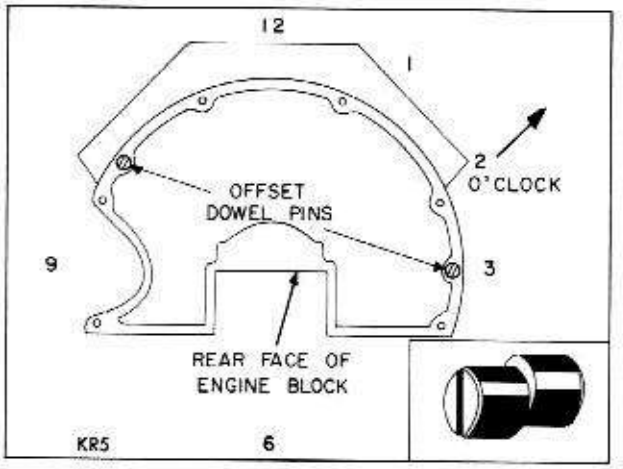


Fig. 9—Offset Dowel Diagram

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inch (one-half total indicator reading).

In the case under consideration, use of the .007 inch offset dowels (pair) will bring runout well within the allowable limits of .008 inch or .008 inch minus .007 inch (offset dowels) which equals .001 inch runout. Dowels must be used in pairs **(same part number).**

(3) To install the dowel pins (pair), remove the clutch housing, after disconnecting and removing the starting motor. Remove dowel pins from the engine block. Select eccentric dowels (pair) which are available with the following amount of offset: .007" (No. 1736347), .014" (No. 1736348), .021" (No. 1736353).

The amount of eccentricity of the dowel will produce a total indicator reading change of double the dowel eccentricity, therefore, select a pair of dowels with the nearest to one-half of the total indicator runout of the bore. For runout (total indicator reading) of .012" through .020", use a .007" dowel (No 1736347), .022" through .034", use .014 dowel (No. 1736348), and .036" through .052", use .021" dowel (No. 1736353).

(4) Install both dowels with the slots parallel and aligned in the direction to correct the bore runout. (Slot indicates the direction of the maximum dowel eccentricity.) Both dowels must be inserted into the engine block, up to the off-set shoulder.

(5) Install and tighten clutch housing bolts to 50 foot-pounds. Remount dial indicator and re-measure bore runout. Small corrections can be made by removing the clutch housing (if necessary) and turning the dowels with a screwdriver to shift the housing and bring the bore within limits.

Face Runout

(1) Relocate the dial indicator (Fig. 10) and rotate the flywheel, using Tool C-771, if total indicator reading is greater than .006 inch, note the amount of the total indicator reading and the location of the lowest indicator reading (i.e., the point where the indicator arm or follower is extended the furthest).

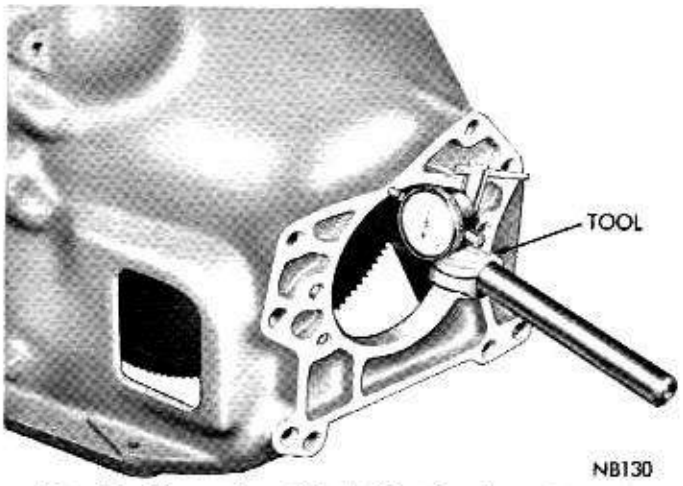


Fig. 10—Measuring Clutch Housing Face Runout

(2) To correct excessive runout, place proper thickness shim stock between the clutch housing and engine block or between the transmission and the clutch housing. After remeasuring face runout, tighten housing bolts to 50 foot-pounds.

(3) Install clutch release bearing, fork, linkage and transmission. Adjust clutch linkage.

STEAM CLEANING PRECAUTIONS

Since the clutch housing has provisions for ventilation, condensation from steam vapors tend to accumulate on the internal clutch mechanism when the vehicle is steam cleaned. The facings of the disc will absorb moisture, and the force exerted by the pressure plate will bond the facings to the flywheel and/or, the pressure plate, if the car is allowed to stand for some time before use. If this condition occurs, it will necessitate replacement of the disc assembly, flywheel and/or clutch assembly. **Immediately after the cleaning operation, start engine and "slip the clutch" in order to dry off the disc assembly, pressure plate, and/or flywheel.**

SPECIFICATIONS

MODEL APPLICATION	CHRYSLER
CLUTCH	
Make	Borg and Beck
Model	1647
Engine Size	383 cu. in. (standard)
Transmission Type	Standard 3-Speed
CLUTCH DISC	
Facing Type	Moulded Woven Asbestos
Outside Diameter	10½"
Thickness	.135"
Disc Springs (number)	10
Disc Spring Color	5 Green 5 Tan
CLUTCH COVER	
Pressure Springs (number)	12
Spring Color	6 Tan 6 White
Pedal Free Play (at fork end)	5/32"

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TIGHTENING REFERENCE

	POUNDS FOOT	POUNDS INCH
Clutch Housing to Engine Bolts	30	
Clutch Cover to Flywheel Bolts	30	
Clutch Pan Bolts		100
Clutch Fork Pivot Bolt		200
Flywheel Screws	55	
Transmission to Clutch Housing Bolts	50	
Torque Shaft Stud	40	

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COOLING SYSTEM

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GENERAL INFORMATION

In order to provide satisfactory protection for the wide variety of corporation models the cooling system of each must be tailored to specific needs. To do this effectively the Corporation offers three basic systems:

1. Standard
2. Air Conditioning
3. High Capacity

The standard system consists of a tube and spacer type radiator, 14 psi radiator pressure cap, centrifugal water pump, 180°F. thermostat, and a four or seven blade fan (Fig. 1). See specifications for application.

The cooling system for air conditioned, clean air package and trailer towing package cars generally requires a greater capacity radiator along with a fan shroud, 16 psi radiator pressure cap, special centrifugal water pump, larger fan, and thermostatically controlled fan drive (Fig. 2) (in some installations). See specifications for applications.

The high capacity system, available as optional equipment to the standard car, is a combination of the standard and air conditioning systems as necessary to provide protection against overheating for unusually severe operation requirements.

For internal cooling system protection each cooling system is factory equipped with sufficient permanent type anti-freeze for —20°F. protection. It is recommended that the coolant be changed annually to insure adequate anti-freeze and corrosion protection. In areas where anti-freeze is not required, MOPAR rust inhibitor or equivalent must be added to the water coolant for normal corrosion protection. Air conditioned cars require year round protection with permanent type anti-freeze with a minimum of +15°F. protection for summer operation and additional anti-freeze in the winter according to the prevailing temperatures.

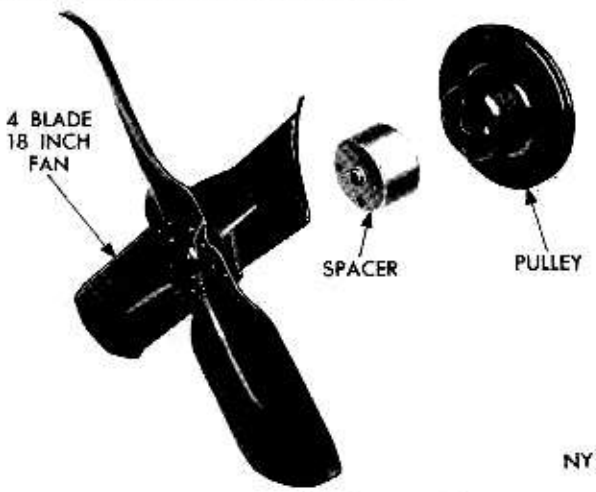


Fig. 1—Standard Fan Drive



Fig. 2—Thermal Control Fan Drive

SERVICE DIAGNOSIS

Condition	Possible Cause	Correction
EXTERNAL LEAKAGE	(a) Loose hose clamp.	(a) Replace the hose clamp.
	(b) Hose leaking.	(b) Replace the hose.
	(c) Leaking radiator.	(c) Repair or replace the radiator as necessary.
	(d) Worn or damaged water pump seal.	(d) Replace the water pump seal and impeller.
	(e) Loose core hole plug.	(e) Install new core hole plug.
	(f) Damaged gasket, or dry gasket, if engine has been stored.	(f) Replace gaskets as necessary.

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Condition	Possible Cause	Correction
	(g) Cylinder head bolts loose, or tightened unevenly.	(g) Replace the cylinder head gasket and torque head in correct sequence.
	(h) Leak at heater connection.	(h) Clean the heater connections and replace the hoses and clamps if necessary.
	(i) Leak at water temperature sending unit.	(i) Tighten the water temperature sending unit.
	(j) Leak at water pump attaching bolt.	(j) Tighten the water pump attaching bolts to 30 foot-pounds.
	(k) Leak as exhaust manifold stud.	(k) Seal and re-drive the stud.
	(l) Cracked thermostat housing.	(l) Replace the thermostat housing.
	(m) Dented radiator inlet or outlet tube.	(m) Straighten the radiator inlet or outlet tube as necessary.
	(n) Leaking heater core.	(n) Repair or replace the heater core.
	(o) Cracked or porous water pump housing.	(o) Replace the water pump assembly.
	(p) Warped or cracked cylinder head.	(p) Replace the cylinder head.
	(q) Cracked cylinder block.	(q) Replace the cylinder block.
	(r) Sand holes or porous condition in block or head.	(r) Replace the cylinder block or cylinder head as necessary.
	(s) Faulty pressure cap.	(s) Replace pressure cap.
	(t) Loose or stripped oil cooler fittings.	(t) Tighten or replace as necessary.
INTERNAL LEAKAGE	(a) Faulty heady gasket.	(a) Install a new head gasket.
	(b) Refer to causes (f), (g), (p), (q), (r) and (t) listed under External Leakage.	(b) Refer to corrections (f), (g), (p), (q), (r) and (t) listed under External Leakage.
	(c) Crack in head into valve compartment.	(c) Pressure test cooling system, replace the cylinder head.
	(d) Cracked valve port.	(d) Pressure test cooling system, replace the cylinder head.
	(e) Crack in block into push rod compartment.	(e) Pressure test cooling system, replace the cylinder block.
	(f) Cracked cylinder wall.	(f) Pressure test cooling system, replace the cylinder block.
	(g) Leaking oil cooler.	(g) Repair or replace the oil cooler.
POOR CIRCULATION	(a) Low coolant level.	(a) Fill radiator to correct level.
	(b) Collapsed radiator hose. (A bottom hose with faulty spring may collapse only at medium or high engine speeds.)	(b) Replace the hose and spring.
	(c) Fan belt loose, glazed or oil soaked.	(c) Tighten or replace the fan belt as necessary.
	(d) Air leak through bottom hose.	(d) Reposition hose clamps or replace the hose. Check radiator outlets for dents or out-of-round.
	(e) Faulty thermostat.	(e) Replace the thermostat.
	(f) Water pump impeller broken or loose on shaft.	(f) Replace the water pump impeller assembly.
	(g) Restricted radiator core water passages.	(g) Flush the radiator thoroughly or rod out if necessary.
	(h) Restricted engine water jacket.	(h) Flush the engine cooling system thoroughly.
OVERHEATING (Refer to Causes and Corrections listed under "Poor Circulation")	(a) Low coolant level.	(a) Fill radiator to proper level.
	(b) Blocked radiator air passages.	(b) Blow out the radiator air passages.
	(c) Incorrect ignition timing.	(c) Time the engine ignition system.
	(d) Low engine oil level.	(d) Add engine oil to the correct level.
	(e) Incorrect valve timing.	(e) Correct the engine valve timing.
	(f) Inaccurate temperature gauge.	(f) Replace the temperature gauge.
	(g) Restricted overflow tube.	(g) Remove restriction from the overflow tube.
	(h) Faulty radiator pressure cap or seat.	(h) Replace the radiator cap. Clean or replace seat.
	(i) Frozen heat control valve.	(i) Free up the manifold heat control valve.

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Condition	Possible Cause	Correction
	(j) Dragging brakes.	(j) Adjust the brakes.
	(k) Excessive engine idling.	(k) Set at faster idle or stop engine.
	(l) Frozen coolant.	(l) Thaw out cooling system, add antifreeze as required.
	(m) Faulty fan drive unit.	(m) Replace the fan drive unit.
	(n) Faulty temperature sending unit.	(n) Replace the sending unit.
OVERFLOW LOSS (Refer to causes listed under "Poor Circulation and Overheating")	(a) Overfilling.	(a) Adjust coolant to the correct level.
	(b) Coolant foaming due to insufficient corrosion inhibitor.	(b) Flush the radiator and add MoPar antifreeze or rust inhibitor as required.
	(c) Blown head gasket.	(c) Replace the head gasket.
	(d) Broken or shifted lower hose spring.	(d) Replace lower hose.
CORROSION	(a) Use of water containing large concentration of lime and minerals.	(a) Use only clean soft water with inhibitor.
	(b) Low coolant level.	(b) Fill the cooling system to the correct level.
	(c) Insufficient corrosion inhibitor.	(c) Use antifreeze or rust inhibitor as required.
	(d) Use of antifreeze for extended length of time.	(d) Drain and flush cooling system and replace with new antifreeze.
	(e) Failure to use corrosion inhibitor in summer.	(e) Flush radiator and refill with clean soft water and rust inhibitor.
	(f) Air leak at bottom radiator hose.	(f) Replace the hose and/or hose clamps.
TEMPERATURE TOO LOW—SLOW ENGINE WARM UP	(a) Faulty thermostat.	(a) Replace the thermostat.
	(b) Inaccurate temperature gauge.	(b) Replace the temperature gauge.
	(c) Faulty temperature sending unit.	(c) Replace the sending unit.
WATER PUMP NOISY	(a) Seal noisy.	(a) Add Water Pump Lube.
	(b) Bearing corroded.	(b) Replace bearing, seal, and impeller.

ACCESSORY BELT DRIVES

INSUFFICIENT ACCESSORY OUTPUT DUE TO BELT SLIPPAGE	(a) Belt too loose.	(a) Adjust belt tension.
	(b) Belt excessively glazed or worn.	(b) Replace and tighten as specified.
BELT SQUEAL WHEN ACCELERATING ENGINE	(a) Belt too loose.	(a) Adjust belt tension.
	(b) Belt glazed.	(b) Replace belt.
BELT SQUEAK AT IDLE	(a) Belt too loose.	(a) Adjust belt tension.
	(b) Dirt and paint imbedded in belt.	(b) Replace belt.
	(c) Non-uniform belt.	(c) Replace belt.
	(d) Misaligned pulleys.	(d) Align accessories (file brackets or use spacers as required).
	(e) Non-uniform groove or eccentric pulley.	(e) Replace pulley.
BELT ROLLED OVER IN GROOVE	(a) Broken cord in belt.	(a) Replace belt.
	(b) Belt not matched (A/C).	(b) Install matched belt.
BELT JUMPS OFF	(a) Belt too loose.	(a) Adjust belt tension.
	(b) Belts not matched (A/C).	(b) Install matched belt.
	(c) Misaligned pulleys.	(c) Align accessories.

SERVICE PROCEDURES

THERMAL CONTROL FAN DRIVE

The thermal control drive (Fig. 2) is a silicone fluid filled coupling connecting the fan to the fan pulley. A thermal spring on the drive face senses the heat from the radiator and engages the drive for normal fan operation when required.

In case of engine overheating during slow vehicle speed or idle operation, increase the engine speed to approximately 1000 rpm in neutral gear. If the condition is not corrected by increasing the engine speed, replace the fan drive unit with a unit known to be operating properly and test by operating the vehicle

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under the same conditions. Replace the original drive unit assembly if the trouble was corrected with the test unit

WATER PUMP

Removal (Fig. 3)

(1) Drain the cooling system. (Remove fan shroud if so equipped.)

(2) Loosen the power steering pump, idler pulley and alternator. Remove all belts.

(3) Remove the fan, spacer and pulley. On Air Conditioning Models, remove the pulley from the water pump fan hub. Loosen all nuts from the fan to remove the fan drive.

(4) Remove the bolts attaching the water pump body to the housing and remove the water pump.

Installation

CAUTION: When replacing the water pump do not install a standard water pump on any air conditioned vehicle except those equipped with trailer towing package or vice versa. See specifications for proper pump.

(1) Install the water pump body on the housing, using a new gasket.

(2) Tighten the bolts to 30 foot-pounds. Install the pulley, spacer and fan. (On Air Conditioning Models, assemble the fan to the fan drive and pulley, and attach the assembly to the water pump.)

(3) Tighten the nuts to 15 foot-pounds. Install fan shroud. Tighten belts as outlined in "Accessory Belt Drives." Run the engine, and test for leaks.

Disassembly (Fig. 3)

(1) Support the pump body on the hub and remove the impeller by breaking the plastic away from the metal insert (Fig. 4).

(2) Remove the impeller metal insert using a chisel and hammer.

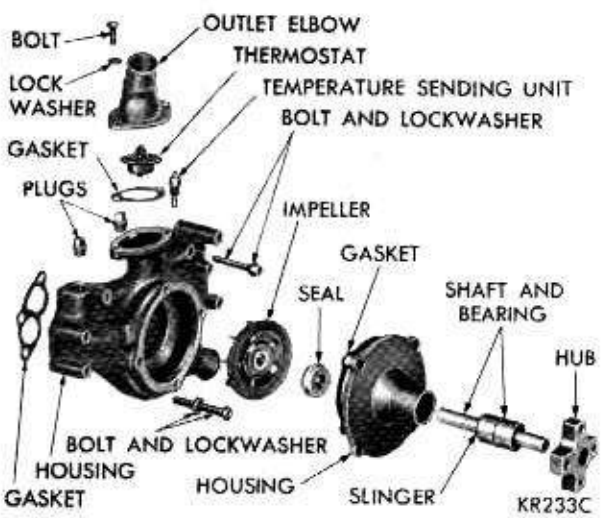


Fig. 3—383 and 440 Cubic Inch Engine Water Pump

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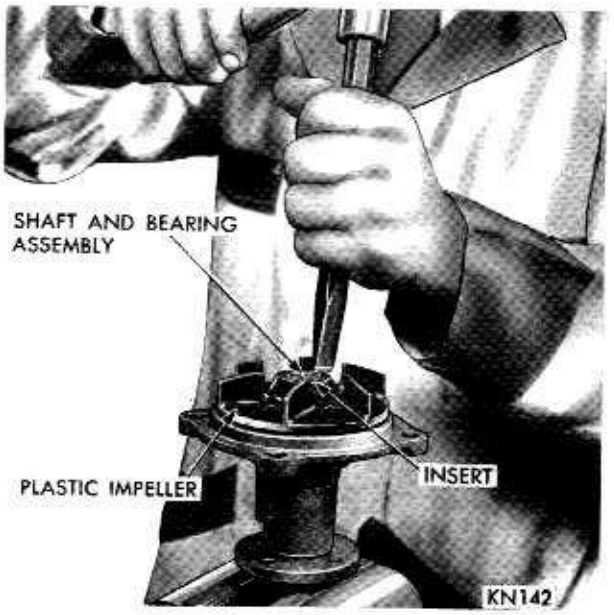


Fig. 4—Removing Plastic Impeller and Metal Insert

The shaft and bearing assembly do not have to be removed to service a leaking pump. The shaft and bearing assembly should be very carefully inspected to be sure the pump leak has not damaged the bearing.

(3) Remove the rubber portion of the shaft seal and the spring.

(4) Using Tool C-3753, remove the seal retainer from the housing.

(5) Remove the fan hub with Tool C-412.

(6) Support the body on the fan hub end and press out the shaft and bearing assembly.

CAUTION: The shaft and bearing assembly can be removed only in the direction described. If an attempt is made to remove the shaft in the opposite direction, damage to the water pump body may result.

The bearing and hub assemblies removed from water pumps for any reason should not be used again because damage to bearings and hub usually result during removal.

(7) Clean all parts thoroughly. Remove rust from the housing with a wire brush.

Assembly (Fig. 3)

Inspect the seal surface of the impeller hub to be sure it is free of nicks, burrs, scratches and rust. If necessary remove these blemishes using crocus cloth on a flat plate.

(1) Apply a thin coat of MoPar Perfect Seal Sealing Compound, Part Number 1057794 or equivalent to the seal pocket in the pump body.

(2) With the pump housing supported at the hub end, use a 1¼ inch (12 point) socket to apply pressure against the outer lip of the seal retainer and press the seal assembly into the body until the retainer lip is against the pump body.

(3) With the slinger ring in position on the long end of the pump shaft (approximately ⅛ inch from the bearing assembly) start the shaft and bearing assembly into the fan hub end of the pump body bore.

(4) Use a 1¼ inch (12 point) socket and support the pump body at the seal end. With Tool C-3468 positioned against the outer bearing race, press the shaft and bearing into the pump body so the end of the bearing is exactly flush with the end of the pump body.

(5) While supporting the pump on the impeller end of the shaft, press the fan hub onto the shaft (flat surface out) so that shaft extends 11/32 inch through the fan hub.

(6) Support the pump on the fan hub end of the shaft and position the new impeller on the pump shaft (blade portion up). Using a tool that will press against the impeller insert only, press the impeller onto the shaft until it is flush with the end of the shaft.

RADIATOR

Removal

(1) Drain the cooling system.

(2) On vehicles with automatic transmission, disconnect the oil cooler lines at the radiator bottom tank.

(3) Remove the upper and lower radiator hoses (using pliers Tool C-3250).

(4) On vehicles with a fan shroud, remove the lower half of the fan shroud.

(5) Remove the radiator attaching screws.

(6) The radiator can now be lifted free from the engine compartment. Care should be taken not to damage the radiator cooling fins or water tubes during the removal. Fan damage should be avoided.

Installation

(1) Slide the radiator down into position behind the radiator support and install the attaching bolts.

(2) Install the fan shroud, connect the hoses, and connect the transmission oil cooler lines.

(3) Fill the cooling system to 1¼" below the filler neck seat with water and rust inhibitor or water and anti-freeze, as required. After warm-up, re-check coolant level.

(4) On vehicles with automatic transmissions, measure the transmission oil level after warm-up and add oil as required.

Cleaning

(1) Drain the cooling system and refill with clean SOFT water and add the contents of one can (No. 1 top-compartment of MoPar Cooling System Cleaner) or equivalent.

(2) Operate the engine at a fast idle for ½ to ¾ hour.

(3) Drain the cooling system and refill with clean water.

(4) Pour the conditioner (No. 2 bottom-compartment) into the radiator and run engine for ten minutes.

(5) Flush the entire cooling system until the water runs clean.

(6) Refill the radiator with clean SOFT water.

(7) Use Radiator Rust Inhibitor during the summer months.

TRANSMISSION OIL COOLER

The transmission oil cooler is located in the bottom radiator tank, which is an integral part of the radiator.

In case of a leak, the engine coolant may become mixed with the transmission fluid, also, the transmission fluid may enter the cooling system. Both the cooling system and the transmission should be inspected in the event the cooler is leaking.

Testing Oil Cooler for Leaks

(1) Disconnect both oil cooler lines at the radiator.

(2) Connect a pressure gauge to one cooler connection and a shut off valve to the other. Close the valve.

(3) Connect a source of air pressure to the valve.

(4) Coat all fittings with oil.

(5) Open the valve and apply (up to 100 psi) air pressure. Oil bubbles will identify any fitting joint leaks. Repair all joint leaks.

(6) Close the valve. The gauge reading will then drop if the cooler is leaking inside of the lower radiator tank.

Repairing the Oil Cooler

(1) Remove the radiator from the vehicle.

(2) Remove the radiator lower tank.

(3) Melt the soft solder holding the cooler to the tank.

(4) Remove the stamped retainer nuts holding the cooler fittings to the bottom tank and remove the cooler.

(5) Install a new cooler or repair the old cooler with **silver solder** and reinstall as follows:

(6) Position the oil cooler in the bottom tank and install the stamped retainer nuts on the oil cooler fittings.

(7) Use soft solder to secure the cooler in the tank.

(8) Attach the bottom tank to the radiator using soft solder.

(9) Install the radiator as described in Paragraph "Radiator."

(10) Fill the cooling system and test for leaks.

If the transmission operates properly after repairing the leak, drain the transmission and torque converter while hot, remove the transmission oil pan and inspect for sludge, rust, dirty or plugged inlet filter. If none of these conditions are found reconditioning may not be necessary. Reassemble the transmission.

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Fill the transmission using Transmission Fluid, AQ-ATF, Suffix "A."

REVERSE FLUSHING THE COOLING SYSTEM

Reverse flushing of the cooling system is the forcing of water through the cooling system, using air pressure, in a direction opposite to that of the normal flow of water.

Flushing Cylinder Block

(1) Drain the radiator and remove the hoses at the radiator.

(2) Remove the thermostat and reinstall the thermostat housing.

(3) Install flushing gun, Tool C-3514 or other suitable flushing gun to the inlet hose.

(4) Connect the water hose of the gun to a pressure water source and the air hose of the gun to a pressure air source.

(5) Turn on the water, and when the cylinder block is filled, turn on the air in short blasts.

(6) Allow the cylinder block to fill between the blasts of air.

(7) Continue this procedure until the water runs clean. Test the thermostat and if satisfactory, reinstall; otherwise, replace, using a new housing gasket.

(8) Refill the cooling system and test for leaks.

Reverse Flushing the Radiator

(1) Drain the cooling system and remove the hoses from the engine.

(2) Install a flushing gun, Tool C-3514, or other suitable flushing gun in the radiator lower outlet.

(3) Fill the radiator and turn on the air in short blasts.

CAUTION: Do not apply more than 15 psi pressure when pressure flushing a radiator, as damage to the radiator may result.

(4) Continue this procedure until the water runs clean. Refill the cooling system.

(5) Run the engine and test for leaks.

THERMOSTAT

The thermostat is actuated by a pellet containing a copper-impregnated wax (Fig. 5). As the temperature of the pellet increases, the wax expands and opens the valve. A 180° thermostat is standard equipment.

If the thermostat does not close completely when cold, the engine will warm up slowly or not at all, and heater performance may also be impaired. Poor heater performance may also be due to the valve opening at too low a temperature. Too high a valve opening temperature or a valve that will not open can cause overheating.

Removal

(1) Drain the cooling system down to the thermostate level or below.

(2) Remove the upper radiator hose from the thermostat housing using pliers Tool C-3250.

(3) Remove the thermostat housing bolts and remove the thermostat and housing.

Testing Thermostat

(1) Visually inspect the thermostat to make sure the valve closes tightly. If the valve does not close completely due to dirt, sand or other foreign material, carefully clean the sealing edge making sure the sealing edge is not damaged. If the valve does not close tightly when clean, install a new thermostat.

(2) Immerse the thermostat in a container of warm water so that the pellet of the thermostat is completely covered. The pellet must not touch the bottom or sides of the container.

(3) Heat the water and stir it continuously (to insure uniform temperature) and test the water temperature with a thermometer at the point when a .003" feeler gauge can be inserted into the valve opening. The feeler gauge should pass freely into the valve opening at a water temperature of 175° to 185°F. If outside of this range, replace the thermostat.

(4) Continue heating the water to approximately 200°F. The thermostat valve should be fully open at this temperature. If it is not, replace the thermostat.

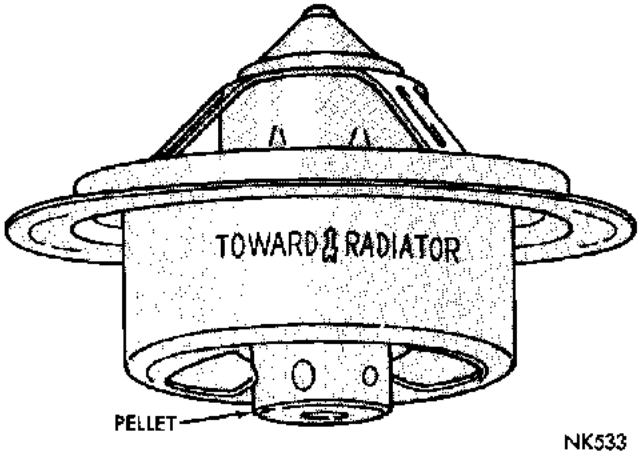


Fig. 5—Thermostat



Fig. 6—Radiator Pressure Cap

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Installation

(1) Using a new gasket, position the thermostat so the pellet end is toward the engine and attach with bolts through the thermostat housing.

(2) If removed, reinstall or replace the upper hose using Tool C-3250.

(3) Fill the cooling system to 1¼ inches below the filler neck with water and rust resistor or water and antifreeze.

RADIATOR HOSES

The hoses are removed and installed using hose clamp pliers Tool C-3250.

A hardened, cracked, swollen or restricted hose should be replaced.

The reinforcement spring inside the lower hose is necessary to prevent collapsing of the hose due to suction at medium or high engine speeds. If this spring is weak or broken, it should be replaced.

RADIATOR PRESSURE CAP

Radiators are equipped with a 14 psi cap, as standard equipment and 16 psi with air conditioning, C.A.P. equipped and trailer towing package (Fig. 6). Always note the identification number on the cap when replacing.

WARNING: When removing the pressure cap, turn counterclockwise to the stop, permitting the built-up pressure to escape through the overflow tube. This will prevent the hot water from spraying out of the radiator filler opening.

TESTING THE RADIATOR CAP

Select the short neoprene seal and metal adapter from the kit, Tool C-3499. Slip the seal on the tube at the bottom of the instrument. Attach either end of the short adaptor to the instrument. Dip the pressure cap in water and apply the cap to the end of the adapter. Working the plunger (Fig. 7), bring the pressure to 14 pounds on the gauge. If the pressure cap fails to hold the pressure within a range of 12 to 15 pounds, replace the cap with a **new tested** cap. If the vehicle is equipped with air conditioning, the cap should test between 15 to 16 psi.

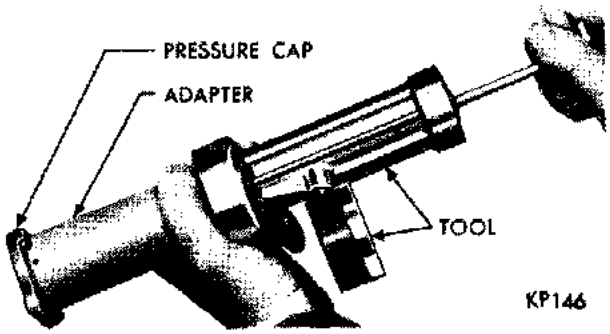


Fig. 7—Testing Pressure Cap

The brass vent valve at the bottom of the cap should hang freely. If the rubber gasket has swollen and prevents the valve from hanging loosely, replace the cap.

PRESSURE TESTING THE COOLING SYSTEM

(1) Wipe the radiator filler neck sealing seat clean. The water level should be ½ inch below the neck of the radiator.

(2) Attach the tester, Tool C-3499 to the radiator (Fig. 8) and apply 15 pounds pressure. If the pressure drops inspect all points for external leaks.

WARNING: Pressure builds up fast. Any excessive amount of pressure built up by continuous engine operation, must be released to a safe pressure point. NEVER PERMIT PRESSURE TO EXCEED 15 LBS.

(3) If there are no external leaks, after the gauge dial shows a drop in pressure, detach the tester and run the engine to operating temperature in order to open the thermostat and allow the coolant to expand. Re-attach the tester and pump to 7 lbs. pressure while the engine is running. Race the engine, and if the needle on the dial fluctuates it indicates a combustion leak, usually a head gasket.

(4) Remove the wires from the spark plugs on one bank and operate the engine on the opposite bank. If the needle continues to fluctuate it indicates a leak on the bank still in operation. If the needle ceases to fluctuate, the leak is in the bank, the combustion has been released from.

(5) If the needle on the dial does not fluctuate, race the engine a few times and if an abnormal amount of water emits from the exhaust system at the tail pipe, it may indicate a leak that can be a faulty head gasket, cracked engine block, or the cylinder head near the exhaust ports.

(6) If pressure test of the cooling system holds the pressure as outlined, then there is no leak, however,

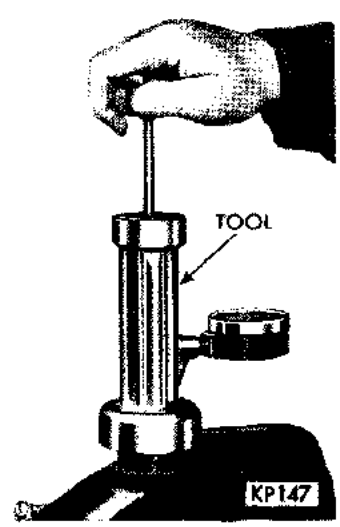


Fig. 8—Pressure Testing Cooling System

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there may be internal leaks which can be determined by removing the oil dipstick and if water globules appear intermixed with the oil it will indicate a serious internal leak in the engine. If there is an internal leak, the engine must be disassembled, the leak located and necessary new parts installed.

ENGINE WATER TEMPERATURE GAUGE

For removal, installation and testing procedures of the water temperature sending and receiving units, refer to "Gauges," Group 8, "Electrical."

ACCESSORY BELT DRIVES

PROPER BELT TENSION

The satisfactory performance of the belt driven accessories (Fig. 9) depends on the maintenance of the proper belt tension. There are two methods by which belt tensions can be properly established. "The Torque Method" and "The Belt Deflection Method." If the specified tensions are not maintained, belt slippage may cause engine overheating, lack of power steering assist, loss in air conditioning capacity, reduced belt life. To avoid any such adverse effects, the following service procedure should be followed:

Adjust all belts to the specified "belt in use" tension at new vehicle preparation. The new belt tension specifications should be used on all belt replacement, and the above procedure followed thereafter.

Torque Method

All alternator and power steering pump belts can be adjusted to the specified tension by use of a torque wrench. The power steering belts are tightened by using Tool C-3832 and torque wrench Tool C-3005. The alternator belts are adjusted by using a special Tool C-3841 and torque wrench Tool C-3005.

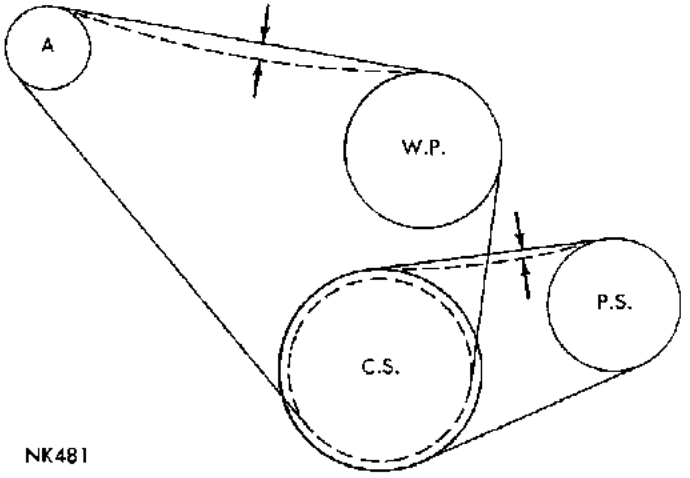
The special tool should be hooked at the heavily-ribbed section of the alternator rectifier end shield. Other belts can also be tightened by this method if the adjusting bracket has a square hole. To tighten belts by the torque method, loosen all mounting bolts and apply the specified torque to the accessory or idler. Tighten all mounting bolts while the torque is applied to the accessory. If it is not possible to use the torque wrench because of clearance, use an extension.

Belt Deflection Method

All belts can also be adjusted by measuring the defletion of the belt at the mid-point between two pulleys under a five-pound push or pull. A small spring scale can be used to establish the five-pound load. See Figure 9 for correct location at which to measure deflection.

This method should be used only when it is not possible to use the torque method. To adjust the belts by the deflection method, loosen all mounting bolts and use a bar to apply tensions to the belts being careful not to damage the accessory. A ½ inch square drive hinge handle can be used if the accessory has a square hole. Tighten the mounting bolts and test the deflection. (See Specifications.) It may be necessary to repeat this procedure several times to establish the correct tension.

Any belt that has operated for a minimum of a half-hour is considered a "belt in use."



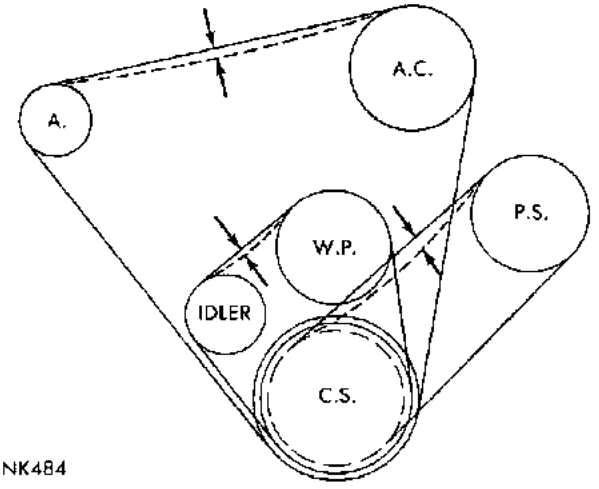


Fig. 9—Belt Deflection Locations

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SPECIFICATIONS

Engine	Options	Transmission	Oil Cooler Size	FAN Box Shroud	FAN Diameter	FAN No. Blades	FAN Width	FAN Ratio	FAN Drive	Water Pump Impeller Spacer	Water Pump Impeller Diameter	Water Pump Impeller Blades	Pressure Cap PSI	Coolant Capacity
Newport 383-2 BBl. & 383-4 BBl.	None	3-Speed Manual 2 BBl. only	—	None	18"	4	2"	.95	Solid	1.72"	4.38"	10	14	16**
		Automatic	10"	*	*	*	*	*	*	*	*	*	*	*
	C.A.P.	3-Speed Manual 2 BBl. only	—	Yes	18½"	7	2½"	*	Torque	None	*	*	16	*
		Automatic	10"	*	18"	7	2"	*	Solid	1.72"	*	*	*	*
	A/C	3-Speed Manual	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Automatic	10"	Yes	18½"	7	2½"	1.4	Thermal	None	3.67"	6	16	16**
	A/C & C.A.P.	3-Speed Manual	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Automatic	10"	Yes	18½"	7	2½"	1.4	Thermal	None	3.67"	6	16	17**
	Trailer Tow	Automatic	12"	*	18"	7	2¼"	.95	Solid	1.72"	4.38"	10	16	*
440	None	Automatic	12"	None	18"	4	2"	.95	Solid	1.72"	4.38"	10	14	16**
	C.A.P.	Automatic	12"	Yes	18½"	7	2½"	*	Torque	None	4.38"	10	16	*
	A/C	Automatic	12"	*	*	*	*	1.4	Thermal	None	3.67"	6	16	17**
	A/C & C.A.P.	Automatic	12"	*	*	*	*	*	*	*	*	*	*	*
	Trailer Tow	Automatic	12"	*	18"	7	2¼"	.95	Solid	1.72"	4.38"	10	16	*
300 & N.Y. 383 or 440	None	3-Speed Manual 383 only	—	None	18"	4	2"	.95	Solid	1.72"	4.38"	10	14	16**
		Automatic	10"+	*	*	*	*	*	*	*	*	*	*	*
	C.A.P.	3-Speed Manual	—	Yes	18½"	7	2½"	*	Torque	None	4.38"	10	16	*
		Automatic	10"+	*	*	*	*	*	*	*	*	*	*	*
	A/C	3-Speed Manual	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Automatic	10"+	Yes	18½"	7	2½"	1.4	Thermal	None	3.67"	6	16	17**
	A/C & C.A.P.	3-Speed Manual	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Automatic	10"+	Yes	18½"	7	2½"	1.4	Thermal	None	3.67"	6	16	17**
	Trailer Tow	Automatic	12"	*	18"	7	2¼"	.95	Solid	1.72"	4.38"	10	16	*
Imperial	None	Automatic	12"	Yes	18"	4	2"	*	Solid	1.72"	4.38"	10	14	17**
	C.A.P.	Automatic	12"	*	18½"	7	2½"	*	Torque	None	*	*	*	*
	A/C	Automatic	12"	*	*	*	*	1.4	Thermal	*	3.67"	6	16	*
	A/C & C.A.P.	Automatic	12"	*	*	*	*	*	*	*	*	*	*	*
	Trailer Tow	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

+ All 440 engines with automatic transmission use a 12" oil cooler.
** Add 1 quart for heater, and additional 1½ quarts for rear seat heater.
* Single asterisk designates same as above

ACCESSORY BELT DRIVES

TORQUE METHOD

Torque (Ft. Lbs.) to be applied to components

ACCESSORY	USED BELT* 383-440 Cu. In.	NEW BELT 383-440 Cu. In.
Power Steering Bracket		
Solid Bracket	55	90
Self Tightening	45	45
Alternator		
With Air Conditioning	40	60
Without Air Conditioning	40	60
A/C Idler Bracket	30**	40**
Fan Idler	35	50

*Any belt that has operated for a minimum of a half-hour is considered to be used.
**"RB" Engine only.

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BELT DEFLECTION METHOD

Deflection (Inches) to be Applied at Midpoint of Belt Segment Under a 5 Pound Load

Accessory	ALL MODELS	
	USED BELT	NEW BELT
Power Steering	3/16	3/16
Fan Belt—Idler	⅛	1/16
Alternator—Without A/C*	¼	⅛
With A/C*	⅜	¼

*A/C—Air Conditioning

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ELECTRICAL

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BATTERY

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BATTERY TESTING CHART

Hydrometer Test (Corrected to 80°F.)	State of Charge or Battery Condition	Correction
LESS THAN 1.220 SP. GR.	Battery low.	Recharge battery. Make a high rate discharge test for capacity. If cells test O.K., recharge and adjust gravity of all cells uniformly. Test voltage regulator setting. Thoroughly test electrical system for short circuits, loose connections and corroded terminals.
CELLS SHOW MORE THAN 25 POINTS (.025 Specific Gravity) VARIATION	Short circuit in low cell. Loss of electrolyte by leakage or excessive overcharge.	Try to recharge the battery. See "Charging the Battery." See "Adjustment of Acid Gravity." Test battery for capacity. Install new battery if necessary.
CELLS SHOWING MORE THAN 1.220 SPECIFIC GRAVITY.	Improper addition of acid. Natural or premature failure. Cracked case. Satisfactory.	No correction required make a high rate discharge capacity test, if cells test O.K., adjust gravity of all cells uniformly.

Cranking Test	Possible Cause	Correction
IF THE VOLTAGE DROP IS MORE THAN 0.3 VOLTS (3/10) BETWEEN THE STARTING MOTOR CABLE AND THE VEHICLE FRAME WHILE CRANKING LOOK FOR:	Poor contact between cable terminal and vehicle frame or between cable clamp terminal and battery post or starter switch contacts. Frayed, corroded or broken cable.	Locate high resistance: repair or replace as necessary.

SERVICE PROCEDURES

BATTERY VISUAL INSPECTION

(1) Protect paint finish with fender covers.

(2) Disconnect battery cables at battery.

(3) Remove battery hold-down clamp and remove battery from vehicle.

(4) Inspect battery carrier and fender side panel for damage caused by loss of acid from battery.

(5) Clean top of battery with a solution of clean warm water and baking soda. Scrub areas with a stiff bristle brush being careful not to scatter corrosion residue. Finally wipe off with a cloth moistened with ammonia or baking soda in water.

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CAUTION: Keep cleaning solution out of battery cells to eliminate weakening the electrolyte.

(6) Inspect cables. Replace damaged or frayed cables.

(7) Clean battery terminals and inside surfaces of clamp terminals with Cleaning Tool MX-75.

(8) Examine battery case and cover for cracks.

(9) Install battery.

(10) Tighten battery hold-down screw nuts to 3 foot-pounds torque.

Observe polarity of battery terminals to be sure the battery is not reversed.

(11) Connect cable clamps to battery posts and tighten securely. Coat all connections with light mineral grease or petrolatum after tightening.

(12) If electrolyte level is low, fill to recommended level with mineral-free water.

SPECIFIC GRAVITY TEST

A hydrometer Tool 40-B is used to measure specific gravity of electrolyte in battery cells. This gives an indication of how much unused sulphuric acid remains in the solution.

A hydrometer should be graduated to read from 1.160 to 1.320, in graduations of .005 specific gravity. Graduated markings should be not less than 1/16 inch apart and accurate to within .002 specific gravity. Graduated portion of stem should be about two inches long. Clearance between float and glass barrel, at smallest diameter, should be a minimum of ⅛" around all sides and barrel must be clean.

Hydrometer floats are calibrated to indicate correctly only at one fixed temperature.

Liquid level of battery cell should be at normal height and electrolyte should be thoroughly mixed with any battery water which may have just been added by charging battery before taking hydrometer readings. See "Adjustment of Acid Gravity."

In reading a hydrometer, the gauge barrel must be held vertically and just right amount of fluid be drawn up into gauge barrel with pressure bulb fully expanded to lift float freely so it does not touch the sides, top or bottom of the barrel. Take a reading with eye on level with liquid level in the gauge barrel. **DO NOT TILT** hydrometer.

Specific gravity of battery electrolyte strength or density varies not only with the quantity of the acid in solution but also with temperature. As temperature increases, the volume of the electrolyte expands and specific gravity is reduced. As temperature drops, electrolyte contracts and specific gravity increases.

Specific gravity variations caused by temperatures must be considered in the analysis of the battery, otherwise specific gravity readings will not give a true indication of state of charge.

Use a battery immersion type thermometer of the mercury-in-glass type, having a scale reading as high as 125° F and designed for not over a 1-inch bulb immersion. A suitable dairy type thermometer may prove satisfactory for the purpose.

Draw electrolyte in and out of the hydrometer barrel several times to bring the temperature of the hydrometer float to that of the acid in the cell and then measure the electrolyte temperature in the cell.

The temperature correction in specific gravity reading at 80° Fahrenheit is zero. Add .004 specific gravity points for every 10° degrees over 80° F. and subtract .004 specific gravity points for every 10 degrees under 80° F. All readings must be corrected to 80 degrees Fahrenheit. Refer to Figure 1 and examples one and two as follows:

Example 1—

Hydrometer Reading	1.260
Acid Temperature	20 degrees Fahrenheit
Subtract Specific Gravity	.024
Correct Specific Gravity is	1.236

Example 2—

Hydrometer Reading	1.255
Acid Temperature	100 degrees Fahrenheit
Add Specific Gravity	.008
Corrected Specific Gravity is	1.263

A fully charged relatively new battery has a specific gravity reading of 1.260 plus .015 minus .005 (all batteries for use in temperature climates).

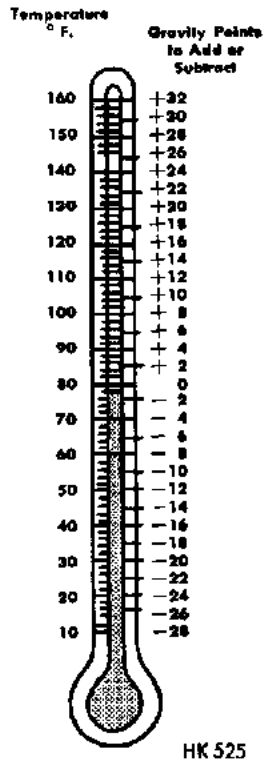


Fig. 1—Hydrometer Reading Correction Chart

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ADJUSTMENT OF ACID GRAVITY

Hydrometer floats usually are not calibrated below about 1.160 specific gravity and cannot indicate the condition of a battery in a very low state of charge. Therefore, it may be necessary to give the battery several hours charge before a hydrometer reading will indicate that the battery is taking a charge.

If the specific gravity of all cells are not within .015 points of specified value, corrected to 80°F, at the end of a full charge, remove some of the electrolyte with hydrometer and add a like amount of distilled water to reduce the gravity if too high, or add 1.400 Specific Gravity acid to raise specific gravity, if too low. Continue the charge so as to give the electrolyte a chance to mix and then read the gravity after another hour of charge to note the effect of the additions. Continue this adjusting procedure until gravity is brought to the desired value by charging for one hour after each adjustment.

Never adjust the specific gravity of any battery cell which does not gas freely on charge. Unless electrolyte has been lost through spilling or leaking, it should not be necessary to add acid to a battery during its life. Acid should never be added unless one is certain that the cell will not come up to normal gravity by continued charging. Always make the temperature correction for hydrometer readings, as warm electrolyte will read low and this might be mistaken for failure of the battery to rise normally in gravity. It could also be falsely concluded that the battery would not take a full charge.

HIGH RATE DISCHARGE TEST OF BATTERY CAPACITY

Satisfactory capacity tests can be made only when battery equals or exceeds 1.220 specific gravity at 80 degrees Fahrenheit. If the reading is below 1.220 the battery should be slow charged until fully charged in order to secure proper test results.

Test Procedure

(1) Turn control knob of Battery-Starter-Tester to **OFF** position.

(2) Turn Voltmeter Selector Switch to the 16 volt position on test units so equipped.

(3) Connect test ammeter and voltmeter positive leads to battery positive terminal. Connect ammeter and voltmeter negative leads to battery negative terminal (Fig. 2).

The voltmeter clips must contact the battery posts or cable clamps and not the ammeter lead clips.

(4) Turn control knob clockwise until ammeter reading is equal to three times the ampere hour rating of the battery.

(5) Maintain this load for 15 seconds; the voltmeter should read 9.5 volts or more, which will indicate that the battery has good output capacity.

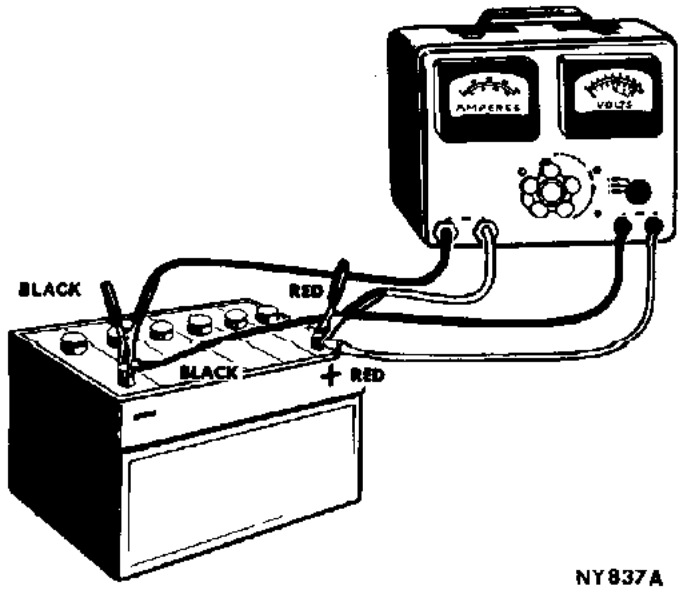


Fig. 2—High Rate Discharge Test

(6) After the 15 second test, turn Battery-Starter-Tester control knob to the **OFF** position.

If the voltage in the "High Rate Discharge Test" was under 9.5 volt, the battery should be test charged to determine whether the battery can be satisfactorily charged.

Charging the Battery

Three Minute Charge Test (Fig. 3)

This test should not be used if battery temperature is below 60 degree F.

(1) Connect Battery Charger positive (+) lead to the battery positive terminal and negative (—) lead to battery negative terminal.

IMPORTANT: Be sure of correct polarity when charging batteries.

(2) Trip the Battery Charger Power Switch to **ON** position. Turn timer switch past three minute mark then back to the three minute mark.

(3) Adjust Battery Charger Switch to highest possible rate not exceeding 40 amperes.

(4) When timer switch cuts off at the end of 3 minutes, turn timer switch back to fast charge.

(5) Use the 16 volt scale of the Battery Starter Tester and measure total voltage of battery posts while battery is being fast charged. If total voltage during charge exceeds 15.5 volts, battery is sulphated and should be cycled and slow-charged until specific gravity reaches 1.260 (See "Slow Charging").

A slow charge is preferable to bring the battery up to a full charge.

If specific gravity remains constant after testing battery at one hour intervals for three hours, battery is at its highest state of charge.

(6) Make another capacity test. If capacity test does not meet specifications, replace battery.

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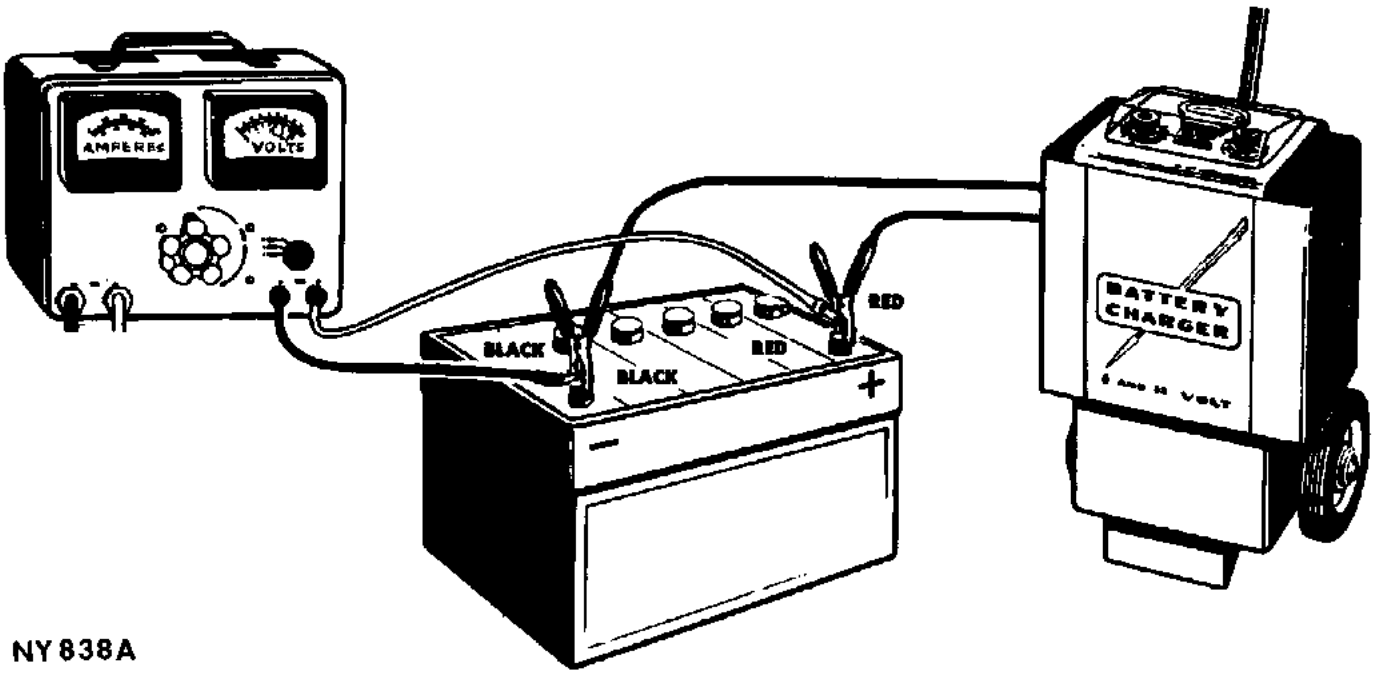


Fig. 3—Three Minute Charge Test

Fast Charging the Battery (Fig. 4)

If adequate time for a slow charge is not available, a high rate (FAST) charge is permissible and will give a sufficient charge in one hour enabling the battery and alternator to continue to carry the electrical load.

Connect Battery Charger positive (+) lead to battery positive terminal and negative (—) lead to battery negative terminal. If battery is not removed from vehicle, **BE SURE** ignition switch is turned off and all electrical accessories are turned off during charging.

CAUTION: The battery can be damaged beyond repair unless the following precautions are taken:

(1) Battery electrolyte temperature must **NEVER** exceed 125 degrees Fahrenheit.

If this temperature is reached, battery should be cooled by reducing charging rate or remove battery from the circuit.

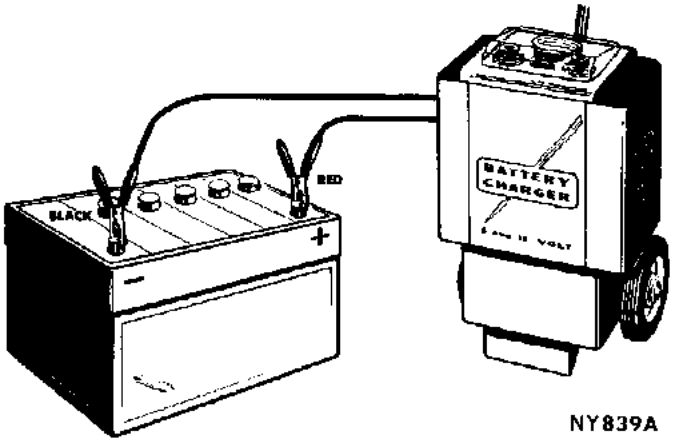


Fig. 4—Fast Charging the Battery

(2) As batteries approach full charge electrolyte in each cell will begin to gas or bubble. Excessive gassing must not be allowed.

(3) Do not fast charge longer than one hour.

If battery does not show a significant change in specific gravity after one hour of "FAST" charge, the slow charge method should be used.

Remember to use temperature correction when checking specific gravity.

The manufacturers of high rate charging equipment generally outline the necessary precautions and some models have thermostatic temperature limiting and time limitiing controls.

WARNING: When batteries are being charged an explosive gas mixture forms beneath the cover of each cell. Do not smoke near batteries on charge or which have recently been charged. Do not break live circuits at the terminals of the batteries on charge. A spark will occur where the live circuit is broken. Keep all open flames away from the battery.

Slow Charging Batteries

Many discharged batteries can be brought back to good condition by slow charging; especially batteries that are sulphated.

Battery should be tested with a hydrometer and a record kept of the readings taken at regular intervals throughout the charge. When a cell has a specific gravity reading that is 25 points (.025) or more below other cells, that cell is faulty and battery should be replaced.

Safe slow charging rates are determined by allowing one ampere per positive plate per cell. Proper

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slow charging rate would be 4 amperes for a 48 ampere hour battery; 5 amperes for a 59 ampere hour battery; and 6 amperes for a 70 ampere hour battery.

Rate of charge for a normally discharged battery is one ampere per positive plate per cell.

The average length of time necessary to charge a battery by the slow charge method at normal rates is from 12 to 16 hours, however, when a battery continues to show an increase in specific gravity, battery charge should be continued even if it takes 24 hours or more.

Watch the temperature of batteries carefully and if the temperature of any one of them reached 110°F., lower the charging rate.

Battery will be fully charged when it is gassing freely and when there is no further rise in specific gravity after three successive readings taken at hourly intervals. Make sure hydrometer readings are corrected for temperature.

The rate of charge for a sulphated battery should be no more than ½ the normal slow charge rate. Many sulphated batteries can be brought back to a useful condition by slow charging at half the normal charging rate from 60 to 100 hours. This long charging cycle is necessary to reconvert crystalline lead sulphate into active materials.

Batteries that are sulphated have the following characteristics:

(1) Battery temperature tends to increase rapidly while charging.

(2) Gravity under charge increases very slowly or not at all.

(3) Battery will gas excessively under normal charging rate.

(4) Excessive voltage required to obtain normal charging rate.

When a battery takes a full charge, but is returned several times in need of a recharge, check for a cracked cell partition with a syringe to provide air pressure; bubbles will appear in an adjacent cell if a crack is present.

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REDUCTION GEAR STARTER

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GENERAL INFORMATION

The starter has an armature-to-engine crankshaft ratio of 45 to 1: a 3.5 to 1 reduction gear set is built into the ctarter assembly, which is housed in an aluminum die casting, Fig. 1. The starter utilizes a solenoid shift device, the housing of the solenoid is integral with the starter drive end housing.

SERVICE DIAGNOSIS

Condition	Possible Cause	Correction
STARTER FAILS TO OPERATE	(a) Weak battery or dead cell in battery.	(a) Test specific gravity. Recharge or replace battery as required.
	(b) Ignition switch faulty.	(b) Test and replace switch if necessary.
	(c) Loose or corroded battery cable terminals.	(c) Clean terminals and clamps, replace if necessary. Apply a light film of petrolatum to terminals after tightening.
	(d) Open circuit, wire between the ignition—starter switch and ignition terminal on starter relay.	(d) Inspect and test all the wiring.
	(e) Inoperative clutch unit.	(e) Replace clutch unit.

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Condition	Possible Cause	Correction
	(f) Faulty starting motor.	(f) Test and repair as necessary.
	(g) Armature shaft sheared.	(g) Test and repair.
	(h) Open solenoid pull-in wire.	(h) Test and replace solenoid if necessary.
STARTER FAILS AND LIGHTS DIM	(a) Weak battery or dead cell in battery.	(a) Test for specified gravity. Recharge or replace battery as required.
	(b) Loose or corroded battery cable terminals.	(b) Clean terminals and clamps, replace if necessary. Apply a light film of petrolatum to terminals after tightening.
	(c) Internal ground in windings.	(c) Test and repair starter.
	(d) Grounded starter fields.	(d) Test and repair starter.
	(e) Armature rubbing on pole shoes.	(e) Test and repair starter.
STARTER TURNS, BUT PINION DOES NOT ENGAGE	(a) Starter clutch slipping.	(a) Replace clutch unit.
	(b) Broken teeth on flywheel drive gear.	(b) Replace flywheel ring gear. Inspect teeth on starter clutch pinion gear.
	(c) Pinion shaft rusted, dirty or dry, due to lack of lubrication.	(c) Clean, test and lubricate.
STARTER RELAY DOES NOT CLOSE	(a) Battery discharged.	(a) Recharge or replace battery.
	(b) Faulty wiring.	(b) Test for open circuit, wire between starter relay ground terminal post and neutral starter switch (automatic transmission only). Also test for open circuit; wire between ignition-starter switch and ignition terminal and starter relay.
	(c) Neutral starter switch on automatic transmission faulty.	(c) Test and replace the switch if necessary.
	(d) Starter relay faulty.	(d) Test and replace if necessary.
RELAY OPERATES BUT SOLENOID DOES NOT	(a) Faulty wiring.	(a) Test for open circuit wire between starter-relay solenoid terminal and solenoid terminal post.
	(b) Faulty solenoid switch or connections.	(b) Test for loose terminal connections between solenoid and starter field.
	(c) Solenoid switch contacts corroded.	(c) Test and replace solenoid if necessary.
	(d) Broken lead or a loose soldered connection inside solenoid switch (brush holder plate).	(d) Test and replace solenoid if necessary.
SOLENOID PLUNGER VIBRATES BACK AND FORTH WHEN SWITCH IS ENGAGED	(a) Battery low.	(a) Test for specific gravity of battery. Replace or recharge battery.
	(b) Faulty wiring.	(b) Test for loose connections at relay, ignition-starter switch and solenoid.
	(c) Lead or connections broken inside solenoid switch cover (brush holder plate) or open hold-in wiring.	(c) Test and replace solenoid if necessary.
	(d) Check for corrosion on solenoid contacts.	(d) Test and clean the contacts.
STARTER OPERATES BUT WILL NOT DISENGAGE WHEN IGNITION STARTER SWITCH IS RELEASED	(a) Broken solenoid plunger spring or spring out of position.	(a) Test and repair.
	(b) Faulty ignition-starter switch.	(b) Test and replace the switch if necessary.
	(c) Solenoid contact switch plunger stuck in solenoid.	(c) Remove contact switch plunger, wipe clean of all dirt, apply a film of SAE 10 oil on plunger, wipe off excess.
	(d) Insufficient clearance between winding leads to solenoid terminal and main contactor in solenoid.	(d) Test and repair.
	(e) Faulty relay.	(e) Test and replace relay if necessary.

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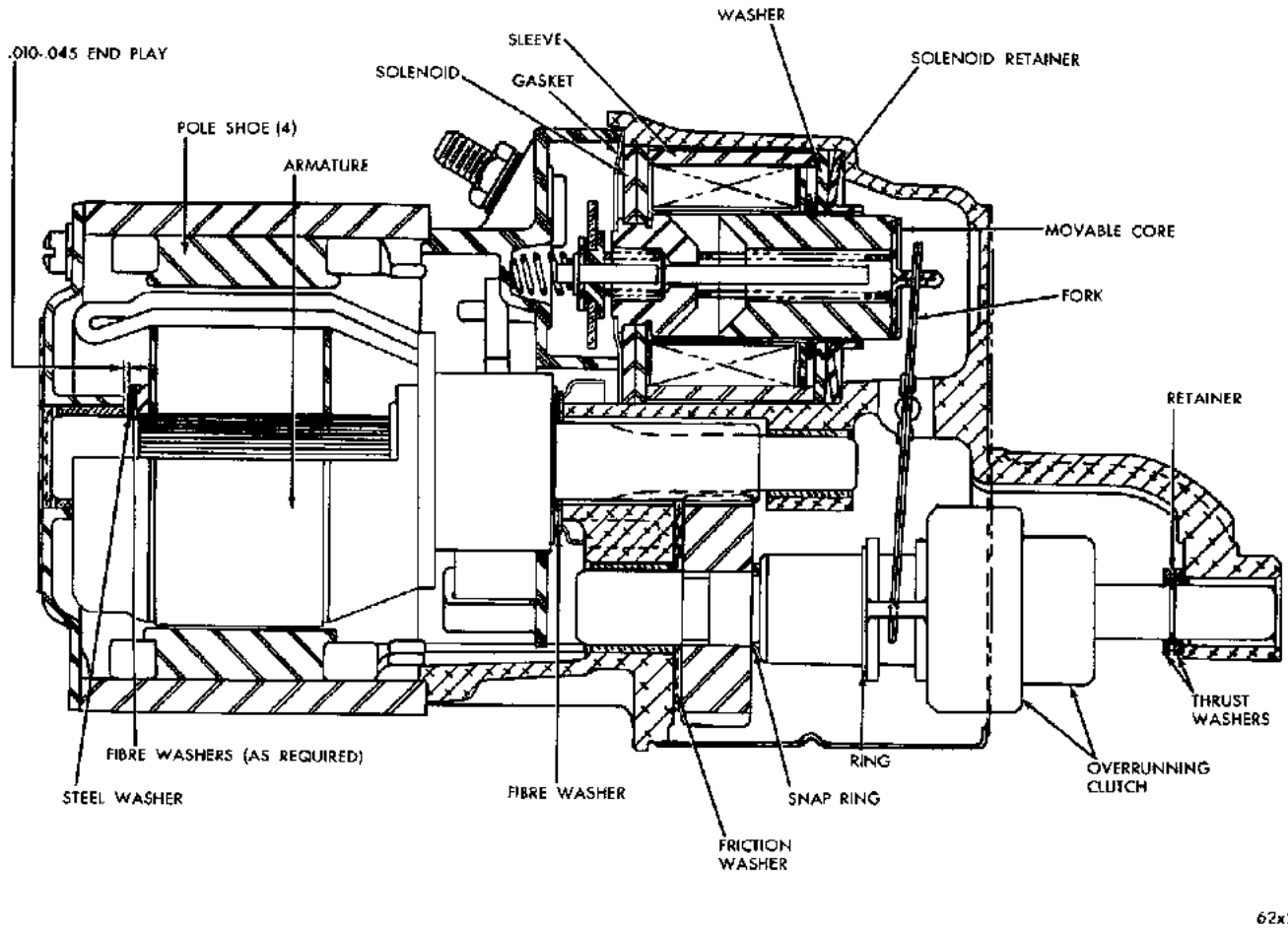


Fig. 1—Starter Cross Section

SERVICE PROCEDURES

STARTER AMPERAGE DRAW TEST (with BST-11, BST-10, or BST-5 Tester)

Check battery electrolyte gravity with a reliable hydrometer. Gravity should be not less than 1.220 (temperature corrected). Or see that battery passes the High Rate Discharge Test shown in the "Battery" section of this manual.

Turn Battery—Starter Tester **CONTROL KNOB** to "OFF" position.

Turn voltmeter Selector Switch to 16 Volt position. Connect heavy **Positive** ammeter lead (Red) to **Positive** battery terminal. Connect heavy **Negative** ammeter lead (Black) to **Negative** battery terminal.

Connect **Positive** voltmeter lead (Red) to **Positive** battery terminal. Connect **Negative** voltmeter lead (Black) to **Negative** battery terminal.

DISCONNECT ignition primary lead from ignition ballast resistor, or primary wire from either side of coil, to prevent engine from starting.

Crank engine with a remote control starter switch and observe **Exact** reading on Voltmeter. Stop cranking engine. Without cranking engine, turn tester **CONTROL KNOB** clockwise until voltmeter reads **Exactly** the same as when engine was being cranked with the remote control starter switch. Ammeter now indicates starter amperage draw. Check specifications.

Engine should be up to operating temperature. Extremely heavy oil or a tight engine will increase starter amperage draw.

STARTER INSULATED CIRCUIT TEST

(1) Test battery electrolyte specific gravity. Specific gravity should be 1.220 or above. If battery specific gravity is below 1.220, recharge battery to full charge before proceeding with test.

(2) Turn voltmeter selector switch to 4 volt position.

(3) Disconnect ignition coil secondary cable.

(4) Connect voltmeter positive lead to battery positive post and voltmeter negative lead to solenoid connector which connects to the starter field coils.

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The voltmeter will read off scale to the right until starter is actuated.

(5) Connect remote control switch to battery and solenoid terminal of starter relay.

(6) Crank engine with a remote starter control starter switch and observe voltmeter reading. Voltmeter reading should not exceed .3 volt. A voltmeter reading .3 volt or less indicates voltage drop is normal in cables, starter relay switch solenoid switch and connections between battery and starter motor. See "Starter Ground Circuit Test."

If voltmeter reading is more than .3 volt, it indicates high resistance in starter insulated circuit. Make following tests to isolate point of excessive voltage loss:

(A) Remove voltmeter lead from solenoid connector and connect to the following points, repeating test at each connection. Starter terminal of solenoid, battery terminal of solenoid, battery cable terminal at solenoid, starter relay and cable clamp at the battery.

(B) A small change will occur each time a normal portion of the circuit is removed from test. A definite change in the voltmeter reading indicates that the last part eliminated in test is at fault.

Maximum allowable voltage loss is as follows:

Battery insulated cable	.2 volt
Solenoid switch	.1 volt
Each connection	.0 volt

Replace faulty cables. Clean and tighten all connections.

STARTER RESISTANCE TEST

(1) Test battery electrolyte specific gravity. Specific gravity should be 1.220 or above.

(2) Disconnect positive battery lead from battery terminal post. Connect an 0 to 300 scale ammeter between disconnected lead and battery terminal post.

(3) Connect a test voltmeter with 10 volt scale division between battery positive post and starter switch terminal at starter solenoid.

(4) Crank engine and observe reading on voltmeter and ammeter. Voltage should not exceed .3 volt. A voltage reading that exceeds .3 volt indicates there is high resistance caused from loose circuit connections, a faulty cable, burned starter relay or burned solenoid switch contacts. A current that is high and is combined with slow cranking speed, indicates starter should be removed and repaired.

STARTER GROUND CIRCUIT TEST

(1) Connect test voltmeter positive lead to starter housing and voltmeter negative lead to battery negative post.

(2) Crank engine with a remote control starter switch and observe voltmeter reading. Voltmeter reading should not exceed .2 volt. A reading of .2 volt or less indicates the resistance of the ground cable and connections is normal. If voltmeter reading is more than .2 volt, it indicates excessive voltage loss in starter ground circuit. Make the following tests to isolate point of excessive voltage loss. Repeating test at each connection.

(a) Starter drive housing.

(b) Cable terminal at engine.

(c) Cable clamp at battery.

A small change will occur each time a normal portion of circuit is removed from the test. A definite change in voltmeter reading indicates that last part eliminated in the test is at fault.

Maximum allowable voltage loss is as follows:

Battery ground cable .2 volt
Engine ground circuit .1 volt
Each connection .0 volt

REMOVING THE STARTER

(1) Disconnect ground cable at battery.

(2) Remove cable at starter.

(3) Disconnect solenoid lead wires at solenoid terminals.

(4) Remove one stud nut and one bolt attaching starter to flywheel housing, slide automatic transmission oil cooler tube bracket off the stud (if so equipped) and remove the starter.

TESTING THE STARTER (Bench Test)

Free Running Test

(1) Place starter in a vise and connect a fully charged, 12 volt battery to starter as follows:

(a) Connect a test ammeter (100 amperes scale) and a carbon pile rheostat in series with battery positive post and starter terminal.

(b) Connect a voltmeter (15 volt scale) across starter.

(c) Rotate carbon pile to full-resistance position.

(d) Connect battery cable from battery negative post to starter frame.

(e) Adjust the rheostat until battery voltage shown on voltmeter reads 11 volts. Amperage draw should be as shown in specifications.

Locked-Resistance Test

(1) Install starter in a test bench.

(2) Follow instructions of test equipment manufacturers and test starter against following specifications. With applied battery voltage adjusted to 4 volts. Amperage draw should be as shown in specifications.

SERVICING THE STARTER

Disassembly

(1) Place the starter gear housing in a vise equipped with soft jaws. Use the vise as support fixture only. **DO NOT** clamp.

(2) Remove two through bolts and starter end head assembly.

(3) Carefully pull armature up and out of gear housing and starter frame and field assembly. Re-

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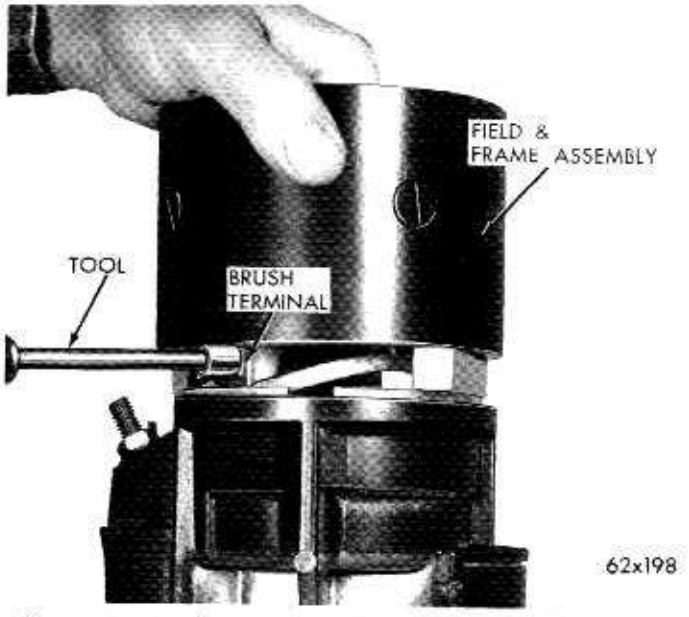


Fig. 2—Removing or Installing Brush Terminal Screw

move steel and fiber thrust washer.

The wire of shunt field coil is soldered to the brush terminal. One set of brushes are connected to this terminal. The other pair of brushes is attached to the series field coils by means of a terminal screw. Carefully pull frame and field assembly up just enough to expose terminal screw and solder connection of shunt field at brush terminal. Place two wood blocks between starter frame and starter gear housing to facilitate removal of terminal screw, Fig. 2.

(4) Support brush terminal by placing a finger behind the terminal and remove terminal screw.

(5) Unsolder shunt field coil lead from starter brush terminal, Fig. 3.

Starter brush holder plate with starter brush terminal, contact and brushes is serviced as an assembly.

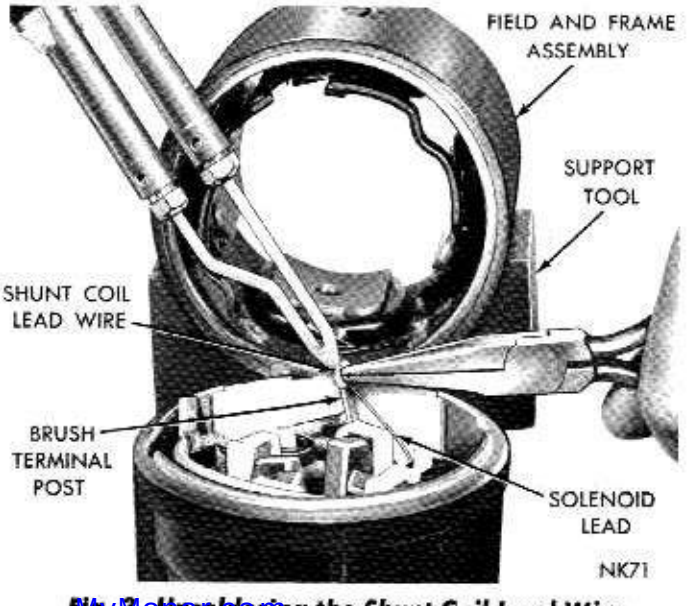


Fig. 3—Unsoldering the Shunt Coil Lead Wire

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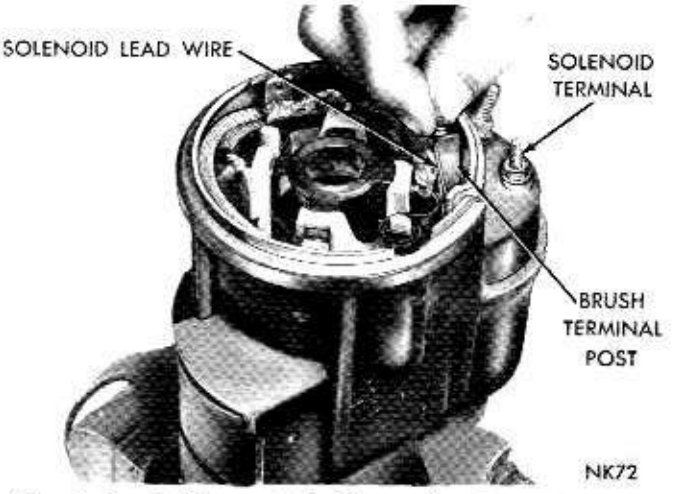


Fig. 4—Unwinding or Winding Solenoid Lead Wire

(6) Remove all old sealer at brush holder plate and gear housing.

(7) Unsolder solenoid lead wire and unwind wire from starter brush terminal (Fig. 4).

(8) Remove screw attaching brush holder plate to starter gear housing (Fig. 5).

(9) Remove nut (11/32 wrench), steel washer and insulating washer from solenoid terminal.

(10) Straighten solenoid wire and remove brush holder plate with brushes as an assembly.

(11) Remove solenoid assembly from gear housing well (Fig. 6).

(12) Remove nut, steel washer and sealing washer from starter battery terminal.

(13) Remove starter battery terminal from holder plate.

(14) Remove solenoid contact and plunger from solenoid.

(15) Remove solenoid return spring from well of solenoid housing moving core.

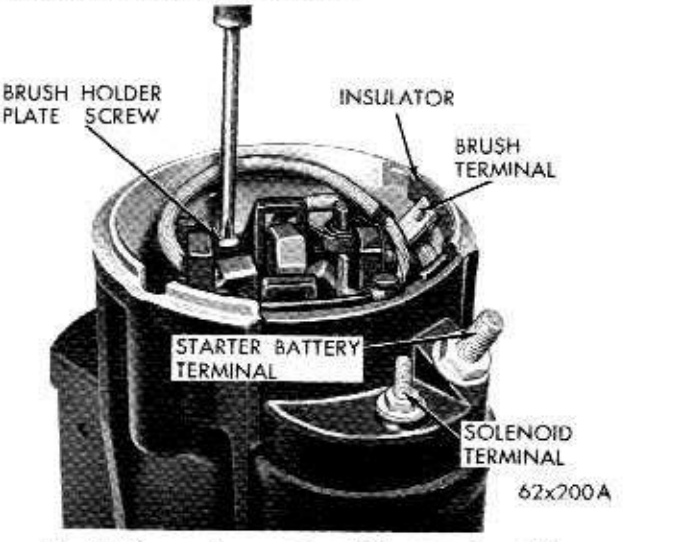


Fig. 5—Removing or Installing Brush Holder Plate Screw

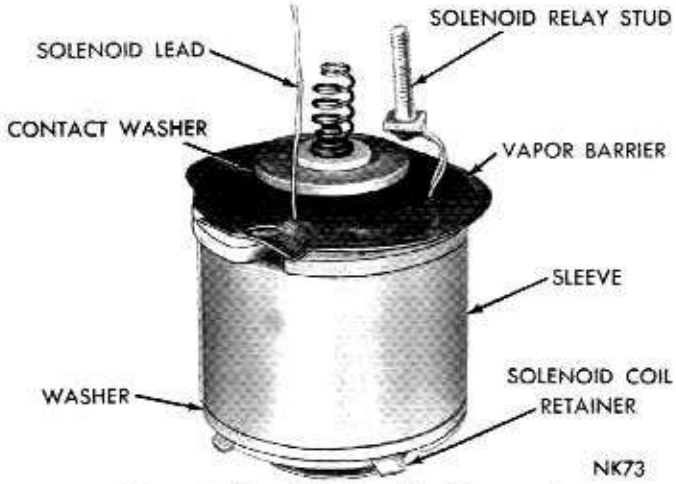


Fig. 6—Solenoid Assembly Removed

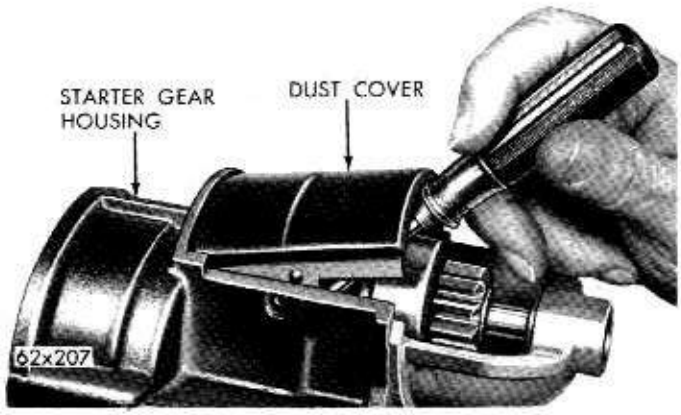


Fig. 7—Removing the Dust Cover

(16) Remove dust cover from gear housing (Fig. 7).

(17) Release retainer that positions driven gear on pinion shaft (Fig. 8).

CAUTION: Retainer is under tension and a cloth should be placed over the retainer to prevent it from springing away after removal.

(18) Release retainer ring at front of pinion shaft (Fig. 9).

Do not spread retainer ring any greater than outside diameter of pinion shaft otherwise lock ring can be damaged.

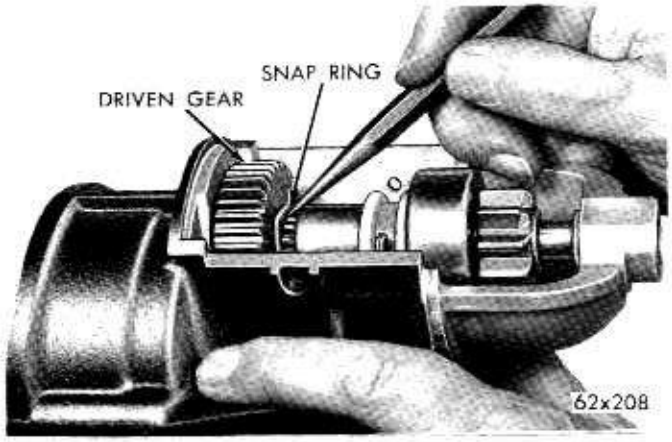


Fig. 8—Removing the Driven Gear Snap Ring

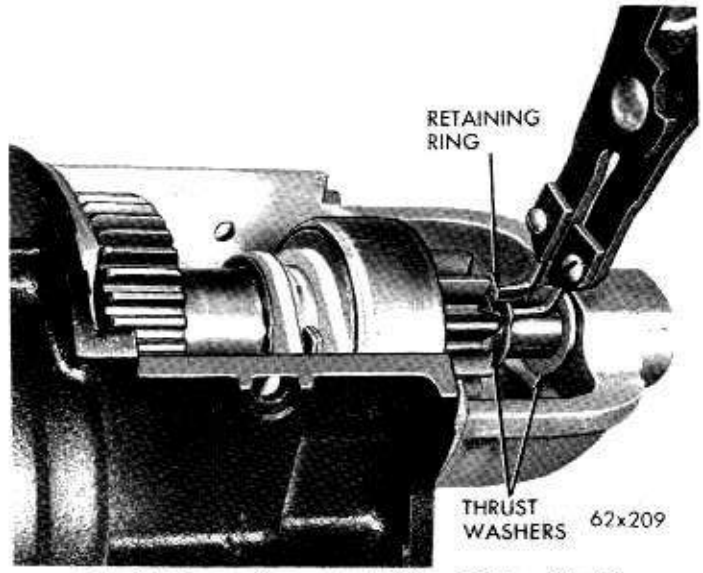


Fig. 9—Removing or Installing Pinion Shaft Retainer Ring

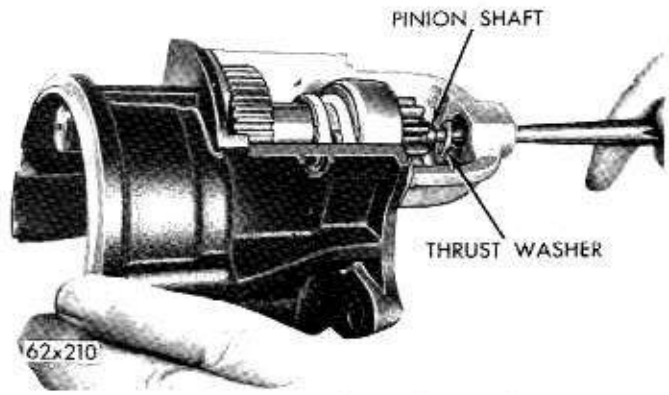


Fig. 10—Removing Pinion Shaft

(19) Push pinion shaft towards rear of housing (Fig. 10) and remove retainer ring and thrust washers, clutch and pinion assembly, with the two shifter fork nylon actuators as an assembly (Fig. 11).

(20) Remove driven gear and friction washer.

(21) Pull shifting fork forward and remove solenoid moving core (Fig. 12).

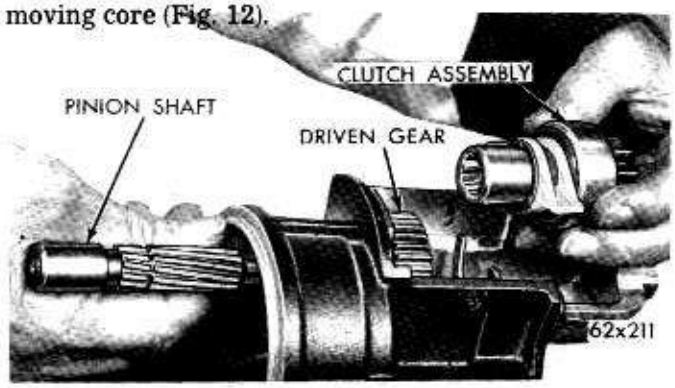


Fig. 11—Removing or Installing Clutch Assembly

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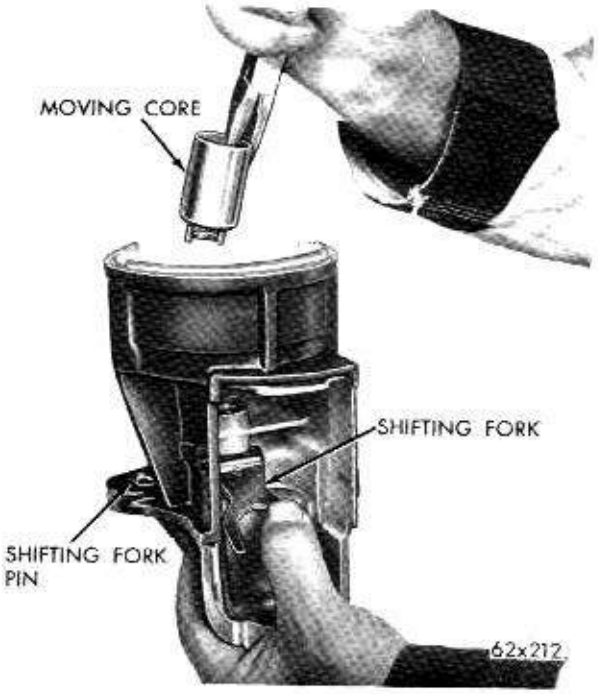


Fig. 12—Removing or Installing Moving Core

(22) Remove shifting fork retainer pin (Fig. 13) and remove clutch shifting fork assembly.

CLEANING THE STARTER PARTS

(1) Do not immerse parts in cleaning solvent. Immersing field frame and coil assembly and/or armature will damage insulation. Wipe these parts with a clean cloth **only.**

(2) Do not immerse clutch unit in cleaning solvent. The clutch is pre-lubricated at the factory and solvent will wash lubricant from the clutch.

(3) The starter-clutch outer housing and pinion gear may be cleaned with a cloth moistened with cleaning solvent and wiped dry with a clean dry cloth.

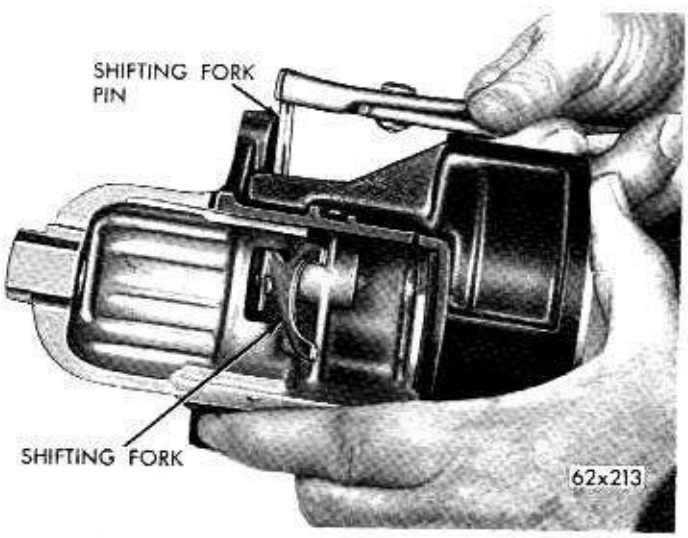


Fig. 13—Removing or Installing Shifting Fork Pin

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(4) Unsolder solenoid lead wires from solenoid terminal relay stud.

(5) Clean all corrosion from solenoid assembly (washers, sleeve and retainer and inside of solenoid housing). These metal parts are part of the solenoid hold-in ground circuit and must be clean.

(6) Clean terminal contacts and contactor with crocus cloth.

(7) Thoroughly clean outside area of brush plate to remove all oil and dirt.

REPLACEMENT OF BRUSHES AND SPRINGS

(1) Brushes that are worn more than ½ the length of new brushes, or are oil-soaked, should be replaced.

(2) When resoldering the shunt field and solenoid lead, make a strong low resistance connection using a high temperature solder and resin flux. **Do not use acid** or acid core solder. **Do not** break the shunt field wire units, when removing and installing brushes.

(3) Measure brush spring tension with a spring scale hooked under the spring near the end. Pull scale on a line parallel to the edge of brush and take a reading just as spring end leaves the brush. Spring tension should be 32 to 36 ounces. Replace springs that do not meet specifications.

TESTING ARMATURE

Testing Armature for Short Circuit

Place armature in growler and hold a thin steel blade parallel to the core and just above it, while slowly rotating armature in growler. A shorted armature will cause blade to vibrate and be attracted to the core. Replace armature if shorted.

Testing Armature for Ground

Contact armature shaft and each of the commutator riser bars with a pair of test lamp test prods. If lamp lights, it indicates a grounded armature. Replace grounded armature.

Testing Commutator Run-Out, Refacing and Undercutting

Place armature in pair of "V" blocks and measure runout with dial indicator. Measure both shaft and commutator. A bent shaft requires replacement of armature. When commutator runout exceeds .003 inch, commutator should be refaced. Remove only a sufficient amount of metal to provide a smooth, even surface.

Testing Field Coils for Ground

(1) Remove field frame assembly from starter.

(2) Carefully drill out the rivet attaching the series field coil ground lead and shunt field coil lead to field frame.

(3) Insulate field coil leads from field frame.

(4) Test for ground using a 110 volt test lamp. Touch one probe of test lamp to series field coil lead and other probe to field frame. Lamp should not light.

Repeat the procedure for shunt field coil.

If lamp lights, it indicates that field coils are grounded and require replacement.

REPLACING THE FEED COILS

A pole shoe impact screwdriver Tool C-3475 should be used to remove and install field coils to prevent damage to pole shoe screws and for proper tightening. Pole shoes that are loose and not properly seated may cause armature core to rub on pole shoes.

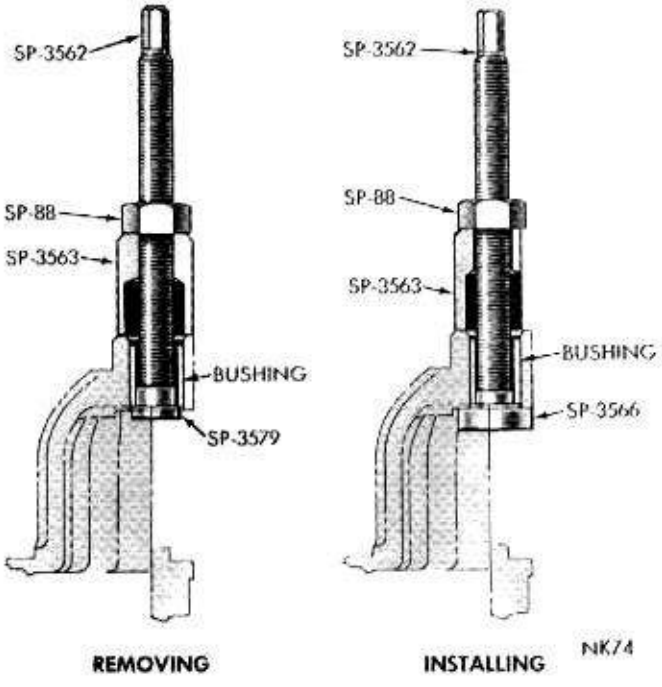


Fig. 14—Removing and Installing Pinion Housing End Bushing

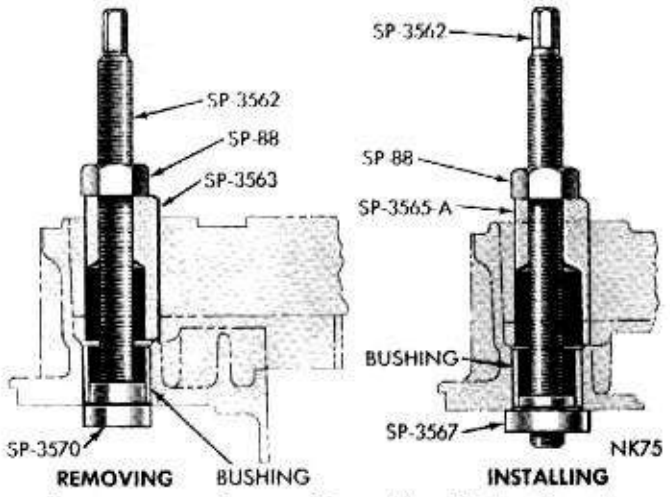


Fig. 15—Removing and Installing Pinion Housing Drive Shaft Bushing

Make sure area between the leads and starter frame is clean. Peen new rivet securely to insure a good electrical contact.

SERVICING THE STARTER BUSHINGS

Inspect armature shaft bearing, pinion shaft surfaces and bushings for wear. Try the bushings for wear by inserting the shafts and test for side play.

Pre-sized starting motor bushings are available as service bushings. Use Tool C-3944 to remove old bushings and install the new. No burnishing or reaming is required to fit pre-sized bushings.

The C-3944 Tool and its adaptors are designed to service all of the gear reduction motor bushings with the exception of the end head bushing. End head bushing and end head are serviced as an assembly.

Remove and install bushings, (Figs. 14, 15 and 16).

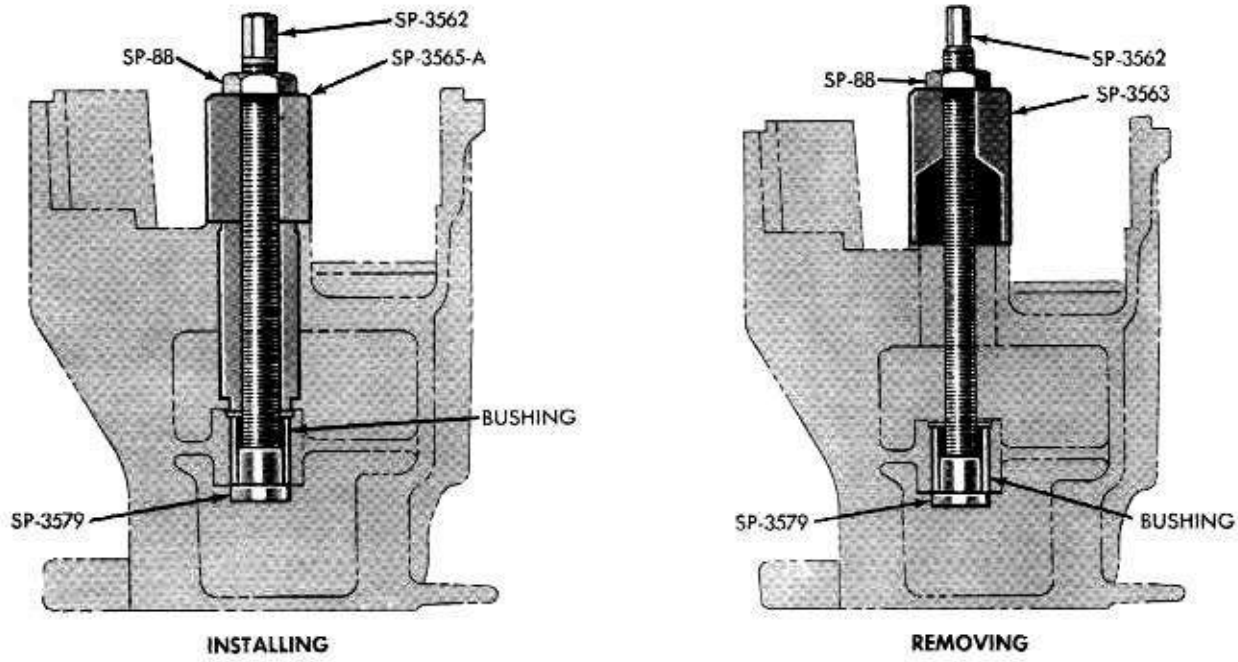


Fig. 16—Removing and Installing Pinion Housing Armature Shaft Bushing

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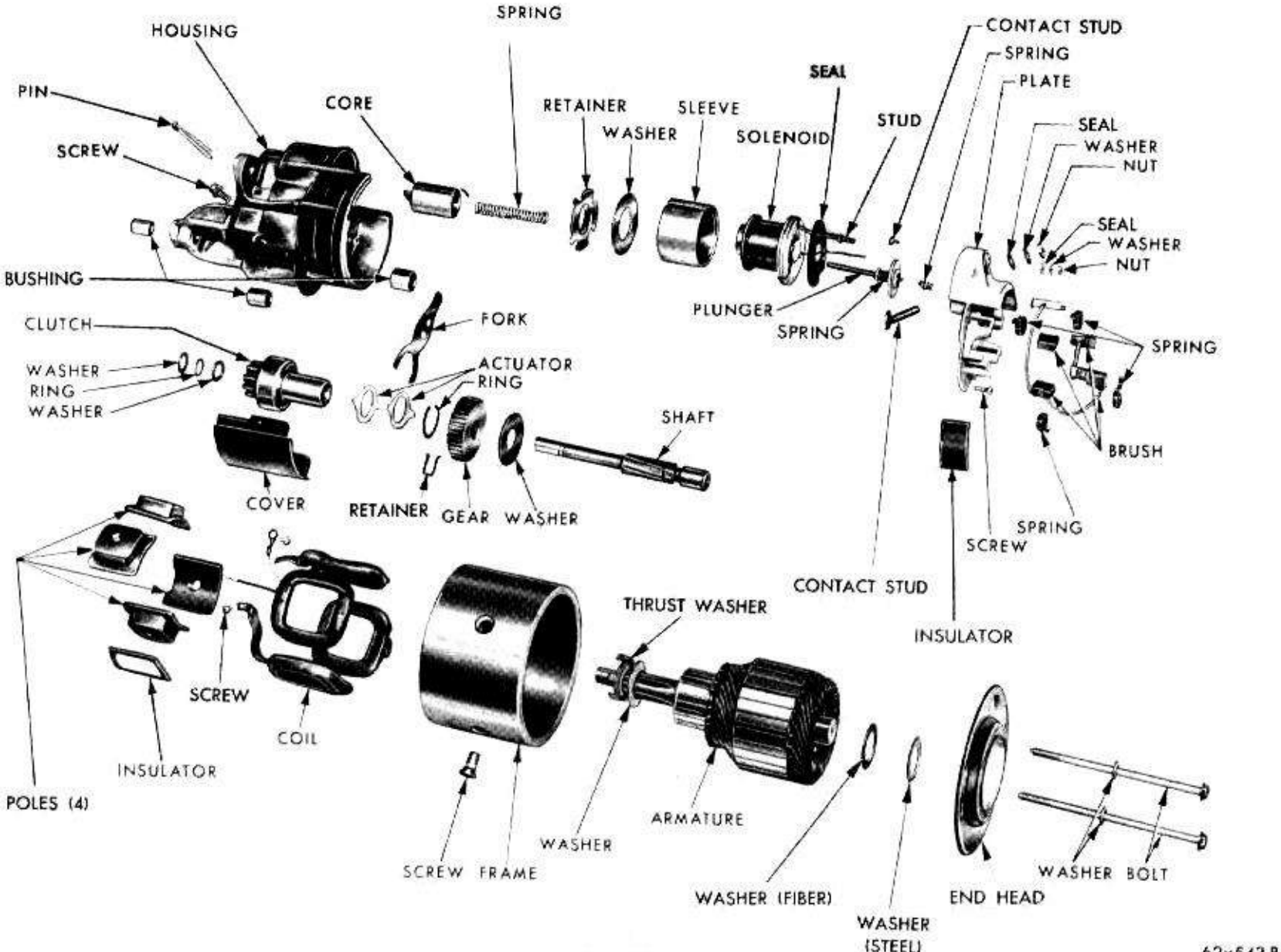


Fig. 17—Starter (Exploded View)

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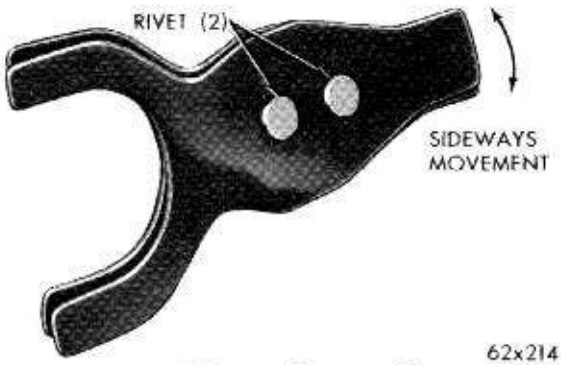


Fig. 18—Shifter Fork Assembly

SERVICING THE STARTER CLUTCH UNIT

Do not immerse starter clutch unit in a cleaning solvent. Starter clutch is pre-lubricated at the factory and a solvent will wash lubricant from the clutch.

The starter clutch outer housing and pinion gear may be cleaned with a cloth moistened with a cleaning solvent and wiped dry with a clean dry cloth.

Rotate the pinion. Pinion gear should rotate smoothly in one direction (not necessarily easily), but should not rotate in opposite direction. If starter clutch unit does not function properly, or pinion is worn, chipped or burred, replace starter clutch unit.

ASSEMBLING THE STARTER (Fig. 17)

The shifter fork consists of two spring steel plates assembled with two rivets. There should be approximately 1/16 inch side movement as shown in Figure 18 to insure proper pinion gear engagement. Lubricate between the plates sparingly with SAE 10 engine oil.

(1) Position shifter fork in drive housing and install shifting fork retainer pin. One tip of pin should be straight, other tip should be bent at a 15 degree angle away from the housing. The fork and retainer pin should operate freely after bending tip of pin.

(2) Install solenoid moving core and engage shifting fork (Fig. 12).

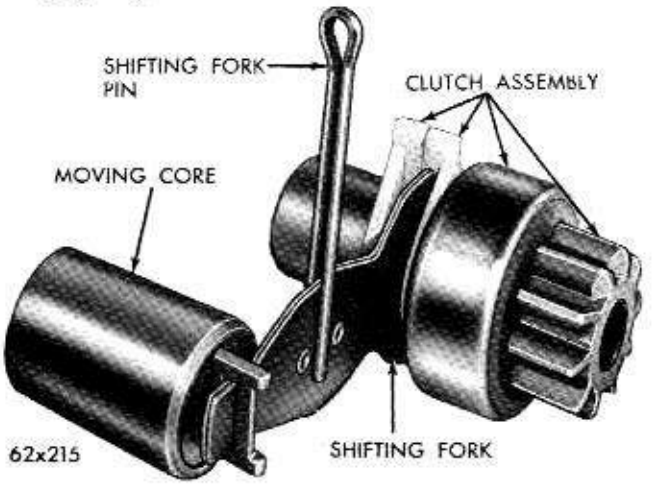


Fig. 19—Shifter Fork and Clutch Arrangement

(3) Enter pinion shaft into drive housing and install friction washer and drive gear.

(4) Install clutch and pinion assembly, thrust washer, retaining ring and thrust washer (Fig. 11).

(5) Complete installation of pinion shaft engaging shifting fork with clutch actuators. Figure 19 shows correct relation of parts at assembly.

The friction washer must be positioned on shoulder of splines of the pinion shaft before driven gear is positioned.

(6) Install driven gear snap ring (Fig. 8).

(7) Install pinion shaft retaining ring (Fig. 9).

(8) Bend the four (4) Tangs of coil retainer "up" to a measurement of 5/32" to 3/16" above surface of retainer (Fig. 20) to ensure higher compression and a more positive ground.

Space the retainer in housing bore so that the four tangs rest on the ridge in housing bore and not in the recesses.

(9) Install starter solenoid return spring into bore of movable core.

(10) Install solenoid contact seal over solenoid lead wires, inserting double wires of terminal stud into large hold (Fig. 6) and solenoid winding lead wire into the small hole.

Inspect condition of starter solenoid switch contacting washer, if top of washer is burned from arcing, disassemble contact switch plunger assembly and reverse the washer.

(11) Install solenoid contact plunger assembly into solenoid and reform double wires to allow for proper entry of terminal stud into brush holder with the double wires curved around the contactor.

CAUTION: The contactor must not touch the double wires when solenoid is energized after assembly is completed (Fig. 6).

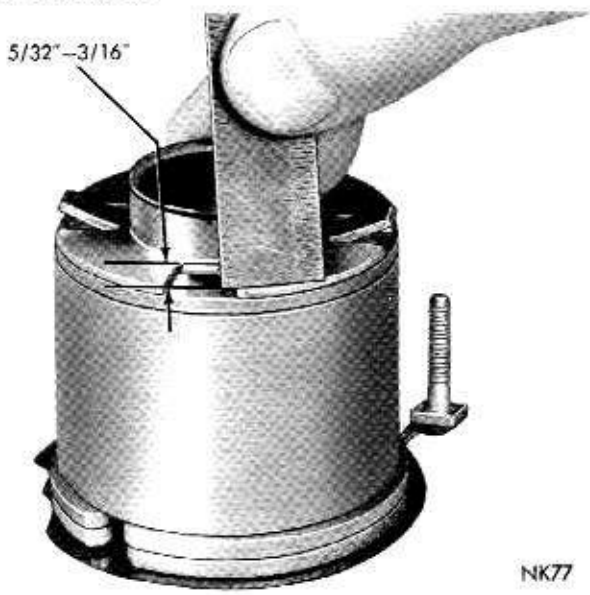


Fig. 20—Checking Height of Solenoid Coil Retainer Rings

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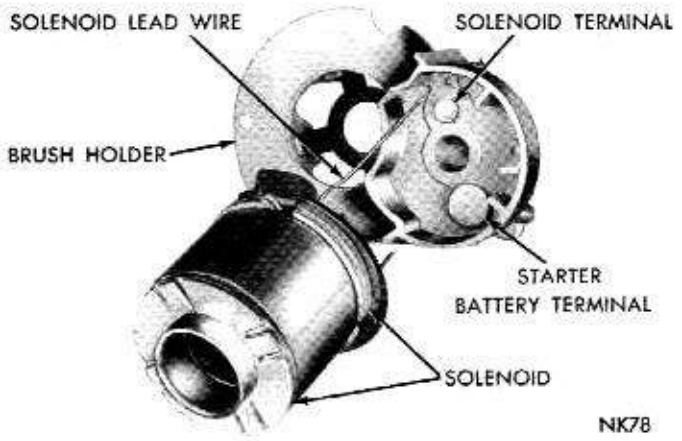


Fig. 21—Assembling Solenoid to Brush Holder Plate

Make sure contact spring is positioned on the shaft of the solenoid contact plunger assembly.

(12) Assemble battery terminal stud in brush holder, placing sealing washer under plain washer.

Inspect condition of the contacts in brush holder plate. If contacts are badly burned, replace brush holder with brushes and contacts as an assembly.

(13) Enter solenoid lead wire through hole in brush holder (Fig. 21) and install solenoid stud, insulating washer, flat washer and nut.

Use care when installing solenoid contact seal over tab on brush plate to prevent tearing the seal.

(14) Wrap solenoid lead wire tightly around brush terminal post as shown in Figure 22 and solder securely with a high temperature resin core solder and resin flux.

(15) Carefully enter solenoid coil and brush plate assembly into bore of gear housing and position brush plate assembly into starter gear housing. Align tongue of ground terminal with notch in brush holder (Fig. 23).

(16) After the brush holder is bottomed in housing, install attaching screw (Fig. 4). Tighten screw to 10-15 inch-pounds. Make sure the insulating tape is in position (Fig. 4).

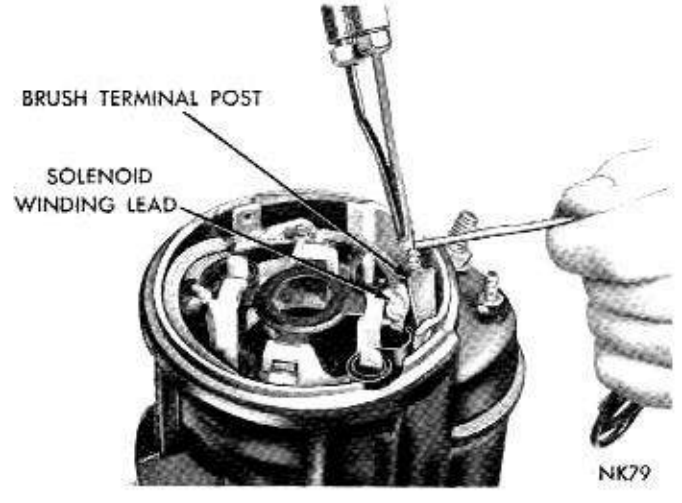


Fig. 22—Soldering Solenoid Winding Lead to Brush Terminal



Fig. 23—Installing Solenoid and Brush Holder into Gear Housing

(17) Position brushes with armature thrust washer as shown in Figure 22. This will hold brushes out and facilitate proper installation of armature.

(18) On starters so equipped, solder shunt coil lead wire to starter brush terminal (Fig. 24).

(19) Install brush terminal screw (Fig. 2).

(20) Position field frame to the exact position on



Fig. 24—Soldering Shunt Coil Lead Wire

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Fig. 25—Installing Starter Armature

gear housing and enter armature into field frame and starter gear housing (Fig. 25); carefully engaging splines of shaft with reduction gear by rotating armature slightly to engage the splines.

(21) Install thrust washer (fiber) and washer (steel) on armature shaft.

(22) Position starter end head assembly and install starter frame lockwashers and through bolts. Tighten through bolts securely.

(23) Clean area at the joint between brush holder plate to field frame and gear housing mating joint. Apply a bead of brush plate sealer Part NO. 2421847 around the four sides of the joint (Fig. 26).

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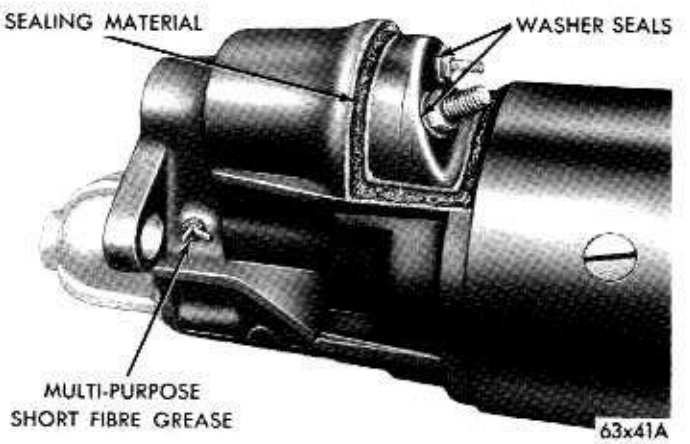


Fig. 26—Sealing Brush Holder Plate

CAUTION: Sealer must be flowed continuously to avoid gaps. After the bead has been flowed on, use a brush or small paddle moistened in mineral spirits to press adhesive into the joint. Do not get adhesive on the battery and/or solenoid terminals.

INSTALLING THE STARTER

(1) Before installing the starter, make sure starter and flywheel housing mounting surfaces are free of dirt and oil to insure a good electrical contact.

(2) Position starter to flywheel housing removable seal (if removed).

(3) Install the starter, washer and bolt, the automatic transmission oil cooler tube bracket (if so equipped) and washer and nut.

When tightening attaching bolt and nut be sure to hold the starter pulled away from the engine to insure proper alignment.

(4) Attach wire at solenoid switch terminal and cable to starter terminal.

(5) Connect battery ground cable and test operation of the starter for proper engine cranking.

ALTERNATOR AND VOLTAGE REGULATOR

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GENERAL INFORMATION

The alternator (Fig. 1) is fundamentally an A.C. current generator, with six (6) built-in silicon rectifiers, that convert A.C. current into D.C. current. D.C. current is available at the "output" "BAT" terminal.

The main components of the alternator are the rotor, stator, rectifiers, the end shields and the drive pulley. (See Fig. 2).

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SERVICE DIAGNOSIS

Condition	Possible Cause	Correction
ALTERNATOR FAILS TO CHARGE (No Output)	(a) Blown fusible wire in voltage regulator.	(a) Locate and correct cause of the fuse blowing. Install new fuse wire. Solder both ends of new fusible wire securely.
	(b) Alternator drive belt loose.	(b) Adjust drive belt to Specifications.
	(c) Worn brushes and/or slip rings.	(c) Install new brushes and/or slip rings.
	(d) Sticking brushes.	(d) Clean slip rings and brush holders. Install new brushes if necessary.
	(e) Open field circuit.	(e) Test all the field circuit connections, and correct as required.
	(f) Open charging circuit.	(f) Inspect all connections in charging circuit, and correct as required.
	(g) Open circuit in stator windings.	(g) Remove alternator and disassemble. Test stator windings. Install new stator if necessary.
	(h) Open rectifiers.	(h) Remove alternator and disassemble. Test the rectifiers. Install new rectifiers if necessary.
LOW, UNSTEADY CHARGING RATE	(a) Alternator drive belt loose.	(a) Adjust alternator drive belt.
	(b) High resistance at battery terminals.	(b) Clean and tighten battery terminals.
	(c) High resistance in charging circuit.	(c) Test charging circuit resistance. Correct as required.
	(d) High resistance in body to engine ground lead.	(d) Tighten ground lead connections. Install new ground lead if necessary.
	(e) Open stator winding.	(e) Remove and disassemble alternator. Test stator windings. Install new stator if necessary.
LOW OUTPUT AND A LOW BATTERY	(a) High resistance in charging circuit.	(a) Test charging circuit resistance and correct as required.
	(b) Low regulator setting.	(b) Reset voltage regulator to specifications.
	(c) Shorted rectifier. Open rectifier.	(c) Perform current output test. Test the rectifiers and install new rectifiers as required. Remove and disassemble the alternator.
	(d) Grounded stator windings.	(d) Remove and disassemble alternator. Test stator windings. Install new stator if necessary.
EXCESSIVE CHARGING RATE TO A FULLY CHARGED BATTERY	(a) Regulator set too high.	(a) Reset voltage regulator to specifications.
	(b) Regulator contacts stuck.	(b) Install new voltage regulator.
	(c) Regulator voltage winding open.	(c) Install new voltage regulator.
	(d) Regulator base improperly grounded.	(d) Connect regulator base to a good ground.
REGULATOR CONTACTS BURNED	(a) High regulator setting.	(a) Reset voltage regulator to specifications.
	(b) Shorted rotor field coil windings.	(b) Test rotor field coil current draw. If excessive install new rotor.
REGULATOR CONTACT POINTS STUCK	(a) Poor ground connection between alternator and regulator. Open resistor element.	(a) Correct ground connection. Install new regulator. Test regulator setting, and reset if necessary.
NOISY ALTERNATOR	(a) Alternator mounting loose.	(a) Properly install and tighten alternator mounting.
	(b) Worn or frayed drive belt.	(b) Install a new drive belt and adjust to specifications.
	(c) Worn bearings.	(c) Remove and disassemble alternator. Install new bearing as required.

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Condition	Possible Cause	Correction
	(d) Interference between rotor fan and stator leads or rectifiers.	(d) Remove and disassemble alternator. Correct interference as required.
	(e) Rotor or rotor fan damaged.	(e) Remove and disassemble alternator. Install new rotor.
	(f) Open or shorted rectifier.	(f) Remove and disassemble alternator. Test rectifiers. Install new rectifiers as required.
	(g) Open or shorted winding in stator.	(g) Remove and disassemble alternator. Test stator windings. Install new stator if necessary.
EXCESSIVE AMMETER FLUCTUATION	(a) High resistance in the field circuit to the alternator or an improperly set voltage regulator.	(a) Clean and tighten all connections as necessary. Adjust voltage regulator as necessary.

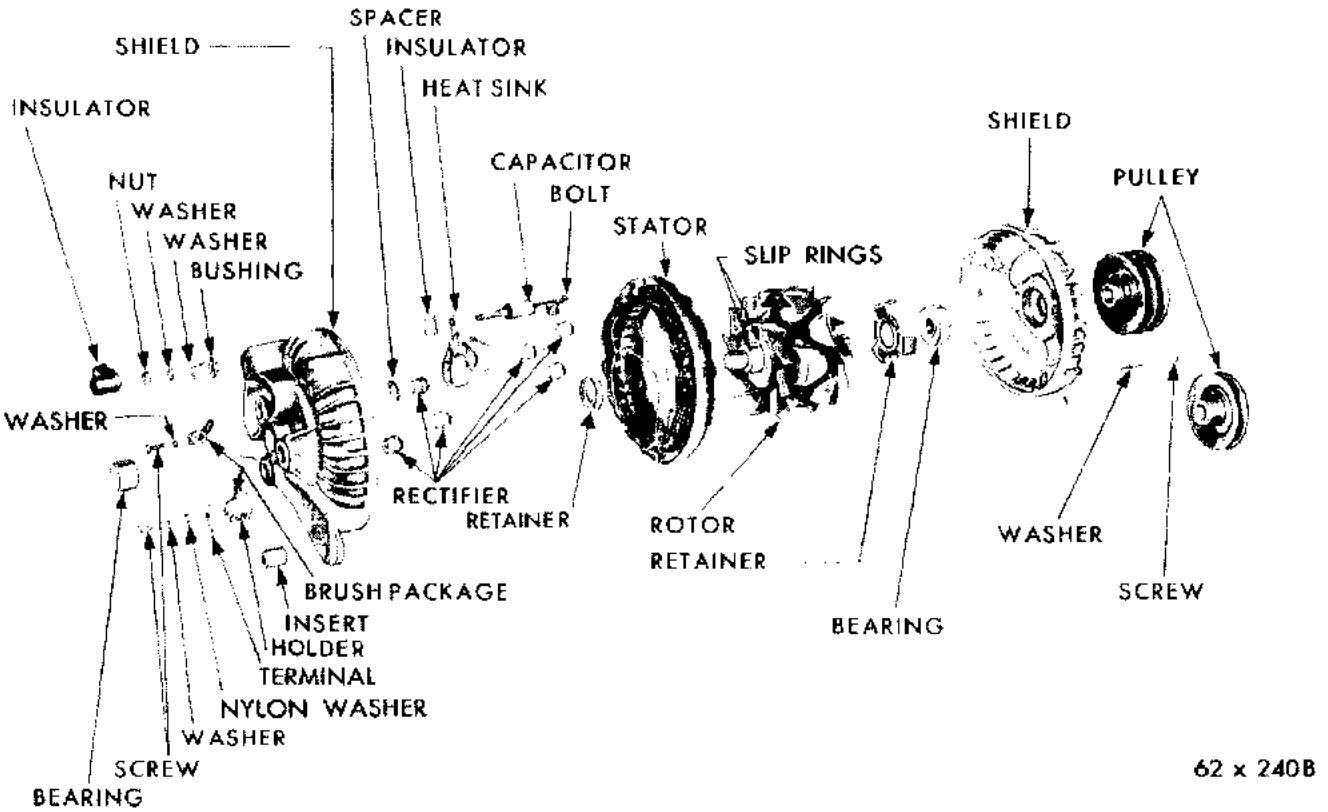


Fig. 1—Alternator (Disassembled View)

TESTING THE ALTERNATOR CIRCUIT

(On the Vehicle Using Sun Volts-Amps Tester Model VAT-20D and Battery Post Adapter)

For the sake of uniformity, one type of equipment is shown. Follow the instructions of the equipment manufacturers on comparable equipment when making the following tests:

Preliminary Checks

(1) **Test the battery condition.** Perform reliable battery tests to determine condition and state of charge of the battery. If battery is defective or not fully charged, install a fully charged battery for test purposes.

(2) **Test the alternator belt condition and tension.** Replace alternator drive belt if necessary and make sure there is adequate tension on the belt.

(3) **Inspect condition of wires and their connections.** Before performing the test on the system, correct any problem with wiring, such as loose connections, corroded connections, burned wiring harness, etc.

Tester Controls and Switches

(1) Set Polarity Switch to NEGATIVE position.
(2) Set tester control knob to DIRECT position.
(3) Set voltage switch to 2 VOLT position.
(4) Set field control to OPEN position.

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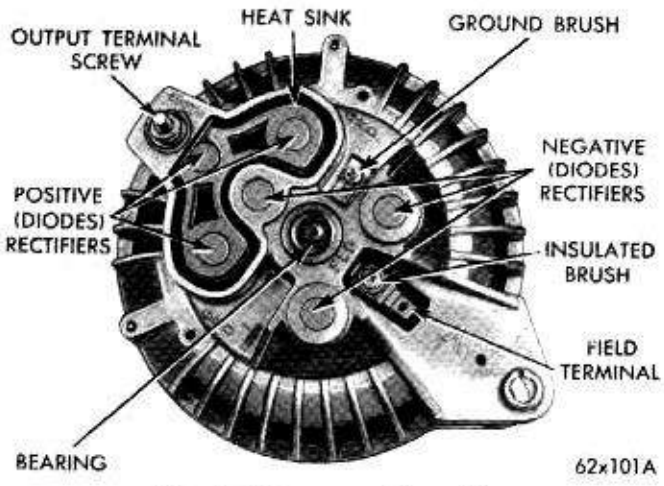


Fig. 2—Alternator Assembly

Tester Lead Connections (Fig. 3)

(1) Disconnect battery positive cable from battery post and install BATTERY POST ADAPTER between cable and post.

(2) Connect "BAT" lead of tester to stud on adapter.

(3) Connect "REG" lead of tester to binding post on adapter.

(4) Connect "GRD" lead of tester to battery negative terminal.

(5) Connect negative lead of voltmeter to field terminal of regulator.

(6) Connect positive lead of voltmeter to battery end of positive battery cable.

Battery Post Adapter BY-PASS SWITCH must be open for all charging system tests. It is closed only for starting the engine.

Field Circuit Resistance Test (Fig. 4)

(1) Disconnect slip-on connector from either end of ignition ballast resistor.

(2) Turn ignition switch on.

(3) With vehicle doors closed and all accessories turned off, observe Voltmeter reading. Voltage should not exceed .55 volt. A reading in excess of .55 volt indicates high resistance in field circuit between battery and voltage regulator field terminal.

(4) If high resistance is indicated, move negative voltmeter lead to each connection along circuit towards battery. A sudden drop in voltage indicates a loose or corroded connection between that point and last point tested. To test terminals for tightness, attempt to move the terminal while observing voltmeter. Any movement of meter pointer indicates looseness.

Excessive resistance in regulator wiring circuit will cause fluctuation in the ammeter, or a below normal charge rate.

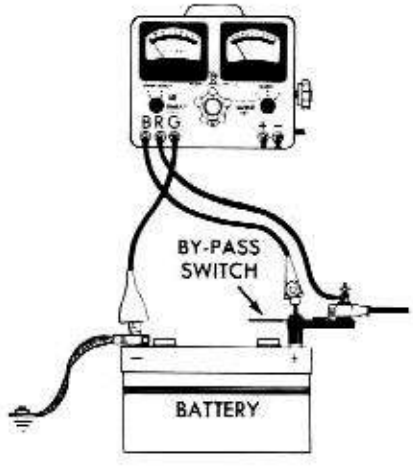


Fig. 3—Tester Lead Connections

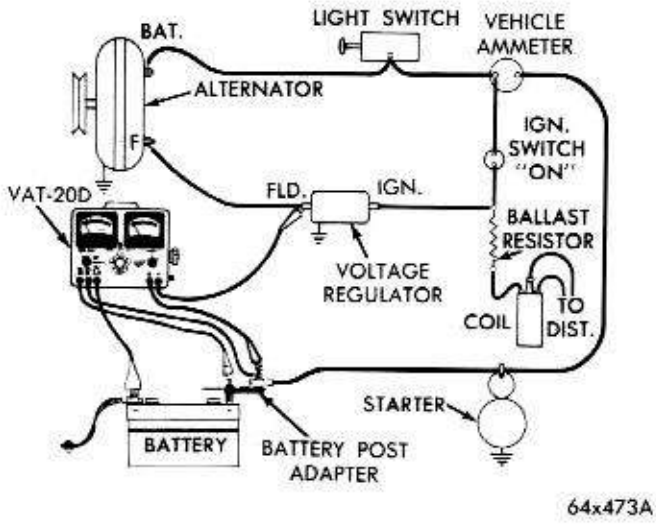


Fig. 4—Field Circuit Resistance and Field Current Draw Test

Field Current Draw Test (Fig. 4)

With tester connections positioned as for the Field Circuit Resistance Test, observe test ammeter. Test ammeter will indicate field current draw. Refer to "Specifications."

Current Output Test (Fig. 5)

(1) With ignition switch off, disconnect the field wire from the "FLD" terminal of the alternator and at the regulator.

(2) Connect one of the test leads of tester Field Control to "FLD" terminal of alternator.

(3) Connect other lead of Tester Field Control to "BAT" terminal of alternator.

(4) Set Tester Voltage Switch to 16 VOLT position.

(5) Connect positive lead of test Voltmeter to "BAT" terminal of alternator.

(6) Connect negative lead of the Test Voltmeter to battery negative post.

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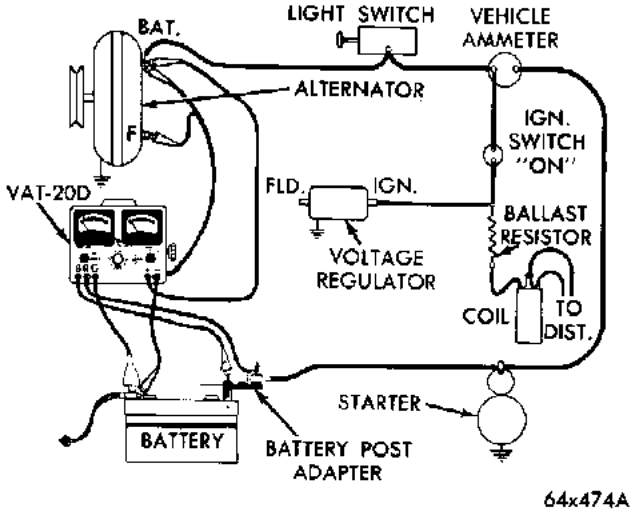


Fig. 5—Current Output Test

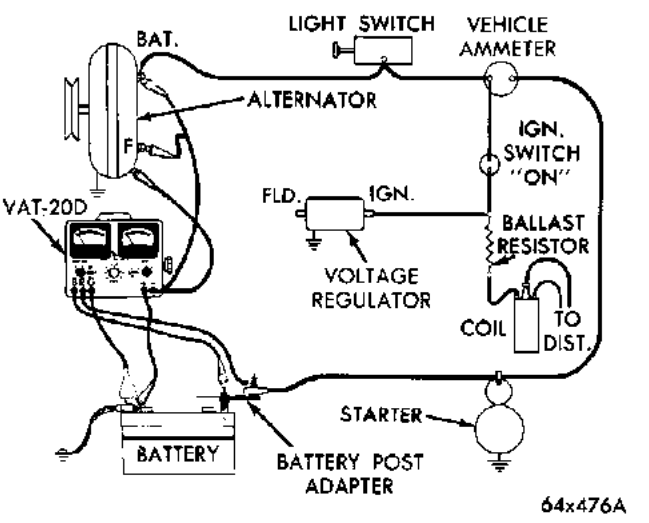


Fig. 7—Ground Circuit Resistance Test

(7) Reconnect slip-on connector at ignition ballast resistor.

(8) Close BY-PASS Switch of Battery Post Adapter.

(9) With tester Field Control in OPEN position, start engine and adjust to 1250 RPM.

(10) Open BY-PASS Switch of Battery Post Adapter.

(11) Rotate tester Control Knob to LOAD position until Voltmeter reads 6 volts.

(12) Rotate tester Field Control to DIRECT position and adjust tester Control Knob until Voltmeter reads exactly 15 volts.

(13) Observe test ammeter. Ammeter now indicates maximum output of alternator. Current output should be within limits shown in "Specification."

Current output should be within 5 amperes of rated output as there is a total of 5 amperes supplied by the alternator that will not appear on test ammeter. This consists of ½ ampere approximate for the instruments, 1½ amperes for the engine ignition system, and 3 amperes for field current.

If output is slightly less (5 to 7 amperes) than that specified above, it may be an indication of a possible "open" rectifier or other alternator internal problems. If output is considerably lower than that specified above, it may be an indication of a possible "shorted" rectifier or other alternator internal problems. In either case the alternator should be removed and tested on the bench before disassembly.

(14) Return tester Field Control to OPEN position.

(15) Return tester Control Knob to DIRECT position.

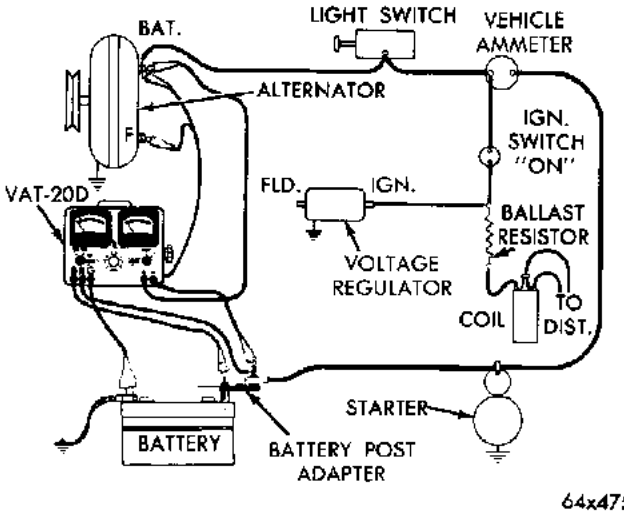


Fig. 6—Insulated Circuit Resistance Test

Insulated Circuit Resistance Test (Fig. 6)

(1) Connect negative lead of Voltmeter to battery end of positive battery cable.

(2) Set Voltage Switch to 2 VOLT position.

(3) Adjust Field Control until tester ammeter reads exactly 10 amperes.

(4) Observe voltmeter reading. Voltmeter now indicates amount of voltage loss across insulated circuit. Voltage loss should not exceed .3 volt. If higher voltage loss is indicated, inspect, clean and tighten all connections in charging circuit. A voltage loss test may be performed at each connection to locate the connection that has excessive resistance.

Ground Circuit Resistance Test (Fig. 7)

(1) Connect positive lead of test voltmeter to negative terminal of battery.

(2) Connect negative lead of test voltmeter to a good ground on the alternator.

(3) With alternator charging 10 amps, observe voltmeter reading. Voltmeter now indicates amount of voltage loss across ground circuit. Voltage loss should not exceed .3 volt.

(4) Rotate tester Field Control to the OPEN position.

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VOLTAGE REGULATOR
(CHRYSLER BUILT)

GENERAL INFORMATION

The only function of the regulator is to limit the output voltage. The voltage regulator accomplishes this by controlling the flow of current in the rotor field coil, and in effect controls the strength of the rotor magnetic field.

The voltage regulator is connected in the field circuit between the battery and the field terminal of the alternator. One terminal of the regulator is marked "IGN" and the other is marked "FLD." The "IGN" terminal of the regulator is connected to the coil side of the ignition switch so that the field circuit is completed **only** when the ignition switch is turned "ON."

The voltage regulator (Fig. 8) has two sets of contacts using a common single armature. The upper and lower stationary contact brackets are mounted on a molded plastic bracket which is attached to the regulator frame by a screw. (Fig. 9) The upper contact bracket is connected to the "IGN" terminal by a fusible wire. The lower contact bracket is connected to ground by another fusible wire. The armature is connected to the insulated "FLD" terminal.

Three resistance units are used (Fig. 10). Resistor number "one" and number "two" are connected between the "IGN" and "FLD" terminals, in parallel with the upper set of contacts. Resistor number "three" is connected between "FLD" terminal and ground. Its function is to reduce arcing at regulator contacts.

A voltage coil, (Fig. 8) consisting of many turns of fine wire, is connected in series between the "IGN" terminal of the regulator and "ground." Thus, when the ignition switch is turned "ON" battery voltage applied to the windings energizes the coil and the magnetic force of the coil tends to attract the regulator armature.

When battery line voltage is relatively low, current flow through the voltage coil will be low. The magnetic force (or pull) of the voltage coil will not be great enough to overcome the regulator armature spring tension, which is holding the armature contact against the upper stationary contact, (Fig. 8).

Battery line voltage applied to the "IGN" terminal causes current to flow through the regulator upper contacts, through the "FLD" terminal of the regulator and to the "insulated" brush and rotor slip ring. The rotor field coil circuit is completed to "ground" through the other rotor slip ring and the "ground" brush. Inasmuch as the upper contacts are "closed," the field circuit resistance is low, and maximum current will flow through the rotor field coil. The rotor

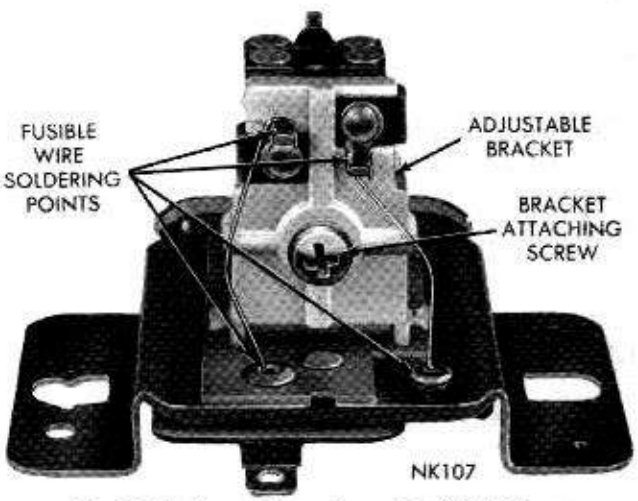


Fig. 9—Voltage Regulator Fusible Wires

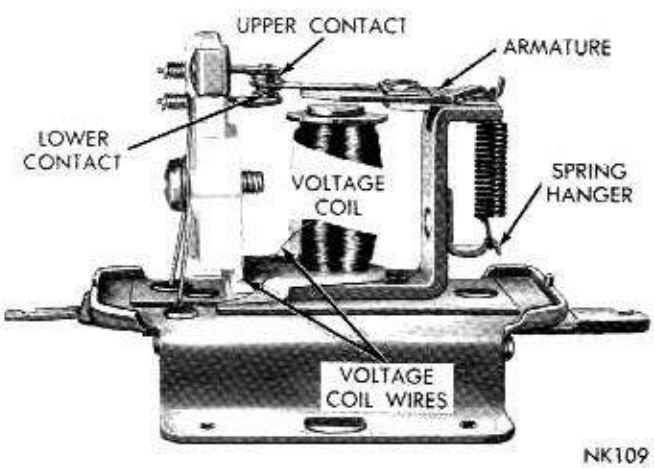


Fig. 8—Voltage Regulator (Cover Removed)

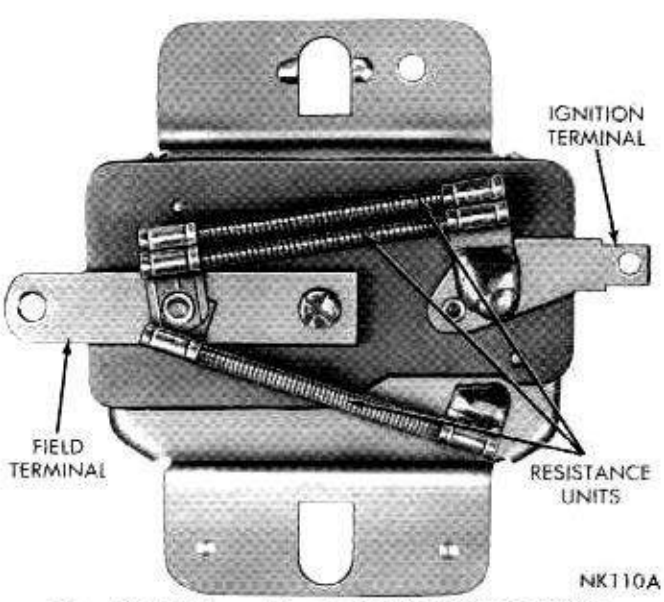


Fig. 10—Voltage Regulator Resistance Units

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field strength will be high, and the alternator output will be at its maximum for any rotor speed.

As the battery line voltage increases, the magnetic pull of the voltage coil overcomes the armature spring tension, and "opens" the upper contacts. The armature contacts at this time do not touch either the upper or lower stationary contacts. Field current now flows through the regulator "IGN" terminal, through resistance number one and number two, through the "FLD" terminal, and through the rotor field to ground.

The two resistors, in series with the field circuit, reduce field current and rotor field strength, with a corresponding reduction in alternator output voltage. This momentarily reduces battery line voltage applied to the regulator voltage coil. The regulator armature spring tension overcomes the magnetic pull of the voltage coil, closing the upper contacts.

When the electrical load requirements are relatively high, the regulator armature oscillates, opening and closing the upper contacts. This alternately "puts in" and "takes out" resistance in the field circuit, and in effect limits the alternator output voltage.

When the electrical load requirements are low and the engine speed is high, the alternator output voltage tends to increase. The battery line voltage (now slightly increased) causes the regulator voltage coil magnetic force to pull the armature contact against the regulator lower stationary contact.

Field current flow is now through the regulator "IGN" terminal, resistors number one and number two, to the regulator "FLD" terminal. Since the regulator armature is connected to the "FLD" terminal and the lower contacts are closed, the current path is through the regulator armature to the movable contact and then through ths lower contact to ground. This is because the resistance to ground is less than the alternator rotor field coil resistance.

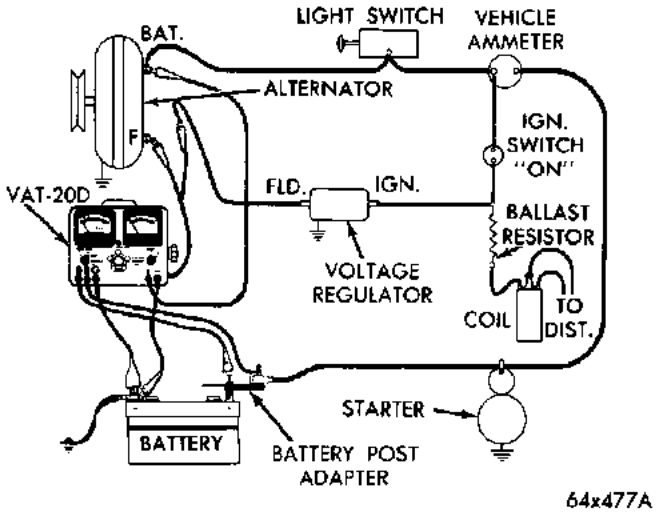


Fig. 11—Voltage Regulator Test

By-passing the alternator field coil will cause the alternator output voltage and the battery line voltage to drop. This reduction in voltage will reduce the magnetic pull of the regulator voltage coil, to the extent that it cannot hold the armature contact against the stationary lower contact.

The armature moves into a "no contact" position between the upper and lower stationary contacts. This momentarily allows the field current to flow through resistors number one and number two, and through the rotor field coil to ground. At high engine speed and low electrical load operation, the armature oscillates between the "no contact" position, and contact with the lower stationary contact, to limit battery line voltage.

VOLTAGE REGULATOR TEST (With VAT-20D Tester) (Fig. 11)

Regulator Temperature should be normalized by operating with a 10 ampere load for 15 minutes just prior to testing.

Tester Controls and Switches

(1) Set Polarity Switch to NEGATIVE position.
(2) Set Tester Control Knob to DIRECT position.
(3) Set Voltage Switch to 2 VOLT position.
(4) Set Field Control to OPEN position.

Tester Lead Connections

(1) Disconnect battery positive cable from battery post and install BATTERY POST ADAPTER between cable and post.

(2) Connect "BAT" lead of tester to stud on ADAPTER.

(3) Connect "REG" lead of tester to binding post on adapter.

(4) Connect "GRD" lead of tester to battery negative terminal.

THE BATTERY POST ADAPTER BY-PASS SWITCH must be open for all charging system tests. It is closed for starting the engine.

Upper Contacts Test

(1) With ignition switch turned off, disconnect field wire from "FLD" terminal of alternator.

(2) Connect one of the test leads of Tester Field Control to "FLD" terminal of alternator.

(3) Connect other lead of Tester Field Control to field wire disconnected from alternator "FLD" terminal.

(4) Set Tester Voltage Switch to 16 VOLT position.

(5) Connect positive lead of Tester Voltmeter to "BAT" terminal of alternator.

(6) Connect negative lead of Test Voltmeter to battery negative terminal.

(7) Rotate Tester Field Control to the DIRECT position.

(8) With engine operating at 1250 RPM, rotate tester Control Knob clockwise until Ammeter reads exactly 15 amperes.

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(9) Rotate tester Field Control from DIRECT position to OPEN position and then back to DIRECT position to cycle the system.

(10) Observe test voltmeter. Voltmeter now indicates setting of the voltage regulator upper contacts. Refer to "Specifications."

(11) Rotate tester Control Knob to DIRECT position. If regulator operates within specifications, proceed to lower contact voltage test. If upper contact voltage setting is not within specifications, remove regulator cover and adjust voltage setting as outlined in "Regulator Adjustments" step number (1).

Lower Contact Test

(1) Increase engine speed to 2200 RPM.

(2) Rotate tester Control Knob to the ¼ OHM position only if tester Ammeter reads over 5 amperes.

(3) Rotate tester Field Control from DIRECT position to OPEN position and then back to DIRECT position to cycle the system.

(4) Observe the voltmeter. Voltmeter now indicates setting of voltage regulator lower contacts. Refer to specifications.

Voltage should increase not less than .2 volt or more than .7 volt above previous operating voltage setting recorded in the upper contact test. A voltage reading of less than .2 volt or more than .7 volt is an indication of a possible wrong air gap setting, refer to "Regulator Mechanical Adjustments."

(5) Rotate tester Field Control to OPEN position and Control Knob to DIRECT position.

Upon completion of test, reduce engine speed to idle, stop engine, and disconnect all test leads and adaptors. Be sure that all vehicle's cables and wiring connections are secure before restarting engine.

CAUTION: Be sure negative post of battery is always connected to ground. Incorrect battery polarity may result in wiring harness damage and may damage alternator rectifiers. Do not ground alternator field circuit, as this may damage regulator.

Adjusting the Voltage Setting to Driving Conditions

Specifications called for in the voltage regulator chart indicate a tolerance of one volt from the low setting to high setting at temperatures indicated.

To maintain battery in a full state of charge, the voltage regulator should be adjusted to provide proper voltage limiting setting according to customer's driving and load requirement habits as follows:

(a) Check entire charging system and battery as outlined in this Service Manual.

(b) If there are no defects in the charging system or in the battery and the battery was found to be in a low state of charge, increase setting by .3 volt (do not exceed specified voltage limits) and retest for an improved battery condition after a reasonable service period (week or two). If battery state of charge has increased to a satisfactory level, do not change voltage setting. If battery shows evidence of over-charge—(low electrolyte level, high water consumption, excessive dampness on top of battery), decrease setting by .3 volt and retest for an improved battery condition after a reasonable service period (week or two).

CAUTION: Always adjust settings in steps not to exceed .3 volt at a time. (Do not exceed specified voltage limits.)

(c) The proper setting of the voltage regulator is attained when the battery remains at least 1.225 specific gravity in the winter or 1.245 specified gravity in the summer, with a minimum water requirement (not more than an ounce of water per cell per one thousand miles).

Regulator Mechanical Adjustments

Step 1—Adjust upper contact voltage setting as necessary by bending regulator lower spring hanger **down** to **increase** voltage setting, **up** to **decrease** voltage setting. Use an insulated **tool** to bend spring hanger (Fig. 12). The regulator must be installed, correctly connected, and retested after each adjustment of lower spring hanger.

If repeated readjustment is required, it is permissible to use a jumper wire to ground the regulator base to the fender splash shield for testing, in lieu of reinstalling regulator each time. However, it is important that regulator cover be reinstalled, regulator connections correctly connected, and regulator satisfactorily insulated by fender cover to prevent grounding the regulator terminals or resistances. When testing, regulator must be at the same attitude (or angle) as when

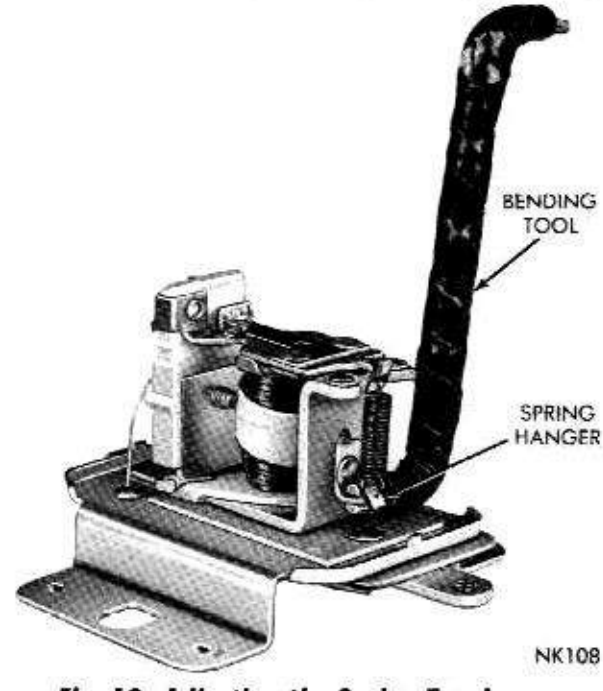


Fig. 12—Adjusting the Spring Tension

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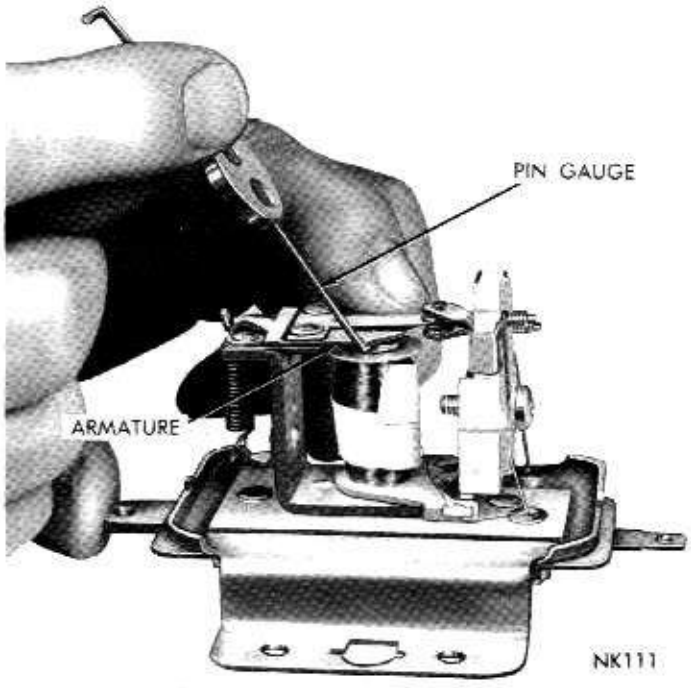


Fig. 13—Testing the Air Gap

installed on vehicle. If step (1) under "Mechanical Adjustments" does not bring voltage regulator within specifications, proceed to Step (2) following:

Step 2—Measure lower contact point gap. Lower contact gap should be .014 inch plus or minus .002 inch. Adjust lower contact gap as necessary by bending lower stationary contact bracket making sure contacts are in alignment.

If lower contact gap is correct and voltage regulator setting is still outside the .2 to .7 volt increase, adjust air gap as follows:

(a) Connect a small dry cell test lamp in series with the "IGN" and "FLD" terminal of voltage regulator.

(b) Insert an .048 inch wire gauge between regulator armature and core of the voltage coil next to stop pin on armature (Fig. 13).

(c) Press down on armature (not on the contact reed) until armature contacts wire gauge. Upper contacts should just **open** and test lamp should be **dim.**

(d) Insert an .052 inch wire gauge between the armature and voltage coil core, next to the stop pin on armature.

(e) Press down on armature until it contacts wire gauge. The upper contacts should remain **closed** and test lamp should remain **bright.**

If an adjustment is required to obtain the difference between the upper contact voltage and lower contact voltage of .2 volt to .7 volt; adjust the air gap by loosening the stationary contact bracket screw and moving bracket up or down as necessary to obtain proper air gap setting as follows:

If the difference is above .7 volt, reduce air gap to a minimum of .045 inch with contacts open and test lamp dim. At .048 inch contacts should close and test lamp should be bright.

If the difference is below .2 volt, increase air gap to a maximum of .055 inch with contacts closed and test lamp bright. At .052 inch contacts should be open and test lamp should be dim.

Make sure air gap is checked with stationary contact bracket attaching screw fully tightened.

Voltage Regulator Fusible Wire Replacement

(1) Cut fuse wire above solder connection at the base and unwind wire at top bracket.

CAUTION: If an attempt is made to unsolder the old fuse, the very small wire from voltage coil may be damaged.

(2) Tin end of fuse wire. **Use resin core solder only.**

(3) Holding tinned end of new fuse wire into recessed rivet at base of regulator and against old piece of fuse wire that remains, cause a drop of solder from soldering iron to fall on these parts. Allow solder to cool sufficiently for fuse wires to make a good solder joint.

(4) Pull new fuse wire up enough to remove slack and wrap it around the bracket. Solder coiled wire to the bracket and cut off surplus fuse wire.

The original fuse wire is machine wound on the upper bracket. Replacement fuse should be soldered to the bracket to ensure a good electrical contact.

VOLTAGE REGULATOR
(ESSEX BUILT)

GENERAL INFORMATION

The only function of the regulator is to limit the output voltage. The voltage regulator accomplishes this by controlling the flow of current in the rotor field coil, and in effect controls the strength of the rotor magnetic field.

The voltage regulator is connected in the field circuit between the battery and the field terminal of the alternator. One terminal of the regulator is marked "IGN" and the other is marked "FLD." The "IGN" terminal of the regulator is connected to the coil side of the ignition switch so that the field circuit is completed **only** when the ignition switch is turned "ON."

The voltage regulator has two sets of contacts moving with the regulator armature (Fig. 14). The common upper and lower stationary contacts are mounted on a bracket which is attached to but insulated from the regulator frame. The lower contact mounted on the armature is connected to the "IGN" terminal. The upper contact, mounted on the armature, but insulated from it, is connected to ground by a flexible

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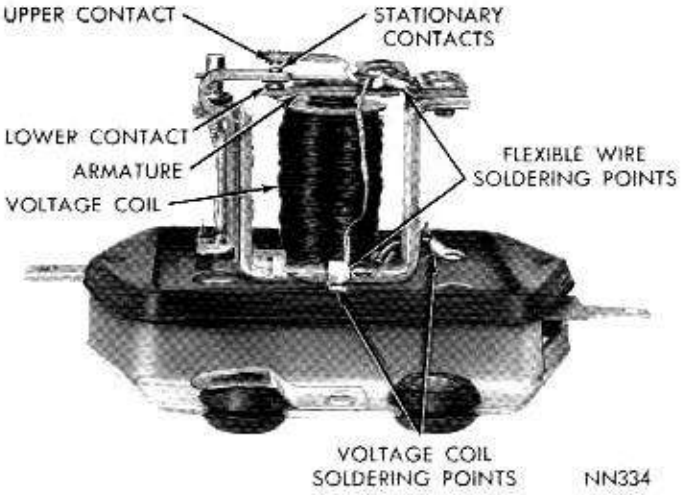


Fig. 14—Voltage Regulator (Cover Removed)

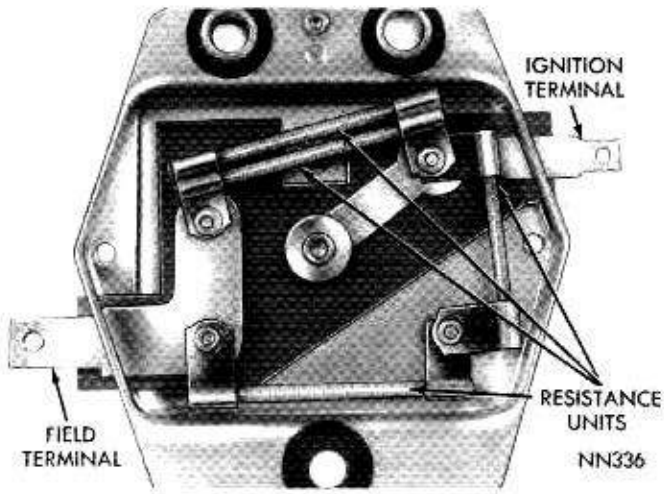


Fig. 16—Voltage Regulator Resistance Units

wire. The stationary contacts are connected to the "FLD" terminal by a fusible link (Fig. 15).

Four resistance units are used (Fig. 16). Resistor number "one" and number "two" are connected between the "IGN" and "FLD" terminals, in parallel with the lower set of contacts. Resistor number "three' is connected between the "FLD" terminal and ground. Its function is to reduce arcing at the regulator contacts.

A voltage coil, (Fig. 14) consisting of many turns of fine wire, is connected in series with resistor number "four" between the "IGN" terminal of the regulator and "ground." Thus, when the ignition switch is turned "ON," battery voltage applied to the windings energizes the coil and the magnetic force of the coil tends to attract the regulator armature.

When the battery line voltage is relatively low, the current flow through the voltage coil will be low. The magnetic force (or pull) of the voltage coil will not be great enough to overcome the regulator armature spring tension, which is holding the armature contact against the lower stationary contact (Fig. 14).

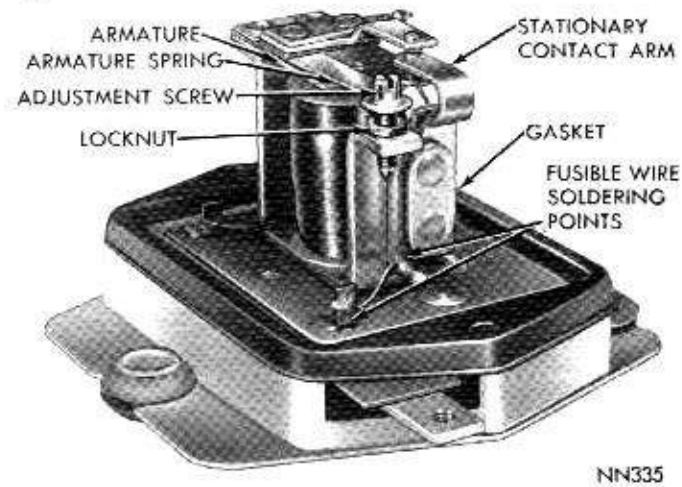


Fig. 15—Voltage Regulator Fusible Wire

Battery line voltage applied to the "IGN" terminal causes current to flow through the regulator upper contacts, through the "FLD" terminal of the regulator and to the "insulated" brush and rotor slip ring. The rotor field coil circuit is completed to "ground" through the other rotor slip ring and the "ground" brush. Inasmuch as the upper contacts are "closed," the field circuit resistance is low, and maximum current will flow through the rotor field coil. The rotor field strength will be high, and the alternator output will be at its maximum for any rotor speed.

As the battery line voltage increases, the magnetic pull of the voltage coil overcomes the armature spring tension, and "opens" the lower contacts. The stationary contacts at this time do not touch either the upper or lower armature contacts. Field current now flows through the regulator "IGN" terminal, through resistance number "one" and number "two," through the "FLD" terminal, and through the rotor field ground.

The two resistors, in series with the field circuit, reduce field current and rotor field strength, with a corresponding reduction in alternator output voltage. This momentarily reduces battery line voltage applied to the regulator voltage coil. The regulator armature spring tension overcomes the magnetic pull of the voltage coil, closing the lower contacts.

When the electrical load requirements are relatively high, the regulator armature oscillates, opening and closing the lower contacts. This alternately "puts in" and "takes out" resistance in the field circuit, and in effect limits the alternator output voltage.

When the electrical load requirements are low and the engine speed is high, the alternator output voltage tends to increase. The battery line voltage (now slightly increased) causes the regulator voltage coil magnetic force to pull the grounded armature contact against the regulator upper stationary contact. The "FLD" terminal is now connected to ground.

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Field current flow is now through the regulator "IGN" terminal, resistors number one and number two, to the regulator "FLD" terminal, and hence to ground. This is because the resistance to ground is less than the alternator rotor field coil resistance.

By-passing the alternator field coil will cause the alternator output voltage and the battery line voltage to drop. This reduction in voltage will reduce the magnetic pull of the regulator voltage coil, to the extent that it cannot hold the armature contact against the stationary upper contact.

The armature moves into a "no contact" position about the upper and lower stationary contacts. This momentarily allows the field current to flow through resistors number one and number two, and through the rotor field coil to ground. At high engine speed and low electrical load operation, the armature oscillates between the "no contact" position, and contact with the upper stationary contact, to limit the battery line voltage.

VOLTAGE REGULATOR TEST (With VAT-20D Tester) (Fig. 11)

Regulator temperature should be normalized by operating with a 10 ampere lead for 15 minutes just prior to testing.

Tester Controls and Switches

(1) Set Polarity Switch to NEGATIVE position.
(2) Set Tester Control Knob to DIRECT position.
(3) Set Voltage Switch to 2 VOLT position.
(4) Set Field Control to OPEN position.

Tester Lead Connections

(1) Disconnect battery positive cable from battery post and install BATTERY POST ADAPTER between cable and post.
(2) Connect "BAT" lead of Tester to stud on adapter.
(3) Connect "REG" lead of Tester to binding post on adapter.
(4) Connect "GRD" lead of Tester to battery negative terminal.

THE BATTERY POST ADAPTER BY-PASS SWITCH must be open for all charging system tests. It is closed for starting the engine.

Lower Contacts Test

(1) With ignition switch turned off, disconnect field wire from "FLD" terminal of alternator.
(2) Connect one of the test leads of Tester Field Control to "FLD" terminal of alternator.
(3) Connect other lead of Tester Field Control to field wire disconnected from alternator "FLD" terminal.
(4) Set Tester Voltage Switch to 16 VOLT position.
(5) Connect positive lead of Tester Voltmeter to "BAT" terminal of alternator.
(6) Connect negative lead of Tester Voltmeter to battery negative terminal.
(7) Rotate Tester Field Control to the DIRECT position.
(8) With engine operating at 1250 RPM, rotate Tester Control Knob clockwise until Ammeter reads exactly 15 amperes.
(9) Rotate Tester Field Control from DIRECT position to OPEN position and then back to DIRECT position to cycle the system.
(10) Observe Tester Voltmeter. Voltmeter now indicates setting of voltage regulator upper contacts. Refer to "Specifications."
(11) Rotate Tester Control Knob to DIRECT position. If regulator operates within specifications, proceed to lower contact voltage test. If upper contact voltage setting is not within specifications, adjust voltage setting as outlined in "Regulator Adjustments" test number (1).

Upper Contact Test

(1) Increase engine speed to 2200 RPM.
(2) Rotate Tester Control Knob to ¼ OHM position only if Tester Ammeter reads over 5 amperes.
(3) Rotate Tester Field Control from the DIRECT position to the OPEN position and then back to the DIRECT position to cycle the system.
(4) Observe voltmeter. Voltmeter now indicates setting of the voltage regulator upper contacts. Refer to specifications.

Voltage should increase not less than .2 volt or more than .7 volt above previous operating voltage setting recorded in lower contact test. A voltage reading of less than .2 volt or more than .7 volt is an indication of a possible wrong air gap setting, refer to "Regulator Mechanical Adjustments."

(5) Rotate Tester Field Control to OPEN position and Control Knob to DIRECT position.

Upon completion of test, reduce engine speed to idle, stop engine, and disconnect all test leads and adaptors. Be sure that all vehicle's cables and wiring connections are secure before restarting engine.

CAUTION: Be sure the negative post of battery is always connected to ground. Incorrect battery polarity may result in wiring harness damage and may damage alternator rectifiers. Do not ground alternator field circuit, as this may damage the regulator.

Adjusting the Voltage Setting to Driving Conditions

Specifications called for in the voltage regulator chart indicates a tolerance of .9 volt from the low setting to the high setting at the temperatures indicated.

To maintain the battery in a full state of charge, the voltage regulator should be adjusted to provide proper voltage limiting setting according to the customer's driving and load requirement habits as follows:

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Fig. 17—Lower Contact Voltage Adjustment

(1) Check entire charging system and battery as outlined in this Service Manual.

(2) If there are no defects in the charging system or in the battery and the battery was found to be in a low state of charge, increase setting by .3 volt (do not exceed specified voltage limits) and retest for an improved battery condition after a reasonable service period (week or two). If battery state of charge has increased to a satisfactory level, do not change voltage setting. If the battery shows evidence of overcharge—(low electrolyte level, high water consumption, excessive dampness on top of battery), decrease setting by .3 volt and retest for an improved battery condition after a reasonable service period (week or two).

CAUTION: Always adjust settings in steps not to exceed .3 volt at a time. (Do not exceed specified voltage limits.

(3) The proper setting of the voltage regulator is attained when battery remains at least 1.225 specific gravity in the winter or 1.245 specified gravity in the summer, with a minimum water requirement (not more than an ounce of water per cell per one thousand miles).

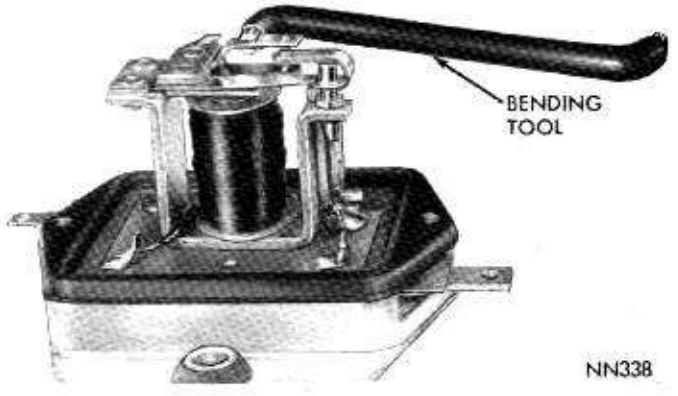


Fig. 18—Bending Upper Contact Arm

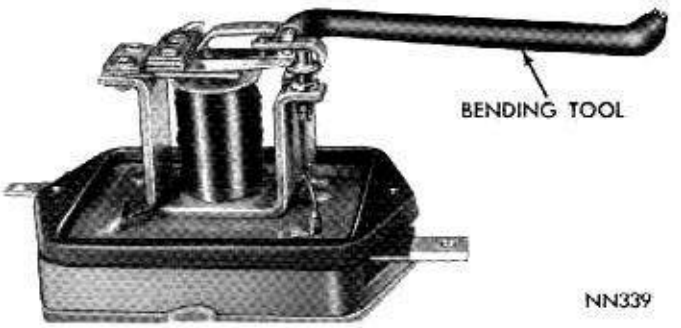


Fig. 19—Bending Stationary Contact Arm

Regulator Mechanical Adjustments

Step One—Adjust lower contact voltage setting as necessary by turning the adjustment screw (Figs. **15** and **17**) clockwise to increase voltage or counterclockwise to decrease voltage.

Step Two—Measure upper contact point gap. Upper contact gap should be .014 inch, plus or minus .004 inch. Adjust upper contact gap as necessary by bending armature upper contact bracket (Fig. **18**), making sure contacts are in alignment.

If upper contact gap is correct and voltage regulator setting is still outside the .2 to .7 volt increase, adjust air gap as follows:

If the difference is above .7 volt, reduce air gap by bending down the fixed contact bracket (Fig. 19). If the difference is below .2 volt, increase air gap by bending fixed contact bracket (Fig. 19) up.

(a) Connect a small dry cell test lamp in series with the "IGN" and "FLD" terminal of the voltage regulator.

(b) Insert a .032 inch wire gauge between regulator armature and core of voltage coil next to stop pin on the armature (Fig. **20**), and press down on the arma-

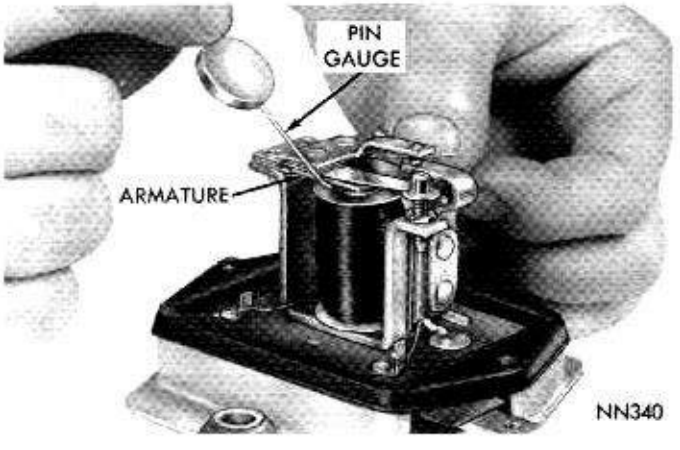


Fig. 20—Testing Air Gap

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ture until armature contacts wire gauge. Lower contacts should just open and test lamp should be dim.

(c) With air gap adjusted as in step (b), a .042 inch wire gauge cannot be inserted between the armature and voltage core.

Voltage Regulator Fusible Wire Replacement

Install a new fuse wire. Solder both ends of a new fuse wire securely using only resin core solder.

ALTERNATOR SERVICE PROCEDURES

If alternator performance does not meet current output specifications limits, it will have to be removed and disassembled for further test and servicing.

(1) Disconnect battery ground cable at battery negative terminal.

(2) Disconnect alternator output "BATT" and field "FLD" leads and disconnect ground wire.

(3) Remove alternator mounting bolts and remove alternator.

BENCH TESTS

Field Coil Draw

If alternator field coil draw has not been tested on vehicle it may be tested on test bench as follows:

(1) Connect test ammeter positive lead to battery positive terminal of a fully charged battery. Connect test ammeter negative lead to field terminal of alternator. Connect a jumper wire to negative terminal of battery, and ground it to alternator end shield.

(2) Slowly rotate alternator rotor by hand. Observe ammeter reading. Field coil draw should be 2.3 amperes to 2.7 amperes at 12 volts.

A low rotor coil draw is an indication of high resistance in field coil circuit, (brushes, slip rings, or rotor coil). A higher rotor coil draw indicates possible shorted rotor coil or grounded rotor.

Testing Alternator Internal Field Circuit for Ground

(1) To test internal field circuit for ground, remove ground brush. Touch one test prod from a 110 volt test lamp to the alternator insulated brush terminal and remaining test prod to end shield. If rotor assembly or insulated brush is not grounded, lamp will not light.

(2) If lamp lights, remove insulated brush assembly (noting how the parts are assembled) and separate the end shields by removing the three through bolts.

(3) Again test by placing one of the test prods to a slip ring and remaining test prod to end shield. If lamp lights, rotor assembly is grounded and requires replacement. If lamp does not light after removing the insulated brush and separating the end shields, the cause of the ground at the first ground test was a grounded insulated brush.

(4) Examine plastic insulator and screw. Screw is a special size and must not be substituted.

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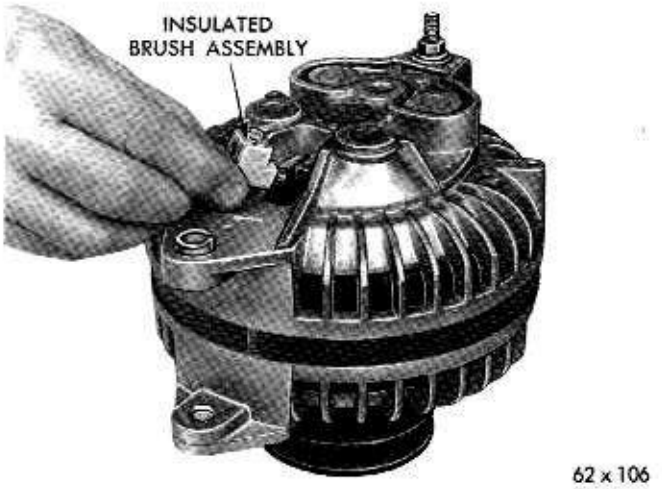


Fig. 21—Removing or Installing Insulated Brush

(5) Install insulated brush holder, terminal, insulated washer, shake proof washer and screw. If the parts were not assembled in this order or if wrong screw was used this could be the cause of the ground condition.

DISASSEMBLING THE ALTERNATOR

To prevent possible damage to brush assemblies, they should be removed before proceeding with disassembly of the alternator. The insulated brush is mounted in a plastic holder that positions brush vertically against one of the slip rings.

(1) Remove retaining screw lockwasher, insulated washer, and field terminal, and carefully lift plastic holder containing spring and brush assembly from end housing, (Figure 21).

(2) The ground brush is positioned horizontally against remaining slip ring and is retained in a holder that is integral with end shield. Remove retaining screw and lift clip, spring and brush assembly from end shield, (Figure 22).

CAUTION: Stator is laminated, do not burr stator or end shield.

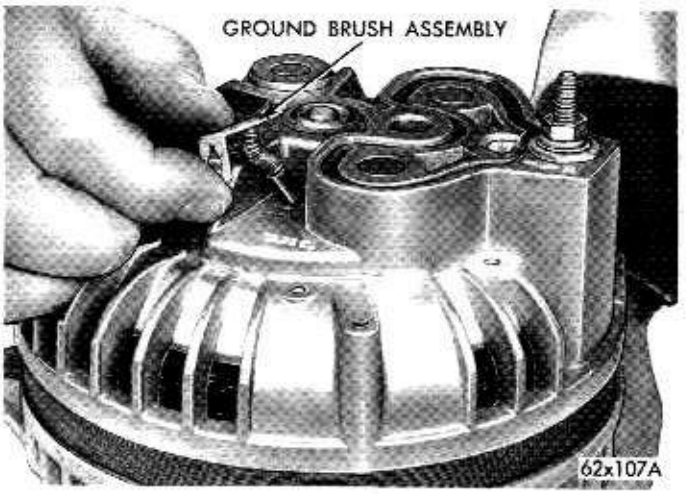


Fig. 22—Removing or Installing Ground Brush

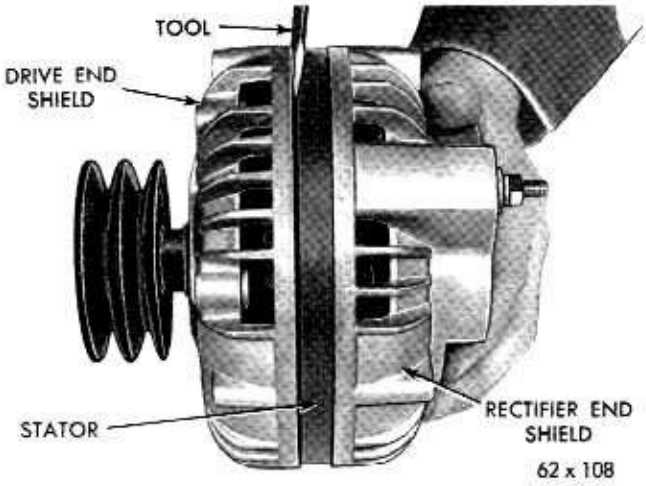


Fig. 23—Separating Drive End Shield from Stator

(3) Remove through bolts and pry between the stator and drive end shield with blade of a screwdriver, as shown in Figure 23. Carefully separate drive end shield, pulley and rotor assembly away from stator and rectifier shield assembly.

Testing the Rectifiers with Tool C-3829

The Rectifier Tester Tool C-3829 provides a quick, simple and accurate test of the alternator rectifiers without the necessity of disconnecting soldered rectifier leads. With alternator rectifier end shield separated from drive end housing proceed with rectifier tests as follows:

Positive Case Rectifier Test (Fig. 24)

(a) Place alternator on an insulated surface. Connect test lead clip to the alternator ("BAT") output terminal.

(b) Plug in Tool C-3829 power source lead into a 110 volt A.C. power supply. Touch exposed bare metal connections of each of the positive case rectifiers, with test prod.

CAUTION: Do not break the sealing around rectifier lead wire. The sealing material is for protection against corrosion. Always touch test prod to exposed metal connection nearest rectifier.

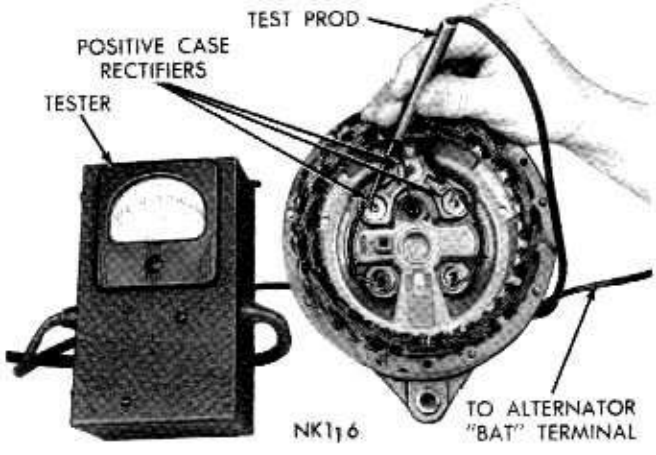


Fig. 24—Testing Positive Rectifiers

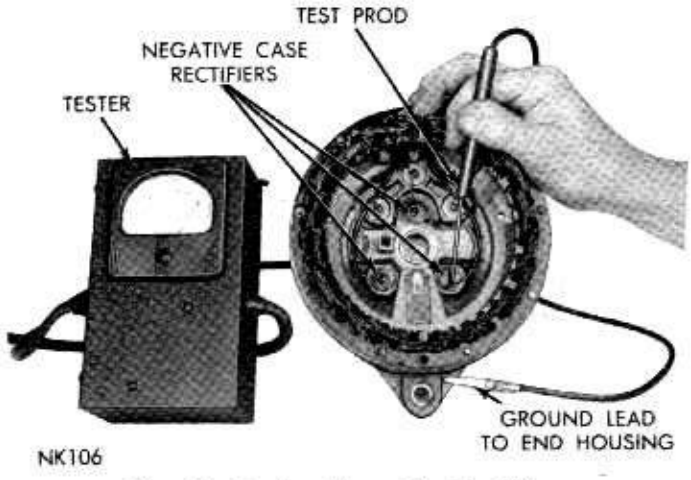


Fig. 25—Testing Negative Rectifiers

The reading for satisfactory rectifiers will be 1¾ amperes or more. Reading should be approximately the same for the three rectifiers.

When two rectifiers are good and one is shorted, reading taken at the good rectifiers will be low, and reading at shorted rectifier will be zero. Disconnect lead to the rectifier reading zero and retest. The reading of the good rectifiers will now be within satisfactory range.

When one rectifier is open it will read approximately one ampere, and two good rectifiers will read within satisfactory range.

Negative Case Rectifier (Fig. 25)

(a) Connect test lead clip to rectifier end housing.

(b) Touch exposed connection of each of the negative case rectifiers with test prod.

Test specifications are the same, and test results will be approximately the same as for positive case rectifiers, except meter will read on opposite side of scale.

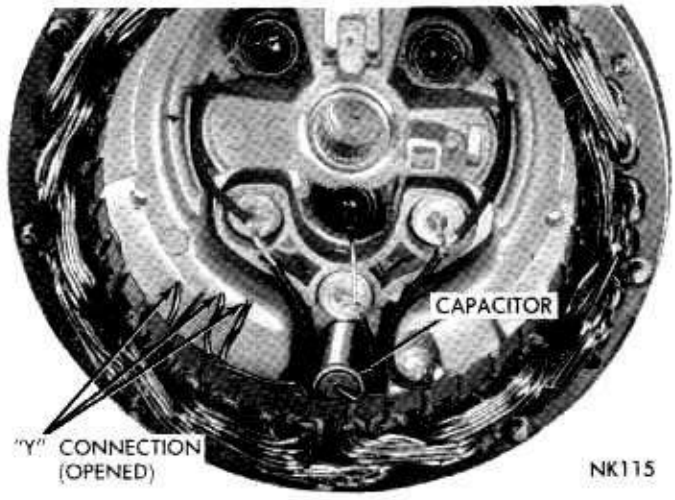


Fig. 26—Separating the Three Stator Leads

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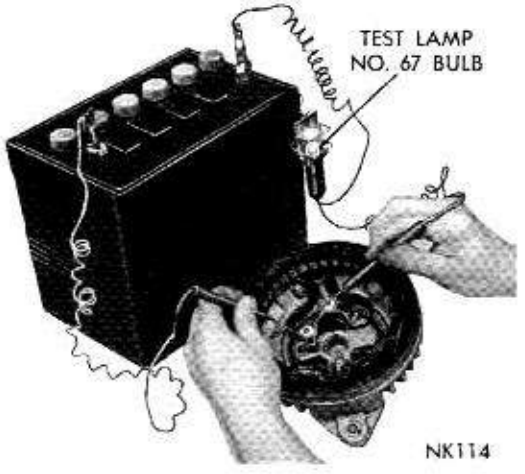


Fig. 27—Testing Rectifiers with Test Lamp

TESTING RECTIFIERS AND STATOR

(When Tool C-3829 is not available)

(a) Separate the three (3) stator leads at "Y" connection (Fig. 26).

Cut stator connection as close to connector as possible. If they are cut too short it may be difficult to get them together again for soldering.

(b) Test rectifiers with a 12 volt battery and a test lamp equipped with a number 67 bulb (4 candle power) by connecting one side of test lamp to positive battery post; other side of test lamp to a test probe with other test probe connected to the negative battery post.

(c) Contact outer case of rectifier with one probe and other probe to wire in center of rectifier (Fig. 27).

(d) Reverse the probes, moving probe from rectifier outer case to rectifier wire, and the probe from rectifier wire to rectifier outer case.

If test lamp "lights" in one direction but does "not light" in other direction, rectifier is satisfactory. If lamp lights in "both directions," **rectifier** is "shorted." If test lamp does "not light" in either direction, rectifier is "open."



Fig. 29—Testing Stator Windings for Continuity

Possible cause of an open or blown rectifier is a faulty capacitor or a battery that has been installed in reverse polarity. If battery is installed properly and the rectifiers are open, test capacitor capacity—.50 microfarad (plus or minus 20%).

(e) Unsolder rectifier leads from stator leads.

(f) Test stator for grounds using a 110 volt test lamp (Fig. 28). Use wood slats to insulate the stator from rectifier shield. Contact one prod of test lamp to stator pole frame, and contact the other prod to each of the three stator leads. Test lamp should "not light." If test lamp lights, stator windings are "grounded."

(g) Test stator windings for continuity, by contacting one prod of test lamp to **all** three stator leads at "Y" connection. Contact each of the three stator leads (disconnected from rectifiers). Test lamp should "light" when prod contacts each of the three leads. If lamp does not light stator winding is "open" (Fig. 29).

(h) Install a new stator if stator tested is "grounded" or "open." If the rectifiers must be replaced un-

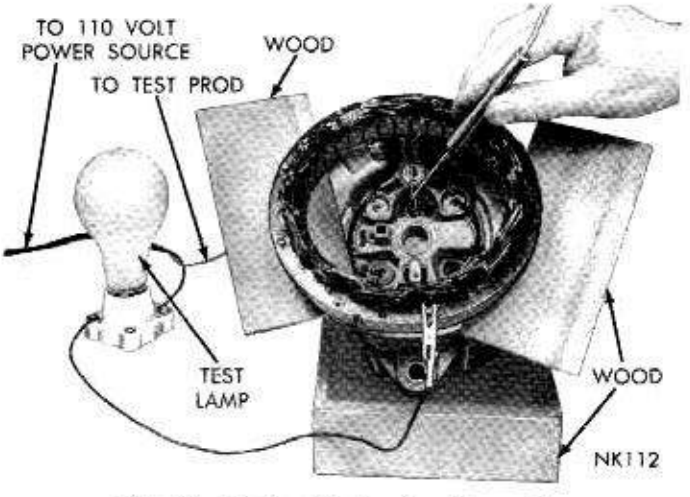


Fig. 28—Testing Stator for Grounds

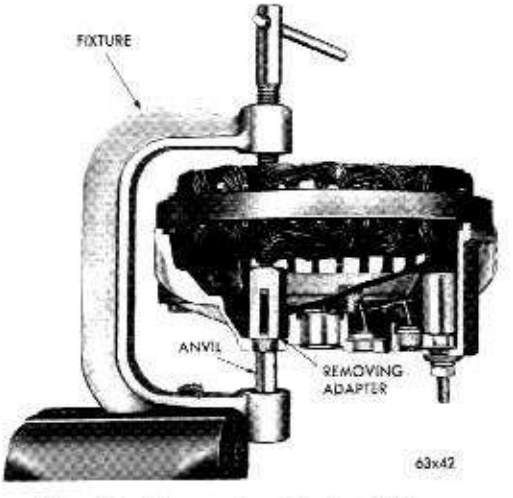


Fig. 30—Removing the Rectifiers

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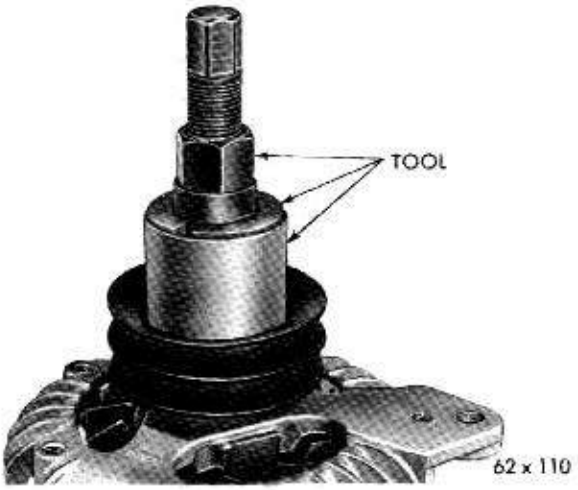


Fig. 31—Removing the Pully

solder the rectifier wire from the stator lead wire at the soldered joint.

Three rectifiers are pressed into the heat sink and three in end shield. When removing rectifiers, it is necessary to support end shield and/or heat sink to prevent damage to these castings.

(4) Cut lead at malfunctioning rectifier.

(5) Place Rectifier Removing and Installing Press in a vise and support end shield on clamp anvil under rectifier to be removed (Fig. 30).

Support tool adapter SP-3821 is cutaway and slotted to fit over wires and around bosses in end shield. Make sure bore of tool completely surrounds rectifier during removal process.

(6) Carefully apply pressure with tool pressure screw until support took, rectifier end shield, and remover pin, and remover adapter are in alignment then press the rectifier out of end shield or heat sink.

(7) The pulley is an interference fit on rotor shaft. Remove pulley with Puller Tool C-3615 or C-3934 and special adapters (Fig. 3l).

(8) Pry drive end bearing spring retainer from end shield with a screwdriver (Fig. 32).

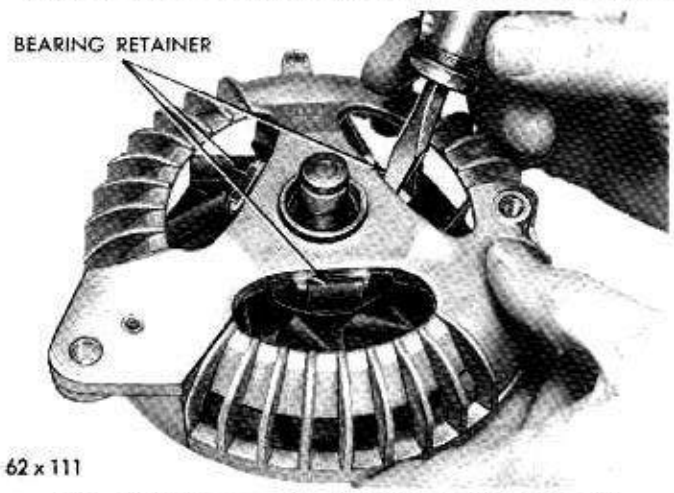


Fig. 32—Disengaging Bearing Retainer from End Shield

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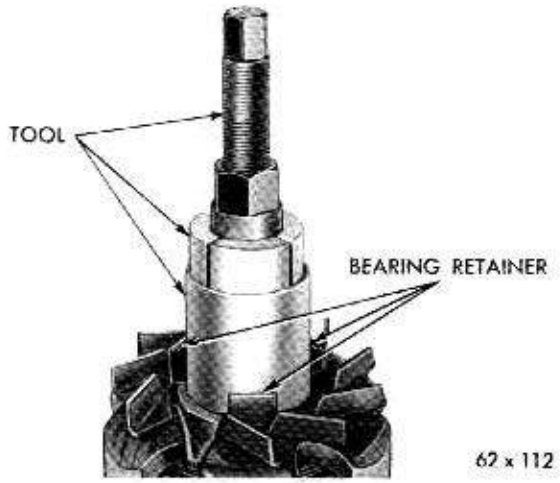


Fig. 33—Removing Bearing from Rotor Shaft

(9) Support end shield and tap rotor shaft with a plastic hammer to separate rotor from end shield.

The new bearing is lubricated with a predetermined amount of special lubricant and does not require additional lubrication.

(10) The drive end ball bearing is an interference fit with the rotor shaft. Remove bearing with puller Tool C-3615 or C-3934 and adapters as follows:

(a) Position center screw of Tool on rotor shaft.

(b) Place thin lower end of adapters SP-3375 under bearing equally spaced with upper end of adapters around center screw.

(c) Hold adapter and center screw in position with tool sleeve.

CAUTION: The tool sleeve must bottom ON bearings, otherwise adapters may be damaged.

(d) Turning center screw while holding outer body of the tool (Fig. 33) will withdraw bearing from rotor shaft.

(11) Remove D.C. output terminal nuts and washers and remove terminal screw and inside capacitor.

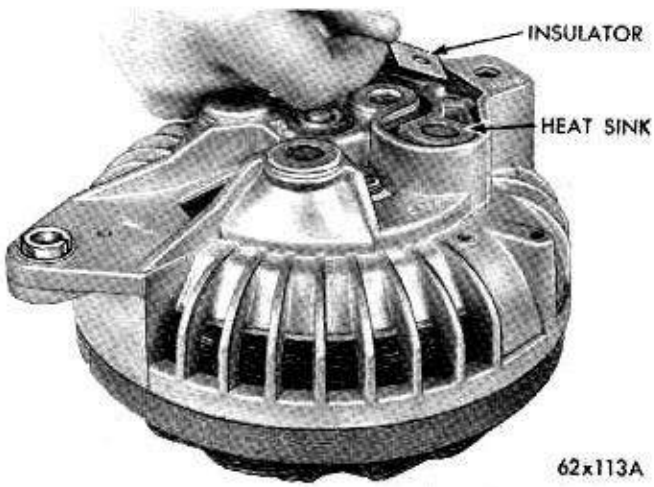


Fig. 34—Removing Heat Sink Insulator

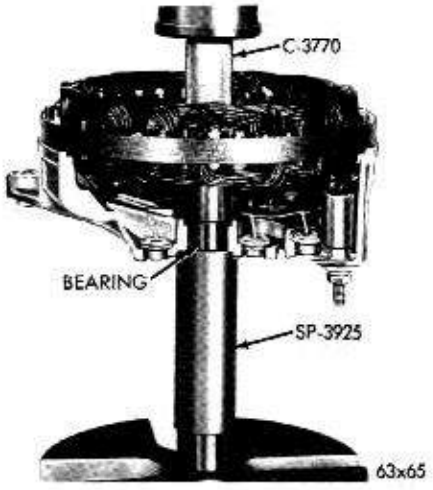


Fig. 35—Removing Rectifier End Shield Bearing

The heat sink is also held in place by the terminal screw.

(12) Remove insulator (Fig. 34).

(13) The needle roller bearing in rectifier end shield is a press fit. If necessary to remove rectifier end frame needle bearing, protect end shield by supporting shield with Tool C-3925 when pressing bearing out with Tool C-3770A (Fig. 35). Make sure notches in tool clear raised section of heat sink.

The new bearing is prelubricated and no additional lubricant should be added, as an excessive amount of lubricant will contaminate the slip rings and cause premature brush and rotor failures.

REPLACING SLIP RINGS

Slip rings that are damaged can be replaced as follows:

(a) Cut through rotor grease retainer with a chisel and remove the retainer.



Fig. 36—Solder Points—Slip Ring Installed



Fig. 37—Cutting Old Slip Rings

(b) Unsolder field coil leads at solder lugs (Fig. 36).

(c) Cut through copper of both slip rings at opposite points (180° apart) with a chisel (Fig. 37).

(d) Break insulator and remove the old ring.

(e) Clean away dirt and particles of old slip ring from rotor.

(f) Scrape ends of field coil lead wires clean for good electrical contact.

(g) Scrape one end (about 3/16 inch) of a piece of bare wire (approx. 18 gauge) three inches long (to be used as a guide wire).

(h) Tin scraped area of guide wire with resin core solder. Lap tinned end of wire over field coil lead to

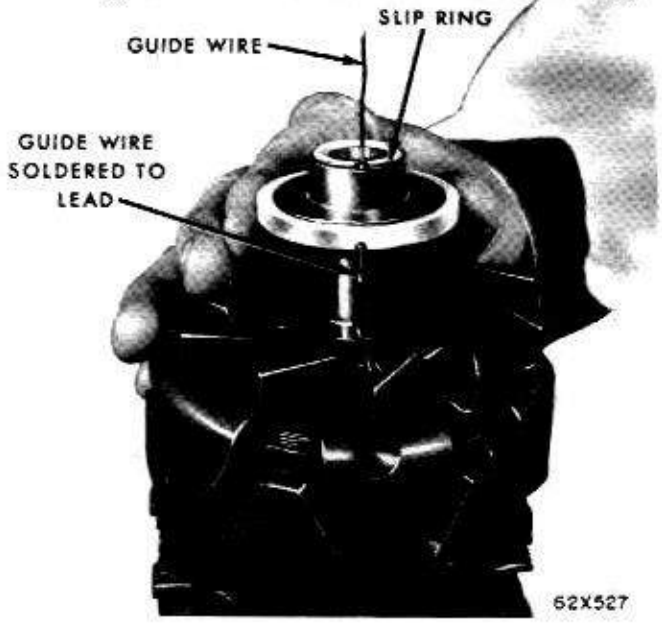


Fig. 38—Aligning Slip Ring with Field Wire and Guide Wire

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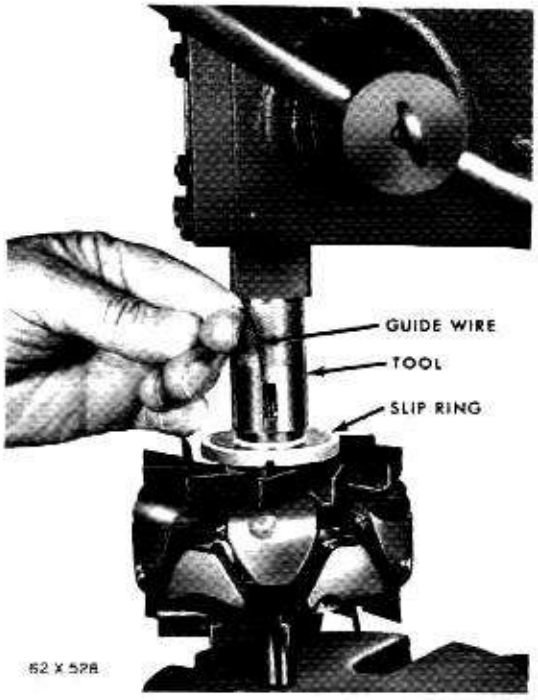


Fig. 39—Installing Slip Ring

the insulated ring and solder the two together.

(i) Position new slip ring carefully over guide wire and rotor shaft so wire will lay in slip ring groove (Fig. 38). The groove in slip ring must be in line with insulated brush field lead to provide room for the lead without damaging it.

(j) Place installing Tool C-3900 over rotor shaft with guide wire protruding from slot in tool.

(k) Position rotor, slip and tool assembly in an arbor press (Fig. 39). Pull up on guide wire being careful to guide insulated field lead into slip ring groove. While guiding insulated field lead through the groove, press slip ring on shaft. When slip ring is bottomed on rotor fan, the end of field lead (insulated brush ring) should be visible at solder lug (Fig. 36).

(l) Unsolder guide wire from insulated brush slip ring lead. Press field lead into solder lug and solder the lead to the lug with resin core solder.

CAUTION: Be sure solder bead does not protrude beyond surface of plastic material. Do not use acid core solder as a short circuit may result and corrosion will definitely occur.

(m) Coil ground brush ring field lead around solder lug and solder with resin core solder.

(n) Test slip rings for ground with a 110 volt test lamp by touching one test lead prod to rotor pole shoe and remaining prod to slip rings. Test lamp should not light. If lamp lights, slip rings are shorted to ground, possibly due to grounding insulated field lead when installing slip ring.

If rotor is not grounded, lightly clean slip ring surfaces with -00- sandpaper.

(o) Position grease retainer on rotor shaft and press retainer on shaft with installer Tool C-3921 (Fig. 40). The retainer is properly positioned when the inner bore of installer tool bottoms on the rotor shaft.

ASSEMBLING THE ALTERNATOR

(1) Check rectifier identification to make sure correct rectifier is being installed. Refer to Parts List for rectifier identification.

(2) Start rectifier squarely into mounting hole.

(3) Support heat sink or rectifier end shield on installer adapter of Tool C-3928. With the installing adapter positioned on the rectifier, carefully apply pressure with tool pressure screw until the installer tool, rectifier, rectifier end shield or heat sink are in alignment and after determining that rectifier is started squarely in the casting, slowly apply pressure with tool pressure screw until you feel the collar of rectifier bottom against casting (Fig. 41.)

Make sure installer support adapter fits square around the rectifier inner boss and that pressure is applied on outer rim of rectifier.

CAUTION: DO NOT USE a hammer to start the rectifier into its bore in end shield. DO NOT HAMMER OR SHOCK the rectifier in any manner as this

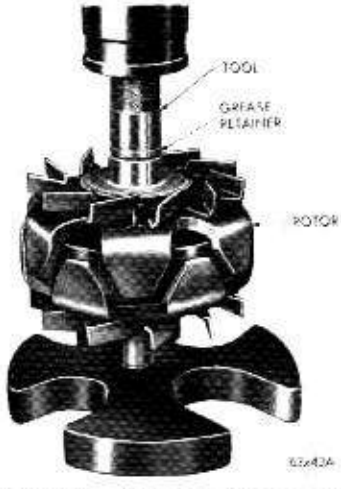


Fig. 40—Installing Bearing Grease Retainer

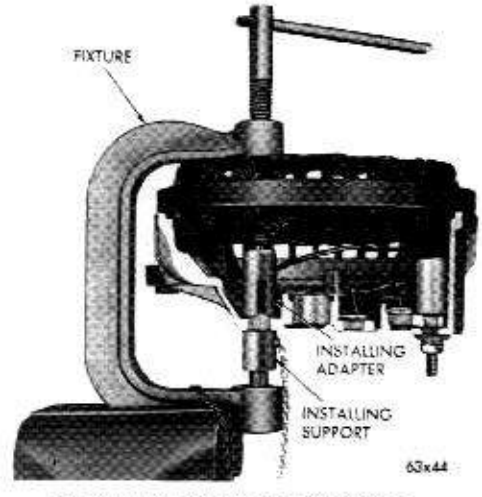


Fig. 41—Installing a Rectifier

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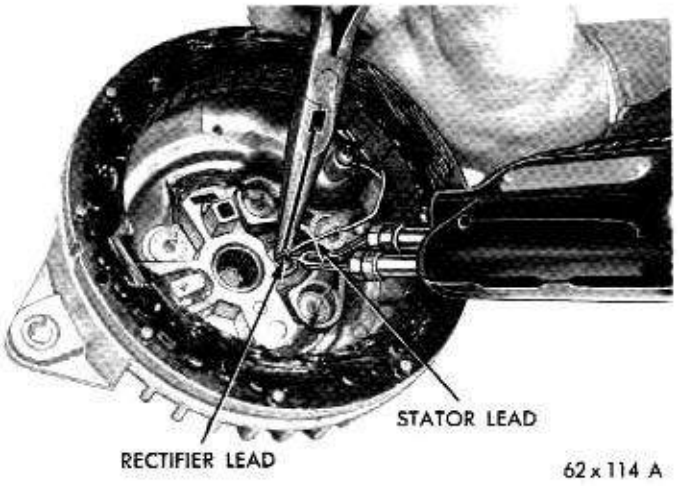


Fig. 42—Soldering Rectifier and Stator Leads

will fracture the thin silicon wafer in the rectifier causing complete rectifier failure.

(4) Clean the leads and mate stator lead with rectifier wire and bend the loop snugly around stator lead to provide a good electrical and mechanical connection. Solder wires with resin core solder. Hold rectifier lead wire with pliers just below the joint while soldering (Fig. 42). Pliers will absorb heat from the soldering operation and protect rectifier.

After soldering, quickly cool soldered connection; touch a dampened cloth against it. This will aid in forming a solid joint.

(5) After soldering, stator leads must be pushed down into the slots that are case into the end shield and cemented with MoPar Cement Part Number 2299314 to protect the leads against possible interference with the rotor fans. Test each replacement rectifier to make certain rectifier was not damaged by the soldering or pressing operations.

(6) Support end shield on Tool C-3925 so that notches in the support tool will clear the raised section of the heat sink and press the bearing into position with Tool SP-3381 (Fig. 43).

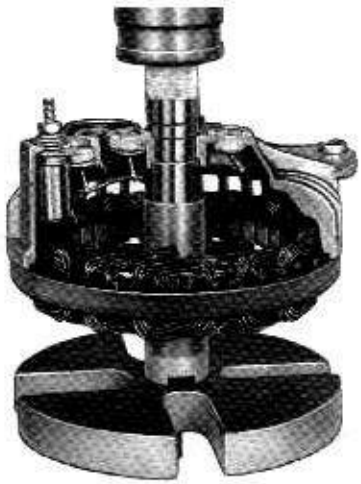


Fig. 43—Installing Rectifier End Shield Bearings

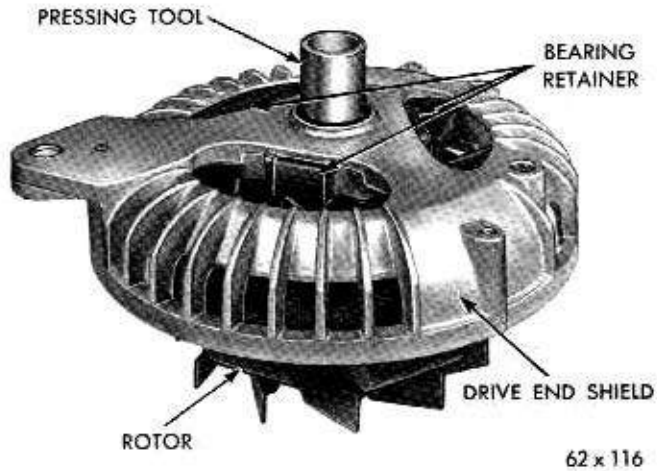


Fig. 44—Installing Drive End Shield and Bearings

New bearings are pre-lubricated, additional lubrication is not required.

(7) Insert drive end bearing in drive end shield and install bearing retainer plate to hold bearing in place.

(8) Position bearing and drive end shield on rotor shaft and, while supporting base of rotor shaft, press bearing and shield into position on rotor shaft with arbor press and Tool C-3858 (Fig. 44).

CAUTION: Make sure bearing is installed squarely at installation; otherwise, damage to bearing will result. Press bearing on rotor shaft until bearing contacts shoulder on rotor shaft.

(9) Install pulley on rotor shaft. Shaft of rotor must be supported in a manner so all pressing force is on pulley hub and rotor shaft (Fig. 45).

Press pulley on rotor shaft until pulley contacts inner race of drive and bearing. Do not exceed 6800 pounds pressure.

(10) The alternators have the capacitor mounted internally. Make sure heat sink insulator is in place (Fig. 34).

(11) Install output terminal screw and capacitor through heat sink and end shield.

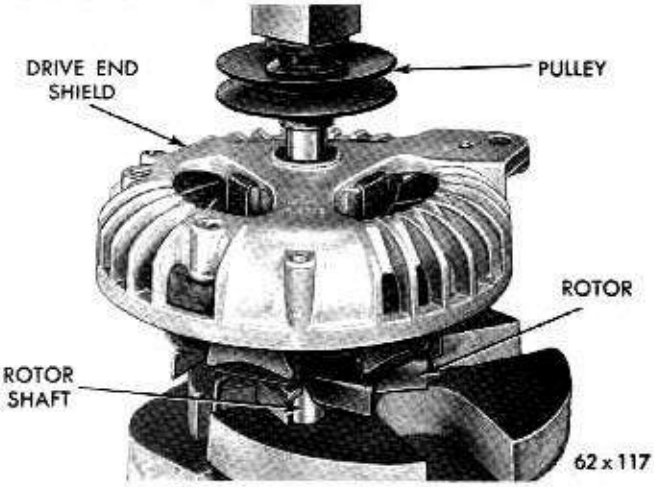


Fig. 45—Installing Alternator Pulley

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(12) Install insulating washers, lockwashers and lock nuts.

(13) Make sure heat sink and insulator are in position then tighten lock nut.

(14) Position stator on rectifier end shield.

(15) Position rotor and end shield assembly on stator and rectifier end shield assembly. Align the through bolt holes in the stator, rectified end shield and drive end shield.

(16) Compress stator and both end shields by hand and install through bolts, washers and nuts.

(17) Install insulated brush in rectifier end shield. Place bronze terminal on plastic holder with tab of terminal in the recess in plastic holder.

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(18) Place **nylon washer** on the bronze terminal and install lockwasher and attaching screw.

(19) Install ground brush and attaching screw.

(20) Rotate pulley slowly by hand to be sure rotor fans do not hit the rectifiers, capacitor lead, and stator connections.

(21) Install alternator and adjust drive belt to specifications.

(22) Connect (output) "BAT" and (field) "FLD" leads and connect ground wire.

(23) Connect battery ground cable.

(24) Start and operate engine, and observe alternator operation.

(25) Test current output and adjust regulator voltage setting, if necessary.

IGNITION SYSTEM

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GENERAL INFORMATION

The ignition system consists of two separate circuits. The battery, ammeter, ignition switch, ballast resistor, primary winding of the ignition coil, distributor contacts and condenser, vehicle frame, and the primary wiring make up the low voltage primary circuit. The secondary high voltage circuit includes the coil secondary winding, distributor cap and rotor, spark plug cables, spark plugs and vehicle frame.

SERVICE DIAGNOSIS

Condition	Possible Cause	Correction
BURNED OR PITTED DISTRIBUTOR CONTACTS	(a) Dirt or oil on contacts.	(a) If the oil is on contact face, determine cause and correct condition. Clean distributor cam of dirt and grease, apply a light film of distributor cam lubricant Part No. 1473595 to cam lobes; wipe off excess. See "Distributor Lubrication". Replace contact set and adjust as necessary.
	(b) Alternator voltage regulator setting too high.	(b) Test alternator voltage regulator setting, adjust as necessary. Replace and adjust distributor contacts.
	(c) Contacts misaligned or gap too small.	(c) Align and adjust contacts.
	(d) Faulty coil.	(d) Test and replace coil if necessary. Replace and adjust contacts.
	(e) Ballast resistor not in circuit.	(e) Inspect conditions, and correctly connect the coil.
	(f) Wrong condenser or faulty condenser.	(f) Test condenser and replace if necessary. Replace and adjust contacts.
	(g) Faulty ignition switch.	(g) Replace ignition switch.

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Condition	Possible Cause	Correction
	(h) Bushings or distributor shaft worn.	(h) Recondition distributor.
	(i) Touching of contacts with hands during installation.	(i) Replace and adjust contacts.
IGNITION COIL FAILURE	(a) Coil damaged by excessive heat from engine.	(a) Replace coil. Inspect condition of distributor contacts.
	(b) Coil case or tower cracked.	(b) Replace coil.
	(c) Oil leak at tower.	(c) Replace coil.
CONDENSER FAILURE	(a) Normal fatigue.	(a) Test and replace condenser. Inspect distributor contacts for pitting.
	(b) Damaged by excessive engine heat or moisture.	(b) Test and replace condenser. Inspect distributor contacts for pitting.

SERVICE PROCEDURES

Secondary Circuit Inspection

Check the high tension cable connections for good contact at the coil and distributor cap towers and at the spark plugs. The terminals should be fully seated. The nipples and spark plug covers should be in good condition. The nipples should fit tightly on the coil cap towers and the spark plug covers should fit tight around the spark plug insulators. Cable connections that are loose will corrode and increase the resistance and permit water to enter the towers causing ignition malfunction.

To maintain proper sealing between the towers and the nipples, the cable and nipple assemblies should not be removed from the distributor or coil towers unless the nipples are damaged or cable testing indicates high resistance or broken insulation.

Clean the high tension cables with a cloth moistened with a non-flammable solvent and wipe dry. Bend cables to check for brittle or cracked insulation.

When testing the secondary cables for punctures and cracks with an oscilloscope follow the instructions of the equipment manufacturers.

If an oscilloscope is not available, the secondary cables can be tested as follows:

(a) Engine not running, connect one end of a test probe to a good ground, other end free for probing.

(b) Disconnect the cable at the spark plug end. Insulate the cable end from grounding.

(c) With engine running, move test probe along entire length of wire. If punctures or cracks are present there will be a noticeable spark jump from the faulty area to the probe. Secondary coil wire may be checked in the same manner, be sure one spark plug cable is disconnected from spark plug while running probe along coil wire secondary cable. Cracked, leaking or faulty cables should be replaced.

When installing new cable assemblies, install the new high tension cable and nipple assembly over the cap or coil tower, entering the terminal into the tower, push lightly, then pinch the large diameter of the nipple (Fig. 1) to release the trapped air between the nipple and tower. Continue pushing on the cable and nipple until the cables are properly seated in the cap towers. Use the same procedure to install the cable in the coil tower (Fig. 2).

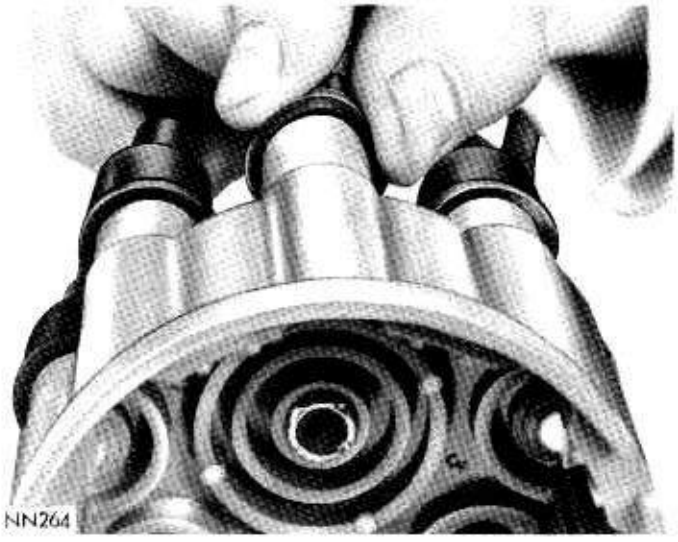


Fig. 1—Installing Secondary Cable and Nipple at Distributor Cap Tower

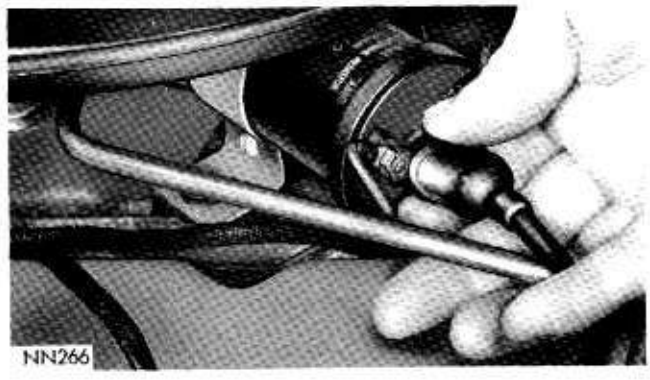


Fig. 2—Installing Secondary Cable and Nipple at Coil Tower

Use the following procedure when removing the high tension cable from the spark plug. First, remove the cable from the retaining bracket. Then grasp the cable **by hand** as close as possible to the spark plug

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Fig. 3—Removing Spark Plug Cable and Cover from Spark Plugs

and use a straight and steady pull (Fig. 3). **Do not use pliers and do not pull the cable at an angle.** Doing so will damage the insulation, the cable terminal or the spark plug insulator. **Wipe the spark plug insulator clean before reinstalling the cable and cover.**

Resistance type cable is identified by the words "Electronic Suppression" printed on the cable jacket. No additional resistors are necessary.

Use an ohmmeter to check resistance type cable for open circuits, loose terminals or high resistance as follows:

(a) Remove the cable from the spark plug and install the proper adapter between the cable and the spark plug.

(b) Lift the distributor cap from the distributor with cables intact. **Do not remove the cables from the cap.**

(c) Connect the ohmmeter between the spark plug adapter and the corresponding electrode inside the cap, making sure the ohmmeter probes are in good contact. If resistance is more than 30,000 ohms, remove the cable at the cap tower and check the cable resistance. If the resistance is more than 30,000 ohms, replace the cable assembly. Test all spark plug cables in the same manner.

To test the coil to distributor cap high tension cable, remove the distributor cap with the cable intact. **Do not remove the cable from the coil or cap.** Connect the ohmmeter between the center contact in the cap and either primary terminal at the coil. If the combined resistance of coil and cable is more than 25,000 ohms, remove the cable at the tower and check the cable resistance. If the resistance is more than 15,000 ohms, replace the cable. If the resistance is less, check for a loose connection at the tower or for a faulty coil.

Inspect the coil tower for cracks, carbon tracking or oil leaks.

DISTRIBUTOR RESISTANCE TEST

This test indicates the resistance of the ignition primary circuit from the distributor side of the coil, through the contacts and the distributor ground. Excessive resistance in this portion of the ignition system will prevent the coil from producing sufficient output for good over-all ignition. To perform test, proceed as follows:

(1) Turn Selector Switch of a Tach-Dwell unit to CALIBRATE position and adjust Dwell Calibrator until Dwell Meter reads on the set line (test leads separated).

(2) Leave Selector Switch in CALIBRATE position, connect Tach-Dwell red lead to distributor terminal of coil and black lead to a good ground.

(3) Turn ignition switch "ON." Observe dwell meter reading. Meter pointer should be well within bar marked "DISTRIBUTOR RESISTANCE." If reading is zero or outside of bar, crank engine with starter until meter pointer moves as far to the right as possible. (This will indicate that contacts are closed.) A reading now within the bar indicates a normal distributor primary circuit.

If reading is outside the bar, high resistance is present in distributor primary circuit.

(4) Remove test lead from distributor terminal of coil and connect to the following points:

(a) Distributor primary terminal (outside).

(b) Distributor primary terminal (inside).

(c) Contact point terminal bracket (insulated bracket).

(d) Ground side of contacts.

(e) Distributor housing.

(5) Repeat test at each connection until a noticeable change occurs in the meter reading. If a poor connection or faulty lead is indicated, clean, tighten or replace as necessary and repeat test (3).

If faulty contacts are indicated, remove distributor for complete inspection, service, testing and calibration.

IDLE RPM TEST

Engine idle rpm setting should be tested and recorded as it is when the vehicle is first brought into the shop for testing. This will assist in diagnosing complaints of engine stalling or complaints of creeping and hard shifting on vehicles equipped with automatic transmissions.

Test procedures are as follows:

(1) Turn Selector Switch to CALIBRATE position and adjust Dwell Calibrator until Dwell Meter reads on the SET line (test leads separated).

(2) Connect red lead of test unit to distributor primary terminal at coil and black lead to a good ground.

(3) Turn Selector Switch to 8 LOBE position.

(4) Turn Tach-Dwell Switch to 1000 RPM position.

(5) With engine at normal operating temperature (off fast idle), momentarily open the throttle and release to make sure there is no bind in the linkage and that idle speed screw is against its stop.

(6) Note engine RPM on 1000 RPM scale and adjust carburetor idle speed to specifications.

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DISTRIBUTOR CONTACT DWELL

The degrees of distributor dwell are the degrees of rotation through which the contacts remain closed. This is also commonly referred to as "dwell angle" or "cam angle."

Correct distributor contact dwell is essential for good ignition performance and contact life.

Test procedures are as follows:

(1) Connect the Tach-Dwell red lead to distributor terminal of coil and black lead to a good ground.

(2) Turn Selector Switch to 8 LOBE position.

(3) Start engine and operate engine at idle speed.

(4) Observe dwell meter reading. If dwell reading is within "Specifications" contact gap, cam rubbing block and contact arm are all in satisfactory condition.

If dwell reading is not within specifications, incorrect contact gap, worn cam, worn rubbing block or distorted movable contact arm may be indicated.

DWELL VARIATION

This test indicates the mechanical condition of the distributor. Excessive wear in distributor mechanical parts causes dwell variations which will affect ignition timing.

Test procedures are as follows:

(1) With engine at idle speed, vacuum hose disconnected, and with test leads connected as in the contact Dwell Test, turn the Tach-Dwell RPM Switch to the 5000 RPM position.

(2) Slowly increase engine speed to 1500 RPM, then slowly reduce to idle speed while observing dwell meter reading.

If dwell reading varies more than 2 degrees from initial reading between idle speed and 1500 RPM, probable wear in the distributor shaft, bushings or contact plate bearing or pivot pin is indicated. Remove distributor for complete inspection and testing on a distributor tester.

Dwell variation at speeds above 1500 rpm does not necessarily indicate distributor wear.

IMPORTANT: Dwell and gap of contacts must both be within their specified tolerance at the same time. If this cannot be accomplished, it is probable that wrong contacts are installed, rubbing block or the cam lobes are badly worn, or the movable contact is distorted.

IGNITION TIMING

To obtain maximum engine performance, the distributor must be correctly positioned on the engine to give proper ignition timing.

The ignition timing test will indicate the timing of the spark at No. 1 cylinder at idle (only).

Test procedures are as follows:

(1) Disconnect vacuum hose at distributor.

(2) Connect secondary lead of Power Timing Light to No. 1 spark plug, red primary lead to positive terminal of battery and black primary lead to negative battery terminal.

Do not puncture cables, boots or nipples with test probes. Always use proper adapters. Puncturing the spark plug cables with a probe will damage the cables. The probe can separate the conductor and cause high resistance. In addition breaking the rubber insulation may permit secondary current to arc to ground.

(3) Start engine and set idle to "Specifications" (Transmission in Neutral).

(4) Loosen distributor hold-down arm screw just enough so distributor housing can be rotated in its mounting.

(5) Aim Power Timing Light at timing plate on chain case cover. If light flash occurs when timing mark on vibration damper is located ahead of specified "BTC" mark on timing plate in the direction of engine rotation, timing is advanced. To adjust, turn distributor housing in direction of rotor rotation.

If flash occurs when the vibration timing mark is located past the specified "BTC" mark in the direction of engine rotation, timing is retarded. To adjust, turn distributor housing against direction of rotor rotation. Refer to "Specifications." (Moving the distributor housing counterclockwise advances ignition timing and clockwise retards timing.)

(6) Tighten distributor hold-down arm screw after timing has been set and recheck timing adjustment with a Power Timing Light.

(7) When ignition timing is correct, reconnect vacuum hose to distributor.

REMOVING THE DISTRIBUTOR

(1) Disconnect vacuum hose at distributor.

(2) Disconnect primary lead wire at coil.

(3) Unfasten distributor cap retaining clips and lift off distributor cap.

(4) Scribe a mark on the edge of the distributor housing to indicate position of the rotor as reference when reinstalling the distributor.

(5) Remove distributor hold-down clamp screw and clamp.

(6) Carefully lift distributor from engine.

Shaft and Bushing Wear Test

(1) Remove distributor rotor.

(2) Disconnect primary lead wire at distributor terminal. DO NOT LOOSEN inner nut that holds movable contact arm tension spring to terminal post.

(3) Clamp ribbed section of distributor housing lightly in a vise equipped with soft jaws and attach the dial indicator to body of distributor with the indicator plunger arm resting against movable contact arm at the rubbing block and with the rubbing block of contact arm on highest point of cam lobe (Fig. 4).

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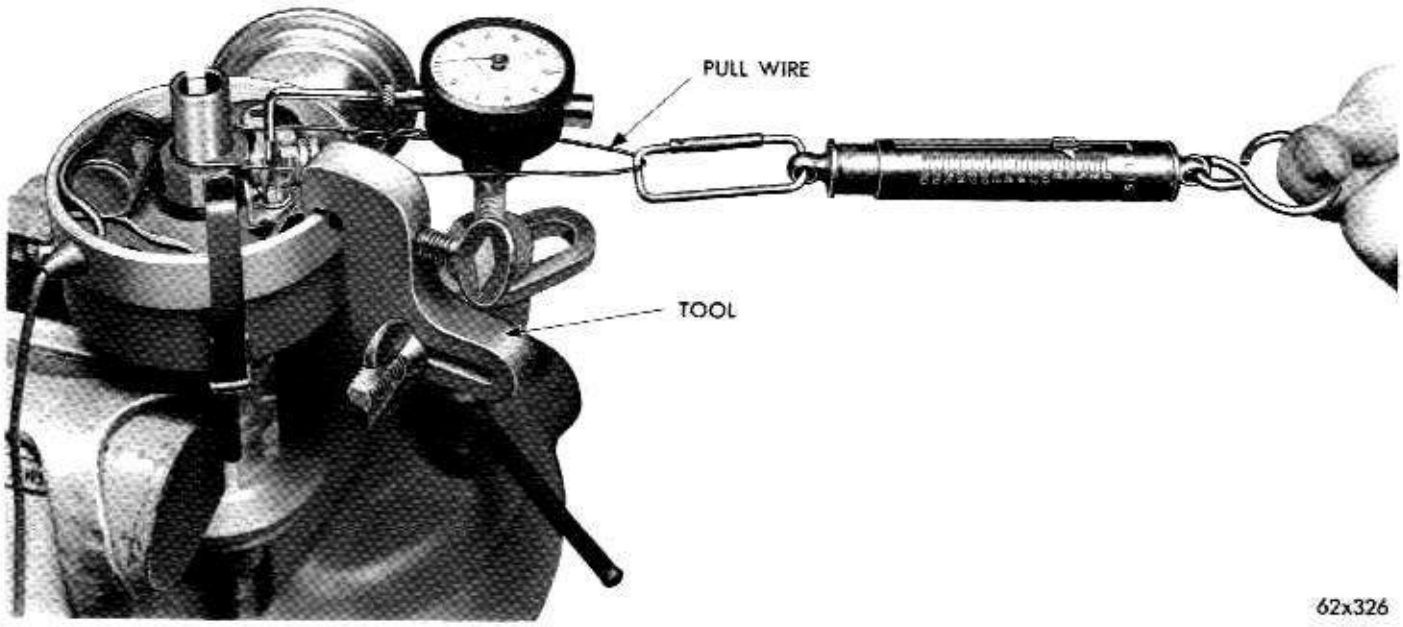


Fig. 4—Shaft and Bushing Wear Test

(4) Place one end of a wire loop around the top of distributor shaft. Hook a spring scale in the other end of wire loop and pull on a line with the plunger of indicator gauge. Be sure wire loop on shaft end is down on the shaft to insure a straight pull and also that wire loop does not interfere with indicator or holding bracket. Apply a five pound pull and read the movement of the plunger on the indicator dial. (Be sure rubbing block of contact arm is on highest point of cam lobe during this test.) If plunger movement exceeds .006 inch, replace bushings and/or distributor shaft, see "Distributor Disassembly."

Disassembling the Distributor

(1) Remove the distributor rotor.

The distributor cap clamp springs on Chrysler built distributors are held in place by peened metal around the openings and should not be removed.

(2) Remove retainer attaching vacuum advance unit to contact plate advance arm.

(3) Remove two screws and lockwashers attaching vacuum advance unit to distributor housing and remove the unit.

(4) Remove primary lead wire and rubber grommet as an assembly. Push grommet towards inside of distributor to remove. **Do not pull the wire.**

(5) Remove two screws, and lockwashers attaching contact plate to housing and lift out contact plate, contacts and condenser as an assembly.

(6) Remove oil wick from the distributor cam (Fig. 6). Remove spring clip from oil well in cam and remove cam and yoke assembly and spacer.

(7) If side play exceeded .006 inch in the "Shaft and Bushing Wear Test," replace bushings and/or distributor shaft as follows:

(a) Remove distributor drive collar retaining pin and slide the collar off end of shaft.

(b) Use a fine file to clean burrs from around pin hole in the shaft and remove lower thrust washer.

(c) Push shaft up and remove it through top of distributor body. Remove upper thrust washer.

(d) Remove shaft oiler and lift out oiler wick.

CAUTION: Do not drive the bushings out of the housing.

(e) Remove upper bushing with Tool C-3744 (Fig. 7) by threading the tap securely into bushing. Place spacer over the tap. Install tool nut and, while holding the tap, tighten tool nut to remove bushing. Invert housing and remove lower bushing in same manner.

(f) Soak new bushing in light engine oil for approximately 15 minutes.

(g) Position new upper bushing with hole in bushing **up** and in line with oil hole in housing, then press the bushing into distributor housing with Tool C-3041 and adapter (Fig. 8) with the flat face of adapter contacting bushing then press bushing into distributor until top of bushing is 1.1613 inches from top of machined face of distributor housing. Place a straightedge on machined surface of housing and measure from bottom face of the straightedge to top of the bushing. Invert housing and install other bushing (Fig. 9) flush with face of distributor base.

(h) Insert a 3/32 inch rod through housing oiler hole to see if hole in bushing indexes with oiler hole in housing. If the rod cannot be inserted through housing and bushing, drill a ⅛" hole through upper bushing by drilling through oil wick hole. Remove burrs caused by drilling operation.

(i) Install burnishing tool part of Tool set C-3041 and force burnisher through both bushings (Fig. 10). Correct bushing inside diameter is .4995 to .5000 inch.

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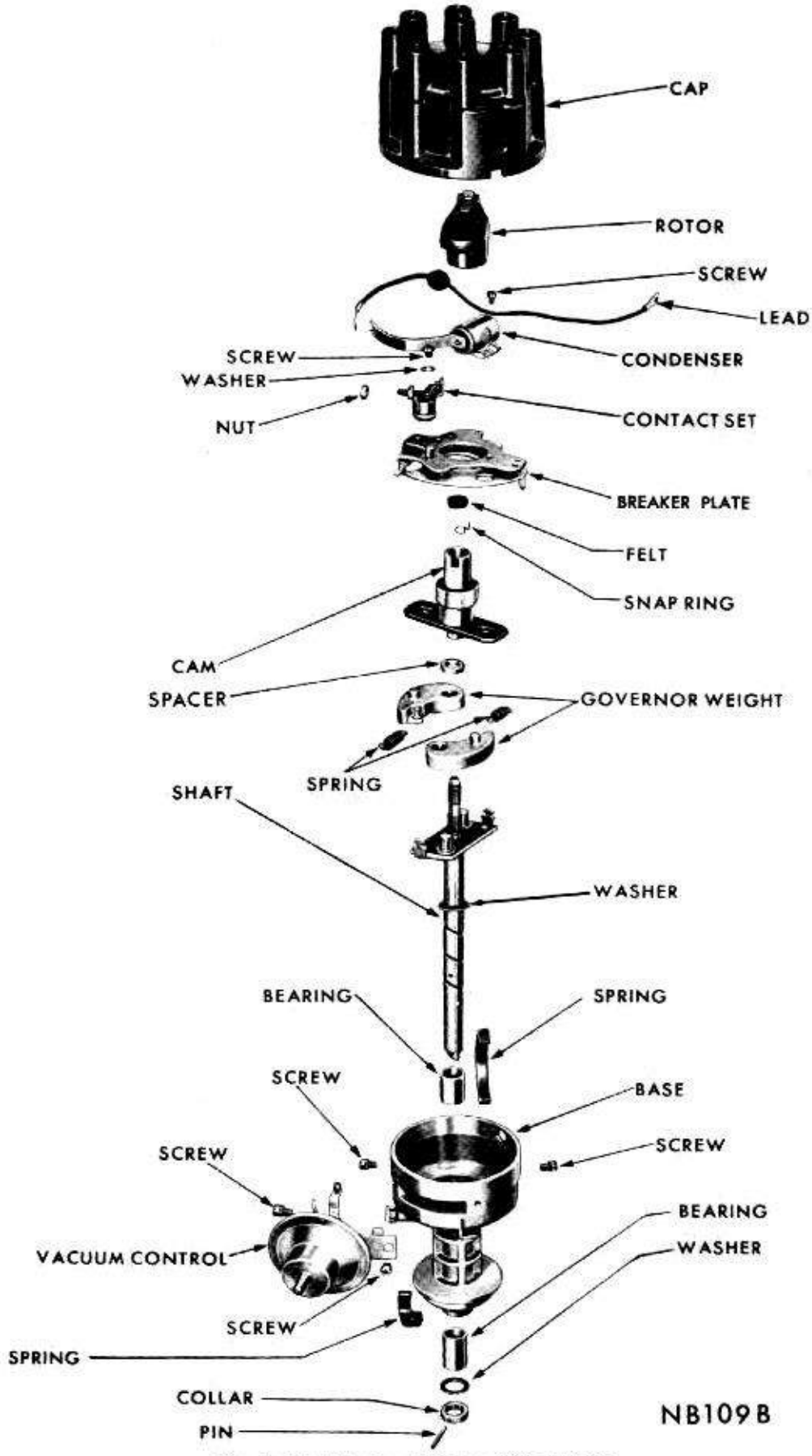


Fig. 5—Distributor—Disassembled View

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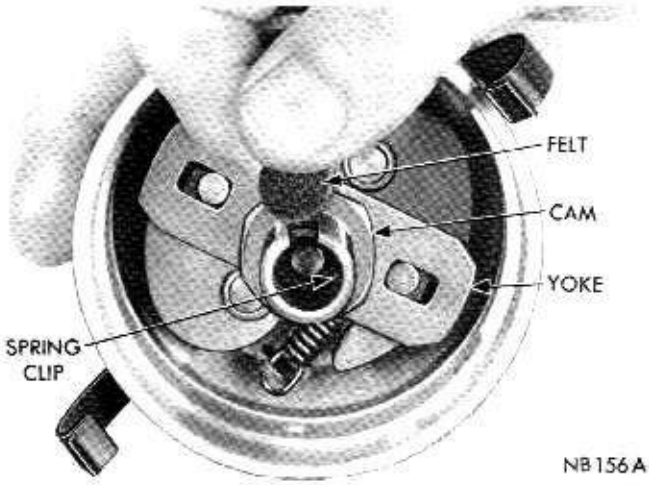


Fig. 6—Removing or Installing Cam Felt Wick



Fig. 7—Removing Distributor Housing Upper Bushing

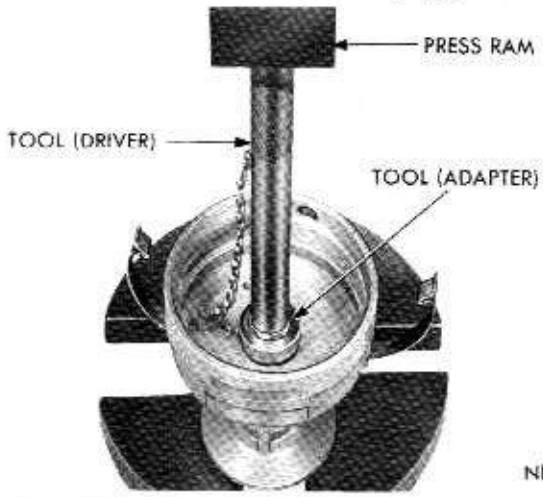


Fig. 8—Installing Distributor Housing Upper Bushing

ASSEMBLING THE DISTRIBUTOR

(1) Test operation of governor weights and inspect weight springs for distortion. Lubricate governor weights.

(2) Inspect all bearing surfaces and pivot pins for roughness, binding or excessive looseness.

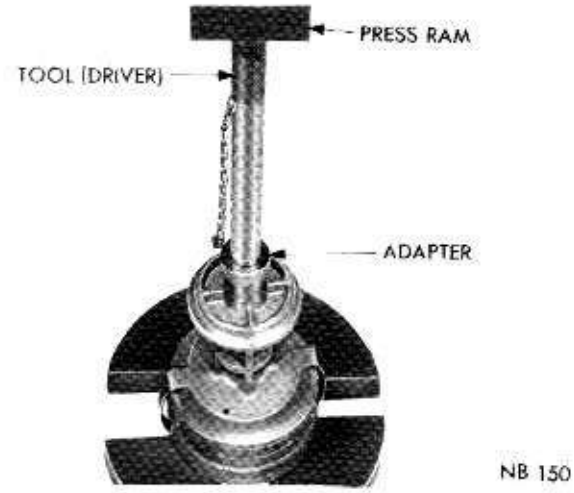


Fig. 9—Installing Distributor Housing Lower Bushing

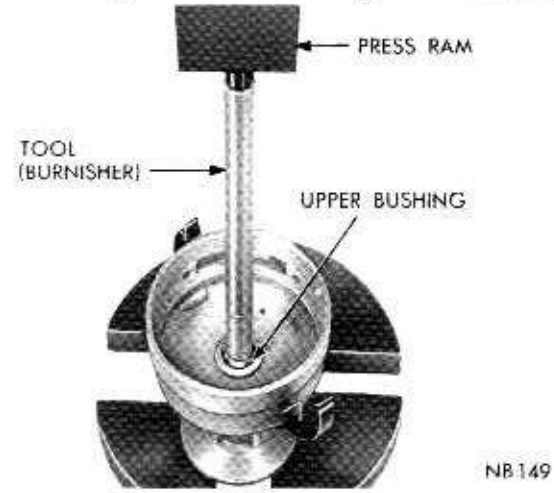


Fig. 10—Burnishing Distributor Housing Bushings

(3) Install cam spacer, chamfered end down on distributor shaft.

(4) Slide cam and yoke on distributor shaft, engage weight lugs with slots in the yoke. Install cam retaining spring clip. Be sure it is properly seated in the groove of distributor shaft.

(5) Lubricate and install flat thrust washer. Position washer on distributor shaft and slide shaft into distributor body. Position lower thrust washer and drive collar on lower end of shaft. Install retainer pin.

(6) Install oiler wick and oiler.

(7) Install contact plate assembly. Align condenser lead, contact point spring, primary lead and install attaching screw.

(8) Install felt wick in the top of distributor cam.

(9) Attach vacuum advance unit arm to contact plate. Install vacuum unit attaching screws and washers.

(10) Test contact arm spring tension, and adjust contact gap.

(11) Lubricate felt pad in the top of distributor cam with 3 drops of light engine oil and install rotor.

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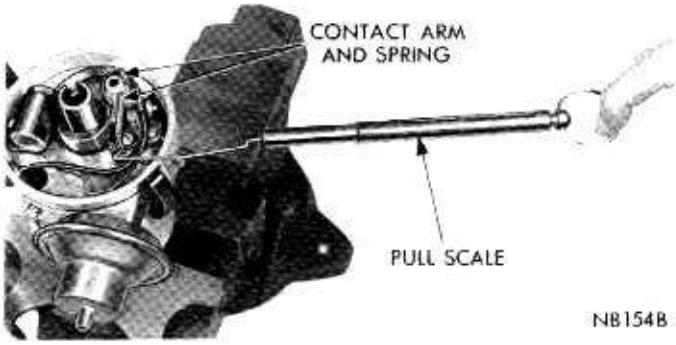


Fig. 11—Testing Contact Arm Spring Tension

TESTING CONTACT ARM SPRING TENSION

(1) Hook a spring scale Tool MTU-36 on the breaker arm and pull in a straight line at a right angle to the contact surfaces (Fig. 11). Take a reading as the contacts start to separate under the slow and steady pull of the scale. Spring tension should be 17 to 20 ounces. If the reading is outside these limits, loosen the screw which holds the end of the contact arm spring, and slide the end of the spring in or out, as necessary.

(2) Tighten the screw and measure the spring tension.

Just the right amount of contact spring tension is very important for effective ignition and efficient engine performance. Spring tension that is too great, will cause excessive wear on the distributor cam and on the nylon block of the movable contact arm. Spring tension that is too weak, is unable to keep the contacts in contact with each other when they close. This is particularly true as engine speed is increased, causing high-speed misfiring.

DISTRIBUTOR CONTACTS

Contact Wear

Contacts which have undergone several thousand miles of operation will have a rough surface, but this should not be interpreted as meaning that the contacts are worn out. If the contact area has a gray color and the roughness between the contacts matches so that a large contact area is maintained, the contacts will continue to provide satisfactory service.

However, if the contact area is oily, mottled or dark in color, or is badly pitted, the contacts will soon become unsatisfactory for further operation. Not only must they be replaced, but the ignition system and engine must be checked to determine the cause of the trouble so it can be eliminated. **Unless the condition causing the contact burning or excessive pitting is corrected, the new contacts will provide no better service than the old contacts.**

Burning of Contacts

Contact burning will result from high primary voltage, presence of oil or other foreign material, defective condenser and improper contacts adjustment. High voltage causes an excessively high current flow through the contacts which burns them rapidly. High voltage can result from an improperly adjusted or inoperative voltage regulator.

Oil or crankcase vapors which work up into the distributor and deposit on the contact surfaces will cause them to burn rapidly. This is easy to detect since the oil produces a smudgy line under the contacts. Clogged engine breather pipes permit crankcase pressure to force oil or vapors up into the distributor. Over-oiling of the distributor will also cause burning.

If the contact opening is too small (cam angle too large), arcing will occur between the contacts resulting in low secondary voltage and engine miss.

High series-resistance in the condenser circuit will prevent normal condenser action so the contacts will burn rapidly. This resistance may be caused by a loose condenser mounting or lead connection, or by poor connections inside the condenser.

Pitting of Contacts

Contact pitting results from the transfer of material from one contact to the other so that a tip builds up on one contact while a pit forms in the other.

A small amount of pitting in several thousand miles is normal and does not affect the distributor operation. However, excessive pitting such as long sharp spikes is harmful and causes arcing and voltage loss. Contacts with this condition should be replaced.

Excessive pitting can be due to too small a contact opening, high primary voltage or wrong condenser capacity. Inspect to be certain the condenser capacity is within the specified range of .25 to .285 MFD; contact spring tension should be 17 to 20 ounces and contact gap should be .014 to .019 inch.

INSTALLING AND ALIGNING CONTACTS

(1) Loosen terminal screw nut, and remove primary lead, condenser lead and terminal screw.

(2) Remove stationary contact lock screw and remove old contact set.

(3) Install a new contact set; the sleeve at one end of adjustable bracket fits over and pivots on upper contact plate mounting pin, the contact insulator also retains terminal screw head.

(4) Connect condenser and primary leads.

(5) Align contacts, if necessary, by bending stationary contact bracket only. **Never bend** movable contact arm to obtain alignment.

(6) After aligning contacts, adjust contact clearance to "Specifications," using dial indicator (Fig. 12). Recheck contact arm spring tension.

(7) Test dwell angle to show proper degree of closure. See Paragraph, "Distributor Contact Dwell." The lock screw should be loosened just enough so stationary contact bracket can be removed with a slight drag; otherwise, it will be difficult to set con-

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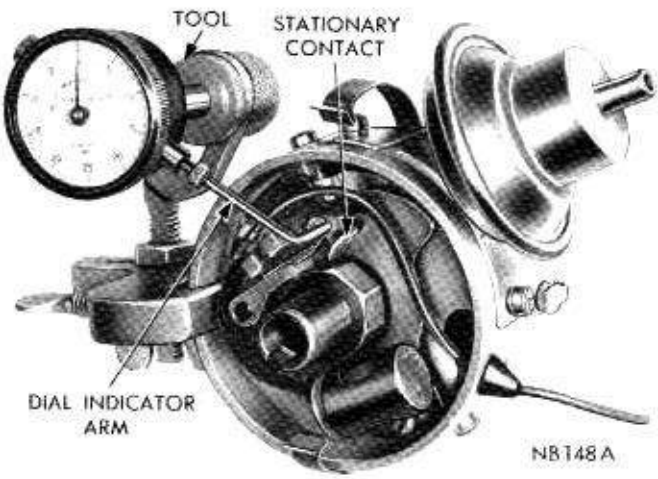


Fig. 12—Adjusting Contact Clearance with Indicator

tacts accurately. After setting contacts to the correct gap, tighten stationary bracket lock screw.

DISTRIBUTOR LUBRICATION

(1) Allow 3 drops of SAE 10W oil to the oiler on outside of distributor base.

(2) Lubricate felt wick under the rotor in top of distributor cam with 3 drops of SAE 10W oil.

(3) Wipe the distributor cam free of dirt and old grease with a clear lintless cloth. Apply a light film of new distributor cam lubricant Number 1473595 or equivalent over the entire cam surface. Lubricant must be able to adhere to the cam surface thereby resisting being thrown from the cam by centrifugal force, must not melt at operating temperatures and must not harden or dry out with age, must not chemically react or be affected by ozone or cause corrosion or pitting of the metal, must possess moisture control properties to prevent rust formation on the cam.

CAUTION: A thin film is all that is required. Do not over-lubricate. Excess grease will be thrown from the distributor cam when engine is running. If this grease strikes the contacts, arcing and burning of contacts will result.

TESTING DISTRIBUTOR ADVANCE

Centrifugal Advance Curve

Mount distributor assembly (less cap and rotor) in a reliable stroboscope-type distributor tester and proceed with tests as follows:

Clamp around ribbed section of distributor housing. The bottom section of distributor housing is not a machined surface and concentricity would be affected, causing a wobble.

(1) Turn Tach-Dwell switch to 8 "LOBE" position and Motor Switch to correct direction of rotation. Refer to "Distributor Specifications" in this manual.

(2) Turn battery switch "ON."

(3) Regulate tester speed control to operate distributor at 200 distributor rpm.

(4) Align the "O" of the distributor tester degree ring with any one of the arrow flashes.

(5) Adjust tester speed control to operate distributor at speeds called for under "Specifications" and observe arrow flashes opposite tester degree ring to determine degrees of advance.

(6) If advance is not according to specifications, corrections can be made by bending the primary and secondary spring tabs on cam yoke to increase or decrease spring tension. The governor spring tabs can be reached through the access hole at breaker plate. Rotate shaft until proper spring and tab line up with access holes. Insert a screwdrive blade through access hole and bend spring tab toward distributor cam to decrease spring tension and advance to spark, or away from the distributor cam to increase spring tension and retard the spark.

The light tension spring controls the lower end of advance curve, and the heavier spring controls upper end of advance curve.

Vacuum Diaphragm Leak Test

With distributor mounted in distributor tester and with vacuum unit attached to distributor, proceed as follows:

(1) Place thumb over end of vacuum pump and hose and adjust regulator control knob to give a reading of 20 inches with hose closed off to be sure tester hose does not leak.

(2) Attach tester vacuum pump hose to the tube on the distributor vacuum unit. The vacuum gauge should hold on maximum vacuum obtainable if no leak exists.

(3) Observe contact plate while performing leak test to test response of contact plate. There should be instant response to the pull of the diaphragm, moving the plate without a drag or bind.

(4) If leakage is indicated, replace vacuum unit assembly.

Vacuum Advance Curve

Connect tester vacuum pump hose to the distributor vacuum advance unit and perform operations 1 through 5 under "Centrifugal Advance Curve." Then proceed as follows:

(1) Turn tester vacuum pump "ON." Adjust vacuum pump regulator to vacuum test specifications. See "Specifications" and observe arrow flashes on tester degree ring to determine degrees of advance.

(2) If vacuum advance is above or below specifications, replace vacuum advance unit. Retest vacuum advance curve.

INSTALLING THE DISTRIBUTOR

(1) Position distributor on engine. Align rotor with marks previously scribed on distributor housing.

(2) Engage tongue of distributor shaft with slot in distributor and oil pump drive gear.

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If engine has been cranked while distributor is removed, it will be necessary to establish the proper relationship between distributor shaft and NO. 1 piston position as follows:

(a) Rotate crankshaft until number one piston is at top of compression stroke.

(b) Rotate rotor to the position of number one distributor cap terminal.

(c) Lower distributor into the opening, connect primary lead and install distributor cap. Make sure all high tension wires "snap" firm in cap towers. Install distributor hold-down clamp screw. Tighten screw finger tight.

(d) Connect secondary lead of a Power Timing Light to NO. 1 spark plug (using proper adapter). Connect red primary lead to positive terminal of battery and black primary lead to negative battery terminal.

(e) Start and operate engine at idle speed. Rotate distributor housing so that specified timing mark and pointer are in alignment. (Moving the distributor housing against shaft rotation advances timing and with shaft rotation retards timing.)

(f) Tighten distributor clamp screw after timing has been set and recheck timing adjustment with a Power Timing Light.

(g) If timing is correct, connect vacuum hose to distributor and remove timing light from engine.

Ignition Timing (with C-744 Test Lamp)

(1) Connect C-744 test lamp between distributor primary terminal and battery positive post.

(2) Turn engine until number 6 exhaust valve is just closing; continue turning engine slowly until specified degree mark on the crankshaft pulley is at specified degree mark at case cover.

(3) Loosen distributor clamp bolt so distributor housing can be rotated with a slight drag, then turn distributor in the normal rotation until test lamp lights.

(4) Turn distributor against normal distributor rotation until test lamp goes out.

If the test lamp lights immediately when connected, turn distributor against normal distributor rotation until light goes out.

(5) Tighten distributor clamp bolt securely and remove test lamp. If the operation is performed properly the engine is timed to specifications.

If the engine is turned beyond the timing mark, continue turning engine for two full revolutions of the crankshaft; this will place the distributor rotor in approximately the initial position.

CAUTION: DO NOT reverse rotation of the crankshaft if you have passed the timing mark as this would affect valve timing and distributor timing.

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IGNITION COIL

The ignition coil is designed to operate with an external ballast resistor. When testing the coil for output, include resistor in tests.

Inspect coil for external leaks and arcing. Always make two tests when testing the coil. One when the coil is cold, the other after the coil has been warmed up.

Test coil according to coil tester Manufacturer's instructions. Test coil primary resistance. Test ballast resistor resistance. Test coil secondary resistance. Replace any coil and ballast resistor that does not meet specifications.

Every time an ignition coil is replaced because of a burned tower, carbon tracking or any evidence of arcing at the tower, the nipple or boot on the coil end of the secondary cable, replace cable. Any arcing at the tower will carbonize the nipple so that placing it on a new coil will invariably cause another coil failure.

If the secondary cable shows any signs of damage, the cable should be replaced with a new cable with the neoprene nipple since the old cable can cause arcing, and therefore, ruin a new coil.

BALLAST RESISTOR

The ballast resistor is a compensating resistance in the ignition primary circuit. During low speed operation, when the primary circuit current flow is high, ballast resistor temperature rises, increasing resistance. This reduces current flow, thereby prolonging ignition contact life. At high speed operation, when primary current flow is low, the ballast resistance cools off allowing more current flow, which is required for high speed operation. During starter operation, the ballast resistor is bypassed, allowing full battery voltage to the ignition primary circuit.

SPARK PLUGS

To insure peak performance, spark plugs should be removed, cleaned, tested and regapped every 5000 miles. Worn and dirty plugs may give satisfactory operation at idling speed but may fail under operation conditions. Spark plug appearance or conditions can reflect a wide variety of engine conditions as follows:



Fig. 1—Normal Conditions



Fig. 2—Cold Fouling



Fig. 3—Wet Fouling



Fig. 4—Splashed Fouling

Normal Conditions

Normal conditions (Fig. 1). This plug has been running at the correct temperature in a "healthy" engine. The few deposits present will probably be light tan or gray in color with most regular grades of commercial gasoline. Electrode burning will not be in evidence; gap growth will average not more than about .001"/1000 miles. Chances are the plug, as pictured, could be cleaned, the gap electrodes filed, regapped and reinstalled with good results.

Cold Fouling

Cold fouling or carbon deposits (Fig. 2). This dry black appearance is fuel carbon and can be due to over rich fuel-air mixture, possibly resulting from a faulty choke, clogged air cleaner, improper carburetor idle adjustment, or dirty carburetor. However, if only one or two plugs in a set are fouled like this it is a good idea to check for sticking valves or faulty ignition cables. This condition also results from prolonged operation at idle. If vehicle is operated extensively at idle and low speeds, improved plug service will be obtained by using the next step hotter spark plugs.

Wet Fouling

Wet fouling (Fig. 3) tells you that the plug has drowned in excess oil. In an old engine, suspect worn rings or excessive cylinder wear. In OHV engines, too much oil may be coming in past the valve guides. Use of a hotter plug may relieve such fouling, but plugs can't take the place of needed engine overhaul. **Remember that "break-in" fouling of new engines may occur before normal oil control is achieved. In new or recently overhauled jobs, such fouling plugs can be cleaned and reinstalled.**

Splashed Fouling

Splashed fouling (Fig. 4) may sometimes occur after a long-delayed tune-up. Here, deposits accumulated after a long period of misfiring may be suddenly loosened when normal combustion temperatures are restored upon installation of new plugs. During a high speed run, these materials shedding off the combustion chamber are thrown against the hot insulator surface. If they happen to short out the plug, they can be removed with regular cleaning techniques. The plugs can then be reinstalled with good results as the engine has scavenged itself.

Core Bridging

Core bridging (Fig. 5) will be encountered only rarely in automotive engines. It's usually due to the same conditions described under splashed deposits. In this case, a chunk of deposit was thrown off the piston and formed a bridge between the insulator and shell. Result: A "dead short." Such evidence of excessive combustion chamber deposits will be more common where oil control is poor . . . or where vehicles are usually driven in slow speed, start-stop service. In such instances, it usually pays to physically remove accumulated deposits from the engine.

Gap Bridging

Gap bridging (Fig. 6) is also relatively rare in automotive engines. It also may be traced to flying deposits in the combustion chamber. In a few cases, fluffy deposits may accumulate on the plugs during in-town driving; when the engine is suddenly put under high load, this material can melt and bridge the gap.

High Speed Glazing

High speed glazing may cause misfiring at speeds above 50-60 mph. The shiny deposit (Fig. 7) may be yellow or tan in color. It usually suggests that temperatures have suddenly risen during a hard acceleration. As a result normal deposits do not get a chance to fluff off the plug . . . instead they melt and form a conductive coating. If this continues to reoccur, suggest a colder heat range and regular spark plug cleanings.

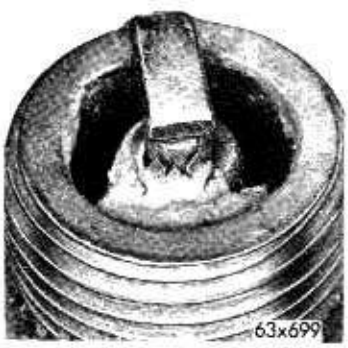


Fig. 5—Core Bridging



Fig. 6—Gap Bridging



Fig. 7—High Speed Glazing



Fig. 8—Scavenger Deposits

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Fig. 9—Overheating

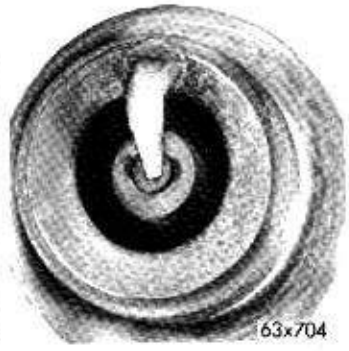


Fig. 10—Turbulence Burning



Fig. 13—Chipped Insulator



Fig. 14—Mechanical Damage

Scavenger Deposits

Fuel scavenger deposits (Fig. 8) may be white or yellow in color. They may appear to be bad, but this is a **normal** appearance with certain branded fuels. Such materials are designed to change the chemical nature of deposits to lessen misfire tendencies. Notice that accumulation on the ground electrode and shell areas may be unusually heavy, but the material is easily flaked off. Such plugs can be considered normal in condition, and can be cleaned with standard procedures.

Overheating

Overheating (Fig. 9) is indicated by a white or light gray insulator which appears "blistered." Electrode gap wear rate will be considerable in excess of .001"/1000 miles. This suggests that a cooler heat range should be used . . . however, over-advanced ignition timing, detonation and cooling system stoppages can also overheat the **correct** spark plug heat ranges.

Turbulence Burning

Turbulence burning (Fig. 10) causes electrodes to wear away on one side. This is the result of normal turbulence patterns in the combustion chambers of certain engines. It can be ignored if normal plug life is being obtained. If gap growth appears excessive, review the corrective measures suggested under **overheating.**

Initial Pre-ignition Damage

Initial pre-ignition damage (Fig. 11) may be caused by excessive temperatures. This produces melting of the center electrode and, somewhat later, the ground electrode. Remember that the spark plug is like an electric fuse . . . when it melts, it warns you to look for the causes, and for damage to the engine such as scuffed pistons, burned pistons or burned valves. Inspect for correct spark plug heat range, over-advanced ignition timing, loose spark plugs, burned head gasket, excessive detonation due to low octane fuel and for similar causes of overheating.

Sustained Pre-ignition Damage

Sustained pre-ignition damage (Fig. 12) usually involves melting of the ceramic firing tip. Since this requires temperatures above 1700F, it's a good possibility that other components of the engine may have been damaged by preignition. This is another sure sign that careful inspection of the engine and its adjustments are required.

Chipped Insulator

Chipped insulator (Fig. 13) usually results from bending the center electrode during regapping of the plug. Under certain conditions, severe detonation can also split insulator firing ends. In a four-cycle engine, a piece of ceramic like this is easily blown out through the exhaust.

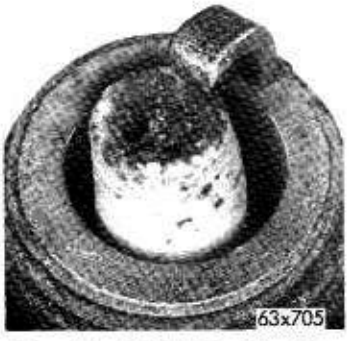


Fig. 11—Initial Pre-Ignition Damage

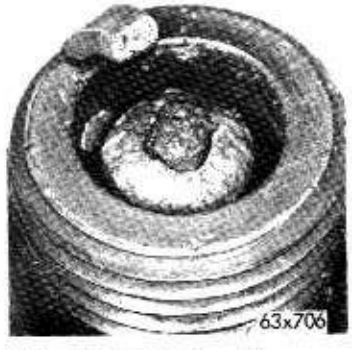


Fig. 12—Sustained Pre-Ignition Damage

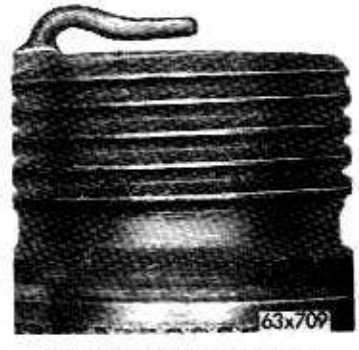


Fig. 15—Pressure Type Gap Tool Damage



Fig. 16—Reversal Coil Polarity

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Mechanical Damage

Mechanical damage to the firing end (Fig. 14) is caused by some foreign object in the combustion chamber. Since small objects can travel from one cylinder to another, always check the other cylinders to prevent reoccurrence of damage.

Pressure Type Gap Tool

Pressure type gap tools, if improperly used, impose a tremendously high unit pressure on the center electrode (Fig. 15). This is because of compression being exerted between the end of the center electrode and the top of the shell. If too much force is applied thru leverage multiplication, the center electrode seal on any type or brand of spark plug is likely to be damaged. There are several of these pliers type gap tools on the market.

Reversed Coil Polarity

Reversed coil polarity can often be detected by "dishing" of the ground electrode. Note in Figure 16 that the center electrode is usually not worn badly. This source of misfiring and rough idle can be corrected by reversing the primary coil leads. An oscilloscope is the surest way to detect reversed polarity.

While these examples may not be conclusive in all instances, they may indicate possible corrective procedures and further diagnosis may be necessary.

Cleaning and Regapping

Carefully clean the spark plugs in an abrasive type cleaner. Use a pin type feeler gauge to check spark plug gap. Reset gaps to .035 inch.

Before setting spark plug gap, file center electrode flat, make adjustment by bending ground (side) electrode, never bend the center electrode.

Inspect spark plug cables, coil secondary (high tension) cable, nipples and covers for cracks, wear and fraying. Always use the neoprene insulating nipples whenever it becomes necessary to replace high tension cables or nipples. Inspect for loose terminals.

When installing spark plugs, tighten to 30 foot-pounds.

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HEADLIGHTS

GENERAL INFORMATION

The dual headlight system consists of four sealed beam headlights.

The two outboard lights are of the two filament type for low and high beam and are marked by a numeral 2 molded in the lens.

The two inboard lights have only one filament and are marked with a numeral 1 molded in the glass.

The lights cannot be installed wrong as mounting lugs for number one (1) and number two (2) lights are offset at different angles.

On high beam, the number one (1) lights provide high intensity "reach" down the highway and an off focus filament in number 2 lights provide "body" light which illuminates the side of the road, ditches, etc. On low beam only, number 2 lights operate.

As optional equipment, Imperial models may be equipped with an automatic control that turns all driving lights on or off according to the light intensity outside the vehicle. See "Safeguard Sentinel," Accessories, Group 1.

Chrysler models may be equipped, with an automatic beam changer as optional equipment. See "Automatic Beam Changer," Accessories, Group 1.

SERVICE DIAGNOSIS

Condition	Possible Cause	Correction
HEADLIGHTS DIM (engine running above idle)	(a) High resistance in lighting circuit.	(a) Test lighting circuit including ground connection. Make necessary repairs.
	(b) Faulty sealed beam units.	(b) Replace sealed beam units.
	(c) Faulty voltage regulator.	(c) Test voltage regulator and alternator. Make necessary repairs.
LIGHTS FLICKER	(a) Loose connections or damaged wires in lighting circuit.	(a) Tighten connections and check for damaged wiring.
	(b) Light wiring insulation damaged producing momentary short.	(b) Test wiring and replace or tape damaged wires.
LIGHTS BURN OUT FREQUENTLY	(a) High voltage regulator setting.	(a) Adjust voltage regulator.
	(b) Loose connections in light circuit.	(b) Tighten connections.
LIGHTS WILL NOT LIGHT	(a) Discharged battery.	(a) Recharge battery and correct cause.
	(b) Loose connections in lighting circuit.	(b) Tighten connections.
	(c) Burned out lamps.	(c) Replace bulbs or sealed beam unit.
	(d) Open or corroded contacts in headlight switch.	(d) Replace headlight switch.
	(e) Open or corroded contact in dimmer switch.	(e) Replace dimmer switch.

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Condition	Possible Cause	Correction
HEADLIGHTS DIM (engine idling or shut off)	(a) Partly discharged battery.	(a) Charge battery.
	(b) Faulty battery.	(b) Test battery. Replace if necessary.
	(c) High resistance in light circuit.	(c) Test headlight circuit including ground connection. Make necessary repairs.
	(d) Faulty sealed beam units.	(d) Replace sealed beam units.
	(e) Corroded battery terminals.	(e) Clean terminals.

TESTS AND ADJUSTMENTS

Pre-Aiming Instructions

(1) Test dimmer switch operation.

(2) Test high beam indicator—indicates high beam is in operation when lighted.

(3) Inspect for badly rusted or faulty headlight assemblies. These conditions must be corrected before satisfactory adjustment can be made.

(4) Place vehicle on level floor.

(5) Adjust front suspension height as necessary.

(6) Inspect tire inflation.

(7) Rock vehicle sideways to allow vehicle to assume its normal position.

(8) If gasoline tank is not full, place a weight in trunk of vehicle to simulate weight of a full tank (6¼ pounds per gallon).

(9) There should be no other load in vehicle other than driver or a substituted weight of approximately 150 pounds placed in driver's position.

(10) Remove headlight from trim panel. Remove glass covers on Imperial. Do not remove sealed beam retainer rims.

(11) Thoroughly clean headlight lenses.

Compensating the Aimers

(1) Place transit on floor in line with vertical centerline of right front wheel (Fig. 1). Place split image target in like position at right rear wheel.

(2) Adjust range screw on transit until target split image coincides or merges into one unbroken line.

Make sure that line of sight is perpendicular from eye to viewing port of transit and that target image is centered in viewing port of transit.

(3) Turn dial on side of transit until bubble in spirit level is centered.

(4) When bubble is centered, note "plus" or "minus" reading on compensator scale. This figure indicates degree of slope of floor and must be transferred to each aimer.

(5) With a screw driver, turn adjusting slot of floor level compensator in each aimer, until correct plus or minus figure (or fractional part) appears in proper window (Fig. 2).



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Fig. 2—Adjusting Floor Level Compensators in Aimers

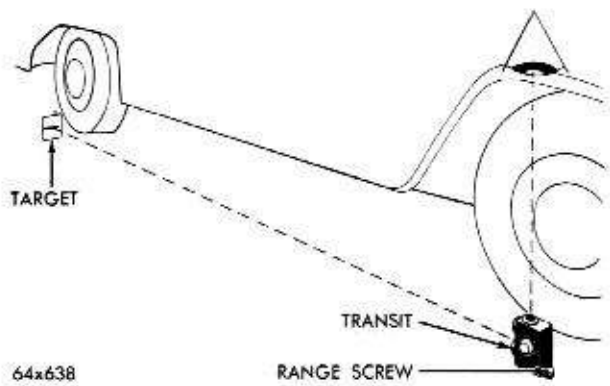


Fig. 1—Determining Slope of Floor

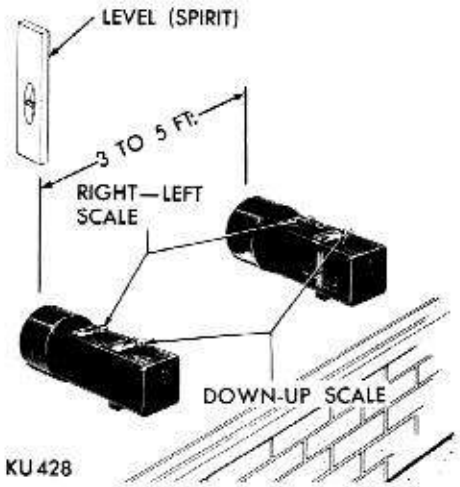


Fig. 3—Checking Aimer Calibration

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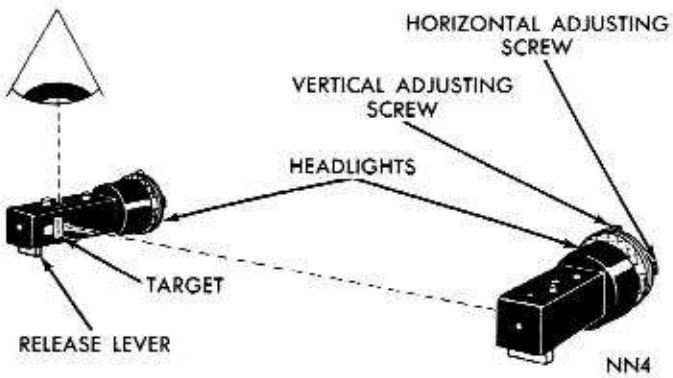


Fig 4—Mounting and Adjusting Aimers

Testing Aimer Calibration (Fig. 3)

(1) Using carpenter or stone mason level of known accuracy, locate a true vertical plate glass window or smooth surface.

(2) Set **DOWN-UP** pointer on **DOWN 2.**

(3) Set **RIGHT-LEFT** pointer and floor level compensator at "O."

(4) Secure aimers to glass or smooth surface three to five feet apart so split image targets can be located in viewing ports.

(5) If bubble is centered in glass dial, vertical calibration is correct. If bubble is not centered, make **DOWN-UP** adjustment by rotating level adjusting screw until bubble is centered in spirit level.

(6) The horizontal aim is correct if targets on opposite aimers are aligned in viewing ports. If targets are not aligned in viewing ports, rotate mirror adjusting screw until target split image becomes aligned.

MOUNTING AND ADJUSTING THE AIMERS

(1) While holding an aimer in alignment with lens of one outer headlight, bring aimer up to and against headlight lens.

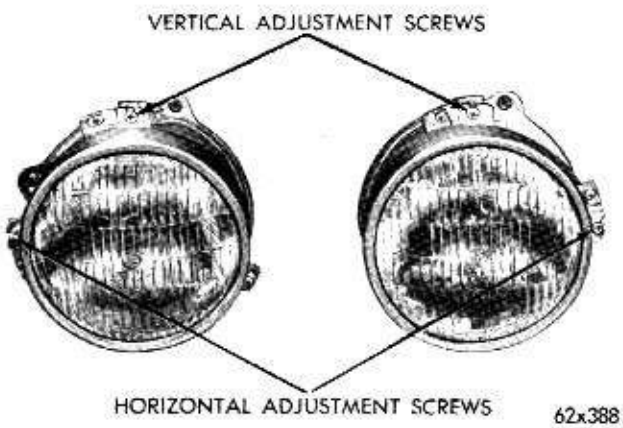


Fig 5—Headlight Adjustments Points

Make certain that headlight lens pads are making full contact with aimer mounting flange and that aimer target is facing inboard.

(2) Push release lever forward (to expel air from suction cup) and while holding aimer firmly against headlight aiming pads, slowly pull release lever back until spring lock engages in the slot, (Fig. 4).

(3) Mount second aimer on other side of vehicle, in the same manner.

(4) On each aimer, set pointer to numeral 2 on **DOWN** side of **DOWN-UP** scale.

(5) On each aimer position pointer, of **RIGHT-LEFT** scale, at **2-RIGHT.**

MEASURING HEADLIGHT AIM

Horizontal Test

Turn the RIGHT-LEFT scale knob until the split image is in alignment. If the **RIGHT** or **LEFT PORTION** of scale exceeds the following values, lights should be aimed.

Values given represent inches at 25 feet.

	Left	Right
No. 1 Unit	4	4
No. 2 Unit	0	4

Vertical Test

Turn **DOWN-UP** scale knob until the spirit level is centered. If **DOWN** or **Up** portion of the scale exceeds the following values, the lights should be aimed.

No. 1 Unit	½ down to 3½ down
No. 2 Unit	½ down to 3½ down

Horizontal Adjustment

(1) With pointer of **RIGHT-LEFT** scale still set at **2-RIGHT,** sight through aimer viewing port.

Make sure that line of sight is perpendicular from eye to viewing port of aimer and that target image is centered in viewing port of aimer.

(2) While sighting through viewing port of aimer, turn horizontal adjusting screw on headlight until split target image line merges into one unbroken line. To remove backlash, be sure to make a final adjustment by turning headlight horizontal adjusting screw in a clockwise direction (Fig. 5).

(3) Make horizontal adjustment on other side of vehicle in same manner.

Vertical Adjustment

(1) Turn vertical adjusting screw on headlight in a counterclockwise direction to bring bubble of spirit level on aimer to vehicle side of center. Use care to avoid disturbing installed position of aimers. Then turn screw clockwise until bubble is centered for correct aim and elimination of backlash.

(2) Make vertical adjustment on other side of vehicle in same manner.

(3) Inspect target alignment on each side and readjust horizontal aim, if necessary.

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Proceed to adjust inboard units by repeating outlined procedure. Install headlight trim panels.
READ "E" plus or minus **3/32"**.

Remove aimers by releasing spring lock at rear (bottom) of aimer and pushing release lever forward. Do not attempt to remove aimers by pulling them away from headlight lens—slide suction cup downward and away from lens.

HEADLIGHT SEALED BEAM REPLACEMENT (ALL MODELS)

The lens, filament and reflector are sealed into one unit which can be removed as follows:

(1) Remove screws from headlight panel and remove panel.

(2) Remove screws from interior retaining ring, and remove ring. **Do not disturb headlight aimer screws.**

(3) Pull out sealed beam unit and unplug connector, pulling it straight off.

(4) Install new sealed beam unit.

(5) Install unit retaining ring.

(6) Aim the headlight and install headlight panel.

INSTRUMENTS—INDICATORS

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GENERAL INFORMATION

Imperial Models

Imperial model clusters are equipped with an oil, temperature and fuel gauge. Also, in the cluster is a "Sentry Signal Light" which serves as a warning to the driver if the oil pressure is low, the engine coolant temperature is above normal or the fuel level is too low (Fig. 1).

The oil temperature gauges use the 5 volt regulated voltage from the fuel gauge and the respective sending units on the engine. For service procedures for

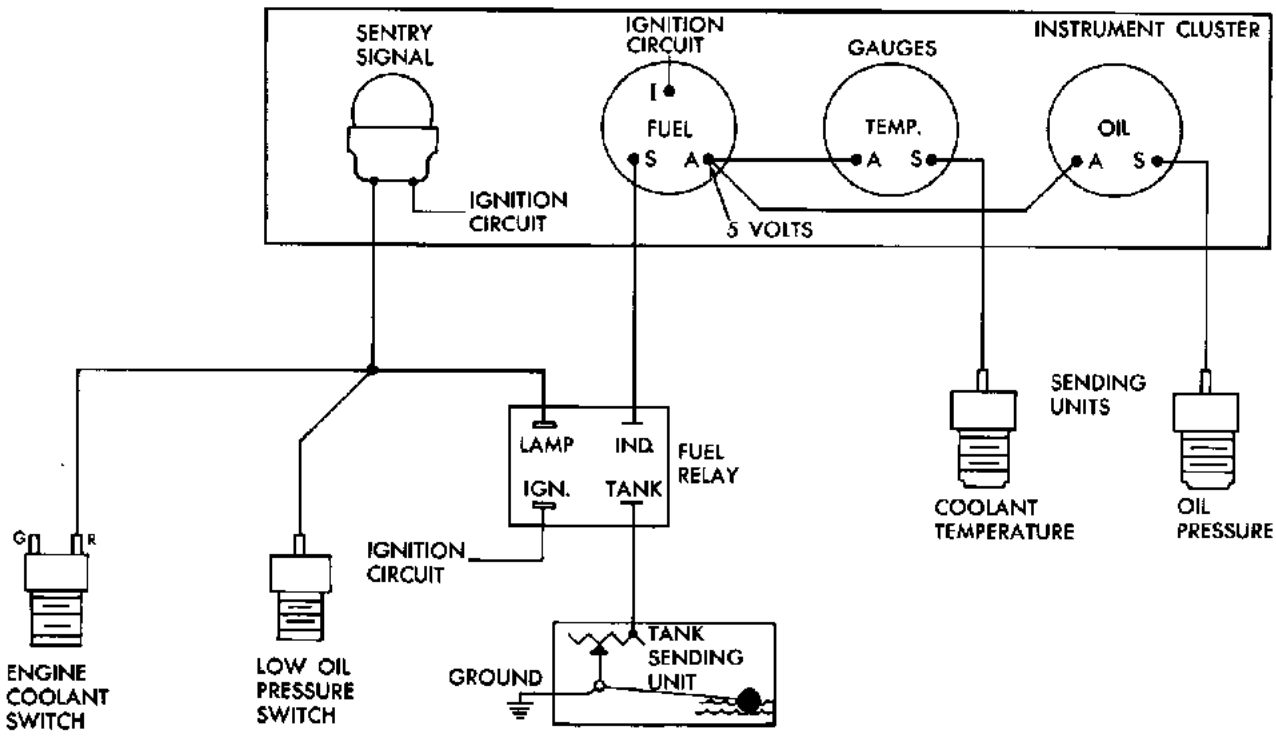


Fig. 1—Gauge Circuits—Imperial Models

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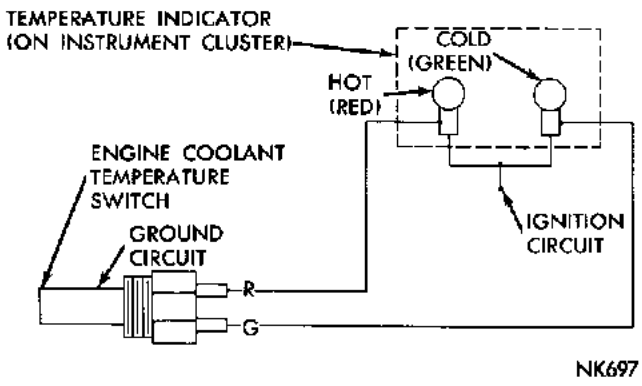


Fig. 2—Temperature Indicator Circuit—Chrysler Models

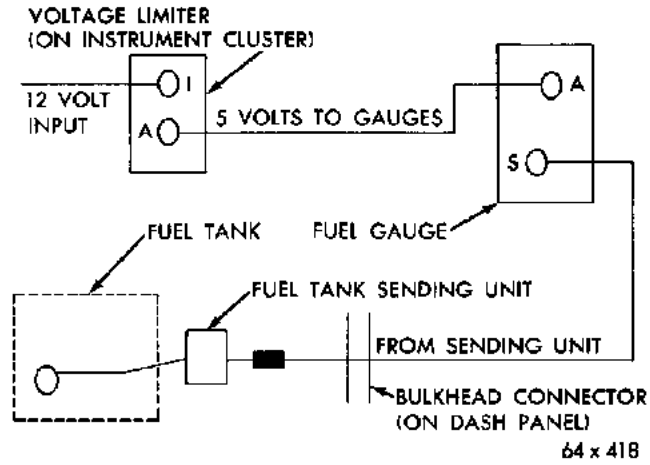


Fig. 3—Fuel Level Indicating System—Chrysler Models

the oil and temperature gauges refer to "Testing Gauges."

The fuel gauge uses a tank sending unit and a fuel relay that is in series in the circuit between the fuel gauge and the fuel tank sending unit. For service procedures refer to "Testing Gauges." When the fuel level is low the movement of the float arm, in the fuel tank, causes a current flow change through the fuel relay which activates a "holding" circuit in the relay. This applies a ground to the "Sentry Signal" to light the bulb. Whenever the ignition circuit of the vehicle is activated, voltage is available to the "Sentry Signal."

For the oil pressure and engine coolant temperature operation of the "Sentry Signal" a separate pair of engine units are used. The oil pressure circuit uses an oil pressure sending switch which is electrically "closed" when the oil pressure is below the normal operating range. When the switch is "closed" a ground is applied to the "Sentry Signal" to light the bulb.

The engine coolant temperature operation of the "Sentry Signal" uses a temperature sensing switch. A bi-metal strip, inside the switch, makes contact with the "R" terminal of the switch when the coolant temperature is above normal. This applies a ground circuit to the "Sentry Signal" to light the bulb.

Chrysler Models

The Chrysler model instrument cluster is equipped with a fuel gauge, an alternator gauge, an oil pressure indicator light and two engine coolant temperature indicator lights; one green for cold indication and a red one for overheating indication (Fig. 2).

The fuel gauge is the thermal type and operates on a principle of constant voltage being applied. The gauge is sensitive to changes in fuel level only (Fig. 3).

The oil pressure indicator is controlled by the low oil pressure switch on the engine. When the oil pressure is below normal the switch is electrically "closed" and applies a ground circuit to light the indicator bulb.

The engine coolant temperature indicator uses two bulbs in the instrument cluster and a coolant temperature sensing switch on the engine (Fig. 2). When the coolant temperature is cold the bi-metal strip, inside the switch, makes contact with the "G" terminal of the switch which applies a ground circuit to the "cold" or green bulb on the cluster. When the coolant temperature is above the normal range the bi-metal strip makes contact with the "R" terminal of the switch which applies a ground circuit to the "hot" or red bulb on the cluster. Through the action of the ignition switch the "hot" bulb of the indicator is momentarily "proofed" everytime the engine is started.

Voltage Limiter—All Models

Constant voltage is provided to the gauges through the use of a voltage limiter mounted externally on the back of the instrument cluster printed circuit board on Chrysler models. On Imperial models the voltage limiter is contained inside the fuel gauge. In both applications, the voltage limiter is connected in parallel to provide the same regulated voltage to the gauges (Figs. 1 and 2).

SERVICE DIAGNOSIS

Condition	Possible Cause	Correction
ALL GAUGES READ HIGH ("against the peg") AFTER IGNITION SWITCH IS TURNED "ON"	(a) Faulty voltage limiter (stuck points or an open heater coil).	(a) Test voltage limiter.
	(b) Cluster not properly grounded to panel.	(b) Tighten cluster mounting screws.

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Condition	Possible Cause	Correction
GAUGE POINTERS DO NOT MOVE WHEN IGNITION SWITCH IS TURNED "ON"	(a) Faulty voltage limiter or an open circuit on battery side (input of limiter).	(a) Test voltage limiter. Test wiring, repair or replace as necessary.
TEMPERATURE AND OIL GAUGES* INDICATE NORMAL OPERATION BUT THE FUEL GAUGE INDICATES A HIGHER OR LOWER FUEL LEVEL THAN ACTUALLY EXISTS	(a) Fuel tank sending unit or instrument panel fuel gauge is faulty. (b) Fuel tank is improperly grounded.	(a) Test sending unit and gauge. (b) Test fuel tank for a good ground. NOTE: Testing the system with the tank sending unit positioned for both "empty" and "full" is usually sufficient to determine the calibration in the range between these positions.
FUEL AND OIL GAUGES* INDICATE CORRETLY BUT TEMPERATURE GAUGE INDICATES HIGHER OR LOWER TEMPERATURE THAN ACTUAL ENGINE TEMPERATURE	(a) Faulty instrument panel temperature gauge, wiring or faulty temperature sending unit in engine.	(a) Test wiring, repair or replce as necessary. Test gauge and sending unit.
ERRATIC TEMPERATURE GAUGE OPERATION*	(a) Loose or dirty electrical connections.	(a) Clean and tighten all electrical connections and test the gauge operation.
ERRATIC OPERATION OF FUEL GAUGE	(a) Loose or dirty electrical connections or faulty fuel tank sending unit. *(b) Faulty Low Fuel Warning Relay.	(a) Test fuel gauge sending unit, and proceed as follows: (1) Clean and tighten all electrical connections. (2) Make sure that the fuel tank sending unit is grounded to the tank and that the tank is grounded to the frame. (b) Test Relay.
ERRATIC OIL GAUGE OPERATION*	(a) Loose or dirty electrical connections.	(a) Clean and tighten all electrical connections and test the gauge operation.

*Imperial Models Only

TESTS IN VEHICLE

VOLTAGE LIMITER

The voltage limiter can be tested in the vehicle or with the instrument cluster removed. To quickly test the voltage limiter in the vehicle, connect one lead of a voltmeter or test light to the temperature sending unit and the other lead to a good ground. Leave the sending unit lead wire attached to the sending unit.

Turn the ignition switch to the "**ON**" position. A fluctuating voltmeter or a flashing light indicates the voltage limiter is operating.

FUEL GAUGE CIRCUIT

Imperial Models

Imperial models incorporate a Low Fuel Warning Sentry Signal on the instrument panel. A relay is used in the circuit between the tank sending unit and the panel gauge. The relay has a 7.4 ohm resistor built in; thus reducing the values of the tank sending unit resistance (Fig. 1).

To test the panel gauge, tester C-3826 must be connected between the Low Fuel Warning Relay and the panel gauge. Values of the tank sending unit are lower than those of other models. To properly diagnose the fuel gauge circuit, the following procedure must be followed carefully.

FUEL GAUGE

(1) Disconnect wire from terminal marked "Ind" on low fuel warning relay (located on left side of cowl panel above kick pad) and connect one lead of gauge tester C-3826 to wire and other lead to ground. Turn ignition key on.

(2) With gauge tester on "L," fuel gauge should READ "E" plus or minus 3/32".

(3) With gauge tester on "M," fuel gauge should slowly advance to ½ position.

(4) With gauge tester on "H," fuel gauge should read "F" plus or minus 3/32". If gauge does not perform as above, inspect for an open circuit paying special attention to printed circuit board. If circuit continuity has been established, replace gauge.

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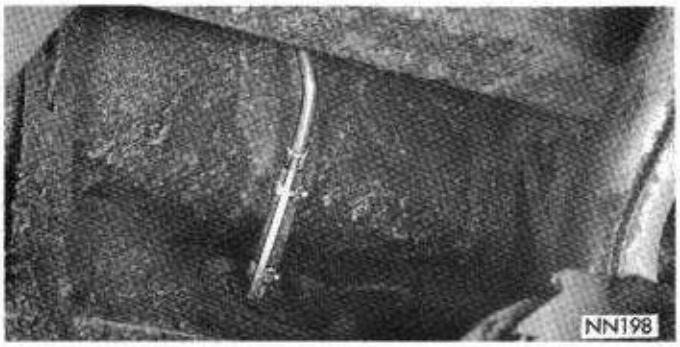


Fig. 4—Fuel Tank Ground Strap

Should panel gauge perform properly, the Low Fuel Warning Relay, should be tested. To test relay, following procedure should be carefully observed:

Low Fuel Warning Relay

(1) Disconnect wires to terminals marked "Ind" and "Tank" on relay (Fig. 1).

(2) Connect one lead of ohmmeter to terminal marked "Ind" and the other to terminal marked "Tank." The ohmmeter should read 7.4 ohms plus or minus .3.

(3) Remove leads and connect one to ground and other lead to terminal marked "Ign." The reading should be 1000 ohms plus or minus 50 ohms. If relay does not meet these values, inspect for a poor ground at attaching screw or corroded or loose connections at terminals and repeat test. If relay still does not meet these values, it should be replaced.

It is important that the ohmmeter is accurate. An accurate value cannot be obtained if the ohmmeter has an error of more than 1 ohm in 10. Test the ohmmeter with a known 10 ohm resistor.

If both the panel gauge and relay tests show them to be operating properly, the fuel tank sending unit should be tested next. Before removing tank unit, the ground strap on the suction tube should be inspected to be sure it is making good contact with the metal portion of the fuel line. Also inspect fuel line to body clip for good contact (Fig. 4).

Fuel Gauge Testing

Chrysler Models

(1) Disconnect wire at fuel tank sending unit. Connect one lead of Tester C-3826 to wire terminal and other lead to a good ground. Turn ignition key on.

(2) Turn knob on dial of tester to "H" and observe gauge on panel. It should read "Full," plus or minus 3/32".

With dial knob on "M," panel gauge should read ½.

(3) With dial knob on "L," panel gauge should read "Empty," plus or minus 3/32.

(4) If panel gauge does not perform as described, continuity of circuit from tank sending unit to panel unit should be tested, with special attention to printed circuit board. If continuity has been established, the gauge should be replaced.

OIL PRESSURE GAUGE

Imperial Models

Disconnect wire from the oil pressure sending unit on the engine. Connect one test lead of Tester Tool C-3826 to the removed wire terminal the other test lead to a good ground. Place the pointer of the gauge tester on the "L" position and turn the ignition switch to "on." Do not start engine. The oil pressure gauge should show "L" plus or minus ⅛ inch. **Thermal gauges are slow in operation. Allow time for gauge to heat up.** When the tester is in the "L" position the "Sentry Signal" on the cluster should be illuminated.

Place the pointer on the tester on the "M" position and the oil pressure gauge should advance to the ½ position of the dial. Place the pointer of the tester in the "H" position and the gauge should advance to the "H" position of the dial.

Should the gauge respond to the above tests, but not operate when the wire is attached to the sending unit, it should be replaced. Should the gauge fail to respond to the above tests indications are of possible loose connections, broken wire, or faulty gauge. The instrument cluster should be removed for further tests. See "Instrument Cluster."

OIL PRESSURE WARNING LIGHT

Chrysler Models

To test the oil pressure warning light, remove the terminal from the oil pressure sending unit. Connect one lead of the gauge tester to the terminal and the other test lead to a good ground.

With the ignition switch in the "on" position and the gauge tester in the "L" position, the indicator light should not light. With the gauge tester in the "M" position, the indicator light should show a dull glow. With the gauge tester in the "H" position, the indicator light should show full brilliance.

Should the oil pressure warning light fail to respond to the above tests, indications are of possible loose connections, broken wire, or burned out lamp.

Low Oil Pressure Warning Switch

The operation of the oil pressure warning switch, mounted on the engine, is dependent on variances in the engine oil pressure.

When the engine oil pressure is high (normal operating condition of the engine) the switch is held in the "OFF" or "OPEN" position allowing no current to flow to the oil pressure warning lamp on the instrument panel.

When the engine oil pressure is low, the switch is in the "ON" or "CLOSED" position allowing current to flow to the oil pressure warning lamp on the instrument panel. This causes the warning lamp to be illuminated.

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TEMPERATURE INDICATING SYSTEM

Imperial Models

Disconnect the terminal from the temperature sending unit on the engine. Connect one test lead of Tester C-3826 to the terminal and the other test lead to a good ground. Place the pointer of the gauge tester on the "L" position and turn the ignition switch to "on." The temperature gauge should show "C" plus or minus ⅛ inch. **Thermal gauges are slow in operation. Allow time for gauge to heat up.**

Place the pointer on the tester on the "M" position and the temperature gauge should advance to the driving range of ½ position of the dial. Place the pointer of the tester in the "H" position and the gauge should advance to the "H" position of the dial.

Should the gauge respond to the above tests, but not operate when the terminal is attached to the sending unit, indications are of a faulty sending unit and it should be replaced. Should the gauge fail to respond to the above tests, indications are of possible loose connections, broken wire, defective printed circuit board or faulty gauge. The instrument cluster should be removed for further tests. See "Instrument Clusters."

To test the temperature indicator turn the ignition key to the "Acc" or left position. Disconnect the wires from the temperature sensing switch on the engine and one at a time touch the wires momentarily to ground. When the wire from the "G" terminal is grounded the "Cold" (green) bulb of the indicator should light. When the wire from the "R" terminal is grounded the "Hot" (red) bulb of the indicator should light. If one of the bulbs fail to light the bulb that did not light is faulty and should be replaced. If both of the bulbs fail to light indications are of a faulty circuitry in the system or possibly both of the indicator bulbs are faulty. Repair or replace as necessary.

INSTRUMENT CLUSTER

Imperial Models

The instrument cluster is not serviced as an assembly. The cluster contains three separate main groups:

(1) Speedometer.
(2) Printed Circuit Assembly
(3) Clock

When servicing the cluster, it is necessary to remove only the group containing the desired instrument or gauge.

Removal

(1) Disconnect battery ground cable.

(2) Remove screws that attach instrument cluster chrome bezel to instrument cluster. Remove bezel.

(3) Remove clock reset knob and temperature control level knob.

(4) Carefully remove lens from cluster.

(5) Remove screws that attach cluster face plate to cluster. Remove face plate.

(6) Remove desired main group of cluster as follows:

Speedometer—Disconnect speedometer and odometer reset cables from under instrument panel. Remove the four screws that attach speedometer to cluster. Remove speedometer.

Printed Circuit Assembly—Remove the screws that attach printed circuit assembly to instrument cluster. Pull assembly forward slightly and disconnect printed circuit multi-connector. Remove assembly for service of fuel, oil, temperature.

Clock—Remove the screws that attach clock to instrument cluster. Pull clock forward and disconnect feed wire to clock and remove clock.

Installation

(1) Position cluster assembly into instrument cluster. Connect printed circuit multi-connector; connect clock feed wire; connect speedometer cable and odometer reset cable. Install assembly attaching screws.

(2) Position cluster face plate in cluster and install attaching screws.

(3) Position cluster lens on cluster face plate.

(4) Position cluster chrome bezel onto cluster and install attaching screws. Take care to have lens properly positioned before tightening bezel attaching screws.

(5) Install clock rest knob and the temperature control lever knob.

(6) Connect battery ground cable and test operation of instruments and lights.

Removal—Chrysler Models

(1) Disconnect battery ground cable.

(2) Remove steering column cover. Disconnect gear selector indicator link, remove column clamp and loosen steering column lower support plate to partially lower steering column.

(3) Disconnect speedometer, odometer cables and multiple connector at printed circuit board.

(4) Using Tool C-3824, remove ignition switch bezel and allow switch to hang under panel.

(5) From under cluster, remove two lower cluster trim moulding screws and moulding.

(6) Loosen the three screws retaining cluster upper trim bezel, two screws (under the panel) from steering column filler and instrument bezel. Remove filler assembly.

(7) Remove the four cluster retaining screws and rotate cluster clockwise around steering column 180 degrees.

(8) Disconnect two wires at ammeter gauge terminals and remove cluster.

Speedometer head and gauges are removed from the front of the cluster after separating the lens from the cluster housing.

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Installation

(1) Position cluster upside down under steering column and connect two wires to ammeter gauge.

(2) Carefully rotate cluster counterclockwise over steering column and locate in panel opening. Secure with the four mounting screws.

(3) Install steering column filler and instrument bezel assembly and the upper trim moulding.

(4) Next install lower trim moulding. **Do not install the ignition switch till after the lower moulding is in place.**

(5) Install ignition switch and bezel using Tool C-3824, connect speedometer, odometer cables and multiple connector to printed circuit board.

(6) Install steering column clamp, two retaining nuts and steering column lower support plate bolts (finger tight). Align steering gear; (see "Steering Gear Alignment," Group 21).

(7) Install steering column cover, connect battery ground cable and test operation of all instruments.

INSTRUMENT CLUSTER BULBS

Imperial Models

Cluster light bulbs can be serviced from under the panel after removing the fuse block.

Chrysler Models

Nine light bulbs in the speedometer cluster, one in the clock and one in the glove box can be serviced from under the panel unless the car is equipped with air-conditioning. If so equipped, it is necessary to remove steering column cover and speedometer cable.

Remove the steering column cover for access to the alternator, fuel gauge, the gear selector indicator or ignition switch light bulbs. The voltage limiter is removed before removal of fuel gauge light bulb.

Service of the heater control light bulb requires removal of the ash receiver, housing and radio. See Radio Removal.

Two ash receiver light bulbs are removed by snapping the sockets out of the ash receiver housing after removing the ash receiver drawer assembly.

SWITCH TITLE LIGHTING—IMPERIAL MODELS

The switch title lenses are illuminated by bulbs located next to the switches. The bulbs can be serviced after removing the switch bezel.

Left Group

(1) Perform steps 1-5 of Switches—**Left Group.**

(2) Remove the screw that attaches bulb diffuser to instrument panel.

(3) Remove diffuser.

(4) Remove bulb from socket.

Right Group

(1) Perform steps 1-5 of switches —**Right Group.**

(2) Remove the screw that attaches bulb diffuser to instrument panel.

(3) Remove diffuser.

(4) Remove the bulb from the socket.

TEST OUT OF VEHICLE

Voltage Limiter

To test the voltage limiter out of the vehicle, remove the instrument cluster. See "Instrument Cluster Removal." Place the instrument cluster or printed circuit board on a padded work bench to prevent damage.

Connect a jumper wire from the positive post of a 12 volt test battery to the voltage limiter input terminal on Chrysler models. On Imperial models, the jumper wire from the positive post of the battery is connected to the "I" terminal of the fuel gauge.

Connect another jumper wire from the battery negative terminal to the voltage limiter case on Chrysler models, or to the fuel gauge case on Imperial models.

Connect the negative lead of a voltmeter to the battery negative terminal. Touch the positive lead of the voltmeter to the input terminal of the voltage limiter on Chrysler models or to the "I" terminal of the fuel gauge on Imperial models. A reading of 12 volts should be shown on the voltmeter.

Move the positive lead of the voltmeter to the output terminal of the voltage limiter on Chrysler models or to the "A" terminal of the fuel gauge on Imperial models.

A fluctuating reading between 0 and 7 volts should be shown on the voltmeter. On Imperial models the same reading should be shown as the "S" terminal of the fuel gauge. Any other readings indicate the voltage limiter is not functioning and should be replaced on Chrysler models. On Imperial models, the fuel gauge should be replaced.

FUEL LEVEL INDICATING SYSTEM

Fuel Tank Sending Unit

Imperial Models

Always inspect fuel tank ground strap for proper installation or good contact before replacing the sending unit.

(1) Remove fuel tank sending unit. See "Fuel System," Group 14.

(2) Using an ohmmeter with a scale of 0 to 100 ohms, connect negative lead to body of tank unit and positive lead to tank unit terminal.

(3) With float arm contacting empty stop, ohmmeter should read 66 ohms plus or minus 11.5 ohms.

(4) Raise float arm to full stop and observe ohmmeter. The reading should be 2.2 plus or minus .5 ohm.

(5) If unit does not perform to these specifications, the unit should be replaced.

Chrysler Models

Always inspect fuel tank ground strap for proper

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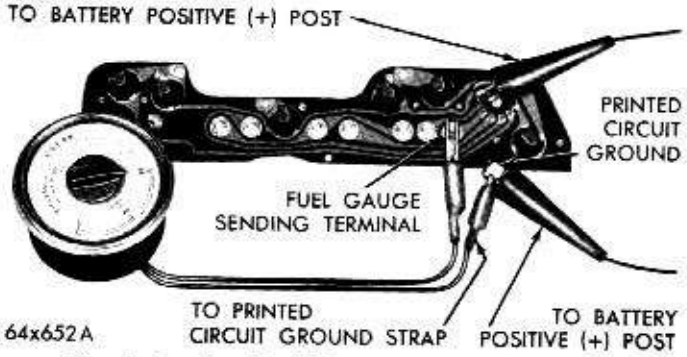


Fig. 5—Testing Fuel Gauge—Imperial Models

installation or good contact before replacing the sending unit.

(1) Remove fuel tank sending unit. See "Fuel System," Group 14.

(2) Using an ohmmeter with a scale of 0 to 100 ohms, connect negative lead to body of tank unit and positive lead to tank unit terminal.

(3) Hold unit so the float arm contacts "Empty Stop." The reading on ohmeter scale should be 73 ohms, plus or minis 12.0 ohms.

(4) Raise arm to "Full Stop." The reading should now be 9.6 ohms, plus or minus 1 ohm.

(5) If unit does not perform to these specifications, inspect the stops or arm for possible distortion. If stops or arm cannot be repaired or are not damaged, unit should be replaced.

Fuel Gauge (Figs. 5 and 6)

Place the instrument cluster (Chrysler models) or the printed circuit assembly (Imperial models) on a padded service bench to protect the assembly.

CAUTION: A direct connection from a 12 volt battery to the gauges will burn them out.

(1) Connect a jumper wire to voltage limiter input terminal on fuel gauge. Connect other end of the jumper wire to positive (+) post of a 12 volt test battery.

(2) Connect a jumper wire from negative (—) post of battery to instrument cluster base (Chrysler models) or to printed circuit ground strap (Imperial models).

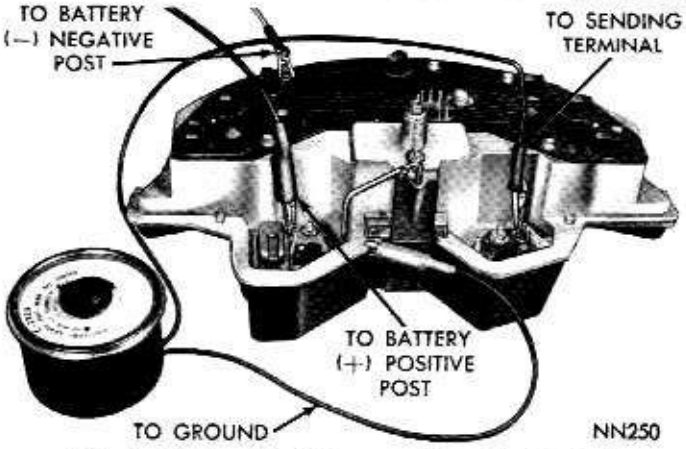


Fig. 6—Testing Fuel Gauge—Chrysler Models

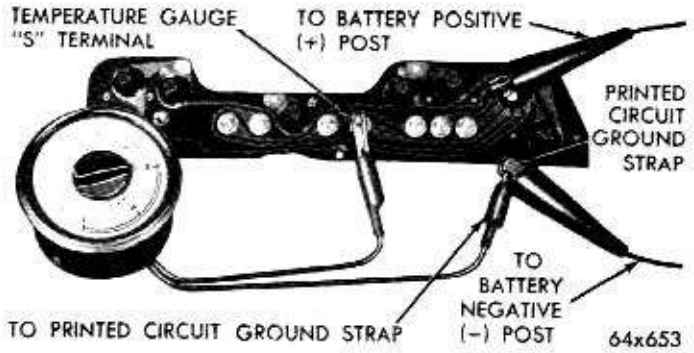


Fig. 7—Testing Temperature Gauge—Imperial Models

(3) Connect one lead of Gauge Tester C-3826 to the fuel gauge sending terminal.

(4) Connect remaining lead of gauge tester to instrument cluster base (Chrysler models) or to printed circuit ground strap (Imperial models).

With gauge tester in "L" position, fuel gauge should show "E" or minus 3/32 inch. **The minus tolerance provides a small fuel reserve when fuel gauge is on "E" position.**

With gauge tester in "M" position, fuel gauge should advance slowly to ½ position. With gauge tester in "H" position, fuel gauge should slowly advance to "F" position plus or minus 3/32 inch. If fuel gauge does not perform as above replace gauge.

TEMPERATURE INDICATING SYSTEM

Temperature Gauge (Fig.7)

The temperature gauge is tested in the same manner as the fuel gauge with the exception that Tester Tool C-3826 is connected to the temperature gauge sending terminal.

With the gauge tester on "L" position, the temperature gauge should show "C" or cold. With the gauge tester on "M" position, the temperature gauge should show ½ of the operating scale of the dial. With the gauge tester on the "H" position, the temperature gauge should show "H." If the gauge does not respond to the above tests test for an open printed circuit or replace the temperature gauge.

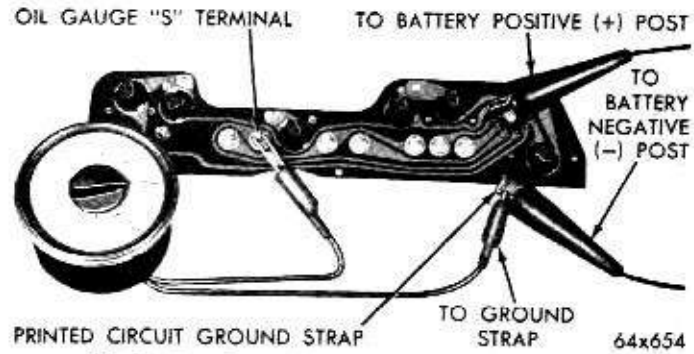


Fig. 8—Testing Oil Gauge—Imperial Models

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OIL PRESSURE INDICATING SYSTEM

Oil Gauge Imperial Models Fig. 8

The oil gauge is tested in the same manner as the fuel and temperature gauges with the exception that Tester C-3826 is connected to the oil gauge sending terminal.

With the gauge tester on "L" position, the oil gauge should show "L" or low. With the gauge tester on "M" position, the oil gauge should show ½ of the operating scale of the gauge. With the gauge tester on "H" position, the oil gauge should show "H" or high. If the gauge does not respond to the above tests, test for an open printed circuit or replace the oil gauge.

Printed Circuit Board Imperial Models

The printed circuit board is removed from the cluster can after the bezel and face plate is removed. See "Instrument Cluster Removal." After the gauges and light bulbs are removed, a visual inspection of the conductors should be made for cracks or damaged circuits. If no visual damage is evident, each circuit should be tested for continuity with an ohmmeter or a test light. Should an open circuit be detected, the printed circuit board should be replaced.

Chrysler Models

Two printed circuit boards are attached to the back of the instrument cluster housing. The main printed circuit board receives current supply from the multiple connector and controls the temperature and oil pressure indicator lights. The small printed circuit board is supplied by a jumper harness from the multiple connector and supplies the voltage limiter and fuel gauge.

To remove and test the main printed circuit board, remove the eight screws retaining the printed circuit board to the back of the cluster housing.

The fuel gauge printed circuit board is removed after the 3 cluster face plate screws are removed from the cluster housing. Separate the can from the face plate. The ammeter fuel gauge terminal nuts are removed next and the printed circuit board separated from the gauges.

A visual inspection of the conductors should be made for cracks or damaged circuits. If no visual damage is evident, each circuit should be tested for continuity with an ohmmeter or a test light. Should an open circuit be detected, the printed circuit board should be replaced.

SWITCHES

CHRYSLER MODELS

All switches on the instrument panel or in the instrument cluster can be serviced from under the instrument panel by removing the switch knob, mounting nut or bezel and disconnecting the wiring to the switch.

IMPERIAL MODELS

The instrument panel swtiches are located in two groups, one group on each side of the steering column. On the left of the steering column are located the headlamp and winshield wiper switches. On the right of the steering column are located the accessory and the ignition switches. To service the switches proceed as follows:

Left Group

(1) Remove lower steering column cover plate.

(2) Remove headlamp switch knob and stem assembly and windshield wiper switch knob.

(3) Remove screw that attaches right end of switch bezel to instrument panel. This screw can be reached from inside steering column opening.

(4) Remove headlamp switch retaining nut using spanner wrench Tool C-3824.

(5) Lift off switch bezel.

(6) Remove headlamp and windshield wiper stem light seals.

(7) Remove mounting nut from desired switch (headlamp or windshield wiper).

(8) From under instrument panel pull switch down and disconnect wiring.

(9) Remove switch from under instrument panel.

Right Group

(1) Remove lower steering column cover plate.

(2) Remove accessory switch knobs.

(3) Remove the screw that attaches left end of switch bezel to instrument panel. This screw can be reached from inside steering column opening.

(4) Remove screw in ignition switch well.

(5) Lift off switch bezel.

(6) Remove mounting nut from desired switch (accessory or ignition).

(7) From under instrument panel pull switch down and disconnect wiring.

(8) Remove switch from under instrument panel.

CIRCUIT BREAKERS

As a safety precaution, circuit breakers are used for the headlamps and wiper circuits. They insure that these essential services will continue to function if an intermittent short circuit occurs. Use only identical type and amperage value circuit breakers as replacements for service. See "Specifications."

FUSE BLOCK (Fig. 9)

The fuse block is located at the forward edge of the instrument panel and is retained to the instrument panel lower reinforcement by a self tapping screw.

In the fuse block are mounted the radio, cigar lighter, air-conditioner or heater, tail-stop-dome light, and accessory fuses. The fuse capacity is printed on the fuse block as an aid to replacement requirements.

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Fig. 9—Fuse Block

HEATER AND AIR CONDITIONING CONTROLS

Removal Chrysler Models

(1) Disconnect battery ground cable.

(2) Remove ash receiver and housing assembly.

(3) From behind panel remove the two screws attaching push button vacuum switch to temperature control bracket. Remove switch.

(4) Remove the three screws from temperature control bracket and lower assembly through ash receiver opening.

(5) Disconnect blower switch multiple connector and bowden cable and remove assembly.

Installation

(1) Pull bowden cable and blower switch multiple connector through ash receiver opening, to connect and adjust cables (See Control Cable Adjustment).

(2) Position control assembly in panel and install the three retaining screws.

(3) Install push button vacuum switch to back of temperature control assembly.

(4) Install ash receiver and housing assembly.

(5) Connect battery ground cable and test operation of controls.

IMPERIAL MODELS

Removal

(1) Disconnect battery ground cable.

(2) Remove the screws that attach instrument cluster chrome bezel to instrument cluster. Remove bezel.

(3) Remove temperature control knob by loosening set screw on underside of the knob and sliding off from control lever.

(4) Remove the four screws holding face plate and lens assembly.

(5) Pull face plate out far enough to disconnect heater blower switch connector and remove face plate.

At this point blower switch may be removed from face plate by removing two retaining screws.

(6) Remove two heater control mounting screws and pull assembly out of cluster far enough to disconnect temperature control cable and vacuum hose connector. Remove control assembly.

Installation

(1) Connect vacuum hose connector and temperature control cable to control assembly. Adjust cable. See "Control Cable Adjustment."

(2) Position and secure control assembly in cluster with the two mounting screws.

(3) Install face plate with the four retaining screws.

(4) Install temperature control knob and tighten set screw.

(5) Install instrument cluster bezel.

(6) Connect battery ground cable and test operation of heater controls.

TURN SIGNAL SYSTEM

GENERAL INFORMATION

The New Yorker models use, as standard equipment, turn signal indicators mounted on the front fenders. The fender mounted indicators are available as optional equipment on Newport and 300 models. When fender mounted indicators are used, the indicators in the instrument cluster are omitted because the fender indicator is visible from the drivers seat.

The non-tilt steering column utilizes a turn signal switch and cancelling cam mounted directly below the steering wheel and horn contact switch. A lobe mounted directly to the underside of the steering wheel actuates the canceling cam which deactivates the turn signal switch mounted to the canceling cam assembly.

The Tilt Steering Column turn signal switch is mounted externally on the steering column near the bulkhead. A canceling cam assembly, actuated by lobe on the bottom of the steering wheel actuates the turn signal switch by means of a control cable.

The turn signal flasher is a plug in type mounted to the right of the steering column, under the instrument panel in a bracket mounted on the ash receiver housing.

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SERVICE DIAGNOSIS

Condition	Possible Cause	Correction
NON-TILT STEERING COLUMN		
EXTERNAL LAMPS OPERATE NORMALLY, NO INDICATIONS ON INSTRUMENT CLUSTER	(a) Faulty pilot bulb in instrument cluster.	(a) Replace bulb.
SYSTEM DOES NOT FLASH	(a) Faulty flasher unit. (b) Faulty external bulb. (c) Faulty contact in switch.	(a) Replace flasher. (b) Replace faulty bulb. (c) Replace switch.
SYSTEM DOES NOT CANCEL AFTER COMPLETION OF TURN	(a) Broken or loose cancelling finger. (b) Improperly aligned cancelling finger. (c) Broken or faulty switch.	(a) Replace cancelling finger. (b) Align cancelling finger properly. (c) Replace switch.
ENTIRE SYSTEM DOES NOT OPERATE	(a) Open circuit in feed wire to switch. (b) Faulty fuse. (c) Faulty flasher unit.	(a) Check wiring circuits. Refer to "Wiring Diagrams." (b) Replace fuse. (c) Replace flasher.
PILOT LAMP ILLUMINATES BRIGHTLY, EXTERNAL LAMPS GLOWS DIMLY WITH NO FLASH	(a) Loose or corroded external lamp ground connection.	(a) Clean and tighten ground connection.
TILT STEERING COLUMN		
TURN SIGNAL NOT CANCELLING FROM EITHER TURN POSITION	(a) Clamps at either end of the bowden cable are broken, loose or pulled off. (b) Bowden cable wire loops uncoiled. (c) Override spring or actuator yoke is bent allowing the plastic trigger to pass over top and possibly bind on spring. (d) Trigger spring is broken or unattached. (e) Channel on underside of the turn signal yoke is not engaging the ball end of bellcrank. (f) Turn signal binding preventing cancellation. Wire ring on yoke pilot installed with open ends out of position. (g) Dimples in actuator yoke worn allowing the override spring to pivot out of position. (h) Signal switch mounting legs bent.	(a) Install a new bowden cable assembly. (b) Install a new bowden cable assembly. (c) Install new yoke assembly. (d) Install new trigger spring or attach trigger spring. (e) Lift yoke and reposition on bellcrank. (f) Reinstall with open ends in hole for the signal switch lever. (g) Replace yoke assembly. (h) Install new switch.
TURN SIGNAL NOT CANCELLING IN THE EXTREME DOWN POSITION OF THE TILT WHEEL	(a) Detent spring deformed so switch will not remain indexed.	(a) Install a new detent spring.
TURN SIGNAL NOT OPERATING IN SOME OF THE TILT POSITIONS	(a) Turn signal switch is mounted incorrectly on jacket tube.	(a) Readjust signal switch.

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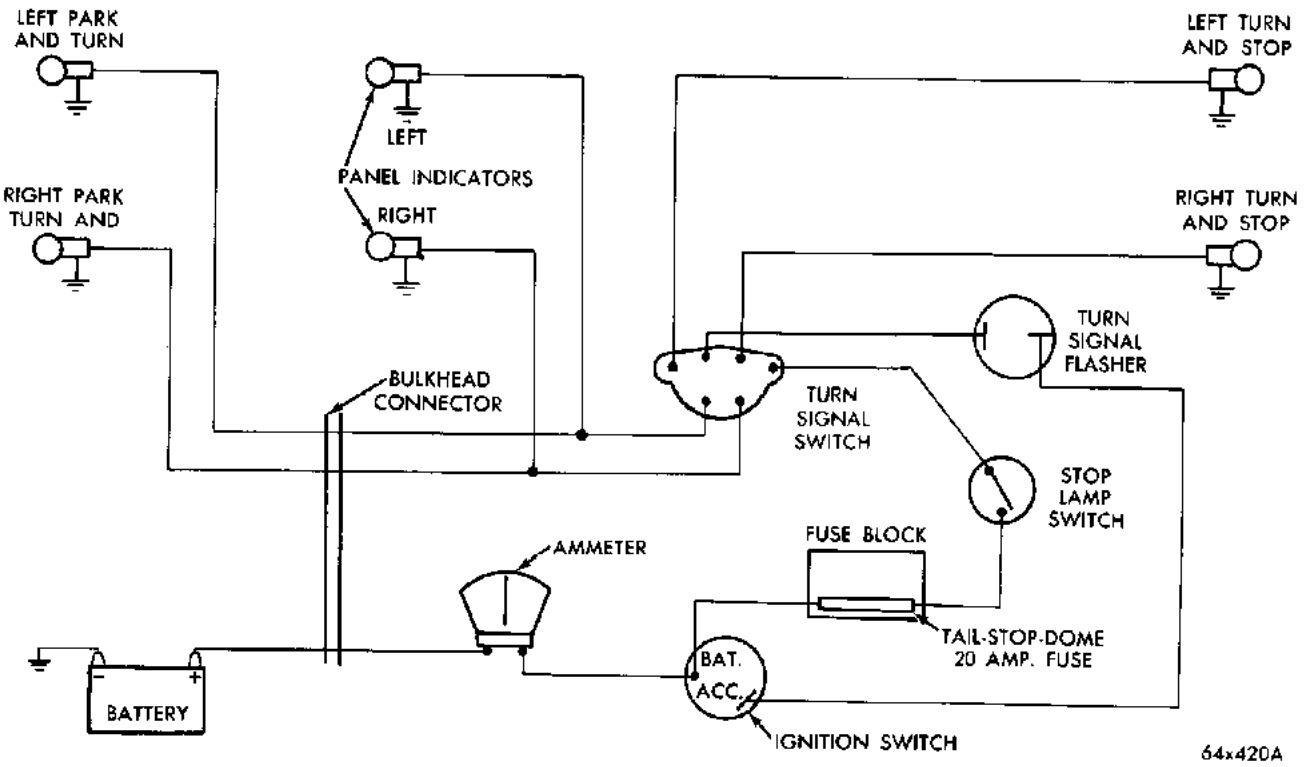


Fig. 1—Turn Signal Wiring—Imperial Models

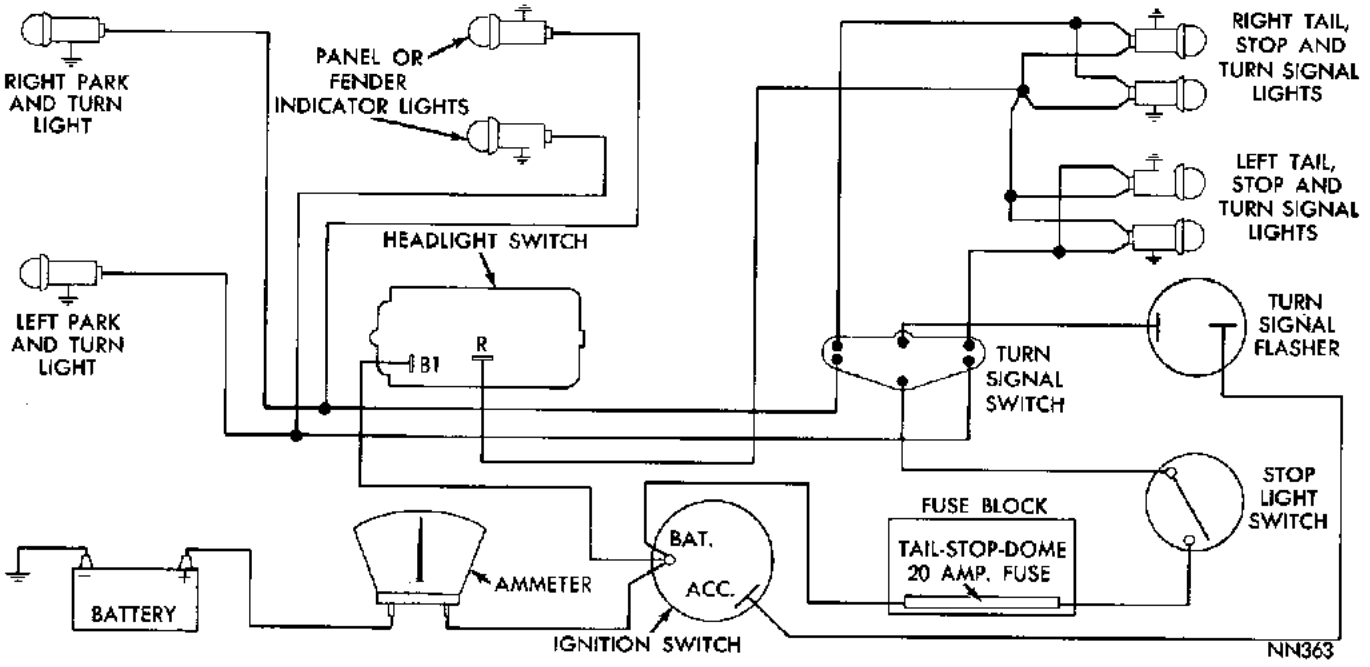


Fig. 2—Turn Signal Wiring—Chrysler Models

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NON-TILT TURN SIGNAL SWITCH

Imperial Models

Removal

(1) Disconnect battery ground cable.

(2) Remove the two screws from underside of steering wheel and remove horn blowing actuator and steering wheel cover.

(3) Loosen steering wheel nut several turns, install steering wheel puller Tool C-3428. Loosen steering wheel first, then remove steering wheel nut and steering wheel.

(4) Remove turn signal operating lever.

(5) Remove steering column lower cover.

(6) Remove the two screws, disconnect switch wires at connection and remove turn signal switch and wires.

Installation

(1) Position turn signal switch on steering column and install attaching screws and wire connections.

(2) Install steering column lower cover.

(3) Install turn signal operating lever.

(4) Install steering wheel and steering wheel nut, tighten nut to 24 foot-pounds. Test operation of cancelling lever.

(5) Install horn blowing actuator, steering wheel cover and attaching screws.

(6) Connect battery ground cable.

Chrysler Models

Removal

(1) Disconnect battery ground cable.

(2) Compress and turn horn button ¼ turn counterclockwise to release button from retainer.

(3) Disconnect horn wire at horn switch.

(4) Remove three screws and insulators attaching horn ring and horn switch to steering column. Remove horn ring and switch.

(5) Loosen steering wheel nut several turns and install Steering Wheel Puller Tool C-3428. Loosen steering wheel first, then remove steering wheel nut and steering wheel.

(6) Remove screw attaching turn signal operating lever to turn signal switch and remove lever.

(7) Disconnect turn signal wiring at steering column jacket tube below instrument panel.

Attach a piece of string or fine wire to turn signal switch wiring before removing switch from steering column. When switch is removed leave string or wire in steering column jacket tubes as an aid to replacement of wiring.

(8) Remove screws attaching turn signal switch to steering column and remove switch from top of steering column.

Installation

(1) Attach string or wire, left in steering column jacket tube during removal, to turn signal switch wiring and carefully pull string or wire down through column jacket tube until directional switch wires can be connected. Position turn signal switch in steering column jacket tube and install attaching screws and connect all wire connections.

(2) Install turn signal operating lever.

(3) Install steering wheel and steering wheel nut. Tighten to 24 foot-pounds. Test operation of cancelling lever.

(4) Install horn switch, horn ring, insulators and attaching screws. Connect horn wire.

(5) Install horn button by compressing and turning ¼ turn clockwise to lock horn button on retainer.

(6) Connect battery ground cable.

TILT STEERING COLUMN TURN SIGNAL SWITCH

Removal—All Models

(1) Remove the two hex head self-tapping screws from switch mounting bracket at lower end of steering column.

(2) Remove screw attaching cable clip to switch and disconnect multiple connector.

Installation—All Models

(1) Attach coil end of cable to switch post with wire next to switch. Install cable clip and screw.

(2) Place steering column in "Down" position, turn signal handle and switch in cancel position.

(3) Connect multiple connector and secure switch to column making sure to center two screws in bracket slots.

CONTROL CABLE

Removal

(1) Remove steering wheel assembly and steering column cover.

(2) Remove turn signal handle and canceling cam spring. Using a pair of long needle nose pliers, gently pull cam assembly from pivot socket.

(3) Remove cable clip screw and slide coil end off upper cable lever. Pull cable up far enough to attach a fine flexible wire to cable to aid in installing cable.

(4) Place gear selector in manual Low and steering column in straight position. Remove cable from bottom of column, leaving wire in column.

Installation—All Models

(1) Position steering column in straight position and gear selector in manual Low.

(2) Attach flexible wire to "L" shaped cable clamp and feed cable through bottom of column while pulling on wire from top of column.

(3) Remove wire from cable clip, position coil end on upper cable lever with coil wire facing away from lever and install cable clip.

(4) Install canceling cam assembly, making sure to engage round head of upper cable lever head with "U" shaped retainer on underside of assembly.

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(5) Install cam retaining spring and turn signal lever.

(6) Place steering column in "Down" position and attach coil end to switch post with wire next to switch. Install cable clip and screw.

(7) Place turn signal lever and switch in neutral position and secure switch to column. Be sure to center mounting screws in slots.

Do not distort cable in any way.

(8) Install steering wheel assembly and steering column cover.

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WINDSHIELD WIPER SYSTEM

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GENERAL INFORMATION

The wiper motor is connected to the wiper switch and from the wiper switch "B" terminal to the "ACC," accessory, terminal of the ignition switch so the wiper motor can be actuated only when the ignition switch is turned to the right or left positions. The wiper circuitry is protected by a circuit breaker that is built into the wiper switch.

The variable speed wiper system has a depressed parking feature which is accomplished by reversing the direction of the wiper motor and the use of a parking cam on the motor crank pin. When the wiper switch is turned "OFF," the motor direction is reversed and at the same time the parking cam rotates 180 degrees, lengthening the drive link slightly to park the wiper blades in a depressed position. The drive link shortens when the motor runs in the wipe direction (Figs. 1 and 2).

SERVICE DIAGNOSIS

Condition	Possible Cause	Correction
WIPER FAILS TO OPERATE	(a) Binding linkage.	(a) Relieve binding condition.
	(b) Faulty instrument panel switch.	(b) Test switch. See "Wiper Switch."
	(c) Linkage disconnected.	(c) Repair as necessary.
	(d) Faulty motor.	(d) Test motor. See "Wiper Motor Bench Testing."
	(e) Open or grounded wiring.	(e) Test wiring for continuity. Repair as necessary.
WIPER BLADES NOT PARKING PROPERLY	(a) Arm set at incorrect position.	(a) Adjust arm. See "Wiper Arm Adjustment."
	(b) Motor park switch timing incorrect.	(b) Time park switch. See "Wiper Motor Park Switch Timing."
	(c) Broken link spring. (Variable Speed)	(c) Replace Spring. See "Wiper Link Assembly."
	(d) Link spring trip not engaging stop on linkage. (Variable Speed)	(d) Inspect "Wiper Link Assembly."
BLADES SLAP WINDSHIELD MOULDINGS	(a) Improperly adjusted wiper arm.	(a) See "Wiper Arm Adjustment."
	(b) Looseness of the motor crank or other drive parts.	(b) Replace the faulty part.
BLADES CHATTER	(a) Twisted arm holds blade at wrong angle to glass.	(a) Replace wiper arm. Do not attempt to straighten bent or twisted arm.
	(b) Bent or damaged blades.	(b) Replace blades.
	(c) Foreign substances such as body polish on glass.	(c) Clean the glass.
MOTOR WILL NOT STOP WHEN INSTRUMENT PANEL SWITCH IS TURNED "OFF"	(a) Motor park switch failure in the "closed" position.	(a) Repair or replace motor park switch.

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Condition	Possible Cause	Correction
MOTOR STOPS IN ANY POSITION WHEN INSTRUMENT PANEL SWITCH IS TURNED "OFF"	(a) Motor park switch failure in the "open" position.	(a) Repair or replace motor park switch.
	(b) Open parking circuit.	(b) Test continuity of blue wiring circuit and correct as necessary.
	(c) Open field circuit.	(c) Test continuity of yellow wiring circuit and correct as necessary.
NO SPEED CONTROL (VARIABLE SPEED)	(a) Open circuit in yellow wiring.	(a) Test continuity and correct as necessray.
	(b) Defective control switch.	(b) Replace switch.

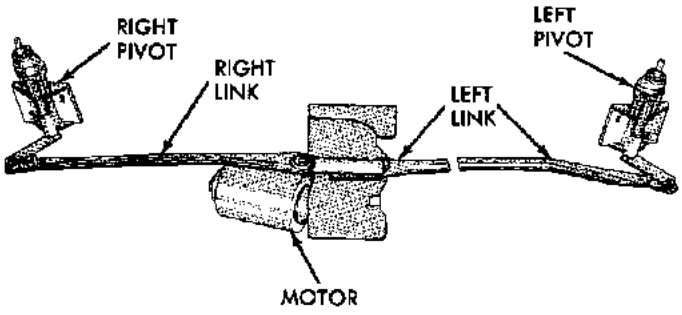


Fig. 1—Wiper System—Imperial Models

TESTS AND ADJUSTMENTS

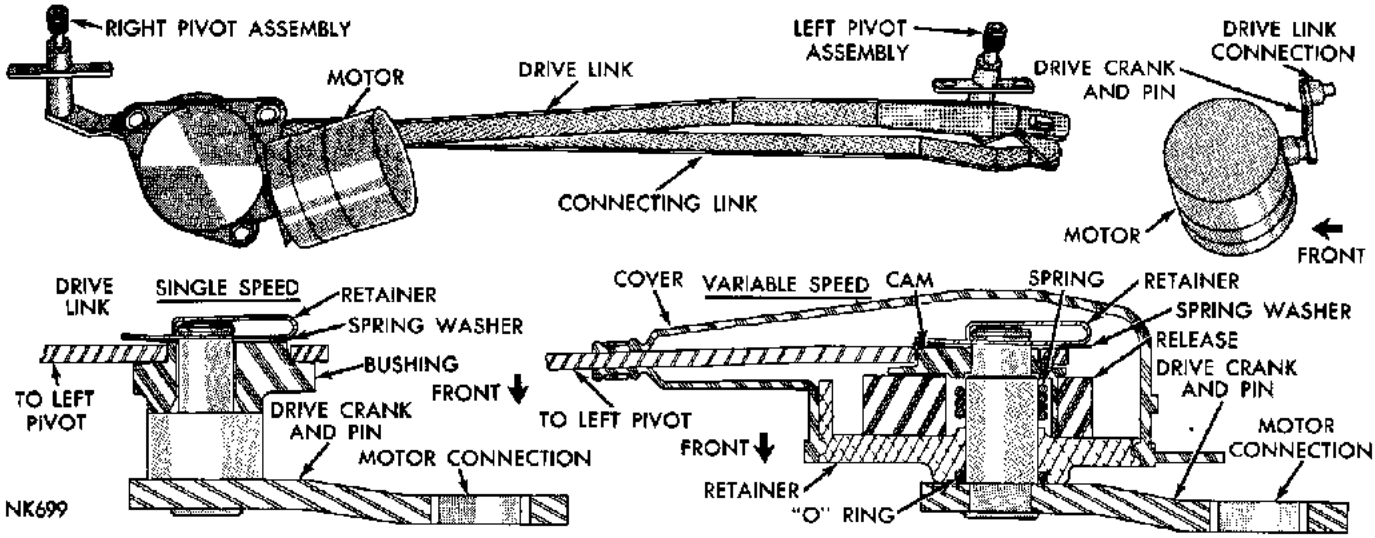
Wiper Arm Adjustment Variable Speed

To determine if an adjustment is required, apply a constant **upward** force of 50 ounces, parallel to the windshield glass, at the end of the wiper arm (where the wiper blade is attached to the arm). With the 50 ounce force applied, pull the wiper blade away from the windshield glass once or twice to prevent glass friction from affecting upward movement of the wiper arm and blade. With the force applied, the clearance between the tip of the wiper blade and the windshied lower moulding should be between ¼ and 2¼ inches on the left side and between 1 and 3 inches on the right side of the vehicle for Chrysler Models and between ¼ and 2¼ on the right side for Imperial Models. If the clearance is not in the specified range, use Tool C-3982 to reposition the wiper and arm and blade assembly (Fig. 3).

Single Speed—Chrysler Models

To determine if an adjustment is required, apply a constant downward force of 25 ounces, parallel to the windshield glass, at the end of the wiper arm (where the wiper blade is attached to the arm). With the 25 ounce force applied pull the wiper blade away from the windshield glass once or twice to prevent glass clearance between the tip of the wiper blade and the windshield moulding should be between ¼ and 2¼ inches on the left side and between 1 and 3 inches on the right side of the vehicle. If the clearance is not in the specified range, use Tool C-3982 to reposition the wiper arm and blade assembly (Fig. 3).

CAUTION: The use of a screwdriver or other prying tool to remove an arm may distort it in a manner that will allow it to come off the pivot shaft in the future, regardless of how carefully it is installed. NEVER under any circumstances push or bend the spring clip in the base of the arm in an attempt to release the arm. This clip is self-releasing.



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Fig. 2—Wiper System—Chrysler Models

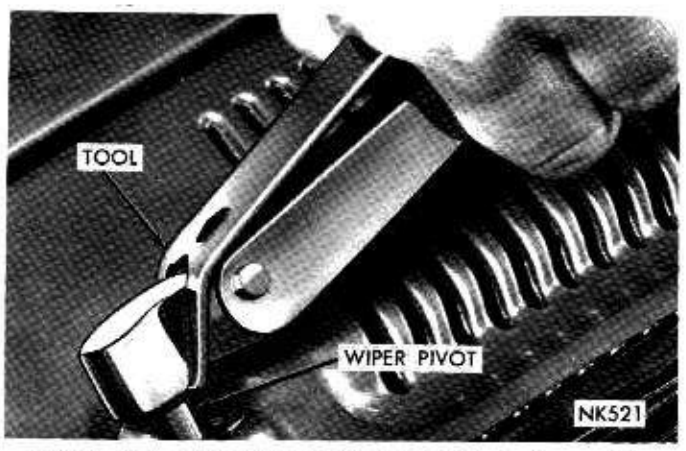


Fig. 3—Removing Wiper Arm and Blade Assembly

Wiper Motor Park Switch Timing

The timing of the motor park switch must be:

(a) Late enough that wiper arms come to rest at extreme lower limit of travel on dry glass.

(b) Early enough that wiper arms do not rise appreciably beyond lower limit of travel on completely wet glass.

Adjust timing of park switch on wiper motor to provide "shut off" at lowest point of wiper blade travel under both wet and dry glass conditions.

When adjusting timing of variable speed park switch, note that variable speed motor rotates in reverse at the time park switch opens. "Early" and "Late" directions are therefore opposite to single speed motors.

Wiper Parking Operation Test—Variable Speed

(1) Turn instrument panel switch to ON and allow wiper system to run through several cycles of operation.

(2) Very slightly, after wiper blades reach top of wipe pattern, turn wiper switch to OFF to cause blades to park in a one-half cycle of wiper motor operation.

If blades do not park in desired ½ cycle but require 1½ cycles to park, procedure of going through switching operation must be repeated as follows:

(a) Turn switch to "ON" position and allow wiper system to operate a few cycles.

(b) Turn switch to "OFF" position, only this time allowing the timing of operating switch to occur at a position in respect to wiper blade travel slightly later than first operation. Again, note cycle requirement to reach park.

Having parked wiper system in ½ cycle of motor operation, note whether wiper blades have traveled well below normal wipe pattern. If they have not, replacement of parking cam, spring and spring trip is indicated. If they have, but have not met the requirements for proper park position wiper arm adjustment is required.

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Fig. 4—End Play Adjustment

End Play Adjustment

To adjust armature shaft end play turn adjustment screw in until it bottoms, then back-off ⅛ turn (Fig. 4).

On Chrysler models, this adjustment may be performed in the vehicle. On Imperial models, the wiper motor must be removed. See "Wiper Motor Removal."

WIPER SYSTEM LUBRICATION

Should it be necessary to service the wiper system for any reason, the parking spring in the **variable speed** parking mechanism should be lubricated with LedPlate, Part No. 2275437, or equivalent lubricant containing powdered lead. Apply the Led-Plate to inside coils of spring first and to the outside of the spring coils after installation of the spring.

The **single speed** crank arm pin and the pivot pins for either variable or single speed systems should be lubricated with Automotive Multi-Purpose Lubricant, NLGI 2.

Should the wiper motor gear box be disassembled, it should be repacked with Automotive Multi-Purpose Lubricant, NLG 2. Use of lubricants other than those specified above will result in noisy operation, rapid wear of components and premature failure of the system.

WIPER SWITCH TEST

Variable Speed

The switch contrains a rheostat which provides a means of controlling the amount of current which flows to the motor. The switch is designed to provide a circuit to the motor to reverse the current to the field winding which in turn reverses the direction of the armature. A circuit breaker, built into the switch, protects the wiper motor circuitry.

To test the switch, remove the switch from the instrument panel. **For removal and installation of the**

wiper switch, see "Instruments and Indicators." Using a continuity tester or an ohmmeter, test for continuity, (no resistance) between the contact terminals of the switch as shown in the following chart. For test purposes the "Park" position is when the switch is in the "Off" position. The "Low" position is when the switch is just turned "On." The "High" position is when the switch knob is rotated to the high or maximum wiper speed position. In the test charter the reference "Ground" means to attach one lead of the continuity tester or ohmmeter to the case of the switch. The bench test of the switch **does not** require the use of a 12 volt battery.

Continuity Chart

Park	Low	High
B to B/U.	B to B/U.	B to B/U.
B/U to P.	B/U to A.	B/U to A.
A to F2.	A to F1.	*A through the
F1 to Ground.	F2 to Ground.	rheostat to F1.
	P-open.	F2 to Ground.
		P-open.

*As the switch knob is rotated the resistance shown on the ohmeter should vary from a high reading to a low reading in a smooth rate of change or if a continuity tester is being used the brightness of the test lamp should vary from bright to dim.

Single Speed

The switch contains a built-in circuit breaker to protect the motor circuitry and is serviced only as an assembly. To test the switch, refer to the proper wiring diagram, and remove the switch from the instrument panel. **For removal and installation of the wiper switch, see "Instruments and Indicators."** Connect a test lamp between "B" terminal of the switch and the negative battery post. Connect the positive battery terminal to the "P" terminal of the post. Lamp should remain lighted in either "ON" or "OFF" position. Failure to light indicates a faulty circuit breaker.

Connect the positive battery lead to the "R" terminal of the switch. The lamp should light when the switch is turned "ON" and go out when turned "OFF."

WIPER MOTOR

Imperial Models

Removal

(1) Disconnect battery ground cable.

(2) If air-conditioning equipped, remove right spot cooler hose and distribution duct.

(3) From under instrument panel remove instrument panel lower reinforcement to windshield wiper motor mounting bracket pencil brace.

(4) Disconnect wiring at motor.

(5) From under panel, remove both left and right, link to pivot retainers.

(6) Remove the three motor bracket mounting nuts.

(7) Carefully work motor and link assembly out from under panel towards right side of car.

(8) Remove links and motor mounting bracket.

Installation

(1) Install motor on mounting bracket and links to crank arm.

(2) Guide motor (left link first) up over heater or air-conditioning housing from right side of car.

(3) Position motor mounting bracket on mounting studs and install three nuts.

(4) Install both right and left links on pivots and secure the retainers.

(5) Connect wiring at motor.

(6) From under instrument panel install right instrument panel lower reinforcement to wiper motor mounting bracket pencil brace.

(7) If air-conditioning equipped, install right spot cooler hose and distribution duct.

(8) Connect battery ground cable and test operation of wipers.

Chrysler Models

Removal

(1) Using Tool 3982, remove wiper arm and blade assemblies (Fig. 3).

(2) Remove windhsield lower moulding.

(3) Remove cowl grille panel. See "Body" - Group 23.

(4) Remove nut that mounts drive crank to motor and remove drive crank from motor, disconnect the wiring to the motor.

(5) Remove the three nuts that mount the motor to the dash panel and remove the motor through the cowl grille panel opening.

Installation

(1) Position motor on the three studs on dash panel. Make certain rubber gasket, between motor and dash panel, is properly positioned.

(2) Install the three nuts that mount motor to dash panel and connect wiring to motor. Make certain ground strap is screwed to switch plate and under one mounting nut.

(3) Position drive crank on motor and install mounting nut and tighten to 200 inch pounds.

(4) Install cowl grille panel.

(5) Install windshield lower moulding.

(6) Install and adjust wiper arm and blade assemblies, using Tool C-3982.

Wiper Motor Disassembly

(1) Remove spring retaining clip and washers on motor output shaft, noting sequence of removal of washers.

(2) Remove switch and cover plate.

(3) Remove gear and shaft assembly.

(4) Remove end head through bolts and pull off end head using care to avoid damaging lead wire to brush holder on variable speed motors.

(5) Remove armature using care to keep commutator free of fingerprints and oil.

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Wiper Motor Inspection

(1) Thoroughly inspect motor parts for wear, corrosion or damage.

(2) Clean armature commutator with 00 to 000 sandpaper. If commutator is worn excessively, wiper motor will have to be replaced.

(3) Replace worn or oil soaked brushes.

(4) Inspect gears for worn or broken teeth and replace those showing damage or excessive wear.

Assembly

(1) Insert armature into motor assembly.

(2) Install end head and end head through bolts using care to avoid damaging lead wire to brush holder on variable speed motors.

(3) Install gear and shaft assembly.

(4) Install washers on motor output shaft, make certain washers are installed in proper order, and install spring retaining clip.

(5) Replace gasket under park switch cover.

(6) Install switch and cover plate.

WIPER MOTOR BENCH TESTING

Variable Speed

(1) Connect a jumper wire between wiper motor green wire and wiper motor ground strap. Connect another jumper wire between battery negative terminal and wiper motor ground strap. Connect another jumper wire between wiper motor red and brown wires and battery positive terminal. The wiper motor should run continuously in wipe direction.

(2) Connect a jumper wire between wiper motor blue and yellow wires and battery positive terminal. Connect green wire to brown wire. Connect another jumper wire between negative battery terminal and wiper motor red wire and wiper motor ground strap. The wiper motor should run in reverse and stop at park position.

Chrysler Models

Single Speed

(1) Connect a jumper wire between battery negative terminal and wiper motor ground strap. Connect another jumper wire between brown wire of wiper motor and battery positive terminal. The motor should run continuously.

(2) Connect a jumper wire betwen battery negative post and wiper motor ground strap. Connect another jumper wire between brown wire of wiper motor and red wire of wiper motor. Connect blue wire to battery positive terminal. The wiper motor should "park."

WIPER LINKS

Imperial Models

Removal

(1) Remove clip holding link to crank arm.

(2) Remove bevel washers and link.

(3) Remove parking cam and spring release.

(4) Remove coil spring by spreading the ends.

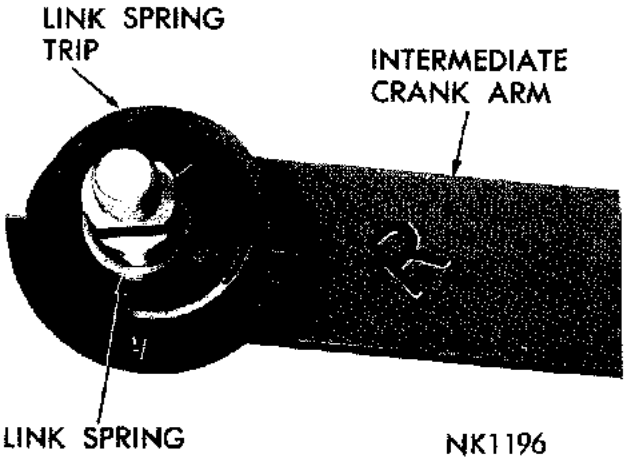


Fig. 5—Parking Spring Release Installed

(5) Disassemble right-hand link in same manner after removing crank arm to lever nut, spacing washers between link crank arm and lever.

Installation

(1) Install spring washer, concave surface toward crank arm. Apply Led-Plate, Part No. 2275437 or equivalent lubricant containing powdered lead to inside of parking spring coils. Spread the spring, install on crank pin and lubricate outside of spring coils. Install spring release.

If the intermediate crank is held so that the letter "L" is visible install the cam release so that the letter "L" can be seen from this position. The opposite side will show three letters "R."

(2) Install parking cam to index with spring release and engage spring ends, between release and parking cam in openings at point of index (Fig. 5).

(3) Install link arm with stop projection on link arm toward cam assembly. Install spring washer, convex surface toward cam assembly.

(4) Install retaining bolt and nut (Fig. 6).

(5) Assemble left link and cam assembly in same manner, locking in place with a clip.

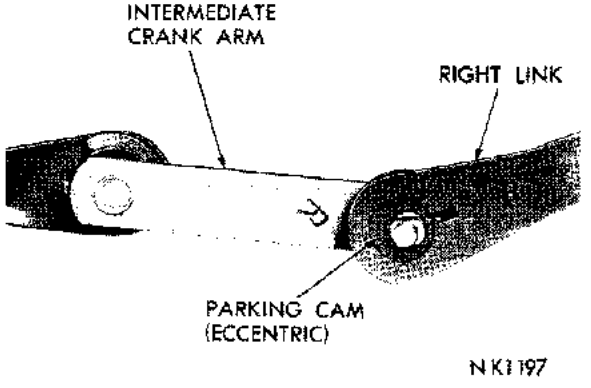


Fig. 6—Linking Arm Installed

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Models—Chrysler Models

To service drive link or connecting link it is necessary to remove wiper arm and blade assemblies, windshield lower moulding and cowl grille panel to provide access to the wiper system. See "Body" - Group 23.

Removal

(1) With wiper system in "park" position remove retainer clip from end of the motor drive crank and pin. For variable speed wipers remove the cover from mechanism to allow access to retainer clip.

(2) Remove spring washer and drive link from drive crank pin.

(3) Remove retainer clip from connecting link pin on right pivot.

(4) Remove the nuts that mount left pivot to body of the vehicle.

(5) Remove links and left pivot through cowl grille panel opening. The connecting link can be serviced on bench after links are removed from vehicle.

Installation

Make certain wiper system is in "park" position before starting installation procedures.

(1) With connecting and drive links assembled as a unit insert links through cowl grille panel opening and position bushing of connecting link on pin of right pivot and install retainer clip. Make certain retainer clip is completely seated on pivot pin.

(2) Install left pivot.

(3) Position motor end of drive link on drive crank pin of the motor. Make certain boot retainer, parking spring, spring release and cam are in proper positions for variable speed wiper systems (Fig. 2).

(4) Install spring washer and link retainer.

(5) Install cover on mechanism on variable speed wiper systems.

(6) Install cowl grille panel, windshield lower moulding and install the wiper arm and blade assemblies. Adjust as necessary, using Tool C-3982.

WIPER PIVOT REPLACEMENT

(1) Using Tool C-3982, remove wiper arm and blade assembly.

(2) Disconnect link from pivot.

(3) Remove pivot and gasket.

(4) Install a new gasket and pivot.

(5) Tighten retaining stud nuts 75 inch-pounds.

(6) Reconnect link to pivot crank pin and install washer and retainer clip.

(7) Install wiper arm using Tool C-3982.

Chrysler Models
Models

To service the wiper pivots it is necessary to remove the wiper arm and blade assemblies, the windshield lower moulding and the cowl grille panel to provide access to the wiper system. See "Body" - Group 23.

Right Pivot

(1) Remove retainer clip holding connecting link to wiper pivot and remove link from pivot.

(2) Remove screws mounting the pivot to body of vehicle and remove pivot through cowl grille panel opening.

(3) Position new or repaired pivot in body opening and install pivot mounting screws. Tighten screws to 75 inch-pounds.

(4) Position connecting link on the pin of pivot and install retainer clip. Make certain clip is completely seated on pivot pin.

(5) Install cowl grille panel, the windshield lower moulding and install and adjust the wiper arm and blade assemblies using Tool C-3982.

Left Pivot

(1) Disconnect drive link at drive crank pin of motor.

(2) Remove retainer clip holding connecting link to right pivot and remove link from pivot.

(3) Remove the screws mounting the left pivot to body of vehicle and remove wiper links and left pivot as an assembly through cowl grille panel opening. The left pivot can then be removed from links on service bench.

(4) With left pivot and wiper links assembled as a unit, insert assembly through cowl grille panel opening and position left pivot in the body opening. Install pivot mounting screws. Tighten screws to 75 inch-pounds.

(5) Position connecting link on right pivot pin and install retainer clip. Make certain clip is completely seated on pivot pin.

(6) Position drive link on drive crank pin of motor, install mounting nut and tighten to 200 inch-pounds.

(7) Install cowl grille panel, windshield lower mounting and install and adjust wiper arm and blade assemblies.

WIPER BLADE REPLACEMENT

Exposure to heat and road splash tends to harden the rubber wiper blade refills. When the refills smear or in general do not satisfactorily clean the windshield, they should be replaced.

To replace, depress the release on the top of the blade assembly and slide out the rubber refill. Slide the new rubber refill into the blade assembly until it locks in place. Refer to the Parts List for the correct rubber blade refill.

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HORNS

SERVICE DIAGNOSIS

Condition	Possible Cause	Correction
HORNS WILL NOT SOUND	(a) Improper adjustment.	(a) See "Adjusting."
	(b) Broken or faulty wiring.	(b) See "Testing."
	(c) Faulty horn.	(c) See "Testing." Replace horn if necessary.
	(d) Faulty relay.	(d) See "Testing." Replace relay if necessary.
HORNS SOUND CONTINUOUSLY	(a) Shorted wiring.	(a) See "Testing."
	(b) Horn button sticking.	(b) Disconnect battery ground cable. Release horn button. After correction, connect battery ground cable.
	(c) Relay sticking.	(c) Replace relay.

Testing

Touch a jumper wire from relay "S" terminal to ground. If horn sounds, difficulty is in the horn button contact ring, the grounding of the steering column or in the wire from "S" terminal to the horn button. If the horn fails to sound connect a jumper wire from "B" to "H" terminal. If horns operate, the relay is defective. If horns fail to operate, difficulty is in wire to the horns, in the horns, the wire to horn relay "B" terminal or in the grounding of the steering column.



Fig. 1—Adjusting Horn (Sparton Horn Shown)

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Adjusting

(1) Disconnect connections at each horn to determine which horn is not operating.

(2) Remove horn and bracket assembly.

(3) With a suitable tool (Fig. 1), turn tone adjuster counterclockwise until there is no vibration (sound).

(4) Turn tone adjuster clockwise, approximately ¼ turn at a time until tone has a clear mellow sound. Do not turn tone adjuster while horn is sounding.

Adjustment will only clear up sound and cannot change horn tone frequency.

(5) Connect a test ammeter between positive post of a 12 volt battery and horn terminal post. Connect a jumper lead from negative battery post to horn base. Clean paint from horn bracket where connection is made. Turn adjusting screw to obtain a reading of six amperes minimum to eight amperes maximum for Sparton horns and eight amperes minimum to ten amperes maximum for Prestolite horns at 12.5 volts.

Amperage must not exceed eight amperes maximum for Sparton horns and ten amperes maximum for Prestolite horns.

SPECIFICATIONS

BATTERY

Model Usage	All Models
Capacity (Amperes)	70
Voltage	12
Number of Plates Per Cell	13
Ground Terminal	Negative
Model Identification Number	27-MB-70

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STARTING MOTOR
SOLENOID SHIFT
(Reduction Gear Type)
(All Models)

Starting Motor Identification No.	2095150
Make	Chrysler Built
Voltage	12
No. of Fields	4 (3 Series, 1 Shunt)
No. of Poles	4
Brushes	4
Spring Tension	32 to 36 Ounces
Drive	Overrunning Clutch
End Play	.010"-.045"
Cranking Amperage Draw	180 to 200 Amps. 383 or 440 Cu. In. Engines*
Free-Running Test	
Voltage	11
Amperage Draw Maximum	90
Speed RPM	1925 to 2400
Lock-Resistance Test	
Voltage	4
Amperage Draw	400 to 450
Solenoid Switch	
Pull-In Coil	14.4-16.0 Amps. @ 6.0 Volts
Hold-In Coil	11.5-12.6 Amps. @ 6.0 Volts

*Engine should be at operating temperature.

ALTERNATOR VOLTAGE REGULATOR
ALTERNATOR

ALTERNATORS	
Rotation	Clockwise at Drive End
Voltage	12 Volt System
Current Output	Design Controlled
Voltage Output	Limited by Voltage Regulator
Brushes (Field)	2
Condenser Capacity	.50 Microfarad plus or minus 20%
Field Current Draw —	
Rotating Rotor by Hand @ 12 Volts	2.38 to 2.75 Maximum amperes
Current Output —	
Standard With 170 or 225 Cu. In. Engine	26 plus or minus 3 amperes*
Standard All Others	34.5 plus or minus 3 amperes*
Special Equipment, Heavy Duty and/or Air Conditioning	44 plus or minus 3 amperes*
Special Equipment	51 plus or minus 3 amperes*

*Plus or minus three ampere tolerance is provided to allow for temperature variation. Current output is measured at 1250 engine RPM and 15 volts at the alternator. If measured at the battery, current output will be approximately 5 amperes lower than above valves.
Voltage is controlled by variable load (carbon pile) across the battery.

ALTERNATOR AND VOLTAGE REGULATOR

Alternator Voltage	(Chrysler Built)	(Essex Wire Built)
Regulator Identification Number	2098300	2444980
Volts	12	12
Ground Polarity	Negative	Negative
Point Gap	.014 inch plus or minus .002 inch	.014 inch plus or minus .004 inch
Air Gap	.048 to .052 inch nominal setting**	.032 to .042 inch**

**Measure gap with gauge back of stop.

Temperature in Degrees	47°F.	70°F.	93°F.	117°F.	140°F.	163°F.
Minimum Setting	13.6 to	13.5 to	13.4 to	13.3 to	13.2 to	13.1 to
Maximum Setting	14.6	14.5	14.4	14.3	14.2	14.1

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ENGINE APPLICATION	WITHOUT CLEAN AIR PACKAGE 383 2-Barrel Carburetor Manual or Automatic Trans.	WITH CLEAN AIR PACKAGE 383 2-Barrel Carburetor Automatic Trans.	WITH CLEAN AIR PACKAGE 383 2-Barrel Carburetor Manual Trans.
Engine Displacement	383 Cu. In.	383 Cu. In.	383 Cu. In.
Distributor Part No.—(Chrysler Built)	2642244	2642289	2642373
Advance—Centrifugal—(Distributor Degrees at Distributor RPM)	0° @ 250 to 450 0° to 2° @ 450 2.5° to 4.5° @ 700 10.5° to 12.5° @ 2150	0° @ 350 to 500 0° to 8.5° @ 500 9.4° to 11.4° @ 665 18° to 20° @ 2200	0° @ 350 to 500 0° to 8.5° @ 500 9.4° to 11.4° @ 665 18° to 20° @ 2200
Advance—Vacuum (Distributor Degrees at Inches of Mercury)	0° @ 4.5" to 8" 4° to 7° @ 10.5" 8° to 11° @ 13.6"	0° @ 4.5" to 8" 6° to 9° @ 12" 11.5° to 14.5° @ 16.5"	0° @ 4.5" to 6.9" 5° to 8° @ 10" 11.5° to 14.5° @ 14.5"
Contact Gap	.014" to .019"	.014" to .019"	.014" to .019"
Dwell Angle	28° to 32°	28° to 32°	28° to 32°
Contact Arm Spring Tension	17 to 20 oz.	17 to 20 oz.	17 to 20 oz.
Condenser Capacity	.25 to .285 mfd.	.25 to .285 mfd.	.25 to .285 mfd.
Shaft Side Play (New or Rebuilt)	.000" to .003" *	.000" to .003" *	.000" to .003" *
Shaft End Play (After Assembly)	.003" to .017"	.003" to .017"	.003" to .017"
Rotation	Counterclockwise	Counterclockwise	Counterclockwise
Timing	12.5° BTC **	5° ATC **	5° ATC **
Spark Plug Type	J-14Y Champion or P-3-6P Mopar J-10Y Champion or P-3-3P Mopar ***	J-14Y Champion or P-3-6P Mopar J-10Y Champion or P-3-3P Mopar***	
Size	14MM-⅜" Reach	14MM-⅜" Reach	
Gap	.035"	.035"	
Firing Order	1-8-4-3-6-5-7-2	1-8-4-3-6-5-7-2	
Coil	Chrysler - Prestolite / Chrysler - Essex	Chrysler - Prestolite / Chrysler - Essex	
Identification Number	2444242 / 2444241	2444242 / 2444241	
Primary Resistance @ 70-80°F	1.65 to 1.79 Ohms / 1.41 to 1.55 Ohms	1.65 to 1.79 Ohms / 1.41 to 1.55 Ohms	
Secondary Resistance @ 70-80°F	9400 to 11700 Ohms / 9200 to 10600 Ohms	9400 to 11700 Ohms / 9200 to 10600 Ohms	
Ballast Resistor—Part No.—(Chrysler Built)	2095501	2095501	
Resistance @ 70-80°F	0.5 to 0.6 Ohms	0.5 to 0.6 Ohms	
Current Draw (Coil and ballast resistor in circuit) Engine Stopped	3.0 amperes	3.0 amperes	
Engine Idling	1.9 amperes	1.9 amperes	

* Service wear tolerance should not exceed .006 inch
** Set at idle speed; See "Idle Speed Adjustment, Fuel System."
*** Mopar P-3-3P, J-10Y Champion (Police Cars)

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ENGINE APPLICATION	WITHOUT CLEANER AIR PACKAGE 383 4-Barrel Carburetor Manual or Automatic Trans.	WITH CLEANER AIR PACKAGE 383 4-Barrel Carburetor Manual Trans.	WITH CLEANER AIR PACKAGE 383 4-Barrel Carburetor Automatic Trans.
Engine Displacement	383 Cu. In.	383 Cu. In.	383 Cu. In.
Distributor Part No.—(Chrysler Built)	2642248	2642367	2642363
Advance—Centrifugal—(Distributor Degrees at Distributor RPM)	0° @ 310 to 490 0° to 2° @ 490 3° to 5° @ 750 7° to 9° @ 2400	0° @ 350 to 500 0° to 7° @ 500 10.7° to 12.7° @ 730 15.5° to 17.5° @ 2400	0° @ 350 to 500 0° to 4.5° @ 500 10.7° to 12.7° @ 850 15.5° to 17.5° @ 2400
Advance—Vacuum (Distributor Degrees at Inches of Mercury)	0° @ 6" to 9" 4.5° to 7.5° @ 12" 8.25° to 11° @ 15"	0° @ 4.5" to 8" 6° to 9° @ 12" 11.5° to 14.5° @ 16.5"	0° @ 4.5" to 8" 6° to 9° @ 12" 11.5° to 14.5° @ 16.5"
Contact Gap	.014" to .019"	.014" to .019"	.014" to .019"
Dwell Angle	28° to 32°	28° to 32°	28° to 32°
Contact Arm Spring Tension	17 to 20 oz.	17 to 20 oz.	17 to 20 oz.
Condenser Capacity	.25 to .285 mfd.	.25 to .285 mfd.	.25 to .285 mfd.
Shaft Side Play (New or Rebuilt)	.000" to .003" *	.000" to .003" *	.000" to .003" *
Shaft End Play (After Assembly)	.003" to .017"	.003" to .017"	.003" to .017"
Rotation	Counterclockwise	Counterclockwise	Counterclockwise
Timing	12.5° BTC **	5° ATC **	5° ATC **
Spark Plug Type	J-13Y Champion or P-3-5P Mopar *** J-10Y Champion or P-3-3P Mopar ****	J-13Y Champion *** P-3-5P Mopar J-10Y Champion or P-3-3P Mopar ****	J-13Y Champion *** P-3-5P Mopar J-10Y Champion or P-3-3P Mopar ****
Size	14MM-⅜" Reach	14MM-⅜" Reach	14MM -⅜" Reach
Gap	.035"	.035"	.035"
Firing Order	1-8-4-3-6-5-7-2	1-8-4-3-6-5-7-2	1-8-4-3-6-5-7-2
Coil	Chrysler - Prestolite / Chrysler - Essex	Chrysler - Prestolite	Chrysler - Essex
Identification Number	2444242 / 2444241	2444242	2444241
Primary Resistance @ 70-80°F	1.65 to 1.79 Ohms / 1.41 to 1.55 Ohms	1.65 to 1.79 Ohms	1.41 to 1.55 Ohms
Secondary Resistance @ 70-80°F	9400 to 11700 Ohms / 9200 to 10600 Ohms	9400 to 11700 Ohms	9200 to 10600 Ohms
Ballast Resistor—Part No.—(Chrysler Built)	2095501	2095501	
Resistance @ 70-80°F	0.5 to 0.6 Ohms	0.5 to 0.6 Ohms	
Current Draw (Coil and ballast resistor in circuit) Engine Stopped	3.0 amperes	3.0 amperes	
Engine Idling	1.9 amperes	1.9 amperes	

* Service wear tolerance should not exceed .006 inch.
** Set at idle speed; See "Idle Speed Adjustment, Fuel System."
*** If J-13Y or Mopar P-3-5P are not available use Champion J-12Y.
**** Mopar P-3-3P, J-10Y Champion (Police Cars).

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ENGINE APPLICATION	WITHOUT CLEANER AIR PACKAGE		WITH CLEANER AIR PACKAGE	
	440 With 4-Barrel Carburetor Automatic or Manual Trans.		440 4-Barrel Carburetor Automatic Trans.	440 4-Barrel Carburetor Manual Trans.
Engine Displacement	440 Cu. In.		440 Cu. In.	440 Cu. In.
Distributor Part No—(Chrysler Built)	2642252		2642365	2642369
Advance—Centrifugal (Distributor Degrees at Distributor RPM)	0° @ 310 to 490 0° to 2° @ 490 3° to 5° @ 750 7° to 9° @ 2400		0° @ 350 to 500 0° to 4.5° @ 500 10.7° to 12.7° @ 850 15.5° to 17.5° @ 2400	0° @ 350 to 500 0° to 7° @ 500 10.7° to 12.7° @ 730 15.5° to 17.5° @ 2400
Advance—Vacuum (Distributor Degrees at Inches of Mercury)	0° @ 6" to 9" 4.5° to 7.5° @ 12" 8.25° to 11° @ 15"		0° @ 4.5" to 8" 6° to 9° @ 12" 11.5° to 14.5° @ 16.5"	0° @ 4.5" to 8" 6° to 9° @ 12" 11.5° to 14.5° @ 16.5"
Contact Gap	.014" to .019"		.014" to .019"	.014" to .019"
Dwell Angle	28° to 32°		28° to 32°	28° to 32°
Contact Arm Spring Tension	17 to 20 oz.		17 to 20 oz.	17 to 20 oz.
Condenser Capacity	.25 to .285 mfd.		.25 to .285 mfd.	.25 to .285 mfd.
Shaft Side Play (New or Rebuilt)	.000" to .003" *		.000" to .003" *	.000" to .003" *
Shaft End Play (After Assembly)	.003" to .017"		.003" to .017"	.003" to .017" *
Rotation	Counterclockwise		Counterclockwise	Counterclockwise
Timing	12.5° BTC **		5° ATC **	5° ATC **
Spark Plug Type	J-13Y Champion or Mopar P-3-5P *** J-10Y Champion or Mopar P-3-3P ****		J-13Y Champion or P-3-5P Mopar *** J-10Y Champion or P-3-3P Mopar ****	J-13Y Champion or P-3-5P Mopar *** J-10Y Champion or P-3-3P Mopar ****
Size	14MM-⅜" Reach		14MM-⅜" Reach	14MM-⅜" Reach
Gap	.035"		.035"	.035"
Firing Order	1-8-4-3-6-5-7-2		1-8-4-3-6-5-7-2	1-8-4-3-6-5-7-2
Coil	Chrysler - Prestolite	Chrysler - Essex	Chrysler - Prestolite	Chrysler - Essex
Identification Number	2444242	2444241	2444242	2444241
Primary Resistance @ 70-80°F	1.65 to 1.79 Ohms	1.41 to 1.55 Ohms	1.65 to 1.79 Ohms	1.41 to 1.55 Ohms
Secondary Resistanace @ 70-80°F	9400 to 11700 Ohms	9200 to 10600 Ohms	9400 to 11700 Ohms	9200 to 10600 Ohms
Ballast Resistor—Part No.—(Chrysler Built)	2095501		2095501	
Resistance @ 70-80°F	0.5 to 0.6 Ohms		0.5 to 0.6 Ohms	
Current Draw (Coil and ballast resistor in circuit) Engine Stopped	3.0 amperes		3.0 amperes	
Engine Idling	1.9 amperes		1.9 amperes	

* Service wear tolerance should not exceed .006 inch.
** Set at idle speed; See "Idle Speed Adjustment, Fuel System."
*** If J-13Y Champion or P-3-5P Mopar are not available, use Champion J-12Y.
**** Police Cars.

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CIRCUIT BREAKERS

CIRCUIT	Location	Ampere Rating Chrysler	Imperial
Door Locks	Behind left front kick panel	15	15
Headlights	Integral with Headlight Switch	20	20
Tail Gate and Power Seats	Behind left front kick panel	30	30
Top Lift, Power Windows	Behind left front kick panel	30	30
Windshield Wiper	Integral with Wiper Switch		
Single Speed		5	—
Variable Speed		7	6

BULBS

	Chrysler	Imperial
Ash Receiver	53X	53
Auto Pilot	1445	53X
Back-up Lights	1073	1073
Clock	57	57
Compass or Vacuum Gauge	57	
Dome Lights	1004	1004
Door and/or Pocket	90	90
Emergency Flasher	57	57
Fender Mounted Turn Signals	1816	
Gear Selector, with Console	57	
Glove Compartment	1891	1891
Handbrake Indicator	158	57
Heater and/or A. C. Control	53	57
High Beam Indicator	158	57
Instrument Cluster Illumination	158	57
Ignition Switch	57	53X
License Light	67	67
Map Light	1004	1004
Oil Pressure Indicator	158	
Panel and/or Ridge Light	90	1004
Park and Turn Signal	1034A	1034A
Radio	1893	1893
Sealed Beam—Hi-Beam (No. 1)	4001	4001
Sealed Beam—Hi-Lo Beam (No. 2)	4002	4002
Sentry Signal		57
Switch Titles		53X
Tachometer with Console	1893	
Tail Lights	1034	67AF
Tail Stop and Turn Signal	1034	1034
Temperature Indicator	158	
Trunk and/or Under Hood Light	1004	1004
Turn Signal Indicator	158	57

FUSES

Circuit	Ampere Rating	Circuit	Ampere Rating
Accessories	7.5 AMP	Rear Air Conditioning	20 AMP
Cigar Lighter	20 AMP	Sentry Signal	5 AMP**
Gauges	5 AMP**	Tail, Stop, Dome	20 AMP
Heater or Air Conditioning	20 AMP		
Instrument Lamps	*		
Radio	7.5 AMP		

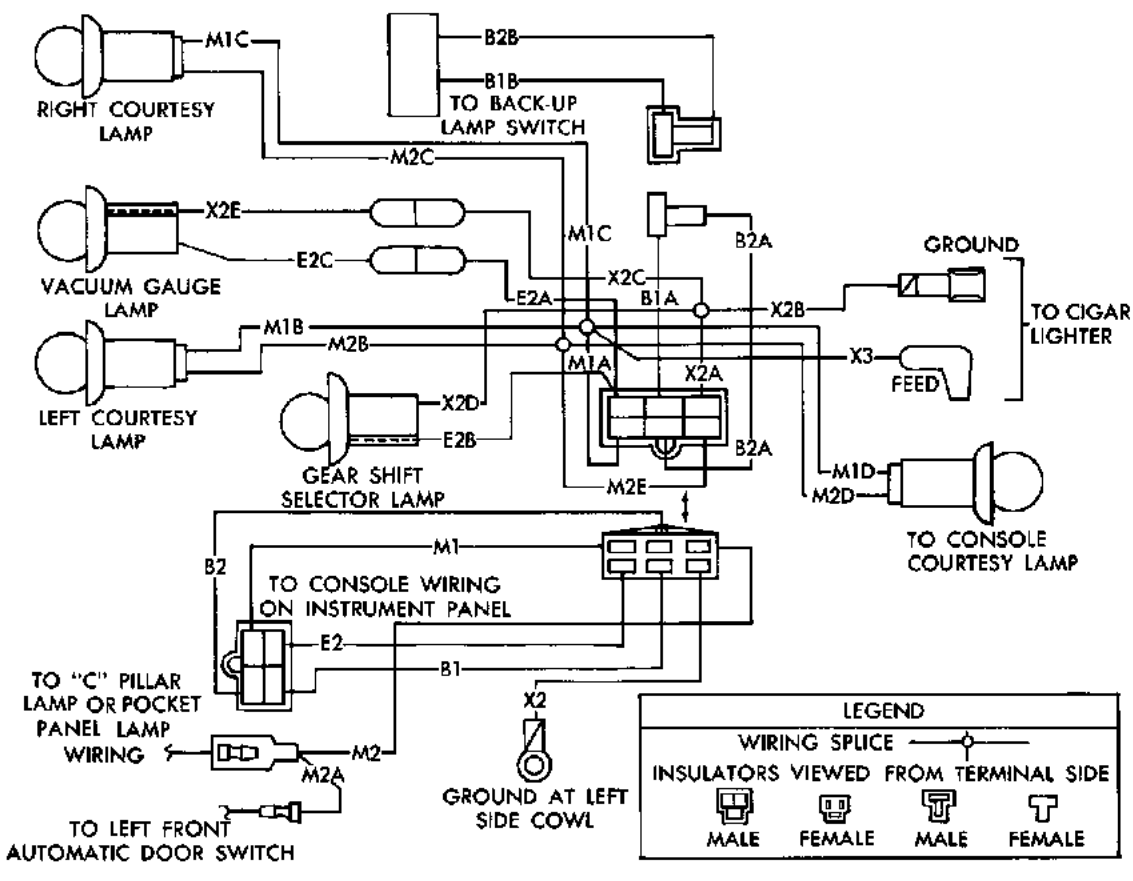
*5 AMP—IMPERIAL
4 AMP—CHRYSLER
**—IMPERIAL Only

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WIRING DIAGRAMS

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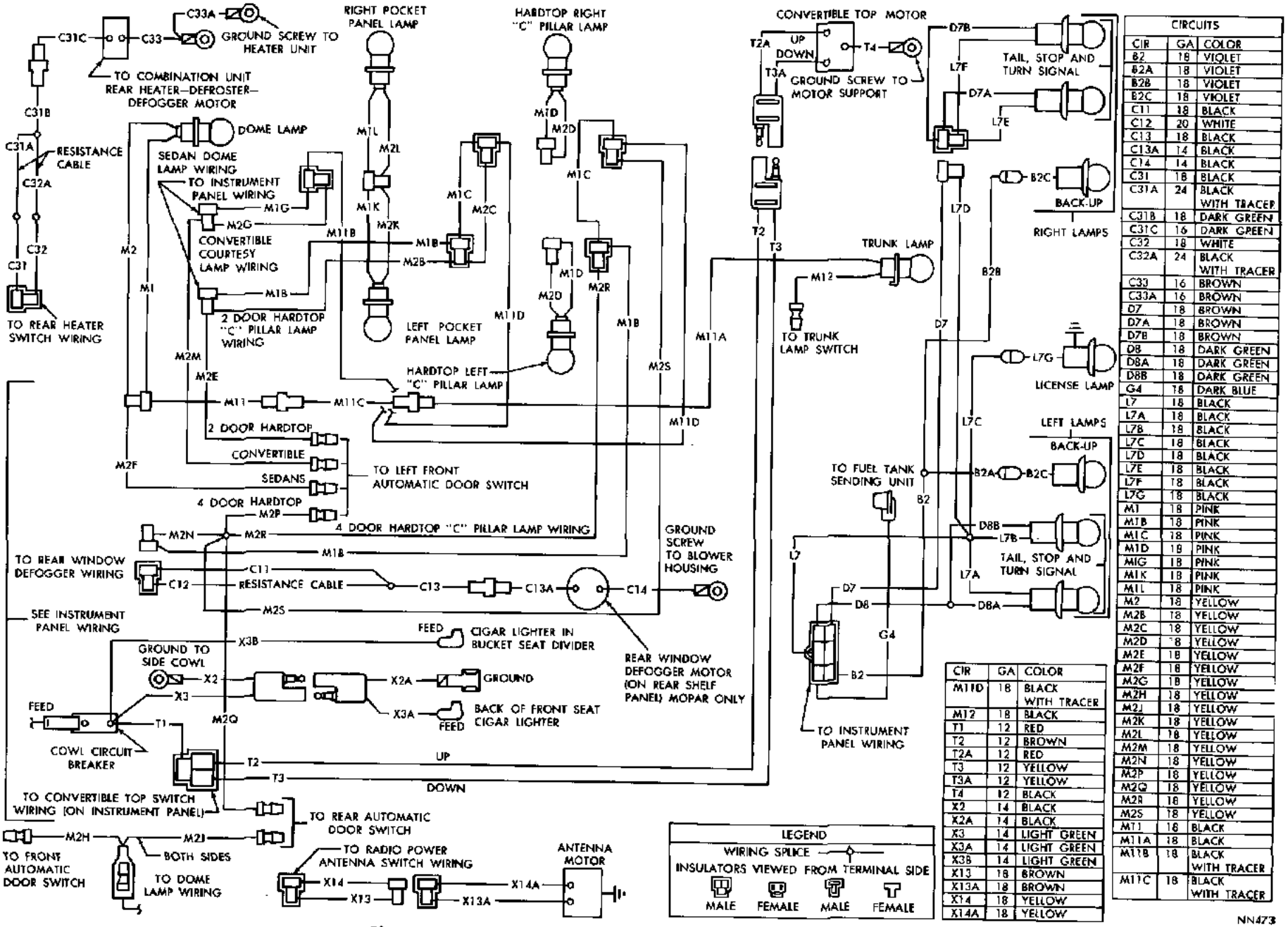
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CIRCUITS		
CIR	GA	COLOR
B1	18	VIOLET WITH TRACER
B1A	18	VIOLET WITH TRACER
B1B	18	VIOLET
B2	18	VIOLET
B2A	18	VIOLET
B2B	18	VIOLET
E2	18	ORANGE
E2A	18	ORANGE
E2B	18	ORANGE
E2C	18	ORANGE
M1	16	PINK
M1A	16	PINK
M1B	18	PINK
M1C	18	PINK
M1D	18	PINK
M2	18	YELLOW
M2A	18	YELLOW
M2B	18	YELLOW
M2C	18	YELLOW
M2D	18	YELLOW
M2E	18	YELLOW
X2	16	BLACK
X2A	16	BLACK
X2B	16	BLACK
X2C	18	BLACK
X2D	18	BLACK
X2E	18	BLACK
X3	16	PINK

Fig. 1—Console Wiring—Chrysler Models

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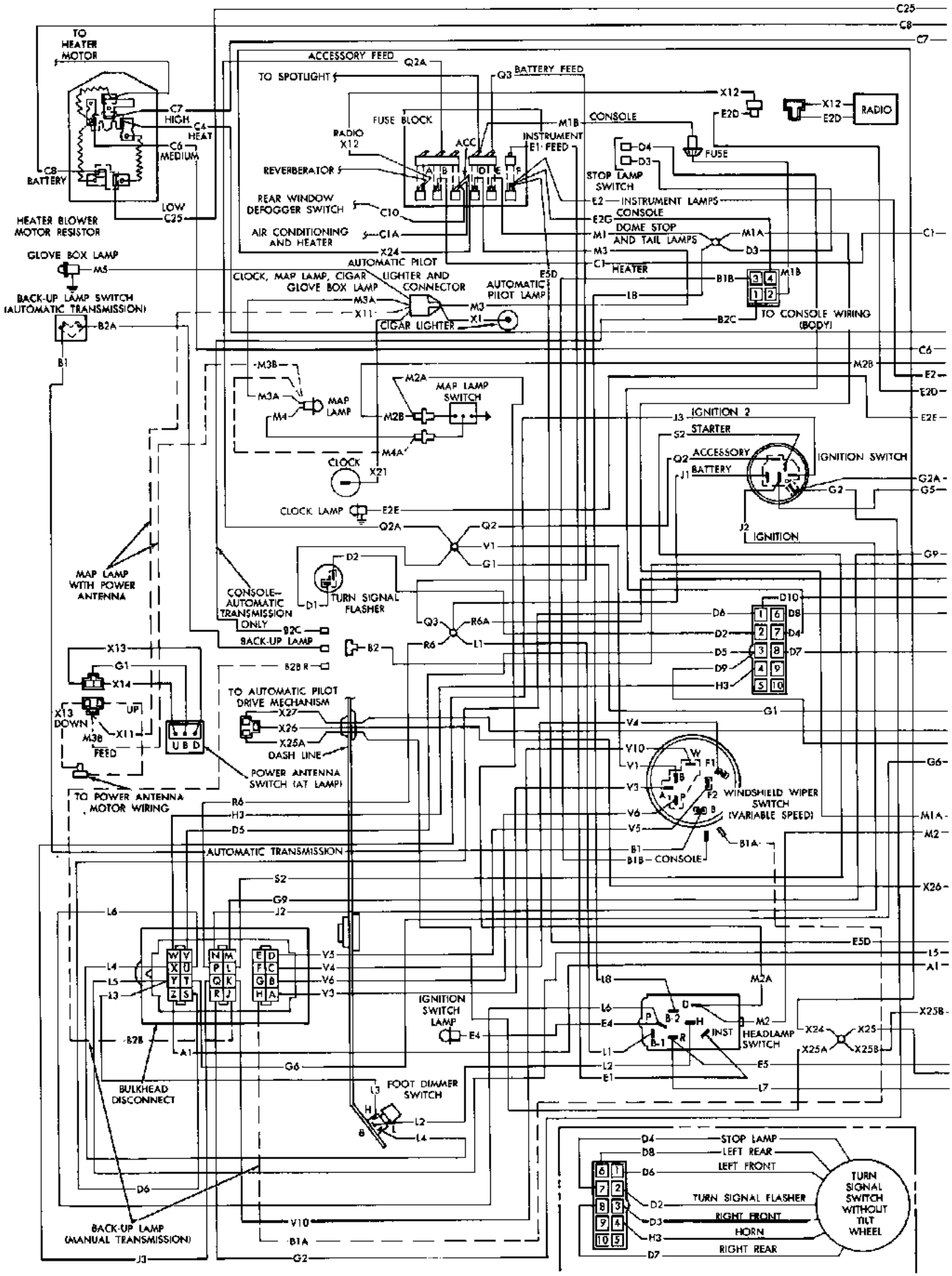
CIRCUITS		
CIR	GA	COLOR
B2	18	VIOLET
B2A	18	VIOLET
B2B	18	VIOLET
B2C	18	VIOLET
C11	18	BLACK
C12	20	WHITE
C13	18	BLACK
C13A	14	BLACK
C14	14	BLACK
C31	18	BLACK
C31A	24	BLACK WITH TRACER
C31B	18	DARK GREEN
C31C	16	DARK GREEN
C32	18	WHITE
C32A	24	BLACK WITH TRACER
C33	16	BROWN
C33A	16	BROWN
D7	18	BROWN
D7A	18	BROWN
D7B	18	BROWN
D8	18	DARK GREEN
D8A	18	DARK GREEN
D8B	18	DARK GREEN
G4	18	DARK BLUE
L7	18	BLACK
L7A	18	BLACK
L7B	18	BLACK
L7C	18	BLACK
L7D	18	BLACK
L7E	18	BLACK
L7F	18	BLACK
L7G	18	BLACK
M1	18	PINK
M1B	18	PINK
M1C	18	PINK
M1D	18	PINK
M1G	18	PINK
M1K	18	PINK
M1L	18	PINK
M2	18	YELLOW
M2B	18	YELLOW
M2C	18	YELLOW
M2D	18	YELLOW
M2E	18	YELLOW
M2F	18	YELLOW
M2G	18	YELLOW
M2H	18	YELLOW
M2J	18	YELLOW
M2K	18	YELLOW
M2L	18	YELLOW
M2M	18	YELLOW
M2N	18	YELLOW
M2P	18	YELLOW
M2Q	18	YELLOW
M2R	18	YELLOW
M2S	18	YELLOW
M11	18	BLACK
M11A	18	BLACK
M11B	18	BLACK WITH TRACER
M11C	18	BLACK WITH TRACER

CIR	GA	COLOR
M11D	18	BLACK WITH TRACER
M12	18	BLACK
T1	12	RED
T2	12	BROWN
T2A	12	RED
T3	12	YELLOW
T3A	12	YELLOW
T4	12	BLACK
X2	14	BLACK
X2A	14	BLACK
X3	14	LIGHT GREEN
X3A	14	LIGHT GREEN
X3B	14	LIGHT GREEN
X13	18	BROWN
X13A	18	BROWN
X14	18	YELLOW
X14A	18	YELLOW

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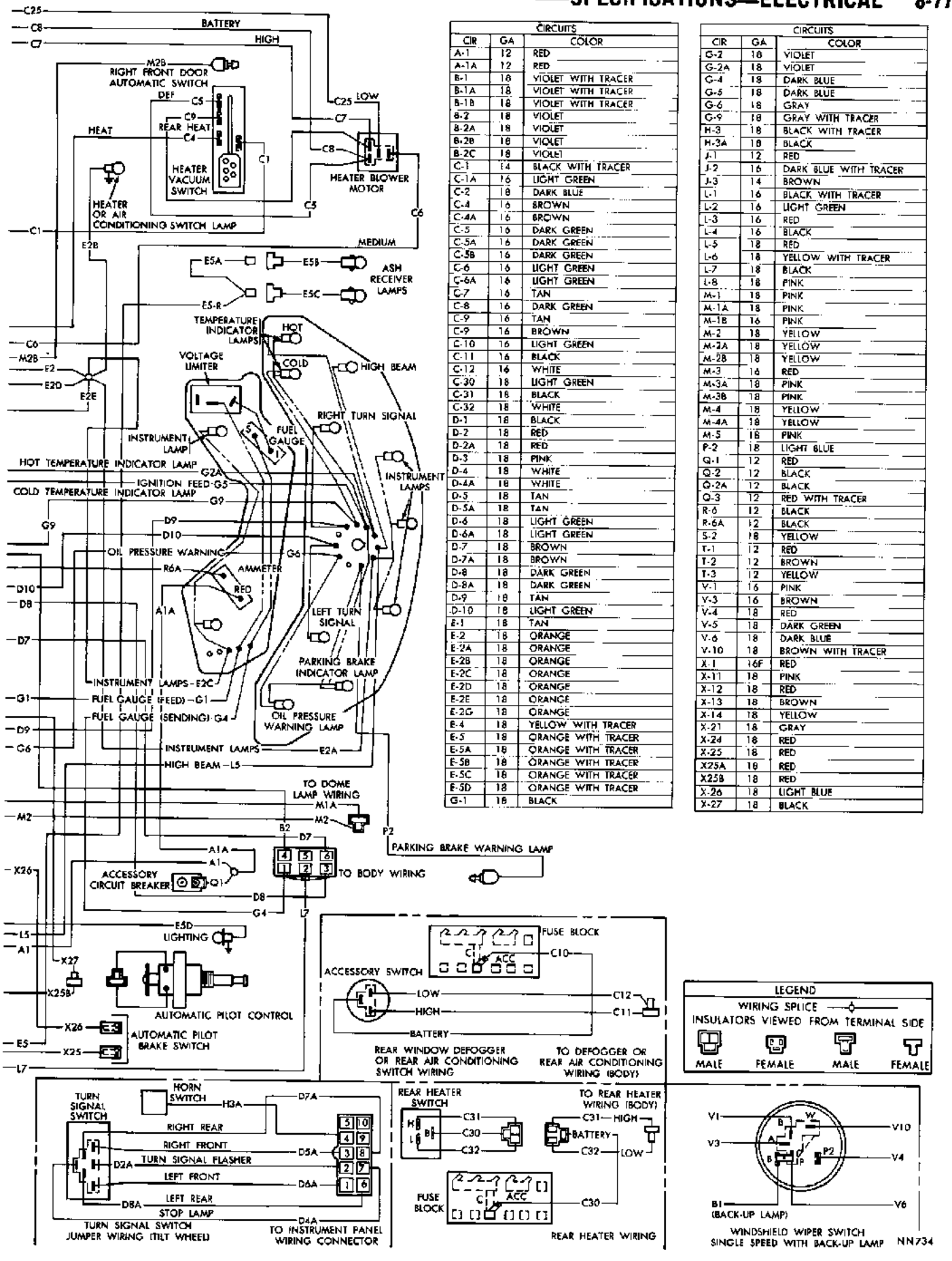
Fig. 2—Body Wiring—(Except Station Wagons)—Chrysler Models

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Fig. 3—Instrument Panel Wiring—Chrysler Models

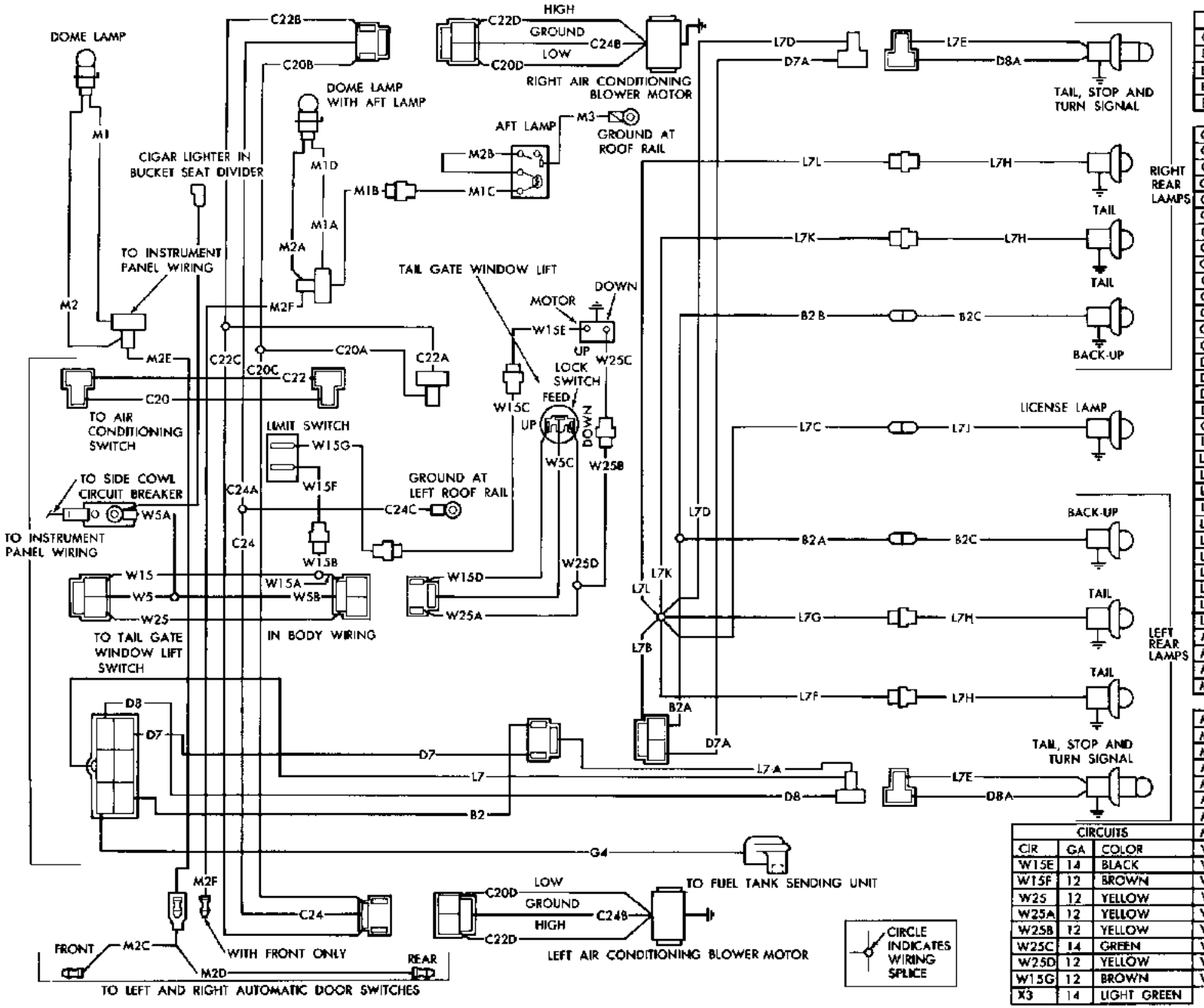


CIRCUITS		
CIR	GA	COLOR
A-1	12	RED
A-1A	12	RED
B-1	18	VIOLET WITH TRACER
B-1A	18	VIOLET WITH TRACER
B-1B	18	VIOLET WITH TRACER
B-2	18	VIOLET
B-2A	18	VIOLET
B-2B	18	VIOLET
B-2C	18	VIOLET
C-1	14	BLACK WITH TRACER
C-1A	16	LIGHT GREEN
C-2	18	DARK BLUE
C-4	16	BROWN
C-4A	16	BROWN
C-5	16	DARK GREEN
C-5A	16	DARK GREEN
C-5B	16	DARK GREEN
C-6	16	LIGHT GREEN
C-6A	16	LIGHT GREEN
C-7	16	TAN
C-8	16	DARK GREEN
C-9	16	TAN
C-9	16	BROWN
C-10	16	LIGHT GREEN
C-11	16	BLACK
C-12	16	WHITE
C-30	18	LIGHT GREEN
C-31	18	BLACK
C-32	18	WHITE
D-1	18	BLACK
D-2	18	RED
D-2A	18	RED
D-3	18	PINK
D-4	18	WHITE
D-4A	18	WHITE
D-5	18	TAN
D-5A	18	TAN
D-6	18	LIGHT GREEN
D-6A	18	LIGHT GREEN
D-7	18	BROWN
D-7A	18	BROWN
D-8	18	DARK GREEN
D-8A	18	DARK GREEN
D-9	18	TAN
D-10	18	LIGHT GREEN
E-1	18	TAN
E-2	18	ORANGE
E-2A	18	ORANGE
E-2B	18	ORANGE
E-2C	18	ORANGE
E-2D	18	ORANGE
E-2E	18	ORANGE
E-2G	18	ORANGE
E-4	18	YELLOW WITH TRACER
E-5	18	ORANGE WITH TRACER
E-5A	18	ORANGE WITH TRACER
E-5B	18	ORANGE WITH TRACER
E-5C	18	ORANGE WITH TRACER
E-5D	18	ORANGE WITH TRACER
G-1	18	BLACK

CIRCUITS		
CIR	GA	COLOR
G-2	18	VIOLET
G-2A	18	VIOLET
G-4	18	DARK BLUE
G-5	18	DARK BLUE
G-6	18	GRAY
G-9	18	GRAY WITH TRACER
H-3	18	BLACK WITH TRACER
H-3A	18	BLACK
J-1	12	RED
J-2	16	DARK BLUE WITH TRACER
J-3	14	BROWN
L-1	16	BLACK WITH TRACER
L-2	16	LIGHT GREEN
L-3	16	RED
L-4	16	BLACK
L-5	18	RED
L-6	18	YELLOW WITH TRACER
L-7	18	BLACK
L-8	18	PINK
M-1	18	PINK
M-1A	18	PINK
M-1B	16	PINK
M-2	18	YELLOW
M-2A	18	YELLOW
M-2B	18	YELLOW
M-3	16	RED
M-3A	18	PINK
M-3B	18	PINK
M-4	18	YELLOW
M-4A	18	YELLOW
M-5	18	PINK
P-2	18	LIGHT BLUE
Q-1	12	RED
Q-2	12	BLACK
Q-2A	12	BLACK
Q-3	12	RED WITH TRACER
R-6	12	BLACK
R-6A	12	BLACK
S-2	18	YELLOW
T-1	12	RED
T-2	12	BROWN
T-3	12	YELLOW
V-1	16	PINK
V-3	16	BROWN
V-4	18	RED
V-5	18	DARK GREEN
V-6	18	DARK BLUE
V-10	18	BROWN WITH TRACER
X-1	16F	RED
X-11	18	PINK
X-12	18	RED
X-13	18	BROWN
X-14	18	YELLOW
X-21	18	GRAY
X-24	18	RED
X-25	18	RED
X25A	18	RED
X25B	18	RED
X-26	18	LIGHT BLUE
X-27	18	BLACK

Fig. 3—Instrument Panel Wiring—Chrysler Models

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CIRCUITS		
C1R	GA	COLOR
B2	18	VIOLET
B2A	18	VIOLET
B2B	18	VIOLET
B2C	18	VIOLET

C20	16	BROWN
C20A	14	BROWN
C20B	14	BROWN
C20C	14	BROWN
C20D	14	BROWN
C22	16	DARK GREEN
C22A	14	DARK GREEN
C22B	14	DARK GREEN
C22C	14	DARK GREEN
C22D	14	DARK GREEN
C24	14	BLACK
C24A	14	BLACK
C24B	14	BLACK
C24C	14	BLACK
D7	18	BROWN
D7A	18	BROWN
D8	18	DARK GREEN
D8A	18	DARK GREEN
G4	18	DARK BLUE
L7	18	BLACK
L7A	18	BLACK
L7B	18	BLACK
L7C	18	BLACK
L7D	18	BLACK
L7E	18	BLACK
L7F	18	BLACK
L7G	18	BLACK
L7H	18	BLACK
L7J	18	BLACK
L7K	18	BLACK
L7L	18	BLACK
M1	18	PINK
M1A	18	PINK
M1B	18	PINK
M1C	18	PINK

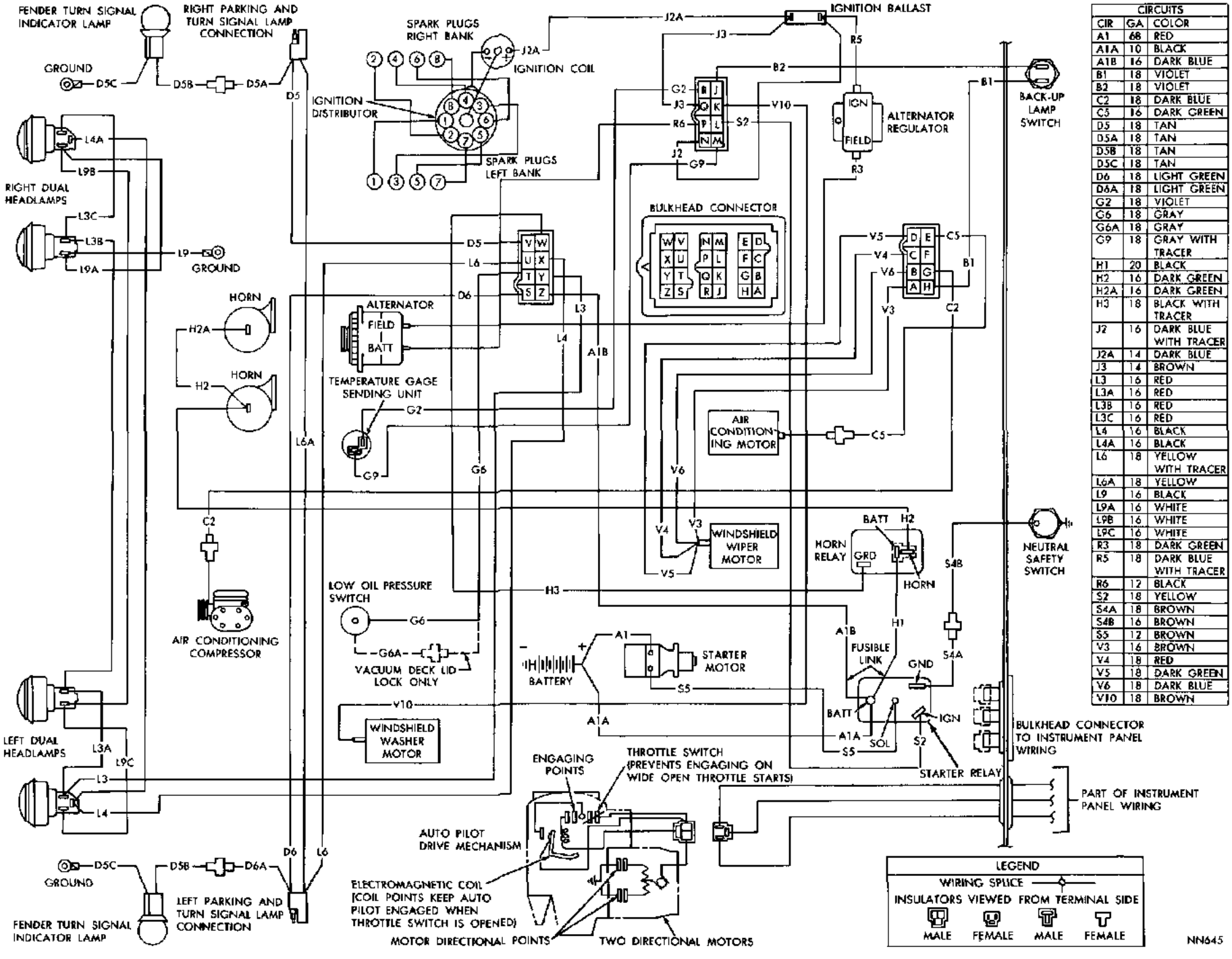
M2	18	YELLOW
M2A	18	YELLOW
M2B	18	YELLOW
M2C	18	YELLOW
M2D	18	YELLOW
M2E	18	YELLOW
M2F	18	YELLOW
M3	18	BROWN
W5	12	RED
W5A	12	RED
W5B	12	RED
W5C	12	RED
W15	12	BROWN
W15A	12	BROWN
W15B	12	BROWN
W15C	12	BROWN
W15D	12	BROWN

CIRCUITS		
CIR	GA	COLOR
W15E	14	BLACK
W15F	12	BROWN
W25	12	YELLOW
W25A	12	YELLOW
W25B	12	YELLOW
W25C	14	GREEN
W25D	12	YELLOW
W15G	12	BROWN
X3	14	LIGHT GREEN

NR 1388A

Fig. 4—Body Wiring—(Station Wagon)—Chrysler Models

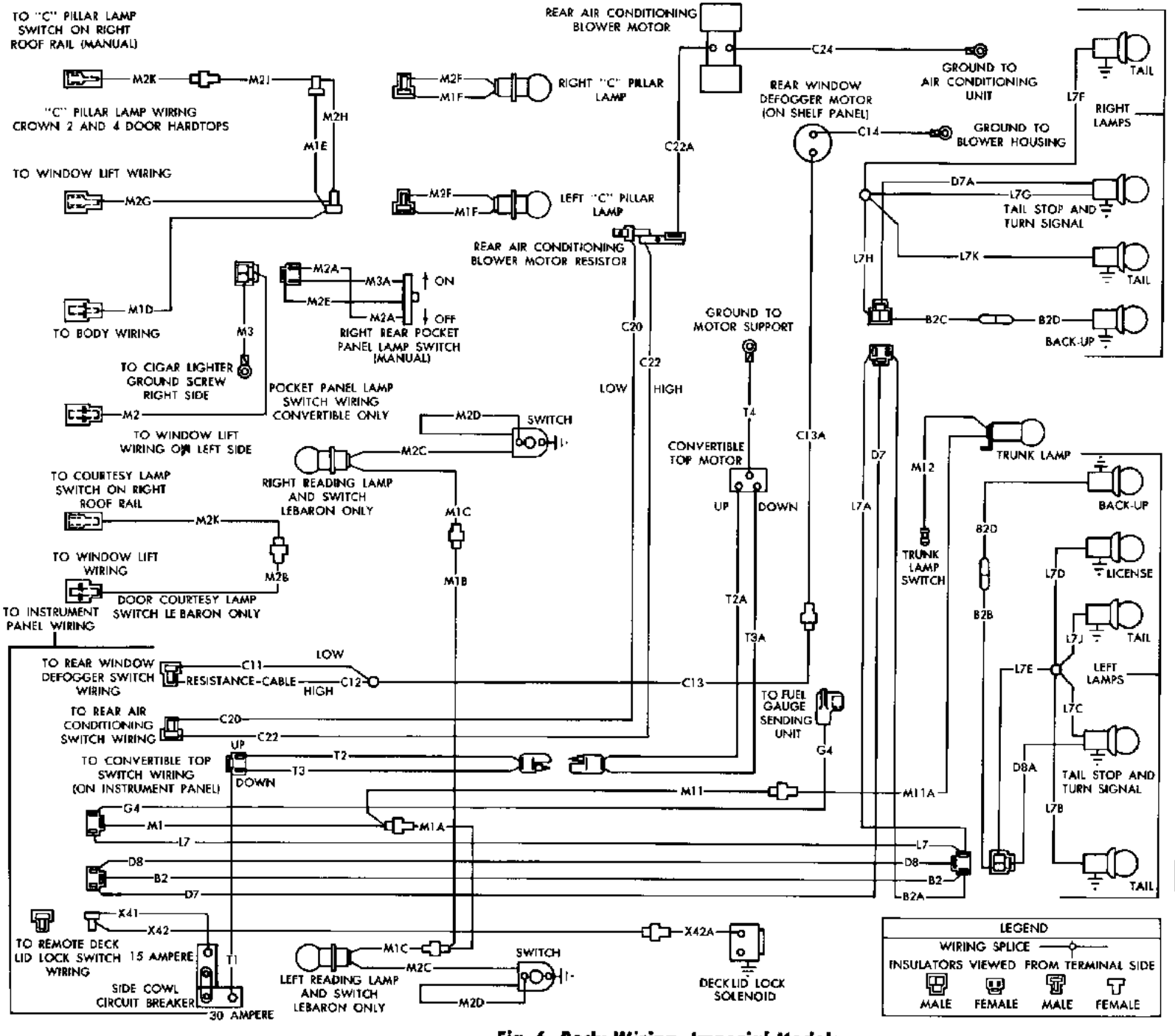
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CIRCUITS		
CIR	GA	COLOR
A1	6B	RED
A1A	10	BLACK
A1B	16	DARK BLUE
B1	18	VIOLET
B2	18	VIOLET
C2	18	DARK BLUE
C5	16	DARK GREEN
D5	18	TAN
D5A	18	TAN
D5B	18	TAN
D5C	18	TAN
D6	18	LIGHT GREEN
D6A	18	LIGHT GREEN
G2	18	VIOLET
G6	18	GRAY
G6A	18	GRAY
G9	18	GRAY WITH TRACER
H1	20	BLACK
H2	16	DARK GREEN
H2A	16	DARK GREEN
H3	18	BLACK WITH TRACER
J2	16	DARK BLUE WITH TRACER
J2A	14	DARK BLUE
J3	14	BROWN
L3	16	RED
L3A	16	RED
L3B	16	RED
L3C	16	RED
L4	16	BLACK
L4A	16	BLACK
L6	18	YELLOW WITH TRACER
L6A	18	YELLOW
L9	16	BLACK
L9A	16	WHITE
L9B	16	WHITE
L9C	16	WHITE
R3	18	DARK GREEN
R5	18	DARK BLUE WITH TRACER
R6	12	BLACK
S2	18	YELLOW
S4A	18	BROWN
S4B	16	BROWN
S5	12	BROWN
V3	16	BROWN
V4	18	RED
V5	18	DARK GREEN
V6	18	DARK BLUE
V10	18	BROWN

Fig. 5—Engine Compartment Wiring—Chrysler Models

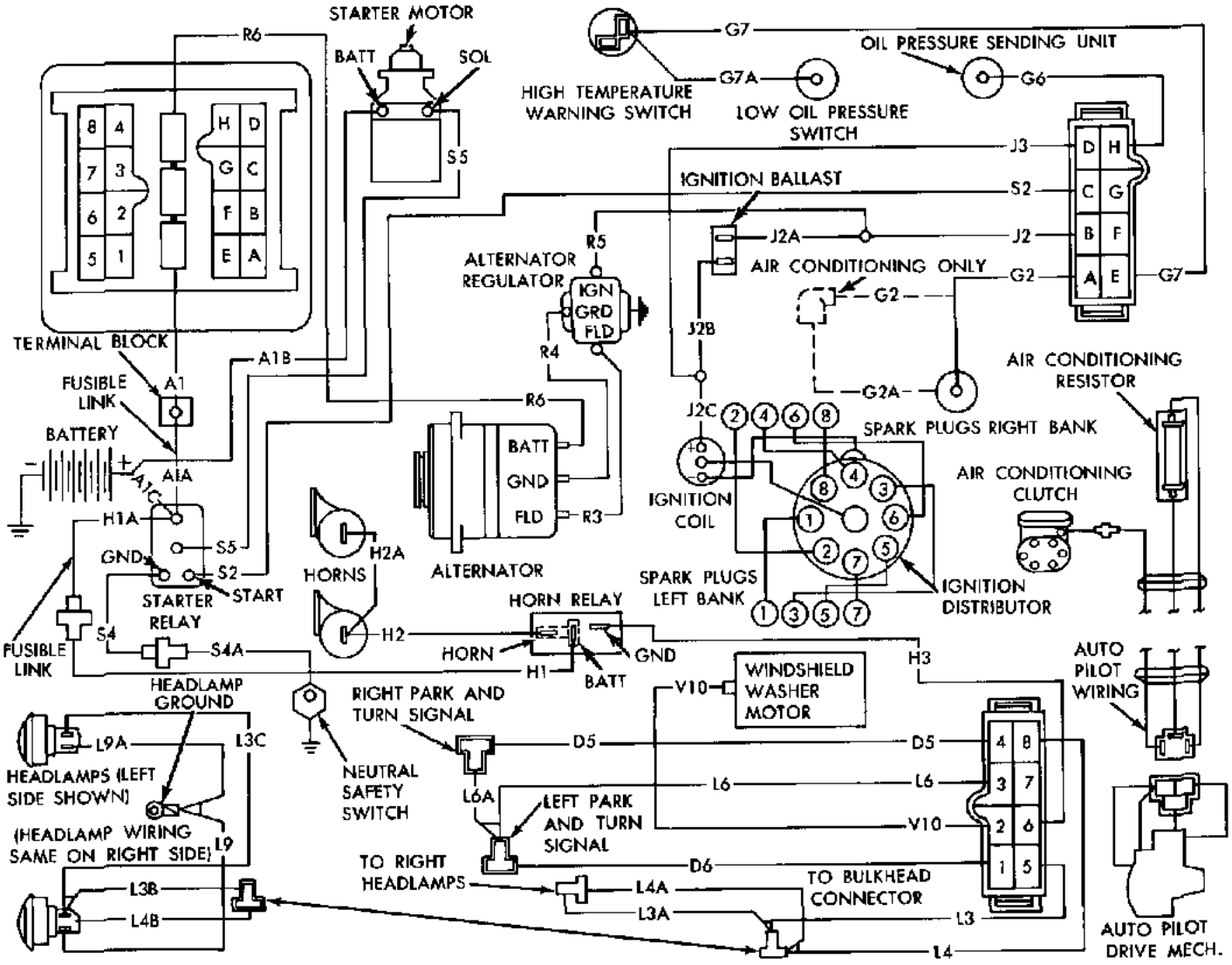
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CIRCUITS		
CIR	GA	COLOR
B2	18	VIOLET
B2A	18	VIOLET
B2B	18	VIOLET
B2C	18	VIOLET
B2D	18	VIOLET
C11	18	BLACK
C12	20	WHITE
C13	18	BLACK
C13A	14	BLACK
C14	14	BLACK
C20	16	BROWN
C22	16	DARK GREEN
C22A	16	DARK GREEN
C24	16	BLACK
D7	18	BROWN
D7A	18	BROWN
D8	18	DARK GREEN
D8A	18	DARK GREEN
G4	18	DARK BLUE
L7	18	BLACK
L7A	18	BLACK
L7B	18	BLACK
L7C	18	BLACK
L7D	18	BLACK
L7E	18	BLACK
L7F	18	BLACK
L7G	18	BLACK
L7H	18	BLACK
L7J	18	BLACK
L7K	18	BLACK
M1	18	PINK
M1A	18	PINK
M1B	18	PINK
M1C	18	PINK
M1D	18	PINK
M1E	18	PINK
M1F	18	PINK
M2	18	BROWN
M2A	18	YELLOW
M2B	18	YELLOW
M2C	18	YELLOW
M2D	18	YELLOW
M2E	18	BROWN
M2F	18	BROWN
M2G	18	BROWN
M2H	18	BROWN
M2J	18	BROWN
M2K	18	BROWN
M3	16	WHITE
M3A	18	WHITE
M11	18	BLACK
M11A	18	BLACK
M12	12	BLACK
T1	12	RED
T2	12	BROWN
T2A	12	RED
T3	12	YELLOW
T3A	12	YELLOW
T4	12	BLACK
X41	16	RED
X42	16	BLACK
X42A	18	PINK

Fig. 6—Body Wiring—Imperial Models

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CIRCUITS		
CIR	GA	COLOR
A1	12	RED
A1A	16	DARK BLUE WITH TRACER
A1B	6B	BLACK
A1C	10	BLACK
D5	18	TAN
D6	18	LIGHT GREEN
G2	18	VIOLET
G2A	18	VIOLET
G6	18	GRAY
G7	18	GRAY/TRACER
G7A	18	DARK GREEN
H1	16	VIOLET
H1A	20	ORANGE WITH TRACER
H2	16	DARK GREEN
H2A	16	DARK GREEN
H3	18	BLACK WITH TRACER
J2	12	DARK BLUE
J2A	12	DARK BLUE
J2B	12	DARK BLUE
J2C	12	DARK BLUE
J3	12	BROWN
L3	16	RED
L3A	16	RED
L3B	16	RED
L3C	16	RED
L4	16	BLACK
L4A	16	BLACK
L4B	16	BLACK
L6	18	YELLOW WITH TRACER
L6A	18	YELLOW
L9	16	WHITE
L9A	16	WHITE
R3	18	DARK GREEN
R4	16	BROWN
R5	12	DARK BLUE
R6	12	BLACK
S2	12	YELLOW
S4	16	BROWN
S4A	16	BROWN
S5	12	BROWN
V10	18	TAN WITH TRACER

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Fig. 7—Engine Compartment Wiring—Imperial Models

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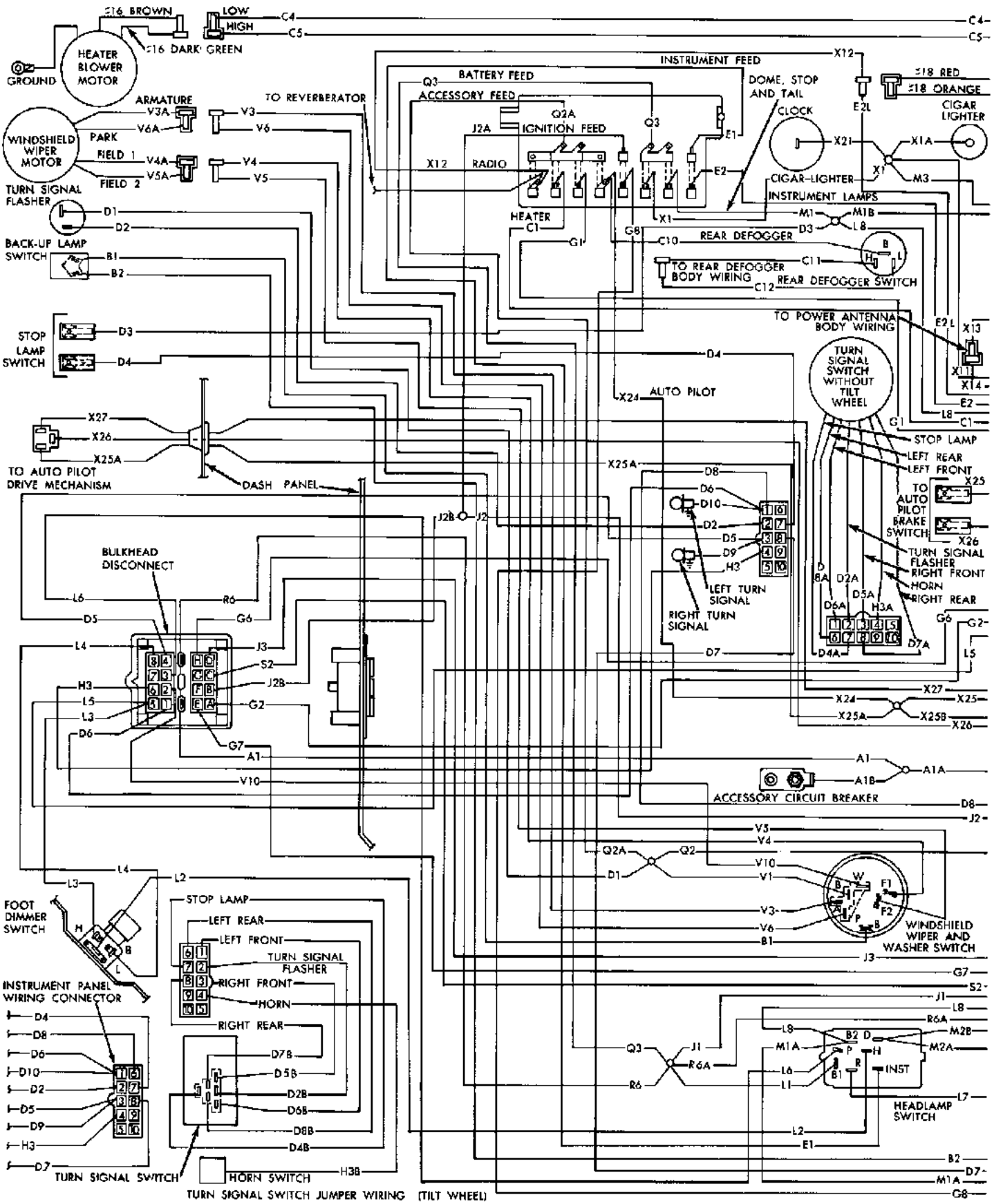
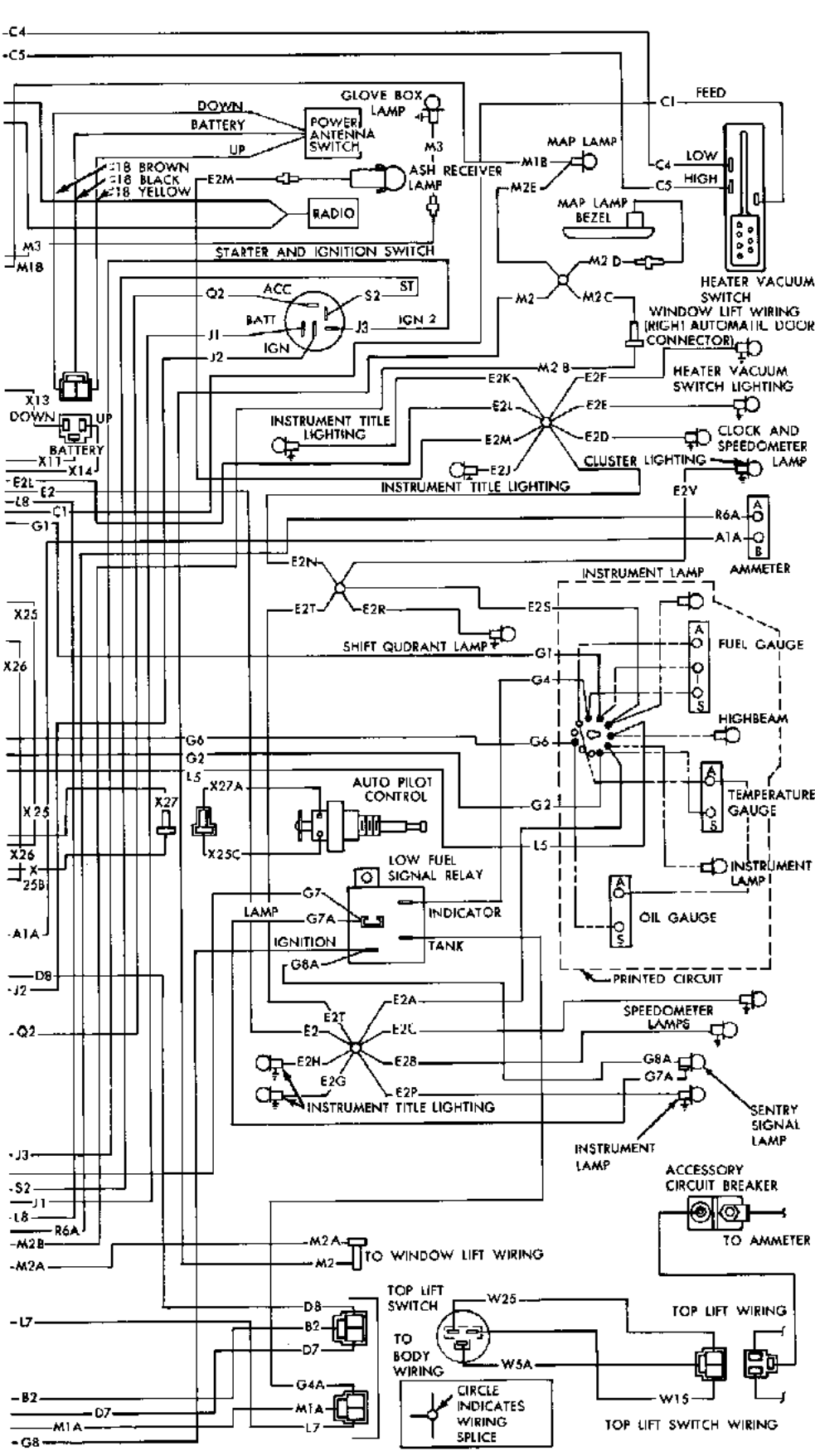


Fig. 8—Instrument Panel Wiring—Imperial Models

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CIRCUITS			CIRCUITS		
CIR	GA	COLOR	CIR	GA	COLOR
A1	12	RED	H3	18	BLACK WITH TRACER
A1A	12	RED	H3A	18	BLACK
A1B	12	RED	H3B	18	BLACK
B1	18	WHITE	J1	12	RED
B2	18	VIOLET	J2	12	DARK BLUE
C1	14	BLACK WITH TRACER	J2A	12	DARK BLUE
C2	16	LIGHT GREEN	J2B	12	DARK BLUE
C2A	18	LIGHT BLUE	J3	12	BROWN
C4	16	BROWN	L1	12	BLACK WITH TRACER
C4A	16	BROWN	L2	16	LIGHT GREEN
C4B	16	BROWN	L3	16	RED
C4C	16	BROWN	L4	18	BLACK
C4D	16	BROWN	L5	18	RED
C5	16	DARK GREEN	L6	18	YELLOW WITH TRACER
C5A	16	BLACK	L7	18	BLACK
C5B	16	DARK GREEN	L8	18	PINK
C5C	16	DARK GREEN	M1	18	PINK
C5D	16	BLACK	M1A	18	PINK
C10	18	LIGHT GREEN	M1B	18	PINK
C11	18	BLACK	M2	18	YELLOW
C12	18	WHITE	M2A	18	BROWN
C20	14	BROWN	M2B	18	BROWN
C22	14	DARK GREEN	M2C	18	YELLOW
C23	14	LIGHT GREEN	M2D	18	YELLOW
C23A	14	LIGHT GREEN	M2E	18	YELLOW
D1	12	BLACK	M3	18	PINK
D2	18	RED	Q2	12	BLACK
D2A	18	RED	Q2A	12	BLACK
D2B	18	WHITE	Q3	12	RED WITH TRACER
D3	18	PINK	R6	12	BLACK
D4	18	WHITE	R6A	12	BLACK
D4A	18	WHITE	S2	12	YELLOW
D4B	18	WHITE	V1	12	PINK
D5	18	TAN	V3	18	BLACK WITH TRACER
D5A	18	TAN	V3A	16	BLACK
D5B	18	TAN	V4	18	RED
D6	18	LIGHT GREEN	V4A	16	RED
D6A	18	LIGHT GREEN	V5	18	YELLOW
D6B	18	LIGHT GREEN	V5A	16	YELLOW
D7	18	BROWN	V6	18	DARK BLUE
D7A	18	BROWN	V6A	16	DARK BLUE
D7B	18	BROWN	V10	18	TAN WITH TRACER
D8	18	DARK GREEN	W5A	12	RED
D8A	18	DARK GREEN	W15	12	BROWN
D8B	18	DARK GREEN	W25	12	YELLOW
D9	18	TAN	X1	16	RED
D10	18	LIGHT GREEN	X1A	16	RED
E1	18	TAN	X11	18	BLACK
E2	18	ORANGE	X12	18	RED
E2A	18	ORANGE	X13	18	BROWN
E2B	18	ORANGE	X14	18	YELLOW
E2C	18	ORANGE	X21	18	GRAY
E2D	18	ORANGE	X24	16	RED
E2E	18	ORANGE	X25	16	RED
E2F	18	ORANGE	X25A	16	RED
E2G	18	ORANGE	X25B	16	RED
E2H	18	ORANGE	X25C	16	RED
E2J	18	ORANGE	X26	16	LIGHT BLUE
E2K	18	ORANGE	X27	16	BLACK
E2L	18	ORANGE	X27A	16	BLACK
E2M	18	ORANGE			
E2N	18	ORANGE			
E2P	18	ORANGE			
E2R	18	ORANGE			
E2S	18	ORANGE			
E2T	18	ORANGE			
E2V	18	ORANGE			
G1	18	BLACK			
G2	18	VIOLET			
G4	18	DARK BLUE			
G4A	18	DARK BLUE			
G6	18	GRAY			
G7	18	GRAY WITH TRACER			
G7A	18	GRAY WITH TRACER			
G8	18	DARK BLUE WITH TRACER			
G8A	18	DARK BLUE WITH TRACER			

Fig. 8—Instrument Panel Wiring—Imperial Models

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ENGINE

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ENGINE APPLICATION

Model Application		No. Cyl.	Engine Type & Displacement	Compression Ratio	
Newport	(Std.)	8	"LB" 383 Cubic Inch	9.2 to 1	2 BBl. Carb., Std. Cam., Sil. Air Cleaner, Single Exhaust
	(Opt.)	8	"LB" 383 Cubic Inch	10.0 to 1	4 BBl. Carb., Std. Cam., Sil. Air Cleaner, Single Exhaust
	(Opt.)	8	"RB" 440 Cubic Inch	10.0 to 1	4 BBl. Carb., Std. Cam., Double Snorkle Air Cleaner, Dual Exhaust
300	(Std.)	8	"LB" 383 Cubic Inch	10.0 to 1	4 BBl. Carb., Std. Cam., Sil. Air Cleaner, Single Exhaust
	(Opt.)	8	"RB" 440 Cubic Inch	10.0 to 1	4 BBl. Carb., Std. Cam., Double Snorkle Air Cleaner, Dual Exhaust
New Yorker	(Std.)	8	"RB" 440 Cubic Inch	10.0 to 1	4 BBl. Carb., Std. Cam., Sil. Air Cleaner, Single Exhaust
	(Opt.)	8	"RB" 440 Cubic Inch	10.0 to 1	4 BBl. Carb., Std. Cam., Double Snorkle Air Cleaner, Dual Exhaust
Imperial		8	"RB" 440 Cubic Inch	10.0 to 1	4 BBl. Carb., Std. Cam., Sil. Air Cleaner, Single Exhaust

GENERAL INFORMATION

The V8 engines for the 1966 Chrysler and Imperial Models are all the valve-in-head type with hydraulic tappets. The engines vary in compression ratio, piston displacement, camshaft, valve springs, carburetor, manifold arrangement.

The standard NEWPORT ENGINE with two bore carburetor, 9.2 to 1 compression ratio uses regular fuel.

All other engines with a 10.0 to 1 compression ratio, 4 bore carburetor; use premium fuel.

SERVICE DIAGNOSIS

Condition	Possible Cause	Correction
ENGINE		
ENGINE WILL NOT START	(a) Weak Battery.	(a) Test battery specific gravity and recharge or replace as necessary.
	(b) Corroded or loose battery connections.	(b) Clean and tighten battery connections. Apply a coat of petrolatum to terminals.
	(c) Faulty starting motor.	(c) Refer to "Starting Motor."*
	(d) Moisture on ignition wires and distributor cap.	(d) Wipe wires and cap clean and dry.
	(e) Faulty ignition cables.	(e) Replace any cracked or shorted cables.
	(f) Faulty coil or condenser.	(f) Test and replace as necessary.*
	(g) Dirty or corroded distributor contacts.	(g) Clean or replace as necessary.
	(h) Incorrect spark plug gap.	(h) Set gap at .035".
	(i) Incorrect ignition timing.	(i) Refer to "Ignition Timing."*
	(j) Dirt or water in fuel line or carburetor.	(j) Clean lines and carburetor.**
	(k) Carbuetor flooded.	(k) Adjust float level—check seats.**
	(l) Incorrect carburetor float setting.	(l) Adjust float level—check seats.**

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Condition	Possible Cause	Correction
	(m) Faulty fuel pump.	(m) Install new fuel pump.**
	(n) Carburetor percolating. No fuel in the carburetor.	(n) Measure float level.** Adjust bowl vent. Inspect operation of manifold control valve.
ENGINE STALLS	(a) Idle speed set too low.	(a) Adjust carburetor.**
	(b) Incorrect choke adjustment.	(b) Adjust choke.**
	(c) Idle mixture too lean or too rich.	(c) Adjust carburetor.**
	(d) Incorrect carburetor float setting.	(d) Adjust float setting.**
	(e) Leak in intake manifold	(e) Inspect intake manifold gasket and replace if necessary.***
	(f) Dirty, burned or incorrectly gapped distributor contacts.	(f) Replace contacts and adjust.*
	(g) Worn or burned distributor rotor.	(g) Install new rotor.
	(h) Incorrect ignition wiring.	(h) Install correct wiring.
	(i) Faulty coil or condenser.	(i) Test and replace if necessary.*
ENGINE LOSS OF POWER	(a) Incorrect ignition timing.	(a) Refer to "Ignition Timing."*
	(b) Worn or burned distributor rotor.	(b) Install new rotor.
	(c) Wrong mechanical or vacuum advance (distributor).	(c) Install correct vacuum advance unit. Adjust mechanical advance.
	(d) Excessive play in distributor shaft.	(d) Remove and repair distributor.*
	(e) Worn distributor shaft cam.	(e) Remove and repair distributor.*
	(f) Dirty or incorrectly gapped spark plugs.	(f) Clean plugs and set gap at .035".
	(g) Dirt or water in fuel line, carburetor or filter.	(g) Clean lines, carburetor and replace filter.**
	(h) Incorrect carburetor float setting.	(h) Adjust float level.**
	(i) Faulty fuel pump.	(i) Install a new pump.
	(j) Incorrect valve timing.	(j) Refer to "Checking Valve Timing."***
	(k) Blown cylinder head gasket.	(k) Install new head gasket.***
	(l) Low compression.	(l) Test compression of each cylinder.*
	(m) Burned, warped, pitted valves.	(m) Install new valves or regrind.***
	(n) Plugged or restricted exhaust system.	(n) Install new parts as necessary.
	(o) Faulty ignition cables.	(o) Replace any cracked or shorted cables.
	(p) Faulty coil or condenser.	(p) Test and replace as necessary.*
ENGINE MISSES ON ACCELERATION	(a) Dirty, burned, or incorrectly gapped distributor contacts.	(a) Replace contacts and adjust.*
	(b) Dirty, or gap too wide in spark plugs.	(b) Clean spark plugs and set gap at .035".
	(c) Incorrect ignition timing.	(c) Refer to "Ignition Timing."*
	(d) Dirt in carburetor.	(d) Clean carburetor.**
	(e) Acccleration pump in carburetor.	(e) Install new pump.**
	(f) Burned, warped or pitted valves.	(f) Install new valves or regrind.***
	(g) Faulty coil or condenser.	(g) Test and replace if necessary.*
ENGINE MISSES AT HIGH SPEED	(a) Dirty or incorrectly gapped distributor contacts.	(a) Clean or replace as necessary.*
	(b) Dirty or gap set too wide in spark plug.	(b) Clean spark plugs and set gap at .035".
	(c) Worn distributor shaft cam.	(c) Remove and repair distributor.*
	(d) Worn or burned distributor rotor.	(d) Install new rotor.
	(e) Excessive play in distributor shaft.	(e) Remove and repair distributor.*
	(f) Faulty coil or condenser.	(f) Test and replace if necessary.*
	(g) Incorrect ignition timing.	(g) Refer to "Ignition Timing."*
	(h) Dirty jets in carburetor.	(h) Clean jets.**
	(i) Dirt or water in fuel line, carburetor or filter.	(i) Clean lines, carburetor and replace filter.**
NOISY VALVES	(a) High or low oil level in crankcase.	(a) Check for correct oil level.***
	(b) Low oil pressure.	(b) Check engine oil level.***
	(c) Dirt in tappets.	(c) Clean tappets.***
	(d) Bent push rods.	(d) Install new push rods.***
	(e) Worn rocker arms.	(e) Inspect oil supply to rockers.***

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Condition	Possible Cause	Correction
	(f) Worn tappets.	(f) Install new tappets.***
	(g) Worn valve guides.	(g) Ream and install new valves with oversize stems.***
	(h) Excessive run-out of valve seats or valve faces.	(h) Grind valve seats and valves.***
CONNECTING ROD NOISE	(a) Insufficient oil supply.	(a) Check engine oil level.***
	(b) Low oil pressure.	(b) Check engine oil level. Inspect oil pump relief valve, damper and spring.***
	(c) Thin or diluted oil.	(c) Change oil to correct viscosity.
	(d) Excessive bearing clearance.	(d) Measure bearings for correct clearance.***
	(e) Connecting rod journals out-of-round.	(e) Remove crankshaft and regrind journals.***
	(f) Misaligned connecting rods.	(f) Replace bent connecting rods.***
MAIN BEARING NOISE	(a) Insufficient oil supply.	(a) Check engine oil level.***
	(b) Low oil pressure.	(b) Check engine oil level. Inspect oil pump relief valve, damper and spring.***
	(c) Thin or diluted oil.	(c) Change oil to correct viscosity.***
	(d) Excessive bearing clearance.	(d) Check bearings for correct clearances.***
	(e) Excessive end play.	(e) Check No. 3 main bearings for wear on flanges.***
	(f) Crankshaft journals out-of-round or worn.	(f) Remove crankshaft and regrind journals.***
	(g) Loose flywheel or torque converter.	(g) Tighten to correct torque.
OIL PUMPING AT RINGS	(a) Worn, scuffed, or broken rings.	(a) Hone cylinder bores if necessary and install new rings.**
	(b) Carbon in piston ring grooves and oil ring slots.	(b) Remove rings. Clean grooves. Check groove width. Install new rings.***
	(c) Rings fitted too tight in grooves.	(d) Remove rings. Check grooves. If groove is not proper width, replace pistons.***
OIL PRESSURE DROP	(a) Low oil level.	(a) Check engine oil level.
	(b) Faulty oil pressure sending unit.	(b) Install new sending unit.
	(c) Clogged oil filter.	(c) Install new oil filter.
	(d) Worn parts in oil pump.	(d) Replace worn parts or pump.
	(e) Thin or diluted oil.	(e) Change oil to correct viscosity.
	(f) Excessive bearing clearance.	(f) Measure bearings for correct clearance.***
	(g) Oil pump relief valve stuck.	(g) Remove valve and inspect, clean, and reinstall.
	(h) Oil pump suction tube loose bent or cracked.	(h) Remove oil pan and install new tube if necessary.

*Refer to the "Electrical and Instrument" Group 8 for service procedures.
**Refer to the "Fuel System" Group 14 for service procedures.
***Refer to the "Engine" Group 9 for service procedures.

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SERVICE PROCEDURES

TUNE-UP

(1) Test battery specific gravity, add water if necessary, clean and tighten battery connections.

(2) Test cranking voltage if below 9.6 volts and more than 130 amperes draw. See *Starting Motor* Cranking Voltage Electrical Section of this manual.

(3) Tighten intake manifold bolts to 50 foot-pounds.

(4) Perform cylinder compression test. The compression should not vary more than 20 pounds for 383 cubic inch engine with 9.2 to 1 compression ratio, 25 pounds for 383 and 440 cubic inch engines with 10 to 1 compression ratio.

(5) Clean or replace spark plugs as necessary and adjust gap to .035 inch. Tighten to 30 foot-pounds using new gaskets.

(6) Test resistance of spark plug cables. Refer to "Ignition System Secondary Circuit Inspection" Electrical Section.

(7) Inspect the breaker plate contacts, primary wire and vacuum advance operation. Replace parts as necessary. Refer to Ignition System and make necessary adjustment. Test coil output, voltage and primary and secondary resistance. Test Condenser.

(8) Install the distributor, distributor cap, and spark plug cables. Reset the ignition timing with the vacuum advance line disconnected. The ignition timing should be set to compensate for altitudes and/or gasoline grades.

(9) Set carburetor idle mixture adjustment. Adjust the throttle stop screw to specifications. Perform a combustion analysis.

(10) Test the fuel pump for pressure and vacuum. Refer to "Fuel System" Group 14, Specifications.

(11) Inspect the manifold heat control valve in the right exhaust manifold for proper operation and apply Manifold Heat Control Valve Solvent Number 1879318 or equivalent to the bushing and shafts.

(12) Every 6 months, remove filter element and blow out dirt gently with air hose. Direct air from inside out, and keep nozzle 2 inches away from element to avoid damaging (Fig. 1). Clean the metal housing and replace the element. Every two years install a new factory recommended MoPar filter element. Service the unit more frequently when driving under severe conditions, such as in dusty areas.

(13) Inspect crankcase ventilation system as outlined on page 00.

(14) Inspect and adjust the accessory belt drives referring to "Cooling System" Group 7 for proper adjustments.

(15) Road test the vehicle as a final check.

FRONT ENGINE MOUNTS

Frame bracket studs and torque nuts are used in the place of bolts.

Removal

(1) Disconnect throttle linkage at transmission and at carburetor.

(2) Raise hood and position fan to clear radiator hose and radiator top tank.

(3) Remove torque nuts from frame bracket studs.

(4) Raise engine just enough to remove front engine mount assembly.

Installation

(1) Install mounts on engine and tighten nuts to specified torque (Figs. 2 and 3).

(2) Lower engine and install washers and pretorque nuts on frame bracket studs. Tighten nuts to specified torque.

(3) Connect throttle to transmission and carburetor linkage.

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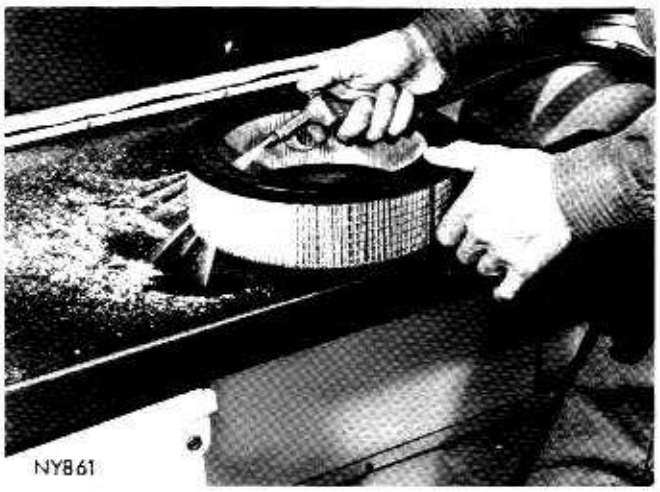


Fig. 1—Cleaning Filter Element

REAR ENGINE MOUNT (Figs. 4 and 5)

Removal

(1) Raise vehicle on hoist.
(2) Install transmission jack.
(3) Remove rear engine crossmember from frame.
(4) Remove rear engine mount from crossmember.

Installation

(1) Install rear engine mount to transmission and tighten bolts to specified torque.
(2) Install rear engine crossmember to frame and tighten bolts to specified torque.
(3) Remove transmission jack.
(4) Install rear engine mount to crossmember bolts and tighten to specified torque.
(5) Lower vehicle.

REMOVAL OF ENGINE ASSEMBLY

(1) Scribe the outline of hinge brackets on hood to assure proper adjustments when installing.

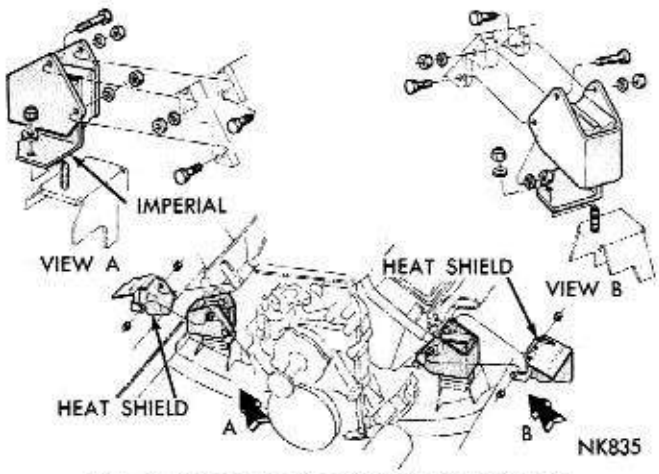


Fig. 2—Front Engine Mounts (Imperial)

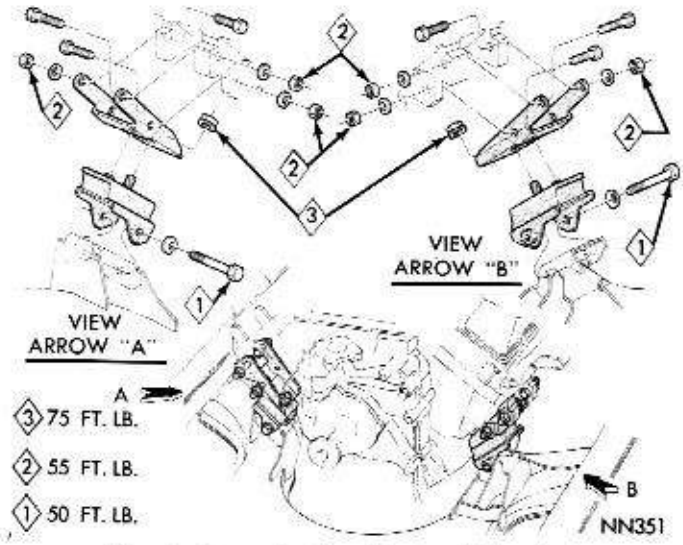


Fig. 3—Front Engine Mounts (Chrysler)

(2) Remove hood.
(3) Drain cooling system and remove battery.
(4) Remove all hoses, the fan shroud, disconnect oil cooler lines and remove radiator.
(5) Disconnect fuel lines and wires attached to engine units. Remove air cleaner and carburetor.
(6) Attach engine lifting fixture Tool C-3466 to carburetor flange studs on intake manifold.
(7) Raise vehicle on a hoist and install engine support fixture Tool C-3487 on frame to support rear of engine.
(8) Drain transmission and torque converter.
(9) Disconnect exhaust pipes at manifolds, propeller shaft, wires, linkage, cable and oil cooler lines at transmission.
(10) Remove engine rear support crossmember and remove transmission from vehicle.
(11) Lower vehicle and attach chain hoist to fixture

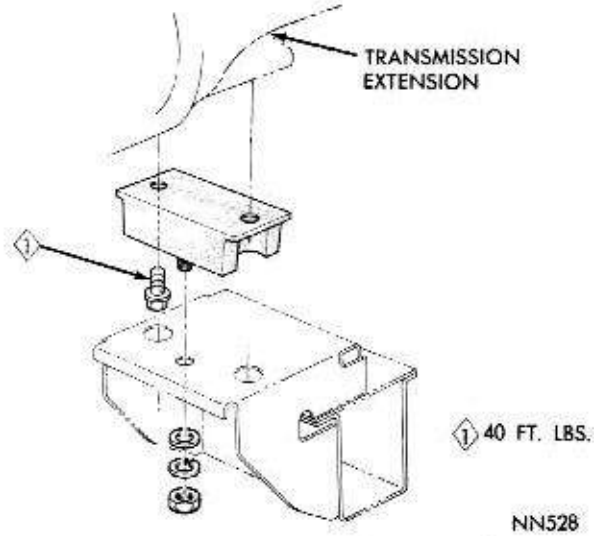


Fig. 4—Engine Rear Support (Imperial)

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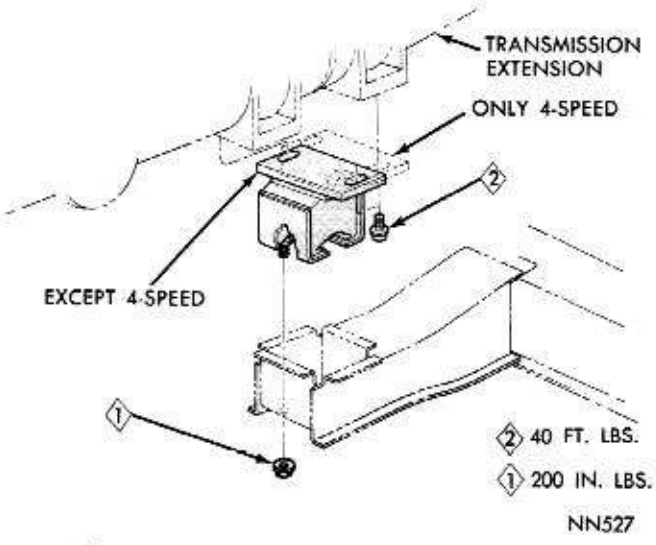


Fig. 5—Engine Rear Support (Chrysler)

eyebolt.

(12) Remove engine front mounting bolts. Raise engine with a chain hoist and work engine out of chassis.

(13) Place engine in repair stand Tool C-3167 and adapter C-3662 for disassembly, using transmission mounting bolts.

INSTALLING ENGINE ASSEMBLY

(1) Attach engine lifting fixture Tool C-3466 to carburetor flange studs on intake manifold.

(2) Attach chain hoist to fixture eyebolt.

(3) Remove engine from repair stand and lower engine carefully until engine is positioned in vehicle.

(4) Install engine support fixture Tool C-3487 on frame and adjust to support rear of engine.

(5) Remove chain hoist from fixture eyebolt.

(6) Raise vehicle on hoist and install and tighten engine front support mounting bolts.

(7) Install transmission and engine rear support crossmember.

(8) Lower engine into position and install engine rear support crossmember bolts. Remove engine support fixture Tool C-3487 from frame.

(9) Connect propeller shaft, wires, linkage, cable, oil cooler lines at transmission, connect exhaust pipes to manifold using new gaskets. Install transmission filler tube.

(10) Lower vehicle and install radiator, fan shroud, hoses, oil cooler lines and connect all wires and linkage.

(11) Remove engine lifting fixture Tool C-3466 from intake manifold and install carburetor and fuel lines. Connect throttle linkage.

(12) Install hood, refer to scribe marks made at removal for proper alignment.

(13) Close all drain cocks and fill cooling system.

(14) Fill engine crankcase and transmission. Refer to "Lubrication" Group 0 for quantities and lubricants to use and check entire system for leaks and correct as necessary.

Whenever an engine is rebuilt and a new camshaft and/or new tappets are installed, add one quart of factory recommended oil additive to engine oil to aid break-in (Engine Oil Additive No. 1879406 or equivalent). The oil mixture should be left in the engine for a minimum of 500 miles, and drained at the next normal oil change.

(15) Start engine and run engine until normal operating temperature is reached.

(16) Inspect ignition timing and adjust carburetor as necessary.

(17) Adjust accelerator and transmission linkages. Road test vehicle.

ROCKER ARMS AND SHAFT ASSEMBLY

The rocker arms are of stamped steel and are arranged on one rocker arm shaft, per cylinder head. The push rod angularity tends to force the pairs of rocker arms toward each other where oilite spacers carry the side thrust at each rocker arm. The rocker shaft is held in place by bolts and stamped steel retainers attached to the five brackets on the cylinder head.

Removal

(1) Remove cylinder head cover and gasket.

(2) Remove rocker shaft bolts and retainers and remove rocker arms and shaft assembly.

(3) If rocker arm assemblies have been disassembled for cleaning, inspection, or replacement, refer to Figure 6 for proper reassembly.

Installation

(1) Install rocker arms and shaft assembly making sure to install the long stamped steel retainers in the number two and four positions.

(2) Install rocker shafts so that 3/16 inch diameter rocker arm lubrication holes point downward into the rocker arm, so that the 15° angle of these holes point



Fig. 6—Rocker Arm Assemblies Installed

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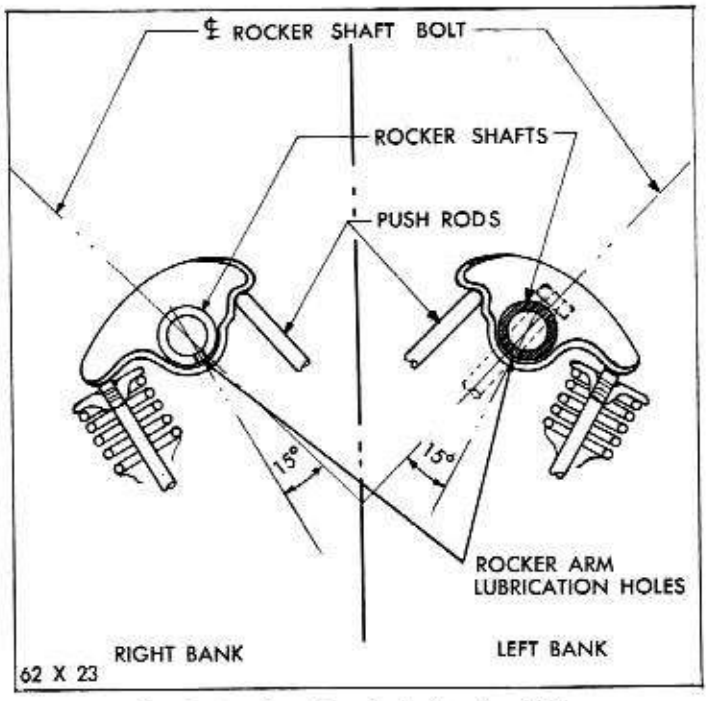


Fig. 7—Rocker Arm Lubrication Holes

outward towards the valve end of the rocker arms (Fig. 7). This is necessary to provide proper lubrication to the rocker assemblies.

The 15° angle of the rocker arm lubrication holes is determined from the center line of the bolt holes through the shaft which are used to attach the shaft assembly to the cylinder head.

Use extreme care in tightening the bolts so that tappets have time to bleed down to their operating length. Bulged tappet bodies, bent push rods and permanent noisy operation may result if the tappets are forced down too rapidly.

CYLINDER HEADS

The chrome alloy cast iron cylinder eads are held in place by 17 bolts. The spark plugs enter the cylinder head horizontally and are located at the wide edge of the combustion chambers.

Removal

(1) Drain cooling system.

(2) Remove alternator, carburetor and air cleaner and fuel line.

(3) Disconnect accelerator linkage.

(4) Remove vacuum control tube at carburetor and distributor.

(5) Disconnect the distributor cap, coil wires and the heater hose.

(6) Disconnect heat indicator sending unit wire.

(7) Remove spark plugs.

(8) Remove intake manifold, ignition coil and carburetor as an assembly.

(9) Remove tappet chamber cover.

(10) Remove cylinder head covers and gaskets.

On Imperial air conditioned cars, rotate crankshaft until the number eight cylinder exhaust valve is open, to allow clearance to remove right bank cylinder head cover and heater housing.

(11) Remove exhaust manifolds.

(12) Remove rocker arms and shaft assembly.

(13) Remove push rods and place them in their respective slots in holder Tool C-3068.

(14) Remove the 17 head bolts from each cylinder head and remove cylinder heads.

(15) Place cylinder head in holding fixture Tool C-3626.

Installation

(1) Clean gasket surfaces of the cylinder block and cylinder head. Remove all burrs from the edges of the cylinder heads.

(2) Inspect all surfaces with a straightedge if there is any reason to suspect leakage.

(3) Coat new gaskets with a suitable sealer, MoPar Number 1057794 or equivalent. Install gaskets and cylinder heads.

(4) Install cylinder head bolts. Starting at the top center, tighten all cylinder head bolts to 50 foot-pounds in sequence (Fig. 8).

Repeat the procedure, tightening all head bolts to 70 foot-pounds.

(5) Inspect push rods and replace any worn or bent rods.

(6) Install push rods with small ends in the tappets maintaining alignment, using rod (Fig. 9).

(7) Install rocker arm and shaft assembly starting each push rod into its respective rocker arm socket (Fig. 6) making sure to install the long stamped steel retainers in the number two and four positions.

Use extreme care in tightening bolts to 30 foot-pounds torque so the tappets have time to bleed down to their operating length. Bulged tappet bodies, bent push rods, and permanently noisy operation may result if the tappets are forced down too rapidly.

(8) Place new cylinder head gasket in position and

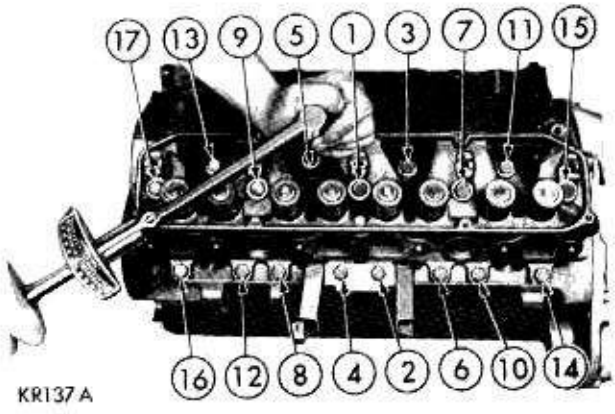


Fig. 8—Cylinder Head Tightening Sequence

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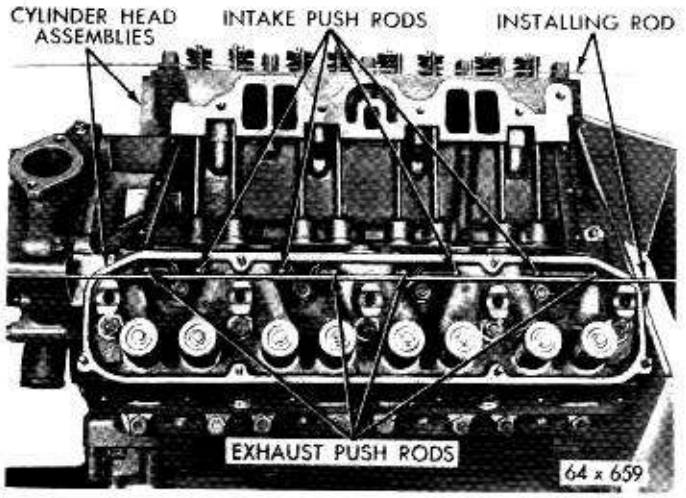


Fig. 9—Push Rods Installed

install cylinder head covers. Tighten nuts to 40 inch-pounds.

(9) Install exhaust manifolds and tighten nuts to 30 foot-pounds.

(10) Adjust spark plugs to .035 inch gap and install plugs, tighten plugs to 30 foot-pounds.

(11) Install a new tappet chamber cover and tighten end bolts to 9 foot-pounds.

(12) Install intake manifold, carburetor and ignition coil as an assembly and tighten manifold bolts to 50 foot-pounds.

(13) Install distributor cap. Connect the coil wire, heat indicator sending unit wire, accelerator linkage, spark plug cables and insulators.

(14) Install vacuum tube at carburetor and distributor.

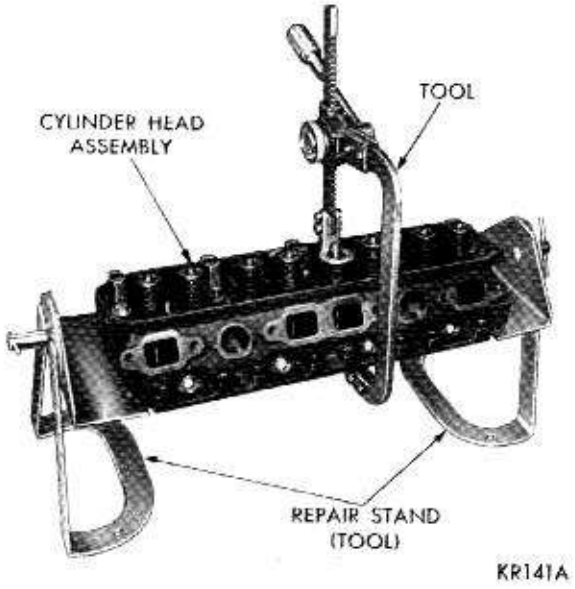


Fig. 10—Compressing Valve Spring Using Tool C-3422A

(15) Install alternator and drive belts. Tighten alternator bracket bolts to 30 foot-pounds, and alternator mounting nut to 20 foot-pounds.

(16) Install fuel line and carburetor air cleaner.

(17) Fill cooling system. Adjust belt tensions as outlined in "Cooling System" Group 7.

VALVES AND VALVE SPRINGS

Valves arranged in-line in the cylinder heads and inclined 30 degrees outward from vertical. The intake and exhaust valves operate in guides that are cast integral with the heads.

Removal

(1) With the cylinder head removed, compress valve springs, using Tool C-3422A (Fig. 10).

(2) Remove valve retaining locks, valve spring retainers, valve stem cup seals and valve springs.

(3) Remove any burrs from valve stem lock grooves to prevent damage to the valve guide when valves are removed.

Valve Inspection

(1) Clean valves thoroughly, and discard any burned, warped or cracked valves.

(2) Measure valve stems for wear. The intake valve stem diameter should measure .372 to .373 inch and the exhaust valve stem diameter should measure .371 to .372 inch. If wear exceeds .002 inch, replace the valve.

(3) Remove carbon and varnish deposist from inside of valve guides with cleaner, Tool C-756.

(4) Measure valve stem guide clearance as follows: Install sleeve Tool C-3973 over valve stem, (Fig. 11) and install valve.

(5) The special sleeve places the valve at the correct height for measuring with a dial indicator. Attach dial indicator Tool C-3339 to the cylinder head and set it at a right angle to the valve stem being

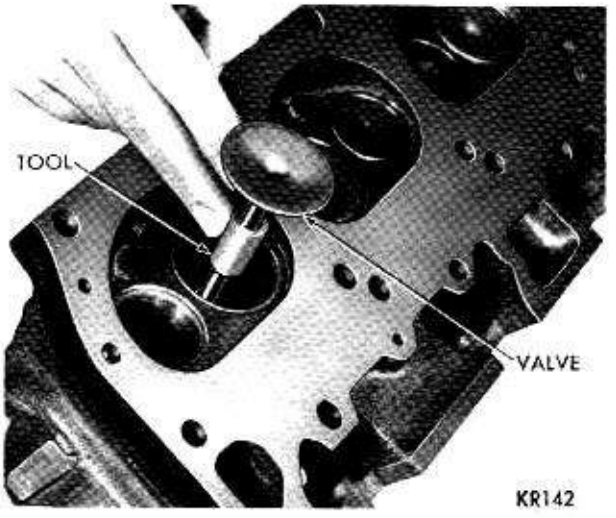


Fig. 11—Installing Tool C-3973

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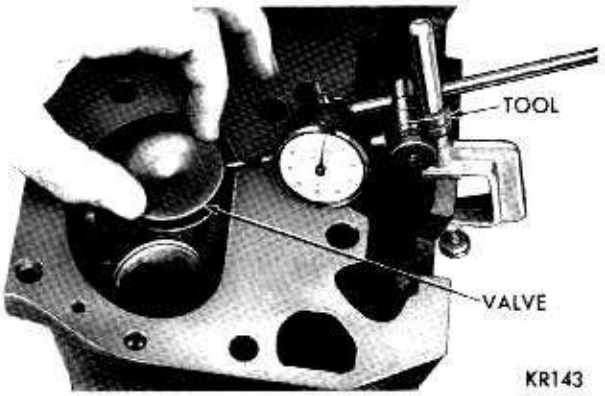


Fig. 12—Measuring Guide Wear Using Tool C-3339

measured (Fig. 12).

(6) Move valve to and from the indicator. Total dial indicator reading should not exceed .017 inch. If the dial indicator reading is excessive or if the stems are scored or worn excessively. Ream the guides for new valves with oversize stems.

(7) Service valves with oversize stems are available in .005, .015 and .030 inch oversizes. Reamers to accommodate the oversize valve stem are as follows: Reamer Tool C-3443 (.379 to .380 inch), Reamer Tool C-3430 (.389 to .390 inch), Reamer Tool C-3427 (.404 to .405 inch).

(8) Slowly turn reamer by hand and clean the guide thoroughly before installing new valves.

CAUTION: Do not attempt to ream the valve guides from standard directly to .030 inch. Use step procedure of .005, .015 and .030 inch so the original valve guide centers may be maintained.

Refacing Valves and Valve Seats

The intake and exhaust valve faces have a 45 degree angle. Always inspect the remaining valve margin after the valves are refaced (Fig. 13). Valves with less than 3/64 inch margin should be discarded.

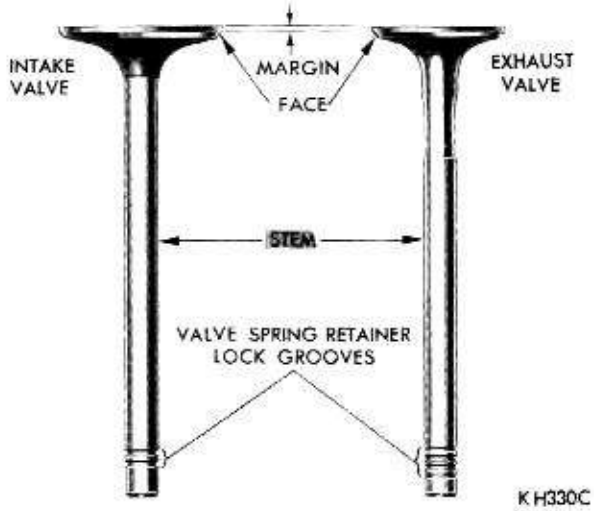


Fig. 13—Intake and Exhaust Valve Faces

(1) The angle of both the valve and seat should be identical. When refacing valve seats, it is important that the correct size valve guide pilot be used for reseating stones. A true and complete valve seat surface must be obtained.

(2) Inspect valve seat with Prussian blue to determine where valve contacts seat. To do this, coat valve seat lightly with Prussian blue, then set valve in place. Rotate valve with light pressure. If the blue is transferred to the center of the valve face, the contact is satisfactory. If the blue is transferred to the top edge of the valve face, lower the valve seat with a 30° stone. If the blue is transferred to the bottom edge of the valve face raise the valve seat with a 60° stone.

(3) When the seat is properly positioned the width of the intake seats should be 1/16 to 3/32 inch. The width of the exhaust seats should be 3/64 to 1/16 inch.

(4) Measure the concentricity of the valve seat using dial indicator No. 13725. The total runout should not exceed .003 inch (total indicator reading).

(5) When valves and seats are reground, the position of the valve in the cylinder head is changed, shortening the operating length of the hydraulic tappet. This means that the plunger is operating closer to its "bottomed" position, and less clearance is available for thermal expansion of the valve mechanism during high speed driving.

(6) The design of the valve mechanism includes a safety factor to allow for a limited amount of wear, and the refacing of the valves and seats.

(7) To insure that limits have not been exceeded, the dimension from valve spring seat in the head to the valve tip should be measured with gauge, Tool C-3648 (Fig. 14).

(8) The end of the cylindrical gauge and the bottom of slotted area represent the maximum and minimum allowable extension of the valve stem tip beyond the spring seat.

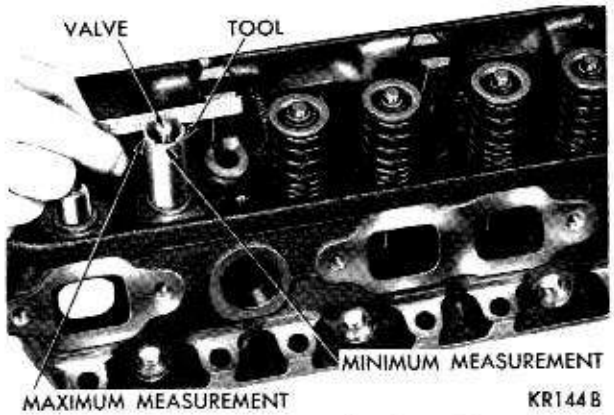


Fig. 14—Measuring Valve Stem Length Using Tool C-3648

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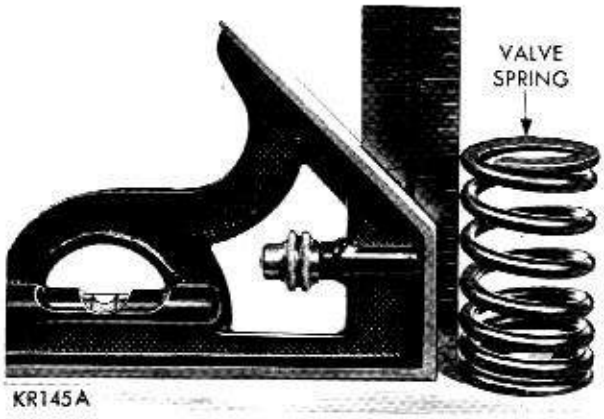


Fig. 15—Inspecting Valve Spring Squareness

(9) If the tip exceeds the maximum, grind stem tip to within gauge limits. Clean the tappets if tip grinding is required.

Testing the Valve Springs

(1) Whenever valves are removed for inspection, reconditioning or replacement, the valve springs should be tested. As an example, the compressed length of the spring to be tested is 1-15/32 inch mark on the threaded stud and the zero mark to the front. Place the spring over the stud on the table and lift the compressing lever to set the tone device. Pull on the torque wrench until a ping is heard. Take the reading on the torque wrench at this instant. Multiply this reading by two. This will give the spring load at the test length. Fractional measurements are indicated on the table for finer adjustments. The valve springs should test 187 to 203 pounds when compressed to 1-15/32 inch. Refer to specifications to obtain specified height and minimum allowable tension. Discard the springs that do not meet specifications.

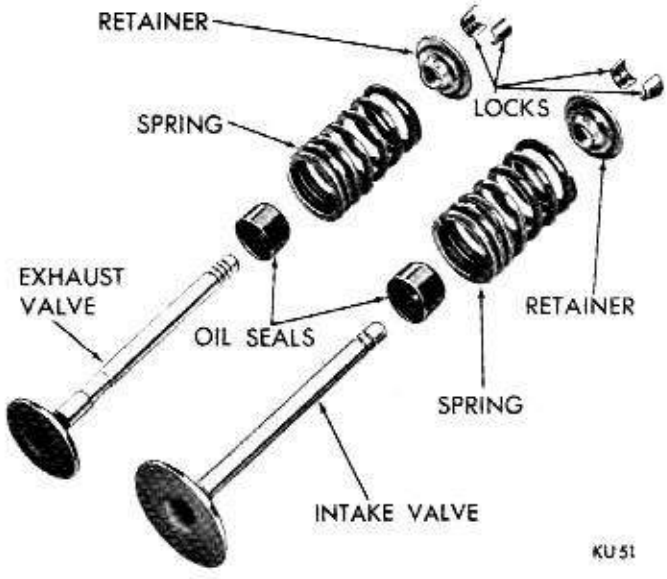


Fig. 16—Valve Assembly (Disassembled View)

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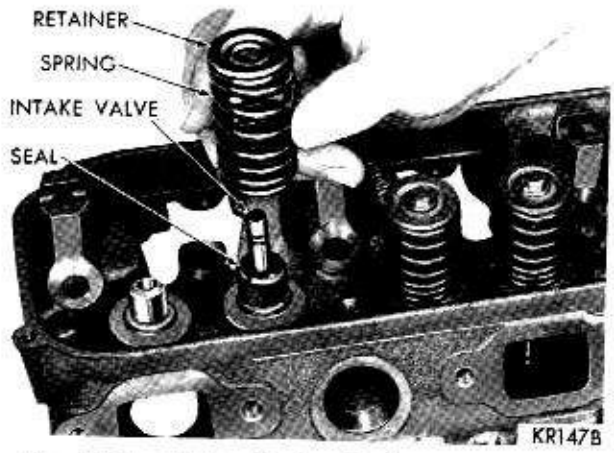


Fig. 17—Installing Valve, Spring and Cup Seal

(2) Inspect each valve spring for squareness at both ends with a steel square and surface plate (Fig. 15).

(3) If the spring is more than 1/16 inch out of square, install a new spring.

Installation

(1) Coat valve stems with lubricating oil and insert them in position in cylinder head.

(2) Install new cup seals on the intake and exhaust valve stems and over valve guides, (Figs. 16 and 17) and install valve springs and retainers.

(3) Compress valve springs with Tool C-3422A. Install the locks and release tool.

If the valves and or seats are reground, measure installed height of springs. Make sure measurement is taken from the bottom of spring seat in cylinder head to bottom surface of spring retainer. If the height is greater than 1-57/64 inches, install a 1/16 inch spacer in the head counterbore to bring the spring height back to normal 1-53/64 to 1-57/64 inch. (If spacers are installed, measure from the top of the spacer.)

HYDRAULIC TAPPETS

Preliminary to Checking the Hydraulic Tappets

(1) Before disassembling any part of the engine to correct tappet noise, read the oil pressure at the gauge and check the oil level in the oil pan. The pressure shouuld be between 45 and 65 pounds at 1000 R.P.M.

(2) The oil level in the pan should never be above the "full" mark on dipstick, or below the "add oil" mark. Either of thes conditions could be responsible for noisy tappets.

Oil Level Too High

(3) If oil level is above the "full" mark on dipstick, it is possible for the connecting rods to dip into the oil while engine is running and create foam. Foam in oil pan would be fed to the hydraulic tappets by the oil

pump causing them to lose length and allow valves to seat noisily.

Oil Level Too Low

(4) Low oil level may allow oil pump to take in air which, when fed to the tappets, causes them to lose length and allows valves to seat noisily. Any leaks on intake side of pump through which air can be drawn will create the same tappet action. When tappet noise is due to aeration, it may be intermittent or constant, and usually more than one tappet will be noisy. When oil level and leaks have been corrected, engine should be operated at fast idle for sufficient time to allow all of the air inside of the tappets to be bled out.

Tappet Noise Diagnosis

(1) To determine source of tappet noise, operate engine at idle with cylinder head covers removed.

(2) Feel each valve spring or rocker arm to detect noisy tappet. The noisy tappet will cause the affected spring and/or rocker arm to vibrate or feel rough in operation.

Worn valve guides or cocked springs are sometimes mistaken for noisy tappets. If such is the case, noise may be dampened by applying side thrust on the valve spring. If noise is not appreciably reduced, it can be assumed the noise is in the tappet. Inspect the rocker arm push rod sockets and push rod ends for wear.

(3) Valve tappet noise ranges from a light noise to a heavy click. A light noise is usually caused by excessive leakdown around the unit plunger which will necessitate replacing the tappet, or by the plunger partially sticking the the tappet body cylinder. A heavy click is caused either by a tappet check valve not seating, or by foreign particles becoming wedged

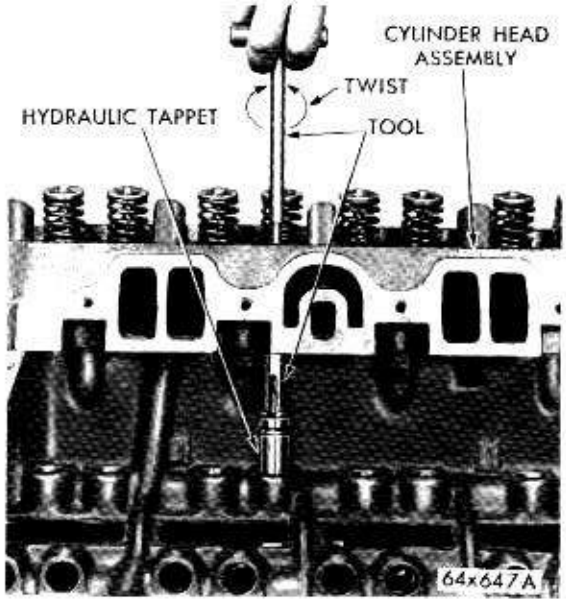


Fig. 18—Removing Tappet Using Tool C-3661

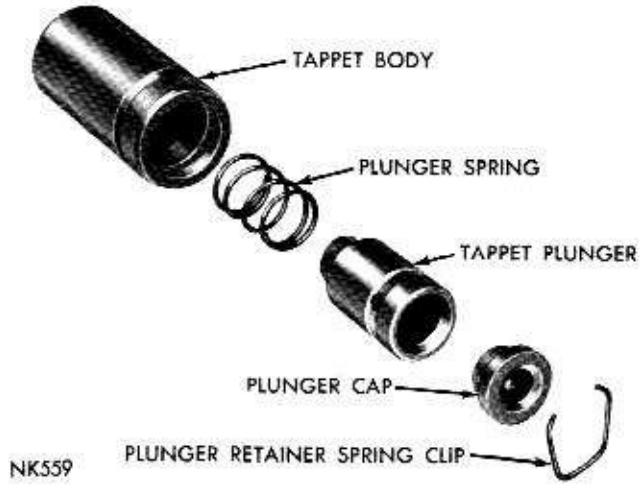


Fig. 19—Hydraulic Tappet Assembly (Disassembled View)

between the plunger and the tappet body, causing the plunger to stick in the down position. This heavy click will be accompanied by excessive clearance between the valve stem and rocker arm as valve closes. In either case, tappet assembly should be removed for inspection and cleaning.

Tappet Removal

(1) The tappet can be removed without removing intake manifold or cylinder heads by following this recommended procedure: Remove cylinder head covers.

(2) Remove rocker arms and shaft assembly.

(3) Remove push rods and place them in their respective holes in Tool C-3068.

(4) Slide puller Tool C-3661 through push rod opening in the cylinder head and seat the tool firmly in the head of the tappet.

(5) Pull tappet out of bore with a twisting motion (Fig. 18).

If all tappets are to be removed, remove hydraulic tappets and place them in their respective holes in tappet and push rod holder, Tool C-3068. This will insure installation of the tappets in their original locations.

A diamond shaped marking stamped on the engine numbering pad indicates that some tappet bodies are .008 inch oversize (Fig. 45).

CAUTION: The plunger and tappet bodies are not interchangeable. The plunger and valve must always be fitted to the original body. It is advisable to work on one tappet at a time to avoid mixing of parts. Mixed parts are not compatible. Do not disassemble a tappet on a dirty work bench.

Disassembly (Fig. 1)

(1) Pry out plunger retainer spring clip.

(2) Clean varnish deposits from the inside of the tappet body above plunger cap.

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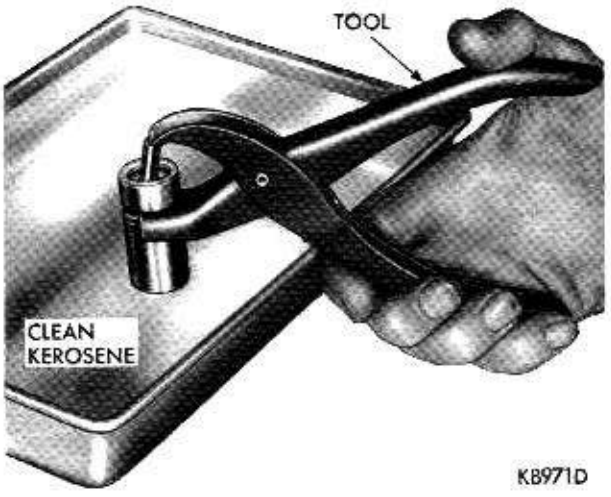


Fig. 20–Testing Tappet Using Tool C-3160

(3) Invert tappet body and remove plunger cap, plunger, flat check valve, check valve spring, check valve retainer and plunger spring.

(4) Separate plunger, check valve retainer and check valve spring. Place all parts in their respective place in tappet holder, Tool C-3068.

Cleaning and Assembly

(1) Clean all tappet parts in a solvent that will remove all varnish and carbon.

(2) Replace tappets are are unfit for further service with new assemblies.

(3) If plunger shows signs of scoring or wear and valve is pitted, or if valve seat on end of plunger indicates any condition that would prevent valve from seating, install a new tappet assembly.

(4) Assembly tappets, (Fig. 19).

Testing

(1) Fill a pan with clean kerosene.

(2) Remove cap from plunger and plunger from tappet body.

(3) Fill tappet body with kerosene and install plunger.

(4) Unseat check valve with a brass rod to permit complete installation of plunger. Replace cap.

(5) Hold tappet in an upright position and insert lower jaw of pliers, Tool C-3160, in the groove of tappet body (Fig. 20).

(6) Engage jaw of pliers with top of tappet plunger. Test leakdown by compressing the pliers. If plunger collapses almost instantly as pressure is applied, disassemble tappet, clean and test again (Fig. 20).

(7) If tappet still does not operate satisfactorily after cleaning, install a new tappet assembly.

Inspection

If the tappet or bore in cylinder block is scored, scuffed, or shows signs of sticking, ream the bore to next oversize.

Installation

(1) Lubricate tappets.

(2) Install tappets and push rods in their original positions.

(3) Install rocker arm and shaft assembly.

(4) Start and operate engine. Warm up to normal operating temperature.

CAUTION: To prevent damage to valve mechanism, engine must not be run above fast idle until all hydraulic tappets have filled with oil and have become quiet.

VALVE TIMING

(All Models)

(1) Turn crankshaft until the NO. 6 exhaust valve is closing and NO. 6 intake valve is opening.

(2) Insert a ¼ iinch spacer between rocker arm pad and stem tip of NO. 1 intake valve (second valve on the left bank).

(3) Install a dial indicator so plunger contacts valve spring retainer as nearly perpendicular as possible.

(4) Allow spring load to bleed tappet down giving in effect a solid tappet. Zero the indicator.

(5) Turn the crankshaft clockwise (normal running direction) until intake valve has lifted .013 inch with 252° camshaft and .034 inch with 256-260° camshaft. See specifications for engine application.

The timing on the timing indicator, located on the chain case cover, should read from 10 degrees BTDC to 2 degrees ATDC. If the reading is not within specified limits: Inspect timing sprocket index marks, inspect timing chain for wear, and determine accuracy of the DC mark on timing indicator. Turn crankshaft counterclockwise until valve is closed and remove indicator and spacer.

CAUTION: Do not turn crankshaft any further clockwise, as the valve spring might bottom and result in serious damage.

TIMING SPROCKET AND CHAIN

Removal

(1) Drain cooling system and remove radiator and water pump assembly.

(2) Remove the crankshaft vibration damper attaching bolt.

(3) Remove two of the pulley bolts, install Tool C-3688, and pull damper assembly off end of crankshaft (Fig. 21).

(4) Remove chain cover and gasket.

(5) Slide crankshaft oil slinger off end of the crankshaft.

Testing Timing Chain for Stretch

(1) Place a scale next to timing chain so any movement of the chain may be measured.

(2) Place a torque wrench and socket over camshaft sprocket attaching bolt and apply torque in the

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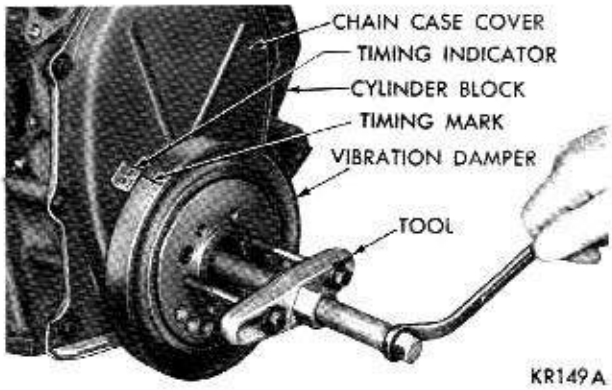


Fig. 21—Removing Vibration Damper Assembly Using Tool C-3688

direction of crankshaft rotation to take up slack; 30 foot-pounds (with cylinder heads installed) or 15 foot-pounds (cylinder heads removed).

(3) Holding a scale with dimensional reading even with edge of a chain link, apply torque in the reverse direction 30 foot-pounds (with cylinder heads installed) or 15 foot-pounds (cylinder heads removed), and note amount of chain movement (Fig. 22).

(4) Install a new timing chain, if its movement exceeds 3/16 inch.

With a torque applied to the camshaft sprocket bolt, crankshaft should not be permitted to move. It may be necessary to block crankshaft to prevent rotation.

(5) If chain is satisfactory, slide crankshaft oil slinger over the shaft and up against sprocket (flange away from sprocket).

(6) If the chain is not satisfactory, remove camshaft sprocket attaching bolt.

(7) Remove timing chain with crankshaft and camshaft sprockets.

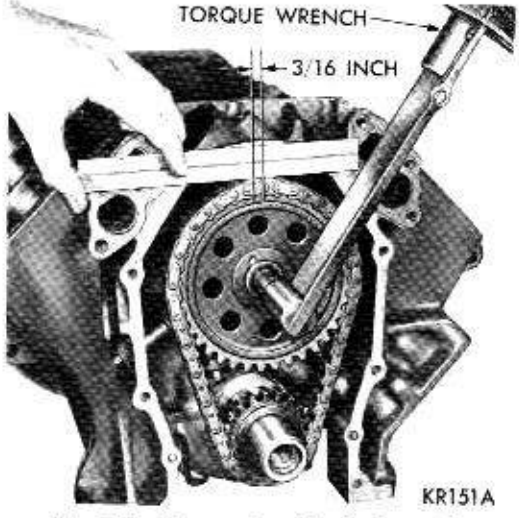


Fig. 22—Measuring Chain Stretch

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Fig. 23—Alignment of Timing Marks

Installation

(1) Place camshaft sprocket and crankshaft sprocket on the bench with timing marks on exact imaginary center line through both camshaft and crankshaft sprocket bores.

(2) Place timing chain around both sprockets.

(3) Turn crankshaft and camshaft to line up with the keyway location on crankshaft sprocket and dowel holes in the camshaft sprocket.

(4) Lift sprockets and chain (keep sprockets tight against chain in position as described).

(5) Slide both sprockets evenly over their respective shafts.

(6) Use a streight edge to measure alignment of timing marks (Fig. 23).

(7) Install washer and camshaft sprocket bolt and tighten to 35 foot-pounds.

TIMING CHAIN COVER OIL SEAL REPLACEMENT (Cover Removed from Engine)

Removal

(1) Position remover screw of Tool C-3506 through case cover, the inside of the case cover up. Position remover blocks directly opposite each other, and force the angular lip between neoprene and flange of seal retainer.

(2) Place the washer and nut on remover screw. Tighten nut as tight as possible by hand, forcing the blocks into the gap to a point of distorting the seal retainer lip (Fig. 24). This is important **remover is only positioned at this point.**

(3) Place sleeve over retainer and place removing and installing plate into the sleeve.

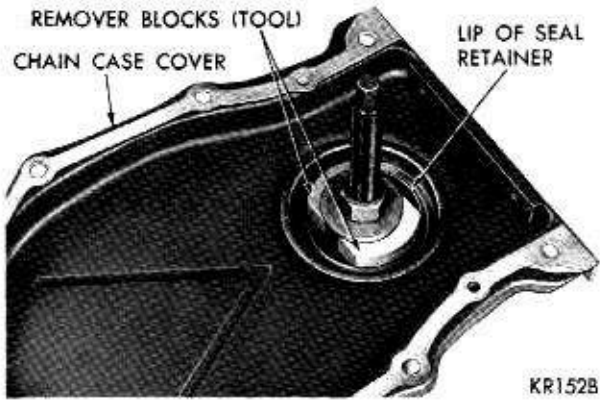


Fig. 24—Remover Blocks Expanded to Puller Position Using Tool C-3506

(4) Place flat washer and nut on remover screw. Hold the center screw and tighten remover nut to remove the seal (Fig. 25).

Installation of the Oil Seal

(1) Insert remover screw through the removing and installing plate so thin shoulder will be facing up.

(2) Insert remover screw with the plate through the seal opening (inside of the chain case cover facing up).

(3) Place seal in cover opening, with neoprene down. Place seal installing plate into the new seal, with the protective recess toward lip of the seal retainer (Fig. 26).

Lip of the neoprene seal must be toward source of oil.

(4) Install flat washer and nut on remover screw, hold screw and tighten nut (Fig. 27).

(5) The seal is properly installed when the neoprene is tight against face of cover. Try to insert a .0015 inch feeler gauge between the neoprene and the cover (Fig. 28). If the seal is installed properly, the feeler gauge cannot be inserted.

It is normal to find particles of neoprene collected between the seal retainer and crankshaft oil slinger after seal has been in operation.

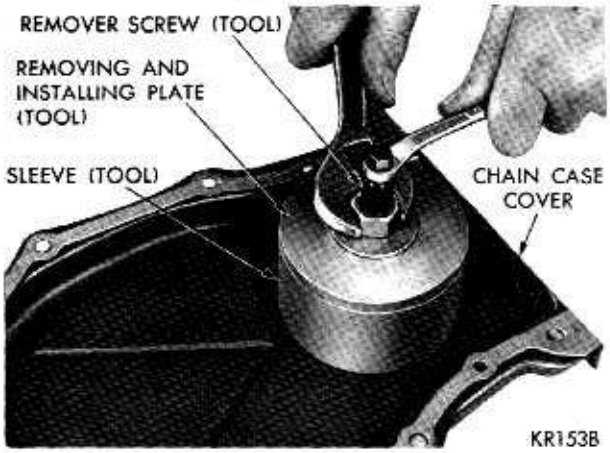


Fig. 25—Removing Oil Seal Using Tool C-3506

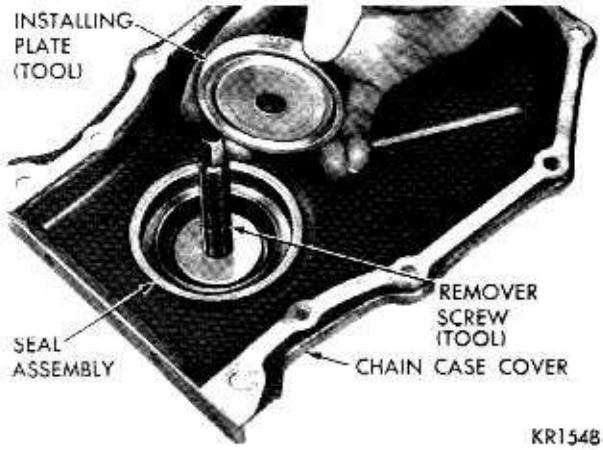


Fig. 26—Positioning Installer Plate on New Seal Using Tool C-3506

Installing the Chain Case Cover

(1) Be sure mating surfaces of chain case cover and cylinder block are clean and free from burrs.

(2) Using a new gasket slide chain case cover over locating dowels. Install and tighten bolts 15 foot-pounds.

Installing Vibration Damper

(1) Place damper hub key in slot in the crankshaft, and slide vibration damper on crankshaft.

(2) Place installing tool, part of puller set Tool C-3688 in position and press damper on the crankshaft (Fig. 29).

(3) Install damper retainer washer and bolt. Tighten to 135 foot-pounds.

(4) Slide belt pulley over shaft and attach with bolts and lockwashers.

(5) Tighten bolts to 15 foot-pounds.

CAMSHAFT

The camshaft has an integral oil pump and distributor drive gear and fuel pump eccentric (Fig. 30).

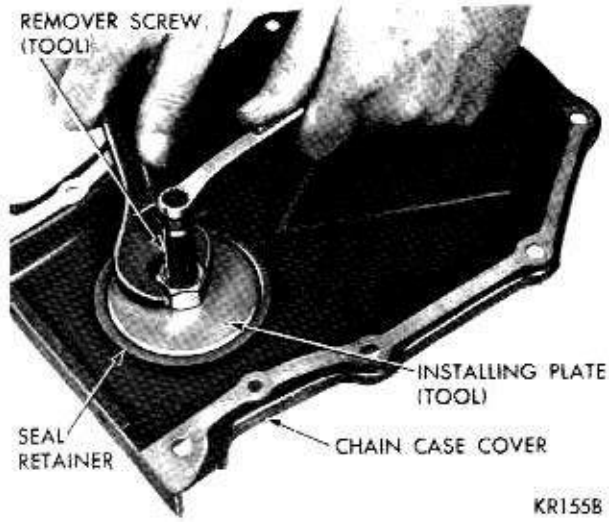


Fig. 27—Installing New Seal Using Tool C-3506

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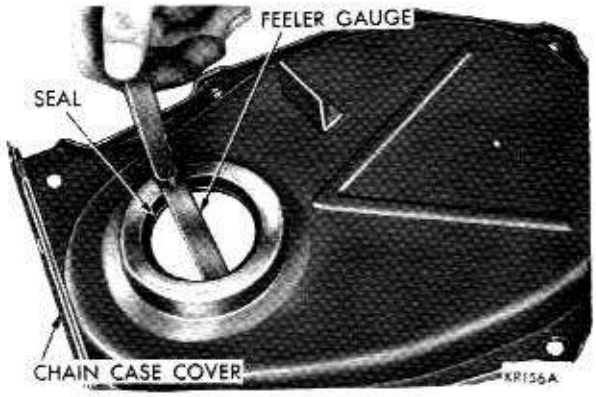


Fig. 28—Inspecting Seal for Proper Seating

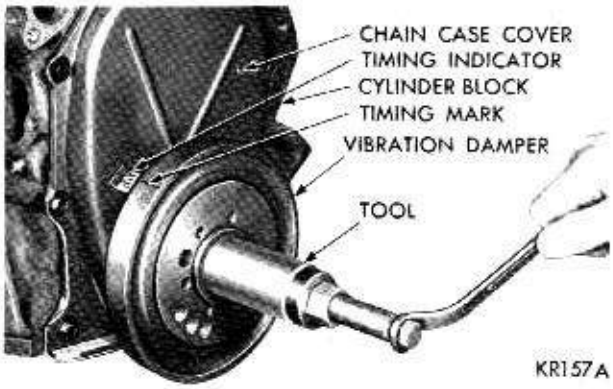


Fig. 29—Installing Vibration Damper Assembly Using Tool C-3688

The rearward camshaft thrust is taken by the rear face of the aluminum camshaft sprocket hub, bearing directly on the front of cylinder block, eliminating need for a thrust plate. The helix of the oil pump and distributor drive gear and camshaft lobe taper both tend to provide a rearward thrust.

Removal

(1) With tappets and the timing chain and sprockets removed, remove distributor and lift out oil pump and distributor drive shaft.

(2) Remove fuel pump to allow fuel pump push rod to drop away from cam eccentric.

(3) Remove camshaft, being careful not to damage the camshaft bearings with the cam lobes.

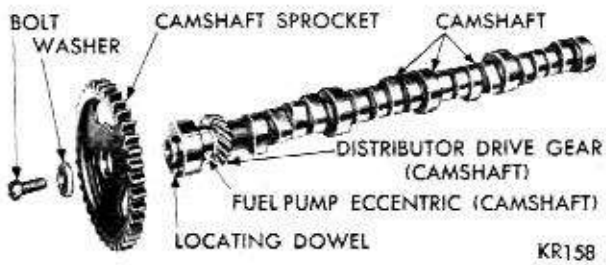


Fig. 30—Camshaft and Sprocket Assembly (Disassembled View)

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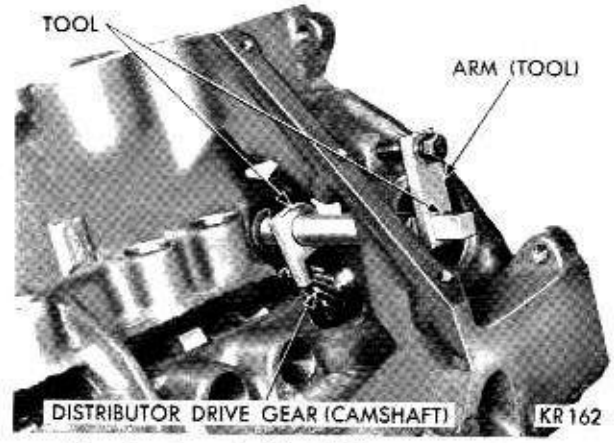


Fig. 31—Camshaft Holding Tool C-3509

Installation

(1) Lubricate camshaft lobes and camshaft bearing journals and insert camshaft to within 2 inches of its final position in the cylinder block.

(2) Modify Tool C-3509 by grinding off index lug holding upper arm on the tool and rotate arm 180 degrees.

(3) Install Tool C-3509 in place of distributor drive gear and shaft (Fig. 31).

(4) Hold tool in position with distributor lock plate screw. This tool will restrict camshaft from being pushed in too far and prevent knocking out the welch plug in the rear of cylinder block.

The tool should remain installed until camshaft and crankshaft sprockets and timing chain have been installed.

Whenever an engine is rebuilt and a new camshaft and/or new tappets are installed, one quart of factory recommended oil additive MoPar Part Number 1879406 or equivalent should be added to the engine oil to aid in break-in. The oil mixture should be left in the engine for a minimum of 500 miles. Drain the oil mixture at the next normal oil change.

Whenever camshaft is replaced, all tappet faces

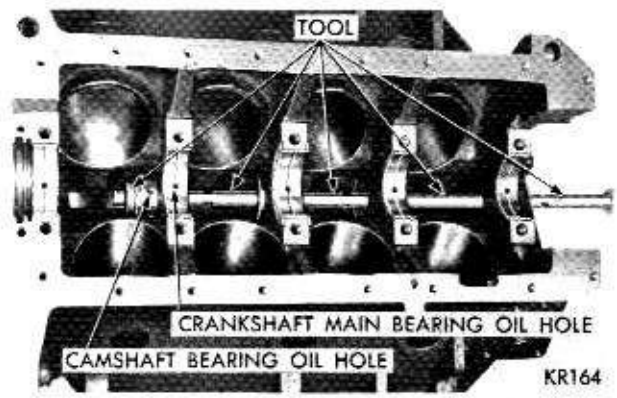


Fig. 32—Removing Camshaft Bearing Using Tool C-3132A

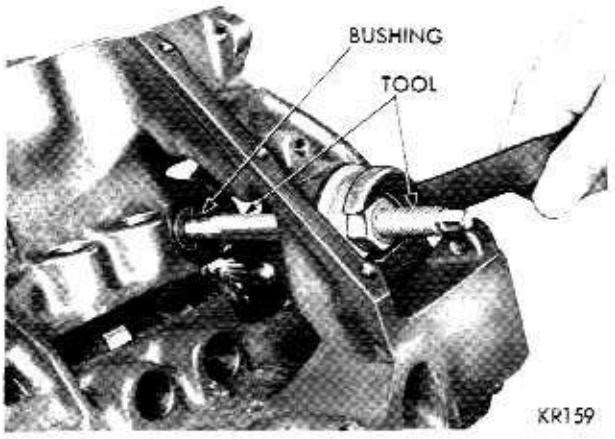


Fig. 33—Removing Distributor Drive Shaft Bushing Using Tool C-3052

must be inspected for crown with a straight edge. If any contact surface is dished or worn, tappet must be replaced.

CAMSHAFT BEARINGS

Removal

(1) With engine completely disassembled, drive out camshaft rear bearing welch plug.

(2) Install proper size adapters and horse shoe washers (part of Tool C-3132A) at back of each bearing to be removed and drive out bearings (Fig. 32).

Installation

(1) Install new camshaft bearings with Tool C-3132A. Place new camshaft bearing over proper adapter.

(2) Position bearing in the tool. Install the horse shoe lock and by reversing removal procedure carefully drive bearing into place (Fig. 32).

(3) Install remaining bearings in like manner.

Install the NO. 1 camshaft bearing 1/32 inward from the front face of cylinder block.

The oil holes in the camshaft bearings and the cylinder block must be in exact register to insure proper lubrication (Fig. 32).

The camshaft bearing index can be inspected after installation by inserting a pencil flashlight in the bearing. The camshaft bearing oil hole should be perfectly aligned with the drilled oil passage from the main bearing. Other oil holes in the camshaft bearings should be visible by looking down on the left bank oil hole above and between NO. 6 and NO. 8 cylinders to NO. 4 camshaft bearing and on the right bank above and between NO. 5 and 7 cylinders to NO. 4 camshaft bearings. If camshaft bearing oil holes are not in exact register, remove and reinstall them correctly. Use Tool C-897 to install a new welch plug at rear of camshaft. **Be sure this plug does not leak.**

DISTRIBUTOR DRIVE SHAFT BUSHING

Removal

(1) Insert Tool C-3052 into the old bushings and thread down until a tight fit is obtained (Fig. 33).

(2) Hold remover screw and tighten remover nut until bushing is removed.

Installation

(1) Slide a new bushing over burnishing end of Tool C-3053 and insert tool bushing into the bore (Fig. 34).

(2) Drive bushing and tool into position, using a soft hammer.

(3) As the burnisher is pulled through the bushing by tightening the remover nut, the bushing is expanded tight in the block and burnished to the correct size (Fig. 35). **DO NOT REAM THIS BUSHING.**

Distributor Timing

Before installing distributor and oil pump drive shaft, time engine as follows:

(1) Rotate crankshaft until NO. 1 cylinder is at top dead center on firing stroke.

(2) When in this position, the straight line on the vibration damper should be under **"O"** on timing indicator.

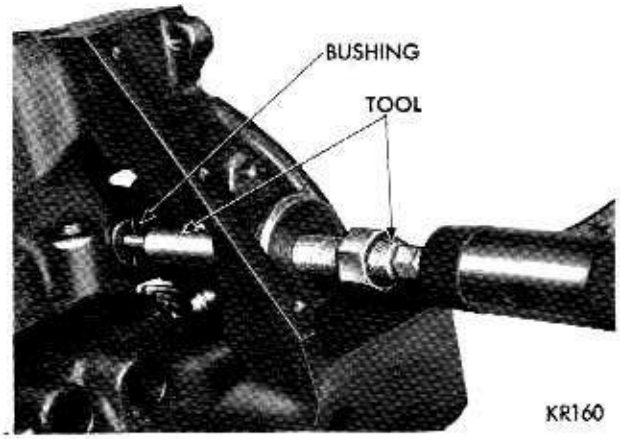


Fig. 34—Installing Distributor Drive Bushing Using Tool C-3053

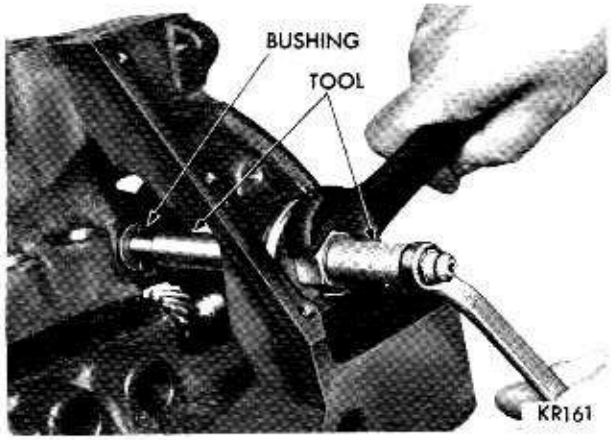


Fig. 35—Burnishing Distributor Drive Shaft Bushing Using Tool C-3053

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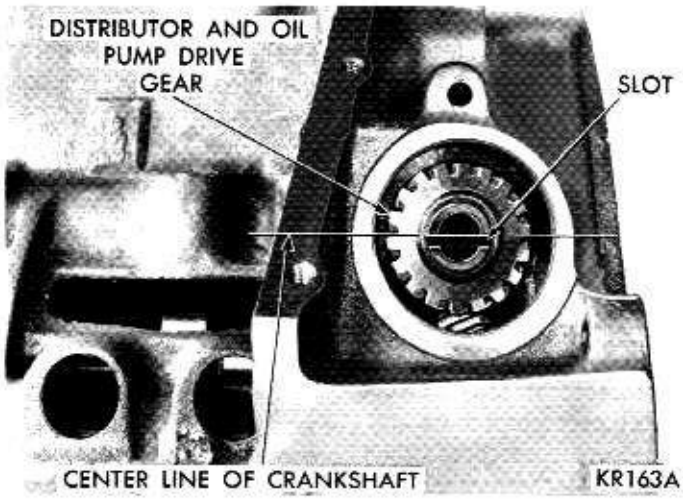


Fig. 36—Distributor Drive Gear Installed

(3) Coat shaft and drive gear with engine oil. Install the shaft so that after gear spirals into place, it will index with the oil pump shaft, so slot in top of drive gear will be parallel with center line of crankshaft (Fig. 36).

Installation of Distributor

(1) Hold distributor over mounting pad on cylinder block with vacuum chamber pointing toward center of engine.

(2) Turn rotor until it points forward and to approximate location of NO. 1 tower terminal in the distributor cap.

(3) Place distributor gasket in position.

(4) Lower the distributor and engage the shaft in the slot of distributor drive shaft gear.

(5) Turn distributor clockwise until breaker contacts are just separating, install and tighten hold down clamp.

CYLINDER BLOCK

The cylinder block is of the deep block design which eliminates the need for a torque converter housing adapter plate. Its sides extend three inches below the crankshaft center line.

Piston Removal

(1) Remove top ridge of cylinder bores with a reliable ridge reamer before removing pistons from cylinder block. **Be sure to keep tops of pistons covered during this operation.**

The pistons and connecting rods must be removed from the top of the cylinder block. When removing the piston and connecting rod assemblies from the engine, rotate crankshaft so each connecting rod is centered in cylinder bore.

(2) Remove connecting rod cap.

(3) Install Tool C-3221 on one connecting rod bolt and protector over the other bolt and push each piston and rod assembly out of cylinder bore.

(4) After removal, install the corresponding bearing cap on the rod.

Cleaning and Inspection

(1) Clean cylinder block thoroughly and inspect all core hole plugs for evidence of leaking.

(2) If new core hole plugs are installed, coat the edges of plug and core hole with a suitable sealer and drive plugs in place with driver, Tool C-897.

(3) Examine block for cracks or fractures.

Inspecting Cylinder Bores

The cylinder walls should be measured for out-of-round and taper with Tool C-119. If the cylinder bores show more than .005" out-of-round, or a taper of more than .010" or if the cylinder walls are badly scuffed or scored, the cylinder block should be rebored and honed, and new pistons and rings fitted. Whatever type of boring equipment is used, boring and honing operation should be closely coordinated with the fitting of pistons and rings in order that specified clearance may be maintained.

Honing Cylinder Bores

Before honing, stuff plenty of clean rags under the bores, over the crankshaft to keep the abrasive materials from entering the crankcase area.

(1) To remove light scoring, scuffing or scratches from the cylinder walls, use resizing hone Tool C-823 with 220 grit stones and 390 extensions necessary with 383 and 440 cubic inch engines. Usually a few strokes will clean up a bore and maintain the required limits.



Fig. 37—Cross-Hatch Pattern

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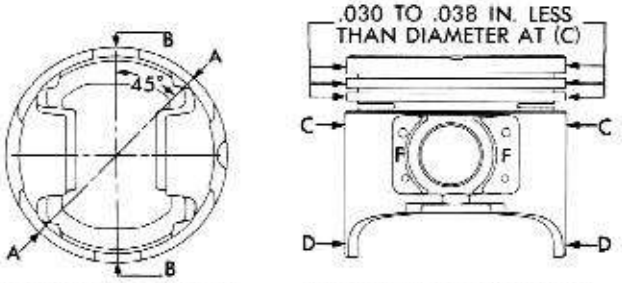


Fig. 38—Piston Measurements

(2) Deglazing of the cylinder walls should be done using a cylinder surfacing hone, Tool C-3501, equipped with 280 grit stones (C-3501-3810). 20 to 60 strokes depending on the bore condition will be sufficient to provide a satisfactory surface. Inspect the cylinder walls after each 20 strokes. Using honing oil C-3501-3880 or a light honing oil available from major oil distributors. Do not use engine or transmission oil, mineral spirits or kerosene.

(3) Honing should be done by moving the hone up and down fast enough to get a cross-hatch pattern. When hone marks intersect at 60°, the cross hatch angle is most satisfactory for proper seating of rings (Fig. 37).

(4) After honing, it is necessary that the block be cleaned again to remove all traces of abrasives. Wash the cylinder block and crankshaft thoroughly.

CAUTION: Be sure all abrasives are removed from the engine parts after honing. It is recommended that a solution of soap and water be used with a brush and the parts then thoroughly dried. The bore can be considered clean when it can be wiped clean with a white cloth and the cloth remains clean. Oil bores after cleaning to prevent rusting.

PISTONS, PINS AND RINGS

Pistons

The pistons are cam ground so that the diameter at the pin boss is less than its diameter across the thrust face. This allows for expansion under normal operating conditions. Under operating temperatures, expansion forces the pin bosses away from each other, thus causing the piston to assume a more nearly round shape. It is important that old or new pistons be measured for taper and elliptical shape before they are fitted into the cylinder bore (Fig. 38).

Finished Pistons

All pistons are machined to the same weight in grams, regardless of oversize so piston balance can be maintained. For cylinder bores which have been honed or rebored, pistons are available in standard and the following oversizes: .005, .020, and .040 inch.

Fitting Pistons

Pistons and cylinder wall must be clean and dry. Specified clearance between the piston and the cylinder wall is .0003 to .0013 inch.

Piston diameter should be measured at the top of skirt 90 degrees to piston pin axis. Cylinder bores should be measured halfway down the cylinder bore and transverse to the engine crankshaft center line.

Pistons and cylinder bores should be measured at normal room temperature, 70 degrees F.

All service pistons include pins, and are available in standard and the following oversizes: .005, .020 and .040 inch.

Fitting Service Rings

(1) Measure piston ring gap about two (2) inches from bottom of cylinder bore in which it is to be fitted. (An inverted piston can be used to push rings down to insure positioning rings squarely in cylinder wall before measuring.)

(2) Insert feeler stock in the gap. Ring gap should be between .013 to .052 inch for the compression rings and .015 to .062 inch for the oil ring steel rails in standard size bores. Maximum gap on .005 inch O/S bores should be .060 inch for compression rings and .070 inch for the oil ring steel rails.

(3) Measure side clearance between piston ring and ring groove (Fig. 39). Clearance should be .0015 to .003 inches for the top compression ring and intermediate ring. Steel rail service oil ring should be free in groove, but should not exceed .005 inch side clearance.

(4) Install the three piece oil ring in lower ring groove using instructions in ring package.

(5) Install tin coated ring in middle groove and chrome compression ring in top groove, so side

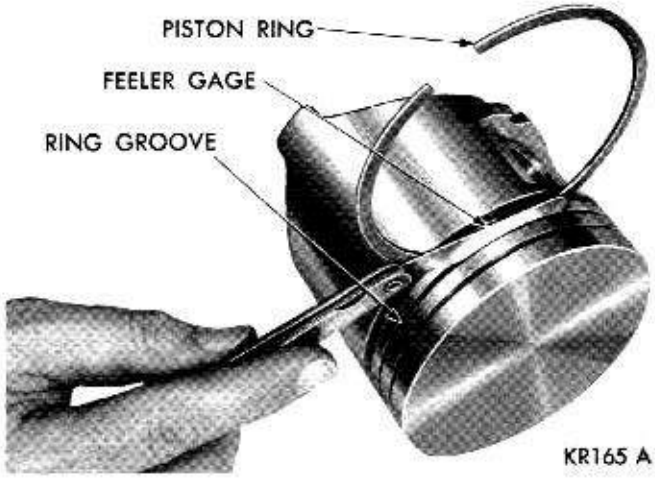


Fig. 39—Measuring Piston Ring Clearance

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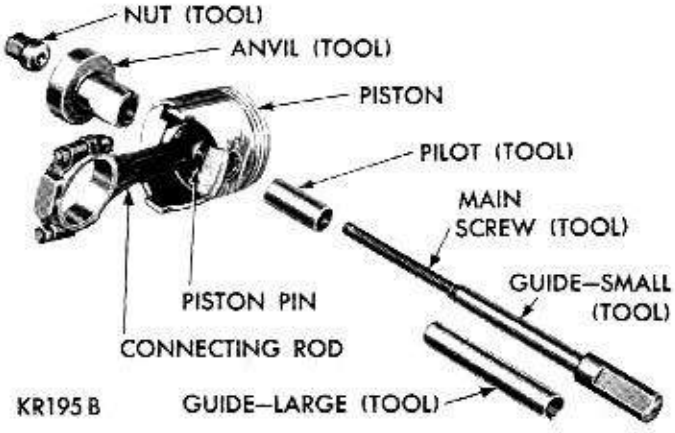


Fig. 40—Tool Arrangement for Removing Piston Pin Using Tool C-3684

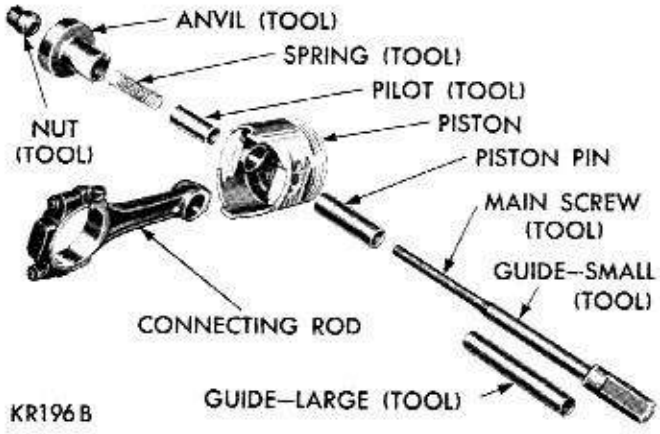


Fig. 42—Tool Arrangement for Installing Piston Pin Using Tool C-3684

marked "TOP" is up.

(6) For the two top rings use ring installer Tool C-3673 for the 383 cubic inch engine, and Tool C-0000 for the 440 cubic inch engines.

Removal of Piston Pin

(1) Arrange Tool C-3684 parts for removal of piston pin (Fig. 40).

(2) Install pilot on main screw.

(3) Install main screw through piston pin.

(4) Install anvil over threaded end of main screw with small end of anvil against piston boss.

Be sure spring is removed from anvil.

(5) Install nut loosely on main screw and place assembly on a press (Fig. 41).

(6) Press piston pin out of connecting rod.

When pin falls free from connecting rod, stop press to prevent damage to bottom of anvil.

(7) Remove tool from piston.

Installation of Piston Pin

(1) Test piston pin fit in the piston. It should be a sliding fit in the piston at 70 degrees F. Piston pins are supplied in standard sizes only.

(2) Lubricate piston pin holes in the piston and connecting rod.

(3) Arrange Tool C-3684 parts for installation of piston pin (Fig. 42).

(4) Install spring inside the pilot and install spring and pilot in the anvil. Install piston pin over main screw.

(5) Place piston, with "front" up, over the pilot so pilot extends through piston pin hole.

(6) Position connecting rod over the pilot which extends through piston pin hole.

Assemble rods to pistons of the right cylinder bank (2, 4, 6, and 8) with indent on piston head opposite to the larger chamfer on the large bore end of connecting rod. Assemble rods to pistons of the left cylinder bank (1, 3, 5, and 7) with indent on piston head on the same side as the large chamfer on the large bore end of the connecting rod.



Fig. 41—Removing Pin Using Tool C-3684

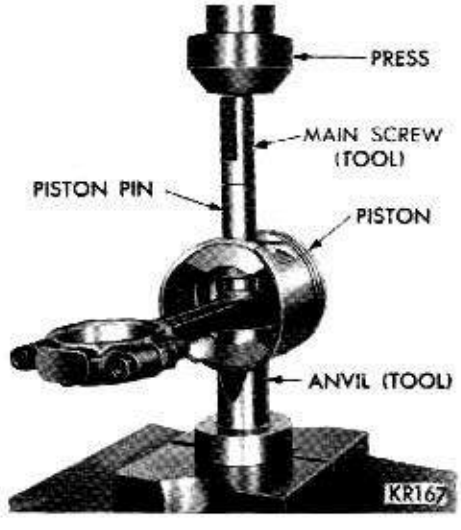


Fig. 43—Installing Piston Pin

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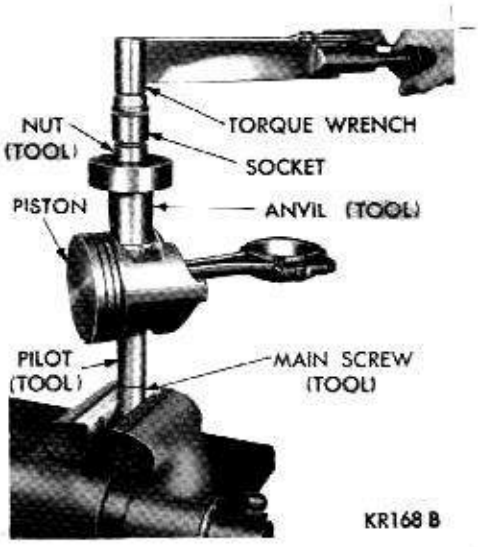


Fig. 44—Testing Fit of Piston Pin in Connecting Rod Using Tool C-3684

(7) Install main screw and piston pin in piston (Fig. 42).

(8) Install nut on puller screw to hold assembly together. Place assembly on a press (Fig. 43).

(9) Press piston pin in until piston pin "bottoms" on pilot. This will position pin in connecting rod.

(10) Remove tool and arrange tool parts and piston assembly in same manner (Fig. 40).

(11) Place assembly in a vise (Fig. 44).

(12) Attach torque wrench to nut and tighten up to 15 foot-pounds. If the connecting rod moves downward on piston pin, reject this connecting rod and piston pin combination. Obtain a connecting rod with proper small end bore diameter and repeat the installation and tightening procedure.

(13) If connecting rod does not move under 15 foot-pounds, piston pin and connecting rod interference is satisfactory, remove tool.

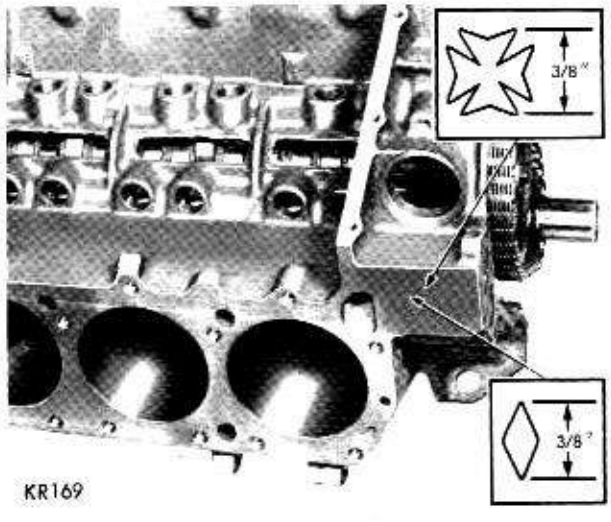


Fig. 45—Showing Location of External Engine Numbering Pad

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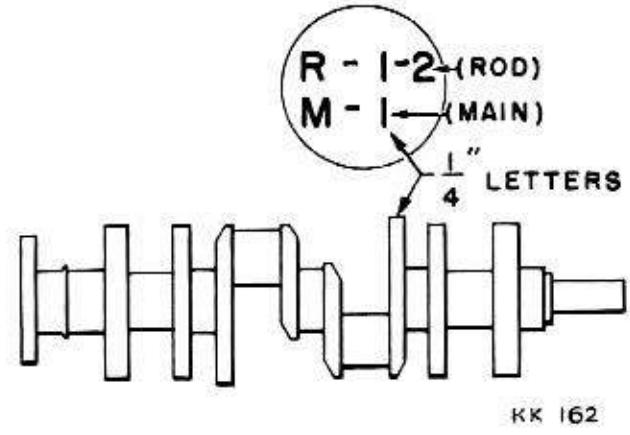


Fig. 46—Showing Location of Mark of No. 3 Counterweight

CONNECTING RODS

IMPORTANT: A Maltese Cross stamped on the engine numbering pad (Fig. 45) indicates that engine is equipped with a crankshaft which has one or more connecting rods and/or main bearing journal finished .001 inch oversize. The position of the undersize journal or journals is stamped on a machine surface of the NO. 3 counterweight (Fig. 46). A MALTESE CROSS followed by an X indicates that all connecting rod and main journals are .010 inch undersize.

Connecting rod journals are identified by the letter "R" and main bearing journals by the letter "M." For example "M-1" indicates that NO. 1 main bearing is .001 inch undersize.

INSTALLATION OF CONNECTING ROD BEARINGS

Fit all rods on one bank until completed. Do not alternate from one bank to another, because when rods are assembled to pistons correctly, they are not interchangeable from one bank to another.

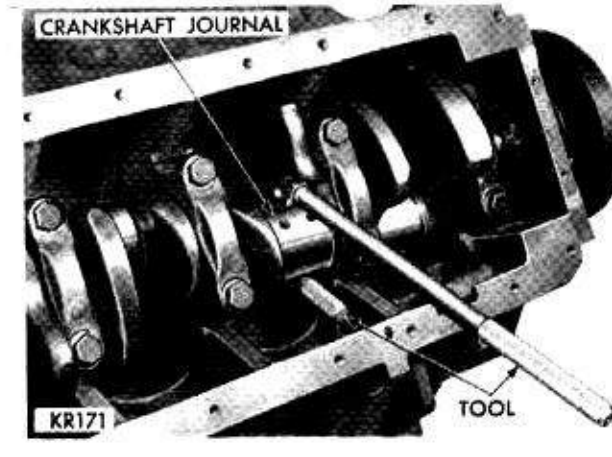


Fig. 47—Installing Connecting Rod Using Tool C-3221

Each bearing cap has a small "V" groove across parting face. When installing the lower bearing shell, make certain "V" groove in shell is in line with "V" groove in cap. This allows lubrication of the cylinder wall. The bearings should always be installed so that the small formed tang fits into the machined grooves of the rods. The end clearance should be from .009 to .017 inch (two rods).

Limits of taper or out-of-round on any crankshaft journals should be held to a maximum of .001 inch. Bearings are available in .001, .002, .003, .010 and .012 inch undersize.

Install the bearings in pairs. Do not use a new bearing half with an old bearing half. Do not file the rods or bearing caps.

MEASURING CONNECTING ROD BEARING CLEARANCE

Shim Stock Method

(1) Place an oiled .001 inch brass shim stock (½ inch wide and ¾ inch long) between bearing and connecting rod journal.

(2) Install bearing cap and tighten to 45 foot-pounds.

(3) Turn connecting rod ¼ turn in each direction. A slight drag should be felt which indicates clearance is satisfactory. The correct clearance is from .0005 to .0015 inch.

(4) Side play should be from .009 to .017 inch.

INSTALLING PISTON AND CONNECTING ROD ASSEMBLY IN CYLINDER BLOCK

(1) Before installing pistons, rods, and rod assemblies in the bore, be sure that the compression ring gaps are staggered so that neither are in line with oil ring rail gaps.

(2) The oil ring expander ends should be positioned toward the outside of the "V" of the engine. The oil ring rail gaps should be positioned opposite each other and above the piston pin holes.

(3) Immerse piston head and rings in clean engine oil, slide ring compressor, Tool C-385, over the piston and tighten with special wrench (part of Tool C-385).

(4) Be sure the position of rings does not change during this operation. Screw connecting rod bolt protector (part of Tool C-3221) on one rod bolt, and insert rod and piston into cylinder bore.

Rotate crankshaft so connecting rod journal is on center of cylinder bore.

(5) Attach puller part of Tool C-3221 on the other bolt, and guide the rod over crankshaft journal (Fig. 47).

(6) Tap piston down in cylinder bore, using handle of a hammer. At the same time, guide the connecting rod into position on crankpin journal.

(7) The notch or groove on top of piston must be pointing toward front of engine and larger chamfer of connecting rod bore must be installed toward the crank pin journal fillet.

(8) Install rod caps, tighten nuts to 45 foot-pounds.

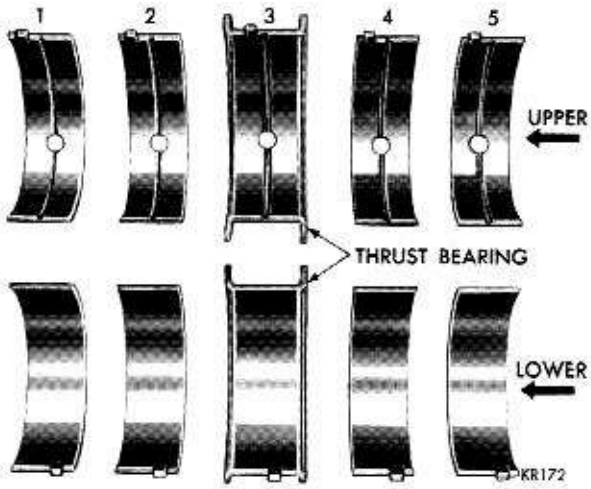


Fig. 48—Main Bearing Identification

CRANKSHAFT MAIN JOURNALS

Crankshaft main bearing journals should be inspected for excessive wear, taper and scoring. Journal grinding should not exceed .012 inch under the standard journal diameter. DO NOT grind the thrust faces of the NO. 3 main bearing. Do not nick crankpin or main bearing fillets. After regrinding, remove rough edges from crankshaft oil holes and clean out all oil passages.

CRANKSHAFT MAIN BEARINGS

New lower main bearings halves Numbers 1, 2, 4, 5 are interchangeable, as shown in Figure 48. New upper main bearing halves Number 2, 4, and 5 are also interchangeable. Upper and lower bearing halves are not interchangeable because upper bearing is grooved

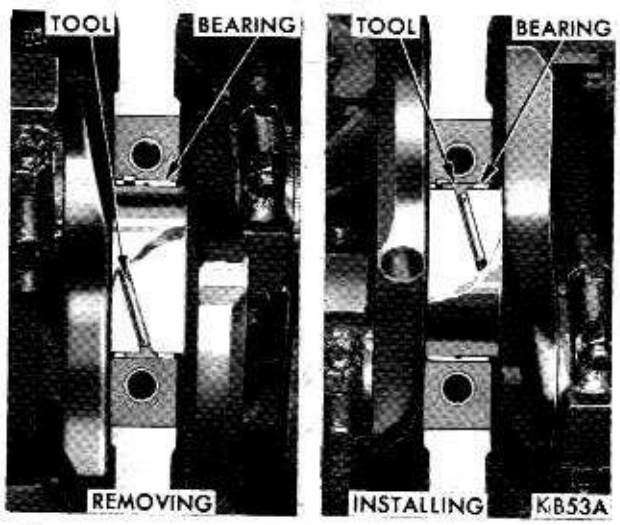


Fig. 49—Removing or Installing Main Bearing Upper Shell

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and the lower is not.

The NO. 1 upper main bearing IS NOT INTERCHANGEABLE AND IS CHAMFERED on the tab side for timing chain oiling and can be identified by a red marking on edge of bearing.

Upper and lower NO. 3 bearings are flanged to carry the crankshaft thrust loads and are **not interchangeable** with any other bearings in the engine.

The bearings that are not badly worn or pitted must be reinstalled in the same position.

Bearing caps are not interchangeable and should be marked at removal to insure correct assembly. Bearings are available in standard and the following undersizes: .001, .002, .003, .010, .011 and .012 inch. Do not install an undersize bearing that will reduce clearance below specifications.

MAIN BEARINGS

Removal

(1) Remove oil pan and mark bearing caps before removal.

(2) Remove bearing caps one at a time. Remove upper half of bearing by inserting Tool C-3059 (Fig. 49) into oil hole of crankshaft.

(3) Slowly rotate crankshaft clockwise, forcing out upper half of bearing.

Installation

Only one main bearing should be selectively fitted while all other main bearing caps are properly torqued.

When installing a new upper bearing shell, slightly chamfer the sharp edges from the plain side.

(1) Start bearing in place, and insert Tool C-3059 into the oil hole of the crankshaft (Fig. 49).

(2) Slowly rotate the crankshaft counterclockwise sliding the bearing into position. Remove Tool C-3059.

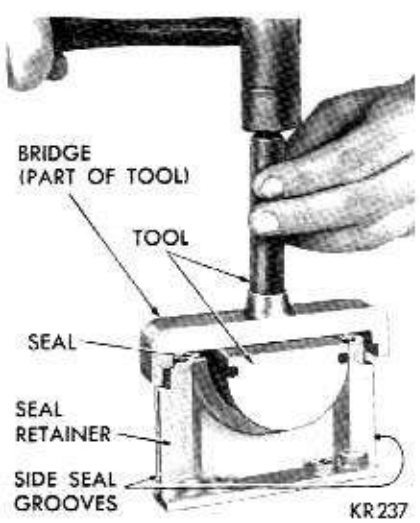


Fig. 50—Installing Rear Main Bearing Lower Oil Seal

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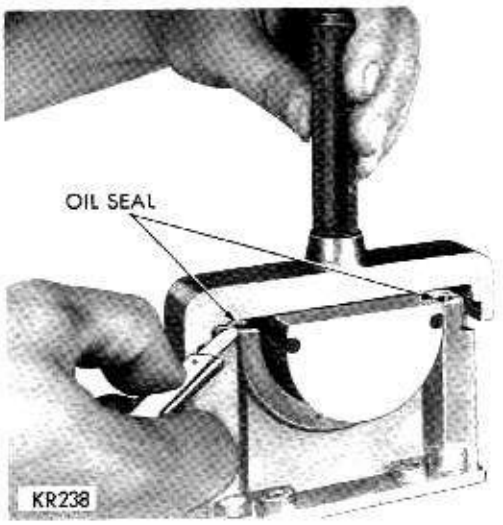


Fig. 51—Trimming Rear Main Bearing Lower Oil Seal

MEASURING MAIN BEARING CLEARANCE

(3) Smooth edges of a ½ x ¾ inch piece of brass shim stock, .001 inch thickness.

(4) Install bearing in center main bearing cap, bearing tang in groove in cap, lubricate bearing and position shim stock across the bearing, install cap, tighten bolts to 85 foot-pounds.

(5) If a slight drag is felt as crankshaft is turned (moved no more than ¼ turn in either direction), clearance is .001 inch or less and is considered satisfactory.

If, however, no drag is felt, the bearing is too large or crankshaft cannot be rotated, bearing is too small and should be replaced with the correct size.

(6) Measure crankshaft end play .002 to .007 inch. If end play is less than .002 inch or more than .007 inch, install a new number 3 main bearing.

(7) Fit remaining bearings in same manner.

It is permissable to use one .001 inch undersize bearing shell with one standard bearing shell or one .002 inch undersize bearing shell with one .001 inch undersize shell. **Always use the smaller diameter bearing half as the upper. Never use an upper bearing half more than .001 inch smaller than the lower bearing half and never use a new bearing half with a used bearing half.**

REPLACEMENT OF THE REAR MAIN BEARING OIL SEAL

(Crankshaft Removed)
Upper Rear Main Seal Installation

(1) Install a new rear main bearing oil seal in cylinder block so that both ends protrude.

(2) Tap seal down into position, using Tool C-3625 for 383 Cubic Inch Engines or Tool C-3743 for 440 Cubic Inch Engines, with bridge removed until tool is seated in bearing bore.

(3) Hold the tool in this position and cut off portion of seal that extends above the block on both sides.

Lower Rear Main Seal Installation

(1) Install a new seal in seal retainer so ends protrude (Fig. 50).

(2) Install the bridge on tool and tap the seal down into position with Tool C-3625 for 383 Cubic Inch Engines or Tool C-3743 for 440 Cubic Inch Engines until tool is seated.

(3) Trim off that portion of the seal that protrudes above the cap (Fig. 51).

Side Seals Installation

Perform the following operations as rapidly as possible. These side seals are made from a material that expands quickly when oiled.

(1) Apply mineral spirits or diesel fuel to the side seals.

(2) Install seals immediately in the seal retainer grooves.

(3) Install the seal retainer and tighten screws to 30 foot-pounds.

Failure to pre-oil the seals will result in an oil leak.

ENGINE OILING SYSTEM

GENERAL INFORMATION

The engine oiling systems consists of an externally mounted rotor type pump, a full flow oil filter, oil pan and the necessary lubrication passages. Oil is forced by the oil pump through the filter to a series of oil passages in the engine (Fig. 52).

SERVICE PROCEDURES

ENGINE OIL PAN

Removal

(1) Disconnect battery cable.

(2) Raise vehicle on a hoist and disconnect steering linkage from idler arm and steering arm.

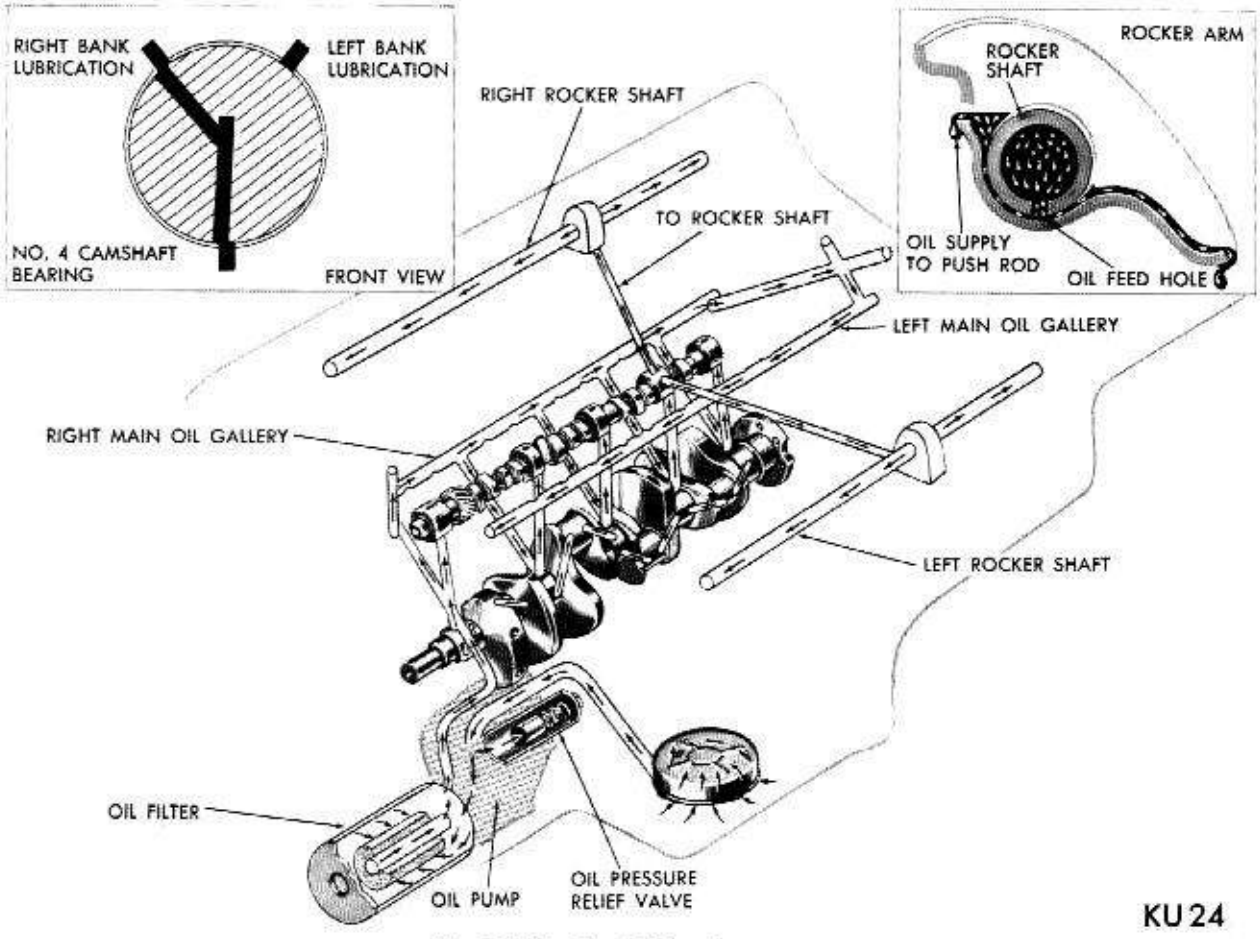


Fig. 52—Engine Oiling System

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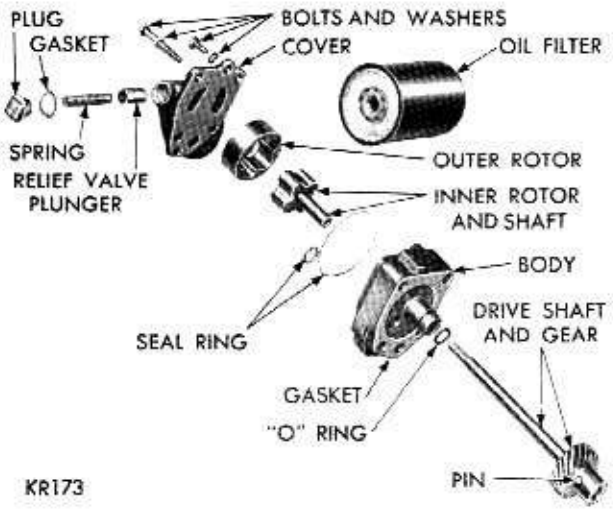


Fig. 53—Oil Pump and Filter Assembly (Disassembled View)

(3) Disconnect exhaust pipe branches from right and left manifolds.

(4) Remove clamp attaching exhaust pipe to extension and remove exhaust pipe.

(5) Drain crankcase oil.

(6) Remove converter dust shield.

(7) Remove oil pan bolts. Turn flywheel until counterweight and connecting rods at front end of crankshaft are at their highest position to provide clearance, and lower the pan. Turn pan counterclockwise to clear oil screen and suction pipe as it is lowered.

Installation

(1) Inspect alignment of oil strainer. The bottom of the strainer must be on a horizontal plane with machined surface of the cylinder block. The bottom of the strainer must touch the bottom of oil pan.

(2) Install oil pan.

(3) Install converter dust shield.

(4) Connect exhaust pipe branches to manifolds and to the exhaust extension.

(5) Connect steering linkage at idler arm and at pitman arm.

(6) Connect battery cable.

(7) Install drain plug and refill crankcase.

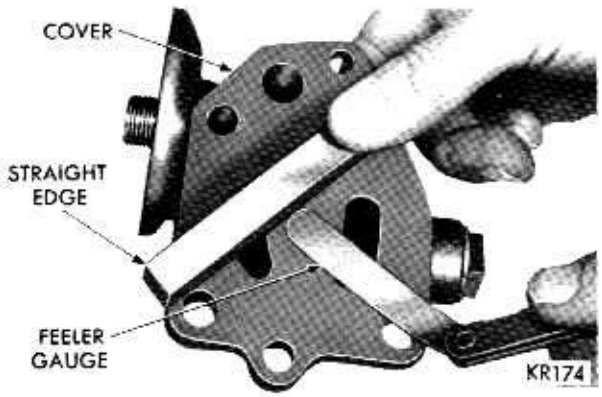


Fig. 54—Measuring Oil Pump Cover Flatness



Fig. 55—Measuring Outer Rotor Thickness

OIL PUMP

Removal

Remove oil pump attaching bolts and remove pump and filter assembly from bottom side of engine.

Assembly

(1) Remove filter base and oil seal ring.

(2) Remove pump rotor and shaft and lift out outer pump rotor.

(3) Remove the oil pressure, relieve valve plug and lift out the spring and relief valve plunger (Fig. 53).

Inspection

(1) Clean all parts thoroughly. The mating face of filter base (oil pump cover) should be smooth. Replace filter base if it is scratched or grooved.

(2) Lay a straightedge across oil pump filter base surface (Fig. 54). If a .0015 inch feeler gauge can be inserted between the base and straightedge, filter base should be replaced.



Fig. 56—Measuring Inner Rotor Thickness

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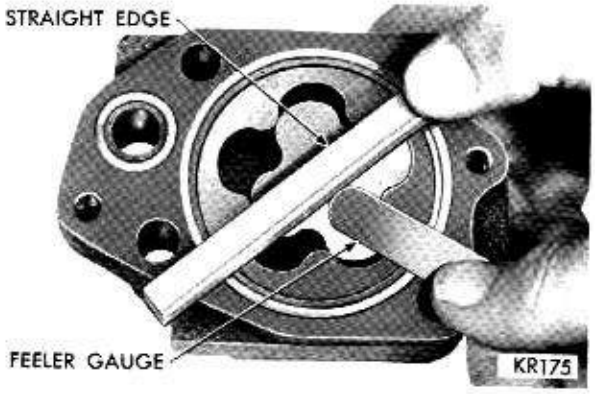


Fig. 57—Measuring Clearance Over Rotors

(3) If outer rotor length measures less than .943 inch (Fig. 55) and diameter less than 2.469 inches, replace outer rotor.

(4) If inner rotor length measures less than .942 inch (Fig. 56), a new inner rotor should be installed.

(5) Slide outer rotor and inner rotor into pump body and place a straightedge across the face (between the bolt holes) (Fig. 57).

(6) If a feeler gauge of more than .004 inch can be inserted between rotor and straightedge replace rotor.

(7) Remove inner rotor and shaft leaving outer rotor in pump cavity.

(8) Press outer rotor body to one side with the fingers and measure the clearance between outer rotor and pump body (Fig. 58).

(9) If measurement is more than .012 inch, replace oil pump body.

(10) If tip clearance between inner and outer rotor (Fig. 59) is more than .010 inch, replace inner and outer rotors.

Servicing Oil Pressure Relief Valve

Inspect oil pump relief valve plunger for scoring and for free operation in its bore. Small scores may be removed with 400 grit wet or dry paper providing extreme care is used not to round off the sharp edge portion of the valve.

For 383 and 440 cubic inch engines the relief valve spring has a free length of 2-9/32 to 2-19/64 inch and is red in color.

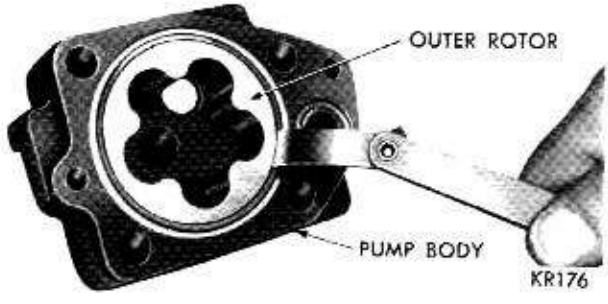


Fig. 58—Measuring Outer Rotor Clearance

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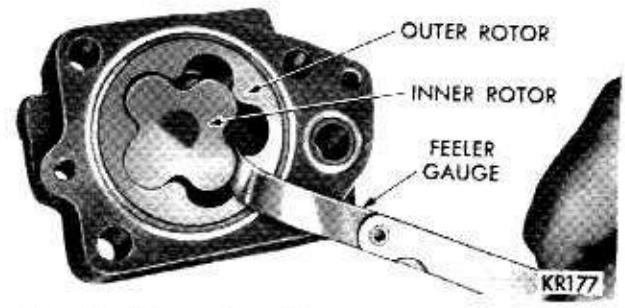


Fig. 59—Measuring Clearance Between Rotors

If the oil pressure is low, inspect for worn bearings, or look for other causes of possible loss of oil pressure.

Installation

When assembling the oil pump, be sure to use new oil seal rings between filter base and pump body.

(1) Install a new "O" ring seal on the pilot of oil pump before attaching oil pump to cylinder block.

(2) Install oil pump on engine, using a new gasket on engine and tighten attaching bolts to 35 foot-pounds.

(3) Install oil filter element.

OIL FILTER REPLACEMENT

The "spin on" oil filter should be replaced every second oil change.

Removal (Fig. 60)

Use care so as not to damage transmission oil cooler lines.

(1) Using Tool C-3845 unscrew the filter from the base on bottom side of engine and discard.

(2) Wipe base clean.

Installation

(1) Install the "spin on" oil filter by hand, finger tight. **Do not use the tool.**

(2) To obtain an effective seal, tighten filter **by hand** the additional number of turns **indicated on the replacement filter.** Start engine and inspect for leaks.



Fig. 60—Removing Oil Filter Using Tool C-3845

CRANKCASE VENTILATION SYSTEM

GENERAL INFORMATION

All models are equipped with a positive crankcase ventilation system consisting of a crankcase ventilator valve and cap mounted on the cylinder head cover, a special carburetor with a hose fitting in its base, and a hose connecting the ventilator valve to the carburetor base fitting. The oil filler cap provides the air inlet for the system. The air drawn into the oil filler cap is circulated through the engine, and drawn out of the cylinder head cover by manifold vacuum into the combustion chambers and dispelled with the exhaust gases (Fig. 1)

SERVICE PROCEDURES

The system must be kept clean to maintain good engine performance durability as deposits will accumulate in the valve, hoses, and the carburetor parts, therefore, the ventilation system should be inspected at least every six months and the valve replaced once a year preferable to coincide with the annual engine performance evaluation. This service will be required more frequently if the vehicle is used extensively for short trips—driving less than 10 miles—with frequent idling, such as city traffic.

With the engine running at idle, remove the ventilator valve and cap assembly from the rocker cover. If valve is not plugged, a hissing noise will usually be heard as air passes through the valve and a strong vacuum should be felt when a finger is placed over the valve inlet. Replace the ventilator valve and cap assembly and remove the inlet breather cap. With engine still running at idle, loosely hold a piece of stiff paper or a parts tag over the oil fill pipe. Within a few seconds, it should be sucked against the oil fill pipe with a holding force. If this occurs, a final test should be made to be certain the valve shuttle is free. A clicking noise should be heard when the valve is shaken (engine not running). If the noise is heard, the unit is functioning satisfactory and no further service is necessary.

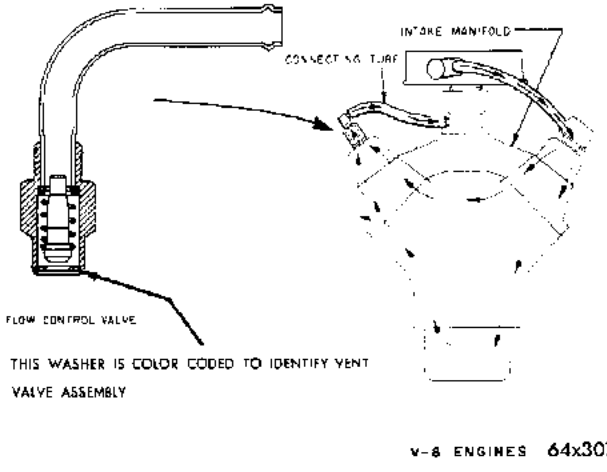


Fig. 1—Crankcase Ventilation System

If the valve does not click when shaken or if the paper is not sucked against fill pipe, valve should be replaced and system retested. (Do not attempt to clean the valve.) On all engines the Mopar Ventilator Valve is identified by a black end washer. With a new valve installed, if the vacuum can be felt with the engine idling, the system is satisfactory. If the vacuum cannot be felt, it will be necessary to clean the ventilator hose and the passages in the lower part of the carburetor. The carburetor must be removed, hand turn a ¼ inch drill through the passages to dislodge the solid particles. Blow clean.

Use a smaller drill if necessary as no metal is to be removed. It is not necessary to disassemble carburetor for this service.

CLOSED CRANKCASE VENTILATING SYSTEM FOR STATE OF CALIFORNIA

GENERAL INFORMATION

A fully closed crankcase ventilation system (Fig. 2) is installed on vehicles built for sale in the State of California and as extra equipment in other states. This fully-closed crankcase system has a closed oil filler cap with a hose connecting the filler cap to the carburetor air cleaner housing.

The air drawn from the carburetor air cleaner through the connecting hose to the filler cap, is circulated through the engine and drawn out of the cylinder head cover by manifold vacuum; through another connecting hose to the carburetor base, into the combustion chamber, and dispelled with the exhaust gases.

On all California vehicles a new outer wrapper is used on the outside of the air cleaner element except High Performance Engines with non-silenced air cleaners. Vehicles **not** equipped with air cleaner element wrapper must be serviced more frequently than the ones with the wrapper.

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SERVICE PROCEDURES

The system must be kept clean to maintain good engine performance and durability as deposits will accumulate in the valve, hose and the carburetor parts, therefore, the ventilation system should be inspected every crankcase oil change and the valve replaced once a year preferable to coincide with the annual engine performance evaluation. This service will be required more frequently if the vehicle is used extensively for short trips—driving less than 10 miles—with frequent idling, such as city traffic.

With the engine running at idle, remove the ventilator valve and cap assembly from the rocker cover. If valve is not plugged, a hissing noise will usually be heard as air passes through the valve and a strong vacuum should be felt when a finger is placed over the valve inlet. Replace the ventilator valve and cap assembly and remove the oil filler cap. With the engine still running at idle, loosely hold a piece of stiff paper or a parts tag over the fill pipe. Within a few seconds, it should be sucked against the oil fill pipe with a holding force. If this occurs, a final test should be made to be certain the valve shuttle is free. A clicking noise should be heard when the valve is shaken (engine not running). If the noise is heard, the unit is functioning satisfactory and no further service is necessary.

If the valve does not click when shaken or if the paper is not sucked against fill pipe, valve should be replaced and system retested. (Do not attempt to clean the valve.) On all engines, the Mopar Ventilator Valve is identified by a black end washer. With a new valve installed, if the vacuum can be felt with the engine idling, the system is satisfactory. If the vacuum cannot be felt, it will be necessary to clean the ventilator hose and the passages in the lower part of the carburetor. The carburetor must be removed, hand turn a ¼ inch drill through the passages to dislodge the solid particles. Blow clean.

Use a smaller drill if necessary as no metal is to be removed. It is not necessary to disassemble carburetor for this service.

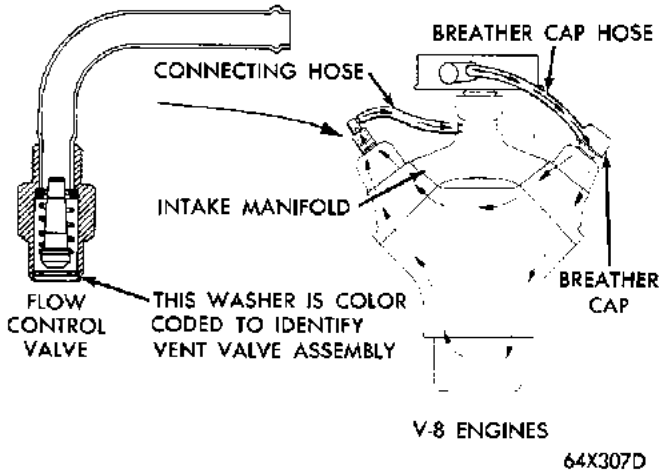


Fig. 2—California Closed Crankcase Ventilation System

CARBURETOR AIR CLEANER

With Wrapper Air Cleaner

The paper element carburetor air cleaner should be inspected and cleaned every six months, and replaced every two years with wrapper.

To clean the filter element, it should be removed from its container. Remove wrapper from element. Wash wrapper in kerosene or similar solvent to remove oil and dirt. Shake or blot dry. Gently blow out dirt from the element with compressed air. Air nozzle should be held about two inches from the inside screen. Clean metal housing, install wrapper on element and reinstall element. Use a new MoPar Filter Element for replacements. These services will be required more frequently if vehicle is used extensively for short trips with frequent idling.

REPAIR OF DAMAGED OR WORN THREADS

Damaged or worn threads can be repaired by the use of Heli-Coils. Essentially, this repair consists of drilling out the worn or damaged threads, tapping the hole with a special Heli-Coil Tap, and installing a Heli-Coil Insert into the tapped holes. This brings the hole back to its original thread size (Fig. 3).

The following chart lists the threaded hole sizes which are used in the engine block and the necessary tools and inserts for the repair of damaged or worn thread. Heli-Coil tools and inserts are readily available from automotive parts jobbers.

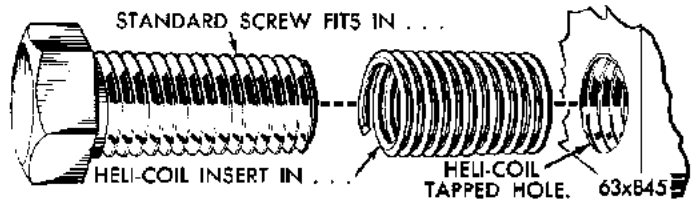


Fig. 3—Heli-Coil Installation

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HELI-COIL INSERT			DRILL	TAP	INSERTING TOOL	EXTRACTING TOOL
Thread Size	Part No.	Insert Length	Size	Part No.	Part No.	Part No.
½-20	1185-4	⅜"	17/64 (.266)	4 CPB	528-4N	1227-6
5/16-18	1185-5	15/32"	Q (.332)	5 CPB	528-5N	1227-6
⅜-16	1185-6	9/16"	X (.332)	6 CPB	528-6N	1227-6
7/16-14	1185-7	21/32"	29/64 (.453)	7 CPB	528-7N	1227-16
½-13	1185-8	¾"	33/64 (.516)	8 CPB	528-8N	1227-16

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SPECIFICATIONS

ENGINE	
Type	90°V
Number of Cylinders	8
Bore	
383 Cubic Inch	4.25 inch
440 Cubic Inch	4.320 inch
Stroke	
383 Cubic Inch	3.375 inch
440 Cubic Inch	3.750 inch
Compression Pressure with Engine Warm, Spark Plugs Removed, Wide Open Throttle	
For 383 cubic inch engine Displacement with 9.2:1 Compression Ratio	125-155 psi.
For 383 and 440 cu. in. engine Displacement with 10.0:1 Compression Ratio	130-165 psi.
Maximum Variation Between Cylinders—Any One Engine	
383 cubic inch Engine 9.2:1	20 psi.
383 and 440 cubic inch Engine 10.0:1	25 psi.
Firing Order	1-8-4-3-6-5-7-2
Basic Timing	12½° B.T.C.
All with Cleaner Air Package (C.A.P.)	5° A.T.C.
CYLINDER NUMBERING (FRONT TO REAR)	
Left Bank	1-3-5-7
Right Bank	2-4-6-8
CYLINDER BLOCK	
Cylinder Bore (Standard)	
383 Cubic Inch	4.2495-4.2515″
440 Cubic Inch	4.320-4.322″
Cylinder Bore out-of-round (Maximum allowable)	.005″
Cylinder Bore Taper (Maximum allowable)	.010″
Reconditioning Working Limits (for taper and out-of-round)	.001″
Maximum Allowable Oversize (Cylinder bores)	.040″
Tappet Bore Diameter	.9050-.9058″
Distributor Lower Drive Shaft Bushing (press fit in cylinder block)	.0005-.0040″
Ream to	.4865-.4880″
Shaft to Bushing Clearance	.0007-.0027″
CRANKSHAFT	
Type	Fully Counter-Balanced
Bearings	Steel Backed Babbitt
Journal Diameter 383 Cubic Inch	2.6245 to 2.6255″
440 Cubic Inch	2.7495 to 2.7505″
Crank Pin Diameter	2.374 to 2.375″
Maximum Out-of-Round Permissible	.001″
Number of Main Bearings	5
Clearance Desired (Bearings Installed I.D. Minus Journal O.D.)	.0005 to 0015″
Maximum Clearance Allowable	.0025″
End Play	.002 to .007″
Thrust Taken by	No. 3 Main Bearing
Finish at Rear Seal Surface	Diagonal Knurling
Interchangeability of Bearings	Upper Nos. 2, 4, 5 Lower Nos. 1, 2, 4, 5

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MAIN BEARINGS (Service)	
All available in standard and the following undersizes	.001, .002, .003, .010, .011, .012"
CONNECTING RODS AND BEARINGS	
Type	Drop Forged "I" Beam
Length (Center to Center) 383 Cubic Inch	6.356 to 6.360"
440 Cubic Inch	6.766 to 6.770"
Weight (Less Bearing Shells) 383 Cubic Inch	812 ± 4 GMS.
440 Cubic Inch	846 ± 4 GMS.
Bearings	Steel Backed Babbitt
Diameter and Length	2.376 x .927"
Clearance Desired (Bearings Installed I.D. Minus Journal O.D.)	.0005 to .0015"
Maximum Allowable	.0025"
Side Clearance	.009 to .017"
Bearings for Service	Standard .001, .002, .003, .010, .012" Undersize
Piston Pin Bore Diameter	1.0923 to 1.0928"
CAMSHAFT	
Drive	Chain
Bearings	Steel Backed Babbitt
Number	5
Thrust Taken By	Cylinder Block
Clearance Desired (Bearing Installed I.D. Minus Journal O.D.)	.001 to .003"
Maximum Allowable	.005"
CAMSHAFT BEARING JOURNALS	
Diameter	
No. 1	1.998 to 1.999"
No. 2	1.982 to 1.983"
No. 3	1.967 to 1.968"
No. 4	1.951 to 1.952"
No. 5	1.748 to 1.749"
CAMSHAFT BEARINGS	
Diameter (after reaming)	
No. 1	2.000 to 2.001"
No. 2	1.984 to 1.985"
No. 3	1.969 to 1.970"
No. 4	1.953 to 1.954"
No. 5	1.750 to 1.751"

VALVE TIMING	383 Cubic Inch 2 BBl. Carburetor	383 and 440 Cubic Inch 4 BBl. Carburetor
Intake Opens (BTC)	13°	18°
Intake Closes (ABC)	59°	58°
Exhaust Opens (BBC)	59°	66°
Exhaust Closes (ATC)	13°	14°
Valve Overlap	26°	32°
Intake Valve Duration	252°	252°
Exhaust Valve Duration	252°	260°

TIMING CHAIN	
Adjustment	None
Number of Links	50
Pitch	.50"
Width	.75"
TAPPETS	
Type	Hydraulic
Clearance in Cylinder Block	.0005 to .0018 inch
Body Diameter	.9040 to .9045
Clearance Between Valve Stem and Rocker Arm Pad (Dry Lash)	.060-.210 inch
Oversize Available for Service	.001, .008, .030 inch
PISTONS	
Type	Horizontal Slot w/ Steel Struts
Material	Aluminum Alloy Tin Coated
Land Clearance	.032" to .040"
Clearance at Top of Skirt	.0005" to .0015"

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Weight (Standard Through .040" Oversize)	
383 Cubic Inch	770 grms.
440 Cubic Inch	864 grms.
Piston Length (Overall)	
383 Cubic Inch	3.84 in.
440 Cubic Inch	3.62 in.
Ring Groove Depth	
No. 1—	
383 Cubic Inch	.220 in.
440 Cubic Inch	.220 in.
No. 2—	
383 Cubic Inch	.220 in.
440 Cubic Inch	.220 in.
No. 3—	
383 Cubic Inch	.208 in.
440 Cubic Inch	.208 in.
Pistons for Service	Standard, .005", .020", .040", Oversize
PISTON PINS	
Type	Press Fit in Rod
Diameter	1.0935 to 1.0937"
Length	3.555 to 3.575"
Clearance in Piston	.00045 to .00075"
Interference in Rod	.0007 to .0012"
Piston Pins for Service	Standard Only
Direction Offset in Piston	Toward Right Side of Engine
PISTON RINGS	
Number of Rings Per Piston	3
Compression	2
Oil	1
Oil Ring Type	3-Piece Chrome-Plated Rails with Stainless Steel Expander-Spacer
Ring Width	
Compression	.0775"-.0780"
Oil—Steel Rails	.025"
Ring Gap	
Compression	.013"-.025"
Oil—Steel Rails	.015"-.055"
Ring Side Clearance	
Compression	.0015"-.0030"
Oil—Steel Rails	.0002"-.005"
Service Rings	
Ring Gap	
Compression	.013"-.052"
Oil—Steel Rails	.015"-.062"
Ring Side Clearance	
Compression	.0015"-.004"
Oil—Steel Rails	.0002"-.005"
VALVES—Intake	
Material	SAE 1041 Steel
Head Diameter	2.08"
Stem Diameter	.372 to .373"
Stem Oversizes Available for Service	Standard .005, .015, .030"
Stem to Guide Clearance	.001 to .003"
Maximum Allowable Before Reconditioning	.017"*
Angle of Seat	45°
Adjustment	None
Lift All Models Except 383 Cubic Inch with 2 BBl. Carburetor	.392"
383 and 440 Cubic Inch with 4 BBl. Carburetor	.425"
VALVES—Exhaust	
Material	Nitrogen Treated Manganese Chromium Nickel Steel
Head Diameter	1.60"
Stem Diameter	.371 to .372"
Stem Oversize Available for Service	Standard .005, .015, .030"

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Stem to Guide Clearance	.002 to .004"
Maximum Allowable Before Reconditioning	.017"*
Angle of Seat	45°
Adjustment	None
Lift 383 Cubic Inch with 2 BBl. Carburetor	.390"
383 and 440 Cubic Inch with 4 BBl. Carburetor	.435"

VALVE SPRINGS	2 BBL. CARB.	4 BBL. CARB.
Number	16	16
Free Length	2.34"	2.58"
Load when compressed to (Valve closed)	95-105 lbs. @ 1-55/64"	121-129 lbs. @ 1-55/64"
Load when compressed to (Valve open)	187-203 lbs. @ 1-15/32"	192-208 lbs. @ 1-7/16"
Valve Springs I.D.	1.010"-1.030"	1.010-1.030"
Maximum allowable out of Plumb	1/16"	1/16"
Valve Spring Installed Height (spring seat to retainer)	1-53/64"-1-57/64"	1-53/64-1-57/64"

Use 1/16" spacer to reduce spring height when over specifications

VALVE GUIDES	
Type	Cast in Head
Guide Bore Diameter	.374-.375" std.

*With tools C-3973 & C-3339 using wobble method.

CYLINDER HEAD	
Number Used	2
Combustion Chamber	Wedge Type
Valve Seat Runout (maximum)	.002"
Intake Valve Seat Angle	45°
Intake Seat Width	.060 to .085"
Exhaust Valve Seat Angle	45°
Exhaust Seat Width	.040 to .060"
Cylinder Head Gasket Compressed (thickness)	.022"

ENGINE LUBRICATION	
Pump Type	Rotor Full Pressure
Capacity (qts.) All except Imperial	4**
Imperial only	5**
Pump Drive	Camshaft
Operating Pressure at 1000 R.P.M.	45 to 65 lbs.
Oil Filter Type	Full Flow
Pressure Drop Resulting from Clogged Filter	7 to 9 lbs.

OIL PUMP INSPECTION LIMITS FOR REPLACEMENT	
Oil Pump Cover (filter base)	.0015 inch or more
Outer Rotor Length	.943 inch or less
Outer Rotor Diameter	2.469 inch or less
Inner Rotor Length	.942 inch or less
Clearance Over Rotor—Outer	.004 inch or more
Inner	.005 inch or more
Outer Rotor Clearance	.012 inch or more
Tip Clearance Between Rotors	.010 inch or more

**When filter is replaced, add 1 quart.

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OVERSIZE AND UNDERSIZE

ENGINE COMPONENT MARKINGS

Engine Displacement	Condition	Identification	Location of Identification
383 cu. in. 440 cu. in.	.001" U/S Crankshaft	Maltese Cross M-2-3 etc. (indicating #2 & 3 main bearing journal) and/or R-1-4 etc. (indicating #1 & 4 connecting rod journals)	Top Pad—Front of Engine Crankshaft Counterweight
	.010" U/S Crankshaft	Maltese Cross and X M-10 (indicate .010" U/S all main journals) and/or R-10 (indicates .010" U/S all rod journals)	Top Pad—Front of Engine Crankshaft Counterweight
— —	.020" O/S Cylinder Bores	A	Top Pad—Front of Engine
—	.008" O/S Tappets	Diamond	Top Pad—Front of Engine
	.005" O/S Valve Stems	O.S.	Single Bolt Boss on End of the Head

TIGHTENING REFERENCE

ENGINE

	FOOT POUNDS	INCH POUNDS
A/C Compressor to Engine Bolt	30	
Alternator Adjusting Strap Bolt	15	
Alternator Adjusting Strap Mounting Bolt	30	
Alternator Bracket to Manifold Bolt	50	
Alternator Mounting Nut	20	
Camshaft Lock Bolt	35	
Carburetor to Manifold Nut	7	
Connecting Rod Nut	45	
Cylinder Head Bolt	70	
Chain Case Cover Bolt	15	
Clutch Housing Bolt	30	
Crankshaft Rear Bearing Seal Retainer	30	
Crankshaft Vibration Damper Bolt	135	
Cylinder Head Cover Stud and Nut		40
Distributor Clamp Nut	15	
Engine Front Mounting to Frame Bolt	75	
Engine Front Mounting to Block Nut	55	
Engine Front Mounting to Frame Stud	20	
Exhaust Manifold Nut	30	
Exhaust Pipe Flange Nut	40	
Exhaust Pipe Clamp Nut	20	
Exhaust Pipe Support Clamp Bolt	20	
Fan Attaching Bolt	15-18	
Fan Belt Idler Pulley Nut	45	
Fan Belt Idler Pulley Bracket Bolt	30	
Fuel Pump Attaching Bolt	30	
Intake Manifold Bolt	50	
Main Bearing Cap Bolt	85	
Manifold Heat Control Counterweight Bolt		50
Oil Pan Drain Plug	20	
Oil Pan Bolt	15	
Oil Pump Cover Bolt	10	
Oil Pump Attaching Bolt	35	
Oil Filter Attaching Stud	30	
Rocker Shaft Bracket Bolt	30	
Spark Plug	30	
Starter Mounting Bolt	50	
Torque Converter Housing Bolt	30	
Transmission Case to Block	30	
Vibration Damper Belt Pulley Bolts	15	
Valve Tappet Cover End Bolt	9	
Water Pump to Housing Bolt	30	
Water Pump Housing to Cylinder Block Bolt	30	

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EXHAUST SYSTEM

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GENERAL INFORMATION

Long life aluminized and stainless steel muffler components are used in the exhaust systems of all models.

Front mufflers on single exhaust systems on Chrysler Newport, 300 and New Yorker models are suspended at the rear by double strap type supports. Rear mufflers and tail pipes are suspended by "L" type supports (Fig. 1).

Mufflers on dual exhaust systems are suspended at the rear by "O" type supports (Fig. 2).

Both single and dual systems use ball joint connections in the exhaust pipes forward of the mufflers to facilitate alignment of the exhaust systems.

Imperial sedan models are equipped with a single exhaust system, using two mufflers (Fig. 3). Imperial convertible models are equipped with a dual exhaust system, using two mufflers in each line (Fig. 4). Supports are provided forward of the front mufflers and rearward of the rear muffler.

The right hand exhaust manifolds on all engines incorporate a thermostatic heat control valve to direct the exhaust gases to a heat chamber beneath the carburetor mounting flange to help vaporize the fuel.

SERVICE DIAGNOSIS

Condition	Possible Cause	Correction
EXCESSIVE EXHAUST NOISE	(a) Leaks at pipe joints.	(a) Tighten clamps at leaking joints.
	(b) Burned or blown out muffler.	(b) Replace muffler assembly.
	(c) Burned or rusted out exhaust pipe.	(c) Replace exhaust pipe.
	(d) Exhaust pipe leaking at manifold flange.	(d) Install a new gasket and tighten exhaust pipe flange nuts to 35 foot-pounds.
	(e) Exhaust manifold cracked or broken.	(e) Replace manifold.
	(f) Leak between manifold and cylinder block.	(f) Tighten manifold to cylinder block nuts to 30 foot-pounds.
LEAKING EXHAUST GASES	(a) Leaks at pipe joints.	(a) Tighten clamps at leaking joints.
	(b) Damaged or improperly installed gaskets.	(b) Replace gaskets as necessary.
	(c) Restriction in muffler or tail pipe.	(c) Remove restriction, if possible or replace as necessary.
ENGINE HARD TO WARM UP OR WILL NOT RETURN TO NORMAL IDLE	(a) Heat control valve frozen in open position.	(a) Free up manifold heat control valve vent nut a suitable solvent.
NOISE IN MANIFOLD	(a) Thermostat broken.	(a) Replace thermostat.
	(b) Weak, broken or missing anti-rattle spring.	(b) Replace spring.
MANIFOLD HEAT CONTROL VALVE RATTLE	(a) Thermostat broken.	(a) Replace thermostat.
	(b) Broken, weak or missing anti-rattle spring.	(b) Replace spring.

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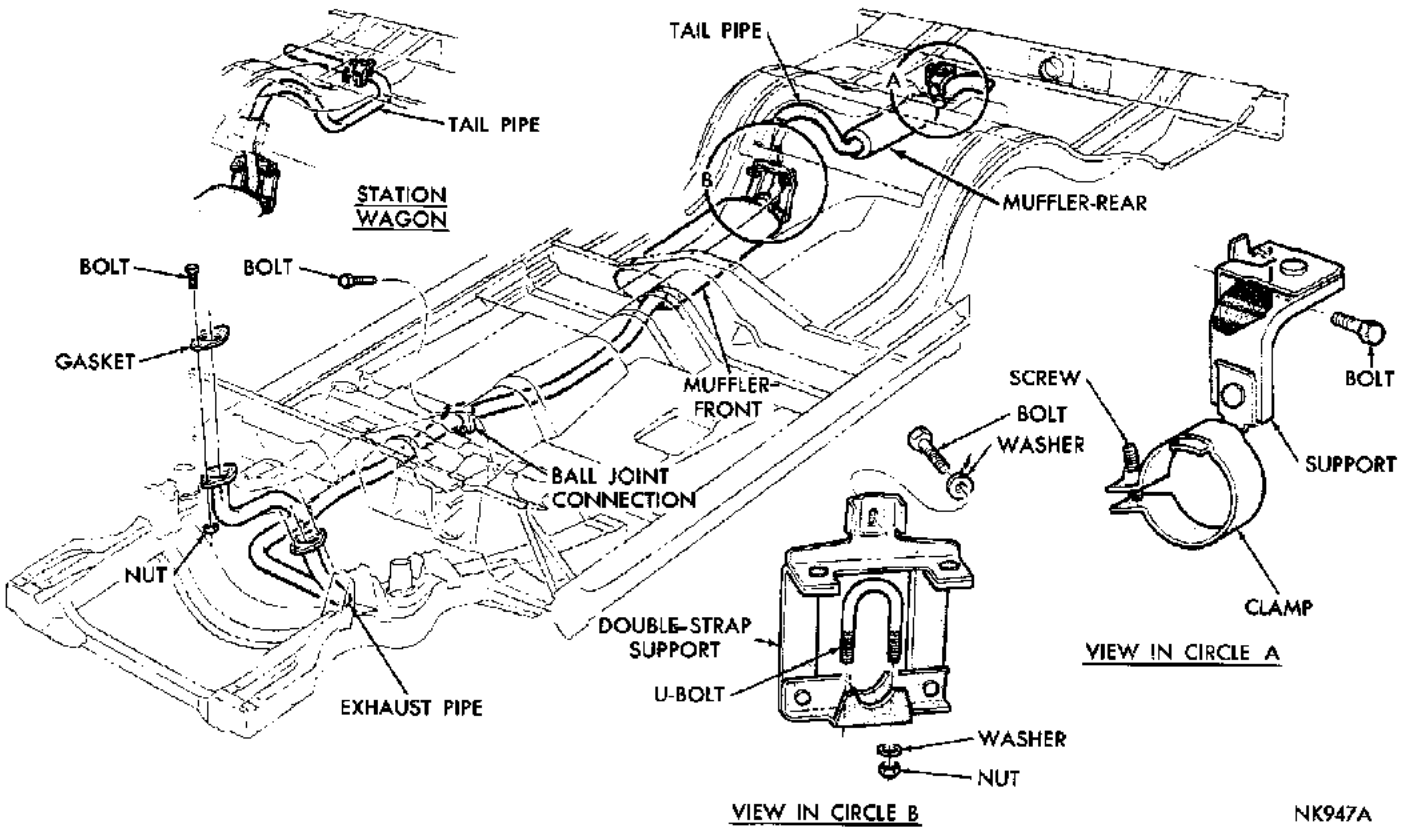


Fig. 1—Exhaust System-Single (Chrysler Newport, 300 and New Yorker)

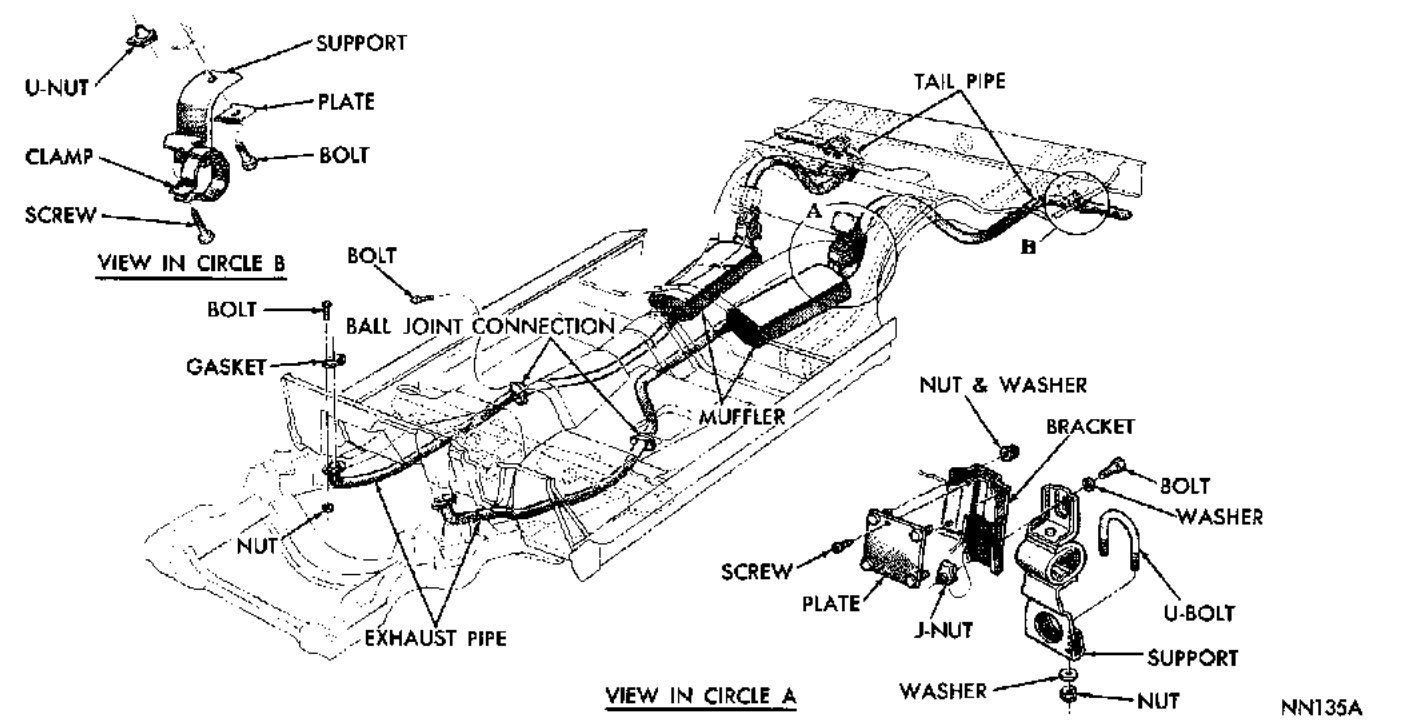


Fig. 2—Exhaust System-Dual (Chrysler Newport, 300 and New Yorker)

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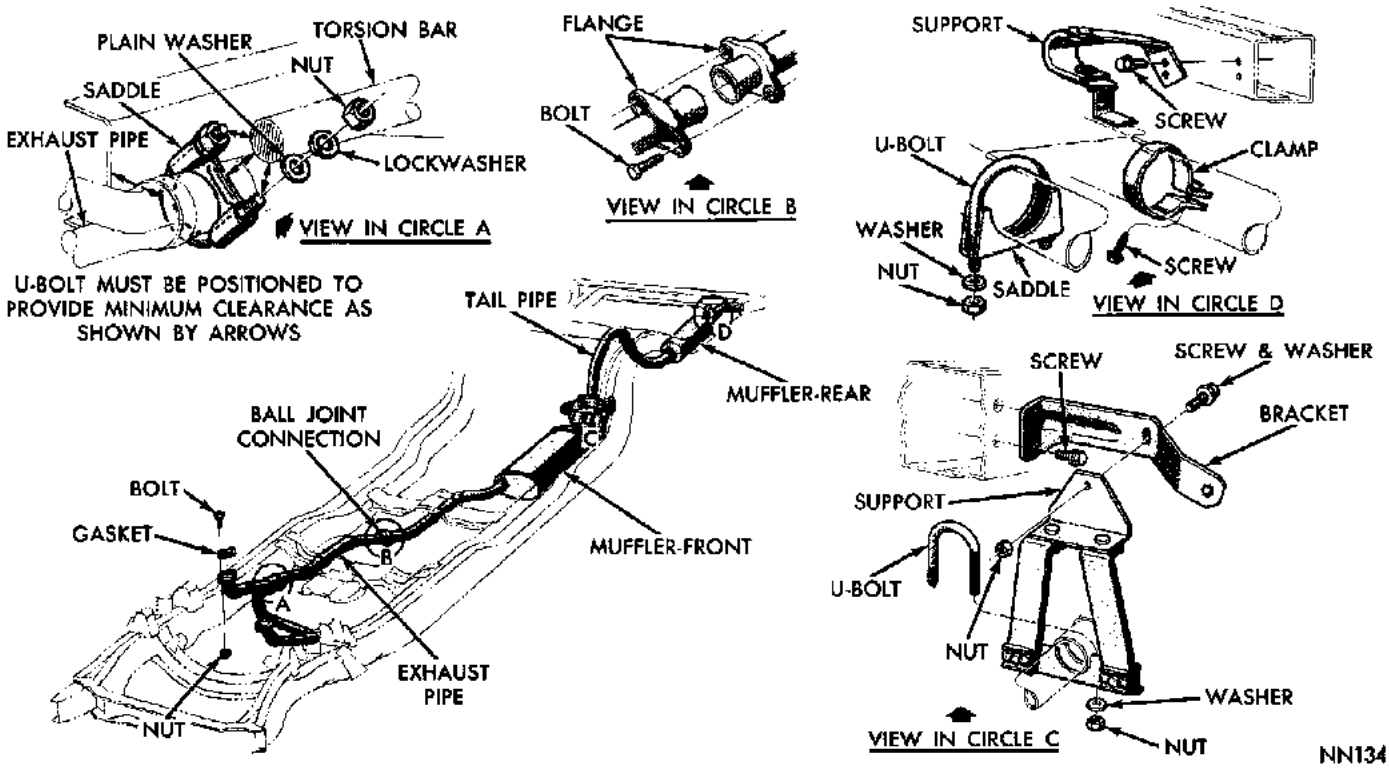


Fig. 3—Exhaust System-Single (Imperial Sedan)

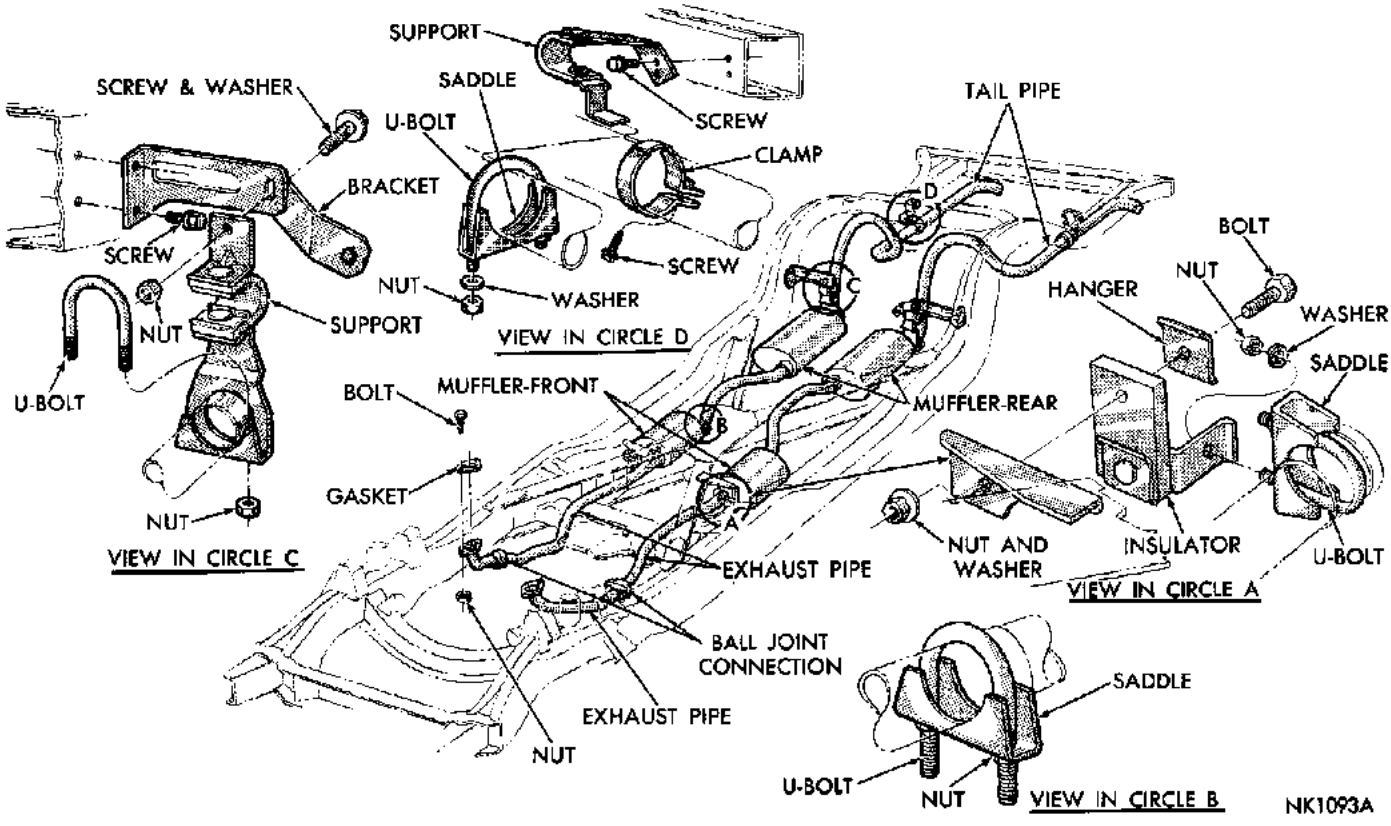


Fig. 4—Exhaust System-Dual (Imperial Convertible)

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SERVICE PROCEDURES

EXHAUST PIPES, MUFFLERS, TAIL PIPES

Removal

(1) Raise vehicle on a hoist and lubricate clamp nuts and bolts with penetrating oil to loosen rust and corrosion.

(2) Remove clamps from exhaust pipe, muffler and tail pipe.

(3) Disconnect ball joint connection in exhaust pipes.

(4) Disconnect exhaust pipe at exhaust manifolds and remove exhaust pipe.

(5) Remove muffler, extension pipe and tail pipe assembly. **If only the muffler is to be replaced, cut the extension at the muffler with a hack saw or cutter. It is not necessary to remove the exhaust pipe. The replacement muffler can be installed, using a clamp at the front of the muffler.**

Installation

(1) Connect exhaust pipe to manifolds, using new gaskets. Tighten nuts to 35 foot-pounds.

(2) Adjust support heights for proper alignment.

(3) Tighten "U" bolt nuts to 100 inch-pounds.

(4) Tighten support clamp screws to 95 inch-pounds.

(5) Align system at ball joint connection and tighten flange bolts to 20 foot-pounds. The inner surfaces of the flanges should be parallel to each other and perpendicular to the pipe axis.

(6) Adjust converter housing bracket, so that it is flat against converter housing and in proper contact with pipe tab. Tighten screw to 15 foot-pounds.

INTAKE MANIFOLD

Refer to "Engine" Group 9 for removal and installation of intake manifold.

With manifold removed, clean and inspect it as follows:

Servicing

(1) Clean manifold in solvent. Blow dry with compressed air.

(2) Inspect exhaust crossover passages and pressure test for leakage into any of the intake passages (Fig. 5).

(3) Inspect mating surfaces for parallelism.

(4) Use new gaskets when installing manifold.

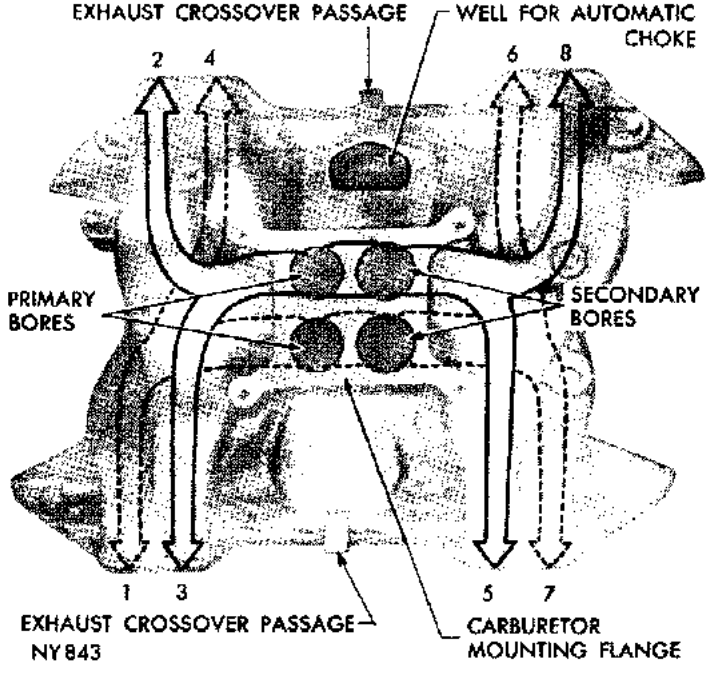


Fig. 5—Intake Manifold (All Models)

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EXHAUST MANIFOLD

Removal

(1) Disconnect spark plug cables from spark plugs.
(2) Remove alternator from right cylinder head.
(3) Disconnect exhaust pipe at exhaust manifold flanges.
(4) Remove nuts that hold exhaust manifolds to cylinder heads.
(5) Slide manifolds off studs and away from cylinder heads.

Cleaning and Inspection

(1) Clean exhaust manifolds in solvent. Blow dry with compressed air.
(2) Inspect manifolds for cracks and distortion.
(3) On right hand manifold test manifold heat control valve for free operation. If necessary to free up, apply a suitable manifold heat control valve solvent to both ends of valve shaft. Be sure mainfold is COOL and solvent allowed to soak a few minutes to dissolve deposits. Then, work valve back and forth until it turns freely. A suitable solvent is available under Part Number 1879318, Manifold Heat Control Valve Solvent.

Installation

If studs came out with the nuts, install new studs, applying sealer on the coarse thread ends. If this precaution is not taken, water leaks may develop at the studs.

(1) Install manifolds on cylinder heads. No gaskets are required. Tighten stud nuts to 30 foot-pounds.
(2) Connect exhaust pipe at exhaust manifolds. Tighten nuts to 35 foot-pounds.
(3) Install alternator on right hand cylinder head and adjust belt tension.
(4) Connect spark plug cables to spark plugs.

MANIFOLD HEAT CONTROL VALVE (All Models)

Servicing

Operation of the manifold heat control valve (Figs. 6 and 11) should be inspected periodically. With engine idling, accelerate momentarily to wide open throttle. The counterweight, on Chrysler models, should respond by moving counter clockwise approximately ½ inch and return to its original position. On Imperial engines, the counterweight should move a similar distance in a clockwise direction. If no movement is observed, the shaft is binding due to accumulation of deposits or the thermostat is weak or broken.

The application of a suitable manifold heat control valve solvent, every six months, to both ends of the manifold heat control valve shaft at the bushings, will keep the valve working freely. The solvent should be applied when the engine is COOL and allowed to soak a few minutes to dissolve the deposits. Then, work the valve back and forth until it turns freely. Such a solvent is available under Part Number 1879318, Manifold Heat Control Valve Solvent.

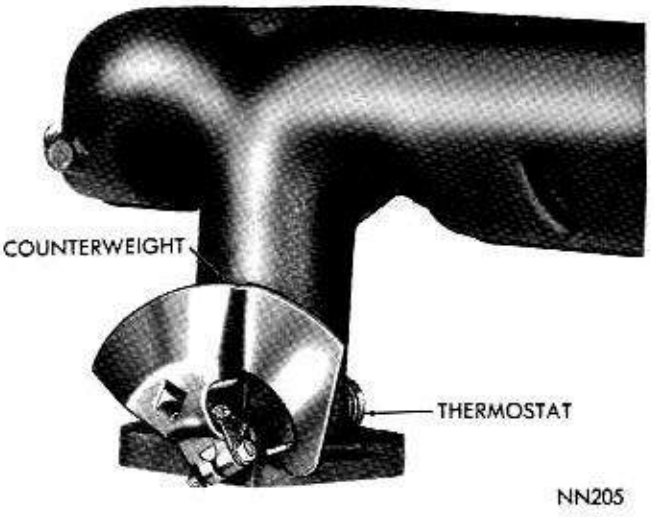


Fig. 6—Heat Manifold Control Valve (Chrysler 383 and 440 Cu. In. Engines)

Removal

The counterweight and the thermostat, on Chrysler Models, being located on opposite ends of the valve shaft, can be serviced individually without the necessity for complete disassembly.

Counterweight—Removal—(Chrysler Models)

(1) Remove counterweight and bumper from outer end of valve shaft by loosening clamp bolt (Fig. 7).

Thermostat—Removal—(Chrysler Models)

(1) To remove thermostat on inner end of valve

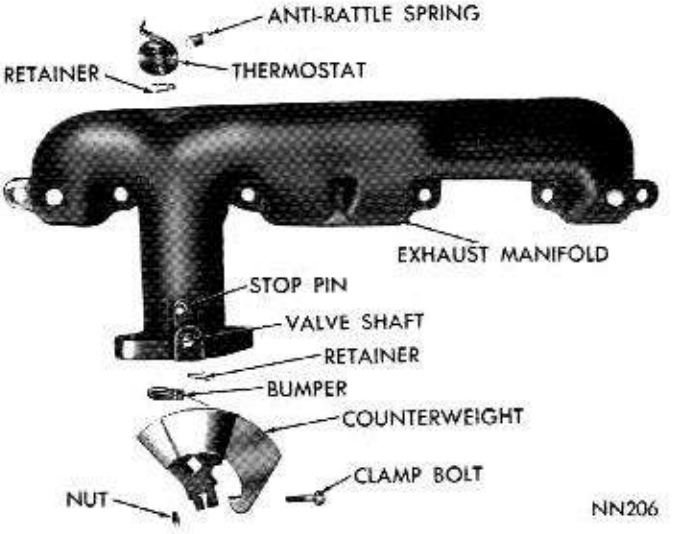


Fig. 7—Heat Manifold Control Valve (Chrysler 383 and 440 Cu. In. Engines)

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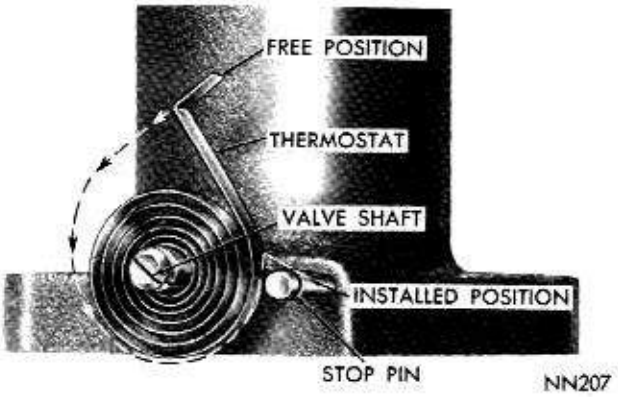


Fig. 8—Installing Thermostat (Chrysler 383 and 440 Cu. In. Engines)

shaft, first remove anti-rattle spring (Fig. 7).

(2) Unhook thermostat from stop pin and slide from valve shaft.

Cleaning and Inspection—(Chrysler Models)

Move valve shaft back and forth and test operation. If the shaft is binding in the manifold, apply a suitable manifold heat control valve solvent to dissolve the deposits, as outlined on page 5.

If fabric on bumper is worn, install a new bumper.

Thermostat—Installation—(Chrysler Models)

(1) Be sure shaft retainer is in place on inner end of valve shaft. Then, turn valve shaft in the extreme clockwise position.

(2) Install a new thermostat in slot in inner end of shaft (Fig. 8) with outer end of thermostat in upper left hand position, as viewed from right hand side of engine. Press inner end of thermostat into shaft and seat firmly.

(3) Wrap outer end of thermostat clockwise, as viewed from right hand side of engine, and engage over stop pin.

(4) Install anti-rattle spring on end of stop pin and end of valve shaft. Make sure it does not interfere with thermostat (Fig. 9).

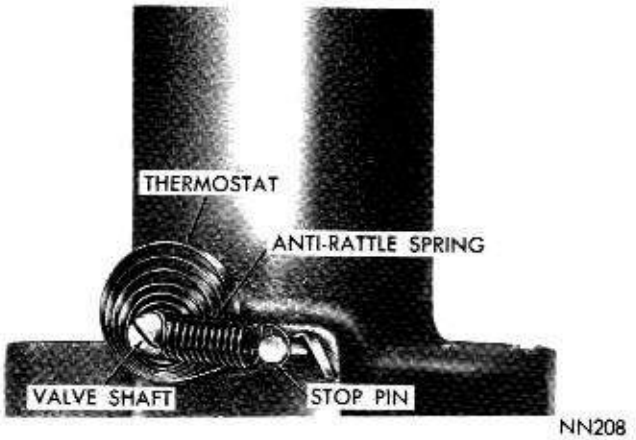


Fig. 9—Thermostat Installed (Chrysler 383 and 440 Cu. In. Engines)

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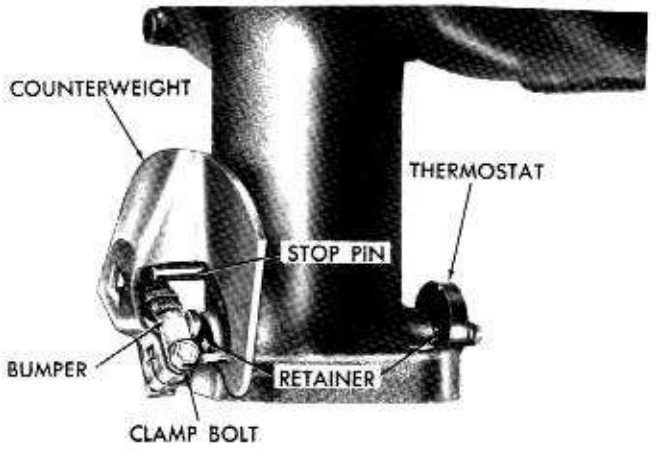


Fig. 10—Installing Counterweight (Chrysler 383 and 440 Cu. In. Engines)

Counterweight-Installation—(Chrysler Models)

(1) Be sure shaft retainer is in place on outer end of valve shaft.

(2) Install counterweight and bumper on outer end of valve shaft. The bumper should be located on the right hand side of the hub section of the counterweight and on the left hand side of the stop pin (Fig. 10).

(3) Tighten clamp bolt to 50 inch-pounds with C-3380 Torque Wrench. Test operation of valve for freedom of movement.

Counterweight and Thermostat—Removal Imperial Models

(1) Loosen counterweight clamp bolt (Fig. 11) and remove counterweight, lock and bumper from end of shaft.

(2) Unhook thermostat from pin and remove by sliding out of valve shaft slot.

(3) If valve shaft is binding in manifold, apply Manifold Heat Control Valve Solvent, Part Number 1879318, or equivalent, and allow to soak a few minutes to dissolve the deposits. Then, work shaft back and forth until it turns freely.

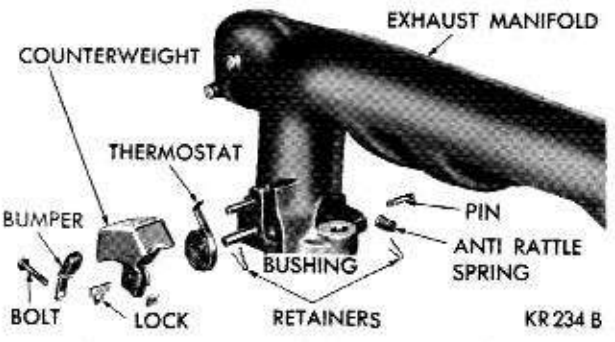


Fig. 11—Manifold Heat Control Valve (Imperial Models)

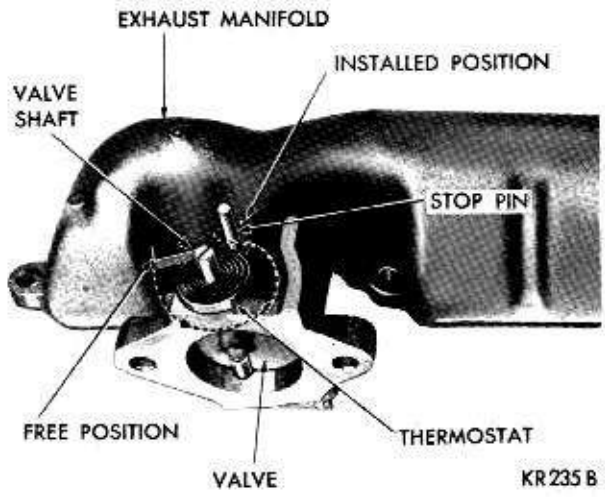


Fig. 12—Positioning the Thermostat (Imperial Models)

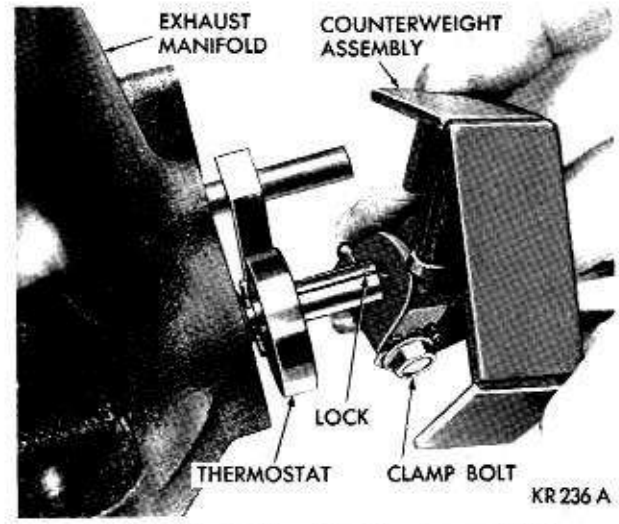


Fig. 13—Installing the Counterweight (Imperial Models)

Thermostat and Counterweight—Installation Imperial Models

(1) Position shaft in extreme counterclockwise position.

(2) Place a new thermostat in shaft slot with outer end of thermostat facing downward on left hand side (Fig. 12). Wrap outer end of thermostat counterclockwise and engage it under pin.

(3) Place counterweight on shaft with shield in upper position and insert lock in shaft slot (Fig. 13).

(4) Center counterweight on shaft and turn valve clockwise until bumper passes pin.

(5) Press counterweight on shaft until it is seated. Tighten clamp bolt to 50 inch-pounds, using C-3380 Torque Wrench.

(6) Make sure anti-rattle spring on opposite end of shaft is in place. Test operation of valve.

MANIFOLD HEAT CONTROL VALVE REPLACEMENT

Removal

(1) Remove alternator.

(2) Remove exhaust pipe from manifold.

(3) Remove exhaust manifold from engine.

(4) Remove counterweight, thermostat, shaft retainers and anti-rattle spring.

(5) Cut valve plate off shaft.

(6) Remove shaft and press bushings from the manifold.

Installation

(1) Install new bushings in exhaust manifold.

(2) **Install shaft in manifold and check shaft for freedom of movement. If shaft fails to turn freely, it will be necessary to hone the bushings to shaft size.**

(3) Pull shaft out far enough to position the valve plate on the shaft, then slide shaft into position in both bushings.

(4) Align hole in valve plate with hole in shaft and insert a drift into both holes to maintain correct positioning of valve plate as it is being welded to shaft.

(5) Remove drift from valve plate and shaft.

(6) Install new thermostat, anti-rattle spring, shaft retainers and counterweight assembly on shaft.

(7) Install manifold on engine assembly.

(8) **Attach exhaust pipe to manifold, using a new gasket where required.**

(9) Install alternator and adjust belt tension.

(10) Start engine and test operation of manifold heat control valve assembly.

Servicing

Test the manifold heat control valve for proper operation during engine tune-up and apply a suitable manifold heat control valve solvent to both ends of valve shaft as outlined on page 5.

TIGHTENING REFERENCE

	POUNDS FOOT	POUNDS INCH
Converter Housing Bracket Screw	15	
Exhaust Manifold Nuts	30	
Exhaust Pipe U-Bolt Nuts		150
Exhaust Pipe Ball Joint Bolts	24	
Exhaust Pipe Flange Bolt Nuts	35	
Heat Control Valve Counterweight Clamp Bolt Nut		50
Rear Muffler Support to Underbody Bolts		200
Support Clamp Screws		95
Tail Pipe Support to Underbody Bolts		200

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FUEL SYSTEM

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GENERAL INFORMATION

SERVICING THE CARBURETOR

Dirt, dust, water and gummy deposits are some of the main causes for poor carburetor operation. However, proper cleaning and the installation of new parts, where required, will return the carburetor to its original designed performance.

When overhauling the carburetor, several items of importance should be observed to assure a good job:

(1) All parts (except the choke diaphragm assembly) should be carefully cleaned in a suitable solvent, then inspected for damage or wear.

(2) Use air pressure only, to clear the various orifices and channels.

(3) Replace questionable parts with NEW ones. When checking parts removed from the carburetor, it is at times rather difficult to be sure they are satisfactory for further service. It is therefore, recommended that in such case, NEW parts be installed.

(4) Always use a complete kit when overhauling the carburetor. Using the code number stamped on the air horn, adjacent to the fuel inlet, refer to the parts catalog and order the correct repair kit for the carburetor being worked on.

CLEANING CARBURETOR PARTS

The recommended solvent for gum deposits is denatured alcohol which is easily obtainable. However, there are other commercial solvents, (such as Metalclene) which may be used with satisfactory results.

The choke diaphragm can be damaged by solvents. Avoid placing the diaphragm assembly in **ANY** liquid. Clean the external surfaces with a clean cloth or soft wire brush. Shake dirt or other foreign material from the stem side of the diaphragm. Depressing the diaphragm stem to the retracted position, will provide an additional hole for the removal of dirt. Compressed air can be used to remove loose dirt, **but should not be connected to the vacuum inlet fitting.**

IMPORTANT: If the commercial solvent or cleaner recommends the use of water as a rinse, it should be "HOT." After rinsing, all trace of water must be blown from the passages with air pressure. It is further advisable to rinse all parts in clean gasoline or kerosene to be certain no trace of moisture remains. Never clean jets with a wire, drill or other mechanical means because the orifices may become enlarged, making the fuel mixture too rich for proper performance.

AUTOMATIC CHOKE (Well Type)

To function properly, it is important that all parts be clean and move freely. Other than an occasional cleaning, the automatic choke control requires no servicing. However, it is very important that the choke control unit works freely at the thermostatic coil spring housing and at the choke shaft. Move the choke rod up and down to check for free movement of the coil housing on the pivot. If the unit binds, a new unit should be installed. **The well type choke is serviced as an assembly. Do not attempt to repair or change the setting, unless authorized by service literature. Changes of the choke setting materially affect summer temperature cold starting and seldom are a satisfactory correction of driveability problems, which are generally associated with carburetors or vacuum diaphragms.**

When installing the well type choke unit, make certain that the coil housing does not contact the sides or bottom of the well. Any contact at this point will affect choke operation.

Do not lubricate any of the choke parts or the control unit, since this causes dirt to accumulate, which would result in a binding condition of the choke mechanism.

The choke control unit is accurately adjusted when originally assembled. Under normal service operation, it is recommended **not** to change the setting, or to disassemble the components for servicing. If however, the setting has been disturbed, reset as follows:

Loosen locknut "A" and turn part with screwdriver until index mark on disk "B" coincides with the correct mark on the bracket. Hold in this position with screwdriver while tightening nut. (See Specifications.)

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SERVICE DIAGNOSIS

Condition	Possible Cause	Correction
POOR IDLING	(a) Idle air bleed carbonized or of incorrect size.	(a) Disassemble the carburetor. Then, use compressed air to clear idle bleed after soaking it in a suitable solvent.
	(b) Idle discharged holes plugged or gummed.	(b) Disassemble the carburetor. Then, use compressed air to clear idle discharge *holes after soaking the main and* throttle bodies in a suitable solvent.
	(c) Throttle body carbonized or worn throttle shaft.	(c) Disassemble the carburetor. Check the throttle valve shaft for wear. If excessive wear is apparent, replace the throttle body assembly.
	(d) Damaged or worn idle mixture needle.	(d) Replace the worn or damaged idle needle. Adjust the air mixture.
	(e) Low grade fuel or incorrect float level.	(e) Test the fuel level in the carburetor. Adjust as necessary to obtain the correct float level.
	(f) Loose main body to throttle body screws.	(f) Tighten the main body to throttle body screws securely to prevent air leaks and cracked housings.
	(g) Worn or corroded needle valve and seat.	(g) Clean and inspect the needle valve and seat. If found to be in questionable condition, replace assembly. *Then, test fuel pump pressure. Refer* to Specifications for correct fuel pump pressure.
	(h) Incorrect timing.	(h) Reset timing.
POOR ACCELERATION	(a) Accelerator pump piston (or plunger) *leather too hard, worn, or loose on* stem.	(a) Disassemble the carburetor. Replace *accelerator pump assembly if leather* is hard, cracked or worn. Test follow-up spring for compression.
	(b) Faulty accelerator pump discharge ball.	(b) Disassemble the carburetor. Use compressed air to clean the discharge nozzle and channels after soaking the *main body in a suitable solvent.* Test accelerator pump capacity.
	(c) Faulty accelerator pump inlet check ball.	(c) Disassemble the carburetor. Check the accelerator pump inlet check ball for poor seat or release. If part is faulty, replace.
	(d) Incorrect fuel or float level.	(d) Test the fuel or float level in the carburetor. Adjust as necessary to obtain the correct float level.
	(e) Worn accelerator pump and throttle linkage.	(e) Disassemble the carburetor. Replace the worn accelerator pump and throttle linkage and measure for the correct position.
	(f) Manifold heat valve sticking.	(f) Free up manifold heat control valve; using recommended solvent.
	(g) No power mixture.	(g) Test power piston operation.
	(h) Incorrect timing.	(h) Reset timing.
CARBURETOR FLOODS OR LEAKS	(a) Cracked body.	(a) Disassemble the carburetor. Replace the cracked body. Make sure main to throttle body screws are tight.
	(b) Faulty body gaskets.	(b) Disassemble the carburetor. Replace the defective gaskets and test for *leakage. Be sure the screws are* tightened securely.
	(c) High float level.	(c) Test the fuel level in the carburetor. Make the necessary adjustment to obtain correct float level.
	(d) Worn needle valve and seat.	(d) Clean and inspect the needle valve

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Condition	Possible Cause	Correction
		and seat. If found to be in a questionable condition, replace the complete assembly and test the fuel pump pressure. Refer to Specifications for correct fuel pump pressure.
	(e) Excessive fuel pump pressure.	(e) Test the fuel pump pressure. If the pressure is in excess of recommended pressure (refer to Specifications), replace fuel pump.
POOR PERFORMANCE MIXTURE TOO RICH	(a) Restricted air cleaner.	(a) Remove and clean the air cleaner.
	(b) Leaking float.	(b) Disassemble the carburetor. Replace leaking float. Test the float level and correct as necessary, to the proper level.
	(c) High float level.	(c) Adjust the float level as necessary to secure the proper level.
	(d) Excessive fuel pump pressure.	(d) Test the fuel pump pressure. Refer to specifications for recommended pressure. If pressure is in excess of recommended pressure, replace the fuel pump assembly.
	(e) Worn metering jet.	(e) Disassemble the carburetor. Replace the worn metering jet, using a new jet of the correct size and type.
POOR COLD ENGINE STARTING INCORRECT PROCEDURE	(a) Throttle must be opened to free choke system. Best position for all temperatures and all conditions is ⅓ open. (Standard Carburetors only) CAP Carburetors require special procedures. (See owner's Manual.)	(a) Instruct owner.
CHOKE VALVE FAILS TO CLOSE	(a) Choke thermostat adjustment leaner than specified.	(a) Adjust.
	(b) Choke thermostat corroded such that it has cracked and distorted lean.	(b) Replace assembly.
	(c) Choke linkage, shaft or related parts corroded, bent or dirty such that the system is not entirely free to move from the open to the closed position.	(c) Repair, clean or replace.
	(d) Choke valve improperly seated.	(d) Reseat valve.
	(e) Air cleaner interfers with choke shaft or linkage.	(e) Rotate cleaner to correct position, instruct owner.
	(f) Air cleaner gasket interfers with choke valve or linkage.	(f) Reinstall gasket properly.
	(g) Spring staging spring distorted or missing.	(g) Replace or install new spring.
LOW ENGINE OUTPUT (10°F or lower)	(a) Engine lubricating oil incorrect viscosity.	(a) Recommend 5W-20.
	(b) Valve lash incorrect.	(b) Readjust.
	(c) Choke thermostat adjustment incorrect, rich.	(c) Adjust to correct setting.
ENGINE RUNS LEAN, FIRST HALF MILE		
CHOKE LEAN	(a) Review items under (Poor Starting).	(a) See "Choke Valve Fails to Close."
	(b) Diaphragm adjustment lean.	(b) Readjust to specification.
ENGINE RUNS LEAN AFTER HALF MILE		
ENGINE HEAT INSUFFICIENT	(a) Heat valve stuck open.	(a) Free with solvent.
	(b) Heat valve thermostat distorted.	(b) Replace thermostat.

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Condition	Possible Cause	Correction
	(c) Heat valve failed within exhaust. See engine section for proper diagnosis.	(c) Replace heat valve.
	(d) Water temperature subnormal.	(d) Check thermostat.
CARBURETOR MIXTURES LEAN	(a) Air leak bypassing the carburetor.	(a) Repair.
	(b) Carburetor has economy metering system.	(b) Inform customer.
ENGINE RUNS EXCESSIVELY RICH AFTER COLD START		
CHOKE SYSTEM RICH	(a) Choke thermostat adjustment richer than specified.	(a) Correct.
	(b) Choke thermostat distorted rich by overheating.	(b) Replace, since this problem can be corrected by use of proper choke assembly.
	(c) Choke vacuum diaphragm inoperative or misadjusted.	(c) Correct or replace.
	(d) Choke vacuum passage blocked or leaking.	(d) Correct.
CARBURETOR RICH	(a) Incorrect gasket or gasket installation between carburetor and intake manifold.	(a) Replace or correct.
EXCESSIVE STALLS AFTER COLD START		
CHOKE SYSTEM LEAN	(a) Review items under "Poor Starting-Choke Valve Fails to Close."	
	(b) Choke vacuum diaphragm adjustment lean.	(b) Adjust to Specification.
ENGINE OUTPUT LOW	(a) Fast Idle speed low.	(a) Adjust to Specification.
	(b) Fast idle cam position adjustment incorrect.	(b) Adjust to Specification.
	(c) Engine lubrication oil of incorrect viscosity.	(c) Recommended 5W-20.
	(d) Incorrect timing.	(d) Reset timing.
CARBURETOR LEAN	(a) Curb idle set very lean.	(a) Adjust.
	(b) Air leak bypassing the carburetor.	(b) Repair.

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WWC3 SERIES STROMBERG CARBURETOR

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GENERAL INFORMATION

The WWC3 Series Stromberg carburetor is a dual throat downdraft type, with each throat having its own idle system, main metering system and throttle valve. The idle and main metering systems are supplemented by the float system, the accelerating system and the power system.

The WWC3 Series carburetor incorporates an idle system vent, operated from the throttle linkage, a double venturi cluster which in addition to the small venturi also includes the discharge nozzles, the main discharge tubes and the idle tube in a single assembly.

The Standard Stromberg carburetor model WWC3-262 is used on the 383 cu. in. engine-automatic transmission equipped vehicles. Special (CAP-Cleaner Air Package) Stromberg carburetor model WWC3-263 is used on the 383 cu. in. engine-automatic transmission equipped vehicles, and is identified by a dab of green paint on the airhorn, over the top of the accelerator pump shaft.

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SERVICE PROCEDURES

DISASSEMBLING THE CARBURETOR

To disassemble the carburetor for cleaning or overhaul, refer to (Figs. 1 and 2), then proceed as follows:

(1) Install four elevating legs, Tool T109-287S in mounting flange holes in throttle body. These legs are used to protect throttle valves from damage and to provide a suitable base for working.

(2) Remove hairpin clip that holds the pump rod in center of the pump arm. Remove rod from slot and disengage from throttle lever.

(3) Remove hairpin clip that holds fast idle rod in fast idle cam. Disengage rod from cam, then rotate the rod to disengage from choke lever.

(4) Remove three short air horn attaching screws, then remove two long air horn attaching screws. Install two short screws through main body into throttle body to hold bodies together. (Refer to Fig. 3.)

(5) Remove vacuum hose between carburetor air horn and vacuum diaphragm.

(6) Remove clip from choke operating link and disengage link from diaphragm plunger (stem) and choke lever. (Refer to Fig. 1.)

(7) Remove remaining air horn attaching screws, then lift air horn straight up and away from main body, as shown in (Fig. 3).

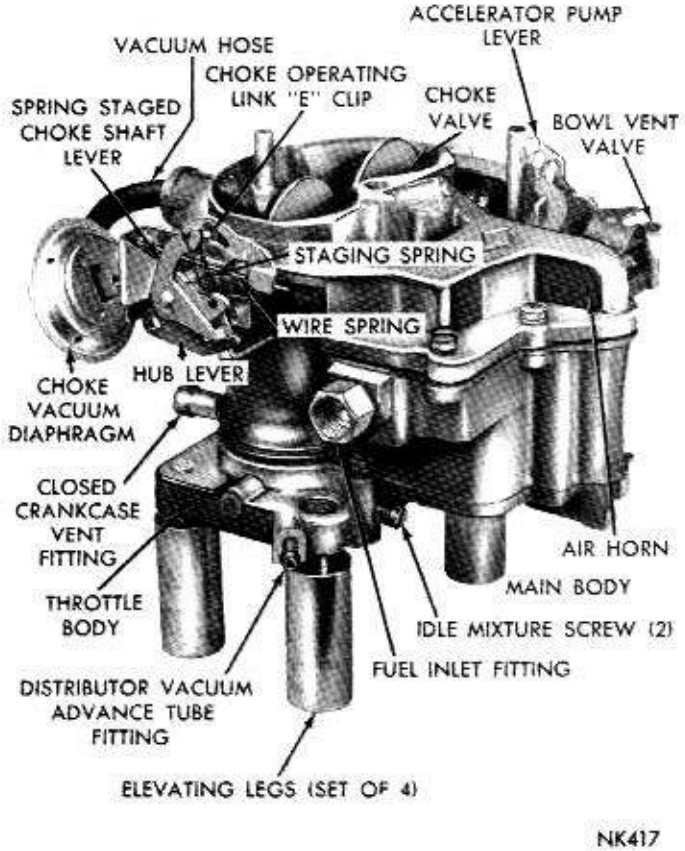


Fig. 1—Carburetor Assembly WWC3-262 or WWC3-263 (Right Side)

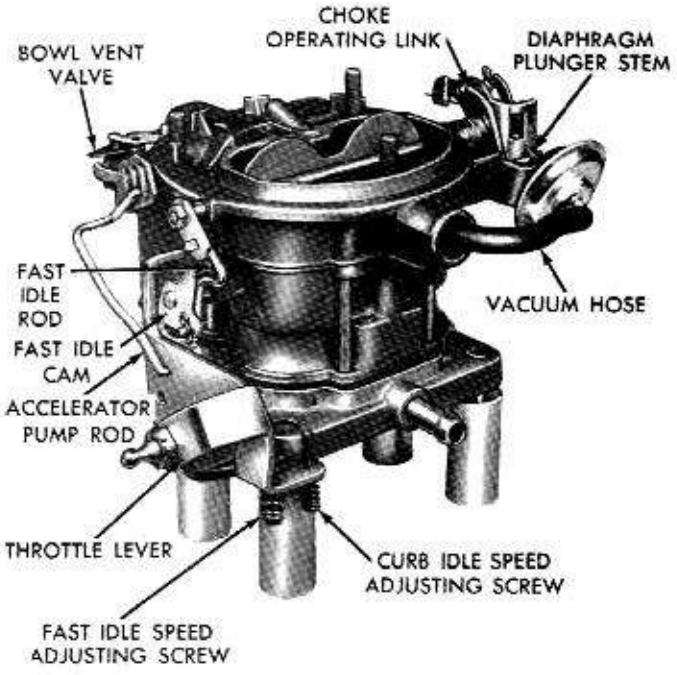


Fig. 2—Carburetor Assembly WWC3-262 or WWC3-263 (Left Side)

Disassembling the Air Horn

(1) Disengage accelerator pump plunger from pump arm hook by tilting down and out from under hook, as shown in (Fig. 4). Remove compression spring.

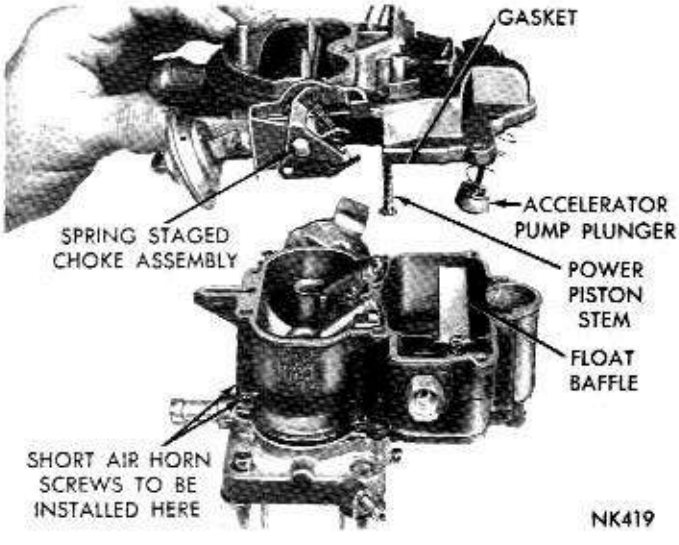


Fig. 3—Removing or Installing the Air Horn

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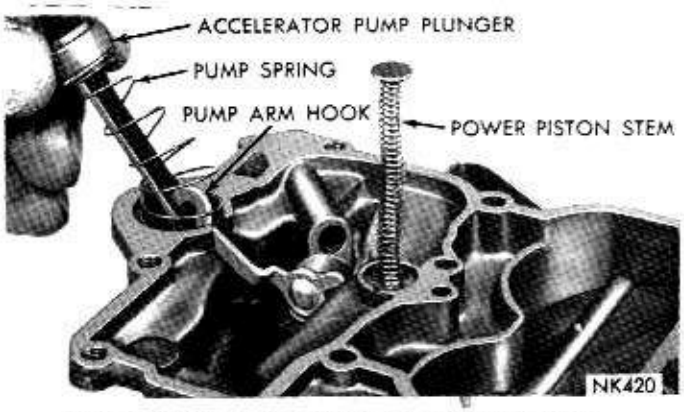


Fig. 4—Removing or Installing Accelerator Pump Plunger

Place accelerator pump plunger in a jar of clean gasoline or kerosene to prevent leather from drying out.

(2) Remove vacuum power piston from air horn, using an open end wrench and wood block, as shown in (Fig. 5). (Exert sufficient pressure on end of wrench to force piston out of its well in air horn. This assembly is staked in the air horn and care should be used at removal.) Discard the air horn gasket.

(3) Remove choke vacuum diaphragm and bracket assembly and place to one side to be cleaned as a special item. **A liquid cleaner may damage the diaphragm material.**

(4) Test freeness of choke mechanism in air horn. The choke shaft must float free to operate correctly. If choke shaft sticks in bearing area or appears to be gummed from deposits in air horn, a thorough cleaning will be required.

Main Body

(1) Remove float fulcrum pin spring, then remove fuel inlet needle valve, seat and gasket.

(2) Slide float baffle up out of its grooves, then remove float and fulcrum pin.

(3) Remove venturi cluster attaching screws, then

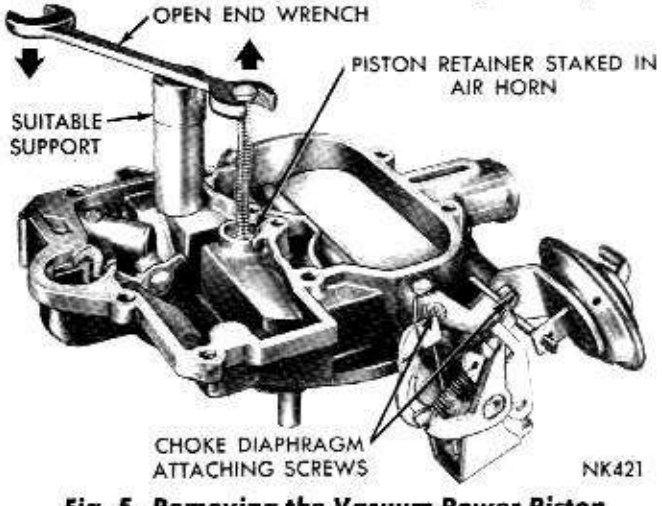


Fig. 5—Removing the Vacuum Power Piston

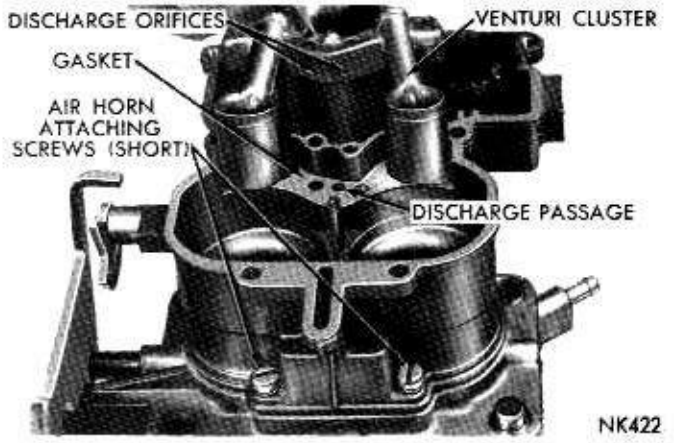


Fig. 6—Removing or Installing the Venturi Cluster

remove venturi cluster gasket, as shown in (Fig. 6). Discard the gasket.

(4) Invert carburetor main body and drop out discharge check ball from discharge passage, refer to (Fig. 6), and accelerator pump inlet check ball from the pump well.

(5) Using T109-73S, remove power by-pass jet and gasket, as shown in (Fig. 7).

(6) Using Tool T109-173, remove two main metering jets, as shown in (Figs. 7 or 8).

(7) Remove two air horn screws, used to hold main and throttle bodies together. Separate throttle and main bodies, and discard gasket.

Throttle Body

(1) Unscrew and remove two idle mixture adjusting screws and springs from throttle body.

(2) The carburetor now has been disassembled into three units, namely, the air horn, main body and throttle body and the component parts of each disassembled as far as necessary for cleaning and inspection. **It is usually not advisable to remove the throttle shaft or valves unless wear or damage necessitates installation of new parts. To install new valves or throttle shaft, refer to Inspection and Reassembly paragraph. Normal throttle shaft clearance is .005 inch. If wear is over .010 inch, install new shaft.**

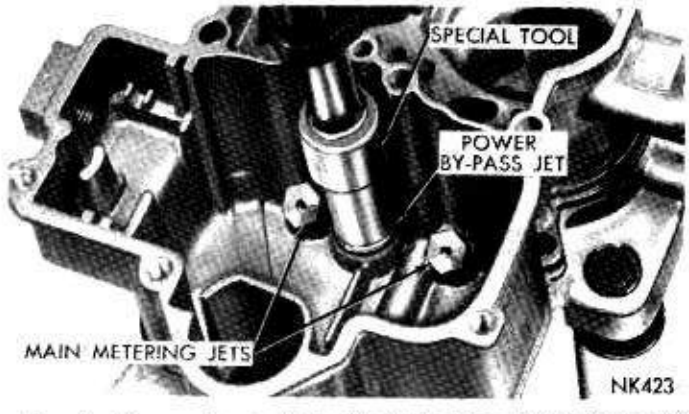


Fig. 7—Removing or Installing the Power By-Pass Jet

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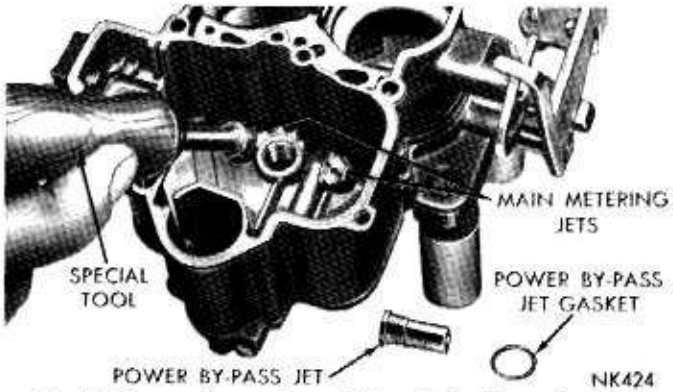


Fig. 8—Removing or Installing Main Metering Jets

INSPECTION AND ASSEMBLY

Throttle Body

(1) Check throttle shaft for excessive wear in throttle body. If wear is extreme, it is recommended that throttle body be replaced, rather than installing a new throttle shaft in the old body.

During manufacture, location of idle transfer ports and the spark advance control ports to the valves are carefully established for one particular assembly. See (Fig. 9).

If a new shaft should be installed in an old worn throttle body, it would be very unlikely that the original relationship of these ports to the valves would be obtained. Changing the port relationship would adversely affect normal car operation between the speeds of 15 and 30 miles per hour. However, if it has been determined that a new shaft or valves are to be installed, adhere closely to the following instructions:

To install a new throttle shaft or valves, refer to (Fig. 10), then proceed as follows:

(2) Mark valves to be sure each is replaced in same bore from whence removed (if replacing throttle shaft only).

(3) Remove screws that hold throttle valves to shaft. Slide valves out of shaft and bore.

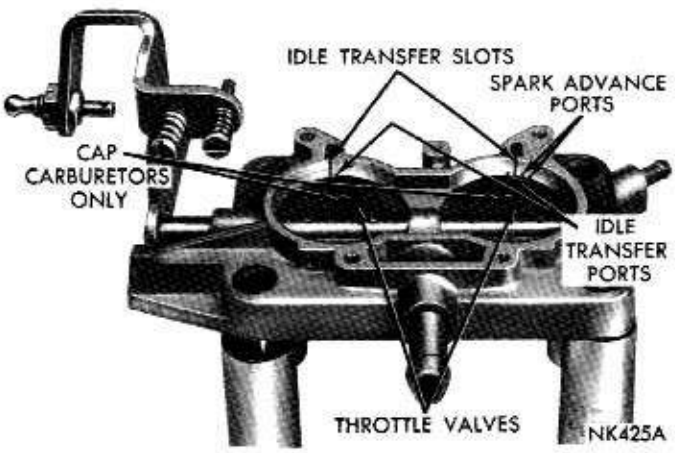


Fig. 9—Ports in Relation to Throttle Valves

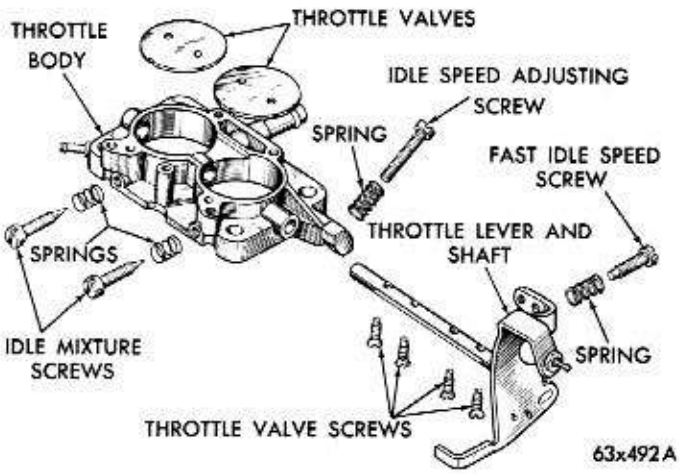


Fig. 10—Throttle Body (Exploded View)

CAUTION: These screws are staked on the opposite side and care should be used at removal so as not to break the screws in the shaft.

Remove staking with a file.

(4) Slide throttle shaft and lever out of body.

(5) Install new throttle shaft and lever in throttle body. **The idle speed adjusting screw must be backed off when seating valves in following operation.**

(6) Slide valves down into position. Install new screws but do not tighten. Hold valves in place with fingers pressing on the high side of valves.

(7) Tap valve lightly with a screwdriver to seat in throttle bores. Holding valves in this position, tighten screws securely and stake by squeezing with pliers.

(8) Install two idle mixture adjusting screws and springs in throttle body. (The tapered portion must be straight and smooth.) If tapered portion is grooved or ridged, a new idle mixture adjusting screw should be installed to insure having correct idle mixture control.

Idle Mixer Screw Adjustment

Turn the screws **lightly** against their seats, then

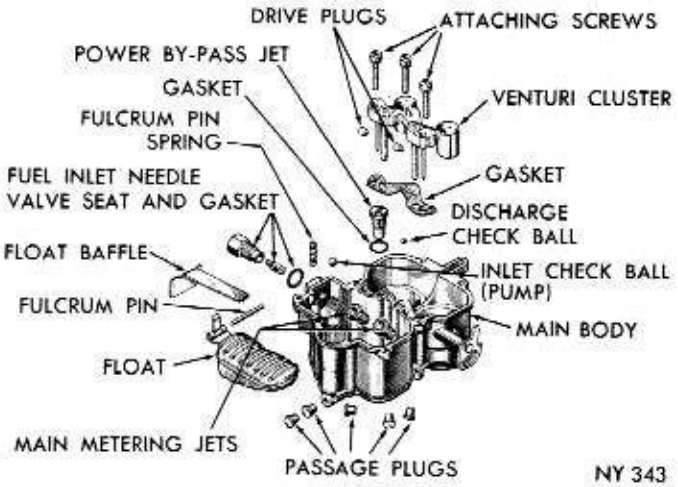


Fig. 11—Main Body (Exploded View)

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back off one and a half turns for an approximate setting.

Main Body

To assemble the main body, refer to (Fig. 11), then proceed as follows:

(1) Place a new gasket on throttle body, then install main body. Install two short screws to secure.

(2) Install main metering jets in main body. Tighten securely, using Tool T-109-173. Refer to (Fig. 8).

(3) Install power by-pass jet and new gasket. Tighten securely, using Tool 73598. Refer to (Fig. 7).

(4) Install accelerator pump inlet check ball (3/16 inch) in pump well, as shown in (Fig. 12).

(5) Install accelerator pump discharge check ball (⅛ inch) in discharge passage, as shown in Fig. 13.

Accelerator Pump Test

(1) Pour clean gasoline into carburetor bowl approximately ½ inch deep. Remove accelerator pump plunger from jar of gasoline and slide down in its well. Raise plunger and press lightly in on plunger shaft to expel air from pump passage.

(2) Using a small clean brass rod, hold discharge check ball firmly down on its seat. Raise pump plunger and press downward. No fuel should be emitted from either intake or discharge passage, as shown in (Fig. 14).

(3) If any fuel does emit from either intake or discharge passages, it indicates presence of dirt or an imperfect seat. The passages should be recleaned and then thoroughly blown out with compressed air. Examine ball seat for signs of damage that would not allow check ball to seat properly.

(4) Reinstall check ball and test again. If still leaking, place a piece of drill rod down on check ball and rap sharply with a hammer. Remove old check ball and install a new one. Then retest. (This operation forms a new ball seat in carburetor casting.)

(5) Install venturi cluster gasket, then slide venturi cluster down into position. Install attaching screws and tighten securely. (Refer to Fig. 6.)

Again depress accelerator plunger. A clear straight stream should emit from each jet orifice. If streams

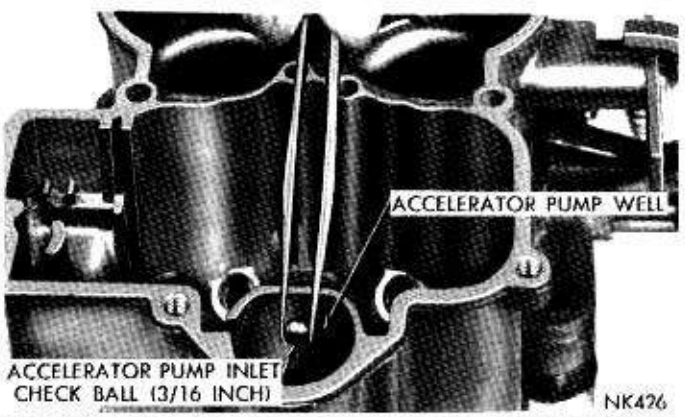


Fig. 12—Installing Accelerator Pump Inlet Check Ball

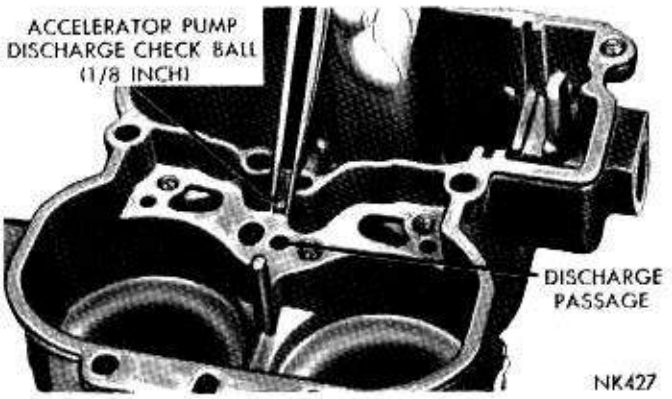


Fig. 13—Installing the Discharge Check Ball

are not identical (if either one is restricted or diverted), remove venturi cluster and reclean.

After test, pour gasoline from bowl and remove pump plunger.

(6) Check float for leak or damage. If satisfactory for further service, install in position in bowl.

(7) Assemble fuel inlet needle valve, seat and gasket, then insert in main body. Tighten securely. (If the needle valve is ridged or grooved, or badly worn, a new inlet needle valve assembly should be installed.)

Measuring Float Height

The carburetor is equipped with a synthetic rubber-tipped fuel inlet needle.

(1) Invert main body so that weight of floats only is forcing needle against seat. **Be sure hinge pin does not drop out of float hinge.** Hold down with fulcrum pin spring.

(2) Using Tool 73725 or a "T" scale, measure float level, as shown in (Fig. 15). There should be 5/32 inch from surface of fuel bowl to the crown of the float at center.

If an adjustment is necessary, remove the float and the fulcrum spring. Bend the lip of the float lever

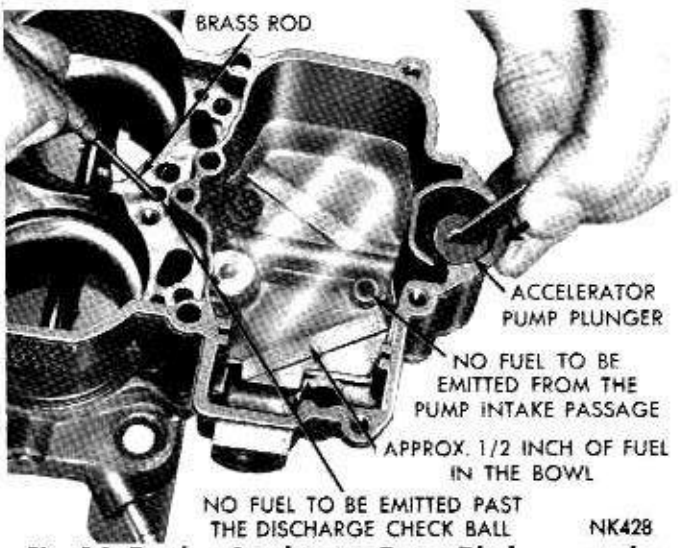


Fig. 14—Testing Accelerator Pump Discharge and Inlet Check Balls

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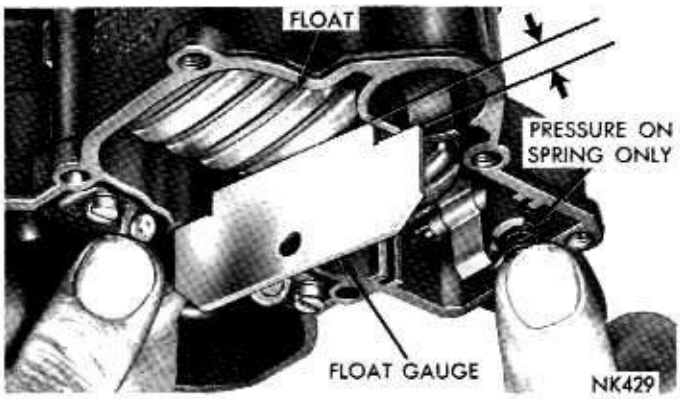


Fig. 15—Checking the Float Setting

either in or out until the correct setting has been obtained.

CAUTION: Do not attempt to change the setting without removing the float, as the synthetic rubber tip can be compressed sufficiently to cause a false setting, which will affect correct level of fuel in the bowl.

It is important that the float lip is perpendicular to the needle or slanted not more than 10 degrees away from the needle when the float is set correctly. Do not bend float lip by forcing float, use Tool 73605.

(3) Install float, then slide float baffle down into position. Install fulcrum pin spring.

Assembling the Air Horn

To assemble the air horn, refer to (Fig. 1), then proceed as follows:

(1) Slide hub lever of spring staged choke onto air horn boss. Insert choke shaft into air horn. Connect hub and shaft levers by installing spring (Fig. 1). The shaft lever arm must be properly positioned between stop surfaces of the hub lever. Slide choke valve down into the slot in shaft.

(2) Hold choke valve closed, and install new screws. **DO NOT TIGHTEN.** Holding valve in closed position, tap gently with a screwdriver, to center and locate valve.

(3) Tighten attaching screws securely, then stake by squeezing with pliers. Reinstall fast idle lever and secure with lockwasher and nut.

(4) Remove accelerator pump plunger from jar of gasoline. Check leather. If leather is hard, cracked, or worn, install a new pump plunger. (Be sure to flex leather several times before installing plunger in air horn.)

(5) Slide compression spring over plunger shaft, then slide plunger over hook and into position. Refer to (Fig. 4).

(6) Install a new air horn gasket, then install vacuum power piston in air horn. Lock in position by prick punching on air horn rim. Compress piston plunger to be sure no binding exists. If piston sticks or binds enough to hinder smooth operation, install a new piston assembly.

(7) Install air horn assembly on main body, guiding pump plunger into its well. (Be sure leather does not curl or fold back.) Install retaining screws and tighten securely. (Refer to Fig. 2.) **The choke valve must be held partially closed while installing air horn.**

(8) Remove two short screws holding main body and throttle body together, refer to (Fig. 3), and install air horn. Reinstall two long screws and tighten securely.

(9) Install fast idle rod and secure with hairpin clip.

(10) Install pump rod and secure with hairpin clip. (Be sure rod is in center slot of arm, refer to Fig. 1.) Work accelerator pump plunger several times to be sure it operates smoothly.

Choke Vacuum Diaphragm

Inspect the diaphragm vacuum fitting to be sure that the passage is not plugged with foreign material. Leak check the diaphragm to determine if it has internal leaks. To do this, first depress the stem, then place a finger over the fitting to seal the opening. Release the stem. If the stem moves more than 1/16 inch in 10 seconds, the leakage is excessive and the assembly must be replaced.

Install the diaphragm assembly on the air horn as follows:

(1) Assemble to air horn and tighten attaching screws securely.

(2) Install choke operating link in position between diaphragm plunger (stem) and choke lever. Install clip to secure. **Be sure the link is on proper side of wire spring. See (Fig. 1).**

(3) Inspect rubber hose for cracks before placing it on correct carburetor fitting. Refer to (Fig. 2). Do not connect vacuum hose to diaphragm fitting until after vacuum kick adjustment has been made. (See Carburetor Adjustments.)

CARBURETOR ADJUSTMENTS

Fast Idle Speed and Cam Position Adjustment

The fast idle engine speed adjustment should be made on the vehicle, as described in the Fast Idle Speed Adjustment (On the Car) Paragraph. However, the Fast Idle Cam Position Adjustment can be made on the bench. This adjustment is important to assure that the speeds of each step of the cam, occur at the proper time during engine warm-up.

To make the fast idle cam position adjustment refer to (Fig. 16), then proceed as follows:

(1) With fast idle speed adjusting screw contacting step on the fast idle cam (Fig. 17), move choke valve toward closed position with light pressure. Insert a Number 38 drill between choke valve and wall of the air horn.

(2) An adjustment will be necessary if a slight drag is not obtained as drill is being removed.

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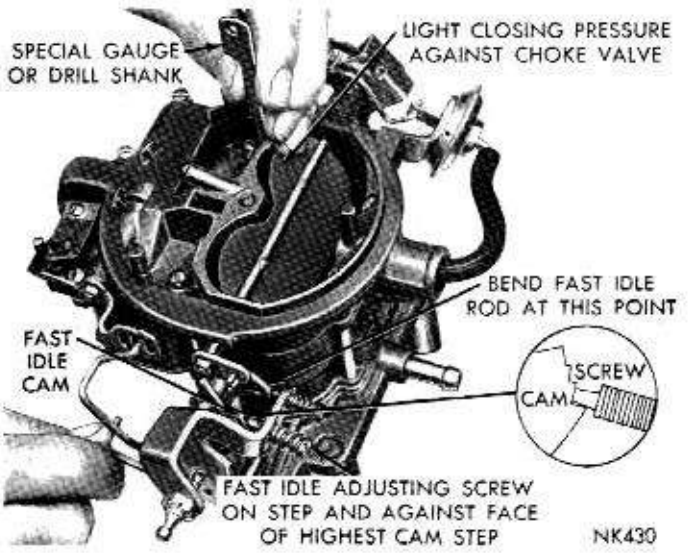


Fig. 16—Fast Idle Cam Position Adjustment

(3) If an adjustment is necessary, bend fast idle rod at upper angle, using Tool T109-213, until correct valve opening has been obtained.

Vacuum Kick Adjustment—(This test can be made **ON** or **OFF** the vehicle.)

The choke diaphragm adjustment controls the fuel delivery while the engine is running. It positions the choke valve within the airhorn by action of the linkage between the choke shaft and the diaphragm. The diaphragm must be energized to measure the vacuum kick adjustment. Use either a distributor test machine with a vacuum source, or vacuum supplied by another vehicle.

(1) With engine **Not** running, open throttle valves far enough to allow choke valve to be moved to closed position.

(2) Disconnect vacuum hose from diaphragm and connect hose from vacuum supply, as shown in (Fig. 17). (A minimum of 10 inches of mercury (HG) will be required.)

(3) Insert a Number 22 drill (CAP Carburetors) or a Number 28 drill (Standard Carburetors) between choke valve and wall of air horn. Refer to (Fig. 17).

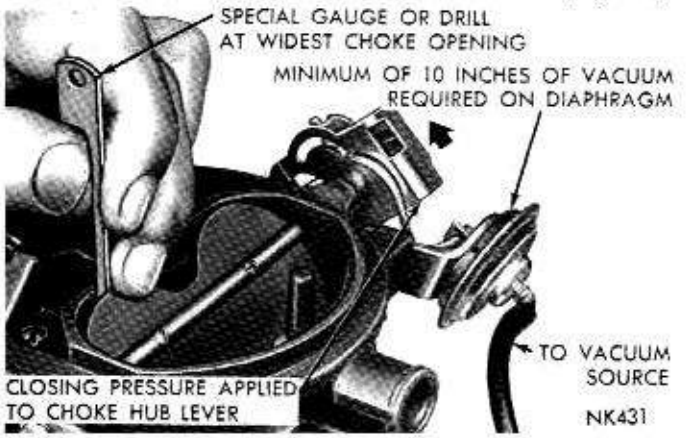


Fig. 17—Checking the Vacuum Kick Setting



Fig. 18—Choke Operating Link Measurement

Apply sufficient closing pressure on choke shaft lever to provide smallest opening possible, without distortion of diaphragm link. Note that link must deflect a wire spring before it reaches end of travel within lever slot. The link must travel to end of slot for proper measurement of kick adjustment.

(4) An adjustment will be necessary if a slight drag is not obtained as drill or gauge is being removed.

The adjustment of this opening will require removal of choke operating link.

CAUTION: Damage to the diaphragm and the choke lever slot can result, if the link is not removed for the bending operation.

(5) Remove clip and disengage choke operating link from the choke lever, then disengage link from diaphragm stem. (The best bending results will be obtained by using a vise and a pair of pliers.)

(6) Bend choke operating link at angle to provide correct choke valve opening.

CAUTION: A correction in the length of the link of .010 inch, will result in a change of .010 inch in the choke valve opening.

As an example, if the choke valve opening is .010 inch in error, the correction in the link length would be .010 inch.

A 2" micrometer will be helpful in establishing the original length of the link, as shown in (Fig. 18), before completing the adjustment.

(7) Install choke operating link and recheck choke

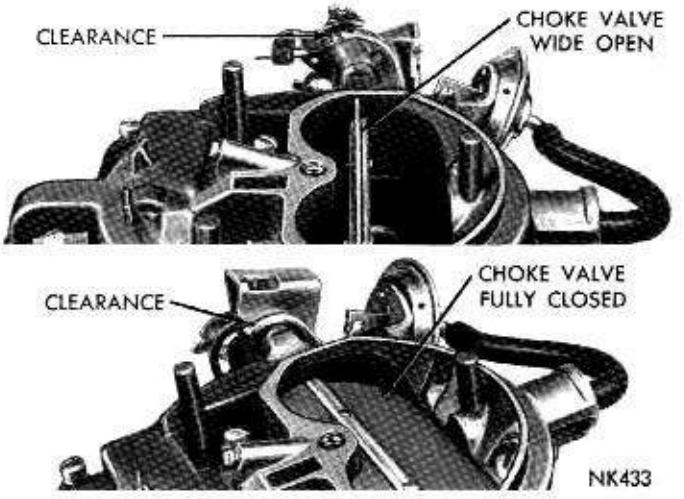


Fig. 19—Choke Operating Link Clearances

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valve opening, using a gauge or drill. Refer to (Fig. 17).

Reinstall vacuum hose to diaphragm and make following check:

(8) With no vacuum applied to diaphragm, some clearance should exist between choke operating link and choke lever slot, in both open and closed choke valve positions, as shown in (Fig. 19). **This clearance is necessary to allow the choke valve to close for starting as well as fully open after the engine reaches the normal operating temperature.**

If a clearance does not exist in both of these positions, a recheck of the operating link adjustment should be made. **Free movement of the choke valve between the closed and open positions is very necessary.**

This free movement should also exist between the kick and the open choke valve positions with the engine running. If binding does exist, the choke operating link has been improperly bent and should be corrected.

Unloader Adjustment (Wide Open Kick)

To make the unloader adjustment, refer to (Fig. 20), then proceed as follows:

(1) Lightly hold choke valve closed, then open throttle valves to wide open position. The choke valve should open sufficiently to allow a 15/64 inch drill or gauge T109-32 to be inserted between choke valve and wall of the air horn as shown.

(2) To adjust, bend tang on throttle lever, using Tool T109-214 until correct opening has been obtained.

(3) Hold choke valve open and then open and close throttle valves. Failure to obtain full throttle operation indicates improper assembly or adjustment of choke mechanism.

(4) With throttle valves held in an open position,

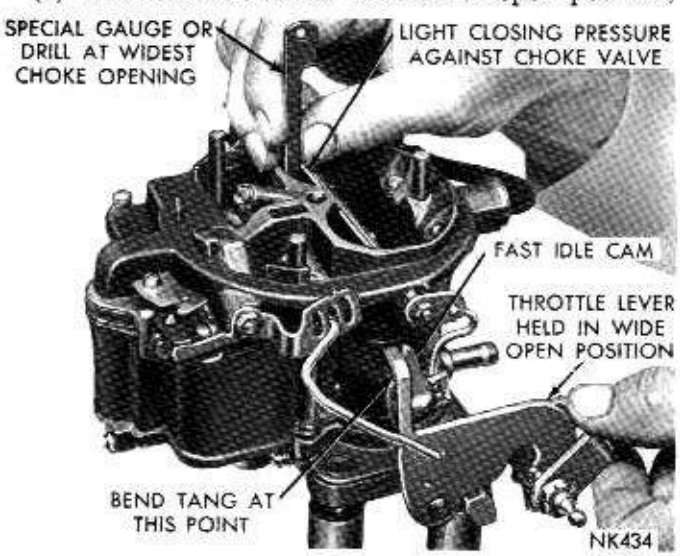


Fig. 20—Choke Unloader Adjustment (Wide Open Kick)

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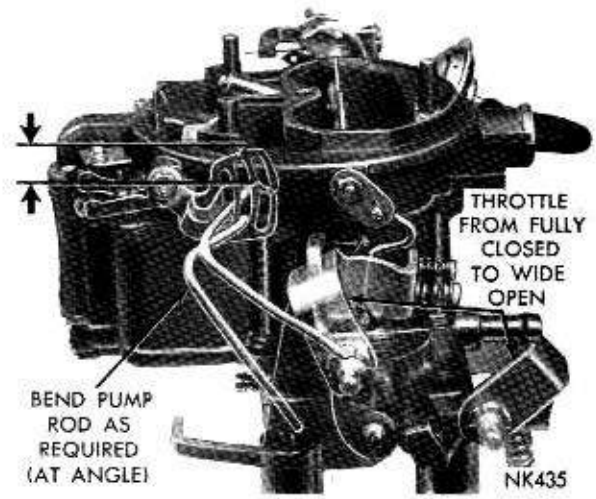


Fig. 21—Accelerator Pump Travel

choke valve should fall open freely. There should be no bind throughout entire travel of choke mechanism.

Accelerator Pump Travel

To check the accelerator pump travel, refer to (Fig. 21), then proceed as follows:

(1) With throttle valves fully closed, measure pump travel from fully closed to fully open throttle.

(2) This travel should be 7/16 inch as shown.

(3) If an adjustment is necessary, bend the pump rod at the point shown, using Tool T109-213, until correct travel has been obtained.

Bowl Vent Valve Setting

To make the bowl vent valve setting, refer to (Fig. 22), then proceed as follows:

This setting is made after the pump travel setting.

(1) With throttle valves at curb idle, there should be 1/16 inch clearance between bowl vent valve and air horn, when measured (at the center of vent valve and the seat) with a gauge or drill shank.

(2) If an adjustment is necessary, bend bowl vent lever, using Tool T109-214, until correct opening has been obtained. **Any adjustment to the accelerator**

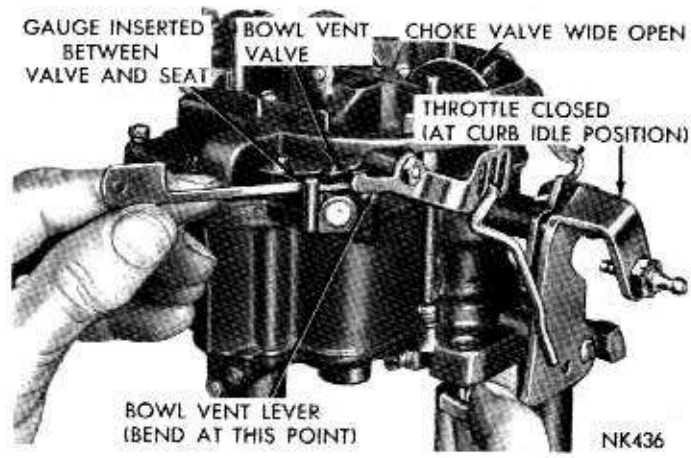


Fig. 22—Checking Bowl Vent Valve Opening

pump setting, means that the bowl vent must be re-adjusted.

Idle Speed Adjustment (Standard Carburetors)

The idle speed adjustment is made after the carburetor has been installed on the engine.

For the best results, it is recommended that a tachometer be used in this adjustment.

(1) Turn idle speed screw **in** or **out** to obtain 500 rpm. (On vehicles with air conditioning, set the idle speed at 500 rpm, with air conditioning ON.) Be sure the choke valve is fully open and that the fast idle adjusting screw is not contacting the fast idle cam (engine off fast idle).

(2) Turn each idle mixture screw **in** or **out** until smooth idle has been obtained.

(3) Readjust to 500 rpm with idle speed screw.

(4) Repeat idle mixture screw adjustment.

Fast Idle Speed Adjustment (On the Vehicle)*

To set the fast idle speed on the vehicle, connect a tachometer to the vehicle, then set the curb idle speed and proceed as follows:

(1) With engine running and transmission in neutral position, open throttle slightly.

(2) **On Standard Carburetors,** close choke valve about 20 degrees, then allow throttle to close. Return choke valve to open position. The fast idle speed adjusting screw should contact slowest speed step on the fast idle cam (Fig. 23).

(3) **On CAP carburetors,** open throttle until fast idle screw can be positioned on second highest step of the cam (Fig. 23). **The air cleaner must be installed while measuring engine speed.**

(4) With engine warmed up to normal operating temperature, turn fast idle speed adjusting screw **in** or **out** to secure 700 rpm (Standard carburetors) or 1300 rpm (CAP carburetors).**

Reposition the cam and throttle after every screw adjustment to apply normal throttle closing torque.

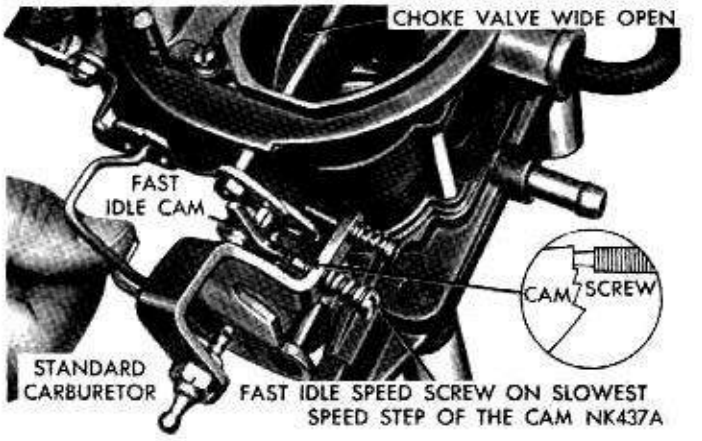
*After Approx. 500 Miles (If Necessary.)

****Special Note: CAP equipped Vehicles**

Before adjusting idle and/or fast idle speeds and mixtures, make sure that the basic timing and the distributor control valve are correctly adjusted as outlined under Idle Speed Adjustment (Curb Idle) CAP Carburetors.

Measuring the Float Setting or Fuel Level (On the Vehicle)

Remove the three short air horn to main body attaching screws. Then remove one long air horn to throttle body screw next to fuel bowl and assemble short screw through main body flange and thread into the throttle body. Remove long screw from side away from fuel bowl and on opposite side and assemble



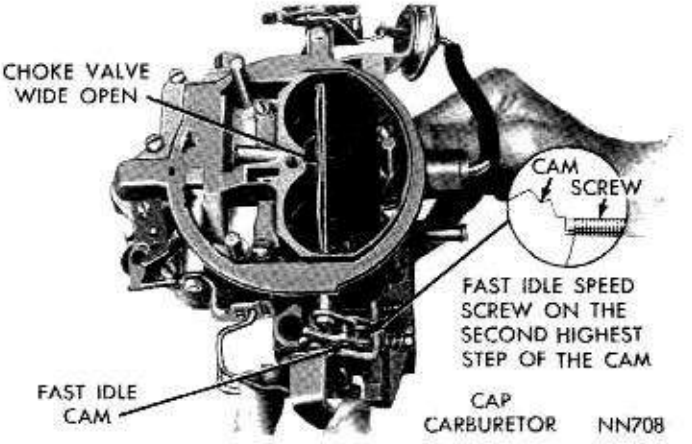


Fig. 23—Fast Idle Speed Adjustment (On the Engine)

short screw through main body flange. Securely tighten. Remove the air horn as follows:

(1) Remove spring clip and disconnect choke operating rod.

(2) Remove hairpin clip and disconnect fast idle rod.

(3) Remove hairpin clip that holds pump rod in center slot of pump arm. Disconnect pump rod.

(4) Remove remaining two long screws and lift off the air horn.

Check float setting as follows:

(5) Seat float fulcrum pin by pressing finger against fulcrum pin spring.

There should be enough fuel in bowl to raise float so that lip bears firmly against needle. Additional fuel may be admitted by slightly depressing the float. If pressure in line is insufficient to force additional fuel into bowl, add necessary fuel from a clean container.

CAUTION: Since the manifolds may be hot, it is dangerous to spill onto these surfaces. Therefore, take the necessary precautions to avoid spillage.

(6) With only pressure from buoyant float holding lip against inlet needle, check float setting, using Tool 73725 or "T" scale. There should be 5/32 inch from surface of bowl (gasket removed) to top of float at

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center.

If an adjustment is necessary, hold float on bottom of bowl, then bend float tip toward or away from needle, using Tool 73605. Recheck 5/32 inch setting again, then repeat lip bending operation as required.

CAUTION: When bending the float lip, do not allow the lip to push against the needle as the rubber tip can be compressed sufficiently to cause a false setting which will affect correct level of fuel in the bowl. After being compressed, the rubber tip is very slow to recover its original shape.

It is very important that the float lip be perpendicular to the needle or slanted not more than 10 degrees away from the needle when the float is set correctly.

(7) Reassemble the air horn.

Spring Staged Choke Adjustment

The new spring staged choke, shown in (Fig. 24) is a device incorporated in the choke mechanism which limits the choke blade closing torque when cranking the engine at temperatures below zero. Thus the spring staging of the choke is a better match for the engine's starting mixture requirements at the low temperatures.

To check the spring staged choke for correct operating clearance, refer to (Fig. 24), then proceed as follows:

(1) Push on hub lever with finger, at closed choke position. A small opening should exist between shaft and hub levers, as shown in (Fig. 24).

(2) Using a drill or gauge, measure opening. The opening should be from .010 to .040 inches.

(3) If an adjustment is necessary, bend the hub lever tang until the correct opening has been obtained.

Idle Speed Adjustment (Curb Idle) CAP Carburetors

To make the idle speed adjustment on CAP carburetors, secure an accurate ignition tachometer and a Sun Electric Combustion-Vacuum Unit, Model 80, Exhaust Condenser, Model EC, and Hose 669-14 or equivalent. (The above analyzer is recommended; however, other reliable makes of analyzers in good condition may be used.) Proceed as follows:

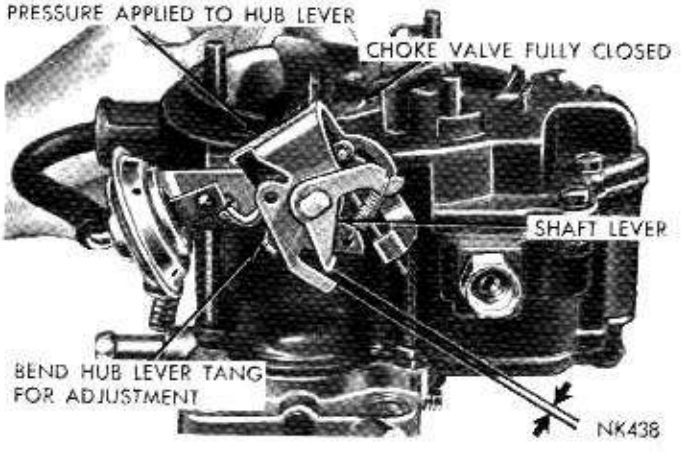


Fig. 24 Spring Staged Choke Clearance

(1) Engine running at normal operating temperature, and timing checked and set at 5° after top dead center.

(2) Air Cleaner installed.

(3) Six cylinder engines only—turn headlights on high beam position.

(4) Automatic transmissions in neutral position (not in park position).

(5) On air conditioned cars, turn air conditioning **off.**

(6) Connect ignition tachometer.

(7) Insert probe of the exhaust gas analyzer in the tail pipe as far as possible (2 ft. minimum distance). On dual exhaust cars use the left side tail pipe (side opposite heat valve). It is very important that the probe and connecting tubing be free of leaks to prevent erroneous readings. If a garage exhaust system is used to conduct the exhaust gases away, a plenum chamber or other means must be used to reduce the vacuum of the exhaust system of ½ inch water or less.

(8) Connect the exhaust gas analyzer, warm up and calibrate according to manufacturer's instructions.

(9) Place clamp on hose between distributor vacuum control valve and intake manifold.

(10) Set the idle speed to the specified value for the specific engine-transmission combination.

(11) **IMPORTANT: When adjusting mixture screws to obtain the air/fuel ratio specified for CAP, do not turn the mixture screw more than 1/16 turn at a time. The combustion analyzer is so sensitive that the ratio must be changed by very small increments if accurate readings are to be obtained. The meters read in air/fuel ratio so that a higher reading indicates a leaner mixture and vice versa.**

(a) Adjust each screw 1/16 turn richer (counterclockwise) and wait 10 seconds before reading the meter.

(b) If necessary, repeat step "a" until the meter indicates a definite increase in richness (lower reading). This step is very important since the meter reverses its readings and indicates a richer mixture as the carburetor is leaned out if the carburetor is set very lean.

(c) When it has been established that the meter is indicating a lower reading (richer mixture) when the idle mixture screws are turned in the richer direction, proceed to adjust the carburetor to give 14.2 air/fuel ratio, turning the screws counterclockwise (richer) to lower the meter reading and clockwise (leaner) to increase the meter reading.

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(d) If the idle speed changes as the mixture screws are turned, adjust the speed to the specified value and readjust the mixture as required so that 14.2 air/fuel ratio is obtained at the specified idle speed.

(e) If the idle is rough, the screws may be adjusted independently to achieve a smooth idle, provided the air/fuel ratio is held to the 14.2 value.

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(12) Remove clamp from distributor vacuum valve hose. If idle speed changes materially check and set valve as described under "Distributor Vacuum Control Valve Adjustment."

BBD SERIES CARBURETORS

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GENERAL INFORMATION

The Standard Ball and Ball carburetor model BBD-4125S is used on the 383 cu. in. engine-manual transmission equipped vehicles (Fig. 1).

The Special (CAP-Cleaner Air Package) Ball and Ball carburetor model BBD-4126S is used on the 383 cu. in. engine-manual transmission equipped vehicles and is identified by a green tag attached to the air horn (Fig. 1).

The dash pot (used on manual transmission equipped vehicles only) is mounted on the carburetor and retards the return of the throttle to idle position. **The proper adjustment of the dash pot is very important!** (See Carburetor Adjustments.)

Since the service procedures are identical on all BBD carburetors, the illustrations showing the various disassembly procedures will not always show any one specific carburetor.

The Ball and Ball carburetor is of the dual downdraft type. Each throat has its own throttle valve, idle and main metering systems and are supplemented by the float, accelerating and power systems.

On each BBD series carburetor, the model number is stamped on metal tag attached to air horn. Do not remove or destroy this tag, as it is the only means provided for carburetor model identification. Before attempting to repair or overhaul carburetor, refer to model number and secure a repair kit for number indicated on tag.

SERVICE PROCEDURES

DISASSEMBLING THE CARBURETOR

To disassemble the carburetor for cleaning or overhauling, refer to (Fig. 1), then proceed as follows:

(1) Insert three Tool T-109-287S and one Tool T109-288S elevating legs through carburetor throttle body stud holes. (These tools are used to protect throttle valves from damage and to provide a suitable base for working.)

(2) Remove hairpin clip and disengage fast idle connector rod from throttle and fast idle levers.

(3) Remove hairpin clip and disengage accelerator rod from throttle lever and pump rocker arm.

(4) Remove vacuum hose between carburetor throttle body fitting and vacuum diaphragm.

(5) Remove clip from choke operating link and disengage link from diaphragm plunger and choke lever. Refer to (Fig. 1).

(6) Remove vacuum diaphragm and bracket assembly and place to one side, to be cleaned as a special item. **A liquid cleaner may damage the diaphragm material.**

(7) Remove air horn retaining screws and lift air horn straight up and away from the main body. Discard gasket (2 screws recessed). Remove dash pot (if so equipped).

(8) Disengage accelerator pump plunger from accelerator pump arm by pushing up on bottom of plunger and sliding plunger shaft off hook. Slide plunger out of air horn and remove the compression spring and seat.

If old plunger can be used again or if a new plunger is to be installed, place plunger in a jar of clean gasoline or kerosene to prevent leather from drying out.

(9) Remove fuel inlet needle valve, seat and gasket from main body.

(10) Lift out float fulcrum pin retainer, and lift out floats and fulcrum pin.

(11) Remove step-up piston and retaining screw and slide the step-up piston and rods out of well, as shown in (Fig. 2). Lift out step-up piston spring. Remove step-up piston gasket from bottom of well.

(12) Remove main metering jets as shown in (Fig. 3).

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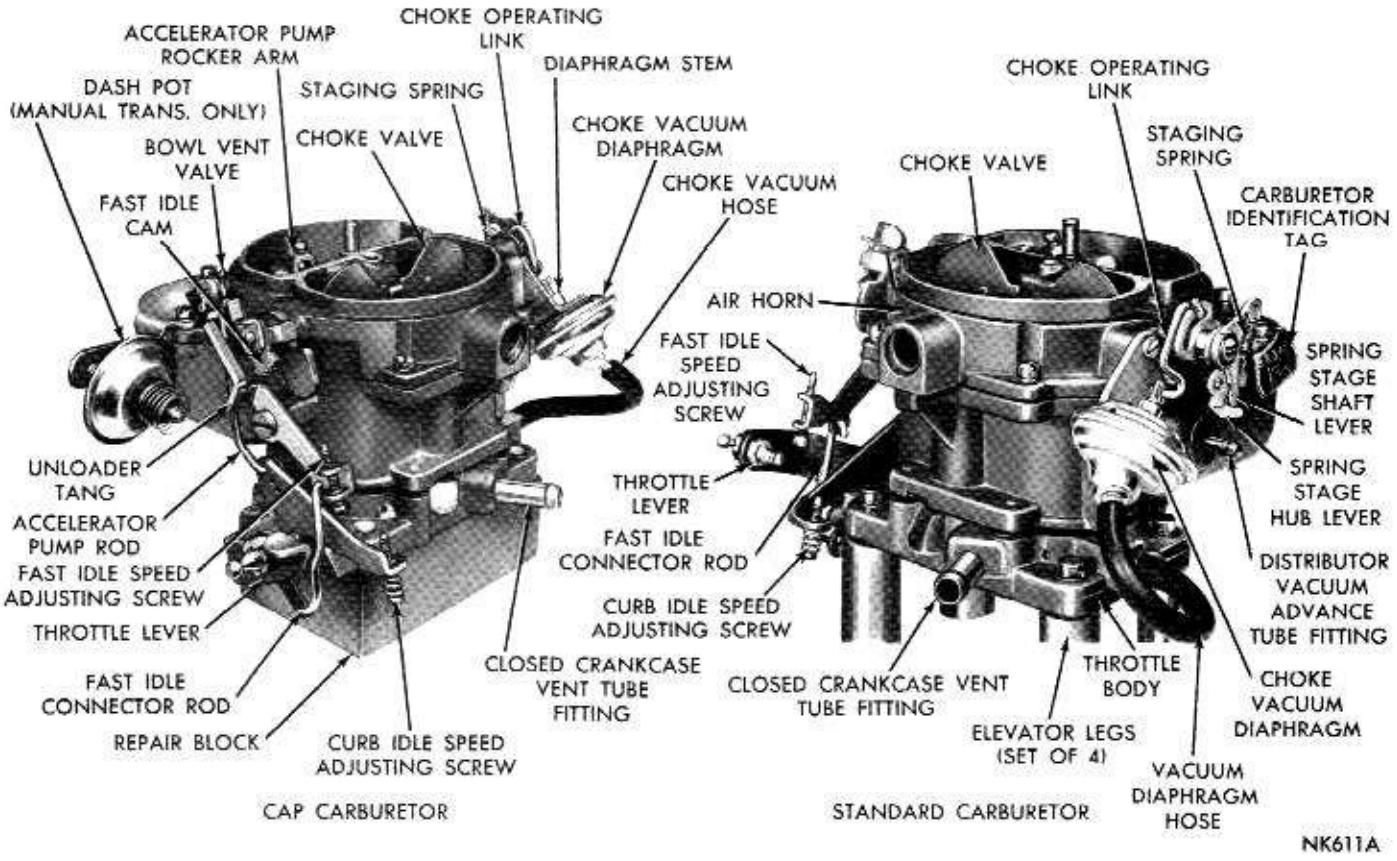


Fig. 1—Carburetor Assembly (Standard) BBD-4125S and (CAP-Cleaner Air Package) BBD-4126S

(13) Remove venturi cluster screws, then lift venturi cluster and gaskets up and away from main body, as shown in (Fig. 4). Discard gaskets. **Do not remove idle orifice tubes or main vent tubes from cluster.** They can be cleaned in a solvent and dried with compressed air.

(14) Invert carburetor and drop out accelerator pump discharge check ball and the intake check ball. (The intake check ball is the largest.)

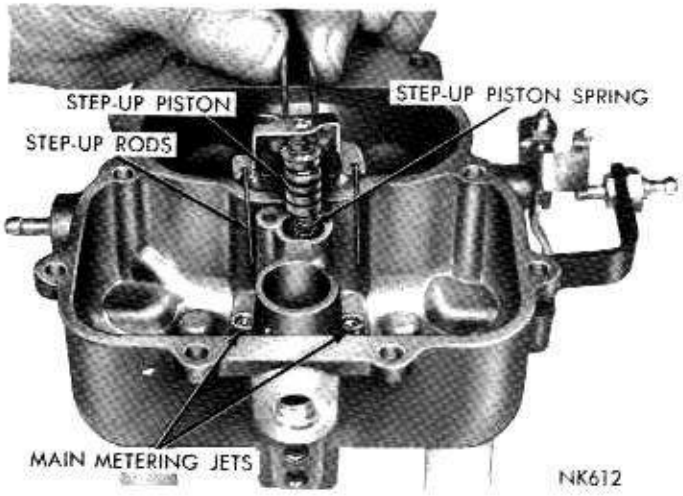


Fig. 2—Removing or Installing the Step-Up Piston

On CAP carburetors, do not remove idle mixture adjusting screws from the throttle body. These screws have limited travel and will be broken if removed.

(15) Remove screws that attach throttle body to main body. Separate bodies and discard gasket.

The carburetor now has been disassembled into three sub-assemblies, air horn, main body and throttle body and components of each disassembled as far as

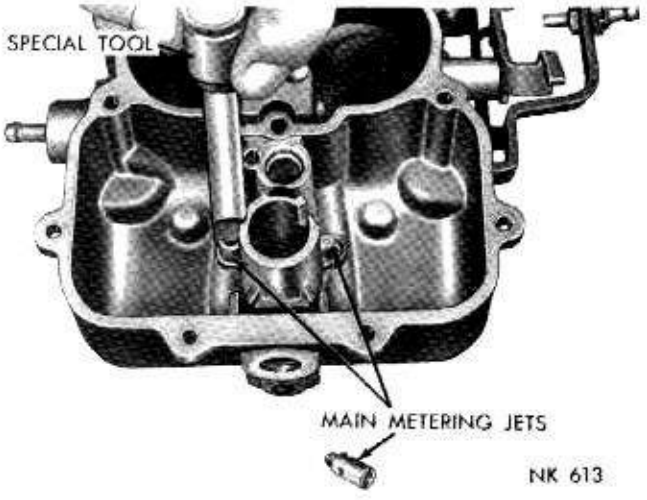


Fig. 3—Removing or Installing the Main Metering Jets

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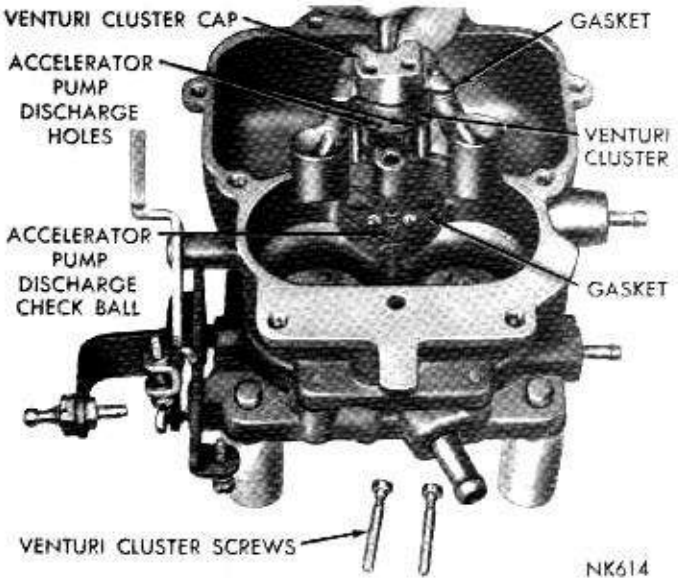


Fig. 4—Removing or Installing the Venturi Cluster

necessary for cleaning and inspection.

It is usually not advisable to remove the throttle shaft or valves from the throttle body, unless wear or damage necessitates the installation of new parts.

There is about .005 inch clearance between the throttle shaft and the throttle shaft bores in the throttle body. Any clearance over .010 inch, a new throttle shaft and/or throttle body should be installed.

INSPECTION AND ASSEMBLY

Throttle Body

(1) Inspect throttle shaft and throttle body for excessive wear. If either or both are worn to the point where the carburetor operation will be affected, replace as required.

During manufacture, the location of the idle transfer port and the spark advance control ports to the throttle valve, is carefully established for one particular assembly, refer to (Fig. 5).

If a new shaft should be installed in an old, worn throttle body, it would be very unlikely that the original relationship of the ports to the valves would be obtained. Changing the relationship of the valves to the ports would adversely affect normal car operation between the speeds of 15 and 30 miles per hour. If it has been determined, however, that a new shaft or valves is to be installed, adhere to the following instructions:

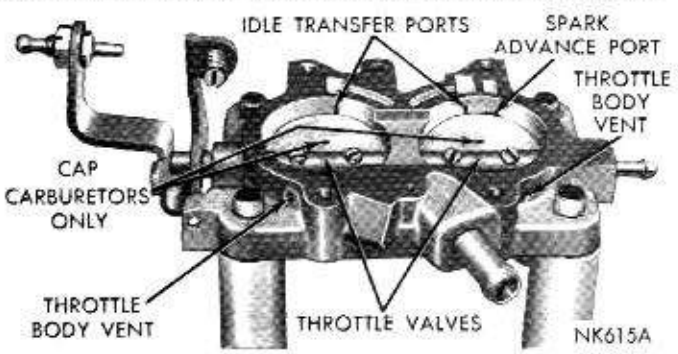


Fig. 5—Ports in Relation to Throttle Valves

(2) Mark position of throttle valves in the bores. Be sure idle speed screw is backed off.

(3) Remove screws that hold throttle valves to shaft and slide the valves out of bores. **These screws are staked on the opposite side and care should be used at removal so as not to break off in the shaft.**

Remove the staked end of the screws with a file.

(4) Slide throttle shaft and lever out of the body.

(5) Install new throttle shaft and lever.

(6) Install throttle valves in their respective bores (with valve numbers toward manifold). Install new screws but do not tighten. Hold valves in place, with fingers pressing on high sides of valves. Tap valves lightly with a screwdriver to seat in throttle bores. Tighten screws securely and stake by squeezing with pliers.

(7) Turn the idle mixture adjusting screws **lightly** against their seats with fingers. Back off one full turn for approximate adjustment. **DO NOT USE A SCREWDRIVER.**

Main Body

(1) Invert main body and place a new gasket in position and place throttle body on main body and align. Install screws and tighten securely.

(2) Install accelerator pump discharge check ball in the discharge passage and check accelerator pump system; fuel inlet and discharge check balls as follows:

(3) Pour clean gasoline into carburetor bowl, approximately ½ inch deep. Remove pump plunger

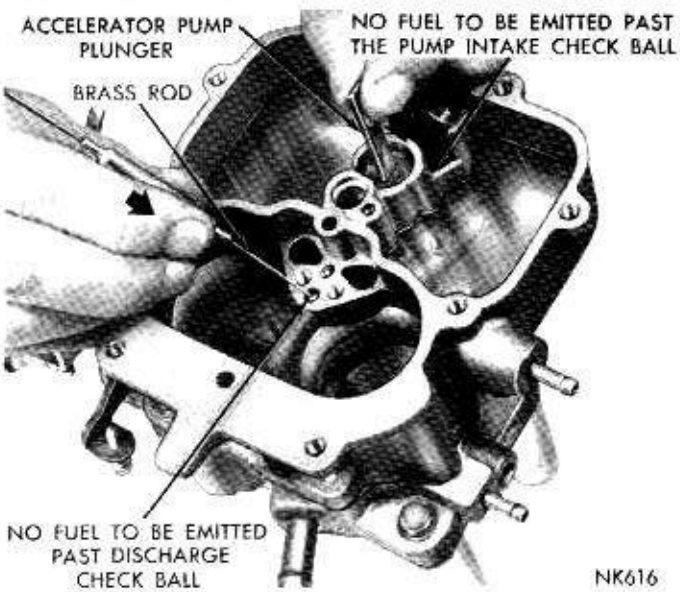


Fig. 6—Testing the Accelerator Pump Intake and Discharge Check Balls

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from jar of gasoline, flex leather several times, then slide down into the pump cylinder. Raise plunger and press lightly on plunger shaft to expel all air from the pump passage.

(4) Using a small clean brass rod, hold discharge check ball down firmly on its seat. Again raise plunger and press downward. No fuel should be emitted from either intake or discharge passage, as shown in (Fig. 6).

If any fuel does emit from either passage, it indicates presence of dirt or a damaged check ball seat. Check the passage again and repeat test. If leakage is still evident, install a new check ball. The fuel inlet check ball is located at bottom of plunger well.

(5) Install new gaskets on venturi cluster, and install in position in main body. Install cluster screws and tighten securely. Test pump discharge by pressing pump plunger down. Two fine streams of fuel should be forced from cluster. If either stream is restricted or diverted, remove cluster and reclean. After test, pour fuel from the bowl and remove pump plunger.

(6) Install the main metering jets. Tighten securely. (Refer to Fig. 3.)

(7) Before installing step-up piston, be sure step-up rods are able to move freely, each side of vertical position, as shown in (Fig. 7). The step-up rods must be straight, smooth and free to move forward and backward from vertical.

(8) Slide step-up piston gasket down into position in piston well, then install step-up piston spring, step-up piston and rods. Carefully guide step-up rods into main metering jets (Fig. 2). Install retaining screw and tighten securely. Check piston for free operation in well.

A step-up piston stuck in the **Up** position will cause a rich mixture at part throttle, whereas a piston stuck in the **Down** position will cause a lean mixture at wide open throttle and poor acceleration.

Measuring Float Setting

The carburetors are equipped with a rubber-tipped fuel inlet needle. The rubber tip is flexible enough to make a good seal on the needle seat, and to give increased resistance to flooding.

The use of the rubber-tipped needle requires a new procedure in adjusting the float setting. Care should be taken to perform this operation accurately in order to secure the best performance and fuel economy.

(1) To correctly set float height when carburetor is being overhauled, install the floats with fulcrum pin and pin retainer in main body.

(2) Install rubber-tipped needle, seat and gasket in body and tighten securely.

(3) Invert main body so that weight of float only is forcing needle against seat. Hold finger against the retainer to fully seat fulcrum pin.

(4) Using Tool T109-280 or a "T" scale, measure float, as shown in (Fig. 8). There should be 5/16 inch from surface of the fuel bowl to **crown of each float at the center.**

If an adjustment is necessary, hold floats on bottom of bowl and bend the float lip toward or away from needle. Recheck 5/16 inch setting again and repeat lip bending operation as required.

CAUTION: When bending the float lip, do not allow the lip to push against the needle as the synthetic rubber tip can be compressed sufficiently to cause a false setting which will affect correct level of fuel in the bowl.

After being compressed, the tip is very slow to recover its original shape.

CAUTION: It is very important that the float lip be perpendicular to the needle or slanted not more than ten degrees away from the needle when the float height is correct.

Air Horn

(1) Test freeness of choke mechanism in air horn. The choke shaft must float free to operate correctly. If choke shaft sticks in bearing areas, or appears to be gummed from deposits in air horn, a thorough cleaning will be required.

(2) Remove accelerator pump plunger from gaso-

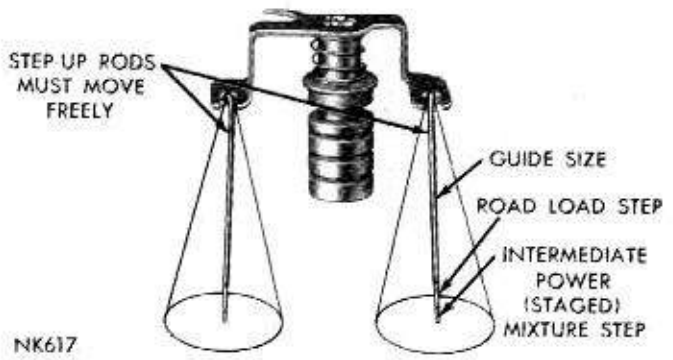


Fig. 7—Step-Up Rods Free Play

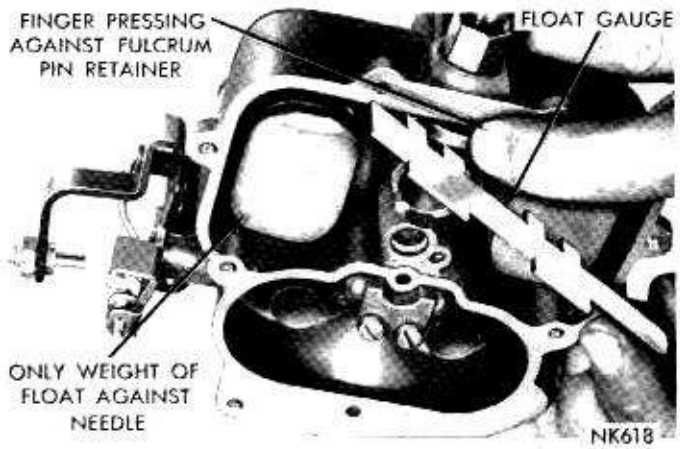


Fig. 8—Checking the Float Setting

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line, slide compression spring and spring seat over shaft. Install assembly in air horn and engage with the accelerator pump arm.

(3) Place a new gasket on main body, and install air horn. Install attaching screws and tighten securely. (When installing air horn, be sure leather on plunger does not wrinkle or fold back.)

(4) Engage accelerator pump rod with pump rocker arm and install loose end in center hole of throttle lever. Install hairpin clip to secure (Fig. 1).

(5) Engage fast idle connector rod fast idle lever and throttle lever. Install hairpin clip to secure.

Choke Vacuum Diaphragm

Inspect the diaphragm vacuum fitting to be sure that the passage is not plugged with foreign material. Leak check the diaphragm to determine if it has internal leaks. To do this, first depress the diaphragm stem, then place a finger over the fitting to seal the opening. Release the stem. If the stem moves more than 1/16 inch in ten (10) seconds, the leakage is excessive and the assembly must be replaced.

Install the diaphragm assembly on the airhorn as follows:

(1) Assemble diaphragm to airhorn and tighten attaching screws securely.

(2) Install choke operating link in position between diaphragm plunger (stem) and choke lever. Install the clip to secure.

(3) Inspect rubber hose for cracks before placing it on correct carburetor fitting. Refer to (Fig. 1). Do not connect vacuum hose to the diaphragm fitting until after vacuum kick adjustment has been made. (See Carburetor Adjustments.)

CARBURETOR ADJUSTMENTS

It is very important that the following adjustments are made on a reconditioned carburetor and in the sequence listed:

Accelerator Pump

(1) Back off idle speed adjusting screw. Open choke valve so that fast idle cam allows throttle valves to be completely seated in bores. Be sure that pump connector rod is installed in center hole of throttle lever.

(2) Close throttle valves tightly. Measure distance between top of the air horn and end of plunger shaft, as shown in (Fig. 9). This measurement should be 1" + or — 1/64 inch.

(3) To adjust pump travel, bend pump connector rod, using Tool T109-213, at lower angle of rod, until correct setting has been obtained.

Fast Idle Speed and Cam Position Adjustment

The fast idle engine speed adjustment should be made on the vehicle, as described in the Fast Idle Speed Adjustment (On the Vehicle) Paragraph. However, the Fast Idle Cam Position Adjustment can be made on the bench. This adjustment is important to assure that the speeds of each step of the cam occur at the proper time during engine warm-up.

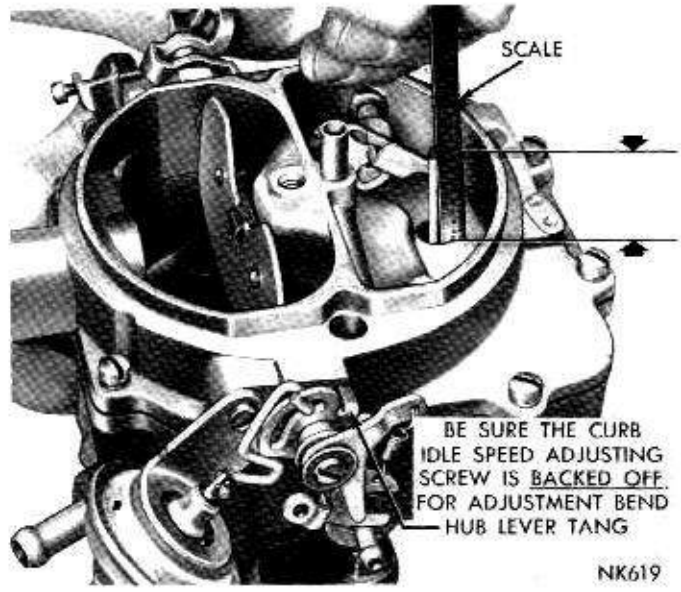


Fig. 9—Checking the Accelerator Pump Setting

(1) With fast idle speed adjusting screw contacting step on fast idle cam shown in (Fig. 10), move choke valve toward closed position with light pressure. Insert a Number 30 drill between choke valve and the wall of the air horn.

(2) An adjustment will be necessary if a slight drag is not obtained as the drill or gauge is being removed.

(3) If an adjustment is necessary, bend stop on choke shaft, using Tool T109-22 until correct valve opening has been obtained. Refer to (Fig. 10).

Vacuum Kick Adjustment—This test can be made

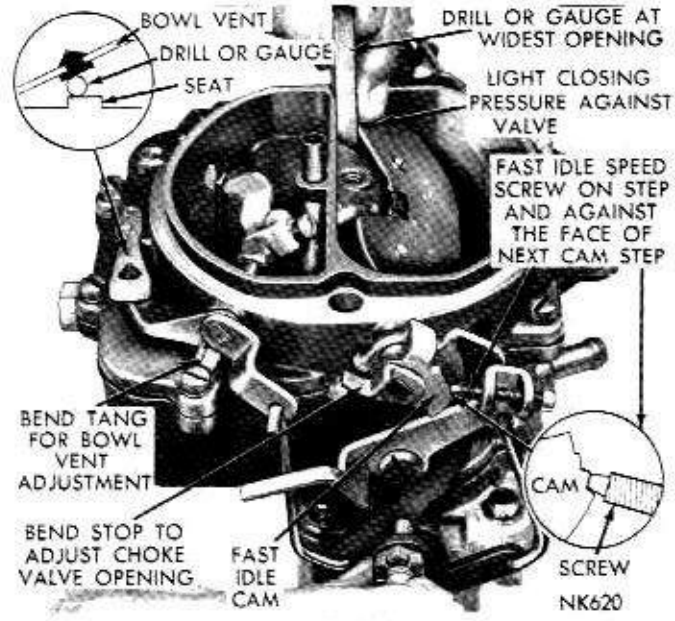


Fig. 10—Fast Idle Cam Position Adjustment

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ON or **OFF** the vehicle.

The choke diaphragm adjustment controls the fuel delivery while the engine is running. It positions the choke valve within the airhorn by action of the linkage between the choke shaft and the diaphragm. The diaphragm must be energized to measure the vacuum kick adjustment. Use either a distributor test machine with a vacuum source, or vacuum supplied by another vehicle.

(1) With engine **Not** running, open throttle valves far enough to allow the choke valve to be moved to closed position.

(2) Disconnect vacuum hose from diaphragm and connect hose from vacuum supply, as shown in (Fig. 11). (A minimum of 10 inches of mercury (HG) will be required.)

(3) Insert a Number 15 drill between choke valve and the wall of the airhorn. Refer to (Fig. 11). Apply sufficient closing pressure on choke valve opening possible without distortion of the diaphragm link. Note that cylindrical stem of the diaphragm will extend as an internal spring is compressed. This spring must be fully compressed for proper measurement of the vacuum kick adjustment.

(4) An adjustment will be necessary if a slight drag is not obtained as the drill or gauge is being removed.

The adjustment of this opening will require removal of the choke operating link.

CAUTION: Damage to the diaphragm and the choke lever slot can result, if the link is not removed for the bending operation.

(5) Remove clip and disengage choke operating link from diaphragm stem (plunger), then disengage link from choke lever. (The best bending results will be obtained by using a vise and a pair of pliers.)

(6) Bend choke operating link to provide the correct choke valve opening.

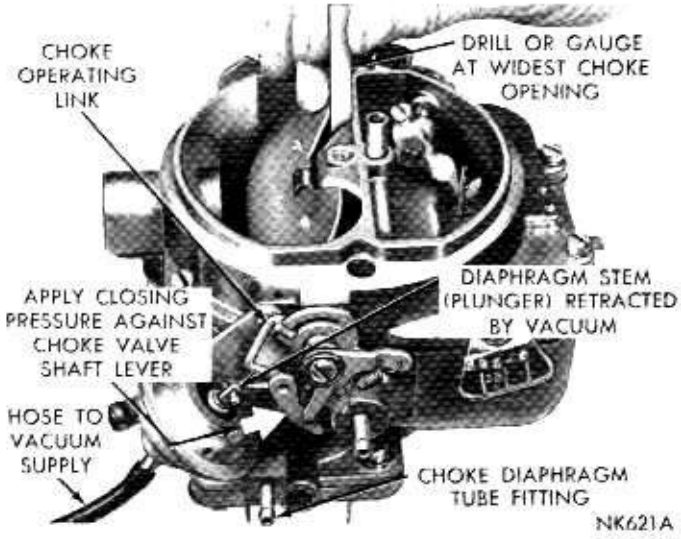


Fig. 11—Checking the Choke Vacuum Kick Setting

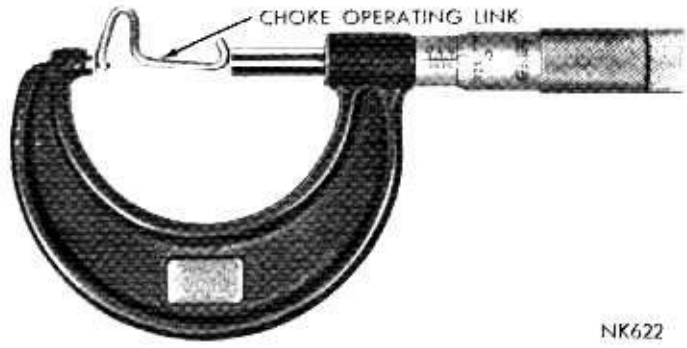


Fig. 12—Choke Operating Link Measurements

CAUTION: A correction in the length of the link of .010 inch, will result in a change of .010 inch in the choke valve opening.

As an example, if choke valve opening is .010 inch in error, correction in the link length would be .010 inch.

A 2″ micrometer will be helpful in establishing the original length of the link, as shown in (Fig. 12), before completing the adjustment.

(7) Install choke operating link and recheck choke valve opening, using a gauge or drill. (Refer to Fig. 11.)

Reinstall the vacuum hose to the diaphragm and make the following check:

(8) With no vacuum applied to diaphragm, some clearance should exist between choke operating link and choke lever slot, in both open and closed choke valve positions, as shown in (Fig. 13). **This clearance is necessary to allow the choke valve to close for starting as well as fully open position after the engine reaches the normal operating temperature.**

If a clearance does not exist in both of these positions, a recheck of the operating link adjustment should be made. **Free movement of the choke valve**

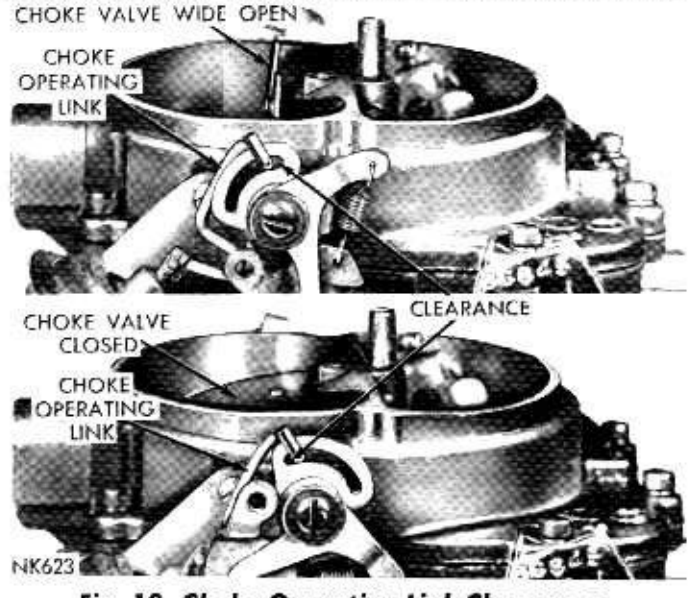


Fig. 13—Choke Operating Link Clearances

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between the closed and open positions is very necessary.

This free movement should also exist between the kick and the open choke valve positions with the engine running. If binding does exist, the choke operating link has been improperly bent and should be corrected.

Choke Unloader (Wide Open Kick)

(1) Hold throttle valves in wide open position. Insert Tool T109-31 (or a ¼" drill shank) between upper edge of choke valve and inner wall of air horn, as shown in (Fig. 14).

(2) With a finger lightly pressing against valve, a slight drag should be felt as gauge is being withdrawn. If an adjustment is necessary, bend tang on fast idle lever, using Tool T109-22, as shown in (Fig. 15) until correct clearance has been obtained.

Bowl Vent Adjustment

(1) With throttle valves at curb idle, there should be 1/16 inch clearance between bowl vent valve and air horn, when measured at innermost or smallest dimension with a drill shank.

(2) If an adjustment is necessary, bend short tang on vent valve operating lever, using Tool T109-22 until correct opening has been obtained. **Any adjustment to the accelerator pump means, that the bowl vent valve must be readjusted.**

Idle Speed Adjustment (Curb Idle) Standard Carburetors

To make the idle speed adjustment, the engine must be thoroughly warmed up. A more reliable idle adjustment can usually be obtained if the car has been driven a minimum of five miles. For best results, it is recommended that a tachometer be used in this adjustment.

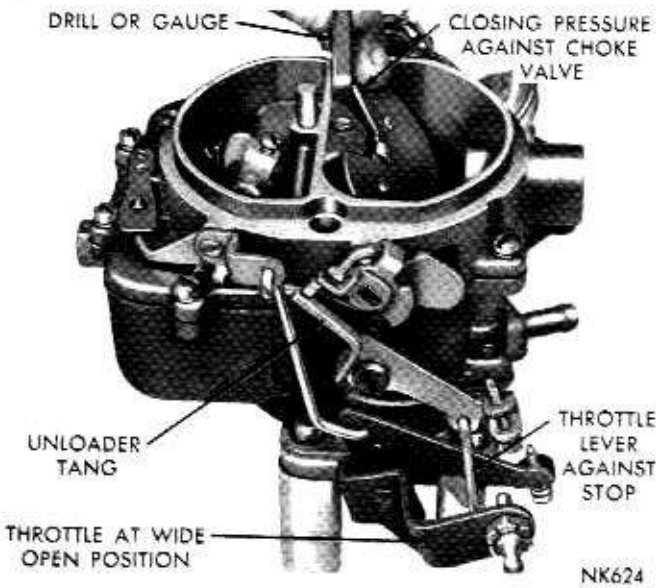


Fig. 14—Checking the Choke Unloader Setting

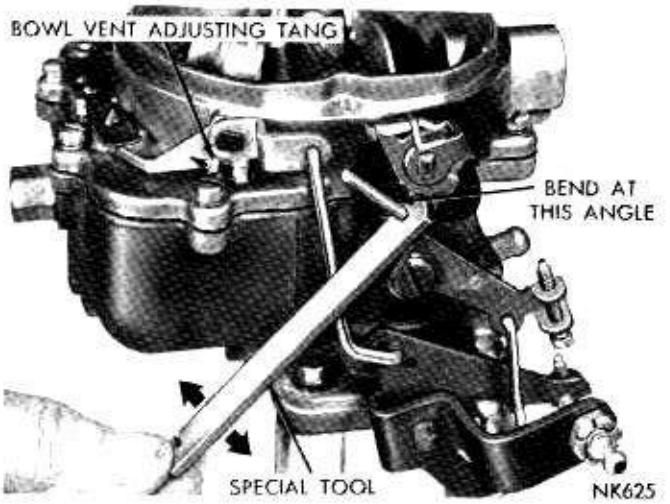
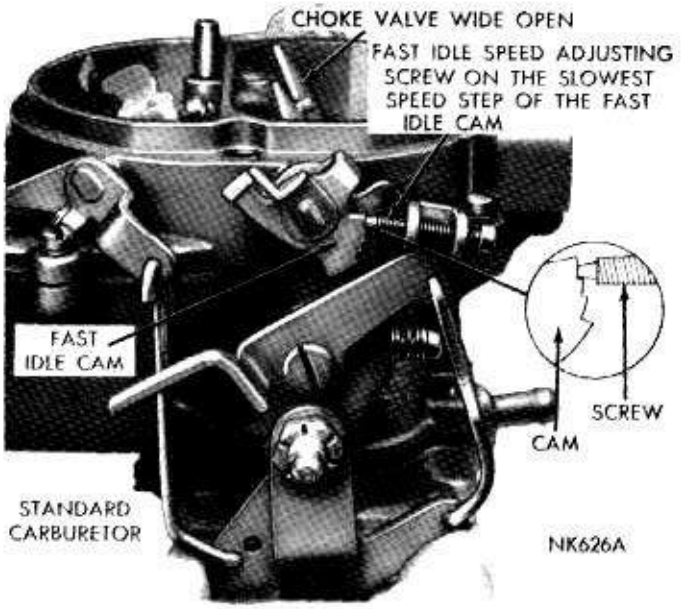


Fig. 15—Bending the Choke Unloader Tang



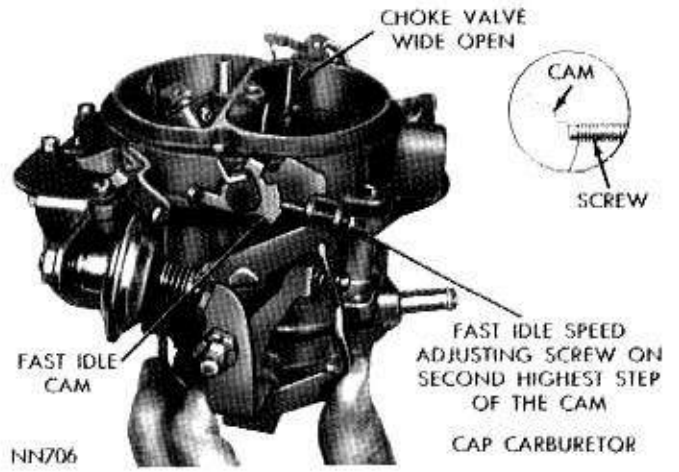


Fig. 16—Fast Idle Speed Adjustment (On the Vehicle)

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The following precautions should be taken before making the idle speed adjustment:

(1) To make idle speed adjustment, turn idle speed screw in or out to obtain 500 rpm. (On cars with air conditioning, set idle speed at 500 rpm **with air conditioning On.**) Be sure choke valve is fully open and that fast idle adjusting screw is not contacting fast idle cam.

(2) Turn each idle mixture screw **in or out** to obtain highest rpm. While making adjustment, carefully watch tachometer and notice that speed can be decreased by turning screws in either direction from setting that gave highest rpm reading.

(3) Readjust to 500 rpm with idle speed screw. (With air conditioning ON.)

(4) Turn each idle mixture adjusting screw in clockwise direction (leaner) until there is a slight drop in rpm. Turn each screw out, counterclockwise (richer) just enough to regain lost rpm.

This procedure will assure that the idle has been set to the leanest mixture possible for smooth idle. **This setting is very important.**

Since the correct speed was originally set, using the speed screw, the speed obtained after finding the leanest smooth idle will probably be too fast.

(5) Readjust speed screw to obtain correct idle speed. Repeat steps 2 and 4 above if necessary.

Measuring Float Setting (On the Vehicle)

To measure the float setting with the carburetor mounted on the engine, proceed as follows:

(1) Remove hairpin clip and disengage accelerator pump rod from throttle lever and pump rocker arm. Disconnect the automatic choke rod by unsnapping clip.

(2) Remove air horn attaching screws and lift air horn straight up and away from main body. Remove gasket.

(3) Set float fulcrum pin by pressing a finger against fulcrum pin retainer.

There should be enough fuel in bowl to raise floats so that lip bears firmly against needle. Additional fuel may be admitted by slightly depressing float. If fuel pressure in the line is insufficient to force additional fuel into the bowl, add the necessary fuel from a clean container.

WARNING: Since the manifolds may be hot, it is dangerous to spill fuel onto these surfaces. Take the necessary precautions to avoid spillage.

(4) With only pressure from buoyant float holding lip against inlet needle, check float setting, using Tool T109-280, or a "T" scale. There should be 5/16 inch from surface of the bowl (gasket removed) to crown of the floats at center.

If an adjustment is necessary, hold floats on bottom of the bowl, then bend float lip toward or away from needle. Recheck the 5/16 inch setting again, then repeat lip bending operation as required. **When bending the float lip, do not allow the lip to push against the needle as the rubber tip can be compressed sufficiently to cause a false setting which will affect correct level of fuel in the bowl. After being compressed, the rubber tip is very slow to recover its original shape. It is very important that the float lip be perpendicular to the needle or slanted not more than 10 degrees away from the needle when the float is set correctly.**

(5) After float has been correctly set, reassemble the air horn.

*Fast Idle Speed Adjustment (On the Vehicle)**

To set the fast idle speed on the vehicle, connect a tachometer to the vehicle, then set the curb idle speed and proceed as follows:

(1) With engine running and transmission in neutral position, open the throttle slightly.

(2) **On Standard carburetors,** close the choke valve about 20 degrees, then allow the throttle to close. Return choke valve to the open position. The fast idle speed screw should contact the slowest speed step on the fast idle cam (Fig. 16.)

(3) **On CAP carburetors,** open the throttle until the fast idle screw can be positioned on the second highest step of the cam (Fig. 16). **The air cleaner must be installed while measuring the engine speed.**

(4) With the engine warmed up to the normal operating temperature, turn the fast idle speed screw in or out to secure 700 rpm (Standard carburetors) or 1600 rpm (CAP carburetors.)**

Reposition the cam and throttle after every screw adjustment to apply normal throttle closing torque.

*After Approx. 500 Miles (If Necessary).

****Special Note: CAP equipped Vehicles**

Before adjusting idle and/or fast idle speeds and mixtures, make sure that the basic timing and the distributor control valve are correctly adjusted as outlined under Idle Speed Adjustment (Curb Idle) CAP Carburetors.

Spring Staged Choke Adjustment

The new spring staged choke, shown in (Fig. 17) is a device incorporated in the choke mechanism which limits the choke blade closing torque when cranking the engine at temperatures below zero. Thus the spring staging of the choke is a better match for the engine's starting mixture requirements at the low temperatures.

To check the spring staged choke for correct operating clearance, refer to (Fig. 17) then proceed as follows:

(1) Push on hub lever with finger, at the closed choke position. A small opening should exist between the shaft and hub levers.

(2) Using a drill or gauge, measure opening. The opening should be from .020 to .030 inches.

(3) If an adjustment is necessary, bend the hub

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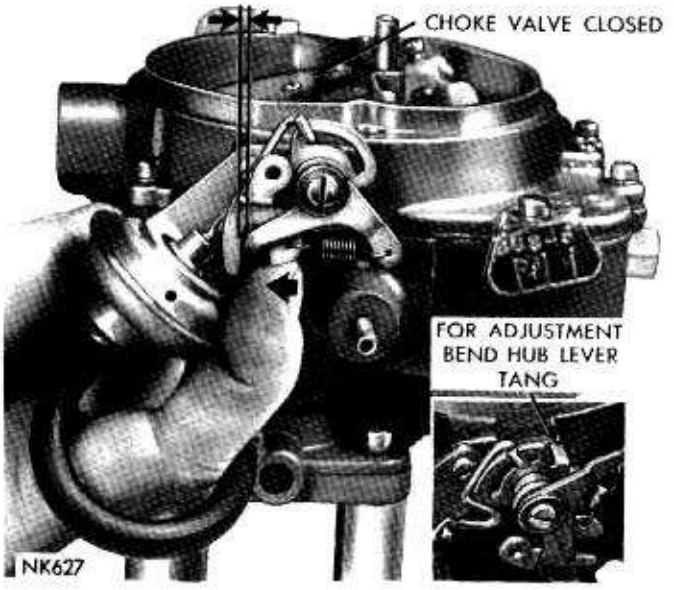


Fig. 17—Spring Staged Choke Adjustment

lever tang until correct opening has been obtained.

Dashpot Setting and Adjustment—CAP Carburetors (Manual Transmissions Only)

With the curb idle speed and mixture properly set and a tachometer installed, position the throttle lever so that the actuating tab on the lever is contacting the stem of the dash pot but not depressing it. The tachometer should read 1000 rpm if the setting is correct. To adjust the setting if necessary, screw the dashpot in or out as required. When the dashpot desired setting is obtained, tighten the lock nut on the dashpot against the bracket.

Idle Speed Adjustment (Curb Idle) CAP Carburetors

To make the idle speed adjustment on CAP carburetors, secure an accurate ignition tachometer and a Sun Electric Combustion-Vacuum Unit, Model 80, Exhaust Condenser, Model EC, and Hose 669-14 or equivalent. (The above analyzer is recommended; however, other reliable makes of analyzers in good condition may be used.) Proceed as follows:

(1) Engine running at normal operating temperature, and timing checked and set at 5° after top dead center.

(2) Air cleaner installed.

(3) Six cylinder engines only—turn headlights on high beam position.

(4) Automatic transmission in neutral position (not in park position).

(5) On air conditioned cars, turn air conditioning **off.**

(6) Connect ignition tachometer.

(7) Insert probe of the exhaust gas analyzer in the tail pipe as far as possible (2 ft. minimum distance). On dual exhaust cars use the left side tail pipe (side opposite heat valve). It is very important that the probe and connecting tubing be free of leaks to prevent erroneous readings. If a garage exhaust system is used to conduct the exhaust gases away, a plenum chamber or other means must be used to reduce the vacuum of the exhaust system to ½ inch water or less.

(8) Connect the exhaust gas analyzer, warm up and calibrate according to manufacturer's instructions.

(9) Place clamp on hose between distributor vacuum control valve and intake manifold.

(10) Set the idle speed to the specified value for the specific engine-transmission combination.

(11) **IMPORTANT: When adjusting mixture screws to obtain the air/fuel ratio specified for CAP, do not turn the mixture screw more than 1/16 turn at a time. The combustion analyzer is so sensitive that the ratio must be changed by very small increments if accurate readings are to be obtained. The meters read in air/fuel ratio so that a higher reading indicates a leaner mixture and vice versa.**

(a) Adjust each screw 1/16 turn richer (counterclockwise) and wait 10 seconds before reading the meter.

(b) If necessary, repeat step "a" until the meter indicates a definite increase in richness (lower reading). This step is very important since the meter reverses its readings and indicates a richer mixture as the carburetor is leaned out if the carburetor is set very lean.

(c) When it has been established that the meter is indicating a lower reading (richer mixture) when the idle mixture screws are turned in the richer direction, proceed to adjust the carburetor to give 14.2 air/fuel ratio, turning the screws counterclockwise (richer) to lower the meter reading and clockwise (leaner) to increase the meter reading.

(d) If the idle speed changes as the mixture screws are turned, adjust the speed to the specified value and readjust the mixture as required so that 14.2 air/fuel ratio is obtained at the specified idle speed.

(e) If the idle is rough, the screws may be adjusted independently to achieve a smooth idle, provided the air/fuel ratio is held to the 14.2 value.

(12) Remove clamp from distributor vacuum valve hose. If idle speed changes materially check and set valve as described under "Distributor Vacuum Control Valve Adjustment."

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AFB SERIES CARTER CARBURETOR

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GENERAL INFORMATION

The Standard Carter AFB carburetor models AFB-4130S and AFB-4131S are used on the 383 and 440 cu. in. engines when the vehicles are equipped with the manual or automatic transmissions respectively.

The Special (CAP-Cleaner Air Package) Carter carburetors models AFB-4132S and AFB 4136S are used on the 383 and 440 cu. in. engines respectively, when the vehicles are equipped with a manual transmission. These two carburetors are supplied with a dash pot which is mounted on the carburetor. The dash pot (used only on manual transmission equipped vehicles) retards the return of the throttle to idle position. The proper adjustment of the dash pot is very Important! (See Carburetor Adjustments.)

The Special (CAP-Cleaner Air Package) Carter carburetor models AFB-4133S and AFB 4137S are used on the 383 and 440 cu. in. engines respectively, when the vehicles are equipped with the automatic transmission.

All CAP AFB carburetors are identified by a green tag mounted on an air horn attaching screw.

Since the service procedures are identical on all Carter AFB carburetors, the illustrations showing the various disassembly procedures will not always show any one specific carburetor.

The AFB (aluminum four barrel) carburetor contains many features, some of which are the locations for the step-up rods and pistons. The step-up rods, pistons and springs are accessible for service without removing the air horn or the carburetor from the engine. The venturi assemblies (primary and secondary) are replaceable and contain many of the calibration points for both the high and low speed system. One fuel bowl feeds both the primary and secondary nozzles on the right side while the other fuel bowl takes care of the primary and secondary nozzles on the left side. This provides improved performance in cornering, quick stops and acceleration.

All the major castings of the carburetor are aluminum, with the throttle body cast integral with the main body. This allows an overall height reduction in the carburetor. The section containing the accelerator pump is termed the primary side of the carburetor. The rear section is the secondary. The five conventional systems used in previous four barrel carburetors are also used in this unit. The five conventional systems are, two float systems, two low speed systems, (primary side only) two high speed systems, one accelerator pump system and one automatic choke control system.

SERVICE PROCEDURES

DISASSEMBLING THE CARBURETOR

To disassemble the carburetor for cleaning or overhaul, refer to (Fig. 1), then proceed as follows:

(1) Place carburetor assembly on repair stand Tool C-3400 or T-109-287S elevating legs. These tools are used to protect throttle valves from damage and to provide a suitable base for working.

(2) Remove hairpin clip that attaches fast idle connector rod to the choke lever. Disengage rod from lever, then swing rod at an arc until it can be disengaged from fast idle cam.

(3) Remove clevis pin that holds throttle connector rod in center hole of the accelerator pump arm. Remove hairpin clip that attaches lower end of rod in the primary throttle shaft lever. Disengage rod from arm and lever, then remove from carburetor.

(4) Remove screws attaching step-up piston and rod cover plates. **Hold cover down with a finger to prevent piston and rods from flying out.** Lift off plates and slide step-up pistons and rods out of air horn, as shown in (Fig. 2). Remove step-up piston springs.

(5) Remove vacuum hose between carburetor throttle body and the vacuum diaphragm.

(6) Remove clip from choke operating link and disengage link from diaphragm plunger (stem) and choke lever. Refer to (Fig. 1).

(7) Remove vacuum diaphragm and bracket assembly and place to one side to be cleaned as a special item. **A liquid cleaner may damage the diaphragm material.**

(8) Remove ten screws that attach air horn to the main body. (1 screw in hole in air horn.) Lift air horn straight up and away from main body. **When**

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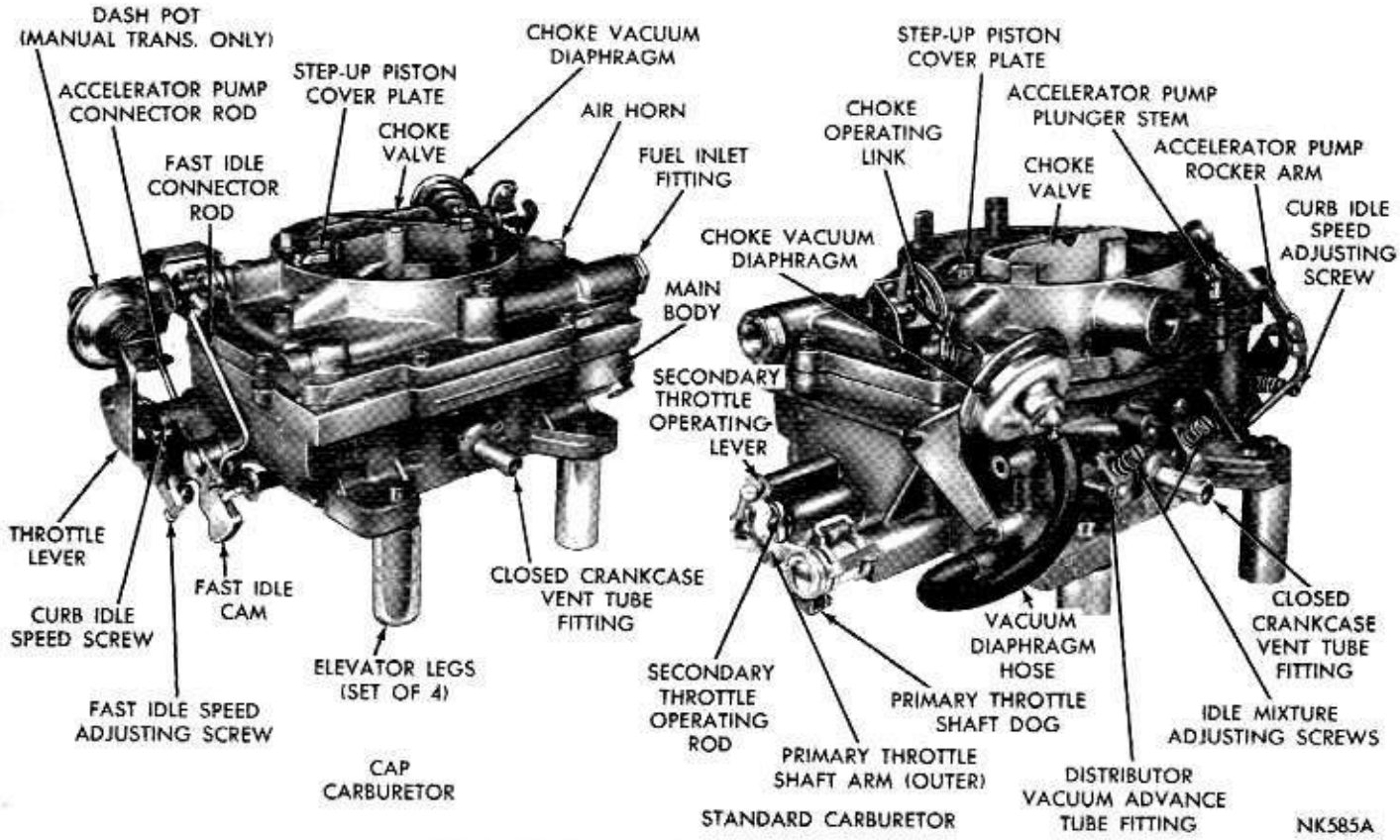


Fig. 1—Carburetor Assembly (Carter AFB)

removing air horn, use care so as not to bend or damage the floats. Remove the accelerator pump, plunger lower spring from the pump cylinder. Remove dash pot (if so equipped).

Disassembling the Air Horn

Place air horn in an inverted position on bench (to protect the floats) then proceed to disassemble as follows:

(1) Using a suitable Tool, remove float fulcrum pins, (left and right) then lift float up and out of bosses on air horn. **It is suggested that the float on the pump side be marked so that the floats can be reinstalled in their respective positions.**

(2) Remove two needle valves from their respective seats, after marking one on the pump side for identification. Using a wide blade screw driver, remove needle valve seats. Be sure each needle valve is returned to its original seat at reassembly.

(3) Remove spring clip that holds throttle connector rod in center hole of pump arm. Remove pump arm pivot screw and lift off pump arm, at the same time, disengage the link from the arm and pump stem. Slide accelerator pump plunger and spring out of air horn. Remove gasket.

(4) Place accelerator pump plunger in a jar of clean gasoline or kerosene, to prevent leather from drying out.

(5) Remove fuel inlet fitting and filter screen from the air horn.

(6) Test freeness of choke mechanism in air horn. The choke shaft must float free to operate correctly. If choke shaft sticks in bearing area, or appears to be gummed from deposits in the air horn, a thorough cleaning will be required.

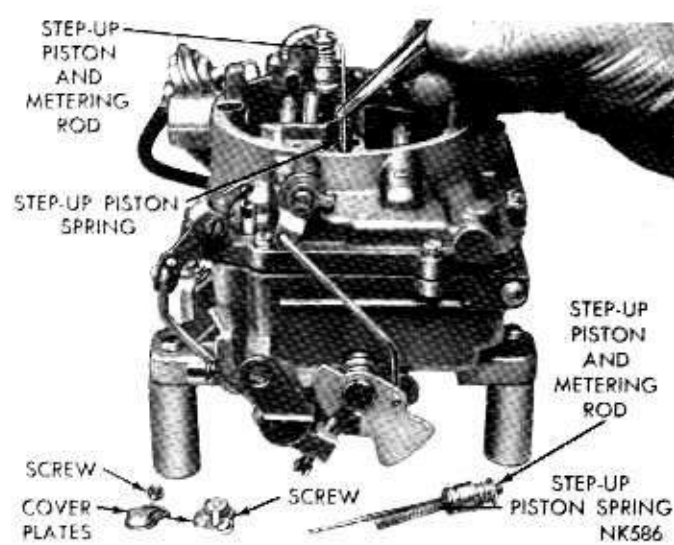


Fig. 2—Removing or Installing Step-Up Pistons and Rods

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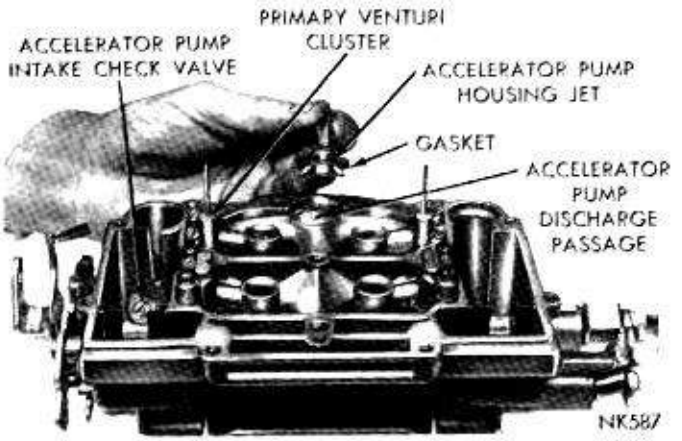


Fig. 3—Removing or Installing Accelerator Pump Jet Housing

Main Body Disassembly

(1) Remove screws that attach the accelerator pump jet housing to the main body. Lift out the jet housing and gasket as shown in (Fig. 3). Discard gasket. Now, invert main body and drop out discharge check needle from discharge passage.

(2) Using Tool T109-58, remove the main metering jets (primary side), as shown in (Fig. 4). **The primary and secondary main metering jets are not interchangeable. It is very important that these jets be installed in their respective locations in the main body at reassembly.**

(3) Again using Tool T109-58, remove main metering jets (secondary side), as shown in (Fig. 4).

(4) Remove screws that attach primary venturi (choke and pump side) to main body. Lift venturi straight up and away from main body, as shown in (Fig. 5). Discard the gaskets. **The venturi assemblies**

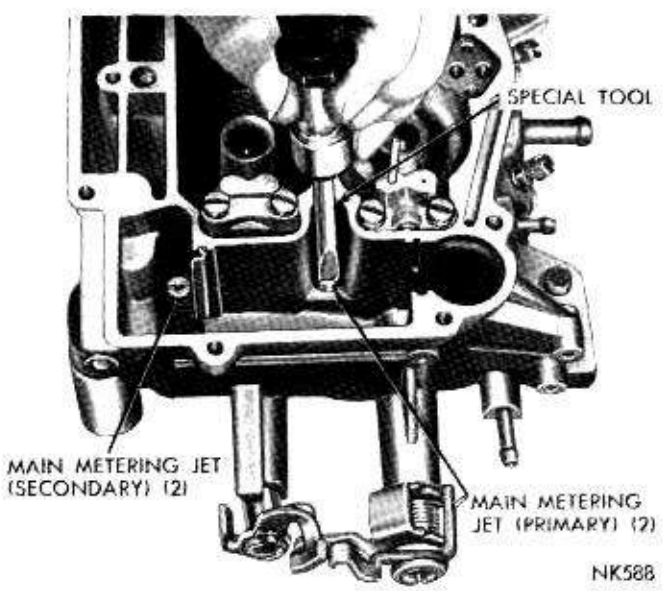


Fig. 4—Removing or Installing Main Metering Jets

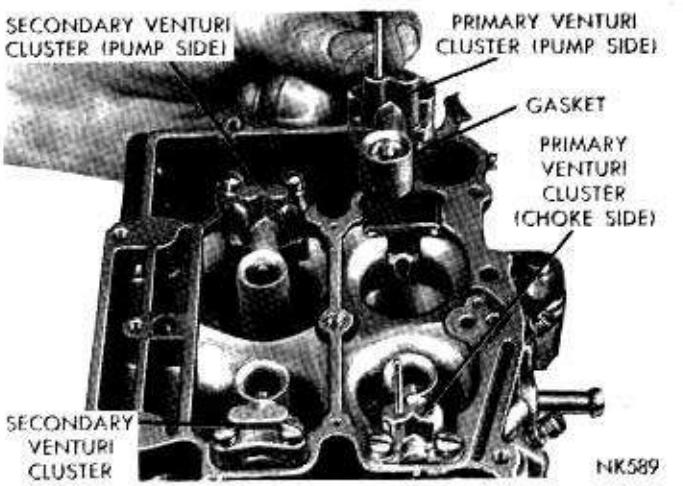


Fig. 5—Removing or Installing Primary Venturi Cluster

are not interchangeable, side for side and must be reinstalled in their original locations at reassembly.

(5) Remove screws that attach secondary venturi (choke and pump side) to main body. Lift secondary venturi assemblies straight up and away from body, as shown in (Fig. 6).

(6) Using Tool T109-59, screw driver bit, remove accelerator pump intake check valve located inside the fuel bowl, adjacent to accelerator pump cylinder.

On CAP carburetors, do not remove the idle mixture adjusting screws from the throttle body. These screws have limited travel and will be broken if removed.

The carburetor now has been disassembled into two units, namely the air horn and the main and throttle body casting. The component parts of each have been disassembled as far as necessary for cleaning and inspection.

It is usually not advisable to remove the throttle shafts or valves unless wear or damage necessitates

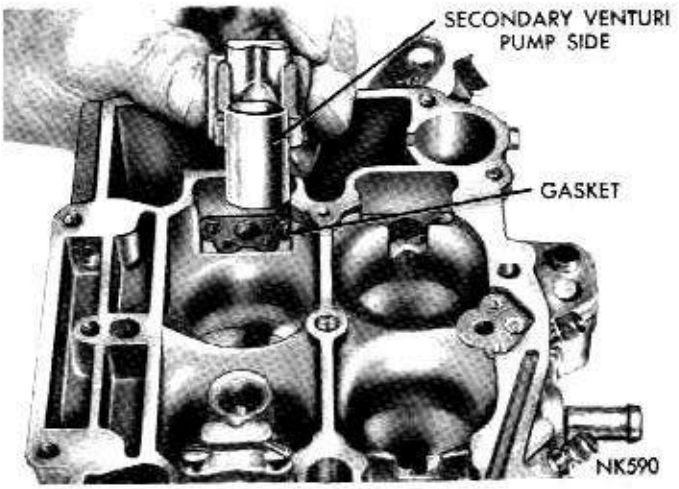


Fig. 6—Removing or Installing Secondary Venturi Cluster

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the installation of new parts. During the manufacture of the carburetor, the location of the idle transfer ports and the idle discharge ports to the valve is carefully established for one particular assembly, as shown in (Fig. 7). The valves are milled to give the proper port relation.

If new throttle shafts should be installed in an old worn body, it would be very unlikely that the original relationship of these ports to the valves would be obtained. A very slight change in the port relationship to the valves would adversely affect normal carburetor operation, between the speeds of 15 and 30 miles per hour.

It is recommended that if the throttle shafts are excessively worn, that a new carburetor be installed. However, if the throttle valves have become nicked, burred or damaged, new valves may be installed, providing the following instructions are carefully followed. **The screws that attach the throttle valves are staked on the opposite side and care should be used in removal so as not to break the screws in the throttle shaft. Remove the staked portion of the screws with a file.**

Remove the screws that attach the primary throttle valves to the throttle shaft and slide valve (or valves) out of bores.

Remove the screws that attach the secondary throttle valves to the throttle shaft and slide valve (or valves) out of bores.

The primary valves and secondary valves are not interchangeable and should be kept separate in order that each may be returned to its respective bore. (See Fig. 8.)

INSPECTION AND ASSEMBLY

(1) Slide primary throttle valve (or valves) into their respective bores, install new screws, but do not tighten. Be sure idle speed adjusting screw is backed out. Hold valves in place with fingers. (Fingers pressing on high side of valves.)

(2) Tap valves lightly in this position, tighten screws securely. Stake screws by squeezing with pliers.

(3) Turn the idle mixture adjusting screws lightly

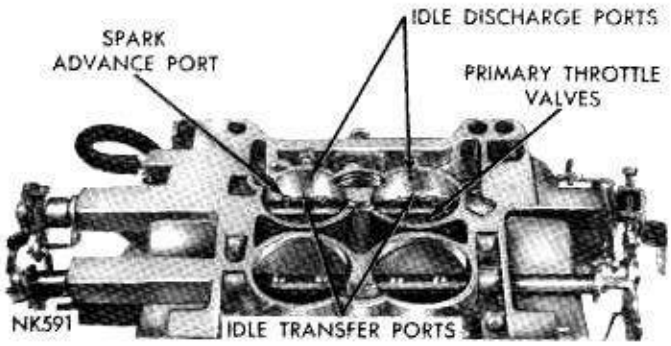


Fig. 7—Ports in Relation to Throttle Valves

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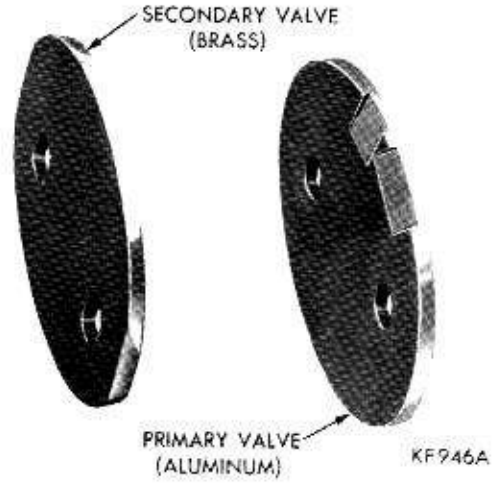


Fig. 8—Throttle Valve Identification

against their seats, then back off one full turn for an approximate adjustment. **Do not use a screw driver.**

(4) Place new secondary venturi gaskets in position, then install secondary venturi (pump and choke side) by lowering straight down on gaskets. Install attaching screws and tighten securely. **Be sure all the metering holes and vent tubes are clean, in both the primary and secondary venturi.**

(5) Place new primary venturi gaskets in position, then install primary venturi (pump and choke side) by lowering straight down on the gaskets. Refer to (Fig. 5). Install attaching screws and tighten securely.

(6) Install primary and secondary main metering jets, using Tool T109-58. Refer to (Fig. 4). Tighten jets securely.

(7) Install accelerator pump intake check ball using Tool T-109-59.

Accelerator Pump Test

(1) Pour clean gasoline into carburetor bowl (approximately ½ inch deep). Remove accelerator pump plunger from jar of gasoline. Flex leather several times, then slide into pump cylinder.

(2) Install accelerator pump discharge check needle in discharge passage. Raise pump plunger and press lightly on the plunger shaft to expel air from pump passages. Using a small clean brass rod, hold discharge check needle firmly on its seat. Again raise plunger and press downward. No fuel should be emitted from either intake or discharge passage.

(3) If fuel does emit from intake passage, remove intake check ball and reclean passage. Fuel leakage at discharge check needle indicates the presence of dirt or a damaged check needle. Clean again and then install a new check needle. Retest for leakage.

(4) If either intake check assembly or discharge check needle leaks after above test and service fix, attempt to reseat as follows:

Intake Check Ball

Remove intake check assembly from throttle body. Install a new check assembly, then retest as described previously.

Discharge Check Needle

(1) With discharge check needle installed, insert a piece of drill rod down on needle. Lightly tap drill rod with a hammer to form a new seat. Remove and discard old needle and install a new one. Retest as described previously. If the service fix does not correct the condition, a new carburetor will have to be installed.

(2) Install accelerator pump discharge check needle, jet housing and gasket. Install housing and attaching screws. Tighten screws securely.

(3) Press down on accelerator pump plunger shaft, and as the plunger is being depressed, a clear straight stream should emit from each jet. If the streams are not identical, (if either one is diverted or restricted) a new accelerator pump jet housing should be installed. After test, pour gasoline from carburetor bowl and remove pump plunger.

Assembling the Air Horn

(1) Slide fuel inlet screen into fuel line fitting, then install in air horn. Tighten securely.

(2) Check to see if leather on accelerator pump plunger is hard, cracked or worn. If any sign of wear or deterioration is evident, install a new plunger assembly.

(3) When reassembling, make sure large diameter of pivot screw enters the hole in pump arm and that shoulder on screw has not pinched the pump arm.

The carburetors are equipped with synthetic rubber tipped fuel inlet needles. The needle tip is a rubber material which is not affected by gasoline and is stable over a wide range of temperatures. The tip is flexible enough to make a good seal on the needle seat, and to give increased resistance to flooding.

The use of the new inlet needles requires that care be used when making float adjustments. Avoid applying any pressure on the floats which might compress the tip of the fuel inlet needles. **The tip can be compressed sufficiently to cause a false setting which will affect correct level of fuel in the bowl.**

(4) Place a new air horn to main body gasket in position on air horn, then install float needle valve seats. (Be sure each needle seat and needle is reinstalled in its original position.)

(5) Slide right and left floats into position in air horn, then install float fulcrum pins. **(Be sure the marked float is installed on the pump side of the air horn.)** See disassembly procedures.

(6) After floats have been installed, check the float alignment, level and drop settings as follows:

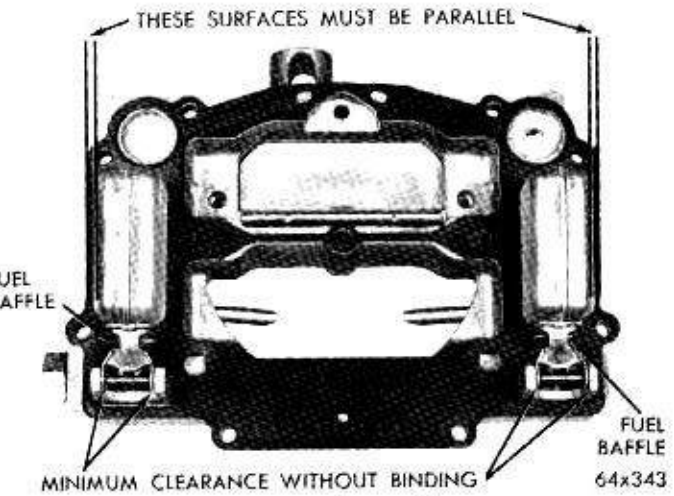


Fig. 9—Checking Float Alignment

Float Alignment Setting

(1) Sight down side of each float shell to determine if side of the float is parallel to outer edge of air horn casting, as shown in (Fig. 9).

(2) If sides of float are not in alignment with edge of casting, bend float lever by applying pressure to the end of the float shell with thumb. **To avoid damage to the float, apply only enough pressure to bend the float lever.**

(3) After aligning floats, remove as much clearance as possible between arms of float lever and lugs of air horn. To do this, bend the float lever. The arms of float lever should be as parallel as possible to inner surfaces of lugs or the casting.

Float Level Setting

(1) With air horn inverted, air horn gasket in place and float needle seated, slide float gauge (refer to specifications for carburetor being worked on) between top of the float (at outer end) and the air horn gasket, as shown in (Fig. 10). Float should just touch gauge (T109-106).

(2) Check other float in same manner. If an adjustment is necessary, bend float arm using Tool T109-22, until correct clearance has been obtained.

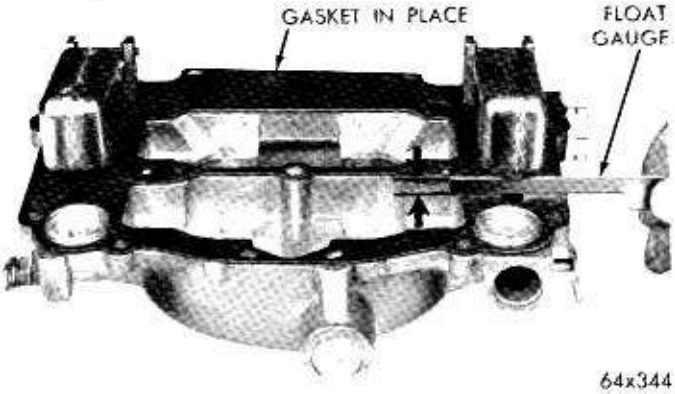


Fig. 10—Checking Float Height

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After bending arm, recheck the float alignment.

Float Drop Setting

(1) Holding air horn in an upright position, measure distance from top of the floats (outer end) to the air horn gasket, as shown in (Fig. 11). This measurement should be ¾ inch. If an adjustment is necessary, bend stop tabs on float levers until correct drop setting has been obtained. Bend tab toward the needle seat to lessen drop, or away from the seat to increase the drop.

(2) After floats have been checked and adjusted, continue to assemble the carburetor as follows:

(3) Place accelerator pump plunger lower spring in pump cylinder, then lower air horn carefully down on the main body. Care must be taken to center small brass main bleed tubes so that they will pass through holes in the air horn without being damaged. **Be sure the fuel baffles on the air horn, slide down in front, (bowl side) of the float chamber baffles, or the air horn will not index correctly with the main body and can cause the floats to hang up. Be sure the leather on the plunger does not curl or wrinkle. Accelerator pump operation will be affected if this precaution is not observed.**

(4) Install 10 air horn attaching screws and tighten securely. (The two long screws should be installed in holes that are located at air cleaner mounting surface. The 1 inch screw at the front and 1½ inch at the rear.)

The change from the low speed, best fuel economy, road load mixtures to the richer wide open throttle full power mixtures is now accomplished in two steps. This has made it possible to secure low speed fuel economy without sacrificing performance in the intermediate speed range. To do this, there is a new step-up piston and spring assembly, new metering rods with three diameters, and new style primary metering jets, as shown in (Fig. 12).

(5) Slide step-up piston spring into piston cylinders, followed by step-up pistons and step-up rods. Install

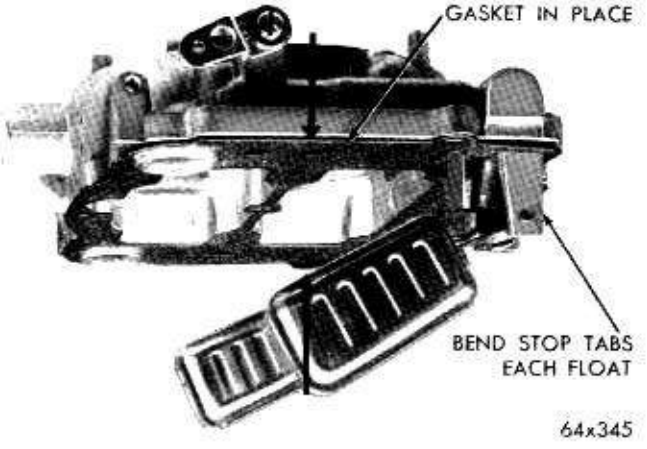


Fig. 11—Checking Float Drop

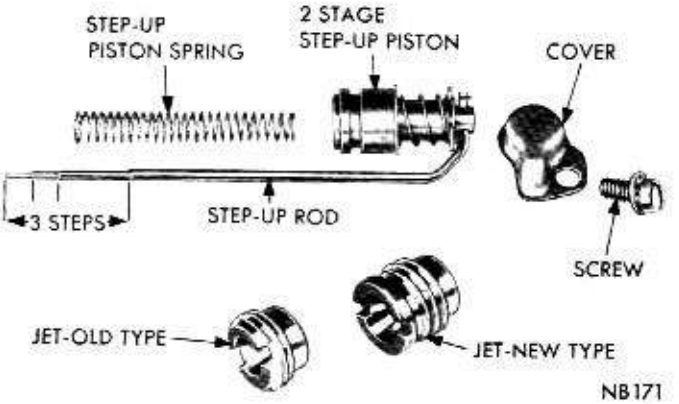


Fig. 12—Step-Up Piston, Rod and Jet

the cover plates and attaching screws while holding step-up pistons down in position. Tighten screws securely.

(6) Check fit of the choke valve in air horn. The valve should be evenly spaced on all sides. Loosen screws and reposition if necessary.

(7) Engage throttle connector rod with the primary throttle shaft lever, then install hairpin clip. Install clevis clip to rod and pump arm.

(8) Engage lower end of the fast idle connector rod with the fast idle cam, then swing in an arc to lock in cam. Slide other end of rod into choke shaft lever and secure with hairpin clip.

Installing the Vacuum Diaphragm

Inspect the diaphragm vacuum fitting to be sure that the passage is not plugged with foreign material. Leak check the diaphragm to determine if it has internal leaks. To do this, first depress the diaphragm stem, then place a finger over the vacuum fitting to seal the opening. Release the diaphragm stem. If the stem moves more than 1/16 inch in ten (10) seconds, the leakage is excessive and the assembly must be replaced. Install the diaphragm assembly on the carburetor as follows:

(1) Assemble to carburetor and tighten attaching screws securely.

(2) Install choke operating link in position between diaphragm plunger (stem) and choke lever. Install the clip to secure.

(3) Inspect rubber hose for cracks, before placing it on correct carburetor fitting. Refer to (Fig. 1.) **Do not connect the vacuum hose to the diaphragm fitting until after the vacuum kick adjustment has been made. (See Carburetor Adjustments.)**

The following adjustments should be made with the carburetor on the bench for ease of working, and, should be made in the following order:

Fast Idle Speed and Cam Position Adjustment

The fast idle engine speed adjustment should be

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made on the vehicle, as described in the Fast Idle Speed Adjustment (On the Vehicle Paragraph). However, the Fast Idle Cam Position Adjustment can be made on the bench.

This adjustment is important to assure that the speeds of each cam step occur at the proper time during engine warm-up. Adjust as follows:

(1) With fast idle speed adjusting screw contacting step on fast idle cam, shown in (Fig. 13), move choke valve toward closed position with light pressure. Insert a NO. 50 drill between choke valve and the wall of the airhorn.

(2) An adjustment will be necessary if a slight drag is not obtained as the drill is being removed.

(3) If an adjustment is necessary, bend fast idle connector rod at angle, using Tool T109-213 until correct valve opening has been obtained. Refer to (Fig. 13).

Vacuum Kick Adjustment—(This test can be made ON or OFF the vehicle.)

The choke diaphragm adjustment controls the fuel delivery while the engine is running. It positions the choke valve within the airhorn by action of the linkage between the choke shaft and the diaphragm. The diaphragm must be energized to measure the vacuum kick adjustment. Use either a distributor test machine with a vacuum source, or vacuum supplied by another vehicle.

(1) With engine **Not** running, open throttle valves far enough to allow choke valve to be moved to closed position.

(2) Disconnect vacuum hose from diaphragm and connect hose from vacuum supply, as shown in (Fig. 14). (A minimum of 10 inches of vacuum) will be required.

(3) Insert a ⅛ inch drill (Manual Transmission, Standard Carburetor) or a Number 35 drill (Automatic Transmission), **On Special CAP Carburetors,** use a Number 44 drill (Manual Transmission) or a Number 40 drill (Automatic Transmission), between choke valve and the wall of the air horn. Refer to (Fig. 14). Apply sufficient closing pressure on the choke shaft lever to provide the smallest choke valve opening possible without distortion of the diaphragm link. Note that the cylindrical stem of the diaphragm will extend as an internal spring is compressed. The spring must be fully compressed for proper measurement of the kick adjustment.

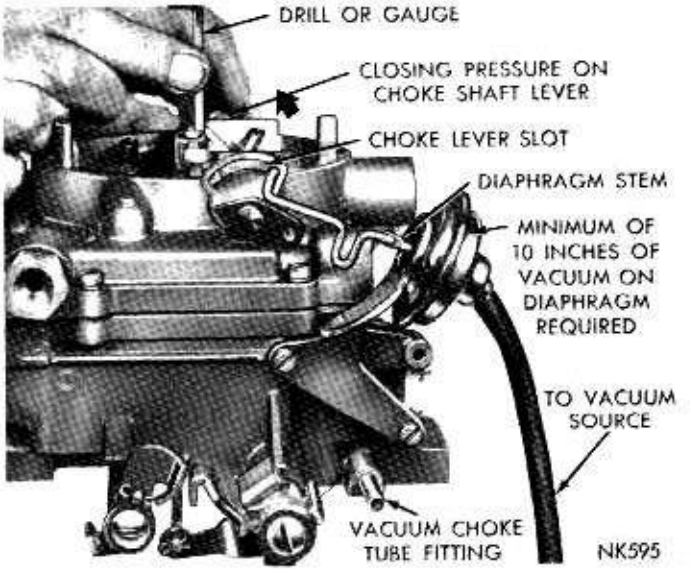


Fig. 14—Checking the Choke Vacuum Kick Setting

(4) An adjustment will be necessary if a slight drag is not obtained as drill or gauge is being removed.

The adjustment of this opening will require the removal of choke operating link.

CAUTION: Damage to the diaphragm and the choke lever slot can result, if the link is not removed for the bending operation.

(5) Remove clip and disengage choke operating link from choke lever, then disengage link from diaphragm stem. (The best bending results will be obtained by using a vise and a pair of pliers.)

(6) Bend choke operating link to provide the cor-

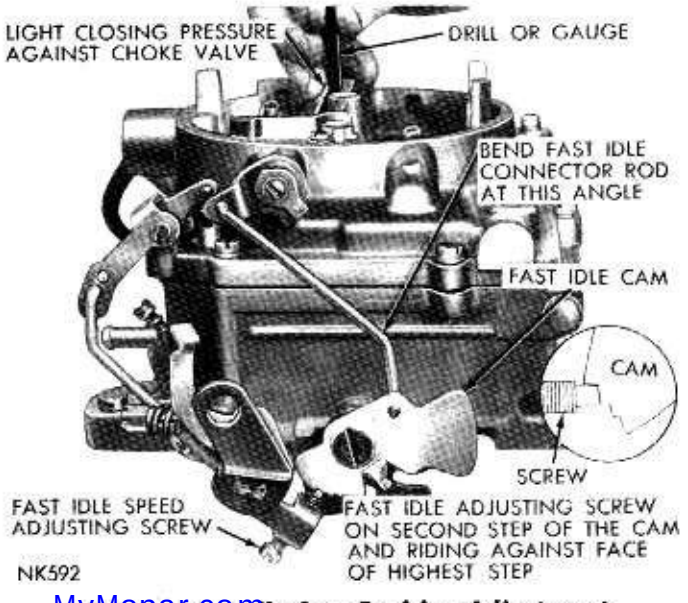


Fig. 13—Fast Idle Cam Position Adjustment

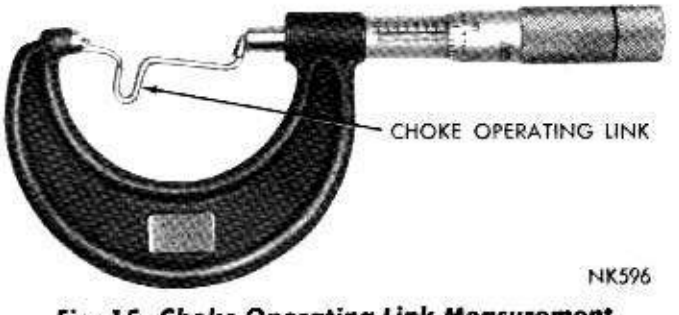


Fig. 15—Choke Operating Link Measurement

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rect choke valve opening.

CAUTION: A correction in the length of link of .015 inch, will result in a change of .010 inch in the choke valve opening.

As an example, if the choke valve opening is .010 inch in error, the correction in the link length would be .015.

A 2" micrometer will be helpful in establishing the original length of the link, as shown in (Fig. 15), before completing the adjustment.

(7) Install choke operating link and recheck choke valve opening, using a drill or gauge. Refer to (Fig. 14).

Reinstall vacuum hose to diaphragm and make following check:

(8) With no vacuum applied to diaphragm, some clearance should exist between the choke operating link and choke lever slot, in both open and closed choke valve positions, as shown in (Fig. 16). **This clearance is necessary to allow the choke valve to close for starting as well as fully open after the engine reaches the normal operating temperature.**

If a clearance does not exist in both of these positions, a recheck of the operating link adjustment should be made. **Free movement of the choke valve between the closed and open positions is very necessary.**

This free movement should also exist between the kick and the open choke valve positions with the engine running. If binding does exist, the choke operating link has been improperly bent and should be corrected.

Choke Unloader Adjustment

With the throttle valves in the wide open position, it should be possible to insert Tool T109-80 (⅜ inch) gauge between the upped edge of the choke valve and

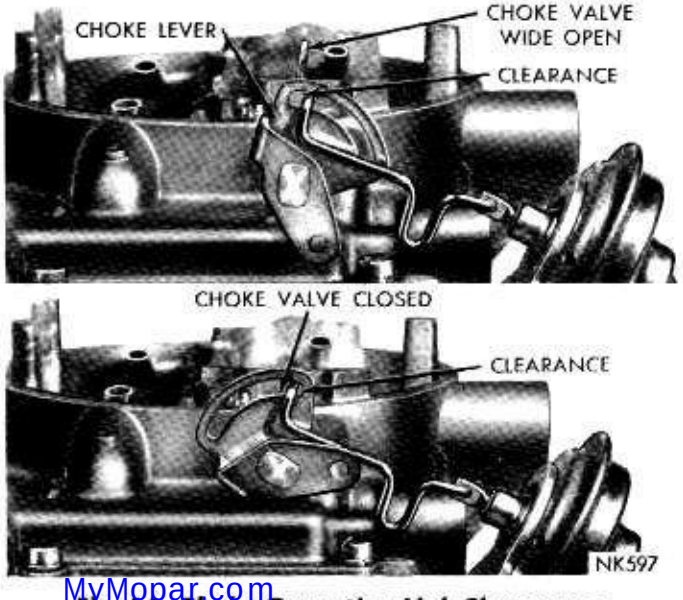


Fig. 16—Choke Operating Link Clearances

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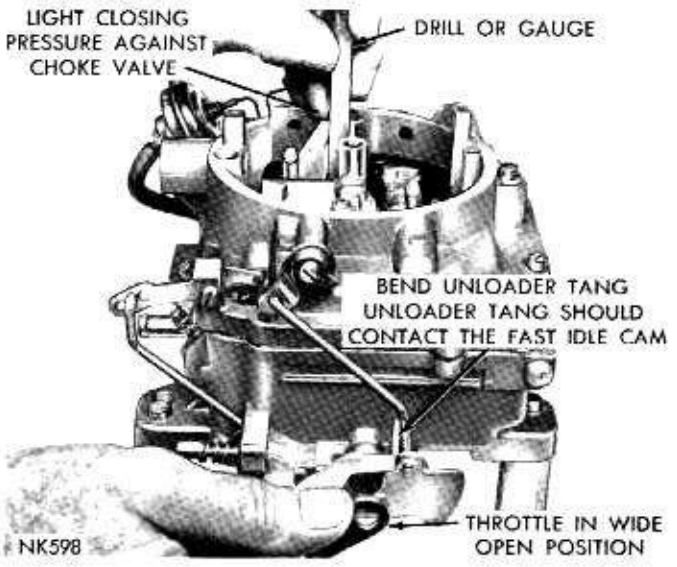


Fig. 17—Checking Choke Unloader (Wide Open Kick)

the inner wall of the air horn, as shown in (Fig. 17).

If an adjustment is necessary, bend the unloader lip on the throttle shaft lever, using Tool T109-41, until correct opening has been obtained.

Accelerator Pump Adjustment

Move the choke valve to wide open position, to release the fast idle cam. Back off the idle speed adjusting screw (curb idle) until the throttle valves are seated in the bores.

Measure the distance from the top of the air horn to the top of the plunger shaft, using a "T" scale, as shown in (Fig. 18). This distance should be 7/16 inch.

If an adjustment is necessary, bend the throttle connector rod at the lower angle, using Tool T109-213, until correct travel has been obtained.

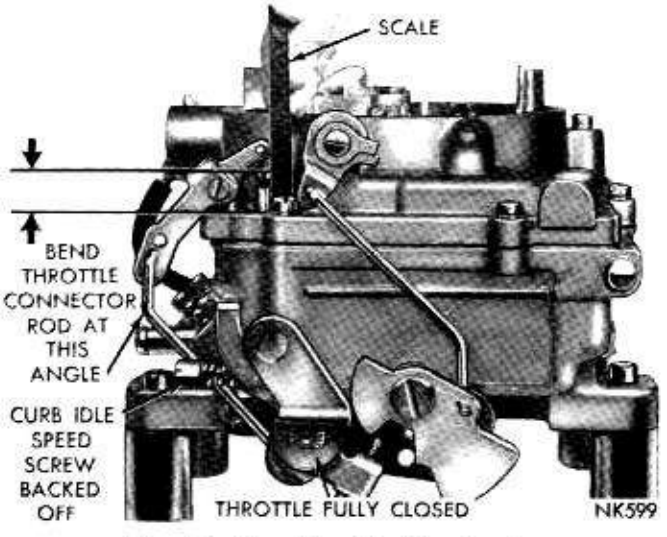


Fig. 18—Checking the Accelerator Pump Adjustment

Secondary Throttle Lever Adjustment

To check the secondary throttle lever adjustment, block the choke valve in the wide open position and invert the carburetor. Slowly open the primary throttle valves until it is possible to measure 21/64 inch between the lower edge of the primary valve and the bore (opposite idle port) as shown in (Fig. 19). At this measurement, the secondary valves should just start to open. If an adjustment is necessary, bend the secondary throttle operating rod at the angle, using Tool T109-213, until correct adjustment has been obtained.

With the primary and secondary throttle valves in the tightly closed position, it should be possible to insert Tool T109-29 (.020") wire gauge, between the positive closing shoes on the secondary throttle levers, as shown in (Fig. 20).

If an adjustment is necessary, bend the shoe on the secondary throttle lever, using Tool T109-22, until correct clearance has been obtained.

Secondary Throttle Lock Out Adjustment

Crack the throttle valves, then manually open and close the choke valve. The tang on the secondary throttle lever should freely engage in the notch of the lockout dog. Refer to (Fig. 19).

If an adjustment is necessary, bend the tang on the secondary throttle lever, until engagement has been made. Use Tool T109-22 for this operation.

After adjustments have been made, reinstall carburetor on engine, using a new gasket.

It is suggested that the carburetor be filled with clean gasoline. This will help prevent dirt that is trapped in the fuel system, from being dislodged by the free flow of fuel, as the carburetor is primed.

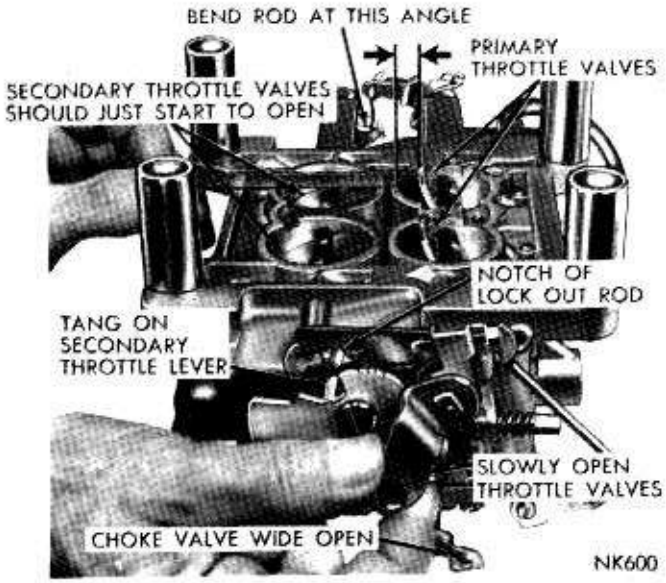


Fig. 19—Checking the Secondary Throttle Adjustment

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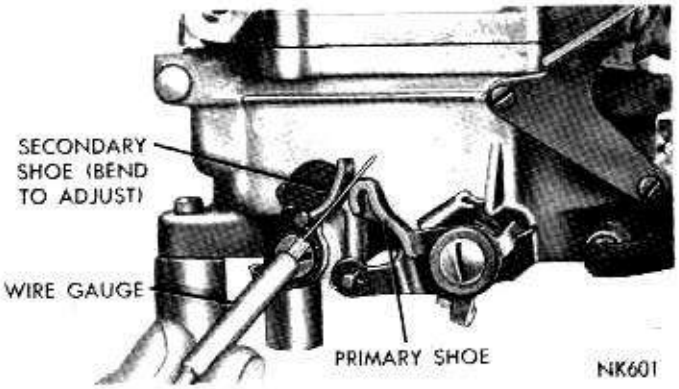


Fig. 20—Checking Clearance Between Closing Shoes

Idle Speed Adjustment—(Curb Idle) Standard Carburetors

To make the idle speed adjustment, the engine must be thoroughly warmed up. A much more reliable idle adjustment can usually be obtained if the car has been driven a minimum of five miles. For the best results, it is recommended that a tachometer be used in this adjustment. (Before making the idle speed adjustment observe the following precautions:)

On cars equipped with the automatic transmission, loosen the nut in the sliding link of the carburetor to bellcrank rod so that the stop in the transmission will not interfere with the free movement of the carburetor throttle lever.

To make the idle speed adjustment, proceed as follows:

(1) Turn idle speed screw **in** or **out** to obtain 500 r.p.m. (With air conditioning **On,** set the idle speed at 500 r.p.m.) Be sure choke valve is fully open and that fast idle adjusting screw is not contacting fast idle cam.

(2) Turn each idle mixture screw to obtain highest r.p.m. While making the adjustment, carefully watch the tachometer and notice that the speed can be decreased by turning the screws in either direction from setting that gave the highest r.p.m. reading.

(3) Readjust to 500 r.p.m. with idle speed screw.

(4) Turn each idle mixture adjusting screw in clockwise direction (leaner) until there is a slight drop in r.p.m. Now, turn each screw out, counterclockwise (richer) just enough to regain the lost r.p.m.

This procedure will assure that the idle has been set to the leanest possible mixture for smooth idle.

This setting is very important.

Since the correct speed was originally set using the speed screw, the speed obtained after finding the leanest smooth idle setting will probably be too fast.

(5) Readjust speed screw to obtain correct idle speed. Repeat steps 2 and 4 above if necessary.

After proper idle speed has been obtained, move the sliding link to the rear, against the stop, and tighten the nut securely.

*Fast Idle Speed Adjustment (On the Vehicle)**

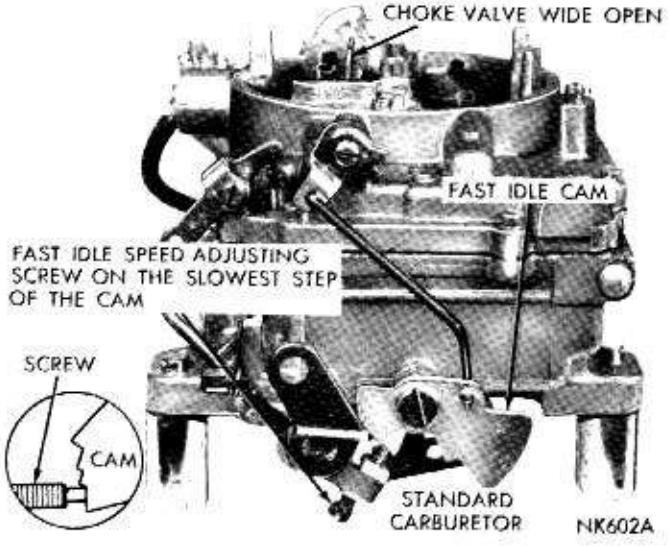
To set the fast idle speed on the vehicle, connect a tachometer to the vehicle, then set the curb idle speed and proceed as follows:

(1) With engine running and transmission in neutral position, open throttle slightly.

(2) **On Standard carburetors,** close the choke valve about 20 degrees, then allow throttle to close. Return choke valve to the open position. The fast idle speed adjusting screw should contact the slowest speed step on the fast idle cam (Fig. 21).

(3) **On CAP carburetors,** open the throttle until the fast idle adjusting screw can be positioned on the second highest step of the cam (Fig. 21). **The air cleaner must be installed while measuring the engine speed.**

(4) With the engine warmed up to the normal operating temperature, turn the fast idle speed adjusting screw in or out to secure 700 rpm (Standard Carburetors) or 1500 rpm (CAP carburetors).** **Reposition the cam and throttle after every fast idle speed screw adjustment to apply normal throttle closing torque.**



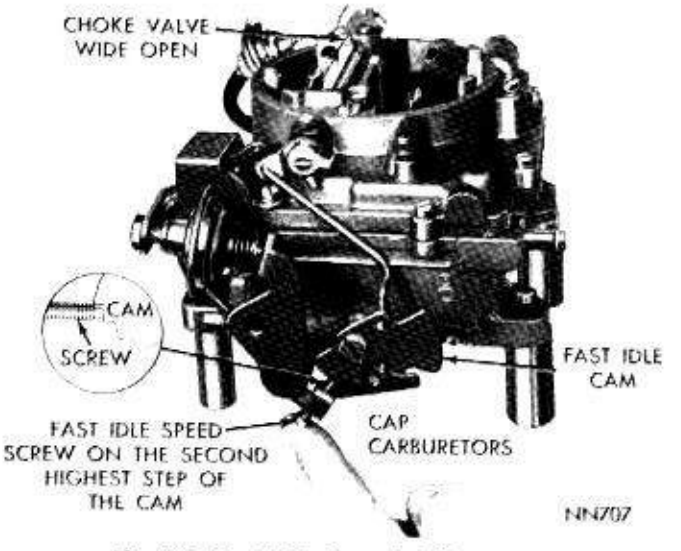


Fig. 21—Fast Idle Speed Adjustment (On the Vehicle)

Special Note: CAP equipped vehicles. Before adjusting idle and/or fast idle speeds and mixtures, make sure that the basic timing and the distributor control valve are correctly adjusted as outlined under Idle Speed Adjustment (Curb Idle) (CAP Carburetors).

*After Approx. 500 Miles (If Necessary).

DASHPOT SETTING AND ADJUSTMENT—C.A.P. CARBURETOR

(Manual Transmission Only)

With the curb idle speed and mixture properly set and a tachometer installed, position the throttle lever so that the actuating tab on the lever is contacting the stem of the dashpot but not depressing it. The tachometer should read 2000 rpm if the setting is correct. To adjust the setting if necessary, screw the dashpot in or out as required. When the desired setting is obtained, tighten the lock nut and the dashpot against the bracket.

Idle Speed Adjustment (Curb Idle) CAP Carburetors Equipment

To make the idle speed adjustment on CAP carburetors, secure an accurate ignition tachometer and a Sun Electric Combustion-Vacuum Unit, Model 80, Exhaust Condenser, Model EC, and Hose 669-14 or equivalent. (The above analyzer is recommended; however, other reliable makes of analyzers in good condition may be used.) Proceed as follows:

(1) Engine running at normal operating temperature, and timing checked and set at 5° after top dead center.

(2) Air Cleaner installed.

(3) Six cylinder engines only—turn headlights on high beam position.

(4) Automatic transmissions in neutral position (not in park position).

(5) On air conditioned cars, turn air conditioning **off.**

(6) Connect ignition tachometer.

(7) Insert probe of the exhaust gas analyzer in the tail pipe as far as possible (2 ft. minimum distance). On dual exhaust cars use the left side tail pipe (side opposite heat valve). It is very important that the probe and connecting tubing be free of leaks to prevent erroneous reading. If a garage exhaust system is used to conduct the exhaust gases away, a plenum chamber or other means must be used to reduce the vacuum of the exhaust system to ½ inch water or less.

(8) Connect the exhaust gas analyzer, warm up and calibrate according to manufacturer's instructions.

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(9) Place clamp on hose between distributor vacuum control valve and intake manifold.

(10) Set the idle speed to the specified value for the specific engine-transmission combination.

(11) **IMPORTANT: When adjusting mixture screws to obtain the air/fuel ratio specified for CAP, do not turn the mixture screw more than 1/16 turn at a time. The combustion anaylzer is so sensitive that the ratio must be changed very small increments if accurate readings are to be obtained. The meters read in air/fuel ratio so that a higher reading indicates a leaner mixture and vice versa.**

(a) Adjust each screw 1/16 turn richer (counterclockwise) and wait 10 seconds before reading the meter.

(b) If necessary, repeat step "a" until the meter indicates a definite increase in richness (lower reading). This step is very important since the meter reverses its readings and indicates a richer mixture as the carburetor is leaned out if the carburetor is set very lean.

(c) When it has been established that the meter is indicating a lower reading (richer mixture) when the idle mixture screws are turned in the richer direction, proceed to adjust the carburetor to give 14.2 air/fuel ratio, turning the screws counterclockwise (richer) to lower the meter reading and clockwise (leaner) to increase the meter reading.

(d) If the idle speed changes as the mixture screws are turned, adjust the speed to the specified value and readjust the mixture as required so that 14.2 air/fuel ratio is obtained at the specified idle speed.

(e) If the idle is rough, the screws may be adjusted independently to achieve a smooth idle, provided the air/fuel ratio is held to the 14.2 value.

(12) Remove clamp from distributor vacuum valve hose. If idle speed changes materially check and set valve as described under "Distributor Vacuum Control Valve Adjustment."

Distributor Vacuum Control Valve Adjustment

To adjust the control valve, refer to (Fig. 1), then proceed as follows:

(1) Connect a tachometer to the engine and warm engine up to the normal operating temperature.

(2) Connect a vacuum gage (0-30 in. mercury) to the distributor vacuum tube. The tee should have the same inside diameter as the distributor vacuum tube.

(3) If the carburetor is equipped with a dash pot, adjust it so that it does not contact the throttle lever at curb idle.

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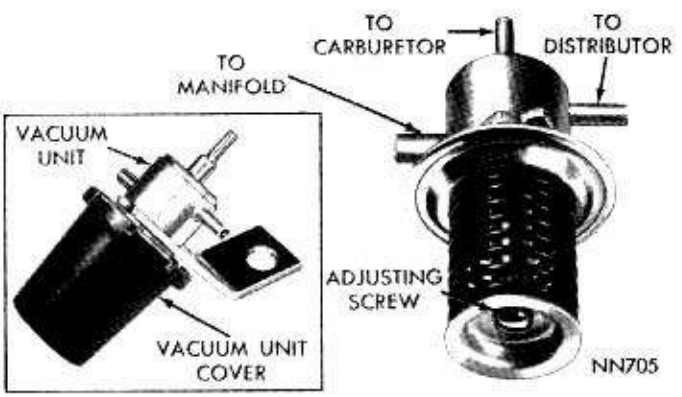


Fig. 1—Distributor Vacuum Control Valve Adjustment

(4) Clamp closed the vacuum tube that connects the vacuum valve to manifold vacuum.

(5) Remove the distributor vacuum tube at the distributor and clamp the tube closed.

(6) Set the basic ignition timing to manufacturers specifications (5° ATC). The curb idle speed must be at the specified rpm before the timing is adjusted.

(7) Adjust carburetor to obtain the specified engine speed and exhaust emission level. The distributor vacuum must be below 6 in. of mercury at curb idle.

(8) Remove the clamps from the vacuum tubes and reconnect vacuum tube to the distributor. Remove vacuum valve cover (Fig. 1).

(9) Speed engine up to 2000 rpm in neutral and hold speed for approximately 5 seconds. Release throttle and observe distributor vacuum. When the throttle is released, the distributor vacuum should increase to above 16 inches of mercury and remain there for a minimum of 1 second. The distributor vacuum must fall below 6 inches of mercury within 3 seconds after the throttle is released.

(10) Adjust valve if necessary. Turning the spring end adjusting screw counterclockwise will increase the time the distributor vacuum remains above 6 inches of mercury after the throttle is released. One turn of the adjusting screw will change the valve setting by approximately ½ inch of mercury. If the valve cannot be adjusted to the specifications described in step No. 9, replace valve (Fig. 1).

(11) Replace vacuum valve cover. Reset the carburetor dash pot (if so equipped) and check valve performance as outlined in step No. 9. If the distributor vacuum does not fall below 6 inches of mercury within 4 seconds after the throttle is released, readjust or replace the dash pot.

FUEL PUMP

GENERAL INFORMATION

Fuel pump Model M-3672S is used on all Chrysler and Imperial engines. The fuel pump is of the pressed steel type and cannot be disassembled for service. If a pump malfunction occurs, remove the old pump and

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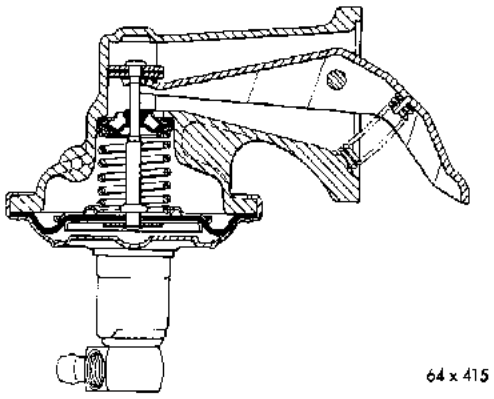


Fig. 1—Fuel Pump Assembly

install a new one.

Operation

The fuel pump (Fig. 1) is driven by an eccentric cam (cast integral with the camshaft) through the medium of a short push rod.

As the camshaft rotates, the eccentric cam presses against the push rod, forcing the pump rocker arm down. This action lifts the pull rod and diaphragm upwards against the fuel pump main spring, thus creating a vacuum in the valve housing, which opens the inlet valve, forcing fuel into the valve housing chamber. On the return stroke, the main spring forces the diaphragm to the down position which closes the inlet valve and expels the fuel in the valve housing chamber, through the outlet valve to the fuel filter and the carburetor.

It is recommended that the fuel filter be replaced when performing an engine tuneup or at least every 20,000 miles. DO NOT ATTEMPT TO CLEAN.

Testing (On the Vehicle)

If the fuel pump fails to supply fuel properly to the carburetor, the following tests should be made before removing the fuel pump from the vehicle.

Pressure Test

If leakage is not apparent, test pump for pressure, as follows:

(1) Insert a "T" fitting in fuel line at carburetor, as shown in (Fig. 2).

(2) Connect a 6 inch piece of hose between the "T" fitting and gauge Tool C-3411. (The hose should not exceed 6 inches. A longer hose may collect fuel and additional weight would be added to the pressure of the pump and result in an inaccurate reading.)

(3) Vent pump for a few seconds (this relieves any air trapped in the fuel chamber). If this is not done, the pump will not operate at full capacity and a low pressure reading will result.

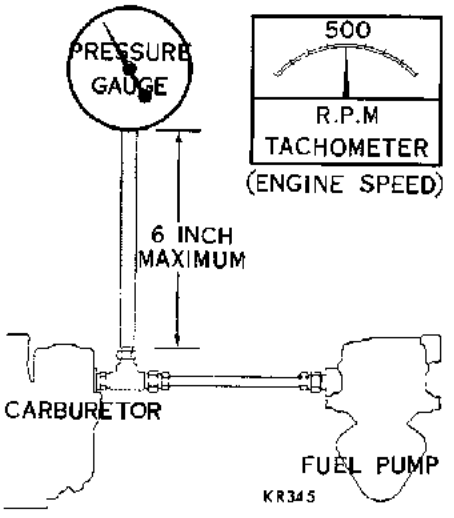


Fig. 2—Pressure Testing the Fuel Pump

(4) Connect a tachometer, then start engine and run at 500 rpm. The reading should be from 3½ to 5 psi. The pressure should remain constant or return to zero very, very slowly when the engine is stopped. An instant drop to zero indicates a leaky outlet valve. If pressure is too low, a weak main spring or improper assembly of the diaphragm may be the cause. If the pressure is too high, the main spring is too strong.

Vacuum Test

The vacuum test should be made with the fuel line disconnected from the carburetor. (This will allow the pump to operate at full capacity, which it must do to prime a dry carburetor.) The vacuum reading should be at least 10 inches of vacuum at 500 r.p.m. with the fuel line disconnected at the carburetor.

The vacuum reading should be at least 10" of vacuum at 500 rpm with the fuel line disconnected at the carburetor.

Volume Test

The fuel pump should supply 1 quart of fuel in 1 minute or less at 500 rpm.

Inlet Valve Test

To test the inlet valve, connect a vacuum gauge on the inlet fitting while the line is disconnected.

(1) Start engine or turn over with the starting motor.

(2) There should be a noticeable vacuum present, not alternated by blowback.

(3) If blowback is present, the inlet valve is not seating properly and a new pump installed.

If fuel pump does not perform to above test requirements, fuel pump should be removed from the vehicle.

FUEL TANK

GENERAL INFORMATION

The fuel tank on all models except Station Wagon Models is located at the rear of the body, under the

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trunk compartment floor, as shown in (Fig. 1). In Station Wagon models, the fuel tank is mounted in the left rear quarter panel beyond the wheel house, as shown in (Fig. 2).

If the vehicle is to be stored for any appreciable length of time, the gasoline should be drained from the entire system, in order to prevent gum formation. If the vehicle has been undercoated, be sure the fuel tank vent tube (under kickup in floor pan) is open. If this is not done, a collapsed fuel tank will result.

The fuel tank on all models except Station Wagon has a 25 gallon capacity. The Station Wagon capacity is 22 gallons. The filler tube on the conventional models is accessible through the center of the deck opening lower panel, while the Station Wagon fills at the left rear upper quarter panel between the quarter post and the fin. The fuel tank is fitted with a gauge unit, including the suction pipe, as shown in (Fig. 3). The filter on the end of the suction pipe is replaceable unit and prevents the entry of water and dirt. When installing a tank unit, be sure the filter is pushed on the end of the tube until seated.

REMOVING THE FUEL TANK (Except Station Wagon and Imperial)

CAUTION: Be sure the ignition switch is turned off before disconnecting or connecting the gauge wire.

Removal

(1) Drain tank into a safety can, then disconnect fuel line and wire lead to gauge unit.

(2) Disconnect vent tube at hose connection at the leading edge of the tank.

(3) Remove screw that attaches filler tube bracket to the trunk panel.

(4) Remove the nuts that hold the ends of the fuel tank hold down straps to the frame. Lower the front end of tank far enough to disengage filler tube from rear panel and slide out from under the vehicle.

(5) Remove tank gauge unit, using spanner wrench Tool C-3582 (Fig. 3). Check the rubber grommet around filler tube. If cracked or deteriorated, install a new grommet at reassembly.

Installation

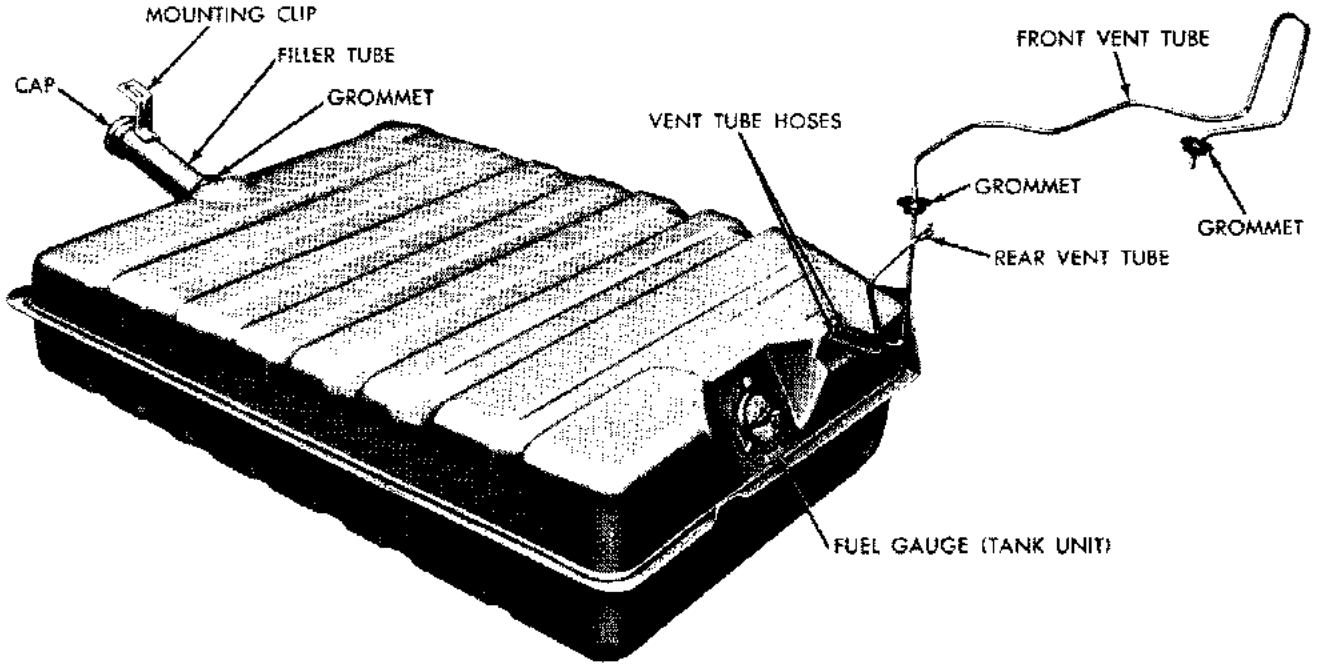
Before installing the tank gauge unit, check the condition of the filter on the end of suction tube. If the filter is plugged, plastic will not corrode, install a new filter.

(1) Position fuel tank gauge unit in tank, using a new gasket. Tighten securely, using Tool C-3582.

(2) Slide fuel tank under vehicle. Raise tank far enough to engage filler spout with opening in rear panel, and locator embossments on the floor pan.

(3) Push tank toward the rear to fully engage the filler spout in the opening.

(4) Hold fuel tank in this position, and place the hold down straps in position, feeding attaching studs through holes in end of the straps. Install the nuts but do not tighten.



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Fig. 1—Fuel Tank Mounting (Chrysler—Except Station Wagon)

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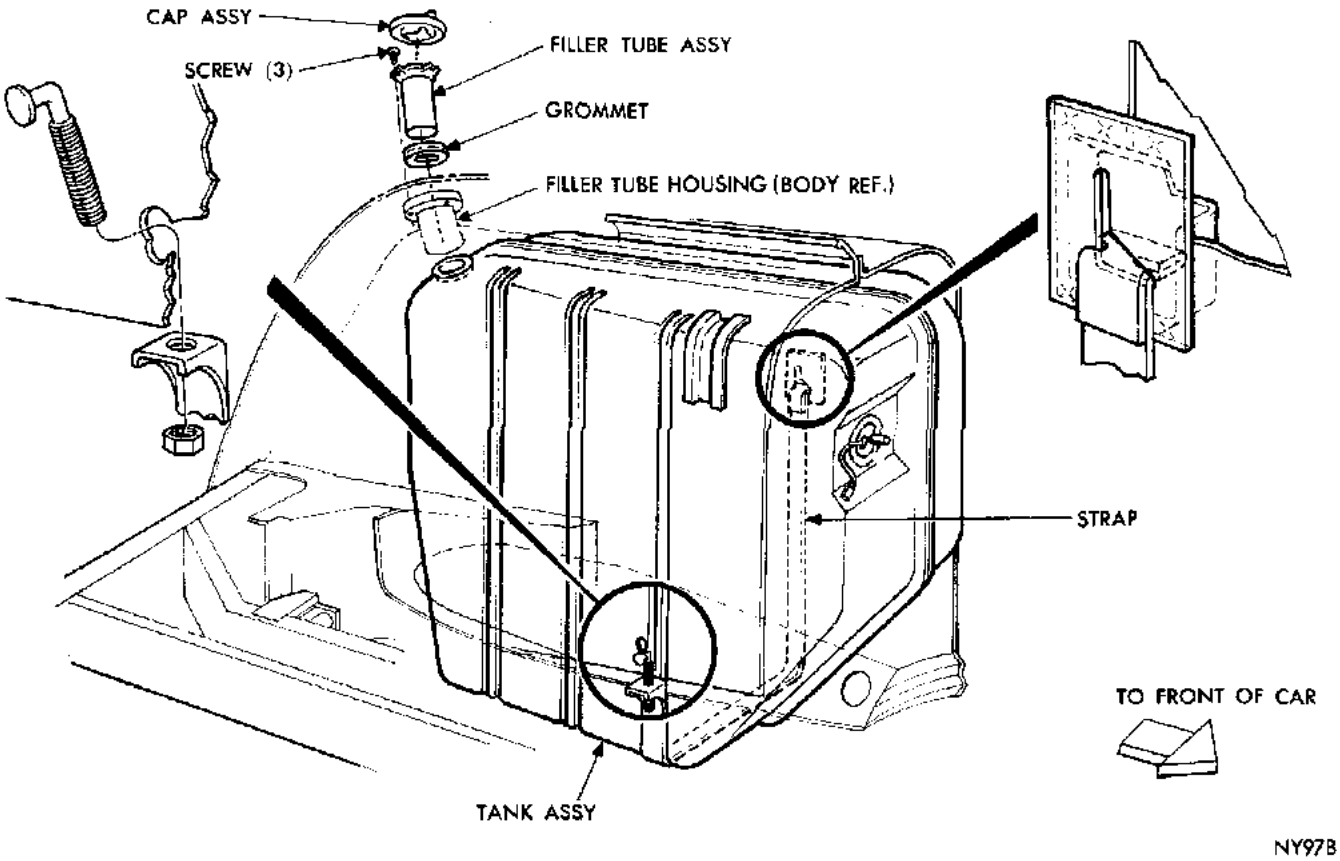


Fig. 2—Fuel Tank Mounting (Station Wagon)

(5) Guide button head of studs into slots in frame and down into position. Tighten the hold down strap attaching nuts securely. (60 in-lbs.)

(6) Install filler tube mounting screw and tighten securely.

(7) Connect lead wire to the tank gauge unit and reconnect the fuel line.

(8) Refill tank and check for leaks.

FUEL TANK AND FILLER TUBE (Imperial) (Fig. 4)

Removal

CAUTION: Disconnect the battery cable at the battery post before disconnecting or connecting the fuel gauge wire.

(1) Drain tank, then disconnect fuel line and the lead wire to the fuel gauge unit.

(2) Remove screw that attaches the filler tube bracket to trunk panel.

(3) Push tube into tank far enough for tube bracket to clear the trunk panel. Push the tube downward slightly so that mounting bracket clears the opening in the panel. Pull tube out of the tank, using a suitable tool.

(4) Loosen nuts that hold ends of the fuel tank tie down straps until button heads can be disengaged from floor pan brackets. Disengage studs from brackets, then lower the tank to the floor.

(5) Remove tube grommet and inspect. If the grommet is cracked or deteriorated, install a new grommet at reassembly.

(6) Remove gauge tank unit, using spanner wrench Tool C-3582. Discard the gasket.

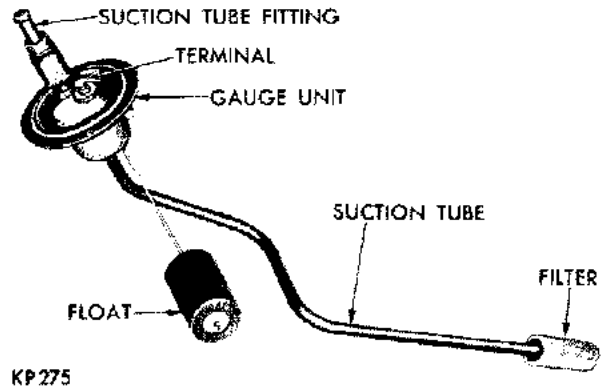


Fig. 3—Fuel Gauge (Tank Unit)

Installation

When installing a new tube seal, be sure the diameter of the seal lip is placed in the tank opening. Do *not use any lubricant on the seal at the tank contact* surface. Before installing the tank gauge unit, inspect the condition of the filter on the end of the suction

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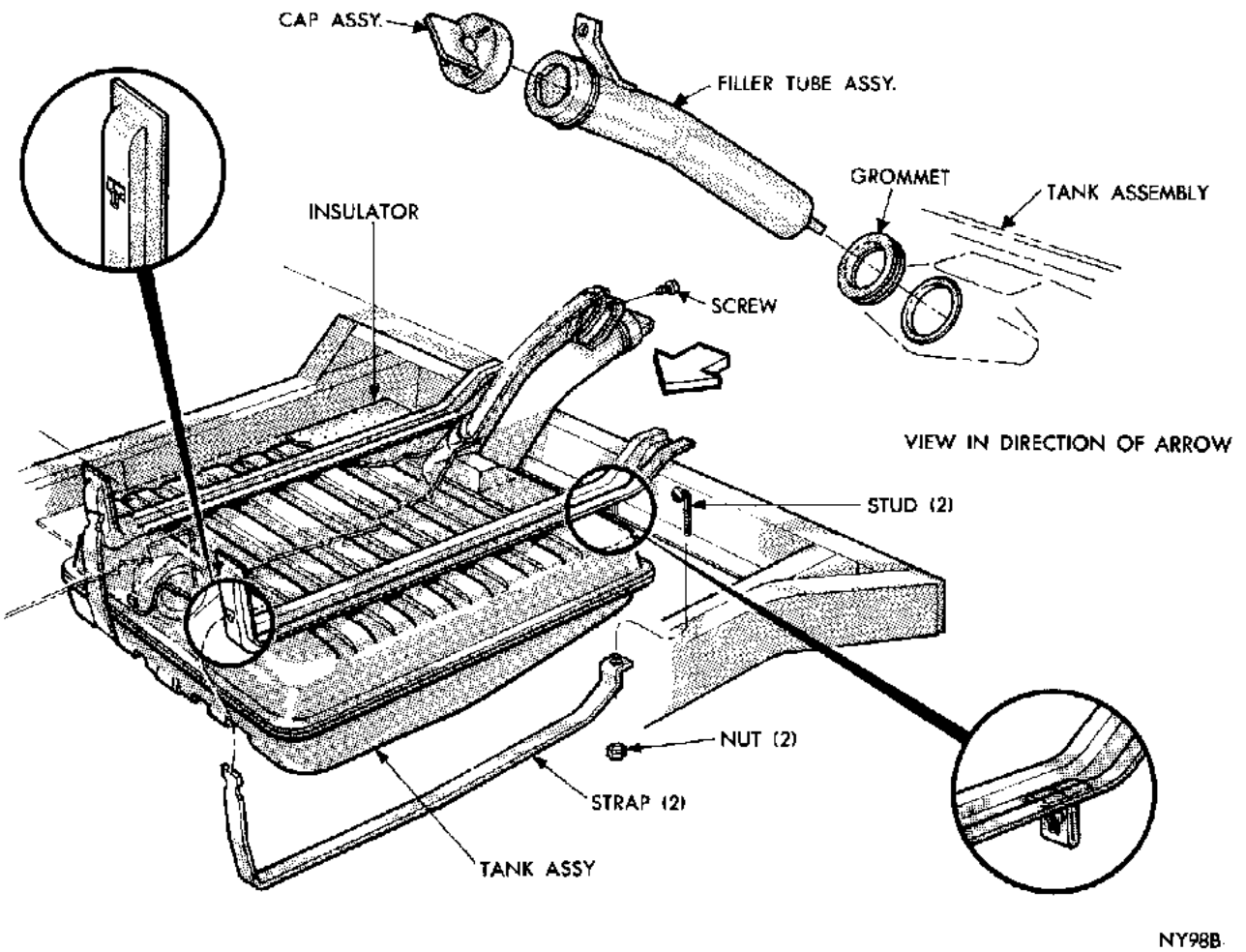


Fig. 4—Fuel Tank Mounting (Imperial)

tube. If the filter is plugged, install a new filter unit.

(1) Position fuel tank gauge unit in tank, using a new gasket. Using Tool C-3582, tighten the unit securely.

(2) Install a new filler tube seal in the tank opening, as described above. Lightly coat inner side of the seal with lubriplate.

(3) Slide tank up into position, against the locator embossments on floor pan. Install button head studs in slots in floor pan brackets. Snug down nuts, but do not tighten.

(4) Check and be sure fuel tank is in the correct position, then tighten nuts securely.

(5) Connect fuel line to tank fitting and lead wire to the gauge unit.

(6) Insert filler tube through trunk panel and insert into the seal. Push tube into tank far enough for tube mounting bracket to clear trunk panel opening. Slightly pull tube out of tank until bracket aligns with mounting screw hole. Install the screw and tighten securely.

(7) Refill tank and inspect for leaks.

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FUEL TANK (Station Wagon) (Fig. 2)

Removal

CAUTION: Be sure the Ignition Switch is turned OFF before disconnecting or connecting the gauge wire.

(1) Drain tank into safety can, then disconnect fuel line and lead to gauge unit under the rear fender, behind wheel house.

(2) Remove screws that attach the stone shield to lower edge of wheel house at the rear. Remove the shield.

(3) Remove button plug at rear of wheel house (in front of gauge unit).

(4) Raise vehicle on a frame type hoist to allow rear axle to fall away from body. Disconnect left shock absorber.

(5) Disconnect rear hangers on both springs and swing axle forward, using a suitable support.

(6) Remove bolt and washer that attaches tank hold down strap to the lower support.

(7) Remove filler cap and filler tube sleeve attaching screws. Using a suitable tool, or Tool C-3584, put out filler tube. (In some cases, it will be necessary to

lubricate rubber grommet to remove filler tube. Squirt light engine oil (SAE 10) down the side of filler tube. Work filler tube back and forth to work oil between filler tube and the grommet.) Slide sleeve out of body opening. Remove the gasket from sleeve.

(8) Slide tank down and out from under quarter panel. Reach up under quarter panel and disengage hold down strap from bracket. If strap is to be replaced, refer to (Fig. 2).

(9) Loosen tank gauge unit, using a spanner wrench Tool C-3582. Slide the unit up and out of tank.

Check condition of rubber grommet. If cracked or deteriorated, install a new grommet at reassembly.

Installation

Before installing the fuel gauge assembly, check the filter on the end of the suction tube. If the filter is plugged, install a new filter. Position the fuel tank gauge in the tank, using a new gasket. Tighten securely, using Tool C-3582.

To install the fuel tank, refer to (Fig. 2), then proceed as follows:

(1) Position fuel tank gauge unit in tank, using a new gasket. Tighten securely using Tool C-3582.

(2) Slide hold down strap up under quarter panel, inserting end of strap into slot. Allow the strap to hang.

(3) Install a new grommet in neck of the tank. Refer to (Fig. 2).

(4) Slide tank up under quarter panel with gauge unit facing front of vehicle. Push tank up into position, with locator embossments on body aligned with those on tank. Make sure filler neck is aligned with opening in top of the quarter panel. Attach with the strap and bolt. Do not tighten.

(5) Place a new gasket over filler tube and down against flange. Insert filler tube down into neck of tank. Be sure anchor tab on tube is aligned with a screw hole. Install the screws and tighten securely.

(6) Tighten fuel tank hold down strap bolt squarely.

(7) Install stone shield. Connect fuel line and lead to gauge unit. Reinstall the button plugs. Refill the tank and check for leaks.

(8) Swing rear axle rearward and connect rear hangers on both springs.

(9) Connect left rear shock absorber.

For cleaning fuel gauge, refer to the "Electrical" Group 8 "Gauges."

THROTTLE LINKAGE ADJUSTMENT

AUTOMATIC TRANSMISSION (Fig. 1)

(Models with 383 or 440 Cu. In. Eng.)

(1) Apply a thin film of multi-purpose grease on both ends of the accelerator shaft [1] where it turns in the bracket, nylon roller [2] where it contacts the pedal, pivot points of both upper [8] and lower [9] transmission linkage bellcranks, also the clipped ends of transmission linkage rod bearing areas [10] [11].

(2) Disconnect return spring and slotted transmission rod [6] from the carburetor level pin. Disconnect the transmission intermediate rod ball socket [7]

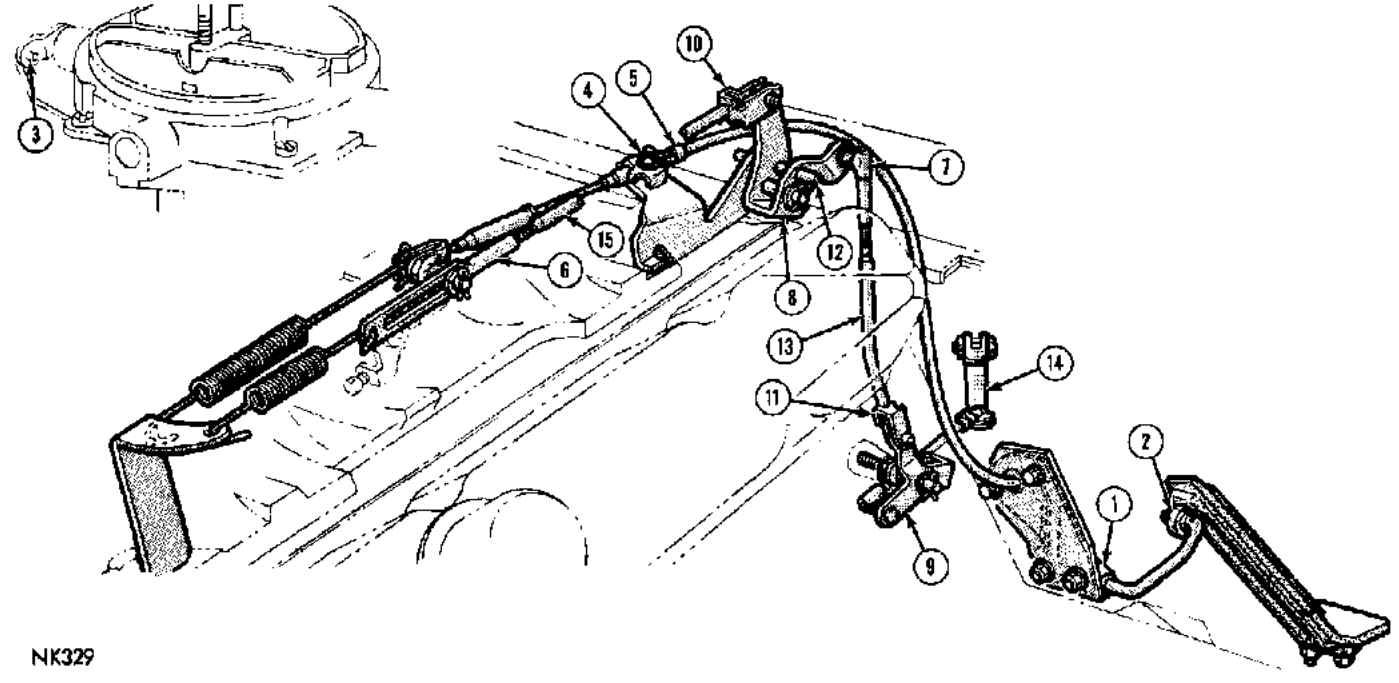


Fig. 1—Throttle Linkage Adjustment (383 and 440 Cu. In. Engine)

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from the upper bellcrank ball end.

(3) Disconnect choke [3] at carburetor or block choke valve in full open position. Open throttle slightly to release fast idle cam, then return carburetor to curb idle.

(4) With a 3/16 inch diameter rod [12] placed in holes provided in the upper engine mounted bellcrank and lever [8], adjust length of the intermediate transmission rod [13] by means of the threaded adjustment at the upper end. The ball socket [7] must line up with the ball end with rod held upward against the transmission stop [14].

(5) Assemble ball socket [7] to ball end and remove 3/16 inch rod [12] from upper bellcrank and lever.

(6) Hold the carburetor rod [15] forward against the transmission stop [14] and adjust its length by means of the threaded adjustment so that the rear end of the slot in the adjusting link [6] just contacts the carburetor lever pin.

(7) Lengthen carburetor rod [15] two full turns by turning slotted link [6].

(8) Assemble slotted link [6] to the carburetor.

(9) Loosen cable clamp nut [4], then adjust the position of the cable housing ferrule [5] in the clamp so that all slack is removed from the cable with carburetor at curb idle. To remove slack from the cable, move ferrule [5] in the clamp in the direction away from carburetor lever.

(10) Back off ferrule [5] ¼ inch. This provides ¼ inch cable slack at idle. Tighten cable clamp nut [4].

(11) Route cable so it does not interfere with carburetor rod [15] or upper bellcrank [8] throughout full throttle linkage travel.

(12) Connect choke rod [3] or remove blocking fixture.

MANUAL TRANSMISSION

Models with 383 or 440 Cu. In. Eng.)

(1) Apply a thin film of multi-purpose grease on both ends of accelerator shaft [1] where it turns in bracket, and nylon roller [2] where it contacts pedal.

(2) Disconnect choke [3] at carburetor or block choke valve in full open position. Open throttle slightly to release fast idle cam, then return carburetor to curb idle.

(3) Loosen cable clamp nut [4], then adjust position of the cable housing ferrule [5] in the clamp so that slack is removed from cable with carburetor at curb idle. To remove slack from the cable move ferrule [5] in the clamp in direction away from the carburetor lever.

(4) Back off ferrule [5] ¼ inch. This provides ¼ inch cable slack at idle. Tighten cable clamp nut [4].

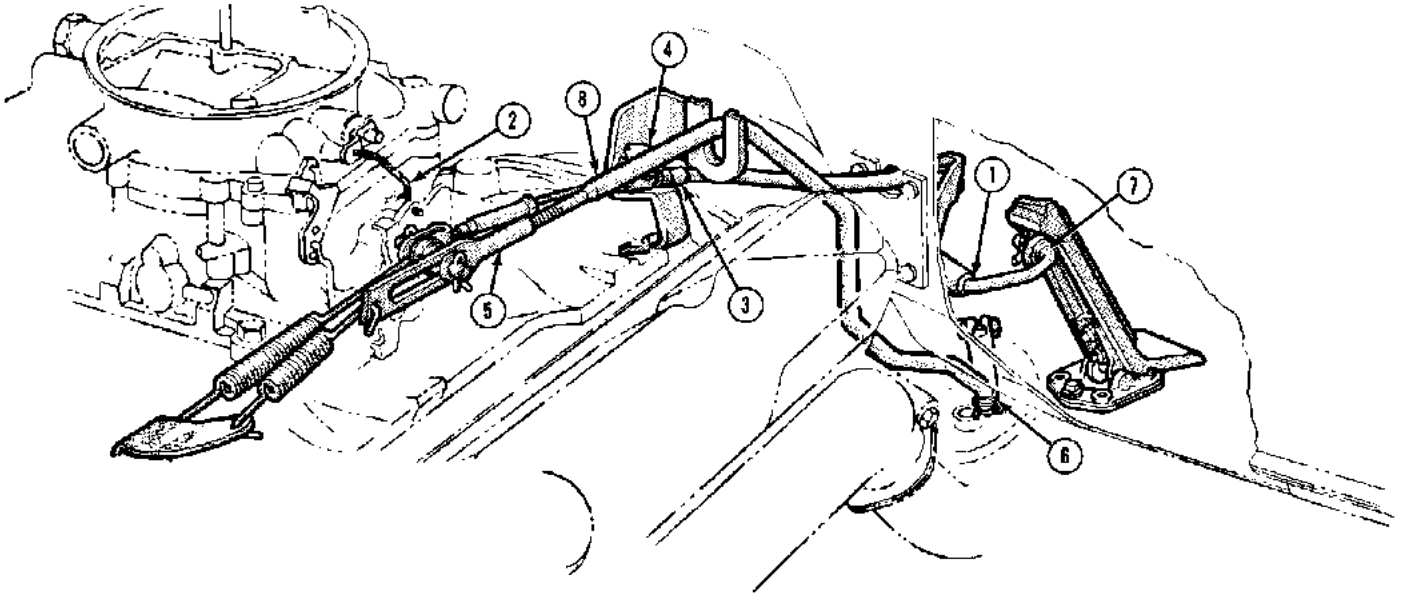
(5) Connect choke rod [3] or remove blocking fixture.

AUTOMATIC TRANSMISSION—Imperial (Fig. 2)

(1) Apply a thin film of multi-purpose grease on both ends of accelerator shaft [1] where it turns in bracket, and nylon roller [7] where it contacts the pedal.

(2) Disconnect return spring and slotted transmission rod [5] from carburetor lever pin.

(3) Disconnect choke [2] at carburetor or block choke valve in full open position. Open throttle slightly to release fast idle cam, then return carburetor to curb idle.



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Fig. 2—Throttle Linkage Adjustment (Imperial)

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(4) Hold transmission lever [8] forward against its stop (rod or lever must not be moved vertically while holding against stop) and adjust length of the transmission rod by means of the threaded adjustment [5] at upper end. The rear end of slot should contact carburetor lever pin without exerting any forward force.

(5) Lengthen rod by 1 full turn of adjustment [5].

(6) Assemble slotted adjustment [5] to carburetor lever pin and install washer and retainer pin. Assemble transmission linkage return spring in place. To check transmission linkage freedom of operation, move slotted adjuster link [5] to full rearward position, then allow it to return slowly, making sure it returns to full forward position.

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(7) Loosen cable clamp nut [4], then adjust the position of cable housing ferrule [3] in clamp so that all slack is removed from cable with carburetor at curb idle. To remove slack from the cable, move ferrule [3] in clamp in direction away from the carburetor lever.

(8) Back off ferrule [3] ¼ inch. This provides ¼ inch cable slack at idle. Tighten cable clamp [4] nut.

(9) Route cable so that it does not interfere with transmission rod throughout its full travel.

(10) Connect choke rod [2] or remove blocking fixture.

SPECIFICATIONS

WWC3

	CAP Automatic Transmission	Automatic Transmission
Type	Dual Throat Downdraft	Dual Throat Downdraft
Model	WWC3-263	WWC3-262
Engine Displacement (cu. in.)	383	383
Bore	1-9/16"	1-9/16"
Venturi	1-5/16"	1-5/16"
Main Metering Jet (Standard) (#389323)	.064"	.065"
(One Step Lean) (#389323)	.062"	.063"
(Two Steps Lean) (#389323)	.060"	.061"
Power Jet	.031 x .086"	.031 x .086"
ADJUSTMENTS		
Idle Mixture (Both Screws)	1-1/2 Turns Open	1-1/2 Turns Open
Idle Speed (rpm)	600	500
(with Air Conditioning ON)		500
Fast Idle Speed (rpm)	1300	700
Fast Idle Cam Position Adjustment (drill size)	#38	#38
Accelerator Pump Travel (throttle fully closed)	7/16"	7/16"
Bowl Vent Valve (throttle at curb idle)	.020"	.040"
Vacuum Kick (drill size)	#22	#28
Float Setting	5/32"	5/32"
Unloader Adjustment (wide open kick)	15/64"	15/64"
CHOKE		
Type	Well Type	Well Type
Control	Thermostatic Coil Spring	Thermostatic Coil Spring
Setting	ON	2 Notch Rich

BBD

	Manual Transmission	Manual Transmission
CARBURETOR	Standard	CAP-Cleaner Air Package
Type	Dual Throat Downdraft	Dual Throat Downdraft
Model	BBD-4125S	BBD-4126S
Engine Displacement (cu. in.)	383	383
Bore	1-9/16"	1-9/16"
Venturi	1-5/16"	1-5/16"
Main Metering Jet		
Standard	120-304S	120-311S
One Step Lean	120-296S	—
Two Steps Lean	120-302S	—
One Step Rich	120-306S	—
Step-Up Wire (Standard)	75-1652	75-1738
Diameter (2 Stage)	.035 x .027"	.038 x .034"

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ADJUSTMENTS		
Accelerator Pump Setting	1" ± 1/64"	1" ± 1/64"
Float Setting (at Center of Floats)	5/16"	5/16"
Vacuum Kick Adjustment	#15	#15
Fast Idle Cam Position Adjustment	#30	#30
Bowl Vent Valve (at curb idle)	1/16"	1/16"
Choke Unloader	1/4"	1/4"
Idle Mixture Screws (Turns Open)	1	1
Idle Speed RPM (Curb Idle)	500	600
Air Conditioning ON)	500	600
Fast Idle Speed RPM	700*	1600*
CHOKE		
Type	Well	Well
Control	Thermostatic Coil Spring	Thermostatic Coil Spring
Setting	2 Notches Rich	2 Notches Rich

*After Approx. 500 Miles (If Necessary)

AFB

	Man. Trans.	Auto. Trans.	Auto. Trans. CAP	Man. Trans. CAP	Auto. Trans. CAP	Man. Trans. CAP
CARBURETOR						
Type			4 Barrel Downdraft			
Model	AFB-4130S	AFB-4131S	AFB-4133S	AFB-4132S	AFB-4137S	AFB-4136S
Engine Displacement (cu. in.)	383, 440	383, 440	383	383	440	440
Car Model						
THROTTLE BORE						
Primary	1-7/16"	1-7/16"	1-7/16"	1-7/16"	1-7/16"	1-7/16"
Secondary	1-9/16"	1-9/16"	1-9/16"	1-9/16"	1-9/16"	1-9/16"
MAIN VENTURI						
Primary	1-3/16"	1-3/16"	1-1/16	1-1/16	1-1/16	1-1/16
Secondary	1-5/16"	1-5/16"	1-1/4	1-1/4	1-1/4	1-1/4
MAIN JET						
Primary	.089"	.089"	.089"	.089"	.089"	.089"
Secondary	.0689"	.0689"	.082"	.082"	.082"	.082"
LOW SPEED JET						
Primary	.035"	.035"	.033"	.035"	.033"	.035"
STEP-UP ROD (2 Stage)						
Standard	16-404	16-404	16-406	16-407	16-406	16-407
1 Size Lean						
2 Sizes Lean						
ADJUSTMENTS						
Accelerator Pump (top of plunger to air horn)	7/16"	7/16"	7/16"	7/16"	7/16"	7/16"
Fast Idle Speed Cam Position Adjustment	(#50)	(#50)	(#50)	(#50)	(#50)	(#50)
Choke Unloader	(3/8")	(3/8")	(3/8")	(3/8")	(3/8")	(3/8")
Vacuum Kick Adjustment	(1/8")	(#35)	(#40)	(#44)	(#40)	(#44)
Fast Idle Speed (r.p.m.)	700	700	1500	1500	1500	1500
Idle Speed (r.p.m.)	500	500	600	650	600	650
(with air conditioning ON)	500	500	600	650	600	650
Secondary Throttle Lever Adjustment	21/64"	21/64"	21/64"	21/64"	21/64"	21/64"
Secondary Throttle Lockout Adjustment	.020"	.020"	.020"	.020"	.020"	.020"
Float Setting	7/32"	7/32"	7/32"	7/32"	7/32"	7/32"
Float Drop	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"
Idle Mixture (both screws open)	1-2 Turns	1-2 Turns				
CHOKE						
Type	Well	Well	Well	Well	Well	Well
Control	Coil Spg.	Coil Spg.	Coil Spg.	Coil Spg.	Coil Spg.	Coil Spg.
Setting	2 N R	2 N R	ON	ON	ON	ON

*After Approx. 500 Miles (If Necessary)

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FUEL PUMP

	383 and 440 cu. in. Engine
Make	Carter
Model	M-3672S
Type	Diaphragm
Number of Valves	2
Driven by	Camshaft
Pump Pressure	3-1/2 to 5 psi

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PROPELLER SHAFT AND UNIVERSAL JOINTS

CONTENTS

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GENERAL INFORMATION

All Chrysler Newport, 300 and New Yorker models with automatic transmission are equipped with a propeller shaft that incorporates an internally splined sliding yoke with inertia ring. A single cross and roller universal joint is used at both front and rear. The sliding splined front yoke slides fore and aft on the transmission output shaft to compensate for the movement of the axle. A bellows type rubber seal provided with a nylon ring which fits over the sliding yoke is used in the opening of the extension housing to exclude road splash and other foreign material (Fig. 1).

Newport models equipped with manual 3-speed transmission use a solid propeller shaft with sliding spline yoke and cross and roller universal joints at both front and rear (Fig. 2).

The universal joints and sliding spline are permanently lubricated. The universal joints should be inspected, every time the car is serviced, for external seal leakage. The universal joints need not be disassembled or relubricated unless seal leakage is observed. If the cross and roller universal joints are disassembled and inspected for any reason they should be repacked with Universal Joint Grease NLGI grade 0 before reassembly.

SERVICE DIAGNOSIS

Condition	Possible Cause	Correction
PROPELLER SHAFT VIBRATION	(a) Undercoating or other foreign matter on shaft.	(a) Clean exterior of shaft and wash with solvent.
	(b) Loose universal joint flange bolts.	(b) Tighten bolt nuts to specified torque.
	(c) Loose or bent universal joint flange.	(c) Install new flange. Tighten to specifications.
	(d) Improper drive line angularity.	(d) Correct angularity. See "Propeller Shaft Angularity."
	(e) Rear spring center bolt not in seat.	(e) Loosen spring U-bolts, reseat center bolt and tighten U-bolts to specified torque.
	(f) Worn universal joint bearings or missing rollers.	(f) Recondition universal joint.
	(g) Propeller shaft damaged (bent tube) or out of balance.	(g) Install new propeller shaft.
	(h) Broken rear spring.	(h) Replace rear spring.
	(i) Rear springs not matched.	(i) Install correct spring.
UNIVERSAL JOINT NOISE	(a) Propeller shaft flange bolts nuts loose.	(a) Tighten nuts to specified torque.
	(b) Lack of lubrication.	(b) Recondition universal joint.

SERVICE PROCEDURES

PROPELLER SHAFT ANGULARITY

The increased emphasis on the need for a quiet, smooth operating drive line in all cars require that the universal joint angles be maintained within acceptable tolerances. Propeller shaft and rear axle housing angularity may be measured by using the Propeller Shaft Angularity Tool C-3976 (Fig. 3). This tool makes it possible to check the angularity at the engine and differential and carrier.

All joint angle measurements on the vehicle should be made with the car supported by the tires if possible; such as, on an alignment pit or a platform hoist. A two post hoist may be used where other means are not available. The vehicle should be approximately level when taking angle measurements with any heavy items removed from the luggage compartment or passenger compartment. The fuel tank should be full or the equivalent weight simulated.

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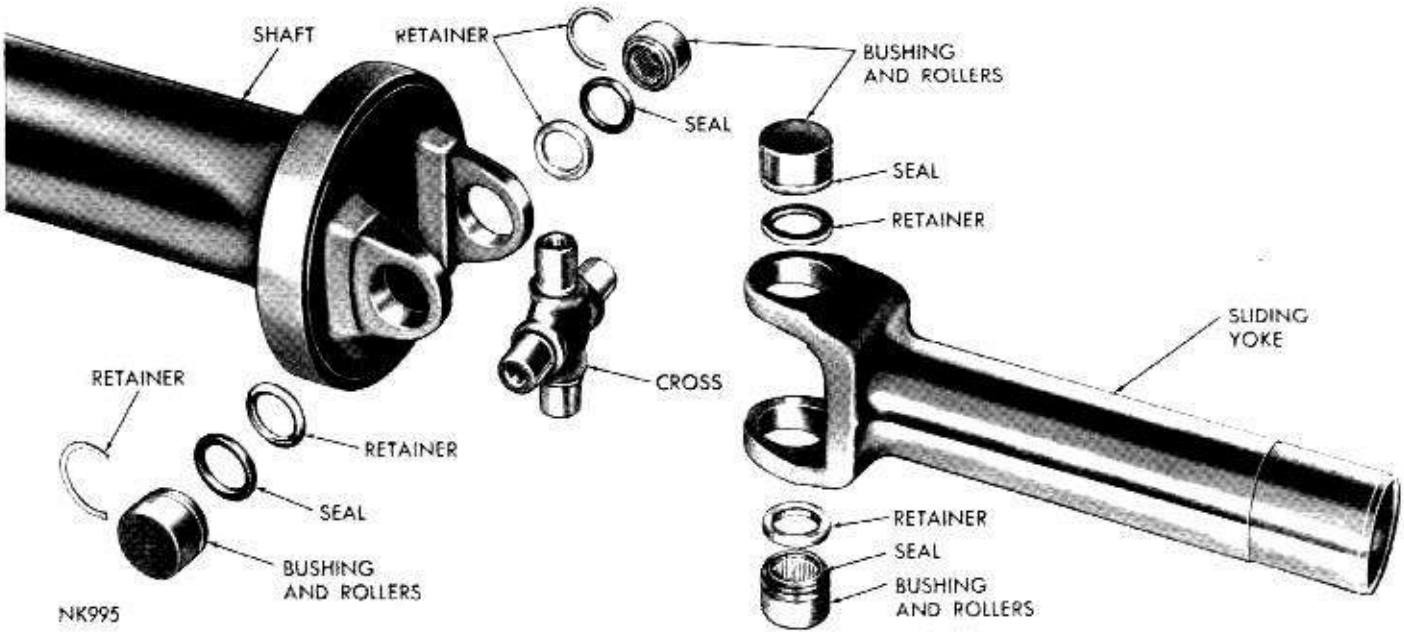


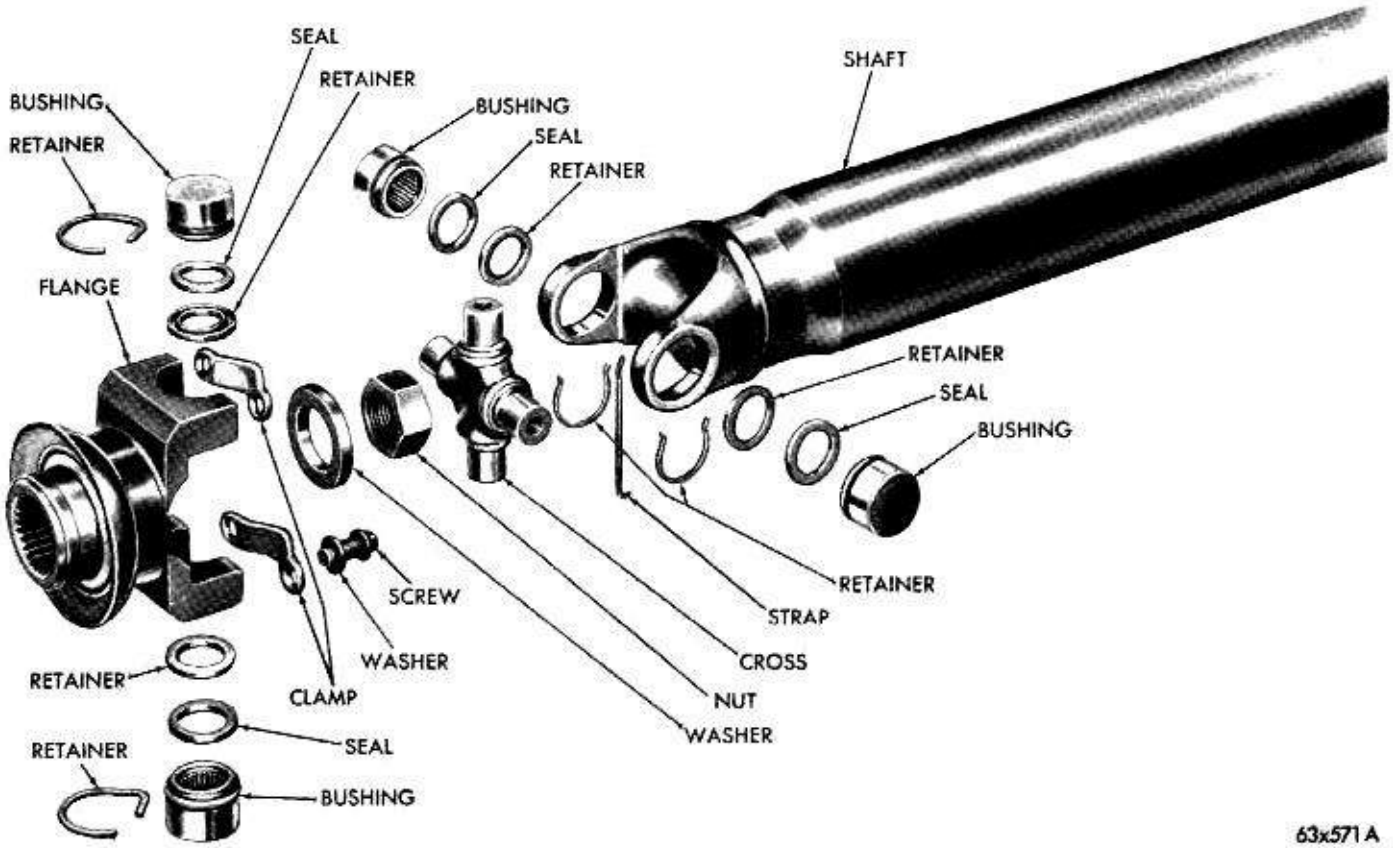
Fig. 1—Cross and Roller Universal Joint with Inertia Ring—Front

When using a twin post hoist, the vehicle must be supported by the lower control arms and rear axle housing. **DO NOT USE A FRAME CONTACT HOIST WHEN MEASURING PROPELLER SHAFT ANGULARITY.**

FRONT UNIVERSAL JOINT ANGLE

(1) Attach engine adapter SP-5046 to gauge SP-5060.

(2) Position gauge or left side of engine so that adapter pins contact flat surface of engine oil pan flange adjacent to vertical wall of the oil pan (Fig. 4).



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Fig. 2—Cross and Roller Universal Joint—Rear—All Models

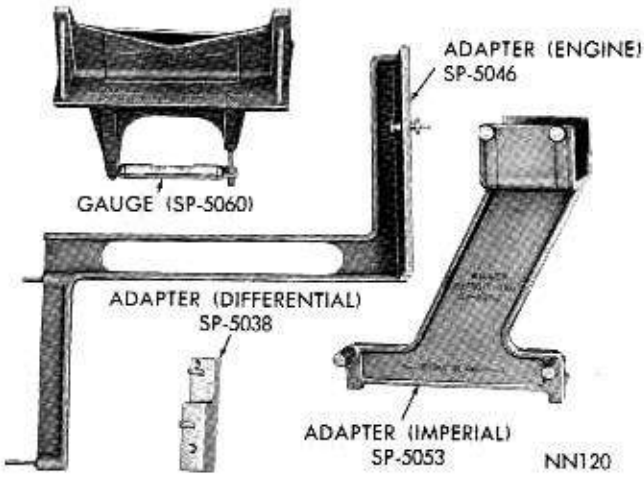


Fig. 3—Propeller Shaft Angularity Tool C-3976

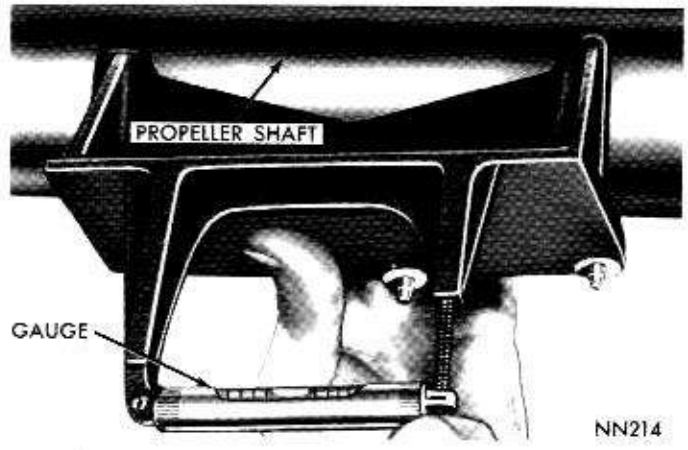


Fig. 5—Measuring Front Universal Joint Angle

The gauge must be held vertical as shown with arrow on gauge SP-5060 pointing toward the front of car.

(3) Adjust position of bubble in spirit level in accordance with the listing for appropriate car model as shown in Chart (Fig. 10).

(4) Remove engine adapter SP-5046 and gauge SP-5060 from flange adjacent to the vertical wall of oil pan and separate the gauge from engine adapter.

(5) With gauge SP-5060 adjusted for the correct engine angle reference, position gauge SP-5060 squarely and firmly along underside of the propeller shaft (Fig. 5). Make sure Veeway is in alignment and that both adapter pins are contacting propeller shaft. Be sure arrow on gauge is pointing toward the front of car.

(6) Observe position of bubble in spirit level and compare the position with that shown on Chart (Fig. 10) for front joint angle. A normal joint angle will cause bubble to position itself within the acceptable range. If bubble is found to be slightly forward of the acceptable tolerance range, this means that the angle is actually smaller than that specified and does not need correcting. If bubble in spirit level is found to be rearward of the acceptable range, the angle is too large, and must be corrected. To reduce front universal joint angle, install a flat shim between the transmission extension housing and rear engine mount (Fig. 6). Flat shims ⅛ inch in thickness are required to move the bubble in spirit level one graduation.

(7) To install shim, loosen bolts in rear mount to transmission extension housing.

(8) Raise transmission sufficiently using a floor stand and block of wood beneath transmission oil pan.

(9) Install ⅛" shim, lower transmission, remove floor stand and tighten bolts in rear mount to transmission extension housing to specifications.

(10) Recheck front joint angle, starting with step (1) of "Procedure."

CAUTION: If a great amount of shimming is required at the transmission extension rear mount, make sure extension housing and inertia dampner on propeller shaft will not make contact with floor pan or make interference with seat belt mounting bolts.

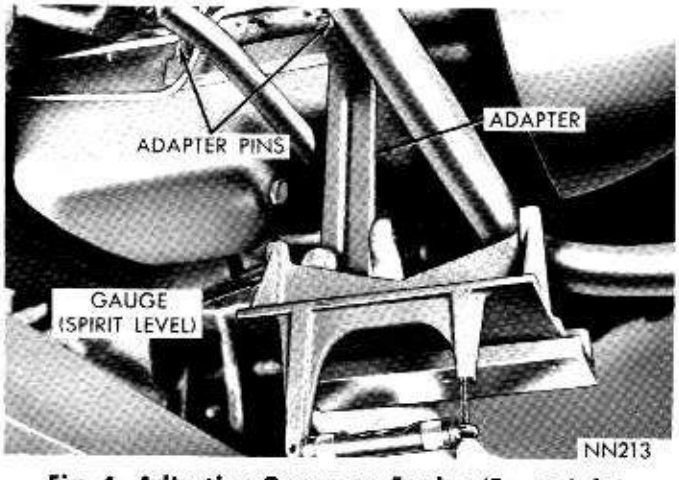


Fig. 4—Adjusting Gauge on Engine (Front Joint Angle Reference)

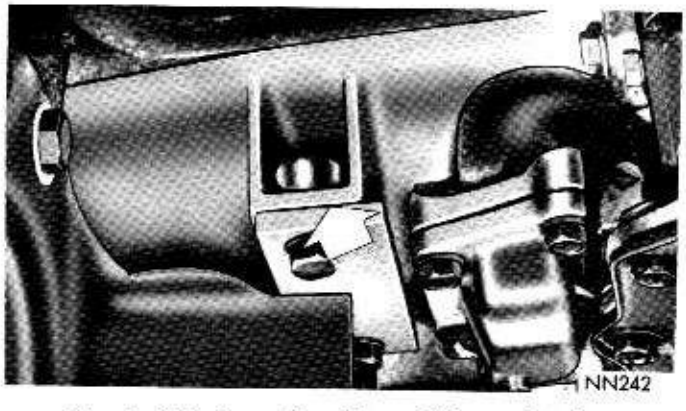


Fig. 6—Shim Location (Front Universal Joint Angle Correction)

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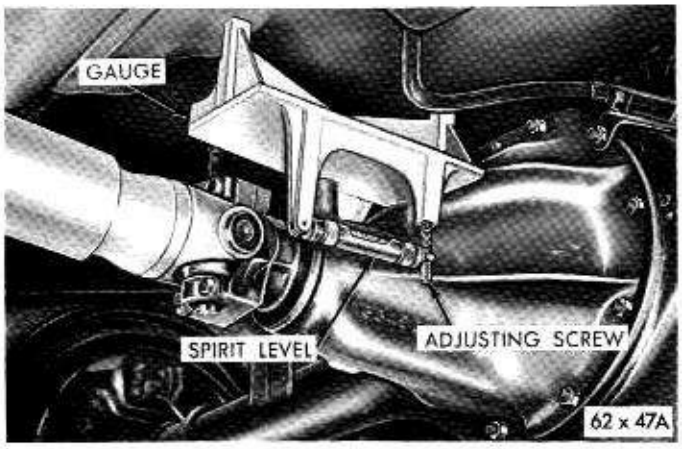


Fig. 7—Adjusting Gauge on Differential (Rear Joint Angle Reference)

REAR UNIVERSAL JOINT ANGLE

(1) Remove pinion bumper plate from differential and carrier housing and position gauge SP-5060 on the machined pads with locating pin in rear bolt hole (Fig. 7). The arrow on gauge should point toward the front of car.

(2) Adjust position of bubble in spirit level in accordance with the listing for appropriate car model as shown in Chart (Fig. 10).

(3) Remove gauge SP-5060 from differential and carrier assembly and position it squarely and firmly along underside of propeller shaft (Fig. 8). Make sure Veeway is in alignment and that both adapter pins are contacting shaft. Be sure arrow on gauge is pointing toward the front of car.

(4) Observe position of bubble in spirit level and compare the position with that shown on Chart (Fig. 10) for rear joint angle. A normal joint angle will cause the bubble to position itself within the acceptable range.

(5) If bubble in spirit level is found outside the acceptable range indicated on Chart (Fig. 10), you will have to install a wedge type shim between both rear springs and the axle housing pads to bring position of bubble within the acceptable range.

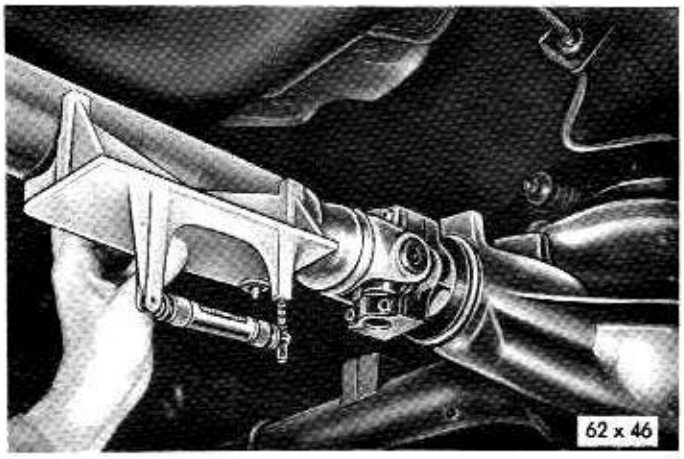


Fig. 8—Measuring Rear Universal Joint Angle

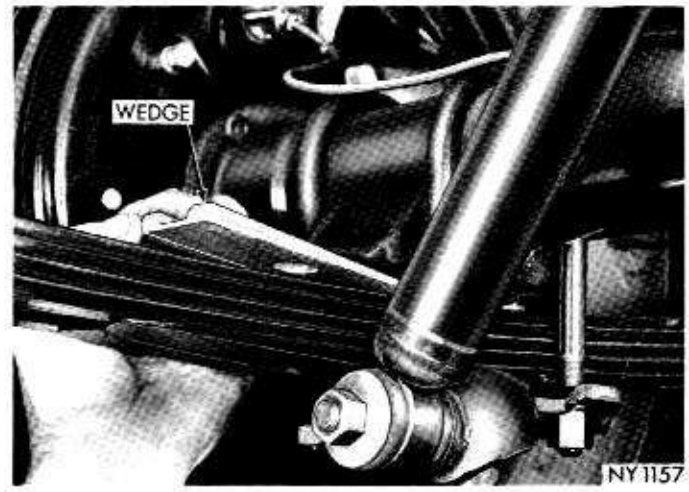


Fig. 9—Tapered Wedge Location (Rear Universal Joint Angle Correction)

To make sure shims are installed properly, remember this rule. If bubble is too far forward, insert shim with thick end toward front of car. If bubble is too far to rear, the nose of differential is too high, so thick end of shim goes toward rear of car (Fig. 9). A 1° shim will move bubble in spirit level about 3 graduations forward or rearward, depending on which way the thick end is installed.

Presently, there are a number of makes of wedge type shims available commercially. Always make sure shims you use are made of steel and are the same width as the springs on the car. Chrysler Parts Division has made available steel shims in varying angles of ½°, 1°, 2°, and 3° making it possible with these combinations to set the rear universal joint angle within ½° of a perfect angle.

(6) To install shims, loosen spring "U" bolt nuts and install shims between rear springs and axle housing spring pads.

(7) Tighten spring "U" bolt nuts to proper specifications.

(8) Recheck rear universal joint angle after installation of wedge type shim, to make sure position of bubble in spirit level is within the acceptable range.

(9) Reinstall rebound bumper and plate assembly on differential carrier, tighten screws to 200 inch-pounds.

CAUTION: Under no circumstances should a shim pack be used that is over ¼ inch thick at the center. If that much shimming is required, look for a possible broken rear spring, mislocated spring seat, etc.

PROPELLER SHAFT

Removal—Rear Joint (All Models)

(1) Remove both rear universal joint roller and

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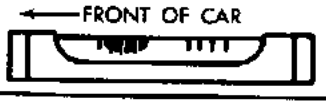
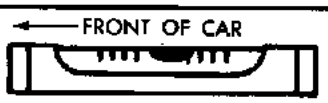
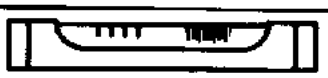
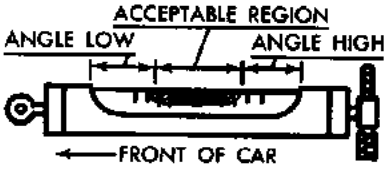
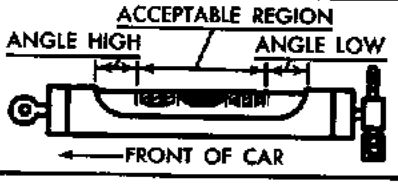
UNIVERSAL JOINT	ANGULARITY MEASUREMENT AND CORRECTION CHART	
CAR TYPE AND WHEELBASE	FRONT JOINT ANGLE ADJUST POSITION OF BUBBLE WITH GAUGE AT ENGINE OIL PAN FLANGE.	REAR JOINT ANGLE ADJUST POSITION OF BUBBLE WITH GAUGE ON DIFFERENTIAL CARRIER.
CHRYSLER (EXCEPT STATION WAGON) 124" W.B.		
CHRYSLER STATION WAGON 121" W.B.		
FINAL READING ON PROPELLER SHAFT (ALL MODELS)		
CORRECTION PROCEDURE	ADD SHIMS AT ENGINE REAR MOUNT (⅛" FOR EACH GAUGE DIVISION) TO REDUCE FRONT JOINT ANGLE. CORRECT LOW ANGLES ONLY IF FLOOR PAN INTERFERENCE IS ENCOUNTERED.	ADD SHIMS AT REAR AXLE HOUSING SPRING SEATS. 1° WEDGE SHIM MOVES BUBBLE 3 TO 4 GAUGE DIVISIONS. TO REDUCE ANGLE, INSTALL THICK END OF WEDGE TO FRONT OF CAR. NN219

Fig. 10—Universal Joint Angularity Reference Chart

bushing assembly clamps from drive pinion flange (Fig. 2).

Do not disturb the retaining strap used to hold the bushing assemblies on the universal joint cross.

CAUTION: Do not allow propeller shaft to drop or hang loose from either joint during removal. Wire up or otherwise support the loose end of shaft to prevent damage to joint.

Front Joint (All Models with Sliding Front Yoke)

(1) Slide propeller shaft with the front yoke from the transmission output shaft (Fig. 11). Be careful not to damage splines on output shaft or yoke. Examine sliding yoke seal for evidence of leakage. If no leakage is evident, do not disturb the seal. If necessary to replace the seal, refer to Transmission Group, 21.

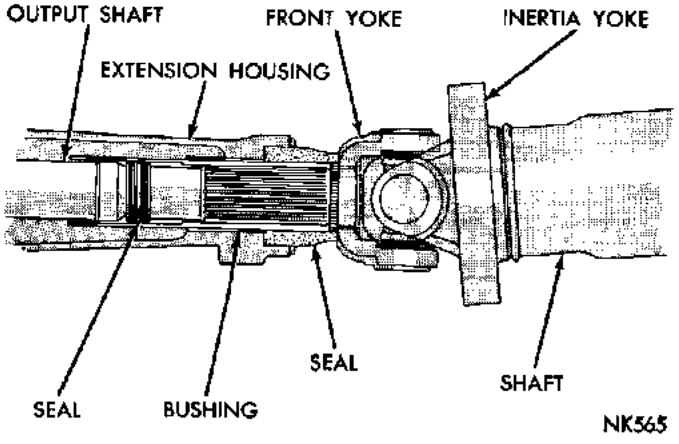


Fig. 11—Front Universal Joint Sliding Yoke

CAUTION: It is important to protect the machined surface of the sliding yoke from damage after propeller shaft has been removed.

Installation

Front Joint (All Models with Sliding Front Yoke)

(1) Before installing propeller shaft clean old lubricant from splines of slip spline yoke (Fig. 1).

Lubricate with approximately one-third ounce of an Automotive Multi-Purpose Grease, NLGI grade 2. Multi-Mileage Lubricant Part Number 2525035 is suitable for this application. Spread evenly over all the splined area of yoke.

(2) Engage the yoke splines on end of output shaft, being careful not to burr the splines (Fig. 11).

Rear Joint (All Models)

(1) Install rear universal joint cross roller bushings in the seats of pinion yoke. Install bushing clamps and attaching screws (Fig. 2). Tighten screws to 170 inch-pounds.

CROSS AND ROLLER UNIVERSAL JOINT

Disassembly

(1) **Before disassembling universal joint, mark yoke, cross and bushings to facilitate reassembly if inspection discloses parts are serviceable.**

(2) Remove the four bushing retainers from the yoke (Figs. 1 and 2). Press one roller and bushing out of yoke by pressing opposite bushing.

(3) Press out remaining roller and bushing assembly by pressing on end of cross.

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(4) Remove cross assembly from yoke. **Do not remove seal retainers from cross.** The cross and retainers are serviced as an assembly.

Cleaning and Inspection

(1) Clean all parts in a suitable solvent and dry with compressed air. Examine bearing surfaces of cross. They should be smooth and free from ripples and pits. If bearing surfaces or seal retainers are damaged, replace cross assembly.

(2) Examine rollers in bushings. Rollers that have operated on a worn cross should be replaced. Rollers should have a uniformly good appearance and roll freely inside bushings.

Assembly

(1) Lubricate roller and bushing assemblies with Universal Joint Grease, NLGI Grade 0. Also, fill reservoirs in the ends of the cross.

(2) Place cross in propeller shaft yoke, observing identification marks made at disassembly. Install roller and bushing assemblies in yoke, matching identifying marks.

(3) Press both bushing assemblies into yoke while guiding cross into bushings. Press until bushing retainers can be installed in grooves in bushings.

(4) Position remaining two bushing assemblies on cross. Install retainer strap to hold bushings on cross during installation of shaft on pinion flange. Lightly tap outer ends of bushings while rotating cross to be sure cross and bushings operate freely.

TWO-PIECE PROPELLER SHAFT AND UNIVERSAL JOINTS

IMPERIAL MODELS

GENERAL INFORMATION

The Imperial two-piece propeller shaft has a single cross and roller universal joint at the front end (Fig. 12) and constant velocity cross and roller universal joints at the center and rear end (Figs. 13 and 14). The shaft is supported by a ball bearing and bracket located forward of the center joint. The bracket height is non-adjustable.

Centering ball and socket arrangements are incorporated in the center and rear constant velocity joints (Figs. 15 and 16). The centering balls being located between the yokes of each joint maintain the relative position of the two joints. The centering balls cause each of the two joints to operate through exactly one-half of the complete angle between the two joints.

When the vehicle is in motion, the shaft yoke on the center joint is free to slide fore and aft inside the splines of the front shaft.

The joints and centering ball and sockets are permanently lubricated. They should be inspected for external leakage whenever the vehicle is serviced. The joints should **not be** relubricated unless leakage is observed. Refer to Paragraph "Propeller Shaft" for servicing instructions.

SERVICE PROCEDURES

PROPELLER SHAFT ANGULARITY

Due to the constant velocity universal joints being able to operate through greater angles, thus eliminating most driveline disturbances, resulting from excess angularity, it will not be necessary to check and adjust the operating angles.

PROPELLER SHAFT

Removal

(1) Remove screws and lockwashers attaching cross and roller bushing clamps to transmission yoke (Fig. 12). Disengage front universal joint cross and roller bushings from yoke.

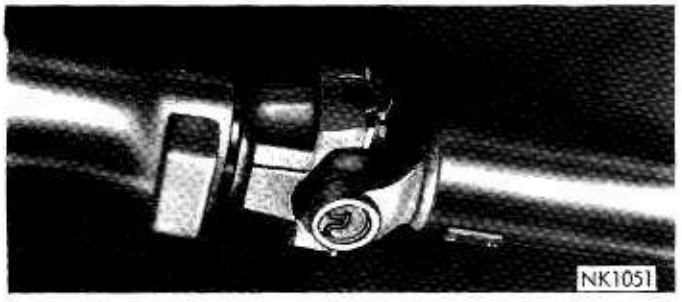


Fig. 12—Front Universal Joint—Single Cross Type (Imperial Models)

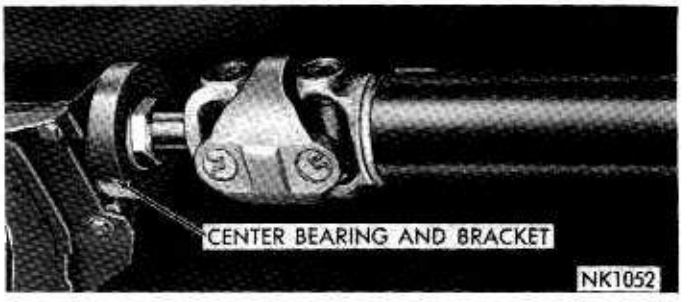


Fig. 13—Center Universal Joint—Constant Velocity Type (Imperial Models)

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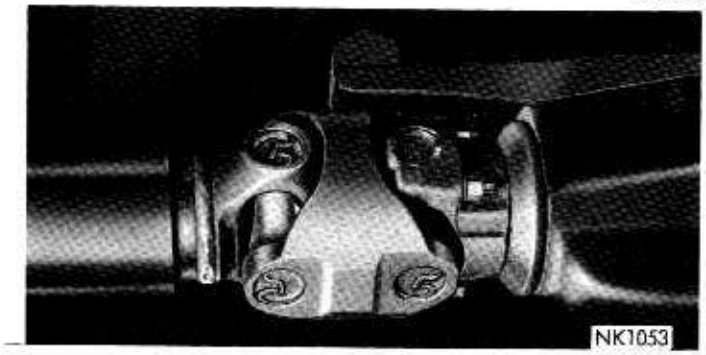


Fig. 14—Rear Universal Joint—Constant Velocity Type (Imperial Models)

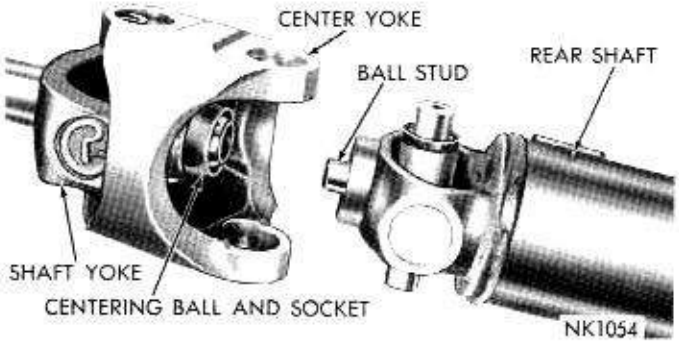


Fig. 15—Center Joint Centering Ball Arrangement

Tie up or otherwise support front end of propeller shaft to prevent damaging center joint.

(2) Remove stud nuts and washers attaching rear universal joint to rear axle pinion yoke (Fig. 14). Support rear end of shaft.

(3) Remove bolts, nuts and washers attaching center bearing bracket to frame crossmember (Fig. 13).

(4) Remove propeller shaft as an assembly toward rear of vehicle.

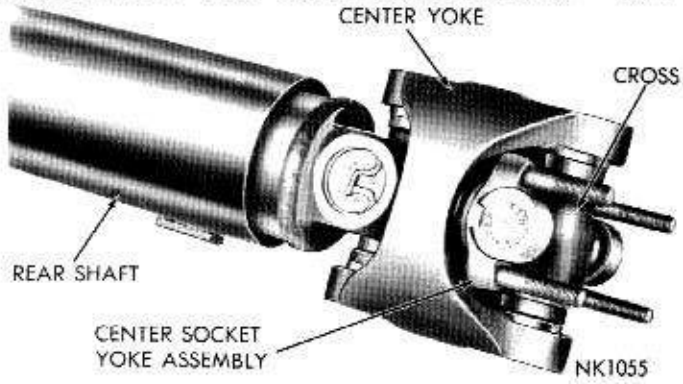


Fig. 16—Rear Joint Centering Ball Arrangement (Imperial Models)

Installation

(1) Insert forward section of propeller shaft over frame crossmember and connect rear universal joint to pinion yoke. Install stud nuts and washers. Tighten nuts to 300 inch-pounds.

(2) Connect front universal joint to transmission output shaft yoke. Install cross and roller bushing clamps, bolts, and washers. Tighten bolts to 170 inch-pounds.

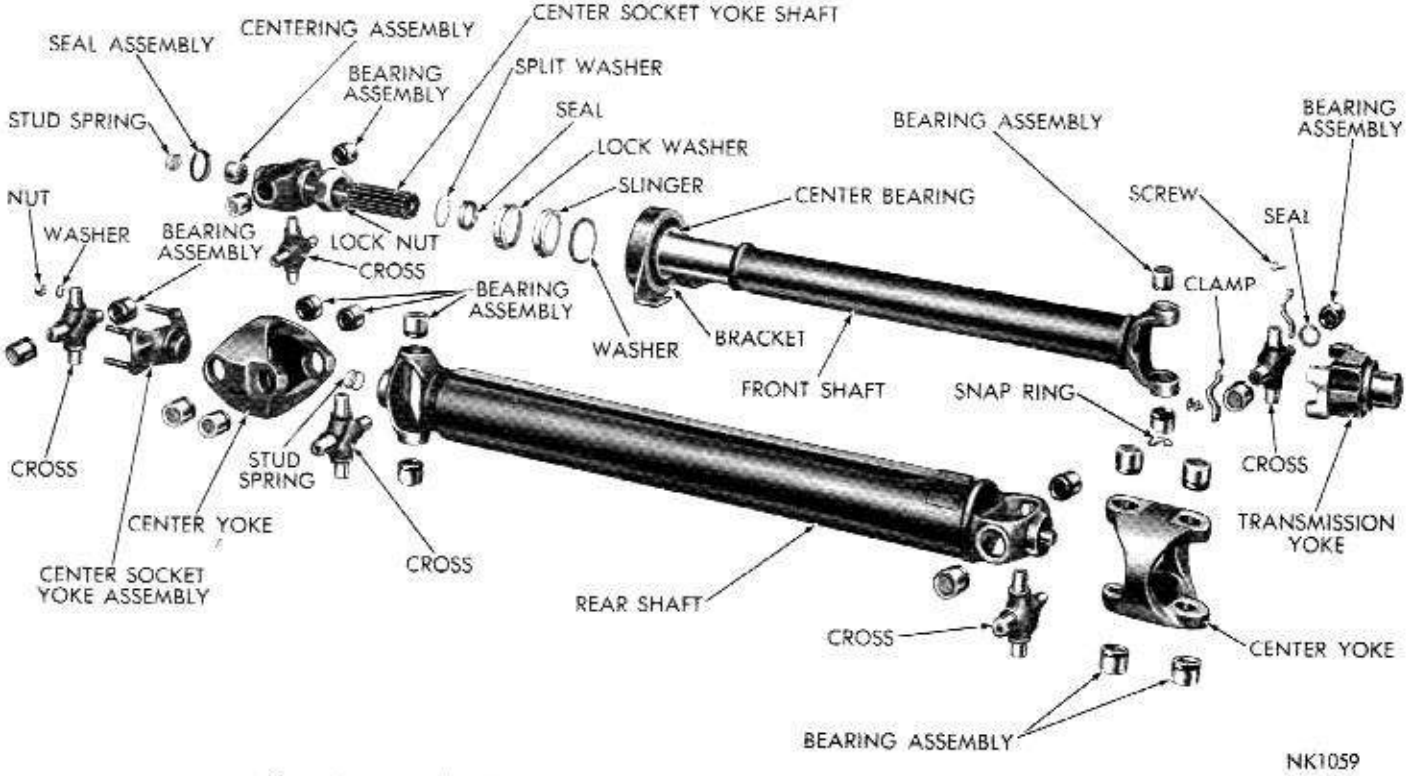


Fig. 17—Propeller Shaft and Universal Joints—Constant Velocity Type (Imperial Models)

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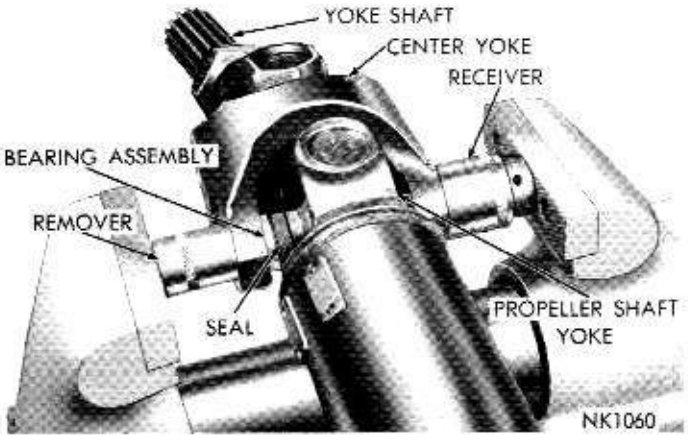


Fig. 18—Pressing Bearing from Center Yoke

(3) Position center bearing bracket on frame crossmember and align with bolt holes. Install bolts, nuts and washers and tighten nuts to 35 foot-pounds.

CENTER UNIVERSAL JOINT

Mark all parts for easy identification at reassembly before disassembling joint.

Disassembly

(1) Straighten staked areas of center bearing locknut lockwasher (Fig. 17) and unscrew locknut from front propeller shaft.

(2) Slide front shaft from rear shaft.

(3) Remove snap rings securing roller bearing assemblies in center socket yoke shaft and center yoke bores (Fig. 17).

CAUTION: If joints are heavily coated with rust or corrosion, apply penetrating oil in bearing bores before attempting to press out the bearings.

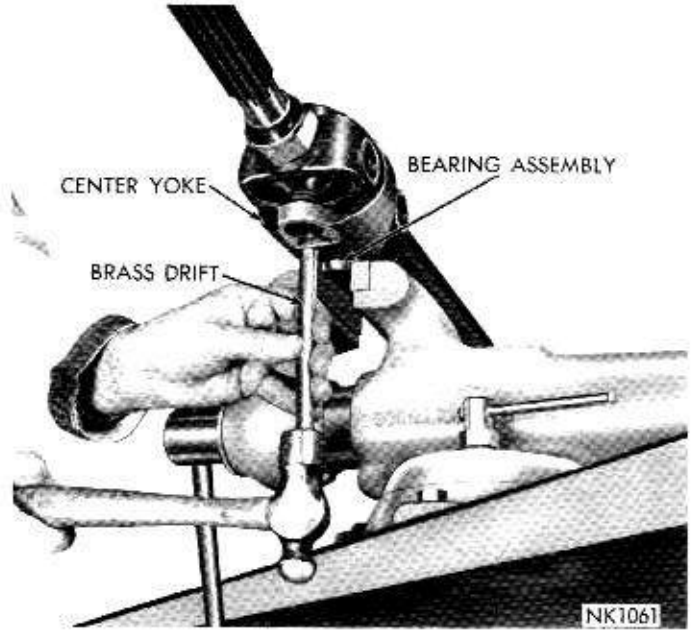


Fig. 19—Removing Bearing from Center Yoke

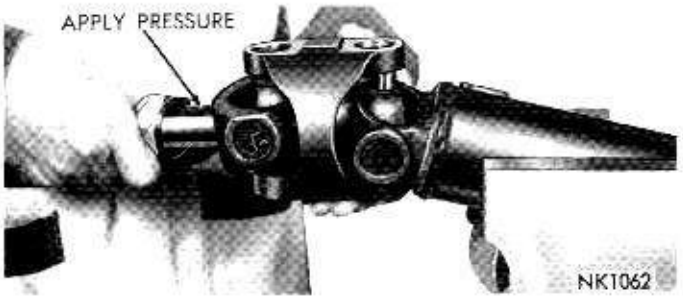


Fig. 20—Disengaging Center Yoke from Shaft

(4) Press bearing assemblies from yokes in following manner: Use a short length of round bar stock ¾ inch in diameter, or a ¾ inch socket as a remover. As a receiver on the opposite bearing, use a short length of pipe or a socket with an inside diameter of not less than 1-1/16 inch. Clamp the joint with remover and receiver in a vise (Fig. 18) and press one of the rear yoke bearings approximately ⅜ inch out of yoke.

(5) Securely clamp the exposed bearing in vise and drive yoke from bearing, using a brass drift (Fig. 19). Apply only light blows on drift.

(6) Using same procedure, press exposed end of cross to force bearing on opposite end approximately ⅜ inch out of yoke. Remove bearing from yoke, using brass drift as previously described.

(7) With propeller shaft firmly held in vise, press in on yoke shaft and work center joint off cross (Fig. 20).

CAUTION: Be careful to avoid damaging cross seals and center stud yoke slinger.

(8) Remove remaining set of bearings from propeller shaft yoke.

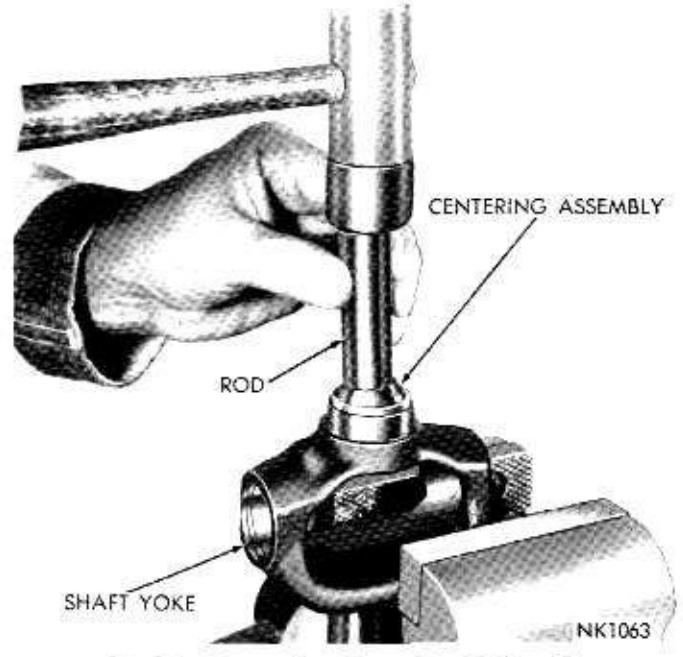


Fig. 21—Removing Centering Ball and Socket Assembly

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(9) Remove cross from propeller shaft yoke. Remove centering stud spring from propeller shaft (Fig. 17).

(10) Remove four roller bearing assemblies to separate yoke shaft from center yoke, as previously described.

CENTERING BALL AND SOCKET ASSEMBLY

(1) Carefully pry centering ball seal assembly from yoke shaft (Fig. 17).

(2) Remove seal and bearing rollers from centering ball.

(3) Fill cavity behind centering ball and inside the ball with Automotive Multi-Purpose Grease, NLGI grade 2. Multi-Mileage Lubricant Part Number 2525035 is suitable for this application.

(4) Insert a rod, slightly smaller than the inside diameter of the centering ball, into the ball and strike it sharply with a hammer (Fig. 21). The hydraulic force applied by initial hammer blow will force the ball and retainer assembly from yoke.

Cleaning and Inspection

(1) Clean all parts in a suitable solvent and blow dry.

(2) Carefully examine all parts for excessive wear or damage. Discard parts that are not serviceable. Examine bearing races for grooves and ridges. Rollers that have been operating in damaged races should not be reused. Examine seals on cross assemblies for damage. Seals are not serviced separately. They are included in the cross assembly. Replace with parts contained in replacement packages. **All parts in the package should be used.** If propeller shaft is damaged or the center stud yoke slinger is bent out of shape, replace the shaft assembly to be assured of a balanced assembly.

Assembly

(1) Position centering assembly in yoke shaft with large diameter hole up and press it firmly into its seat.

(2) Apply a film of Automotive Multi-Purpose E.P. Grease, NLGI grade 2 on the inside surface of centering ball. Install rollers (34 required). Install centering stud seal in ball.

(3) Install centering ball seal assembly on yoke and press firmly in place.

(4) Coat inside surfaces of bearing races with Automotive Multi-Purpose E.P. Grease, NLGI grade 2, and install rollers (32 are required). Also, pack reservoirs in ends of cross with same lubricant.

(5) Place cross in shaft yoke. Insert one bearing assembly in bearing bore of shaft yoke. Using bar stock or socket used as a remover when disassembling joint, press bearing into bore, at same time guiding cross into bearing. Press bearing into yoke approximately 3/16 inch or far enough to install snap ring. Install snap ring. Reverse position of yoke and install bearing and snap ring in opposite bore in same manner.

(6) Place center yoke on cross installed in shaft yoke. Install the two bearings and snap rings in yoke, as previously described.

(7) Install cross assembly and two bearing assemblies in propeller shaft yoke, in same manner as previously described. Install snap rings.

(8) Install centering stud spring on centering stud, **large end first.** Apply a film of Automotive Multi-Purpose E.P. Grease, NLGI grade 2 on stud.

(9) Position center universal joint on cross in propeller shaft, guiding centering ball on centering stud, applying pressure at same time. Work center yoke over cross, being careful not to damage cross seals.

(10) Install two bearing assemblies in rear bores of center yoke, as previously described. Install snap rings.

(11) Coat splines of center socket yoke shaft with approximately one-ounce of Automotive Multi-Purpose E.P. Grease, NLGI grade 0.

(12) Slide yoke shaft splines into splines of front propeller shaft, aligning index clip on yoke spline with wide spline in propeller shaft.

(13) Turn locknut with seal and split washer on end of front propeller shaft. Tighten nut to 65 foot-pounds.

FRONT UNIVERSAL JOINT

Before disassembling joint, mark all parts for easy identification at reassembly.

Disassembly

(1) Slide two transmission yoke bearing assemblies from cross (Fig. 17).

(2) Remove snap rings securing two bearing assemblies in propeller shaft yoke (Fig. 17).

(3) Remove two bearing assemblies from yoke as described in Center Universal Joint, Disassembly.

Cleaning and Inspection

(1) Clean all the parts in a suitable solvent. Carefully examine bearing surfaces on cross for grooves and ridges. Replace unserviceable parts. Rollers that have been operating on a grooved cross should not be reused.

Assembly

(1) Coat inside surfaces of bearing races with Universal Joint Grease, NLGI grade 0, and install rollers (32 are required). Also, pack reservoirs in ends of cross with same lubricant.

(2) Place cross in propeller shaft yoke. Start one bearing in yoke. Clamp the propeller shaft in vise with round bar stock or socket and press bearing into yoke approximately 3/16 inch or far enough to install snap ring, as described in Center Universal Joint, Assembly. Install snap ring.

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(3) Change position of shaft and install second bearing in yoke. Install snap ring.

REAR UNIVERSAL JOINT

Before disassembly joint mark all parts for easy identification at reassembly.

Disassembly

(1) Remove snap rings securing two bearing assemblies in rear bores of center yoke (Fig. 17). Remove bearings as described in Center Universal Joint, Disassembly.

(2) Remove cross and center socket yoke as an assembly. Remove centering stud spring from stud. Slide bearings and cross from socket yoke assembly.

(3) Remove centering bearing and socket assembly from yoke, as described in Centering Ball and Socket Assembly.

(4) Remove four remaining bearing assemblies from center yoke and propeller shaft yoke, as previously described.

Cleaning and Inspection

(1) Clean all parts in a suitable solvent and blow dry.

(2) Carefully examine all parts for serviceability as described in Center Universal Joint, Cleaning and Inspection.

Assembly

(1) Coat inside surfaces of bearing races with Automotive Multi-Purpose E.P. Grease, NLGI grade 2, and install rollers (32 are required). Also, pack reservoirs in ends of crosses with same lubricant.

(2) Install cross in propeller shaft yoke and install two bearing assemblies, as described in Center Universal Joint, Assembly. Install snap rings.

(3) Position center yoke over cross in propeller shaft yoke. Install two bearings in front bores of yoke. Install snap rings.

(4) Apply film of Automotive Multi-Purpose E.P. Grease, NLGI grade 2, on centering stud.

(5) Install cross and center socket yoke as an assembly in center yoke. Guide centering ball on stud at same time engaging cross ends in yoke bores.

(6) Apply pressure to center of cross to align the end of cross in the yoke bore. Start one bearing in yoke and press into place, as previously outlined. Install snap ring. Change position of joint in vise and install remaining bearing in the center yoke. Install snap ring.

SPECIFICATIONS

MODEL APPLICATION	NEWPORT	300	NEW YORKER
PROPELLER SHAFT			
Type	Tubular	Tubular	Tubular
*LENGTH—INCHES			
Manual Transmission 3-Speed—except station wagon	58.17	58.17	58.17
Automatic Transmission—except station wagon	58.17	58.17	58.17
station wagon	56.17	—	—
DIAMETER—INCHES			
Axle Ratio	2.76	2.94	3.23
Manual Transmission 3-Speed			
383 Cu. In Engine—except station wagon	—	—	3.25
Automatic Transmission			
383 Cu. In. Engine—except station wagon	3.25 (I)	3.25 (I)	3.25 (I)
station wagon	3.00 (I)	3.00 (I)	3.00 (I)
440 Cu In. Engine—except station wagon			
single exhaust	3.25 (I)	—	3.25 (I)
dual exhaust	—	—	3.25 (I)
UNIVERSAL JOINTS			
Type—Front	Sliding spline cross and roller		
Rear	Cross and roller		

*From Centerline of front yoke bearing bores to centerline of rear bearing bores.
(I) Inertia ring at front joint of propeller shaft

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MODEL APPLICATION	IMPERIAL
PROPELLER SHAFT	Tubular
LENGTH—INCHES	
Front shaft—Cross centerline to end of shaft	26.59
Rear shaft—End of spline to rear cross centerline	40.81
DIAMETER—INCHES	
Front Shaft	2.25
Rear Shaft	3.00
UNIVERSAL JOINTS	
Front	Cross and Roller
Center	Constant Velocity
Rear	Constant Velocity

TIGHTENING REFERENCE

	POUNDS FOOT	POUNDS INCH
Front-Transmission Flange Clamp Screw		170
Rear-Pinion Flange Clamp Screw		170
Rear-Pinion Yoke Stud Nuts		300
Center Bearing Bracket Bolt Nuts	35	
Pinion Bumper Plate Screw		200
Rear Spring "U" Bolt Nuts	45	

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SHOCK ABSORBERS AND REAR SPRINGS

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GENERAL INFORMATION

The rear springs are of the semi-elliptic type with rubber bushings in the "eye" of each end of the main leaf.

The ends of the springs are attached to mounting brackets bolted to the body. The rear ends of the springs are attached to the body by flat plate shackles (Station Wagons, use offset plates) with rubber shackle bushings. The springs are attached to the rear axle housing spring seats by "U" bolts.

Zinc Interleaves—Zinc Interleaves are used between the spring leaves for heavy duty suspension equipped vehicles to help increase spring life. Zinc interleaves are flat pieces of zinc or metal to help reduce corrosion.

Double acting "Oriflow" shock absorbers are used with rubber mounting bushings at each end of the shock absorber.

Shock absorbers should only be replaced when they have lost their resistance in one or both directions, if they DRIP or if they have been damaged. **EVIDENCE OF OIL MOISTURE IS NOT CAUSE TO REPLACE THEM. REPLACE ONLY THE FAULTY UNIT, DO NOT REPLACE IN PAIRS.**

SERVICE DIAGNOSIS

Condition	Possible Cause	Correction
SPRINGS SAG OR BOTTOM	(a) Springs sagged or taken set.	(a) Replace spring.
	(b) Broken, bent or weak spring leaves.	(b) Replace main leaf, or spring as necessary.
SPRING NOISE	(a) Loose "U" bolts.	(a) Tighten "U" bolt nuts 45 foot-pounds.
	(b) Loose or worn shackle bushings.	(b) Replace bushings. Tighten shackle bolt nuts 35 foot-pounds.
	(c) Worn or missing interliners.	(c) Install new interliners.
SPRING BREAKAGE	(a) Loose "U" bolts.	(a) Replace spring. Inspect "U" bolts for damage. Tighten "U" bolt nuts 45 foot-pounds.
	(b) Shock absorber inoperative.	(b) Replace spring and shock absorber.
SHOCK ABSORBER NOISY	(a) Bushings excessively worn.	(a) Replace bushings.
	(b) Faulty internal valve.	(b) Replace shock absorber.
	(c) Loose bolt or stud.	(c) Tighten to specifications.
SHOCK ABSORBER DRIPPING OIL	(a) Faulty seal.	(a) Replace shock absorber.

SERVICE PROCEDURES

SHOCK ABSORBERS FRONT REPLACEMENT

Removal

(1) Remove nut and washer from upper end of shock absorber piston rod (Fig. 1).

(2) Compress shock absorber by pushing the rod through shock absorber bushing.

(3) Remove lower mounting bolt and remove shock absorber.

(4) If upper bushing appears worn, damaged or deteriorated remove it by first pressing out the inner stud sleeve, then prying-out or cutting-out the rubber bushing. (This bushing takes some permanent set so that once removed it should be replaced.)

(5) If lower bushing is to be replaced, remove it from the shock absorber using Tool C-3553 to press on the **outer** sleeve of bushing, (Fig. 2). (Pressing on inner sleeve will not remove the outer sleeve from the shock absorber.)

Installation

(1) To aid installation of upper bushing, dip bushing in water, start it into frame opening with a twist-

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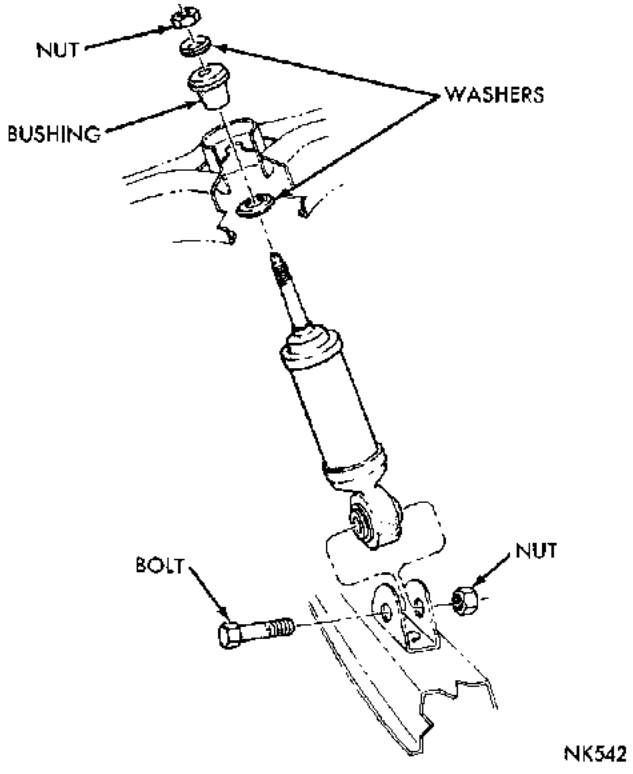


Fig. 1—Front Shock Absorber

ing motion, then press or tap it into place. When installed properly, the groove in bushing will index with opening in shock absorber tower.

(2) Install steel sleeve in bushing.

(3) Using Tool C-3553, press lower bushing into shock absorber eye until it is centered. **Always press against outer steel sleeve to avoid damage to assembly.**

(4) Bleed and test shock absorber, then compress to its shortest length.

(5) Install lower cup washer (concave side up) on rod and into position.

(6) Hold shock absorber in the installed position in frame. Slide the upper cup washer (concave side down) over piston rod and down onto bushing, install nut finger tight.

(7) Position lower end of shock absorber in mounting bracket on lower control arm, and install retaining bolt, lockwasher, and nut. Tighten nut to 50 foot-pounds. While holding the piston rod, tighten piston rod nut to 25 foot-pounds.

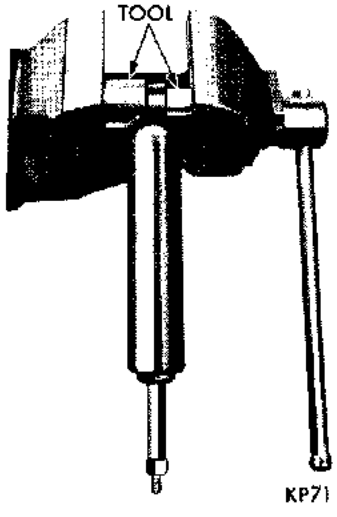


Fig. 2—Replacing Shock Absorber Bushing

REAR SHOCK ABSORBER REPLACEMENT

Removal

(1) Remove nuts and washers from shock absorber upper mounting bolts and lower mounting studs (Fig. 3).

(2) Remove upper mounting bolt and shock absorber assembly.

(3) Inspect bushing for deterioration, damage, or wear. Install new bushings if necessary. Test and bleed shock absorber.

Installation

(1) Position shock absorber on mounting studs and install remaining cupped washers and nuts. **Do not tighten.**

(2) Install upper mounting bolt through shock absorber eye and frame member, and install retaining nut.

(3) Tighten upper bolt nut 70 foot-pounds and lower stud nut 50 foot-pounds with full weight of vehicle on the wheels.

TESTING

(1) With shock absorber removed from vehicle, extend shock absorber fully in an upright position.

(2) Inspect for evidence of fluid running from upper end of reservoir. (Actual leakage will be a stream of fluid running down the side and dripping off lower end of unit. A slight amount of seepage is not

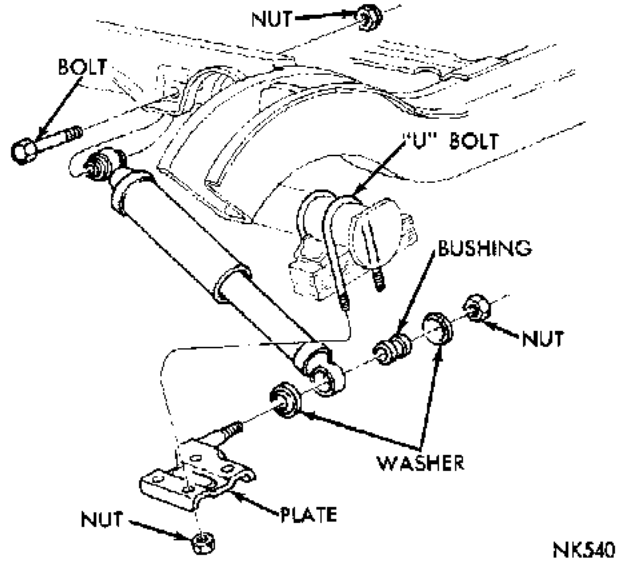


Fig. 3—Rear Shock Absorber

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unusual and does not affect performance.)

(3) To test for low fluid level or air trapped in cylinder, hold shock absorber in a vertical position and alternately extend and compress the unit. There should be no lost motion in either direction.

(4) Should lost motion be evident, hold shock absorber in its normal vertical position and fully extend it.

(5) Invert unit and compress it. **Do not extend the unit while inverted.**

(6) Repeat steps 4 and 5 several times to expel any air trapped in cylinder.

(7) Should lost motion persist, replace shock absorber. Repeat operation 4 and 5 prior to installation of a new shock absorber. New shock absorbers may have a greater resistance than an old one due to friction of the new seal.

REAR SPRINGS

MEASURING SPRING HEIGHT

When measuring rear spring heights, vehicle should be placed on a level floor, have the correct front suspension height on both sides, correct tire pressures, no passenger or luggage compartment load and a full tank of fuel.

(1) Jounce car several times (front bumper first). Release the bumpers at the same point in each cycle.

(2) Measure shortest distance from highest point on the underside of rear axle bumper strap (at rear of bumper) to top of axle housing.

(3) Measure both right and left sides.

If these measurements vary by more than ¾ inch (side to side), it is an indication that one of the rear springs may need replacing. **It is normal for rear springs to show some reverse arch, even with no load, so appearance alone should not be the reason for spring replacement.**

PIVOT BUSHING REPLACEMENT

Removal of old bushing and installation of new bushing is performed in one operation, using Tool C-3709 (Fig. 4).

(1) On bolt SP-3178, position bearing washer SP-92, thrust bearing SP-332, bushing adaptor SP-3179 (flat side of adaptor next to washer), spring leaf bushing and remove adaptor SP-3180.

(2) Insert bolt SP-3178 through bushing to be removed.

(3) Install adaptor SP-3242 on bolt SP-3178. The slot in adaptor SP-3242 should be visible to aid in correct positioning of bushing as it is being installed.

(4) Tighten bolt SP-3178 to remove old bushing and install new bushing. Remove tool after new bushing has been correctly positioned.

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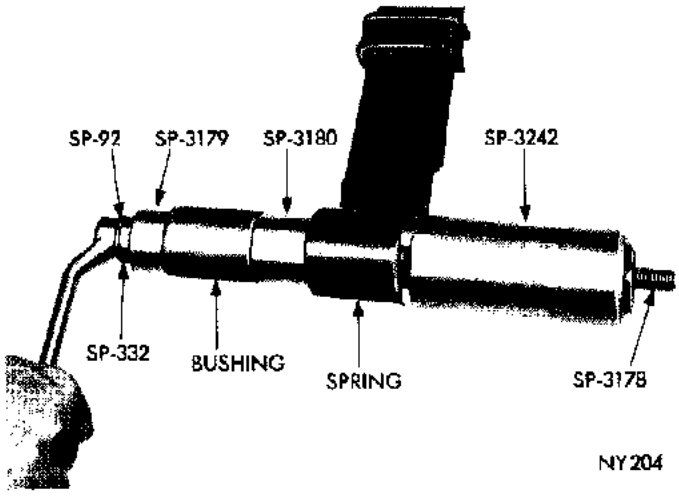


Fig. 4—Pivot Bushing Replacement

LEAF SPRING INTERLINERS

Removal

(1) Raise rear end of vehicle until shock absorbers are fully extended.

(2) Remove alignment clips from spring.

(3) Separate spring leaves with a tapered pry bar or screwdriver and remove interliners.

Installation

(1) With leaves separated, **be sure spring leaf area where the interliner makes contact, is clean and smooth.**

(2) Insert interliner between spring leaves until fasteners are aligned with the holes.

(3) Force the fastener into the hole in spring leaf.

(4) Position aligning clip and tighten retainer nut. **Do not lubricate rear springs.** The interliners act as the friction control and receive no lubrication.

ZINC INTERLEAF (Fig. 5)

(1) Remove rear spring.

(2) Remove center bolt from spring and separate the leaves.

(3) Install zinc interleaves between spring leaves and install centerbolt.

(4) Tighten center bolt 10 foot-pounds.

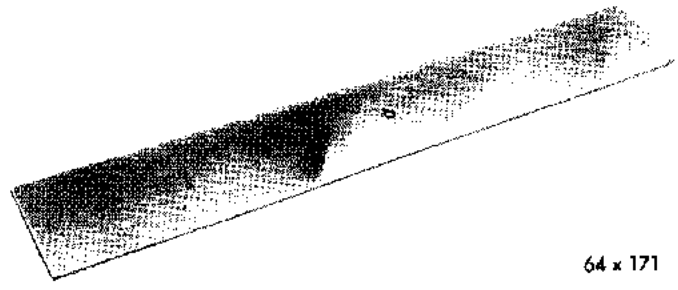


Fig. 5—Zinc Interleaf

SPRING REPLACEMENT

Removal

(1) With car body frame supported on floor stands and jack pressure under axle housing, disconnect shock absorber.

(2) Lower jack until it supports only the weight of axle housing and remove the rear spring rear shackle (Fig. 6).

(3) Loosen rear spring pivot bolt nut. The nut should be backed off until it is retained on pivot bolt by two or three threads.

(4) Remove pivot bolt nut and using a suitable tool force pivot bolt out of the spring.

(5) Remove spring "U" bolts and spring.

Installation

(1) Position springs in their respective front hangers and install pivot bolts and nuts **(finger tight only).**

(2) Install spring shackles and nuts.

(3) Install spring "U" bolts and nuts.

(4) Tighten spring U-bolt nuts 45 foot-pounds.

(5) Connect shock absorbers.

(6) Remove vehicle floor stands and with the vehicle weight on the wheels, tighten pivot bolt to 125 foot-pounds and shackle bolt nuts 35 foot-pounds.

(7) Measure car curb height whenever a rear spring or shackle has been replaced.

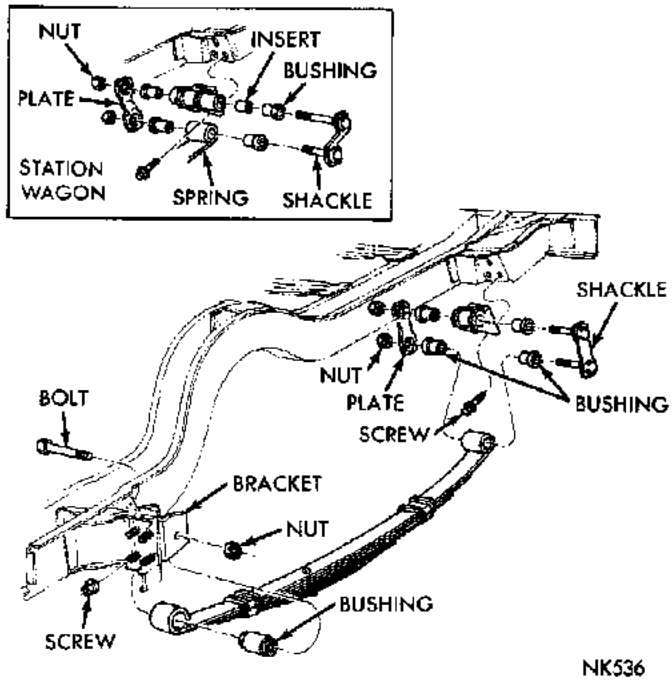


Fig. 6—Rear Spring Assembly

SPECIFICATIONS

	NEWPORT	300	NEW YORKER	IMPERIAL
REAR SPRINGS				
Type		Semi-Elliptic		
NUMBER OF LEAVES				
Std.	5½	6½	6½	6
Heavy Duty	6½*	6½*	6½*	7
Town and Country (Standard)	6½		6½	
(Heavy Duty)*	6½*		6½*	
Police & Taxi	6½*	6½*	6½*	
WIDTH (inches)	2.50	2.50		
LENGTH (inches)	62	62	62	60
MOUNTING				
Front		Rubber Bushing		
Rear		Shackle, Rubber Bushing		
*Zinc Interleaf used between all leaves.				
SHOCK ABSORBERS				
Type		Oriflow		
Mounting		Rubber Bushing		

TIGHTENING REFERENCE

	FOOT POUNDS
REAR SPRINGS	
Center Bolt Nut	10
Front Hanger Nut	30
Pivot Bolt or Nut	125
Rear Hanger	30
Shackle Nut	35
"U" Bolt Nut	45
SHOCK ABSORBERS	
Front Lower Bolt Nut	50
Upper Shaft Nut	25
Rear Lower Stud Nut	50
Upper Bolt Nut	70

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STEERING

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MANUAL STEERING GEAR

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GENERAL INFORMATION

The manual steering gear (Fig. 1) is designed to provide easy steering with a minimum of friction in the steering gear. A ball nut travels up or down on the wormshaft, riding on recirculating balls acting as a screw thread.

The wormshaft and ball nut assembly is supported in the gear housing by an adjustable ball thrust type upper and lower bearing. The lower bearing cup is pressed into the gear housing, and the upper bearing cup is pressed into the wormshaft bearing adjuster.

The cross shaft is integral with the sector gear. The sector gear meshes with the rackteeth on the recirculating ball nut. Adjustment at this point is controlled by the cross shaft adjusting screw which extends through the housing cover.

SERVICE DIAGNOSIS

Condition	Possible Cause	Correction
HARD STEERING	(a) Low or uneven tire pressure.	(a) Inflate tires to recommended pressures.
	(b) Insufficient lubricant in the steering gear housing or in steering linkage.	(b) Lubricate as necessary.
	(c) Steering gear shaft adjusted too tight.	(c) Adjust according to instructions.
	(d) Front wheels out of line.	(d) Align the wheels. See "Front Suspension."
	(e) Steering column misaligned.	(e) See "Steering Column—Manual Transmission."
PULL TO ONE SIDE (Tendency of the Vehicle to veer in one direction only)	(a) Incorrect tire pressure.	(a) Inflate tires to recommended pressures.
	(b) Wheel bearings improperly adjusted.	(b) See "Front Wheel Bearing Adjustment."
	(c) Dragging brakes.	(c) Inspect for weak, or broken brake shoe spring, binding pedal.
	(d) Improper caster and camber.	(d) See "Front Wheel Alignment."
	(e) Incorrect toe-in.	(e) See "Front Wheel Alignment."
	(f) Grease, dirt oil or brake fluid on brake linings.	(f) Inspect, replace and adjust as necessary.
	(g) Front and rear wheels out of alignment.	(g) Align the front wheels. See "Front Suspension."
	(h) Broken or sagging rear springs.	(h) Replace rear springs.
	(i) Bent suspension parts.	(i) Replace parts necessary.
WHEEL TRAMP (Excessive Vertical Motion of Wheels)	(a) Incorrect tire pressure.	(a) Inflate tires to recommended pressures.
	(b) Improper balance of wheels, tires and brake drums.	(b) Balance as necessary. See "Wheels and Tires."
	(c) Loose tie rod ends or steering connections.	(c) Inspect and repair as necessary.
	(d) Worn or inoperative shock absorbers.	(d) Replace shock absorbers as necessary.

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Condition	Possible Cause	Correction
EXCESSIVE PLAY OR LOOSENESS IN THE STEERING WHEEL	(a) Steering gear shaft adjusted too loose or badly worn.	(a) Replace worn parts and adjust according to instructions.
	(b) Steering linkage loose or worn.	(b) Replace worn parts. See "Front Wheel Alignment."
	(c) Front wheel bearings improperly adjusted.	(c) Adjust according to instructions.
	(d) Steering arm loose on steering gear shaft.	(d) Inspect for damage to the gear shaft and steering arm, replace parts as necessary.
	(e) Steering gear housing attaching bolts loose.	(e) Tighten attaching bolts to specifications.
	(f) Steering arms loose at steering knuckles.	(f) Tighten according to specifications.
	(g) Worn ball joints.	(g) Replace the ball joints as necessary. See "Front Suspension."

SERVICE PROCEDURES

Adjustments

Two adjustments are provided in the steering gear (Fig. 2). The worm-bearing pre-load adjustment, and the ball nut rack sector gear mesh adjustment.

Before correct adjustment can be made at ball nut rack and sector gear, it must be determined that worm bearing pre-load is properly adjusted.

The worm-bearing pre-load adjustment is controlled by the worm thrust bearing adjuster which threads into the housing at the upper end of the wormshaft.

Worm Bearing Pre-Load

(1) Disconnect steering gear arm from cross shaft with Tool C-3646 (Fig. 3).

(2) Remove horn button or horn ring.

(3) Loosen cross shaft adjusting screw lock nut, and back out adjusting screw approximately two turns. This will relieve any friction load which may be present at closely meshed ball nut rack and sector gear teeth.

(4) Turn steering wheel two complete turns from straight ahead position, and place torque wrench Tool C-3380 on steering shaft nut.

(5) Rotate steering shaft at least one turn toward straight ahead position, while testing rotating torque with torque wrench.

The torque required to keep wheel moving should be between 1½ and 4½ inch-pounds. If reading is not within these limits, adjustment can be made in or out of vehicle as follows:

(a) Loosen adjuster lock nut.

(b) Use adjuster wrench from Tool C-3884 set and

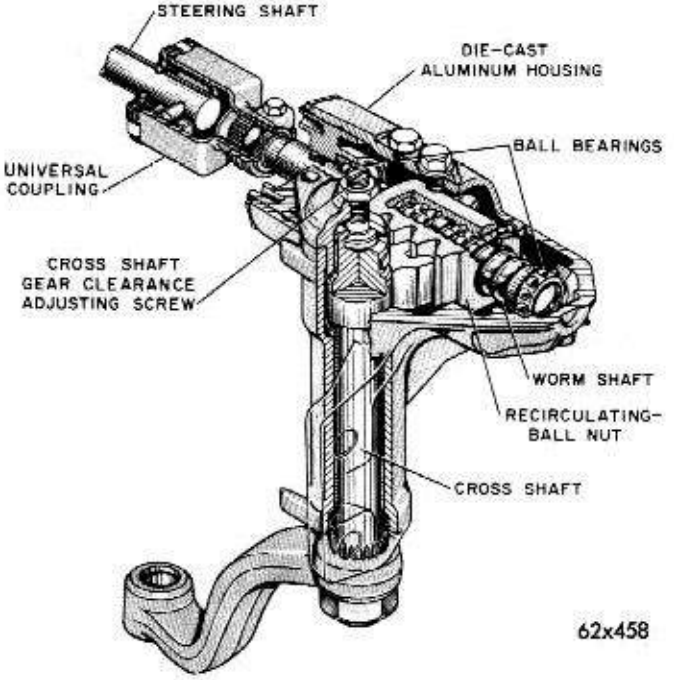


Fig. 1—Steering Gear Cross Section

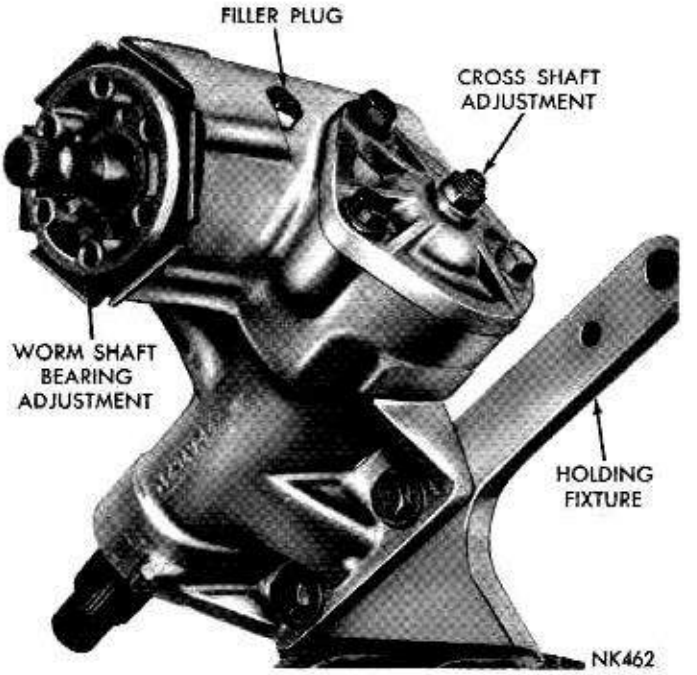


Fig. 2—Gear Adjustment Locations

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turn adjuster clockwise to increase preload, or counterclockwise to decrease pre-load.

(c) While holding adjuster from turning, tighten lock nut securely. Retest worm bearing pre-load.

Ball Nut Rack and Sector Mesh

The cross shaft adjusting screw, located in housing cover, raises or lowers the shaft to provide proper mesh load between tapered teeth of sector gear and tapered teeth of ball nut. **This adjustment can be accurately made only after proper worm bearing pre-load has been established.**

(1) Turn steering wheel gently from one stop all way to other, carefully counting number of turns. Turn steering wheel back exactly half way, to center position.

(2) Turn cross shaft adjusting screw clockwise to take out all lash between ball nut rack and sector gear teeth, then tighten adjusting screw lock nut to 35 foot-pounds.

(3) Turn steering wheel about ¼ turn away from center or "high spot" position. Using torque wrench Tool C-3380, at steering wheel nut, measure torque required to rotate steering wheel through high spot at center position. The reading should be between 8¼ and 11¼ inch-pounds. This represents total of worm shaft bearing pre-load and ball nut rack and sector gear mesh load. Readjust cross shaft adjustment screw if necessary, to obtain proper torque reading.

(4) After adjustments have been completed, place front wheels in a straight ahead position, and with steering gear and steering wheel centered, install steering arm on cross shaft.

(5) Tighten steering arm retaining nut to 120 foot-pounds.

Gear Removal

The manual steering gear can be removed without removing the steering column assembly.

(1) Remove steering arm retaining nut. Remove arm with Tool C-3646 (Fig. 3).

(2) Remove pin from coupling clamp at upper end of steering gear wormshaft.

(3) To provide sufficient clearance at coupling, loosen column jacket to instrument panel clamp bolts sufficient to disengage tab on clamp from slot in column jacket. Slide column assembly up far enough to disengage coupling from wormshaft.

CAUTION: Care is required to avoid scratching column jacket when sliding it up and down in clamp assemblies.

It is not necessary to disconnect the shift linkage on models equipped with manual transmission, or to remove floor plate to floor pan bolts when removing steering gear. If floor plate bolts are loosened, it will be necessary to realign steering column when reinstalling gear.

(4) Remove three steering gear housing mounting bolts and remove steering gear from under vehicle.

Gear Reconditioning

Thoroughly clean entire outside surface of steering gear before disassembly to avoid contaminating wormshaft and ball nut assembly with dirt or grit.

(1) Attach steering gear to holding fixture, Tool C-3323 and install holding fixture in a vise (Fig. 2).

(2) Loosen cross shaft adjusting screw lock nut, and back out screw about two turns to relieve load caused by close mesh between ball nut rack and sector gear teeth. **Remove cross shaft seal as outlined in "Cross Shaft Oil Seal Replacement."**

(3) Position steering wormshaft in straightahead position.

(4) Remove bolts from cross shaft cover and slowly remove cross shaft while sliding arbor Tool C-3786 into housing (Fig. 4).

(5) Remove lock nut from cross shaft adjusting screw and remove screw from cover by turning screw clockwise.

(6) Slide adjustment screw and shim out of slot in end of cross shaft.

(7) Loosen wormshaft bearing adjuster lock nut with a soft drift and remove the lock nut. Hold wormshaft from turning while unscrewing adjuster, using wrench from Tool Set C-3884 (Fig. 5).

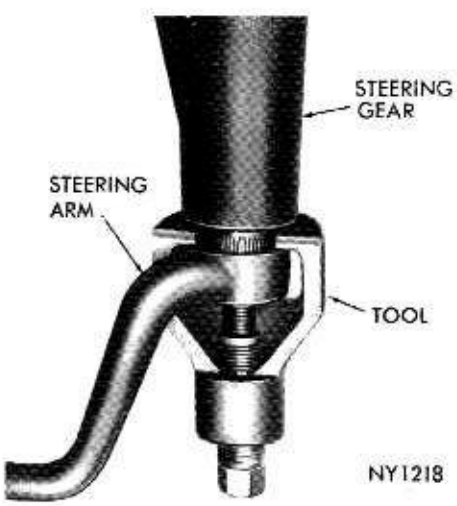


Fig. 3—Removing Steering Gear Arm

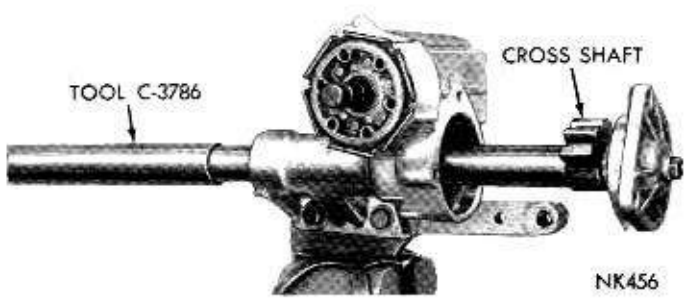


Fig. 4—Removing Cross Shaft

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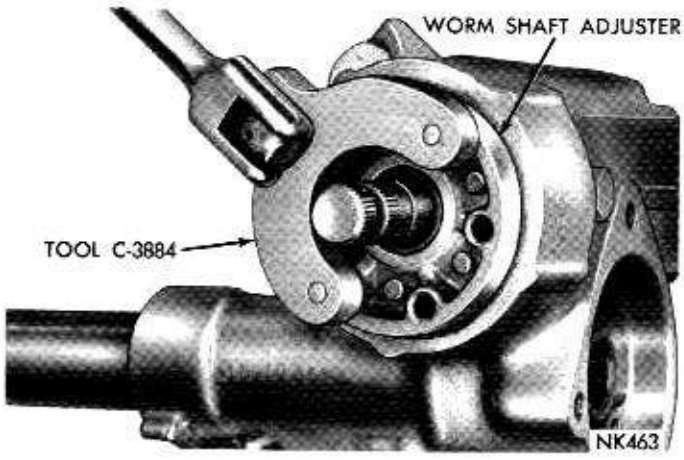


Fig. 5—Removing Worm Shaft Adjuster

(8) Slide worm shaft adjuster off shaft.

CAUTION: The adjuster must be handled carefully to avoid damage to aluminum threads.

Be careful that ball nut does not run down to either end of wormshaft. The ball guide ends can be damaged if ball nut is allowed to rotate until stopped at end of worm.

(9) Carefully remove worm and ball nut assembly (Fig. 6).

The ball nut and wormshaft are serviced as an assembly only, and are not to be disassembled. Do not remove or disturb ball return guides. **Place ball nut and wormshaft assembly in a clean place.**

(10) Remove cross shaft needle bearing by placing steering gear housing in an arbor press; insert Tool C-3786 in lower end of housing (Fig. 7) and press both bearings through housing. **The cross shaft cover assembly, including a needle bearing or bushing, is serviced as an assembly.**

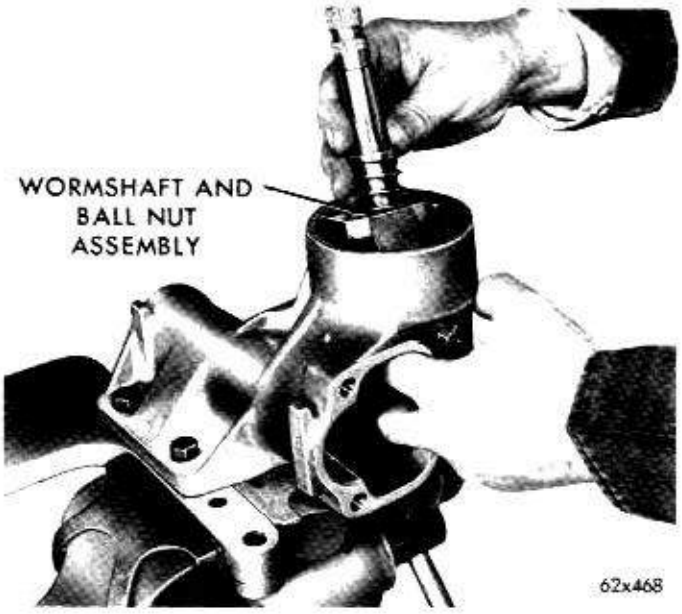


Fig. 6—Removing Worm Shaft and Ball Nut Assembly

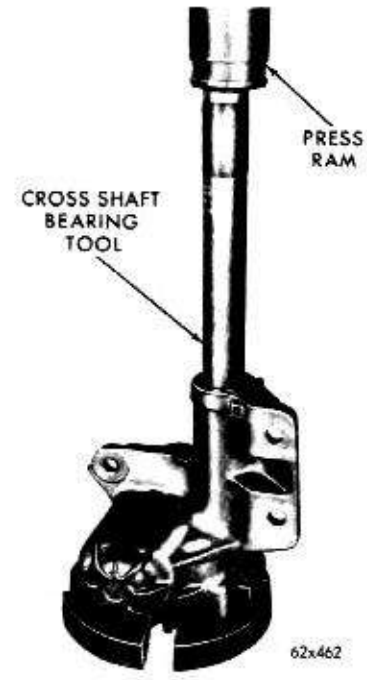


Fig. 7—Removing Cross Shaft Inner and Outer Bearings

(11) Remove wormshaft oil seal from wormshaft bearing adjuster, by inserting a blunt punch behind seal and tap alternately on each side of seal until seal is driven out of adjuster.

(12) Remove wormshaft spacer and upper bearing cup in same manner. However, this must be done carefully to avoid cocking bearing cup and distorting adjuster counterbore.

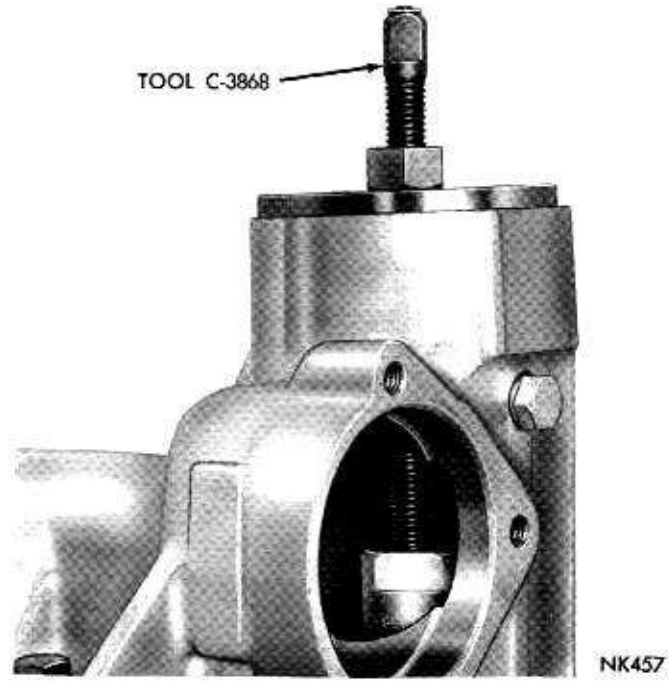


Fig. 8—Removing Lower Bearing Cup

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(13) Remove lower cup if replacement is necessary by positioning locking head jaws of remover Tool C-3868 (Fig. 8) behind bearing cup and expanding remover head by pressing down on center plunger of tool. Withdraw bearing cup by turning remover screw nut in a clockwise direction while holding center screw.

(14) Wash all parts in clean solvent and dry with compressed air.

(15) Test operation of ball nut assembly on wormshaft. If ball nut does not travel smoothly and freely on wormshaft and there is roughness or binding, assembly must be replaced.

(16) Extreme care is necessary when handling aluminum worm bearing adjuster to avoid damaging threads. It is equally important to avoid damaging mating threads in gear housing. The wormshaft adjuster must **never** be screwed into housing without lubrication, or when threads are dirty or damaged. These precautions **must** be taken to avoid "picking up" threads and ruining housing and/or wormshaft bearing adjuster.

(17) Inspect cross shaft for wear and check fit of shaft in housing bearings. Inspect fit of shaft pilot in its housing bearing in cover. Make sure wormshaft has not been bent or otherwise damaged.

(18) The cross shaft and wormshaft oil seals should be replaced when unit is reconditioned.

(19) Install cross shaft outer needle bearing by placing bearing on end of Tool C-3333 with adapter ring. Press bearing into housing to ½ inch below end of bore to provide space for oil seal.

(20) Install inner needle bearing by placing bearing on Tool C-3333 (Fig. 9). Press bearing into inside end of housing bore flush with inside end of bore surface.

(21) Install wormshaft bearing cups, position bearing cup and spacer into adjuster nut, and press them in place with Tool C-3865 (Figs. 10 and 11).

(22) Install wormshaft oil seal by positioning seal in wormshaft adjuster with lip of seal up. Drive seal into place with a suitable sleeve so it is slightly below end of bore in adjuster.

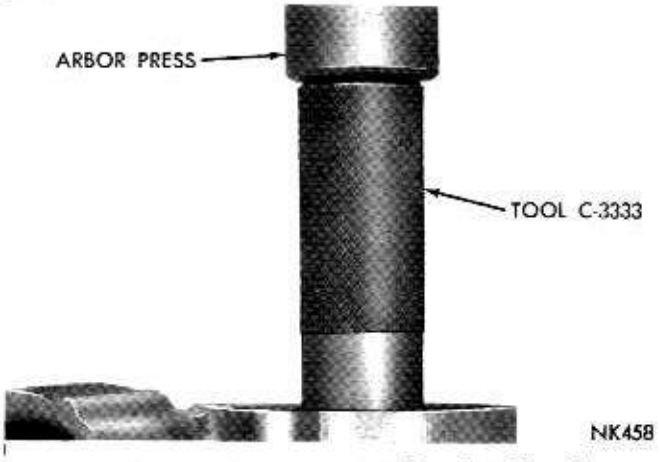


Fig. 9—Pressing Inner Bearing Into Housing

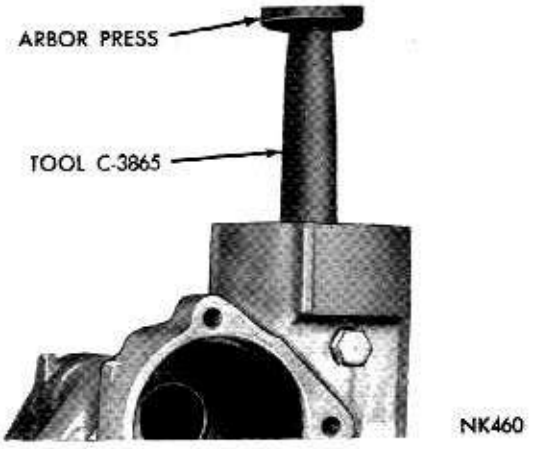


Fig. 10—Installing Wormshaft Lower Bearing Cup

(23) Apply a coating of steering gear lubricant to all moving parts during assembly, also place lubricant on and around oil seal lips.

(24) Clamp holding fixture and housing in a vise with bearing adjuster opening upward.

(25) Place a thrust bearing in the lower cup in housing.

(26) Hold ball nut from turning (Fig. 6), and insert wormshaft and ball nut assembly into housing with end of worm resting in thrust bearing.

(27) Place upper thrust bearing on wormshaft. Thoroughly lubricate threads on adjuster and threads in housing.

(28) Place a protective sleeve of plastic tape over wormshaft splines so splines do not damage seal. Slide adjuster assembly over shaft.

(29) Thread adjuster into steering housing, and

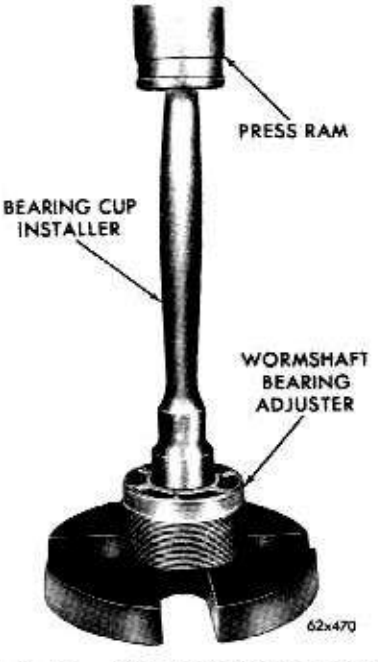


Fig. 11—Installing Wormshaft Upper Bearing Cup

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with Tool wrench C-3884 and splined nut set, tighten adjuster to 50 foot-pounds while rotating wormshaft. This is done to effectively seat bearings.

(30) Loosen adjuster so no bearing preload exists. Then, using torque wrench Tool C-3380, adjust wormshaft bearing preload from 1⅛ to 4½ inch-pounds.

(31) After adjusting preload, tighten bearing adjuster lock nut, and retest to be sure preload remains between 1⅛ and 4½ inch-pounds.

(32) Before installing cross shaft, pack wormshaft cavities in housing above and below ball nut with steering gear lubricant. Use steering gear lubricant whenever possible, but if not available, a good grade of multi-purpose lubricant may be used. Do not use gear oil. When gear is properly packed with steering gear lubricant it will contain eleven fluid ounces of lubricant, and level of lubricant will be at top of worm.

(33) Slide cross shaft adjusting screw and shim into slot in end of shaft.

(34) Test end clearance (Fig. 12). The screw must be free to turn with zero to .004 inch end play. Three different thickness shims are available to obtain specified clearance.

(35) Start cross shaft and adjuster screw into bearing in housing cover. Using a screw driver through hole in cover, turn screw counterclockwise to pull shaft into cover.

(36) Install adjusting screw lock nut, but do not tighten at this time.

(37) Rotate wormshaft to centralize ball nut.

(38) Place new cover gasket on housing cover.

(39) Carefully install cross shaft and cover assembly into steering gear housing (Fig. 4).

The cross shaft and sector teeth should be coated with steering gear lubricant before installing cross shaft in housing.

(40) Make certain some lash exists between cross shaft sector teeth and ball nut rack. Install and tighten cover bolts to 25 foot-pounds.

GEAR INSTALLATION

(1) Slide steering column assembly upward to where column coupling will clear end of wormshaft to permit installation of steering gear. Make sure clamp is in place on steering shaft coupling.

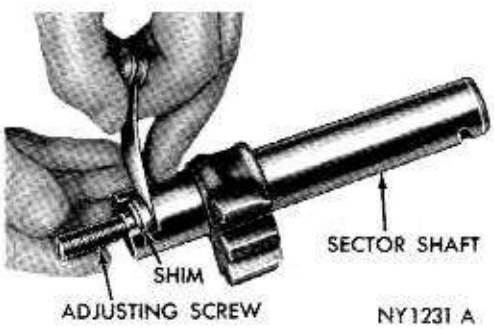


Fig. 12—Measuring Cross Shaft Adjusting Screw End Clearance

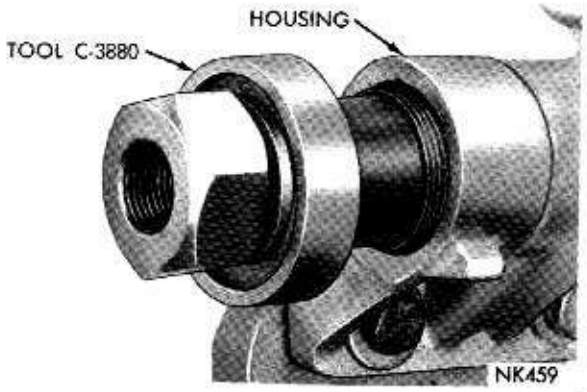


Fig. 13—Removing Cross Shaft Oil Seal

(2) Position steering gear underneath vehicle and install three mounting bolts.

(3) Tighten mounting bolts to 80 foot-pounds.

(4) With master serration on wormshaft, aligned with notch mark on coupling housing, slide steering column assembly down far enough to engage column coupling with wormshaft.

(5) Align groove on steering column coupling with groove in wormshaft and install coupling pin.

(6) Install coupling pin.

(7) While jacket clamp bolts are loose, position jacket assembly so steering shaft coupling is centered at midpoint of its travel.

The coupling travel midpoint can be determined by a 3/16" diameter gauge hole which is provided in steering shaft.

The coupling is centered in its travel when dimension from top of coupling to center of gauge hole is 13/16 inch.

(8) After centering coupling, tighten column jacket to instrument panel clamp bolts to 95 inch-pounds. **On vehicles equipped with manual transmission and concentric shift linkage, it will be necessary to readjust length of 1st and reverse shift rod and 2nd and 3rd**

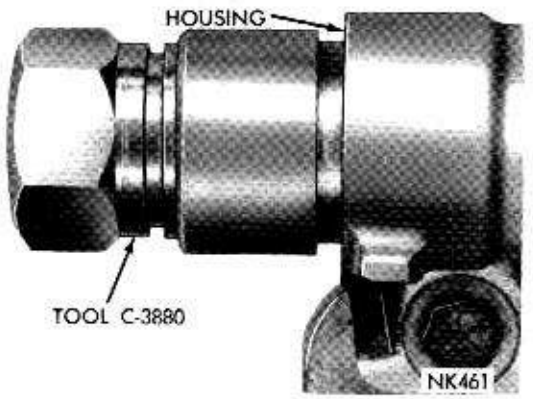


Fig. 14—Installing Cross Shaft Oil Seal

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shift rod after steering column assembly has been secured in position. See "Manual Transmission Linkage Adjustments" Group 21.

(9) Turn steering gear and steering wheel to midpoint of its travel.

(10) Place front wheels in straight ahead position so master serrations in steering gear arm align, with those on steering cross shaft.

(11) Install steering gear arm, lock washer and nut on cross shaft and tighten nut to 120 foot-pounds.

(12) After steering gear has been completely installed, test steering wheel to be sure it is centered in straight ahead position. If it is found to be off center with wheels straight ahead, adjust tie rods to center the wheel. See Group 2, "Front Suspension."

CROSS SHAFT OIL SEAL REPLACEMENT

The cross shaft oil seal may be replaced by the following procedure either on the bench, or without removing steering gear from vehicle.

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CAUTION: When replacing oil seal in vehicle, clean the exposed portion of cross shaft to help prolong oil seal life.

Use Tool C-3880 to service cross shaft seal. The tool consists of adapter SP-3056; half rings SP-1932 and nut SP-3610.

(1) Slide threaded adapter over end of cross shaft and install nut portion of tool on shaft. (Fig. 13). Maintain pressure on adapter with tool nut while screwing adapter into seal until it grips oil seal firmly. Place two half rings and retainer over both portions of tool. Turn tool nut counterclockwise to withdraw seal from housing.

(2) Place seal onto splines on cross shaft with lip of seal facing gear housing.

(3) Place installing adapter SP-3052 from Tool C-3880 against seal. Press seal in until a gap of ¼ inch exists between adapter and housings (Fig. 14).

(4) Place nut down from Tool Set C-3880 on cross shaft, and turn it down against adapter, pressing seal into housing until step on adapter contacts end of housing.

POWER STEERING GEAR

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GENERAL INFORMATION

The power steering gear (Figs. 1 and 2) consists of a gear housing containing a gear shaft with sector gear, a power piston with gear teeth broached into the side of the piston which is in constant mesh with the gear shaft sector, and a wormshaft connecting the steering wheel to the power piston through a U-joint type coupling. The wormshaft is geared to the piston through recirculating ball contact. The steering valve, mounted on top of the steering gear, directs the flow of fluid in the system.

Fluid is supplied to the steering gear, by an engine driven constant displacement slipper type pump through a pressure hose. Oil is returned to the pump reservoir from the steering gear through a return hose.

SERVICE DIAGNOSIS

Condition	Possible Cause	Correction
HARD STEERING	(a) Tires not properly inflated.	(a) Inflate tires to recommended pressures.
	(b) Low oil level in pump reservoir (usually accompanied by pump noise).	(b) See "Fluid Level," Power Steering Pump.
	(c) Loose pump belt.	(c) See "Group 7—Cooling."
	(d) Improper caster and camber.	(d) See "Front Wheel Alignment," Front Suspension Group 2.
	(e) Power steering output low.	(e) Perform the "Pump Pressure and Flow Tests."
	(f) Steering linkage binding.	(f) Repair and lubricate as necessary.
	(g) Steering gear malfunctions. 1. Gear shaft adjustment too tight. 2. Faulty or damaged valve lever. 3. External leakage.	(g) Adjust or repair as follows: 1. See "Gear Shaft Adjustment." 2. Remove steering gear, repair as necessary. 3. Inspect for leakage at the lower sector shaft oil seal; the sector shaft cover "O" ring.

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Condition	Possible Cause	Correction
POOR RECOVERY FROM TURNS	4. Excessive internal leakage.	4. Remove steering gear and repair as necessary.
	(a) Tires not properly inflated.	(a) Inflate tires to recommended pressures.
	(b) Steering linkage binding.	(b) Repair and lubricate as necessary.
	(c) Improper wheel alignment.	(c) See "Front Wheel Alignment," Front Suspension, Group 2.
	(d) Damaged steering tube bearing.	(d) Remove jacket tube and replace bearings.
	(e) Steering wheel column jacket and steering nut improperly aligned.	(e) See "Gear Installation."
	(f) Steering gear malfunctions.	(f) Adjust or repair as follows:
	1. Improper gear shaft adjustment.	1. See "Gear Shaft Adjustment."
	2. Column support spanner nut loose.	2. Remove steering gear, disassemble, inspect and reassemble as outlined in this section.
	3. Damaged valve lever.	3. Remove steering gear and repair as necessary.
	4. Improper worm thrust bearing adjustment.	4. Remove steering gear, disassemble, inspect and reassemble. See "Gear Reconditioning."
	5. Worn or damaged cylinder head worm seal ring or faulty worm piston ring.	5. See "Steering Gear Removal, Disassembly and Inspection," replace parts as necessary. See "Gear Reconditioning."
	6. Burrs or nicks in the reaction ring grooves in the cylinder head or column support.	6. Remove steering gear and repair as necessary.
	7. Dirt or chips in the steering gear unit.	7. Remove steering gear, disassemble completely, clean in a clean solvent, inspect and make repairs as necessary.
	8. Rough or catchy worm in the piston assembly.	8. Replace worm and piston assembly. See "Gear Reconditioning."
CAR LEADS TO EITHER SIDE	(a) Tires not properly inflated.	(a) Inflate tires to recommended pressures; See "Wheels and Tires."
	(b) Improper wheel alignment.	(b) See "Front Suspension, Front Wheel Alignment," Group 2.
	(c) Valve body out of adjustment.	(c) If vehicle leads to the left, move the steering valve housing down on the steering housing. If vehicle leads to the right, move the steering valve housing up on the steering housing.
	(d) Valve lever damaged.	(d) Remove steering gear and replace or repair as necessary.
	(e) Column support spanner nut loose.	(e) Remove steering gear and repair as necessary.
	(f) Coupling not centered.	(f) Center coupling. Refer to "Gear Installation."
EXCESSIVE STEERING WHEEL FREE-PLAY	(a) Improper gear shaft adjustment.	(a) See "Gear Shaft-Adjustment."
	(b) Column support spanner nut loose.	(b) Remove the steering gear, disassemble, inspect, and reassemble.
	(c) Improper worm thrust bearing adjustment.	(c) Remove the steering gear, disassemble, inspect and reassemble, See "Gear Reconditioning."
	(d) Coupling loose on the worm shaft.	(d) Inspect wormshaft splines for wear.
LACK OF ASSIST (One Direction)	(a) Oil leaking past worm shaft oil seal ring.	(a) Remove steering gear, disassemble, inspect and replace the parts as necessary.
	(b) Broken or worn ring on worm piston.	(b) See "Gear Reconditioning."
	(c) Piston end plug loose.	(c) Replace the worm and piston assembly.

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Condition	Possible Cause	Correction
	(d) Reaction seal missing.	(d) Remove the steering gear and repair as necessary.
LACK OF ASSIST (Both Directions)	(a) Pump belt slipping.	(a) See "Pump Belt Adjustment," Group 7.
	(b) Pump output low.	(b) Perform the "Pump Pressure and Flow Tests," also refer to correction (e) in Diagnosis under "Hard Steering."
	(c) Broken or worn ring on worm piston	(c) See "Gear Reconditioning."
	(d) Piston end plug loose.	(d) Replace the worm and piston assembly.
	(e) Internal leakage in the steering gear valve body.	(e) Replace the steering gear valve body assembly.
TEMPORARY INCREASES IN EFFORT WHEN TURNING STEERING WHEEL TO THE RIGHT OR LEFT	(a) Oil level low in pump reservoir.	(a) See "Fluid Level."
	(b) Loose pump belts.	(b) See "Group 7—Cooling."
	(c) Oil on pump belt.	(c) Replace the belt and adjust.
	(d) Binding steering linkage.	(d) Lubricate and repair as necessary.
	(e) Engine idle too slow.	(e) See "Fuel Specifications," Group 14.
	(f) Air in the system.	(f) Work the steering wheel from right to left until the air is expelled.
	(g) Power steering pump output low.	(g) See Diagnosis "Hard Steering" correction (e).
	(h) Gear malfunction.	(h) Adjust and repair as outlined under "Hard Steering"—condition and correction (g).
NOISES	(a) Buzzing noise in neutral and stops when the steering wheel is turned.	(a) Noisy pump, make pressure test and repair as necessary. Damaged hydraulic lines or interference of the hoses with components attached to the fender shield. Air in system; work steering wheel from right to left until the air is expelled.
	(b) Chucking noise. Cause as follows: 1. Improper gear shaft adjustment. 2. Improper worm shaft thrust bearing adjustment. 3. Coupling loose on the worm shaft. 4. Worm and piston assembly.	(b) Correct as follows: 1. See "Gear Shaft Adjustment." 2. Remove steering gear, disassemble, inspect and reassemble. 3. Inspect worm shaft splines for wear. Inspect coupling bolt for tightness, if loose, replace bolt and inspect wormshaft and coupling. 4. Replace worm and piston assembly.
	(c) Metallic clatter or tapping noise.	(c) Replace back pressure valve cushion.
	(d) Knocking condition at the bracket stop when the engine is running.	(d) Rubber stop worn or missing from pump bracket.
	(e) Loose pump belt.	(e) See Group 7.

SERVICE PROCEDURE

SERVICE IN VEHICLE

Gear Shaft Adjustment

(1) Disconnect center link from steering gear arm.

(2) Start engine and run at idle speed.

(3) Turn steering wheel gently from one stop all the way to the other, counting number of turns. Then turn wheel back exactly half way, to center position.

(4) Loosen adjusting screw until backlash is evident in steering gear arm. Feel backlash by holding end of steering gear arm between thumb and forefinger with a light grip. Do not "grasp" steering gear arm with whole hand. Tighten adjusting screw until backlash just disappears.

Continue to tighten ⅜ to ½ turn from this position and tighten lock nut to 50 foot-pounds to maintain this setting.

Valve Body Recondition

(1) Disconnect high pressure and return hoses at the valve body and tie the ends above the reservoir

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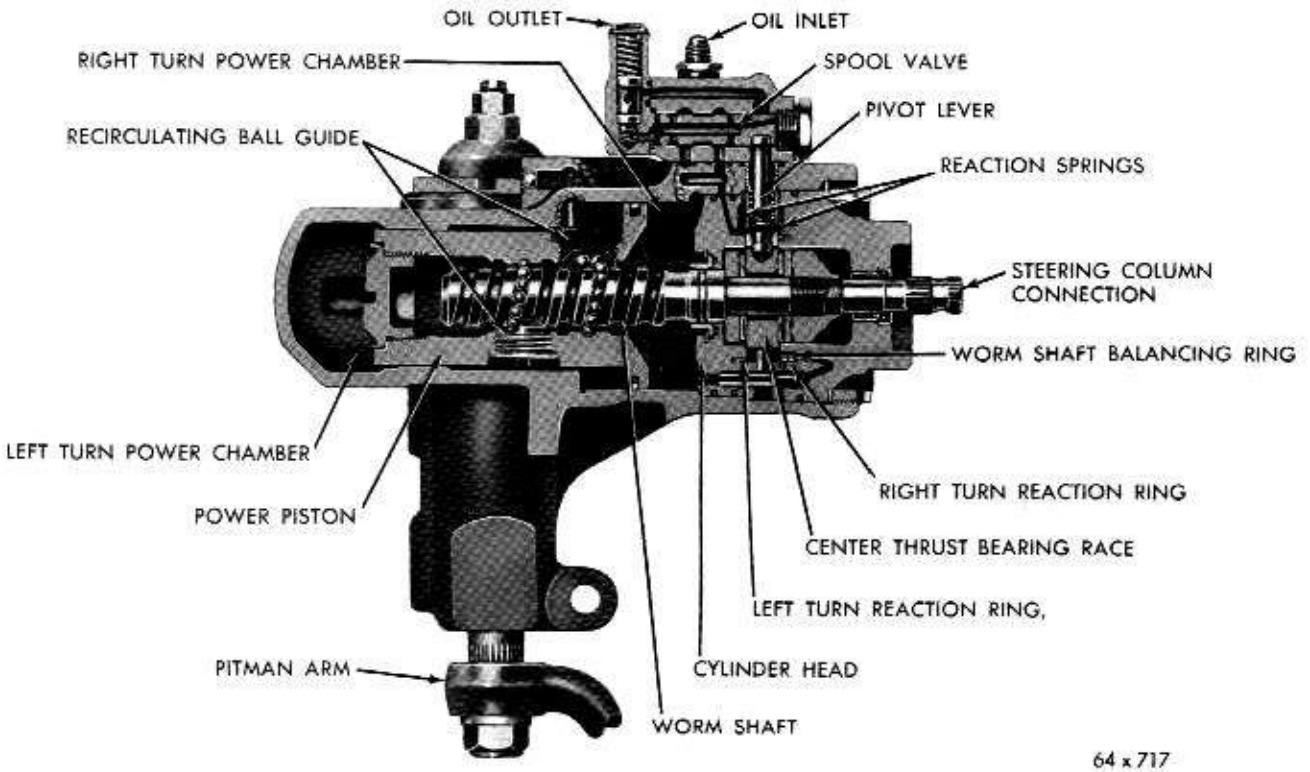


Fig. 1—Power Steering Gear (Sectional View)

level.

(2) Remove two screws attaching valve body to main gear housing.

(3) Lift valve body upward to disengage from valve lever (Fig. 8).

(4) Remove the two screws attaching control valve body to steering valve body and separate two bodies (Fig. 3).

(5) Compress control valve spring and remove retainer pin, spring, valve piston and cushion spring.

(6) Carefully shake out spool valve and inspect for nicks, burrs and scores. Do not remove valve body end plug unless inspection indicates a leak at gasket.

If spool valve or valve body is damaged, replace valve and body assembly.

Small burrs and nicks may be removed with crocus cloth if extreme care is used not to round off sharp edges of valve. The sharp edge is vitally important to operation of this valve.

(7) Clean valve bodies and valve piston thoroughly in clean solvent. Blow out all passages with compressed air. Lubricate pistons and bores with power steering fluid.

(8) Install steering spool valve in valve body so valve lever hole is aligned with lever opening in valve body. Valve must be perfectly free in valve body without sticking or binding (Fig. 3).

(9) Install a new gasket on end plug (if removed). Tighten plug to 25 foot-pounds.

(10) Install piston cushion spring in control valve body being sure it seats in counterbore at bottom of

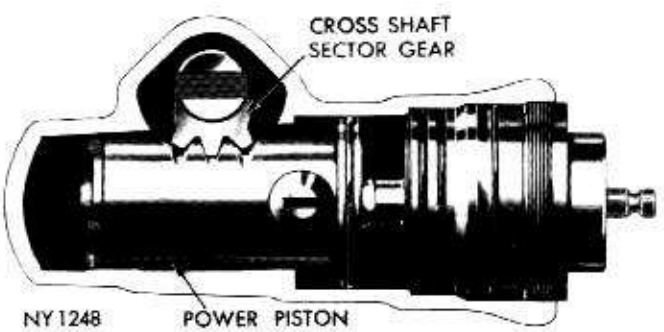


Fig. 2—Steering Gear Housing (Sectional View)

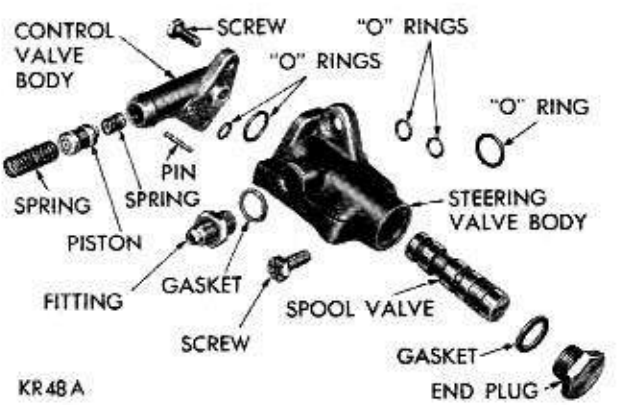


Fig. 3—Valve Body (Disassembled View)

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housing. Lubricate piston and insert nose end of piston into body bore. Test for smooth operation. Be sure cushion spring is not cocked.

(11) Install spring on top of piston, compress spring and install retaining pin.

(12) Position two new "O" rings on control valve body and attach to steering valve body. Tighten the two attaching screws to 95 inch-pounds.

(13) If pressure inlet fitting has been removed, tighten fitting to 30 foot-pounds.

(14) Align lever hole in valve spool with lever opening in valve body.

(15) Install gear housing making sure the valve lever enters hole in valve spool and key section on bottom of valve body nests with the keyway in housing.

CAUTION: These parts should go together with relative ease. Use of force may damage the lever. If they do not go together easily, lift off valve assembly, realign valve spool hole with lever opening in valve body and install valve body.

(16) Install two screws and tighten to 7 foot-pounds to prohibit leakage during valve centering operation.

(17) Connect high pressure and return hoses to valve body.

(18) Start the engine. If the unit is self-steering tap the valve up or down to correct. **When tapping valve "down," hit valve body on end plug. When tapping valve "up," tap on head of the screw attaching the valve body to main valve body. Do not hit control valve body.**

(19) Turn steering wheel from stop to stop several times to expel air from system. Refill reservoir as required.

CAUTION: Do not turn hard against ends of travel. This will generate high pressure and may blow out the "O"- rings since the valve body screws have not been finally tightened.

(20) With steering wheel in straight ahead center position, start and stop the engine several times, tapping the valve body up or down as required until there is no movement of the steering wheel when the engine is both started or stopped.

(21) The valve is now centered. Tighten the two screws attaching valve body to housing to 200 inch-pounds.

Gear Shaft Oil Seal Replace

The gear shaft oil seal may be replaced without removing the steering gear from the vehicle.

(1) Remove steering arm nut.

(2) Disconnect-steering gear arm from sector shaft with Tool C-3646 (Fig. 4).

(3) Slide threaded adapter SP-3609 of Tool C-3880 over end of gear shaft and thread tool nut SP-3610 on gear shaft. Maintain pressure on threaded adapter with tool nut while screwing adapter far enough to engage metal portion of grease retainer. Place the two



Fig. 4—Removing Steering Gear Arm

half rings SP-1932, and Tool retainer ring over both portions of the tool, (Fig. 5). Turn the tool nut counterclockwise to withdraw grease retainer from housing.

(4) Remove oil seal snap ring with pliers Tool C-3229 and remove seal back-up washer.

(5) Use Tool C-3880 in same manner as outlined in step (3) to remove inner seal.

(6) Place tool adapter SP-3828 with long step of adapter against new seal and slide it over shaft with seal lip toward housing (Fig. 6). Install tool nut on gear shaft and tighten tool nut until shoulder of tool adapter contacts gear housing.

(7) Remove tool nut and adapter and install seal back-up washer and oil seal snap ring with sharp edge out.

(8) Position grease retainer in housing bore. Place tool adapter SP-3828 with short step of lip against seal (Fig. 7). Install tool nut on gear shaft and tighten tool nut until shoulder of tool adapter contacts gear housing.

(9) Place steering gear and front wheels in straight ahead position and install steering gear arm and nut.

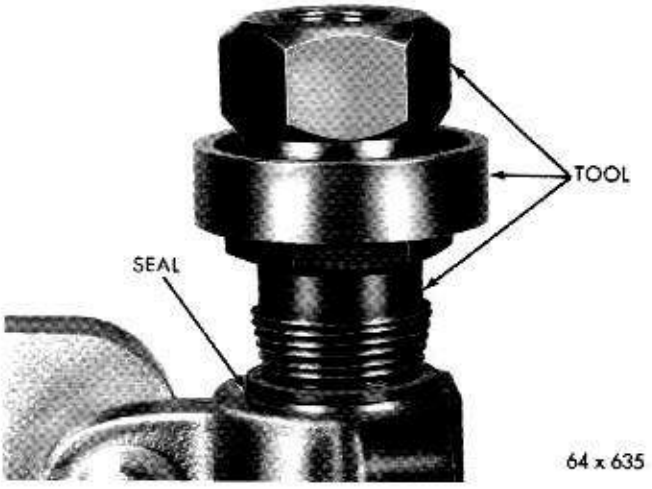


Fig. 5—Removing Gear Shaft Oil Seal

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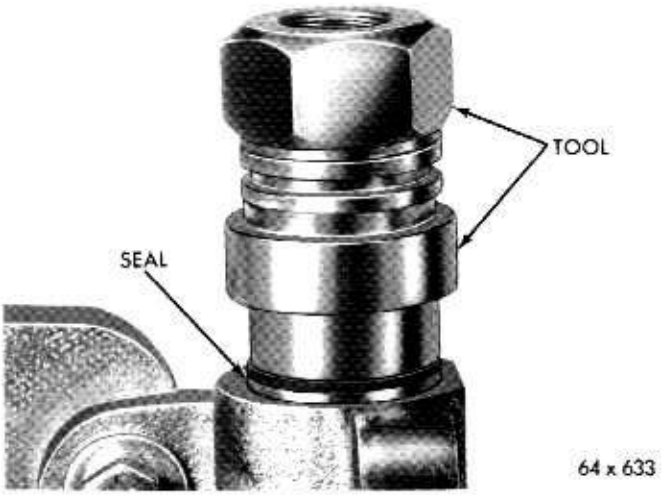


Fig. 6—Installing Gear Shaft Inner Oil Seal

(10) Tighten steering gear arm nut to 120 foot-pounds.

SERVICE OUT OF VEHICLE

Gear Removal—Chrysler Models

(1) Disconnect battery ground cable.

(2) Disconnect pressure and return hoses at steering gear. Fasten ends of the hoses above oil level in pump reservoir.

(3) Remove rubber coupling heat shield.

(4) Remove nuts and allen head bolts which retain rubber coupling to flange of intermediate shaft.

(5) Remove roll pin that attaches rubber coupling upper flange to steering column shaft.

(6) Tap rubber coupling as far as it will go upward onto steering column shaft splines.

(7) Remove roll pin that attaches pot coupling to power steering worm shaft.

(8) Move intermediate shaft until upper flange clears rubber coupling and withdraw from worm shaft splines.

(9) Remove steering gear arm using Tool C-3646 (Fig. 4).

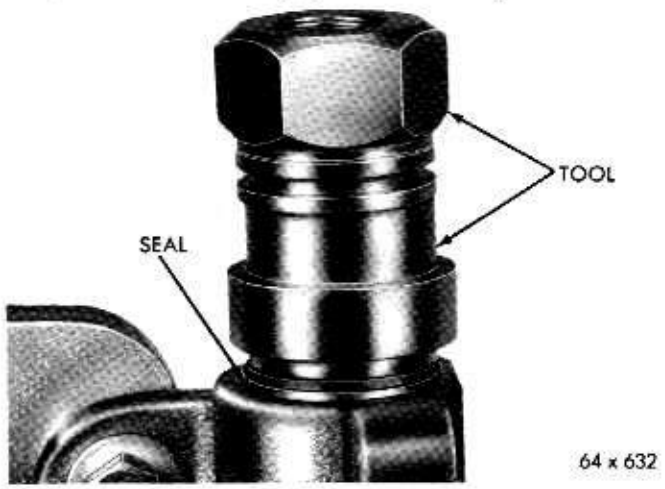


Fig. 7—Installing Gear Shaft Grease Retainer

CAUTION: Do not remove the steering arm by prying with a lever or striking with a hammer as serious steering gear internal damage may result.

(10) Remove the three bolts that mount steering gear to crossmember and remove gear from under vehicle.

Imperial Models

(1) Disconnect battery ground cable.

(2) Remove cotter key and nut at center link and disconnect link from steering gear arm using Tool C-3894.

CAUTION: Removal by any other method may damage steering gear arm stud seal.

(3) Remove steering gear arm nut and lockwasher from steering gear shaft.

(4) Remove steering gear arm using Tool C-3646 (Fig. 4).

CAUTION: Do not remove the steering arm by prying with a lever or striking with a hammer as serious steering gear internal damage may result.

(5) Disconnect pressure and return hoses at steering gear. Fasten ends of hoses above oil level in pump reservoir.

(6) Drive out roll pin in flexible coupling.

(7) Remove the four nuts and washers connecting master cylinder to brake booster and move master cylinder towards engine.

(8) On cars equipped with Autopilots, remove the two screws attaching the Autopilot to its mounting bracket and lay over to one side out of the way.

(9) From inside drivers compartment remove steering column cover plate.

(10) Remove the three cap screws in lower support plate.

(11) Disconnect transmission indicator linkage.

(12) Remove steering column to instrument panel clamp while supporting weight of column. Pull up on steering wheel just far enough to disengage flexible coupling from worm shaft. Allow steering wheel to rest on front seat.

(13) Remove steering gear to frame mounting bolts, nuts, spherical washers and alignment wedge.

(14) Remove power steering gear through engine compartment.

Gear Reconditioning

Clean the gear assembly thoroughly in a suitable solvent and install unit in holding fixture Tool C-3323.

(1) Drain steering gear through the pressure and return connections by turning steering wormshaft from one extreme of travel to the other.

(2) Remove valve body attaching screws, and remove valve body and three "O" rings (Fig. 8).

(3) Remove pivot lever and spring. Pry under spherical head with a screw driver (Fig. 9).

CAUTION: Use care not to collapse slotted end of the

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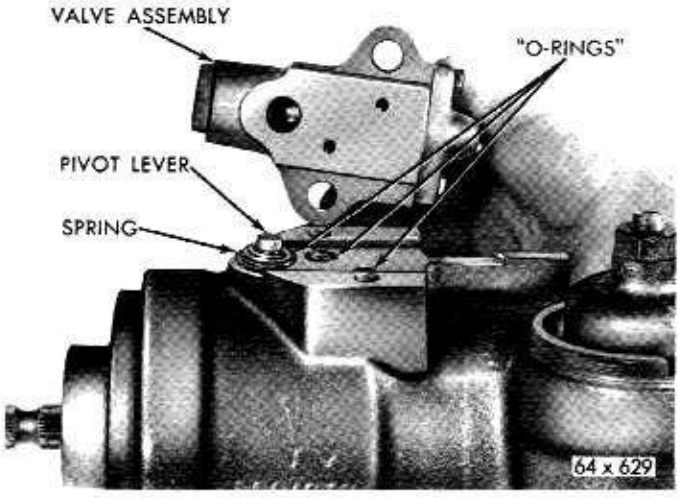


Fig. 8—Removing Valve Body Assembly

valve lever as this will destroy the bearing tolerances of the spherical head.

(4) Remove gear shaft grease retainer and oil seal as outlined in "Gear Shaft Oil Seal Replacement."

(5) Loosen gear shaft adjusting screw locknut and remove gear shaft cover spanner nut with Tool C-3633 (Fig. 10).

(6) Rotate wormshaft to position gear shaft sector teeth at center of piston travel. Loosen steering power train retaining nut with Tool C-3634 (Fig. 11).

(7) Position holding Tool C-3323 so sector shaft is in a horizontal position. Place Tool C-3875 on threaded end of gear shaft and slide tool into housing until both tool and shaft are engaged with bearings.

(8) Turn wormshaft to **full left** turn position for Chrysler models or **full right** turn position for Imperial models to compress power train parts. Remove power train retaining nut with Tool C-3634 (Fig. 11). Remove housing head tang washer.

(9) While holding power train firmly compressed, pry on piston teeth with a screw driver using gear

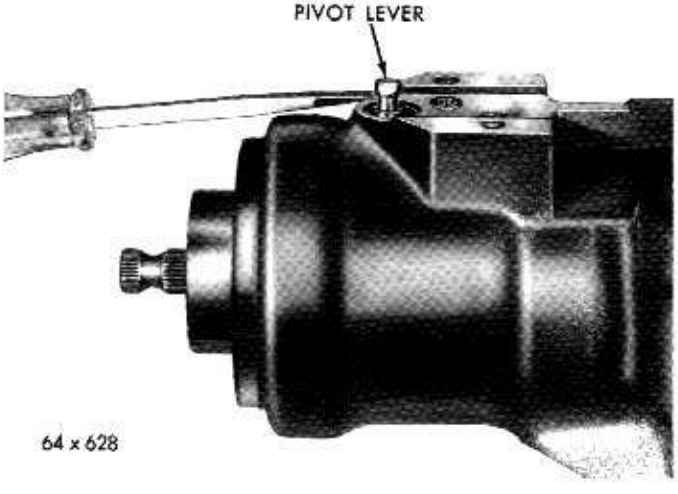


Fig. 9—Remove Pivot Lever



Fig. 10—Removing Gear Shaft Cover Retaining Nut



Fig. 11—Removing Power Train Retaining Nut

shaft as a fulcrum and remove complete power train.

It is important that the cylinder head, center race and spacer assembly and the housing head be maintained in close contact with each other. This will eliminate the possibility of the reaction rings becoming disengaged from their grooves in both the cylinder head and housing head. It will prohibit the center

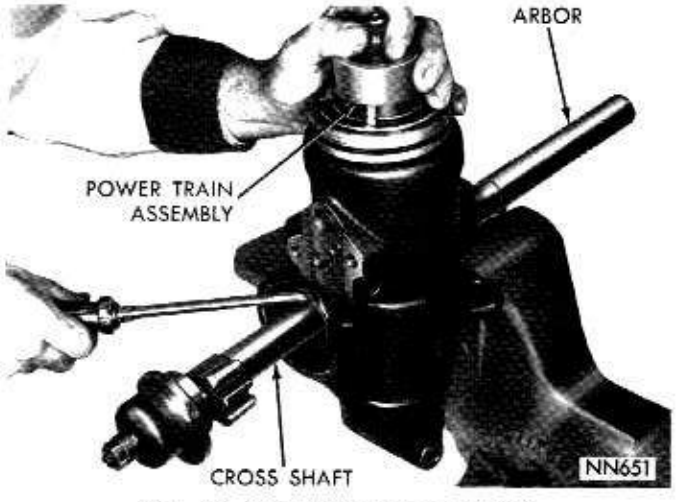


Fig. 12—Removing Power Train

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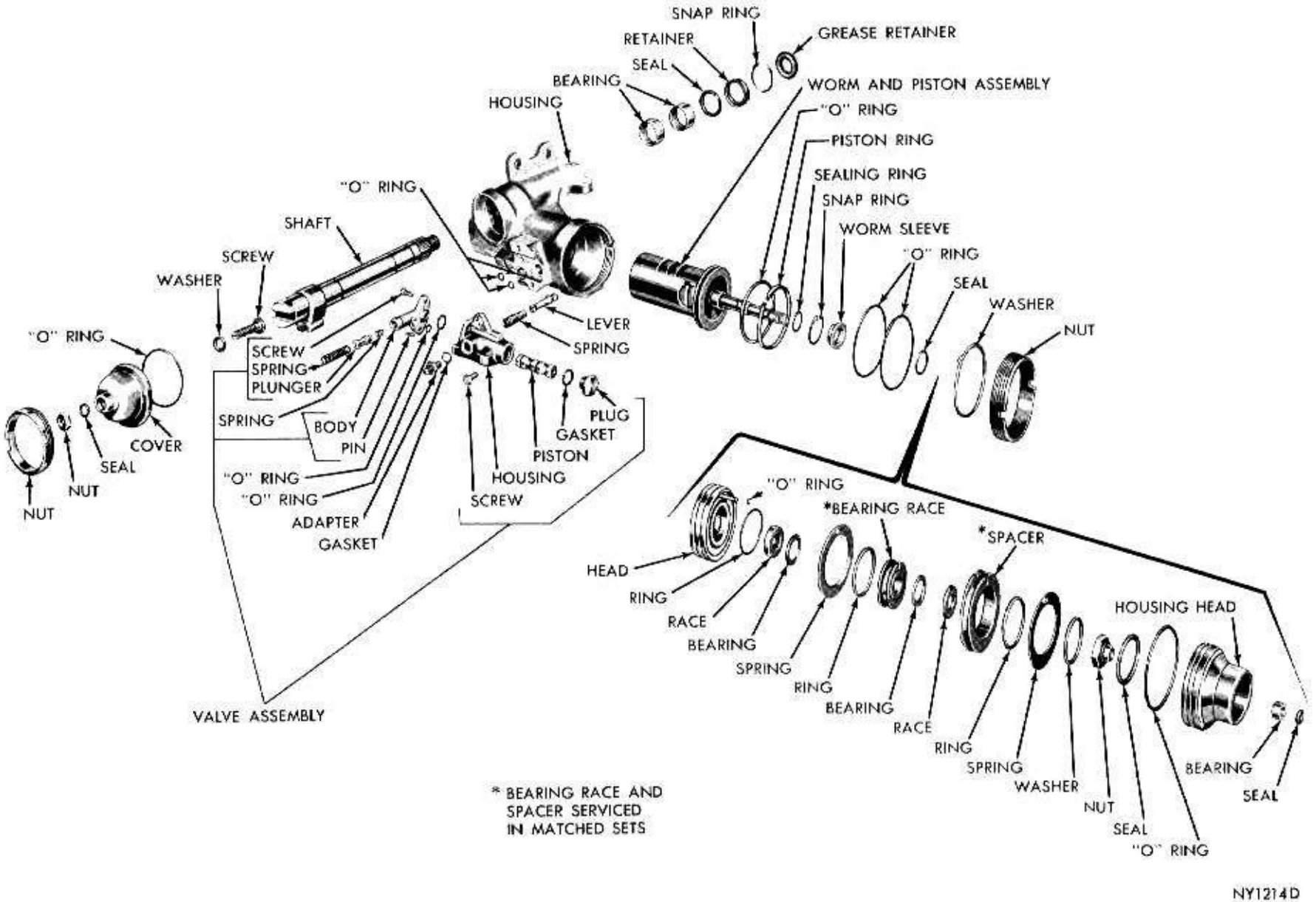


Fig. 13—Steering Gear Disassembled View—Chrysler Models

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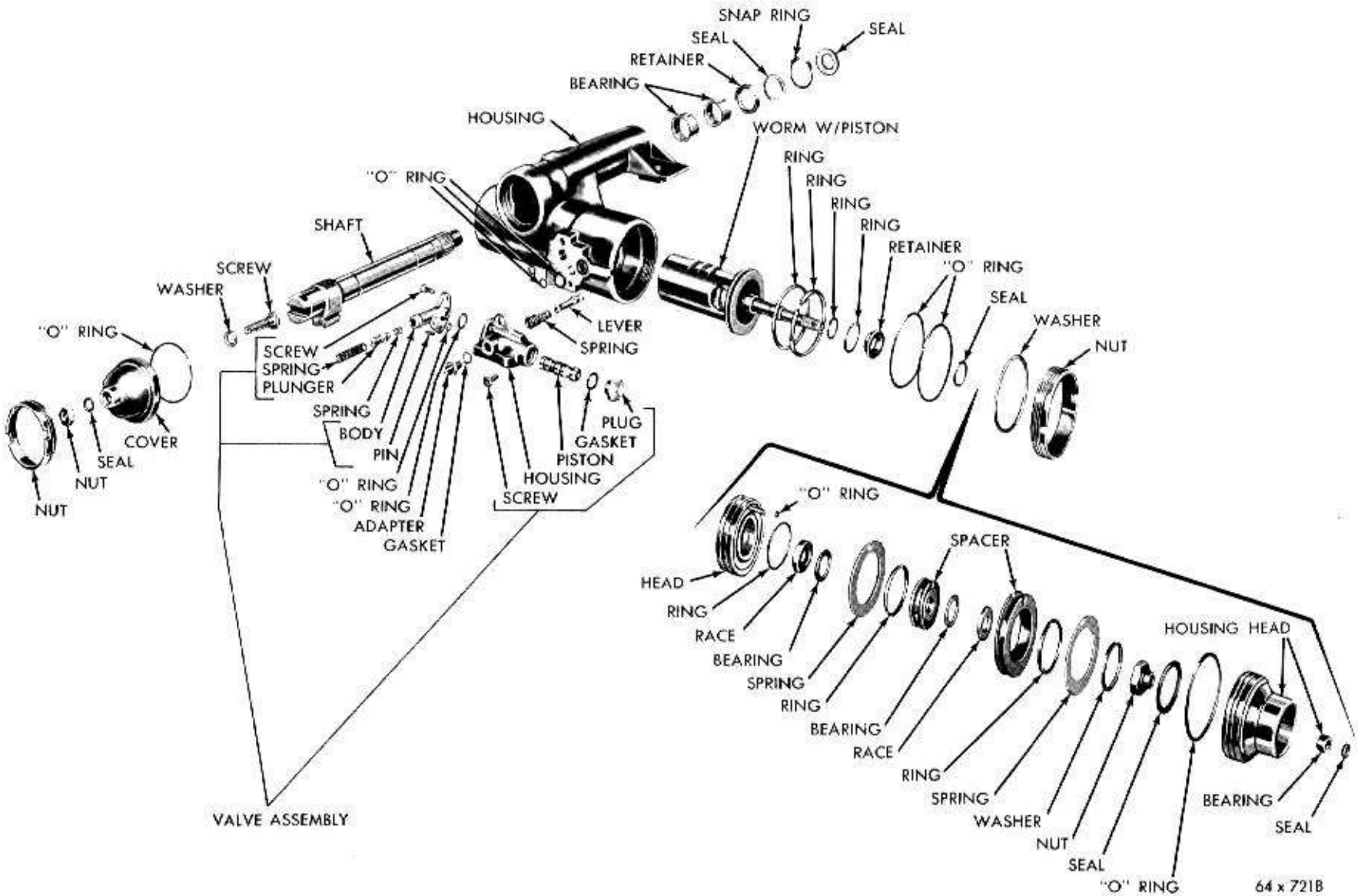


Fig. 14—Steering Gear Disassembled View—Imperial Models

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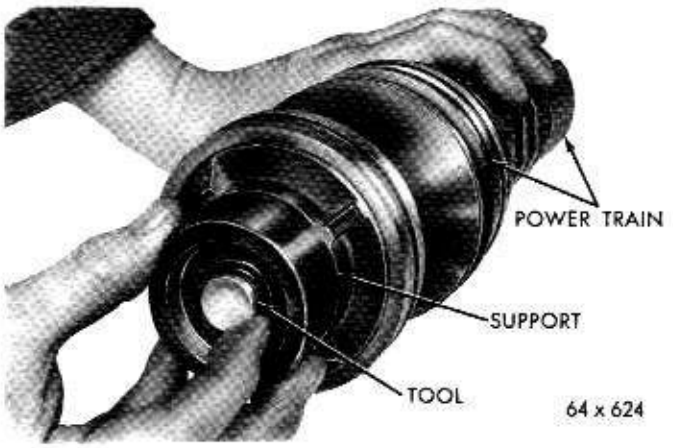


Fig. 15—Retaining Bearing Rollers with Arbor Tool

spacer from becoming separated from the center race and becoming "cocked" in the housing which may make it impossible to remove the power train without damaging the spacer, the housing, or both.

(10) Place power train vertically in a vise equipped with soft jaws to avoid damaging piston assembly. See Figs. 13 and 14 for parts identification.

The 33 worm bearing needle rollers will fall out when the housing head is removed from the wormshaft. Use arbor Tool C-3929 (Fig. 15), to hold rollers in position when the housing head is removed.

(11) Raise housing head until wormshaft oil seal just clears top of wormshaft and position arbor tool C-3929 on top of wormshaft and into oil seal. With arbor in position pull up on housing head until arbor is positioned in bearing. Remove housing head and arbor.

To reinstall rollers, if they should become dislodged, retain rollers in the cage with wheel bearing lubricant.

CAUTION: If the wormshaft oil seal is to be replaced, perform the operation with the housing head assembled in the steering gear housing.

(12) Remove large "O" ring from groove in housing

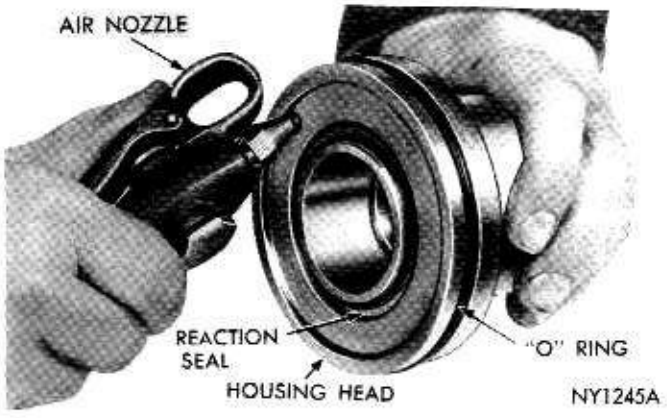


Fig. 16—Removing Reaction Seal from Worm Shaft Support

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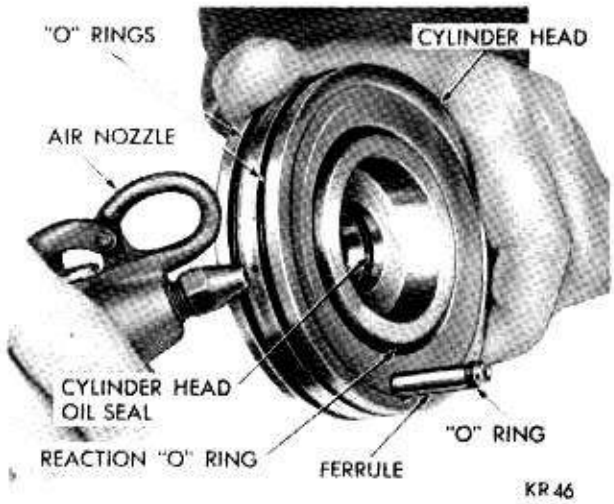


Fig. 17—Removing Reaction Ring from Cylinder Head

head.

(13) Remove reaction seal from groove in face of housing head with air pressure directed into ferrule chamber (Fig. 16).

(14) Inspect all grooves for burrs. Make sure passage from ferrule chamber to upper reaction chamber is unobstructed.

(15) Remove reaction spring, reaction ring, worm balancing ring and spacer.

(16) Hold wormshaft from turning, then turn nut with sufficient force to release staked portions from knurled section and remove nut. **Wire brush the knurled sections to remove the chips, then blow out the nut and wormshaft to remove any metal particles.**

(17) Remove upper thrust bearing race (thin) and upper thrust bearing.

(18) Remove center bearing race.

(19) Remove lower thrust bearing and lower thrust bearing race (thick).

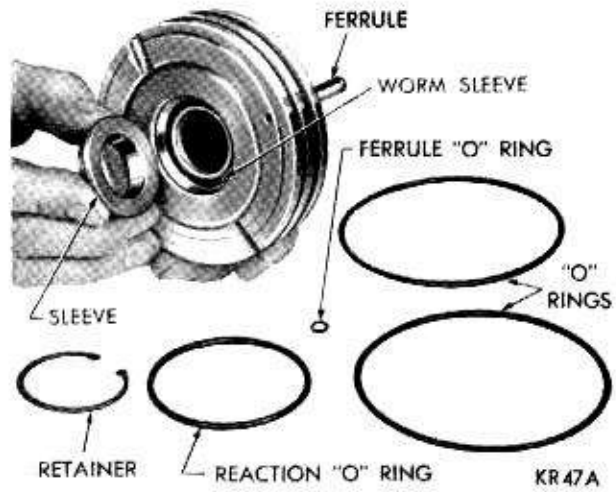


Fig. 18—Removing Cylinder Head Oil Seal

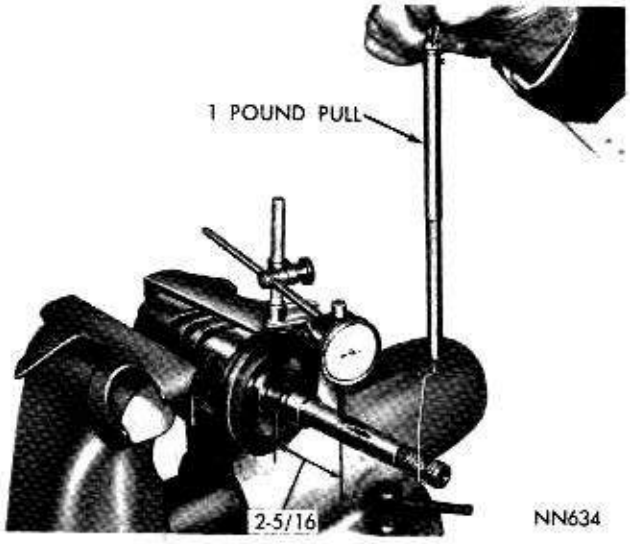


Fig. 19—Checking Worm Shaft Side Play

(20) Remove lower reaction ring and reaction spring.

(21) Remove cylinder head assembly.

(22) Remove two "O" rings in two outer grooves in cylinder head.

(23) Remove reaction "O" ring from groove in face of cylinder head with air pressure directed into oil hole located between two "O" ring grooves (Fig. 17).

(24) Remove snap ring, sleeve and rectangular oil seal ring from cylinder head counterbore (Fig. 18).

(25) Test operation of wormshaft. The torque required to rotate wormshaft throughout its travel in or out of piston must not exceed 2 inch-pounds with a 15 pound side load. The worm should run in and out of piston under its own weight. **The worm and piston is serviced as a complete assembly and should not be disassembled.**

(26) Test for excessive side play with the piston held firmly in a vise with the rack teeth up, and the worm in its approximate center of travel. The vertical side play measured at a point 2-5/16 from the piston flange should not exceed .008 inch when the end of the worm is lifted with a force of 1 pound (Fig. 19).

(27) Inspect condition of rubber sealing ring located under cast iron ring and replace if necessary. Install cast iron piston ring as follows:

(a) Slide a new piston ring into place in piston groove, then place piston and ring assembly in Tool C-3676 with lower part of piston and ring resting on land of tool (Fig. 20).

(b) Press down on piston to seat ring in piston groove, forcing open ends of ring out for ease of locking the ring.

(28) Place piston assembly in a vertical position (wormshaft up) in a vise equipped with soft jaws.

(29) Inspect cylinder head ferrule oil passage for obstructions and the lands for burrs, then lubricate the two large "O" rings and install them in the cylinder head grooves.

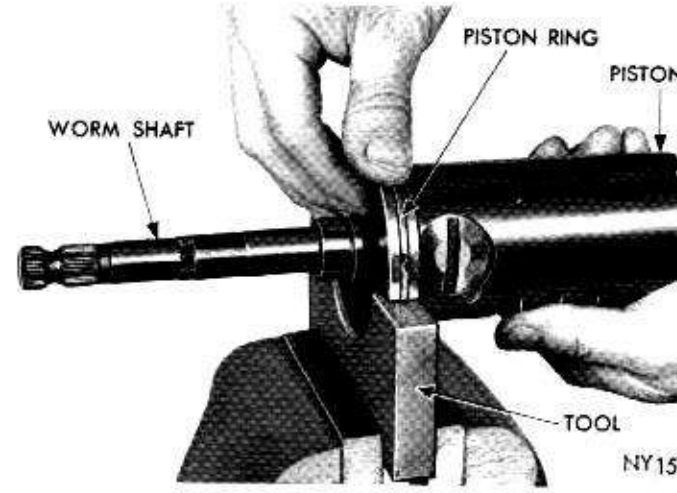


Fig. 20—Installing Piston Ring

(30) Install worm sleeve seal, sleeve and snap ring (if removed). Make sure snap ring is seated in groove.

(31) Install lower reaction seal (O-ring) in cylinder head groove.

(32) Slide cylinder head assembly (ferrule up) on wormshaft. Check wormshaft seal ring making sure gap is closed to avoid damaging the ring as the cylinder head moves against piston flange.

(33) Lubricate with power steering fluid, and install parts in the following order:

(a) Lower thrust bearing race (thick).

(b) Lower thrust bearing.

(c) Lower reaction spring (with the small hole over the ferrule).

(d) Lower reaction ring (flange up so ring protrudes through reaction spring and contacts the reaction "O" ring in the cylinder head).

(e) Center bearing race.

(f) Upper thrust bearing.

(g) Upper thrust bearing race (thin).

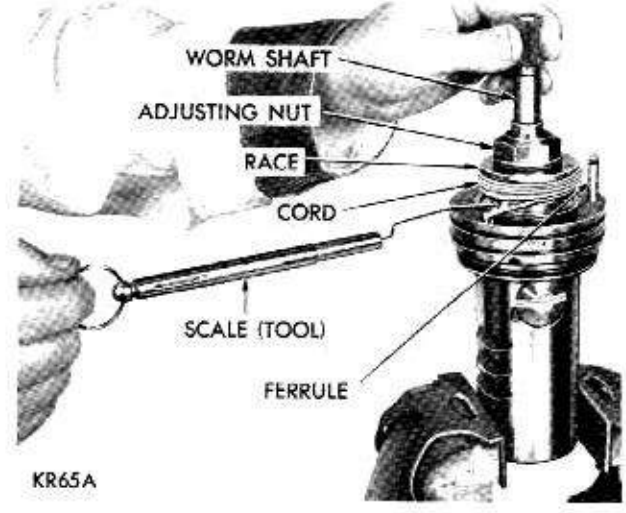


Fig. 21—Checking Center Bearing Pre-Load

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(h) Start wormshaft thrust bearing adjusting nut (do not tighten).

(34) Turn wormshaft counterclockwise one-half turn for Imperial models (clockwise for Chrysler models). Hold wormshaft in this position with splined nut, Tool C-3637 and socket wrench, and hold in this position thru items 35 and 36, then tighten nut to 50 foot-pounds to prestretch wormshaft threads.

(35) Loosen adjusting nut. Place several rounds of cord around center bearing race (Fig. 21). Make a loop in one end of cord and hook loop of a distributor breaker arm spring scale Tool MTU-36 in cord loop. Pulling cord will cause bearing race to rotate. Retighten worm bearing adjusting nut while pulling on cord with scale. When adjusting nut is tightened properly, reading on the scale should be 16 to 24 ounces (20 ounces preferred while the race is turning).

(36) Stake upper part of wormshaft adjusting nut into knurled area of shaft.

(a) Hold a ¼ inch flat end punch on center line of wormshaft end at a slight angle to nut flange (Fig. 22).

(b) Strike punch a sharp blow with a hammer and test preload. **If adjusting nut moved during staking operation, it can be corrected by striking the nut a glancing blow in the direction required to regain proper preload.**

(c) After retesting for proper preload, stake the nut at three more locations 90° apart around upper part of the nut.

(d) To test total staking, tighten nut to 20 foot-pounds in either direction. If nut does not move, staking operation is satisfactory. **Retest preload adjustment, torque o 16 to 24 ounces must remain after adjusting nut is securely locked.**

(37) Position spacer assembly over center race, engaging dowel pin of spacer in slot of race, and slot of spacer entered over cylinder head ferrule. **This will align the valve pivot lever hole in the center bearing race with the valve pivot lever hole in center bearing spacer assembly. The small "O" ring for the ferrule groove should not be installed until after upper reaction spring and spacer have been installed.**

(38) Install upper reaction ring on center race and spacer with flange down against spacer.

(39) Install upper reaction spring over reaction ring with cylinder head ferrule through hole in reaction spring.

(40) Install worm balancing ring (without flange) inside upper reaction ring.

(41) Lubricate ferrule "O" ring with Petrolatum and install in groove on cylinder head ferrule.

(42) If oil seal was removed from housing head, install a new seal with Tool C-3650 (Fig. 29). See "Worm Shaft Oil Seal Replacement." With lip of seal toward bearing, drive seal until tool bottoms on the support.

(43) Lubricate and install reaction seal in groove in face of housing head with flat side of seal out (Fig. 23). Install "O" ring in groove on housing head.

(44) Slide housing head and arbor, Tool C-3929 over the wormshaft carefully engaging cylinder head ferrule and "O" ring and making sure reaction rings enter circular groove in housing head. The power train is now ready for installation in housing.

(45) It is generally not necessary to remove sector shaft cover. However, this may be easily accomplished by removing the adjusting screw. While holding the cover, turn adjusting screw clockwise until the shaft becomes disengaged from cover. The adjusting screw and thrust washer will now slide out of the "T" slot in end of shaft.

Gear Shaft Assembly

(46) To remove gear shaft needle bearings from housing, remove grease retainer, oil seal snap ring

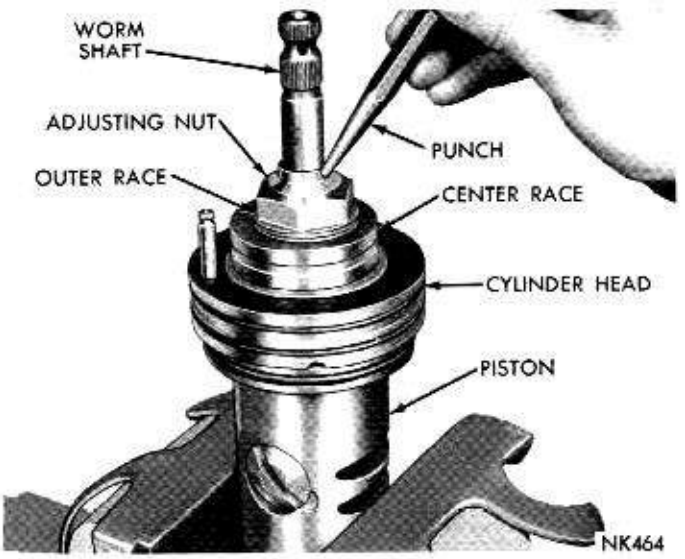


Fig. 22—Staking Worm Shaft Bearing Adjusting Nut

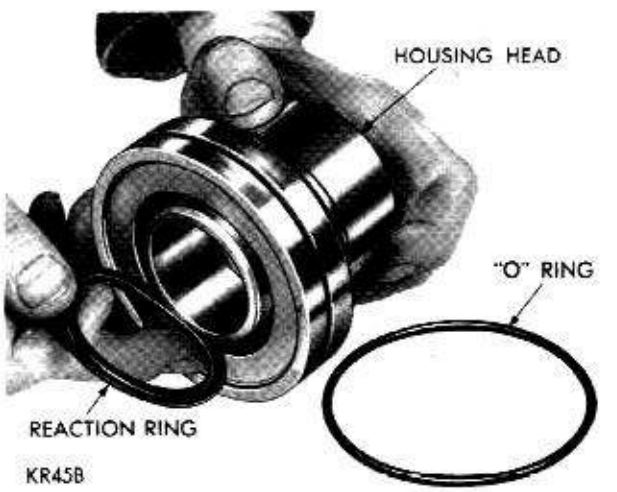


Fig. 23—Installing Reaction Seal Ring in Worm Shaft Support

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with pliers, Tool C-3229 and remove seal back-up washer.

(47) Insert Tool C-3875 in steering housing; place housing in a press and then press out bearings and oil seal.

(48) To install gear shaft lower needle bearing, place bearing on end of Tool C-3875. Press bearing into steering gear housing 1/32 inch below end of bearing bore to provide space for oil seal, back-up washer and snap ring and cross shaft grease retainer. See "Cross Shaft Oil Seal Replacement."

CAUTION: The arbor adapter ring must be used with C-3875 Remover and Installer Arbor, otherwise the bearings may be crushed.

(49) To install upper needle bearing, place bearing on end of Tool C-3875. Press bearing into housing flush with end surface of bore.

(50) Insert gear shaft and adjusting screw into cover and using a screwdriver through the threaded hole in cover, turn screw counterclockwise to pull shaft completely into the cover. Lubricate a new square section seal ring and slide it over adjusting screw into position on top of cover. Install adjusting screw lock nut, but do not tighten at this time.

(51) Lubricate cover "O" ring and gear shaft cover groove with wheel bearing grease and place "O" ring in cover groove. The shaft assembly is now ready for installation.

Gear Shaft Installation

(52) Lubricate power train bore of the housing with power steering fluid, and carefully install power train assembly. To keep reaction rings from coming out of their grooves keep worm turned fully counterclockwise for Chrysler models (clockwise for Imperial models). The piston teeth must be facing to the right and the valve lever hole in center race and spacer must be in the "up" position.

CAUTION: Make sure the cylinder head is bottomed on the housing shoulder (Figs. 1 and 2).

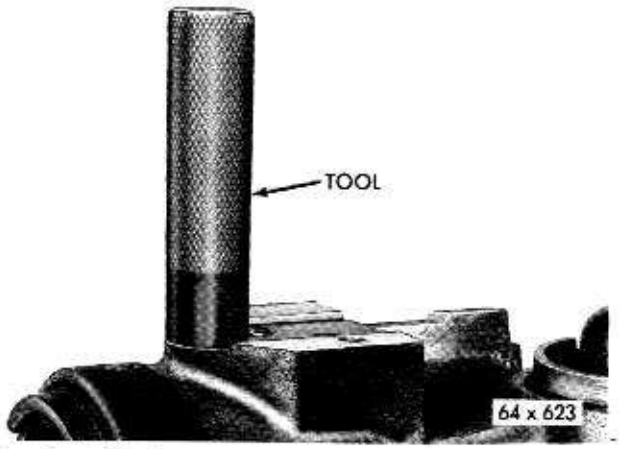


Fig. 24—Aligning Center Bearing Spacer with Steering Valve

(53) Align valve lever hole in center bearing race and spacer exactly with the valve lever hole in the gear housing. Turn the housing head by tapping on a reinforcing rib with hammer and drift. Use Tool C-3649 to maintain alignment (Fig. 24). **The aligning tool should not be removed until the spanner nut is securely tightened.**

(54) Install housing head tang washer to index with groove in housing. Install spanner nut and tighten to 110 to 200 foot-pounds with Tool C-3634.

(55) Set the power piston at the center of travel and install gear shaft and cover assembly so that sector teeth index with piston rack teeth. Make sure "O" ring is positioned in face of cover.

(56) Install cover spanner nut and tighten 110 to 200 foot-pounds with Tool C-3633.

(57) Install valve pivot lever (double bearing end first) (Fig. 25) into center race and spacer through hole in steering housing so that slots in valve lever are parallel to wormshaft in order to engage the anti-rotation pin in center race. Install valve pivot lever spring small end first. **Turn worm until the piston bottoms in both directions and observe the action of the lever. It must be in the center of the hole and snap back to its center position when the worm torque is relieved.**

(58) Install valve body on housing making sure valve pivot lever enters hole in valve spool (Fig. 1). Be sure "O" ring seals are in place. Tighten valve mounting screws to 7 foot-pounds.

(59) Install new gear shaft seal followed by seal back-up washer and snap ring and a new grease retainer as outlined under "Gear Shaft Oil Seal Replacement."

Final Tests and Adjustments

(1) Remove oil reservoir cover and fill reservoir with Power Steering Fluid, Part No. 2084329 or equivalent, to the level mark.

(2) Connect test hoses C-3211 and C-3318 with proper adapters to hydraulic pump on the vehicle with pressure gauge C-3309B installed between the

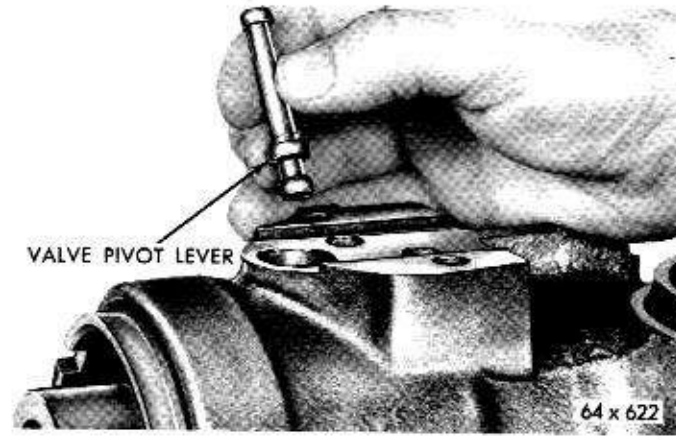


Fig. 25—Installing Valve Pivot Lever

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pump and steering gear.

(3) Start the engine.

(4) Roughly center valve until the unit is not self-steering. Expel all air from the unit by turning wormshaft back and forth through the travel several times. Tap on the head of valve body attaching screws to move valve body up on steering housing, and tap on end plug to move valve body down on housing.

(5) Refill reservoir before proceeding with following tests and adjustments on the bench.

(a) With steering gear on center, tighten gear shaft adjusting screw until backlash in steering gear arm just disappears. See "Gear Shaft Adjustment."

If the power train has been removed, tighten 1¼ turns from this position and while holding the adjusting screw in this position, tighten lock nut (Fig. 26). **This is a temporary adjustment to bring the piston rack and sector teeth in full alignment.**

(b) Operate the unit through its full travel several times to align piston rack and sector teeth.

(c) With the gear on center, readjust the sector shaft backlash. This will require loosening the adjusting screw until backlash is evident. Then retighten the adjusting screw until the backlash just disappears. Continue to tighten for ⅜ to ½ turn from this position and tighten the lock nut to 50 foot-pounds to maintain this setting.

(d) Starting from a point at least one full turn of the wormshaft either side of center, torque at the sector shaft required to turn the unit through center at 2 rpm in each direction shall not exceed 20 foot-pounds or vary more than 5 foot-pounds from left to right.

(e) Adjust the torque to be equal in both directions by readjusting the valve.

Tighten valve body adjusting screw to 200 inch-pounds.

(f) With gear at or near the full turn in either direction, attempt to return the unit to center by applying a torque wrench at steering gear shaft. Hold wormshaft until cross shaft torque builds up to 50 foot-pounds. Release wormshaft and maintain a constant steady pull at 2 rpm on the gear shaft. If cross shaft torque does not drop to 20 foot-pounds maximum as the unit passes through center, check for too much interior drag; binding valve lever, binding spool valve, or tight cross shaft adjustment.

(6) With unit under power, but with no load, the torque required to rotate wormshaft through an included angle of 180° (90° either side of center) at 6 rpm (or one revolution every ten seconds) shall be 6-10 inch-pounds. Disconnect test equipment and mounting fixture and install unit in vehicle.

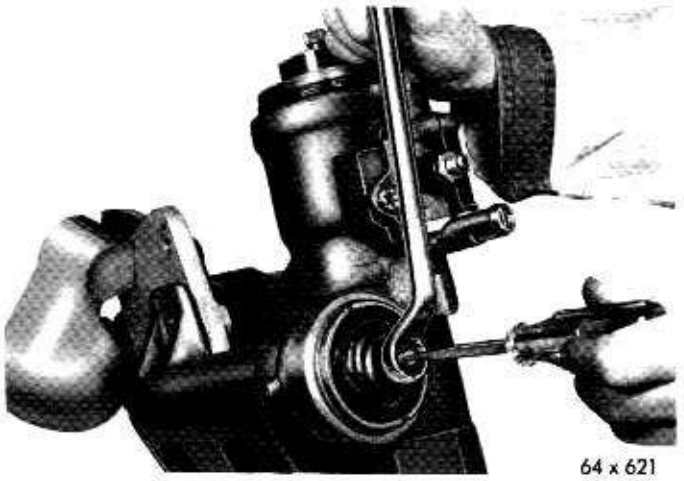


Fig. 26—Adjusting Steering Gear Mesh

Gear Installation—Chrysler Models

(1) From under vehicle, position steering gear on crossmember, install the three bolts and tighten to 80 foot-pounds.

(2) Position steering gear in center of high spot (worm shaft master serration should be at 12 o'clock). With the front wheels in straight ahead position, install steering arm, washer and nut and tighten to 120 foot-pounds.

(3) Center steering wheel and install intermediate shaft pot coupling on worm shaft indexing master serration.

(4) Install roll pin in pot coupling.

(5) Tap rubber coupling down, install roll pin in flange hub, install the two flange bolts and nuts and tighten to 200 inch-pounds.

(6) Install rubber coupling heat shield making sure it does not interfere with rubber coupling.

(7) Connect pressure and return hoses to steering gear.

(8) Connect battery ground cable.

(9) Fill pump reservoir, start engine and expel all air from system by turning steering wheel several times from right to left.

(10) Inspect pump reservoir fluid level and replenish as necessary.

Imperial Models

(1) Install steering gear from under vehicle and in-

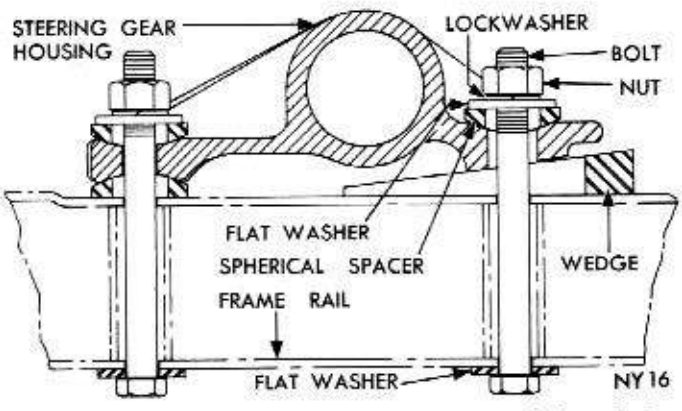


Fig. 27—Steering Gear Mounting—Imperial Models

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stall spherical, flat and lockwashers and nuts, but do not tighten.

(2) Install Steering Gear Housing Aligning Tool C-3949 in place of vehicle steering column and jacket tube and align steering gear as follows:

(a) Slide lower end of aligning tool into position on steering gear wormshaft support and upper end at instrument panel clamp.

(b) Install jacket tube support bracket clamp at instrument panel. Tighten instrument support bracket clamp bolts to 95 inch-pounds.

(c) Tighten two forward steering gear mounting bolts to 50 foot-pounds.

(d) Install serrated wedge over rear mounting bolt between steering housing and frame parallel to axis of steering gear wormshaft so that tapered surfaces match, then tap wedge gently but firmly into the space (Fig. 27).

(e) Tighten rear mounting bolt to 50 foot-pounds. This locks gear in place and maintains steering gear alignment.

(f) Remove jacket tube support bracket clamp at instrument panel and the Steering Gear Housing Aligning Tool C-3949.

(3) Install steering column and jacket assembly through floor panel from driver's side and start the coupling on steering gear wormshaft, making certain master serration on the coupling indexes with master serration on wormshaft. **The steering column assembly should be moved down onto wormshaft until wormshaft lightly bottoms on the locating pin preassembled into coupling.**

(4) Install coupling clamp bolt and tighten to 33 foot-pounds.

(5) Align jacket tube at instrument panel and install jacket tube clamp and attaching screws. Tighten screws finger tight.

CAUTION: While the steering column is not rigidly attached to the instrument panel use extreme care to prevent any misalignment of the column from the true column position which would result in damage to the flexible coupling disc and horn ground.

(6) After positioning steering column assembly so that flexible coupling disc assumes an unstressed axial position, and top of steering column is correctly aligned with instrument panel bracket clamp, tighten clamp bolts to 95 inch-pounds.

(7) Slide floor pan support plate into position, centering it around column jacket, install attaching bolts. Tighten bolts to 95 inch-pounds.

(8) Move jacket "O" ring down the jacket into position and bolt "O" ring retaining plate to toe board support plate. Tighten bolts to 95 inch-pounds.

(9) Connect shift indicator linkage and install lower column jacket to instrument panel.

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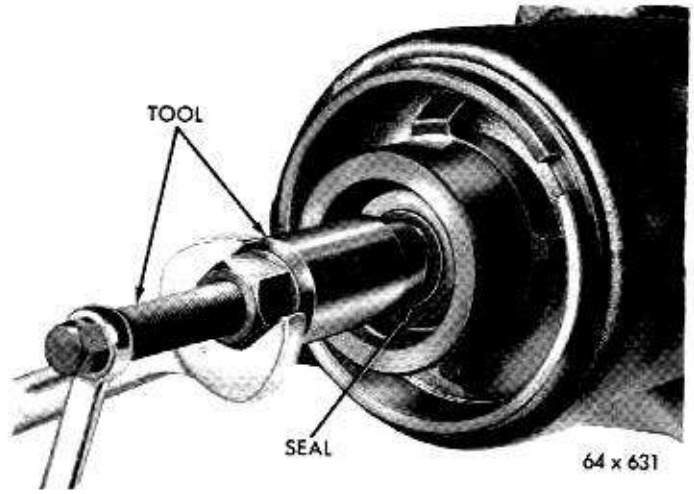


Fig. 28—Removing Worm Shaft Oil Seal

(10) Connect pressure and return hoses at steering gear.

(11) With steering gear centered in its travel and steering wheel and front wheels in straight ahead position, connect steering gear arm to steering gear cross shaft. Install washer and nut. Tighten nut to 120 foot-pounds.

(12) Install steering center link, tighten to 30 foot-pounds and install cotter pin.

(13) Connect battery ground cable.

(14) Refill reservoir. Start engine and expel all air from system by turning steering wheel several times to right and left.

Worm Shaft Oil Seal Replacement

The worm shaft oil seal replacement requires removal of the steering gear assembly from the vehicle. See "Gear Removal."

(1) Remove oil seal with Tool C-3638 (Fig. 28).

(2) Drive new oil seal in place (lip of seal toward housing head) with Tool C-3650 (Fig. 29).

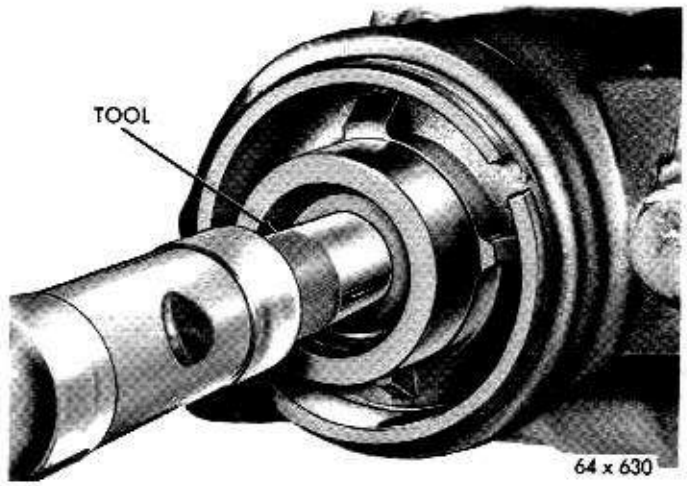


Fig. 29—Installing Worm Shaft Oil Seal

POWER STEERING PUMP

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GENERAL INFORMATION

The power steering pump is a belt-driven constant displacement pump.

In operation (Fig. 1) the spring loaded slippers in the pump rotor are in contact with the accentric inside diameter of the cam-insert. As the rotor turns, the slippers force the oil from the inlet side of the pump to the flow control valve. Orifices in the metering insert permit a flow of approximately two gallons per minute to the steering gear before the valve moves to the left to allow the excess to flow back to the inlet side of the pump. Maximum pressure in the system is limited by the pressure relief valve. The valve opens into the reservoir when the pressure exceeds the maximum pressure specified.

SERVICE DIAGNOSIS

Condition	Possible Cause	Correction
INTERMITTENT ASSIST	(a) Flow control valve sticking.	(a) See "Pump Flow Test." Service flow control valve as necessary.
	(b) Slipping belt.	(b) Adjust belt. See "Cooling System," Group 7.
	(c) Low fluid level.	(c) Inspect and correct fluid level.
	(d) Low pump efficiency.	(d) Perform "Pump Flow Test" and service as necessary.
NO ASSIST	(a) Pump seizure.	(a) Replace pump.
	(b) Broken slipper spring (s).	(b) Recondition pump or replace as necessary.
	(c) Flow control bore plug ring not in place.	(c) Replace snap ring. Inspect groove for depth.
	(d) Flow control valve sticking.	(d) See "Pump Flow Test." Service flow control valve as necessary.
NO ASSIST WHEN PARKING ONLY	(a) Wrong Pressure - relief valve.	(a) Install proper relief valve.
	(b) Broken "O" ring on flow control bore plug.	(b) Replace "O" ring.
	(c) Low pump efficiency.	(c) Perform "Pump Flow Test."
NOISY PUMP	(a) Low fluid level.	(a) Inspect and correct fluid level.
	(b) Belt loose.	(b) Inspect for pulley alignment, paint or grease on pulley and correct.
PUMP VIBRATION	(a) Pump hose interference with sheet metal or brake lines.	(a) Reroute hoses.
	(b) Belt loose.	(b) Adjust belt. See "Cooling System," Group 7.
	(c) Pulley loose or out of round.	(c) Replace pulley.
	(d) Crankshaft pulley loose or damaged.	(d) Replace crankshaft pulley.
	(e) Bracket pivot bolts loose.	(e) If unable to tighten, replace bracket.
PUMP LEAKS	(a) Cap or filler neck leaks.	(a) Repair as necessary.
	(b) Reservoir solder joints leak.	(b) Resolder or replace reservoir as necessary.
	(c) Reservoir "O" ring leaking.	(c) Inspect sealing area of reservoir. Replace "O" ring or reservoir as necessary.

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Condition	Possible Cause	Correction
	(d) Shaft seal leaking.	(d) Replace seal.
	(e) Loose rear bracket bolts.	(e) Tighten bolts. See "Tightening Reference."
	(f) Loose or faulty high pressure ferrule.	(f) Tighten fitting to 24 foot-pounds or replace as necessary.
	(g) Rear bolt holes stripped or casting cracked.	(g) Repair, if possible, or replace pump.

SERVICE PROCEDURES

TESTS AND ADJUSTMENTS
CHECKING FLUID LEVEL

(1) Start engine, turn steering wheel back and forth several times to expel air from system, then shut off engine.

(2) Wipe reservoir filler cap free of dirt, remove cap and visually inspect oil level in reservoir.

Engine Cold—Oil level should be at bottom of filler neck.

Engine Hot—Oil level should be one-half way up in filler neck.

If necessary, add only Power Steering Fluid Part No. 2084329 or equivalent.

PRESSURE TEST

(1) Measure pump belt tension. See "Cooling System," Group 7.

(2) Disconnect pressure hose at pump and in its place install adapter fitting and test hose C-3388. Connect pressure hose, from steering gear, to shut off valve of test hose (Fig. 2).

IMPORTANT: Before disconnecting power steering hoses, carefully observe routing so they are in same position when reinstalled.

(3) Remove oil reservoir cap and place a thermometer, with a range of 200°F. in oil.

(4) Install a tachometer and operate engine 500 RPM. Inspect and correct pump fluid level if necessary.

(5) Expel all air from unit by turning steering wheel to full right turn and back to full left turn several times and recheck oil level.

To assist in heating pump oil; slowly close pressure gauge valve until gauge reads 400 psi and open valve fully when oil temperature reaches 150 degrees F.

(6) With engine running at 500 rpm and no steering effort applied, oil temperature at 150-170 degrees, pressure gauge should read less than 100 psi. If pressure is higher inspect hoses for kinking or obstructions and steering gear for restrictions.

(7) Increase engine speed to 1000 rpm and slowly close valve. With valve fully closed, pump pressure should be as listed under "Specifications."

CAUTION: Closing valve for more than a few seconds will cause abnormal pump wear.

(8) If pressure is higher or lower than shown in "Specifications" relief valve could be faulty. Replace valve with valve known to be good and repeat test. If pressure is still below minimum specification, disassemble pump and inspect flow control valve for fouling and rotating parts for unusual wear.

(9) If pressure is correct, open valve fully and operate steering unit through another cycle, holding

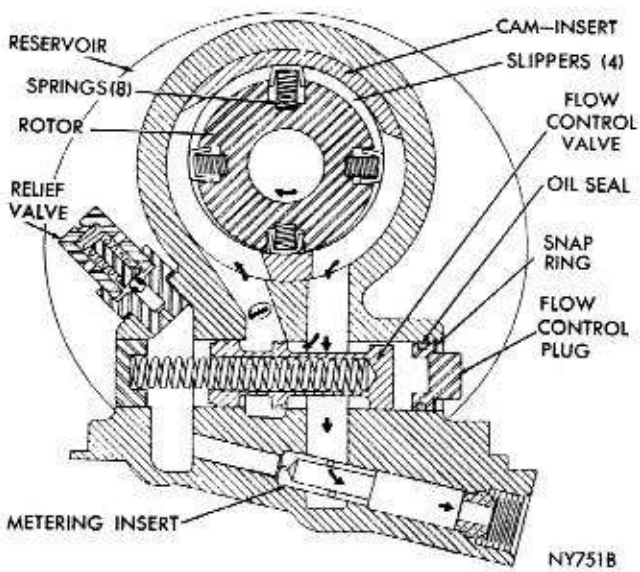


Fig. 1—Power Steering Pump (1.2 Pump)

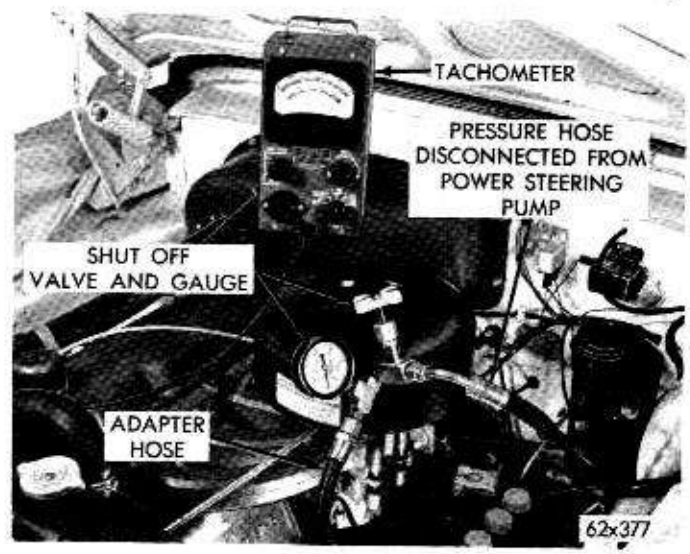


Fig. 2—Pressure Test

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steering wheel at extreme travel in each direction while watching pressure gauge. Unequal gauge readings indicate internal leakage in steering gear unit. Do not hold gear in either extreme position for more than a few seconds.

(10) If pressures are within specifications, perform pump flow test.

PUMP FLOW TEST

(1) Inspect pump belt tension and correct if necessary. See "Belt Adjustment—Cooling System" Group 7.

(2) With test hose and pressure gauge connected as in preceeding pressure test (Fig. 2) open valve fully.

(3) Disconnect return hose from pump and install flow gauge set C-3885 between pump and return hose. The arrow on "tee" connector must be pointed towards pump (Fig. 3). Use orifice SP-3825.

(4) Inspect and correct pump fluid level if necessary.

(5) Start engine and operate at 500 rpm.

(6) Expel all air from system by turning steering wheel from full right turn to full left turn several times.

(7) Increase engine speed to 1000-1200 rpm. Heat oil to 150-170 degrees F. by steering car from side to side. With no steering effort applied, gauge in return line should read 14-25 psi. A reading of less than 14 psi. or greater than 25 psi., indicates that flow valve may be sticking or pump may be badly worn. Remove, clean and reinstall flow valve.

(8) Decrease engine speed to 500 rpm and slowly close valve till gauge in pressure line reads 850 psi without fully closing valve. The flow gauge in return line should read a minimum of 10 psi. A value of less than 10 psi indicates a sticking flow control valve, a leaking pressure-relief valve or a badly worn pump.

When removing test equipment, reinstall pressure and return hoses in same position they were in before removal.

PUMP REMOVAL

(1) Loosen pump lower mounting and locking bolts and remove the belt.

(2) Disconnect both hoses at pump.

(3) Remove mounting and locking bolts and remove pump and brackets.

OIL SEAL REPLACEMENT

(1) Remove pump from engine. Drain reservoir and clean exterior before servicing.

(2) Remove brackets, reservoir screws, reservoir, gasket and "O" ring.

(3) Using spacer washers between front bracket and pump, reinstall front bracket for use as a holding fixture. Clamp bracket in a vise (Fig. 4).

(4) Remove pulley with Tool C-3615 as follows:

(a) Engage one half-collar under flange of pulley hub. Position screw shaft and nut with flange section inside collar.

(b) Engage other half-collar under pulley hub and over flange of screw shaft. Install retainer sleeve over both half-collars.

(c) Hold nut from turning and turn screw till pulley is removed.

(5) Thread Tool C-3783 into metal portion of seal (Fig. 5) and turn center screw while holding tool body. Be careful not to damage pump shaft.

(6) After inspecting for and removing all burrs and scratches from end of shaft, install a new seal with lip toward pump. Use Tool C-3782 to drive seal flush with

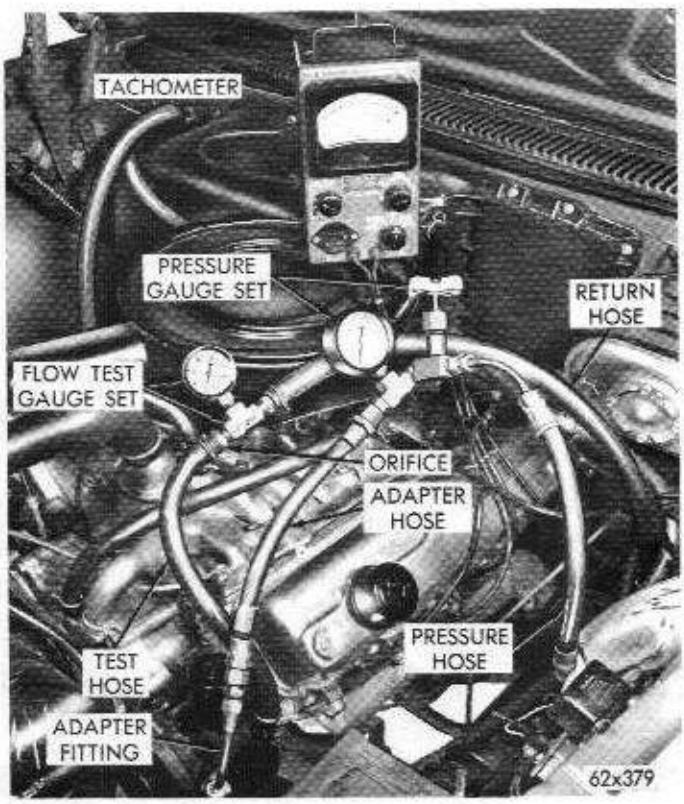


Fig. 3—Flow Test

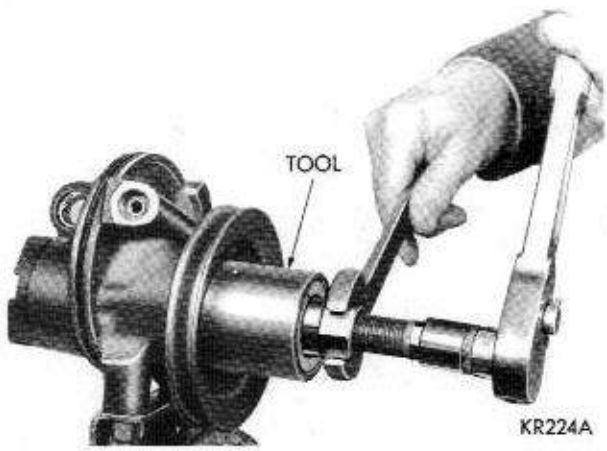


Fig. 4—Removing Pump Pulley

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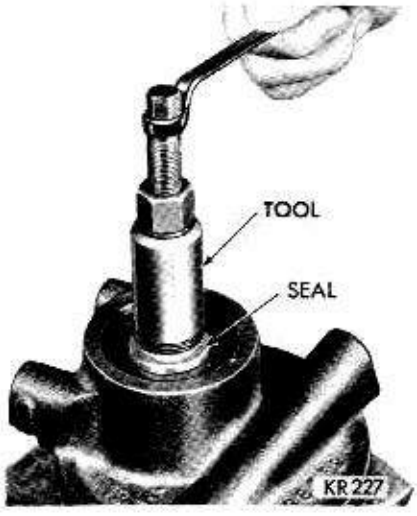


Fig. 5—Removing Pump Shaft Oil Seal

insert (Fig. 6).

(7) Support pump body on holding fixture Tool C-3643, with locating pins in reservoir bolt holes so all pressure will be applied to lower end of pump shaft.

The pump **MUST** be supported in a manner in which all pressing force will be applied to shaft only; otherwise pump body and rotor will be damaged.

(8) Press pulley hub on shaft with a heavy duty arbor press until hub of pulley is flush with end of shaft (Fig. 7).

(9) Install new pump "O" ring and reservoir gasket. Lubricate "O" ring before installation.

(10) Install reservoir and pump brackets. Tighten screws to 16 foot-pounds.

(11) Install pump and adjust belt as outlined under "Cooling," Group 7.

DISCHARGE FITTING FERRULE REPLACEMENT

(1) Remove pump from engine.

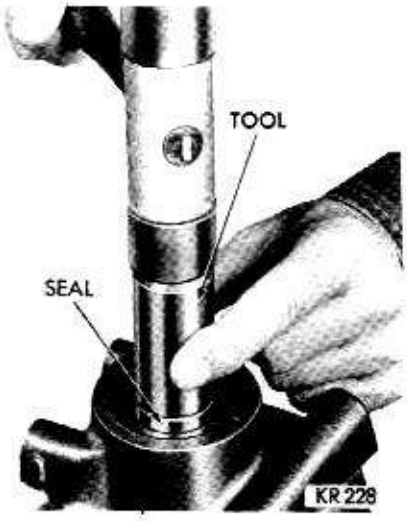


Fig. 6—Installing Pump Oil Seal

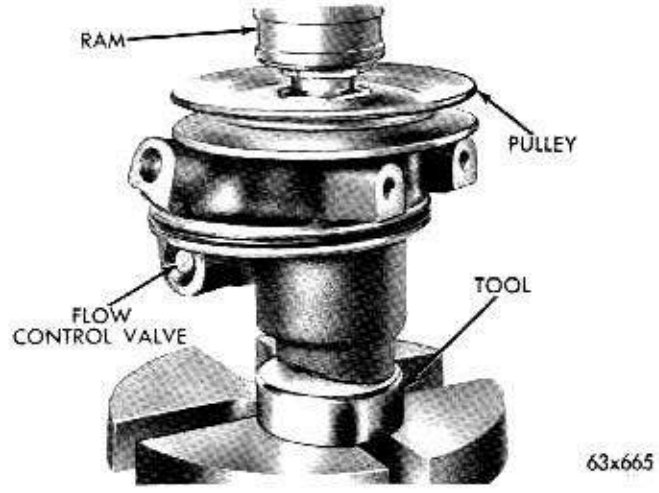


Fig. 7—Installing Pump Pully

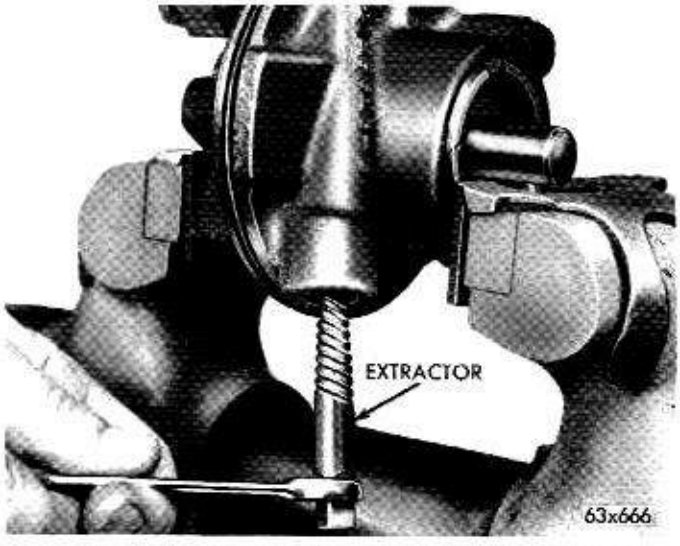


Fig. 8—Removing Brass Ferrule (.96 Pump Shown)

(2) Clamp pump in vise upside down to prevent chips from falling into pump.

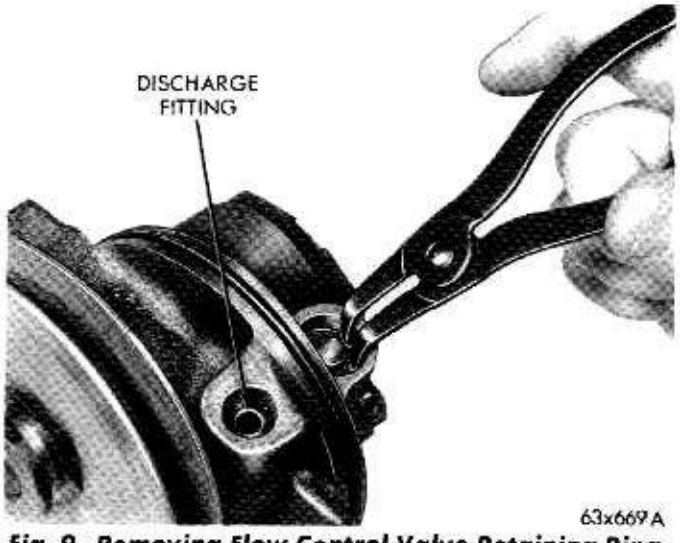


Fig. 9—Removing Flow Control Valve Retaining Ring

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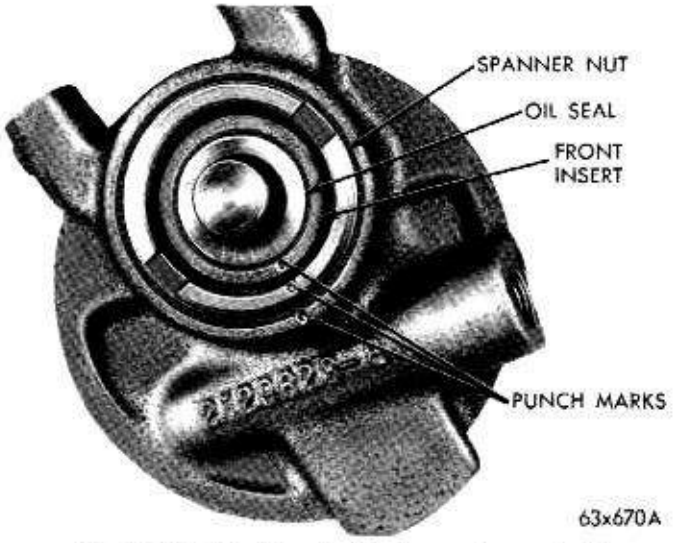


Fig. 10—Center Punch Marks on Pump Body, Spanner nut and Front Insert (1.2 Pump Shown)

(3) Use a No. 4 screw-extractor (E-Z out) and turn into ferrule. Carefully rock extractor back and forth so as not to damage threads of housing (Fig. 8).

(4) Clean bore and center new ferrule with tapered end up in bore. Installing pressure hose and tightening to 24 foot-pounds will seat ferrule.

FLOW CONTROL VALVE SERVICING

(1) Remove pump from engine and reservoir from pump.

(2) Remove snap ring and plug from opening located next to discharge fitting (Fig. 9).

(3) Depress control valve against spring pressure and allow it to spring back. The valve should pop out



Fig. 11—Removing Spanner Nut

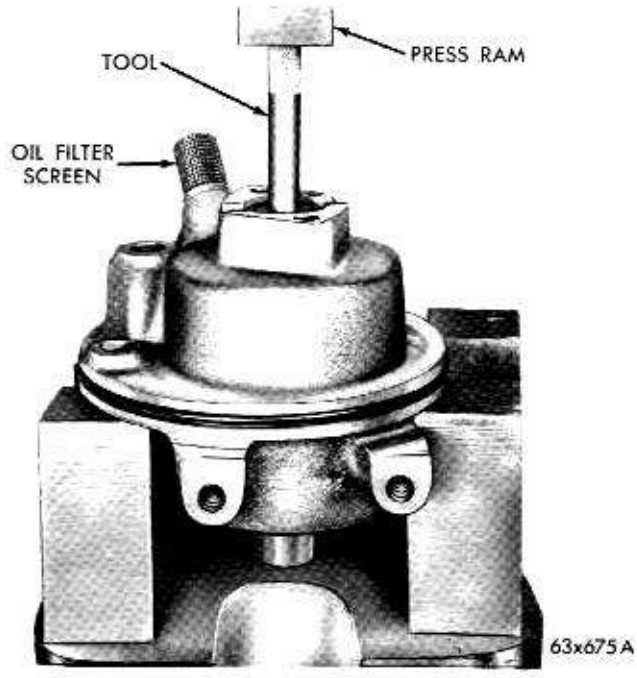


Fig. 12—Removing Shaft, Rotor and Front Insert

of the bore. It may be necessary to lightly rap valve and repeat above operation if it is stuck in position.

If dirt chips, etc. are found on valve or within valve bore, entire pump should be disassembled, washed out and rebuilt. If valve bore is badly scored, replace pump body.

(4) Seat control valve spring in spring pocket.

(5) Remove any burrs on valve with crocus cloth, but **DO NOT** round off edges of valve lands.

(6) Lubricate valve with Power Steering Fluid and install over spring making sure it moves freely in bore.

(7) Replace and lubricate "O" ring on plug, install in bore with projection **OUT.**

(8) Install snap ring with sharp edge **UP.**

(9) Install pulley (Fig. 7), new "O" ring on pump body, new reservoir gasket, reservoir and brackets.

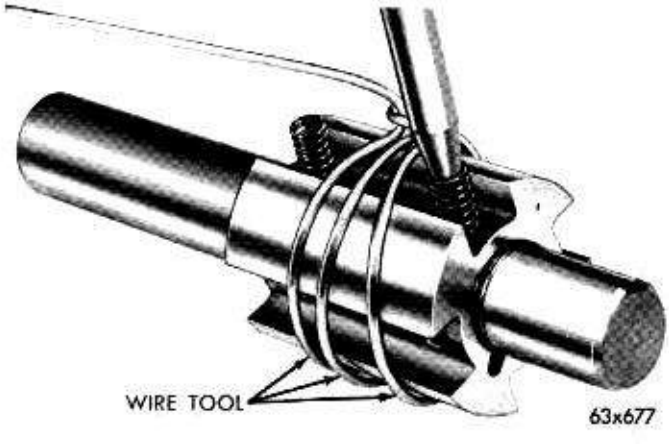


Fig. 13—Installing Slipper Rings

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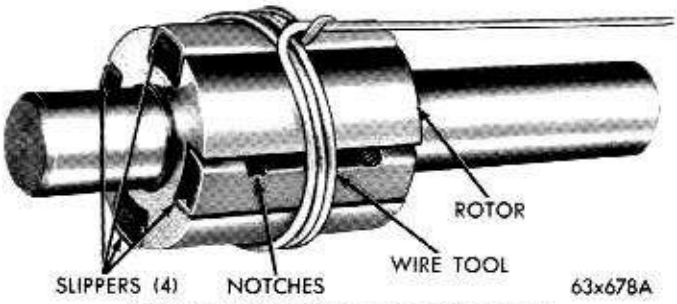


Fig. 14—Slippers Installed in Rotor

(10) Install pump on engine.

PRESSURE RELIEF VALVE

The pressure relief valve should be replaced as an assembly if pressure test indicates it is incorrectly set or leaking. The valve screws out of pump body after brackets and reservoir are removed. **Do not attempt to readjust this valve.**

OIL FILTER SCREEN

The oil filter screen is located in reservoir return tube. Remove and replace screen only when torn or completely clogged. Wash screen off whenever pump is disassembled.

SLIPPER SPRING REPLACEMENT

(1) Remove pump from vehicle and bracket, pulley and reservoir from pump.

(2) Center punch spanner nut, front insert and housing to aid in proper indexing when reassembling (Fig. 10).

(3) Use a drift to remove spanner nut (Fig. 11).

(4) Support pump housing with insert clear of arbor press table and press shaft, rotor and insert out of housing (Fig. 12).

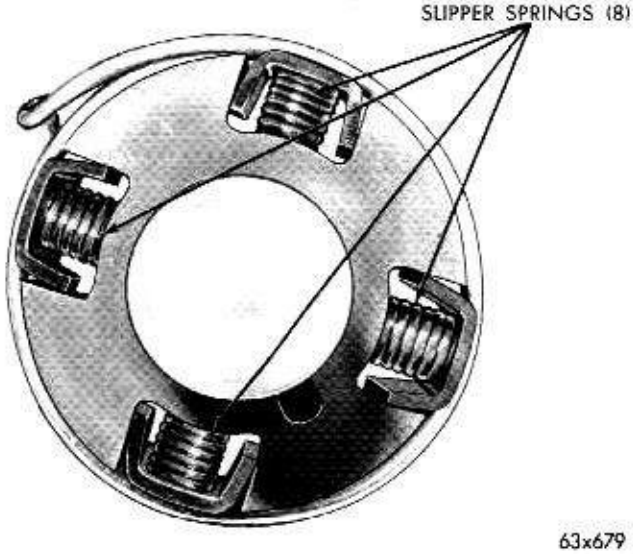


Fig. 15—Slippers and Springs Installed in Rotor

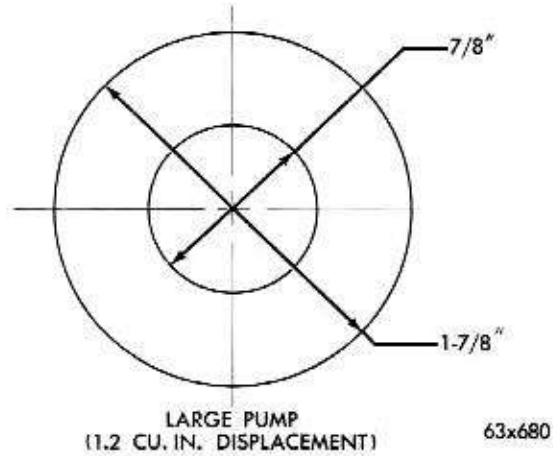


Fig. 16—Slipper Retainer Tool (1.2 Pump)

(5) Broken edges or deep scoring of rotor and slippers will require pump body replacement.

Do not mistake two machined notches on inside surface of cam insert, for scoring.

(6) Smooth off burrs on pulley end (only) of pump shaft to prevent seal damage on installation. Clean all parts thoroughly with solvent. Cleanliness is essential throughout pump assembly. Reassemble with new slipper springs if possible.

(7) Using a piece of wire 25 inches long, make three turns around center of rotor, fastening ends (Fig. 13). Bend ends of wire towards pulley end of shaft.

Use caution in handling rotor to prevent damage to sharp corners which are necessary for good pump performance.

(8) Install springs by turning clockwise into pockets in rotor, using a pencil with point broken off (Fig. 13)

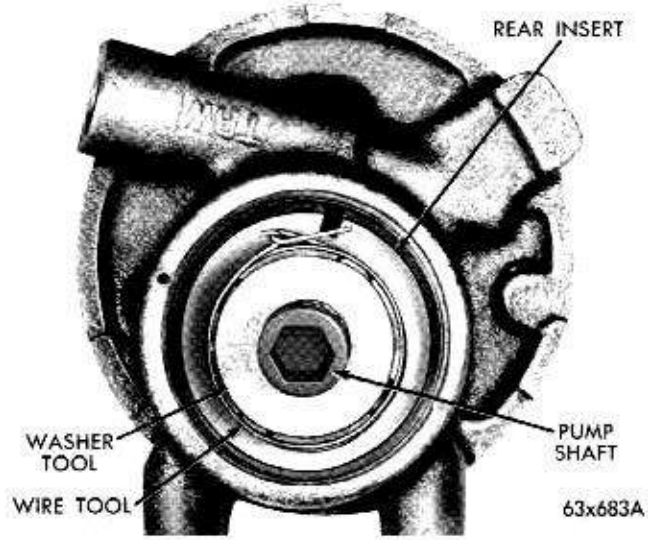


Fig. 17—Installing Rotor, Shaft (1.2 Pump Shown)

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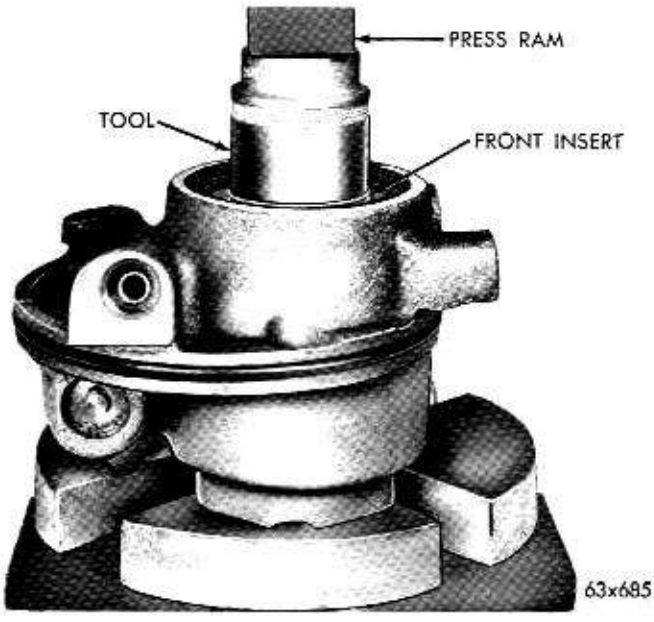


Fig. 18—Pressing Front Insert Into Pump Housing

if necessary.

(9) Install each slipper by sliding between two springs and wire wrapped around rotor. The notched end must be installed as shown in Figure 14.

(10) Inspect springs to make sure they are in pockets and in an upright position under slipper (Figure 15). Cocked springs will not right themselves, but will break in use.

(11) Install a washer of dimensions shown, in Figure 16, over pulley end of shaft to keep slipper, flush with end of rotor throughout assembly operation.

(12) Insert shaft and rotor assembly into pump cam-insert so slippers are started in cam and shaft has entered pump body bearing housing (Fig. 17).

(13) Hold washer firm against rotor while removing wire and gently push rotor assembly down into cam insert. The rotor will be flush with end of cam insert when fully inserted. **The slipper ends may hang up in cam insert ports during installation. Rotate shaft while installing to prevent this occurence.**

(14) Remove flat washer. Make sure slipper springs are in place by rotating shaft and looking through end of each slipper.

(15) Lubricate rotor assembly and rotate to make sure slippers do not bind.

(16) Replace shaft seal (See "Oil Seal Replacement") and "O" ring seal on front insert. Lubricate and position insert in pump body so punch marks align with punch marks on pump flange (Fig. 10).

(17) Support pump housing in an arbor press (Fig. 18) and using a 1¼ inch socket, press insert into body making sure two punch marks remain aligned.

(18) Install spanner nut and tighten to its original position with a drift by aligning punch marks.

(19) Install pump pulley (Fig. 7), new "O" ring reservoir gasket, reservoir and pump brackets.

PUMP INSTALLATION

(1) Position pump on engine and install remaining

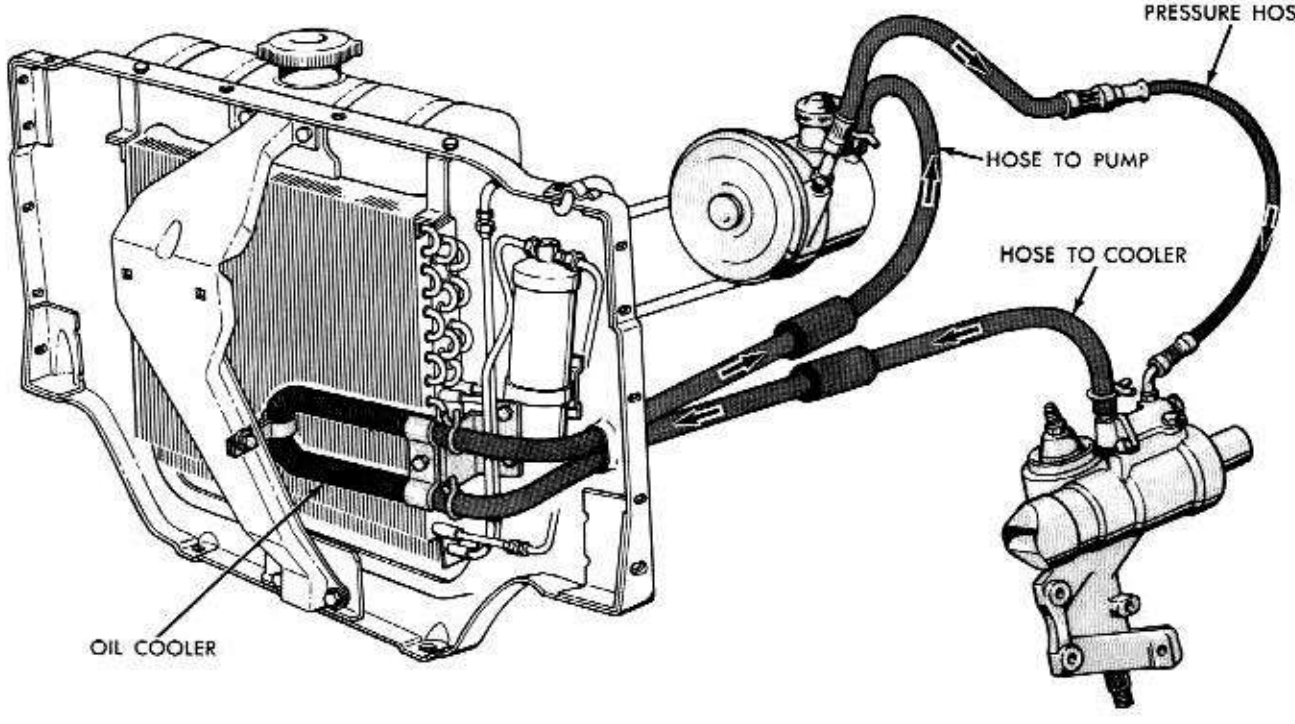


Fig. 19—Power Steering Pump Oil Cooler

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and locking bolt.

(2) Install drive belt and adjust. See "Cooling System—Group 7." Tighten pump bracket bolts to 30 foot-pounds.

(3) Connect pressure and return hoses, routing hoses in same position they were in before removal.

(4) Fill pump reservoir with Power Steering Fluid, Part No. 2084329 or equivalent. See "Checking Fluid Level."

(5) Start engine and turn steering wheel all the way from left to right to bleed the system. Stop engine, check oil level and correct if necessary.

OIL COOLER

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Models equipped with air conditioning utilize an oil cooler mounted on the left side of the radiator support in front of the air conditioning condenser (Fig. 1).

The oil return hose from the steering gear returns the oil to the pump through the cooler.

To replace or service the cooler, remove the return hose at the pump and drain the oil out of the cooler. Next remove the hose clamps and hoses from the cooler and the cooler support retaining bolt from the radiator support.

To install, position the cooler in place on the radiator support and install the retaining bolt. Install the return hoses and clamps, fill the oil reservoir and bleed the system by turning the steering wheel from full left stop to full right stop. Check the oil level and inspect for leaks.

SPECIFICATIONS

MANUAL STEERING GEAR

Type	Recirculating Ball Nut
Ratio	24 to 1
Cross Shaft Bearings	3-Needle Bearings
Wormshaft Bearings	2-Caged Ball Bearings
Cross Shaft Adjusting Screw End Play	.000-.004 Inch
Worm Bearing Preload (in car)	1½ to 4½ in. lbs. to Keep Wheel Moving
Worm Bearing Preload (out of car)	1⅛ to 4½ in. lbs. to Keep Wheel Moving
Sector Mesh Adjustment Preload Torque— Includes Worm Bearing Preload (in car)	8¼ to 11¼ in. lbs. Pull through high spot
Sector Mesh Adjustment Preload Torque— Includes Worm Bearing Preload (out of car)	7⅞ to 11¼ in. lbs. Pull through high spot

POWER STEERING GEAR

Type	Constant Control Full Time Power
Ratio	15.7 to 1
Wheel Turns—Stop to Stop	3½
Cross Shaft Bearings	2 Needle Bearings and 1 Direct Bearing on Gray Iron Cover
Worm Shaft Thrust Bearing Pre-Load	16-24 Ozs.
Cross Shaft Adjustment	Tighten Adjusting Screw ⅜ to ½ turn past Zero Back Lash (Center of High Spot)
Fluid Capacity of Hydraulic System	4 Pts.
Type of Fluid	Power Steering Fluid Part No. 2084329 or equivalent

POWER STEERING PUMP

Type	Constant Displacement—1.2 cu. in. per revolution
Maximum Pump Pressure	
Chrysler	1000-1100 psi
Imperial	1200-1300 psi
Maximum Fluid Flow	2.25 gpm
Type of Fluid	Power Steering Fluid—Part No. 2084329 or equivalent—**DO NOT** use Type A. Transmission Fluid

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TIGHTENING REFERENCE

MANUAL STEERING GEAR

	FOOT POUNDS
Cross Shaft Adjusting Screw Lock Nut	35
Cross Shaft Cover Bolt	25
Gear Assembly to Frame Bolt	80
Steering Arm Nut	120
Steering Wheel Nut	24

POWER STEERING GEAR

	POUNDS FOOT	POUNDS INCH
Gear Housing to Frame Bolt	80	
Gear Shaft Adjusting Screw Lock Nut	50	
Gear Shaft Cover Nut	20	
Pump Inlet Fitting	30	
Steering Arm Nut	120	
Steering Column Support Nut	12	
Steering Shaft Coupling Bolts		200
Valve Body Attaching Bolts		200
Valve Body End Plug	25	
Steering Wheel Nut	24	

POWER STEERING PUMP

	FOOT-POUNDS
Pump Inlet Fitting	30
Pump to Bracket Bolts (.96 pump)	30
(1.2 pump)	35
Reservoir to Pump Body Bolts	10-15

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TRANSMISSIONS

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MANUAL TRANSMISSION—A-745

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GENERAL INFORMATION

The A-745 three speed manual transmission (Fig. 1), is of the synchromesh type with helical cut gears to provide silent operation. The countershaft gear is in constant mesh and is supported by two rows of needle type bearings at each end.

The mainshaft front end is piloted in roller bearings in the end of the main drive pinion, and is supported by a ball bearing in the rear of the case. The rear end of the mainshaft is supported by the sliding yoke and bushing in the extension housing. The speedometer drive gear is integral with the mainshaft.

IMPORTANT: All transmissions have the sliding spline type output shaft. Whenever the propeller shaft front sliding yoke is removed from the transmission, it should be cleaned and relubricated as outlined in Group "O" of this Manual.

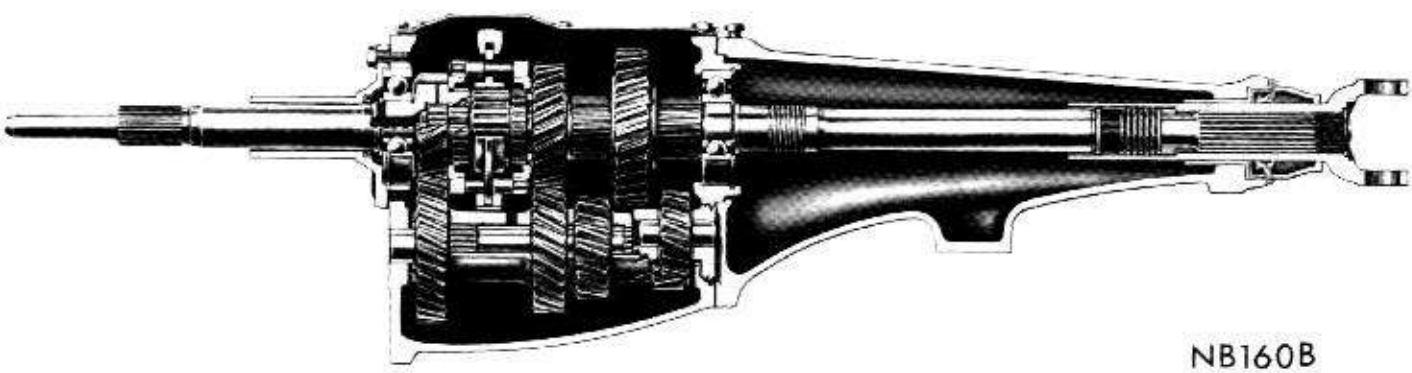


Fig. 1—A-745 Three Speed Transmission

SERVICE DIAGNOSIS

Condition	Possible Cause	Correction
HARD SHIFTING	(a) Incorrect clutch adjustment.	(a) Refer to the Clutch Group for corrections.
	(b) Improper cross-over adjustment.	(b) Perform the cross-over adjustment as outlined in "Gearshift Linkage Adjustments."
	(c) Synchronizer clutch sleeve damaged. (d) Synchronizer spring improperly installed. (e) Broken or worn synchronizer stop rings.	(c-d-e) Causes noted can only be corrected by disassembling the transmission and replacing damaged or worn parts.

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Condition	Possible Cause	Correction
TRANSMISSION SLIPS OUT OF GEAR	(a) Linkage interference.	(a) Inspect and remove all linkage interferences.
	(b) Gearshift rods out of adjustment.	(b) Adjust the gearshift rods as outlined in "Gearshift Linkage Adjustments."
	(c) Second or direct speed gear synchronizer clutch teeth worn.	(c) Disassemble the transmission and replace parts as necessary.
	(d) Clutch housing bore or face out of alignment.	(d) Refer to the Clutch Group for correction procedures.
TRANSMISSION NOISES	(a) Excessive end play in the countershaft gear.	(a) Replace the thrust washers.
	(b) Loose synchronizer hub spline fit on mainshaft.	(b) Inspect the mainshaft and synchronizer hub and replace parts as necessary.
	(c) Loose spline fit on low speed sliding to mainshaft spline.	(c) Inspect the low speed sliding gear and mainshaft. Replace parts as necessary.
	(d) Damaged, broken or excessively worn gear teeth.	(d) Replace the worn gears.
	(e) Drive pinion bearing worn.	(e) Replace the worn bearing.

SERVICE PROCEDURES

SERVICE IN VEHICLE

GEARSHIFT LINKAGE ADJUSTMENTS

(1) With 2nd and 3rd control rod disconnected from lever on the column and 1st and reverse control rod disconnected from the transmission lever, position both transmission levers in neutral. (The neutral detent balls must be engaged to make this adjustment correctly.) To check this, start engine (with clutch disengaged) then release the clutch slowly.

(2) Inspect fore and aft movement of shift levers in the steering column. If movement at outer end of levers exceeds 1/16 inch, loosen the two upper bushing screws (Fig. 2) and rotate bushing (downward) until all free play of levers has been removed. Retighten bushing screws securely.

(3) Install a wedge or suitable tool between the cross-over blade and 2nd and 3rd lever, so that cross-over blade is engaged with both lever cross-over pins.

(4) Adjust length of 2nd and 3rd control rod until stub shaft of control rod or swivel enters hole in the column lever (Fig. 3). Install washer and clip to secure and tighten swivel lock nut to 70 inch-pounds. During above setting, 2nd and 3rd control rod should be adjusted to also position selector lever (on the column) 5 degrees above horizontal level.

(5) Slide clamp and swivel (on end of 1st and reverse control rod) either **in** or **out**, until swivel stub shaft enters hole in the transmission lever (Fig. 3). Install washers and clip to secure. Determine mid back-lash position in the linkage, then tighten control rod lock nut.

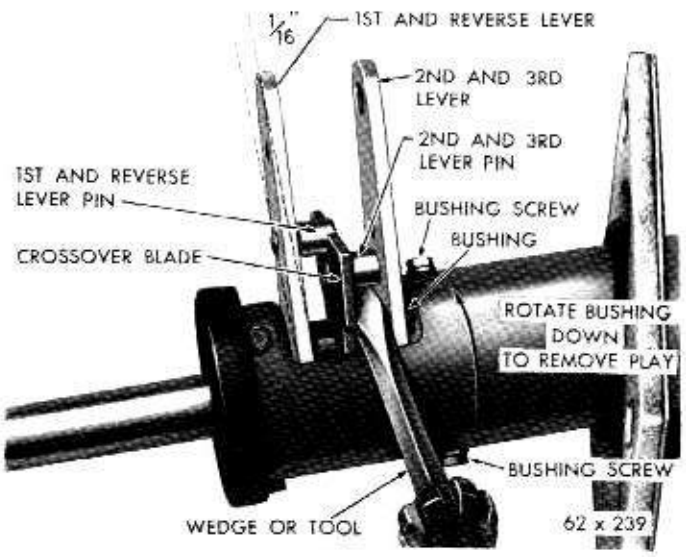


Fig. 2—Gearshift Lever Adjustment

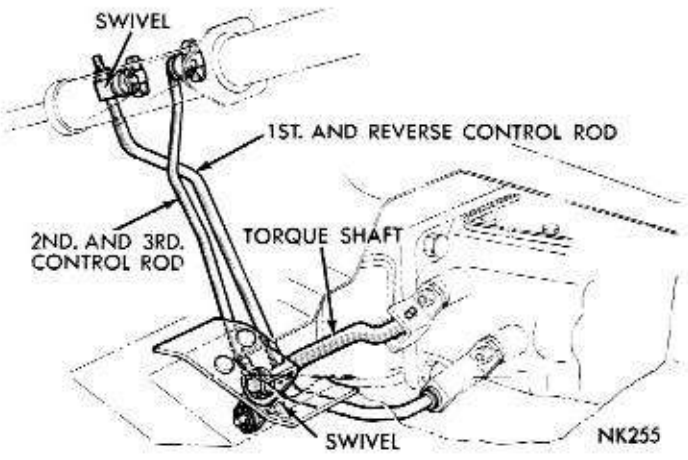


Fig. 3—Gearshift Controls

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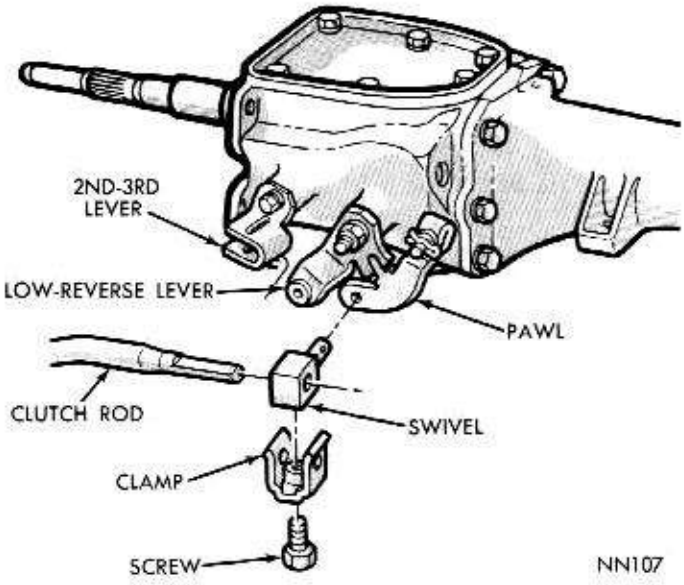


Fig. 4—Gearshift Interlock

(6) Remove positioning wedge or tool from cross-over blade and lever, then move selector lever through all positions to check adjustments and to insure cross-over smoothness.

(7) Shift the transmission into neutral (Fig. 4). Make sure clutch pedal free play is adjusted to specifications.

(8) Loosen clutch interlock rod swivel clamp bolt; hold clutch pedal to its fully returned position. Slide swivel along interlock rod to fully engage pawl with lever, then tighten swivel clamp bolt.

CAUTION: Do not pull interlock rod rearward to engage swivel in the pawl.

(9) Shift transmission in normal manner from neutral to first, and from neutral to reverse (disengage clutch while shifting and engage clutch when in gear). If operation is not normal; perform the following steps:

(a) Disconnect interlock rod from pawl and check clutch pedal free play.

(b) Connect interlock rod and re-adjust as in step (8).

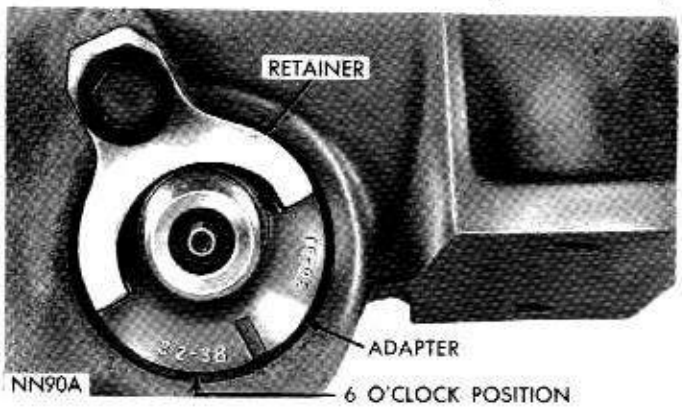


Fig. 5—Speedometer Pinion and Adapter—Installed

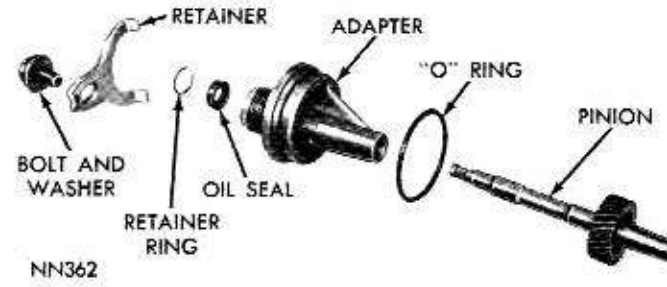


Fig. 6—Speedometer Drive—Disassembled

(10) Disengage the clutch. Shift transmission halfway between neutral and first. Let out the clutch pedal. The interlock when properly adjusted should allow pedal to return to about one inch from the floor.

SPEEDOMETER PINION

Removal and Installation

Rear axle gear ratio and tire size determines pinion gear size requirements. Refer to "Speedometer Pinion Chart" for pinion usage.

(1) Remove bolt and retainer securing speedometer pinion adapter in the extension housing (Fig. 5).

(2) With cable housing connected, carefully work adapter and pinion out of the extension housing.

(3) If transmission fluid is found in cable housing, replace seal in the adapter (Fig. 6).

(4) Select pinion range numbers on outside of adapter to correspond with number of pinion teeth.

(5) Install adapter in pinion housing with pinion range numbers aligned with 6 o'clock position (Fig. 5).

(6) Install retainer and bolt, with retainer tangs in adapter positioning slots. Tap adapter firmly into the extension housing and tighten retainer bolt to 100 inch-pounds.

SPEEDOMETER PINION CHART
A-745—3-SPEED
OUTPUT SHAFT DRIVE GEAR—13 TEETH

Tire Size	Axle Ratios—Number of Pinion Gear Teeth and Color
	3.23:1
8.25-14	32-Black
8.55-14	31-Green
9.00-14	31-Green
8.15-15	32-Black
8.45-15	31-Green

EXTENSION HOUSING AND BUSHING

Removal

(1) Disconnect propeller shaft at rear universal joint. Carefully pull shaft yoke out of the transmission extension housing.

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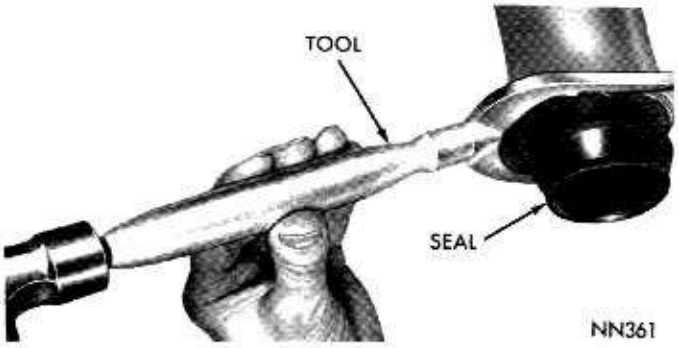


Fig. 7—Removing Extension Housing Yoke Seal

CAUTION: Be careful not to scratch or nick ground surface on sliding spline yoke during removal and installation of the shaft assembly.

(2) Remove the speedometer pinion and adapter, refer to Page 3.

(3) Remove bolts securing extension housing to the crossmember. Raise transmission slightly with service jack and remove the center crossmember.

(4) Remove extension housing transmission bolts and slide extension housing off the mainshaft.

NOTE: To replace the extension housing bushing, refer to Page 10.

Installation

(1) Using a new gasket, slide extension housing over mainshaft and down against the case. Install and tighten attaching bolts to 50 foot-pounds.

(2) Install center crossmember and tighten retaining bolts securely. Lower transmission, install extension housing to crossmember bolts and tighten to 50 foot-pounds.

(3) Install the speedometer pinion and adapter, refer to Page 3.

(4) Clean and lubricate sliding spline yoke as outlined in Group O in this Manual. Carefully guide front univeral joint yoke into extension housing and onto mainshaft splines. Connect propeller shaft to rear axle pinion yoke.

EXTENSION HOUSING YOKE SEAL

Replacement

(1) Disconnect propeller shaft at rear universal joint. Carefully pull shaft yoke out of the transmission extension housing.

CAUTON: Be careful not to scratch or nick ground surface on sliding spline yoke during removal and installation of the shaft assembly.

(2) Remove the extension housing yoke seal (Fig. 7) with Tool C-3985.

(3) To install a new seal, position seal in opening of extension housing and drive it into the housing with Tool C-3972 (Fig. 8).

(4) Carefully guide front universal joint yoke into extension housing and on mainshaft splines. Connect propeller shaft to rear axle pinion shaft yoke.

SERVICE OUT OF VEHICLE

TRANSMISSION REMOVAL

(1) Drain lubricant from the transmission.

(2) Disconnect propeller shaft at rear universal joint. Carefully pull shaft yoke out of the transmission extension housing.

CAUTION: Be careful not to scratch or nick ground surface on sliding spline yoke during removal and installation of the shaft assembly.

(3) Disconnect speedometer cable and back-up light switch leads.

(4) Install engine support fixture C-3487, mounting hooks firmly into holes in side frame members with support ends up against underside of the oil pan flange.

(5) Raise engine slightly with support fixture. Disconnect transmission extension housing from the removable center crossmember.

(6) Support transmission with a suitable jack and remove the center crossmember. Remove bolts that attach transmission to the clutch housing.

(7) Slide transmission rearward until pinion shaft clears clutch disc before lowering the transmission. (This precaution will avoid damaging the clutch disc.)

(8) Lower transmission and remove from under the vehicle.

(9) Remove rear motor support and crossmember, then mount the transmission in repair stand DD-1014.

DISASSEMBLING THE TRANSMISSION

To disassemble transmission for cleaning and overhaul, refer to (Fig. 9), then proceed as follows:

(1) Remove bolts that attach cover to the case. Remove cover then discard the gasket.

(2) Using a pair of feeler gauges, measure synchronizer float. The measurement of "float" should be taken before any further disassembly of the transmission is attempted.

(3) The synchronizer "float" should be between .050 and .090 inch, when measured between synchronizer outer ring pin and the opposite synchronizer

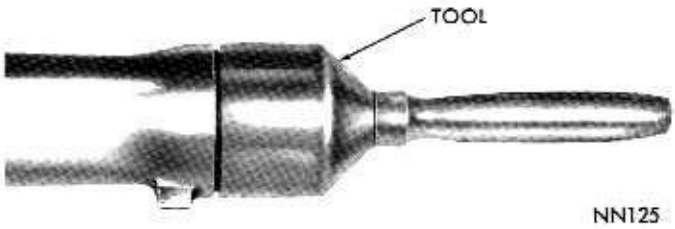


Fig. 8—Installing Extension Housing Yoke Seal

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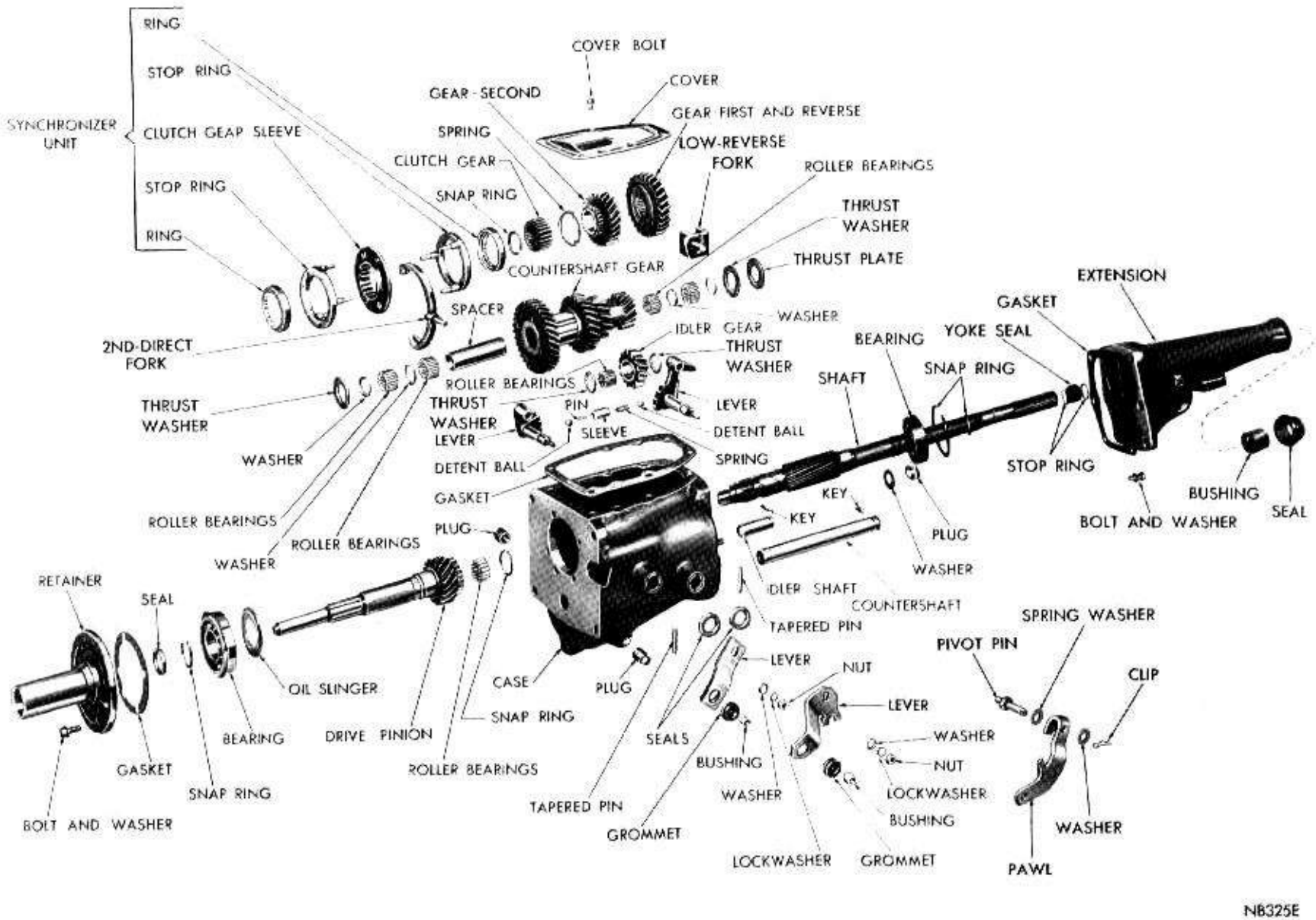


Fig. 9—A-745 Transmission—Disassembled

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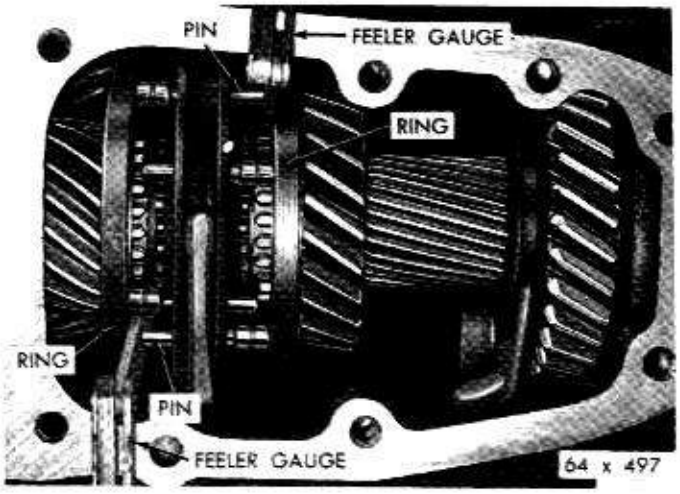


Fig. 10—Measuring Synchronizer "Float"

outer ring (Fig. 10). This measurement must be made on two pins, 180 degrees apart with equal gap on both ends for "float" determination.

(4) There should be a snug fit between the pins and outer rings, similar to that obtained when measuring with a micrometer.

Extension Housing

(1) Remove bolt and retainer securing speedometer pinion adapter in the extension housing (Fig. 5) Carefully work adapter and pinion out of the extension housing.

(2) Remove bolts and one nut that attaches extension housing to the transmission case. Slide extension housing off the mainshaft.

(3) Unwind and slide yoke seal rear stop ring from the mainshaft (Fig. 11). Slide seal and front stop ring off the shaft.

Drive Pinion

(1) Remove bolts that attach main drive pinion bearing retainer, then slide retainer off the pinion. Discard gasket and drive seal out of the retainer, using a suitable drift.

(2) Grasp pinion shaft and pull assembly out of case slightly, then slide synchronizer front inner stop ring from the short splines on pinion as pinion assembly is being removed from the case (Fig. 12).

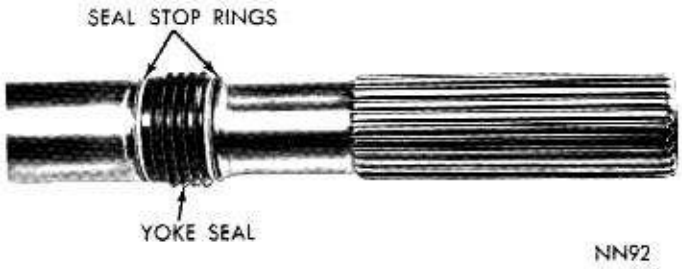


Fig. 11—Sliding Spline Yoke Seal

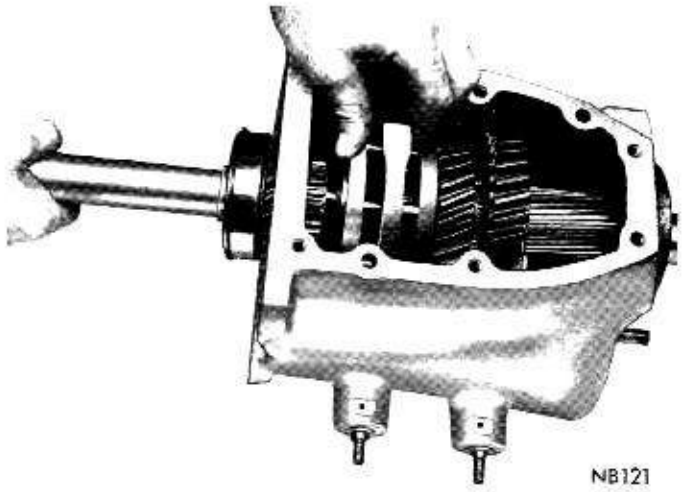


Fig. 12—Removing Drive Pinion Assembly

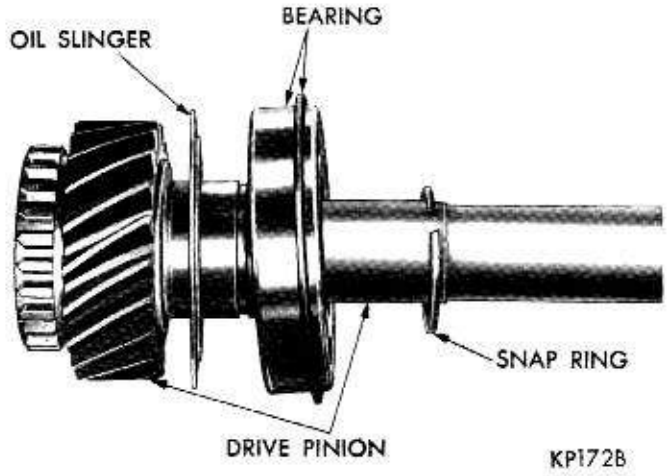


Fig. 13—Drive Pinion Assembly

(3) Remove snap ring (Fig. 13), which locks main drive pinion bearing on the pinion shaft. Remove pinion bearing washer, then carefully press pinion shaft out of bearing, using an arbor press. Remove the oil slinger.

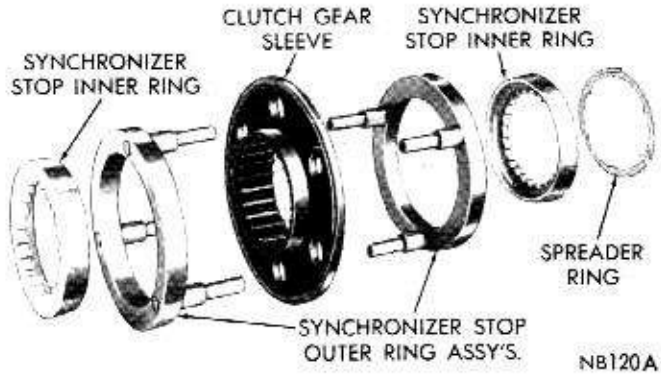


Fig. 14—A-745 Synchronizer Unit

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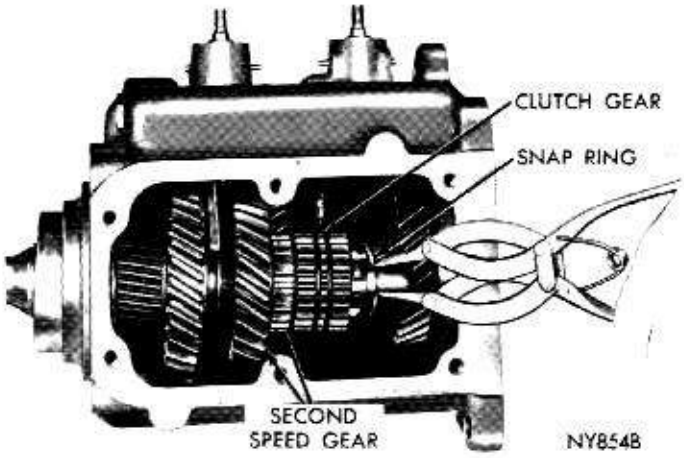


Fig. 15—Removing or Installing Snap Ring

(4) Remove snap ring and 15 bearing rollers from cavity in end of the drive pinion.

Mainshaft

(1) With transmission in reverse, remove mainshaft rear bearing outer snap ring, using a hook or a flat blade, then partially remove the mainshaft.

(2) Cock the mainshaft, then remove clutch sleeve outer synchronizer rings, front inner ring and 2-3 shift fork (Fig. 14).

(3) Remove clutch gear retaining snap ring, using snap ring pliers (Fig. 15). Slide clutch gear off end of the mainshaft.

(4) Slide second speed gear, stop ring and synchronizer spring off the mainshaft (Fig. 16).

(5) Remove low and reverse sliding gear and shift fork (Fig. 17) as mainshaft is completely withdrawn from the case.

Countershaft Gear

(1) Using a feeler gauge, check end play of countershaft gear (Fig. 18). The end play should be from .0045 to .028 inch. (This measurement will determine if new thrust washers are to be installed at reassembly).

(2) Using countershaft bearing arbor Tool C-3834, driver countershaft toward rear of case until small key can be removed from countershaft.

(3) Drive countershaft remaining way out of the case, keeping arbor tight against end of countershaft to prevent loss of roller bearings.

(4) Remove countershaft gear, thrust washers and thrust plate from the case.

(5) Remove bearing rollers (88), spacer rings (4) and center plate from the countershaft gear.

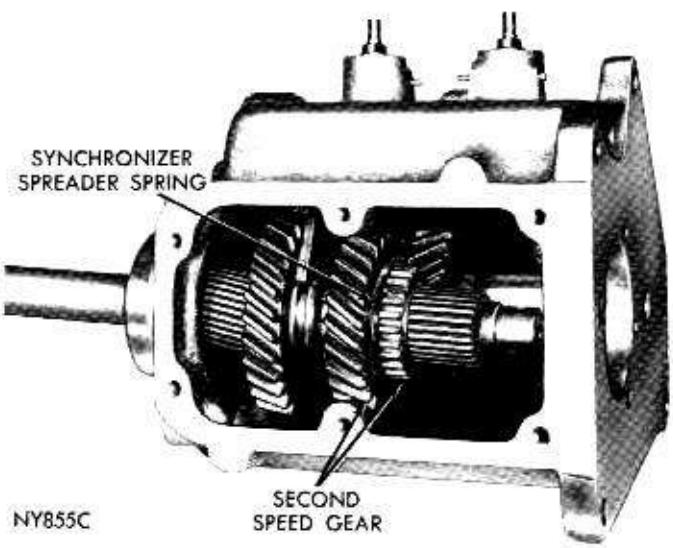


Fig. 16—Mainshaft Assembly

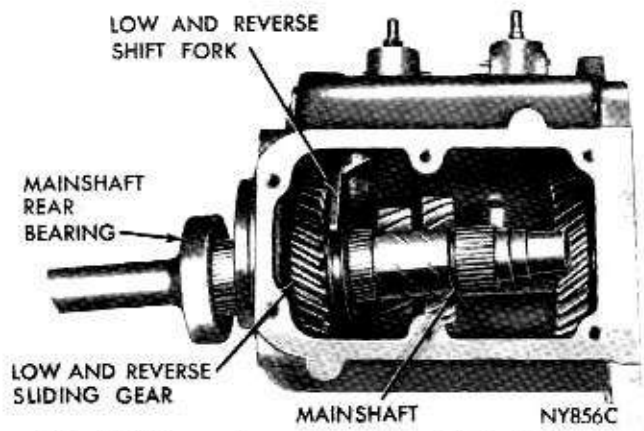


Fig. 17—Removing or Installing Mainshaft

Reverse Idler Gear

(1) Using a suitable drift, drive reverse idler gear shaft towards rear and out of the case. Remove woodruff key from end of the shaft.

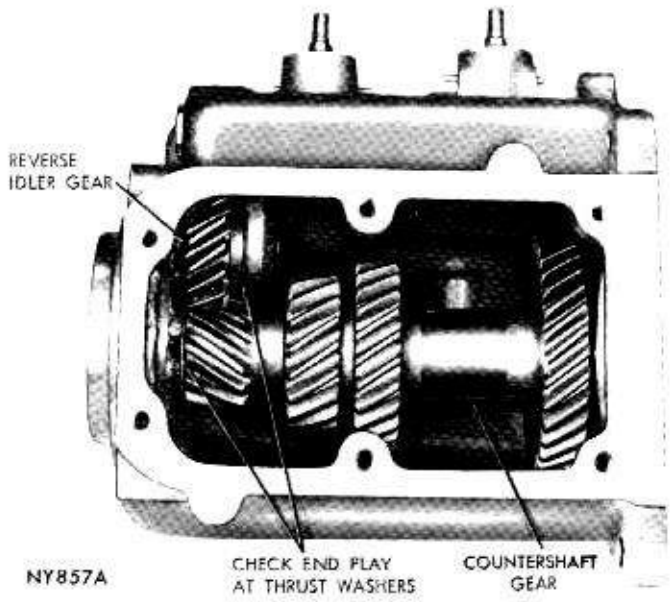


Fig. 18—Countershaft and Reverse Idler Gear

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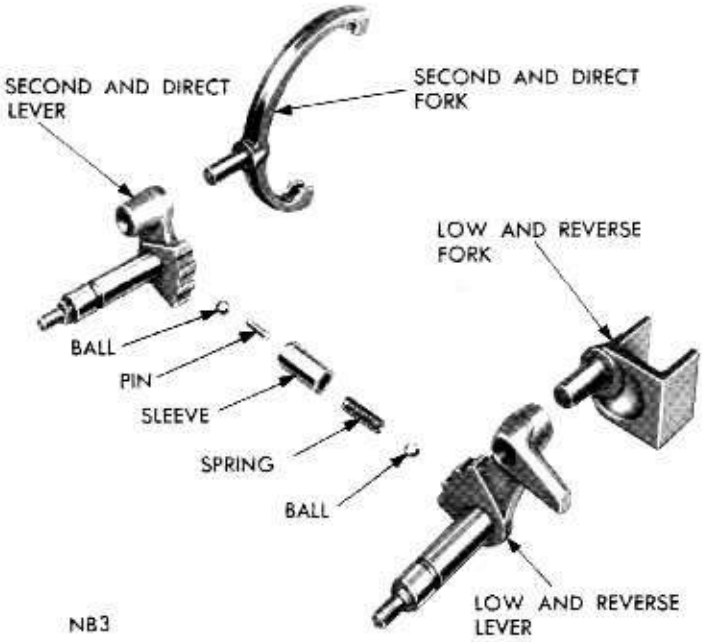


Fig. 19—A-745 Shift Forks and Levers

(2) Lift reverse idler gear, thrust washers and bearing rollers (22) out of the case. Remove bearing rollers from the gear.

Gearshift Mechanism

(This operation need only be done if the seals are leaking.)

(1) Remove operating levers from their respective shafts.

(2) Drive out tapered retaining pin from either of the two lever shafts, then withdraw levershaft from inside the transmission. (The detent balls are spring loaded; as shaft is being withdrawn, ball will drop to bottom of the case.)

(3) Remove interlock sleeve, spring, pin and both balls from the case (Fig. 19). Drive out remaining tapered pin, then slide lever shaft out of the transmission.

(4) Using a suitable drift, drive out lever shaft oil seals.

CLEANING AND INSPECTION

Clean transmission case thoroughly, using a suitable solvent, dry with compressed air. Inspect case for cracks, stripped threads in various bolt holes and machined mating surfaces for burrs, nicks or any condition that would render the case unfit for further service. The front mating surface should be smooth; if any burrs are present, dress them off with a fine mill file. If threads are stripped, install Helicoil inserts.

Ball Bearings

Wash ball bearings using a clean solvent and blow dry with compressed air.

CAUTION: Do not spin bearings with air pressure; turn slowly by hand. Spinning unlubricated bearings may cause damage to the races and balls.

Be sure ball bearings are clean, then lubricate them with light grade engine oil. Inspect bearings for roughness. This can best be determined by slowly turning outer race by hand. Measure fit of the bearings on their respective shafts.

Needle Type Bearing Rollers and Spacers

Inspect all bearing rollers for flat spots or brinelling. Inspect all bearing roller spacers for signs of wear or galling. Install new parts as required.

Gears

Inspect gear teeth on synchronizer clutch gears and stop rings. If there is evidence of chipping or excessively worn teeth, install new parts at reassembly. Be sure clutch sleeve slides easily on the clutch gear. Inspect countershaft gear and all sliding gear teeth for chipped or broken teeth, or showing signs of excessive wear. Small nicks or burrs must be stoned off.

Inspect teeth on the main drive pinion. If excessively worn, broken or chipped, a new pinion should be installed.

Test interlock sleeve and pin for free movement in bore of the shift housing. Examine detent balls for signs of brinelling. If lever detents show signs of excessive wear to extent of not locking in gear, install a new part. Inspect shift forks for wear on the shanks and pads.

Synchronizer Stop Rings

Inspect gear teeth and threads on synchronizer inner stop rings for broken teeth or worn threads. Inspect pins on synchronizer outer stop ring assembly for being straight and attached securely. Replace parts as required.

Mainshaft

Inspect mainshaft gear and bearing mating surfaces. If gear contact surfaces show signs of galling or are excessively worn, a new mainshaft should be installed.

Inspect snap ring grooves for burred edges. If rough or burred, remove condition using a fine file or crocus cloth. Inspect synchronizer clutch gear teeth on the shaft for burrs.

ASSEMBLING THE TRANSMISSION

Countershaft Gear

To reassemble transmission, refer to (Fig. 9), then proceed as follows:

(1) Slide countershaft gear bearing roller spacer over arbor Tool C-3834. Coat bore of gear with lubricant and slide tool and spacer in the gear bore.

(2) Lubricate bearing rollers with heavy grease and install 22 rollers next to spacer in each end of gear in area around the arbor. Place a bearing spacer ring in

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each end of gear next to bearing rollers, and install another row of 22 rollers in each end. Coat with heavy grease and install bearing spacer in each end of the gear.

(3) **If countershaft gear end play was found to exceed .028 inch during disassembly, install new thrust washers.** Coat with heavy grease and install front thrust washer over arbor at front of countershaft gear, with the tabs outward. Install tabbed rear thrust washer over arbor with tabs positioned in grooves in the gear.

Install remaining rear thrust washer plate over arbor at rear of the gear. The washer plate must be installed so step on plate will engage on ledge inside rear of case, thus preventing plate rotation. Install gear and arbor in case making sure front thrust washer tabs slide into grooves in the case, and rear thrust washer step engages on the ledge.

(4) Using countershaft and a soft hammer, drive arbor forward out of countershaft gear and through bore in front of the case. Before driving countershaft all the way into case, be sure keyway is positioned in line with key recess provided in rear of case. Insert shaft key and continue to drive countershaft forward in case until key is bottomed in recess.

Reverse Idler Gear

(1) Position arbor Tool C-464 in reverse idler gear and using heavy grease, install the 22 bearing rollers in the gear.

(2) Place front and rear thrust washers at each end of reverse idler gear, and position assembly in transmission case with chamfered end of gear teeth toward the front.

(3) Insert reverse idler shaft into bore at rear of case with keyway to rear, pushing arbor toward front of the transmission.

(4) With keyway aligned with recess in case, drive shaft forward, inserting key before keyway is obscured. Continue driving shaft forward until key seats in recess.

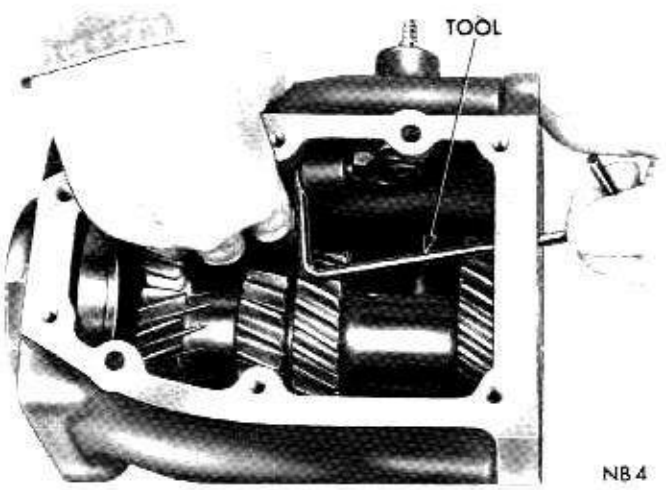


Fig. 20—Installing Detent Balls

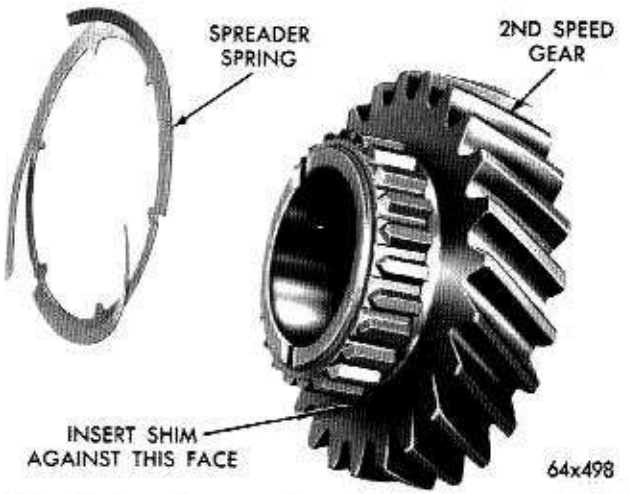


Fig. 21—Synchronizer "Float" Shim Location

Gearshift Mechanism

To install gearshift mechanism, refer to (Fig. 19), then proceed as follows:

(1) Place new shift lever shaft seals centered in their bores in the case. Using Tool C-3766, drive both seals into the case, until tool bottoms.

(2) Install seal protector, Tool C-3767, on end of low and reverse lever shaft, then slide shaft into rear boss of case and through the seal. Lock in position with tapered pin. Turn lever until center detent is in line with the interlock bore.

(3) Slide interlock sleeve in its bore in case followed by one of the interlock balls. Install interlock spring and pin.

(4) Place remaining interlock ball on top of interlock spring, using Tool C-3765 (Fig. 20). (A good method of installing second ball is to stick ball in the tool recess by means of lubricant, then use tool to position ball on the detent spring.)

(5) Install seal protector Tool C-3767, on second and high lever shaft, depress interlock ball, using Tool C-3765 and at same time install second and high lever into fully seated position, with center detent aligned with detent ball. Remove the tool. Secure lever shaft with remaining tapered pin.

(6) Install operating levers, install and tighten retaining nuts securely.

(7) Place low and reverse fork in lever shaft, with offset toward rear of transmission.

Mainshaft

(1) While holding low and reverse sliding gear in position in fork, with hub extension to rear, insert mainshaft with rear bearing through rear of case and into the sliding gear.

(2) Place synchronizer spreader spring, and then rear stop ring on synchronizer splines of 2nd speed

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gear. Install 2nd speed gear on mainshaft, (and or shims if required).

In cases where synchronizer "float" measurement was above .090 inch, synchronizer shims should be installed to reduce "float" to .090 inch or less. Install shim on shoulder of second speed gear, before spreader spring is installed (Fig. 21).

If synchronizer "float" is below .050 inch, an equal amount of material should be removed from ends of all six synchronizer pins until synchronizer "float" is above .050 inch.

(3) Install synchronizer clutch gear on the mainshaft. Install synchronizer clutch gear snap ring in the mainshaft groove. Make certain ring is bottomed all the way around in the groove.

(4) Measure clearance between clutch gear and 2nd speed gear. Clearance should be .004 to .014 inch. End play in excess of .014 inch may cause 2nd speed gear "jump out."

(5) Install 2nd and direct fork in the lever shaft. Hold synchronizer clutch gear sleeve and two outer rings together, with pins properly entered in holes in clutch gear sleeve. Engage 2nd and direct fork with the clutch gear sleeve.

(6) While holding synchronizer parts and fork in position, slide mainshaft forward, entering synchronizer clutch gear into clutch gear sleeve and at same time entering mainshaft rear bearing in the case bore. **If synchronizer parts are not positioned as described in steps 5 and 6, it will not be possible to place them in position after mainshaft is fully in position, due to interference with countershaft gear.**

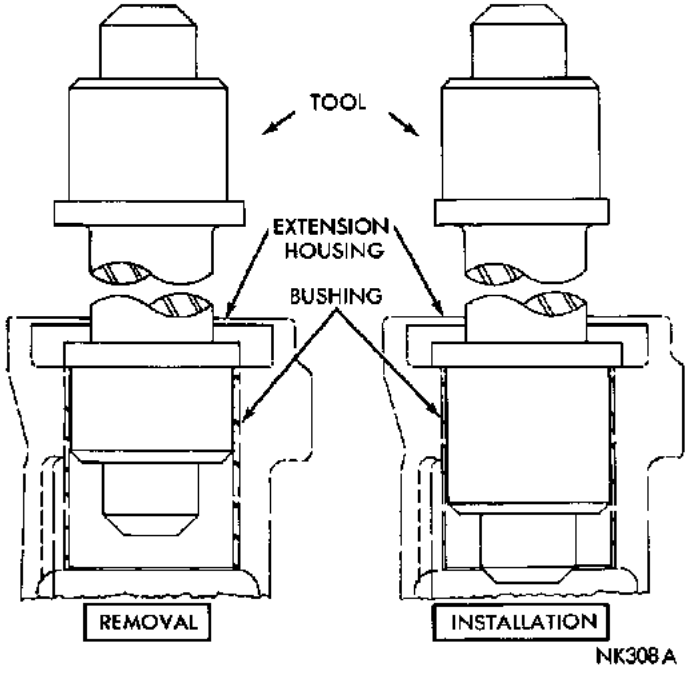


Fig. 22—Replacing Extension Housing Bushing

(7) While continuing to hold synchronizer parts in position, tap mainshaft forward until rear bearing bottoms in the case bore.

(8) Install mainshaft rear bearing snap ring in groove in the case bore. **This snap ring is a select fit.**

(9) Unwind and slide yoke seal front stop ring into place on the mainshaft (Fig. 11). Slide seal on shaft with lips of seal toward rear, then install the rear snap ring.

Drive Pinion

(1) Slide oil slinger (if removed) over pinion shaft and down against the gear (Fig. 13).

(2) Slide bearing over pinion shaft (snap ring groove away from gear end), then seat on the shaft, using an arbor press.

(3) Secure bearing and washer with selected thickness snap ring. Four snap rings are available to eliminate end play (same thickness as clutch gear and mainshaft snap rings).

Be sure snap ring is properly seated. If the large snap ring around bearing was removed, install at this time.

(4) Place pinion shaft in a vise (with soft jaws). Coat 15 bearing rollers with heavy grease, then install in cavity of the shaft. Install bearing retaining ring in its groove.

(5) Install third gear inner stop ring (Fig. 14), in third gear outer stop ring. Guide drive pinion through front of the case and engage inner stop ring with clutch teeth, then seat the pinion bearing.

The pinion shaft bearing is fully seated when snap ring is in full contact with the case.

(6) Install a new seal in pinion bearing retainer, using Tool C-3789.

(7) Using a new gasket, install drive pinion and retainer in the case. Install attaching bolts and tighten to 35 foot-pounds.

Extension Housing

(1) If extension housing bushing requires replacement, drive out oil seal with a suitable tool. Be sure not to damage oil seal surface in the housing.

(2) Drive bushing out of housing with Tool C-3974 (Fig. 22).

(3) Slide a new bushing on installing end of Tool C-3974. Align oil hole in bushing with oil slot in the housing, then drive bushing into place (Fig. 22).

(4) Drive a new oil seal into housing with Tool C-3972 (Fig. 8).

(5) Using a new gasket, slide extension housing over mainshaft while guiding shaft through bushing and oil seal. Install and tighten attaching bolts to 50 foot-pounds.

(6) Install transmission gasket and cover, install and tighten cover bolts to 15 foot-pounds.

(7) Install the speedometer pinion and adapter assembly. Refer to Page 3.

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(8) Install drain plug and back-up light switch and tighten securely.

(9) Refill transmission with Automatic Transmission Fluid AQ-ATF, Suffix "A." Install filler plug and tighten securely.

TRANSMISSION INSTALLATION

Place a small amount of short fibre wheel bearing lubricant around inner end of main drive pinion shaft pilot bushing in flywheel and on pinion bearing retainer release bearing sleeve area. **Do not lubricate end of pinion shaft, clutch disc splines or clutch release levers.**

(1) Remove transmission from repair stand, place it on a suitable jack and slide assembly under the vehicle.

(2) Raise transmission until drive pinion shaft is centered in the clutch housing bore.

(3) Roll transmission slowly forward until pinion shaft enters the clutch disc. Turn pinion shaft until splines are aligned, then push transmission forward until seated against clutch housing. **Do not allow transmission to "hang" after pinion has entered the clutch disc.**

(4) Install transmission attaching bolts and tighten to 50 foot-pounds. Remove the jack.

(5) Using a pointed drift, align crossmember bolt holes, then install attaching bolts. Tighten to 35 foot-pounds.

(6) Remove engine support fixture and disengage hooks from holes in frame side rails. Install extension housing to crossmember bolts and tighten to 35 foot-pounds.

(7) Reconnect speedometer cable, gearshift rods and back-up light switch wires.

(8) Lubricate the internal spline area of front universal joint yoke, refer to "Lubrication and Maintenance," Group O. Carefully guide front universal joint yoke into extension housing and on mainshaft splines. Connect propeller shaft to the rear axle pinion shaft yoke.

(9) Road test vehicle, making sure transmission shifts smoothly and operates quietly.

(10) If the shift linkage requires adjustment, refer to Page 2.

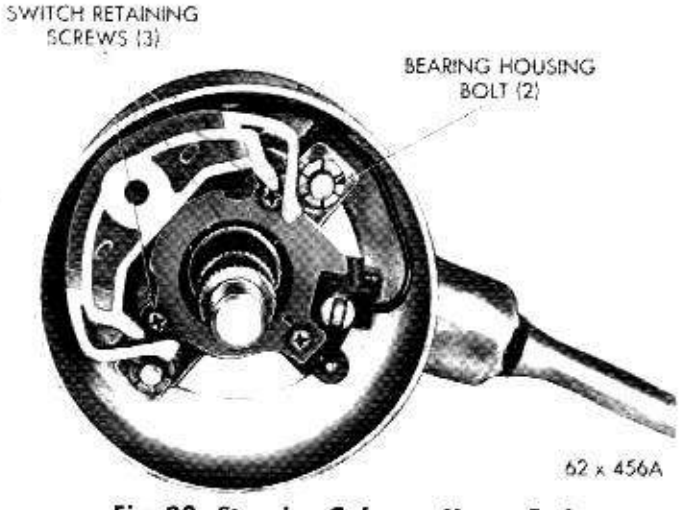


Fig. 23—Steering Column—Upper End

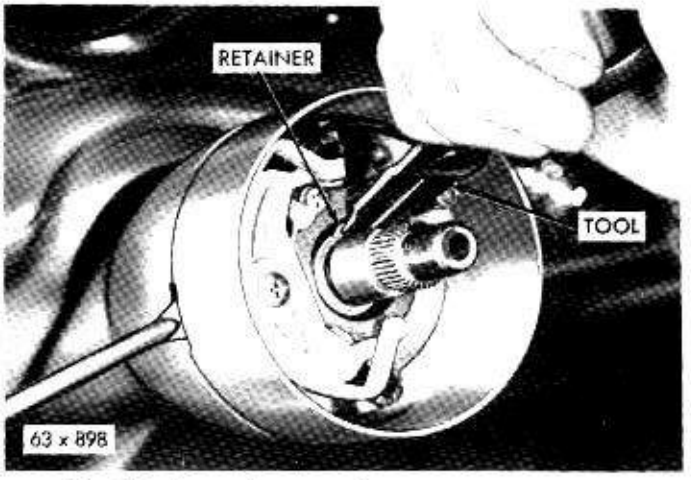


Fig. 24—Removing Bearing Upper Snap Ring

STEERING COLUMN AND GEARSHIFT

Removal

(1) Disconnect battery cable at the battery negative terminal.

(2) Disconnect shift linkage rods from shift levers at bottom of the steering column.

(3) Remove clamp and heat shield from lower end of steering column. Disconnect steering shaft by removing roll pin from upper joint coupling.

(4) Disconnect the turn signal, and horn wires.

(5) Depress horn ring or horn ring ornament and rotate ¼ turn counterclockwise to remove.

(6) Remove horn switch retaining screws.

(7) Disconnect horn wire clip and remove horn switch assembly.

(8) Remove steering wheel retaining nut and washer.

(9) Remove steering wheel, using remover Tool C-3428.

(10) Remove floor plate to toe board attaching screws.

(11) Disconnect steering column at instrument panel bracket by removing retaining screws and clamp.

(12) Lift steering column assembly up and off end of wormshaft, and remove assembly out through passenger compartment being careful not to soil or damage the headlining.

Disassembly

Place steering column assembly on a clean padded bench to protect the paint finish.

(1) Remove turn signal lever retaining screw and remove the lever.

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Fig. 25—Removing Steering Shaft Bearing

(2) Remove the three switch retaining screws (Fig. 23) and pull turn signal switch and switch plate up and out, feeding wires and connectors through the steering column jacket.

(3) Remove snap ring from upper groove in steering shaft with Tool C-3128 (Fig. 24).

(4) Install steering wheel nut on steering shaft, then bump steering shaft on a wood block to release bearings and shaft from the column jacket. Slide steering shaft out of column jacket and remove lower snap ring.



Fig. 26—Removing Shift Lever Pivot Pin

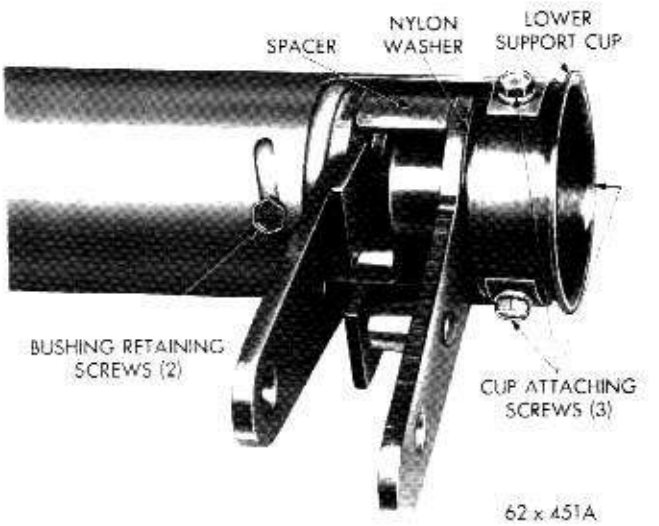


Fig. 27—Steering Column—Lower End

(5) While supporting gearshaft housing in area around shift lever pivot pin, drive out pivot pin, using a 3/16" punch, and remove the shift lever (Fig. 25).

(6) Remove three lower support cup to jacket attaching screws (Fig. 26) and remove the cup.

(7) Remove nylon thrust washer, low and reverse lever, and the spacer.

(8) Remove two lower shift tube bushing retaining screws at slotted holes in the jacket.

(9) Slide shift tube with 2nd and direct lever, nylon bushing, spring and spring retainer out of the jacket (Fig. 27).

NOTE: The shift tube with 2nd and direct lever spring, retainer and nylon bushing are serviced as an assembly, and are not to be disassembled.

(10) Remove floor plate assembly from the column jacket.

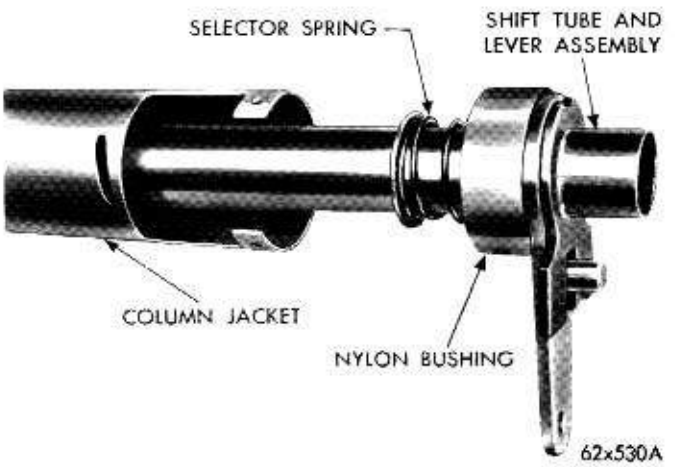


Fig. 28—Removing Shift Tube Assembly

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(11) Remove hexagon nuts from the two bearing housing retaining bolts, and lift steering column upper bearing housing off the jacket (Fig. 28).

(12) Lift gearshift housing and spring washer off the steering column jacket.

Inspection

After cleaning, inspect all parts for wear or damage. Note condition of pins in two lower shift levers, shift lever socket at top end of shift tube, and inner end of shift lever.

Inspect steering shaft upper bearing for smooth operation, and lubricate with Multi-Purpose Chassis Lubricant or similar lubricant. If bearing has any signs of roughness or wear, it should be replaced. Replacement bearings are pre-lubricated.

Assembly

(1) Position spring washer on the ledge in top end of steering column jacket (Fig. 28), and place shift lever housing in position at top end of the column jacket.

(2) Place two bearing housing retaining bolts in position in the housing, and just start retaining nuts.

(3) Stand column upright, and lower bearing housing into position, engaging bolt heads in slots in the column jacket.

(4) Tighten two retainer bolt nuts alternately and evenly in steps to prevent unseating bolt heads from the slots. Tighten to 50 inch pounds.

(5) Lubricate floor plate O-ring with a soap solution or rubber lubricant and slide assembly on the steering column.

The floor plate assembly must be installed before installing shift tube and levers, since this cannot be done after shift tube and levers are in place in the steering column.

(6) Turn nylon bushing on shift tube (Fig. 27), so the two holes in bushing are aligned with centerline of 2nd and 3rd speed shift lever, then slide shift tube and lever assembly through jacket tube and into the bearing housing.

(7) Install spacer (Fig. 26), around selector lever so

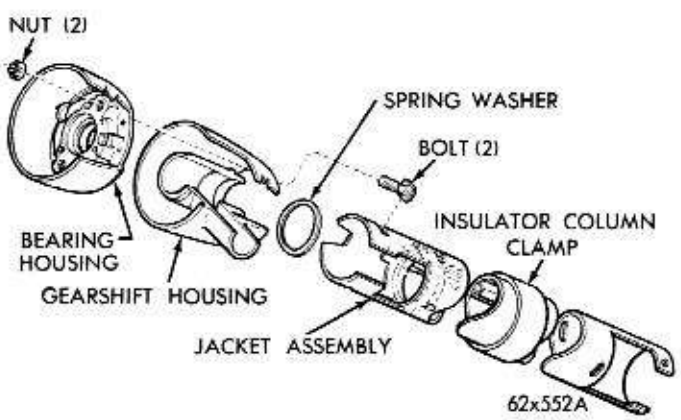


Fig. 29—Jacket Tube—Disassembled

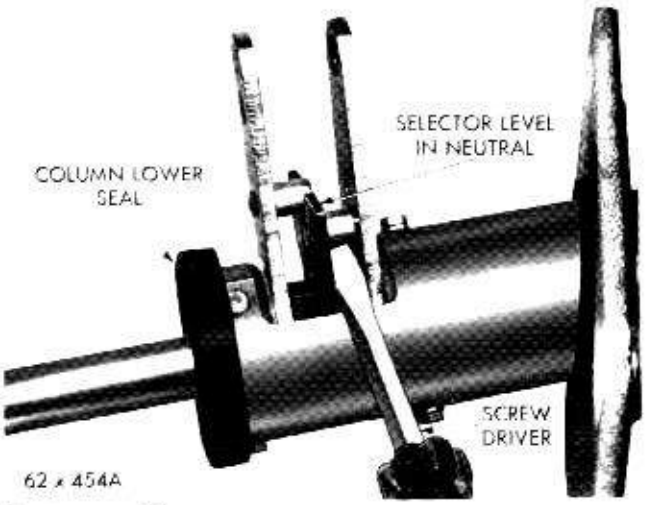


Fig. 30—Holding Selector Lever in Neutral Position

it rests against the 2nd and 3rd speed shift lever.

(8) Install low and reverse lever. Then install the nylon washer, centering it over end of the shift tube.

(9) Install lower support cup in the jacket (Fig. 26), while holding pressure against cup to overcome selector spring load, start the three support cup retaining screws, and tighten to 30 inch pounds.

(10) Loosely enter lower bushing retaining screws through slots in the jacket, and into the nylon bushings (Fig. 26).

(11) Rotate nylon bushing to where all play at shift levers and spacers is eliminated, but no binding occurs. With bushing in this position, tighten the two bushing to jacket screws to 30 inch pounds.

(12) The gearshift lever insulator should be examined, and if any wear or damage is evident, it should be pulled off the lever and replaced.

(13) Place a screw driver blade between 2nd and 3rd speed shift lever and selector lever, so it will hold selector lever at neutral position half way between the two shift levers (Fig. 29).

(14) Position gearshift lever in shift lever housing so it engages hole in shift tube plate with the pin hole aligned.

(15) Support jacket tube housing in area around pin hole (Fig. 25) and drive pivot pin in flush with the housing.

(16) Place insulator over upper column bearing and into bore in the bearing housing. Use a soap solution or rubber lubricant to ease installation.

(17) Install snap ring in lower groove on steering shaft and slide shaft upward into column and through the upper bearing. Lubricate steering shaft lower bearing to ease installation.

(18) Position wavy upper snap ring against top of the bearing. Place bearing installing sleeve Tool C-3879 and steering wheel retaining washer and nut, on top of steering shaft in that order (Fig. 30).

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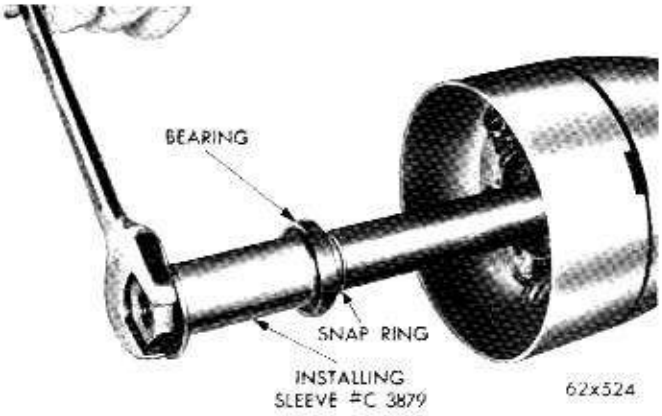


Fig. 31—Installing Steering Column Upper Bearing

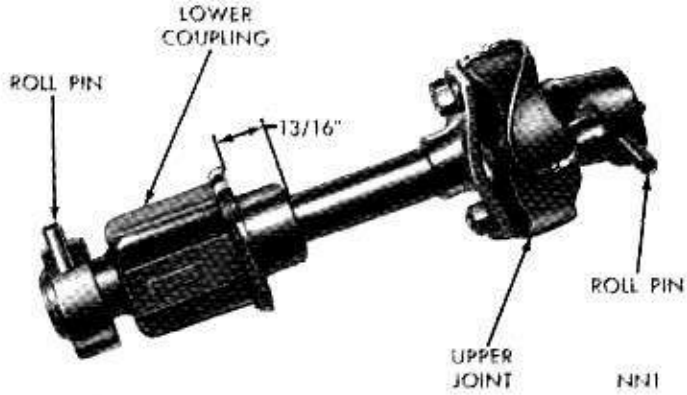


Fig. 32—Positioning Steering Shaft Coupling

(19) Turn steering wheel retaining nut to exert pressure on installing sleeve, upper snap ring, and bearing, pressing the bearing down onto knurled section of steering shaft and against the lower snap ring.

Exert sufficient pressure against upper snap ring to flatten it against the bearing so it can enter groove in the steering shaft. Be sure snap ring is firmly seated in the groove.

(20) Position turn signal switch assembly in bearing housing, while feeding wiring through steering column and out through opening provided in the column jacket.

(21) Place switch plate over switch, and install three retaining screws (Fig. 23). Tighten screws to 24 inch pounds.

(22) Position turn signal lever in the assembly, sighting down through hole in switch to align screw hole, and install the lever attaching screw. Tighten screws to 24 inch pounds.

Installation

(1) Insert column and jacket tube assembly through floor pan opening, being careful not to soil or damage the headlining.

(2) With front wheels in straight ahead position, align master splines of steering shaft with upper joint coupling. Engage steering shaft far enough to install a new roll pin.

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(3) Loosely fasten steering column jacket to instrument panel bracket with clamp and the two attaching screws. Be sure tab on clamp is entered in locating slot in the column jacket.

(4) The steering shaft coupling must be centered at midpoint of its travel. Move column assembly up or down in instrument panel bracket so dimension between top of coupling and center of gauge hole (Fig. 31) is 13/16 inch. Tighten steering column bracket clamp screws to 95 inch pounds.

(5) Slide floor plate down column and into position on the floor. Install retaining bolts finger tight so plate can be shifted to align lower end of column.

(6) Shift floor plate to position lower end of column to obtain minimum steering shaft coupling angles. Tighten all floor plate retaining screws to 90 inch pounds. After tightening screws, recheck alignment.

(7) Install heat shield on lower end of steering column and secure with the clamp screws. Make sure shield clears the rubber coupling.

(8) With master splines in steering wheel hub and steering shaft aligned, place steering wheel on the steering shaft.

(9) Install steering wheel retaining washer and nut. Tighten nut to 24 foot pounds.

(10) Install horn switch parts previously removed from steering wheel. Install the horn ring or horn ring ornament.

TORQUEFLITE TRANSMISSION (A-727-B)

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GENERAL INFORMATION

The TorqueFlite Transmission model identification markings are cast in raised letters about 3/8 inch high on the lower left side of the transmission bell housing.

The A-727-B transmission (Fig. 1) combines a torque converter with a fully-automatic 3-speed gear system. The converter housing and transmission case are an integral aluminum casting. The transmission consists of two multiple disc clutches, an over-running clutch, two servos and bands, and two planetary gear sets to provide three forward ratios and a reverse ratio. The common sun gear of the planetary gear sets is connected to the front clutch by a driving shell which is splined to the sun gear and to the front clutch retainer. The hydraulic system consists of an oil pump, and a single valve body which contains all of the valves except the governor valve.

Venting of the transmission is accomplished by a drilled passage through the upper part of the oil pump housing.

The torque converter is attached to the crankshaft through a flexible driving plate. Cooling of the converter is accomplished by circulating the transmission fluid through an oil-to-water type cooler, located in the radiator lower tank. The torque converter assembly is a sealed unit which cannot be disassembled.

The transmission fluid is filtered by an internal "Dacron Type" filter attached to the lower side of the valve body assembly.

Engine torque is transmitted to the torque converter then, through the input shaft to the multiple disc clutches in the transmission. The power flow depends on the application of the clutches and bands. Refer to "Clutch Engagement and Band Application Chart." Refer to Page 25.

The A-727-B TorqueFlite Transmission servicing procedures are in general the same for all models. However, when a "Hi-Performance" engine is used, several parts are different due to high performance of the vehicle.

The special parts are listed in the 1966 Parts Catalog; therefore, be sure they are used when replacement is necessary.

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HYDRAULIC CONTROL SYSTEM

The hydraulic control circuits on pages 17 through 24 show the position of the various valves with color coded passages to indicate those under hydraulic pressure for all operations of the transmission.

The hydraulic control system makes the transmission fully automatic, and has four important functions to perform. In a general way, the components of any automatic control system may be grouped into the following basic groups:

The pressure supply system, the pressure regulating valves, the flow control valves, and the clutches and band servos.

Taking each of these basic groups or systems in turn, the control system may be described as follows:

Pressure Supply System

The pressure supply system consists of an oil pump driven by the engine through the torque converter. The single front pump furnishes pressure for all the hydraulic and lubrication requirements.

Pressure Regulating Valves

The pressure regulating valves consist of a regulator valve which controls line pressure at a value dependent on throttle opening.

The torque converter control valve maintains torque converter operating pressure and transmission lubricating pressure.

The governor valve transmits regulated pressure to the transmission (in conjunction with throttle pressure) to control upshift and downshift speeds.

The throttle valve transmits regulated pressure to the transmission (in conjunction with governor pressure) to control upshift and downshift speeds.

Flow Control Valves

The manual valve obtains the different transmission drive ranges as selected by the vehicle operator.

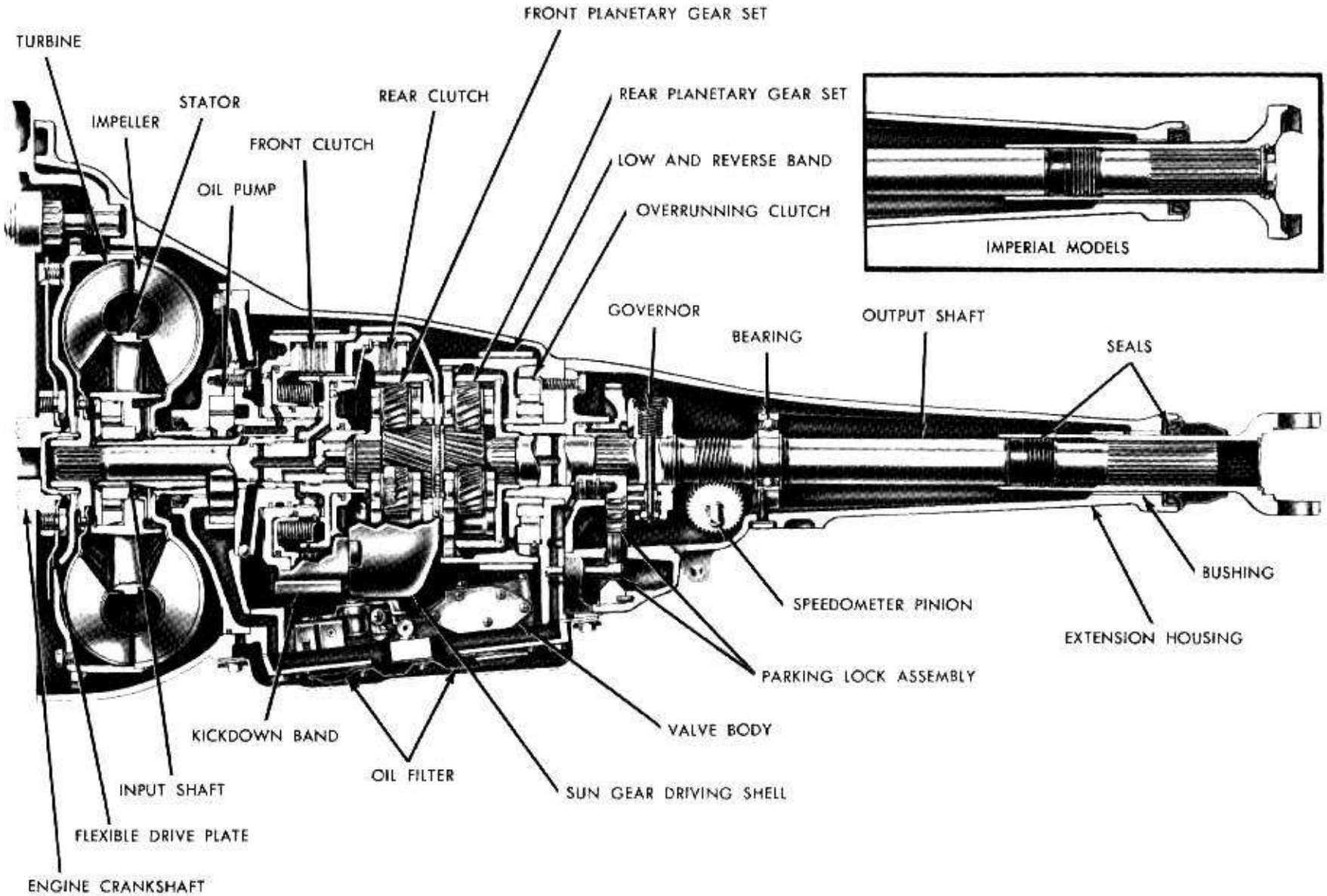
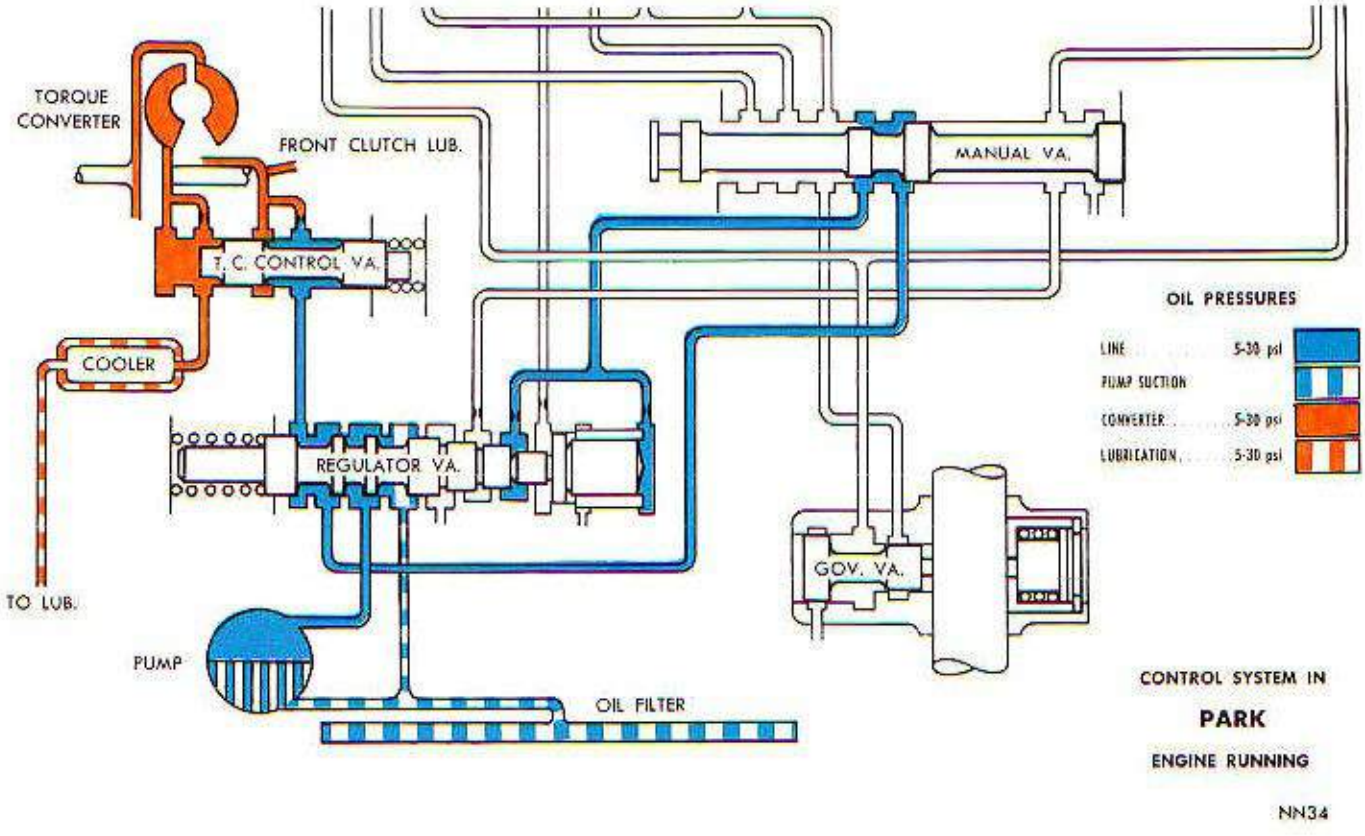
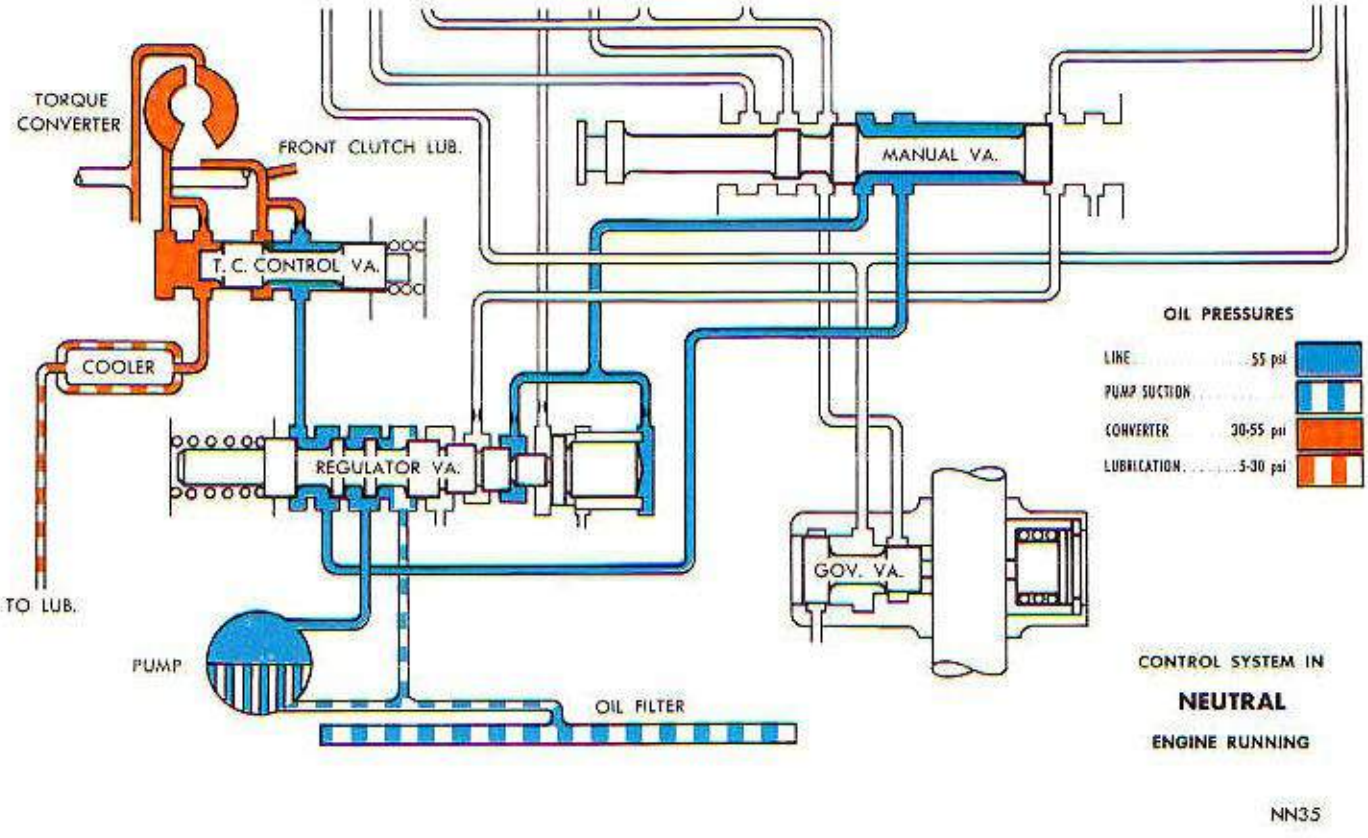


Fig. 1—TorqueFlite Transmission and Converter

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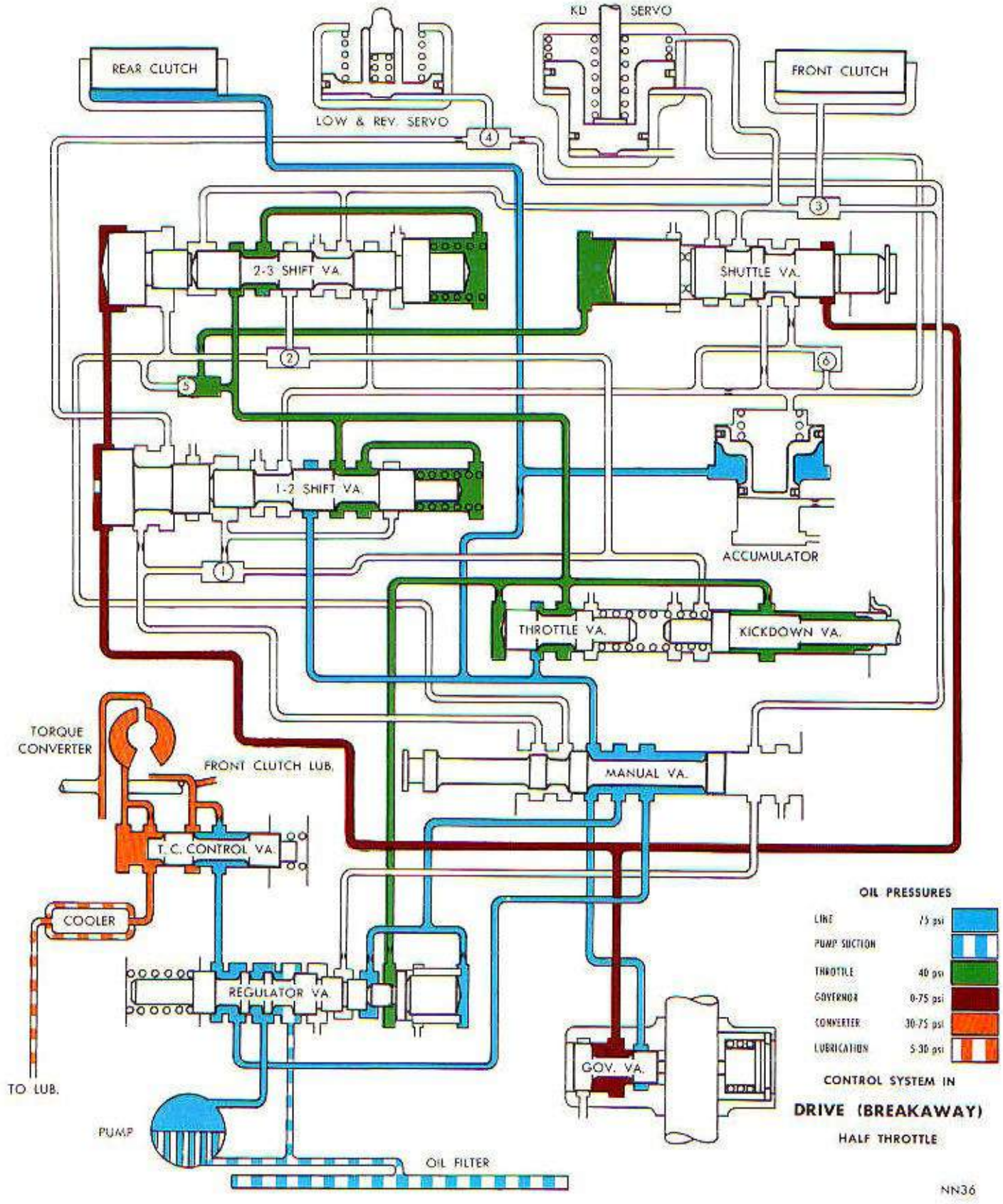


Park Hydraulic Circuits



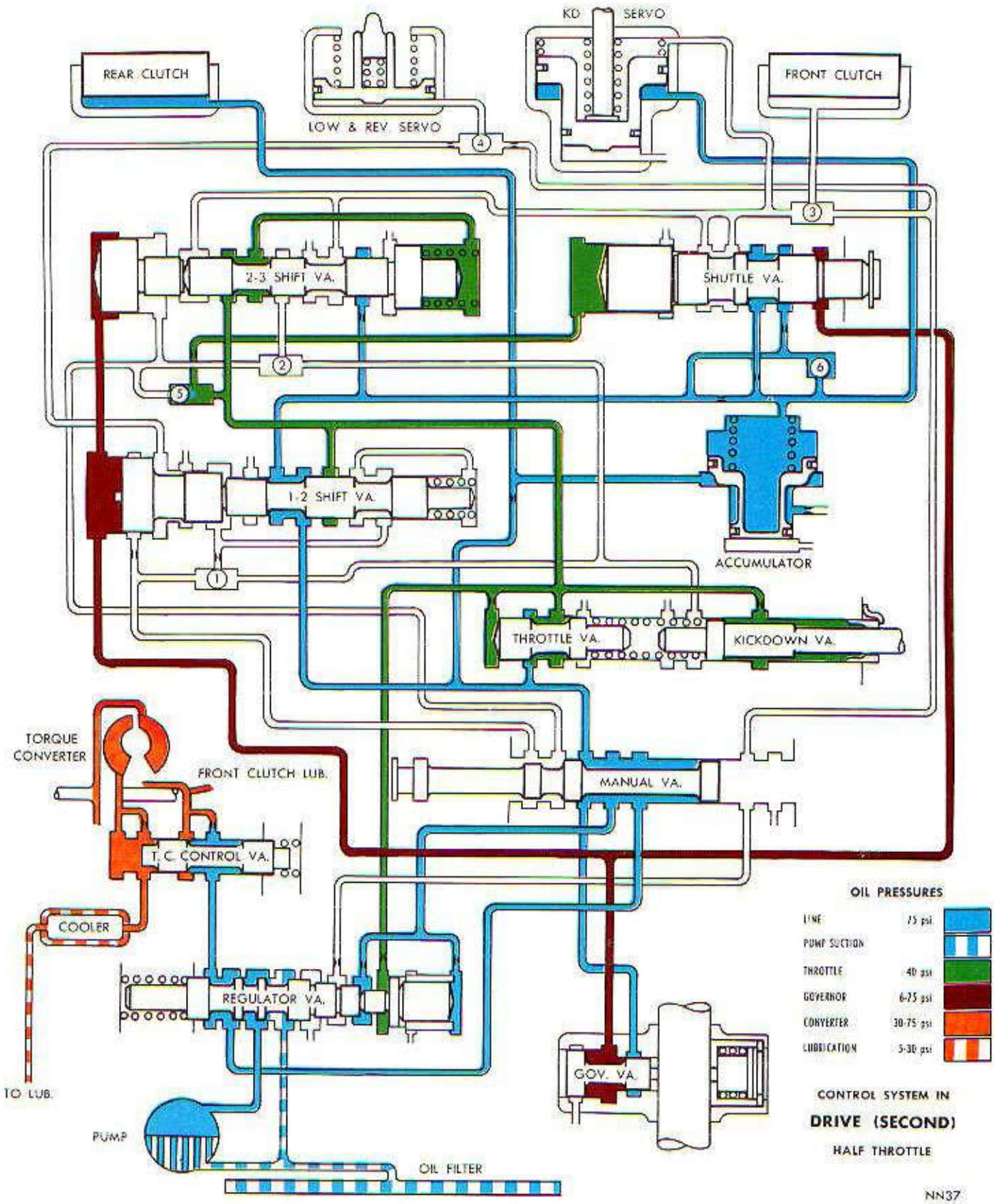
Neutral Hydraulic Circuits

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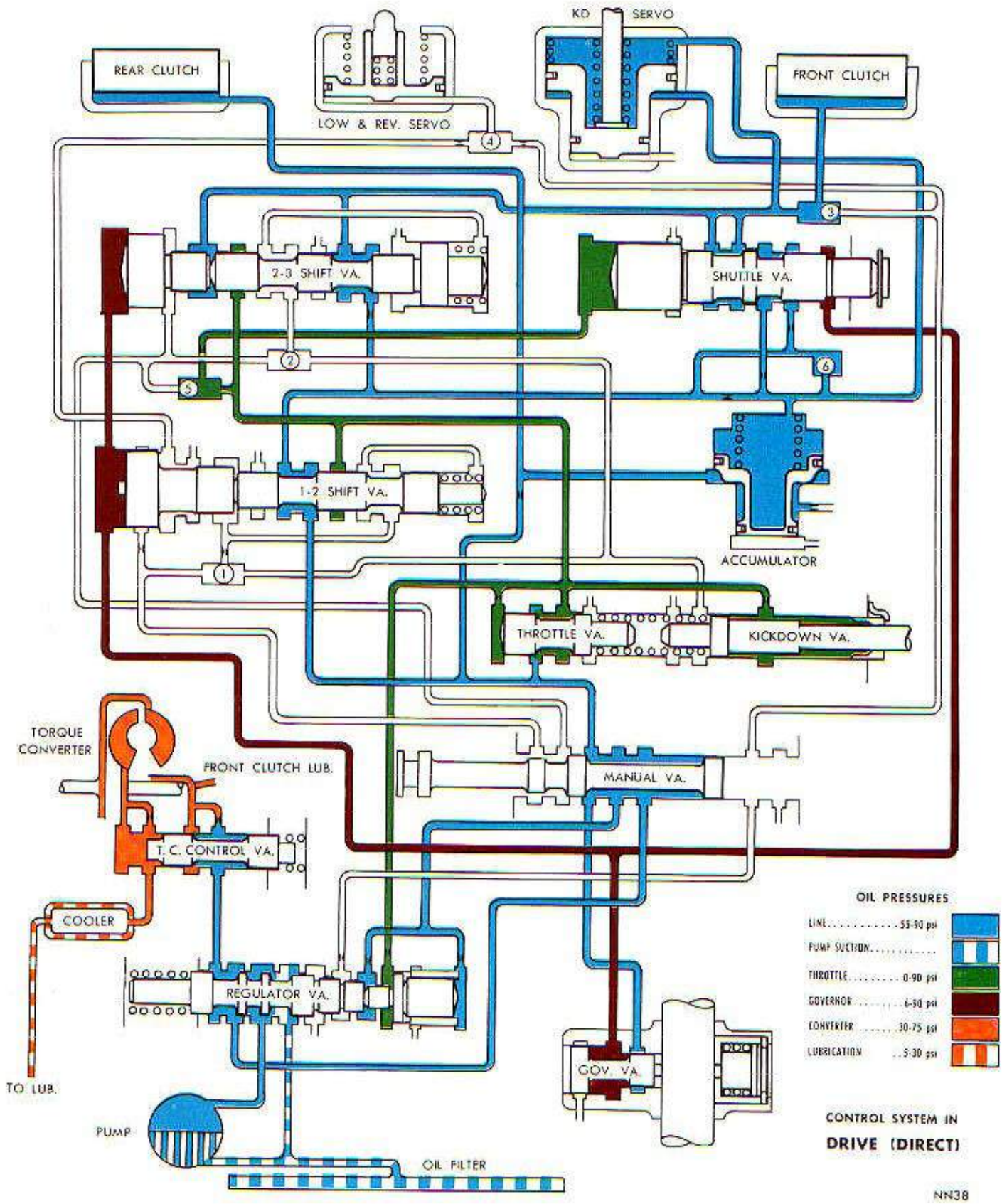
Drive-Breakaway Hydraulic Circuits

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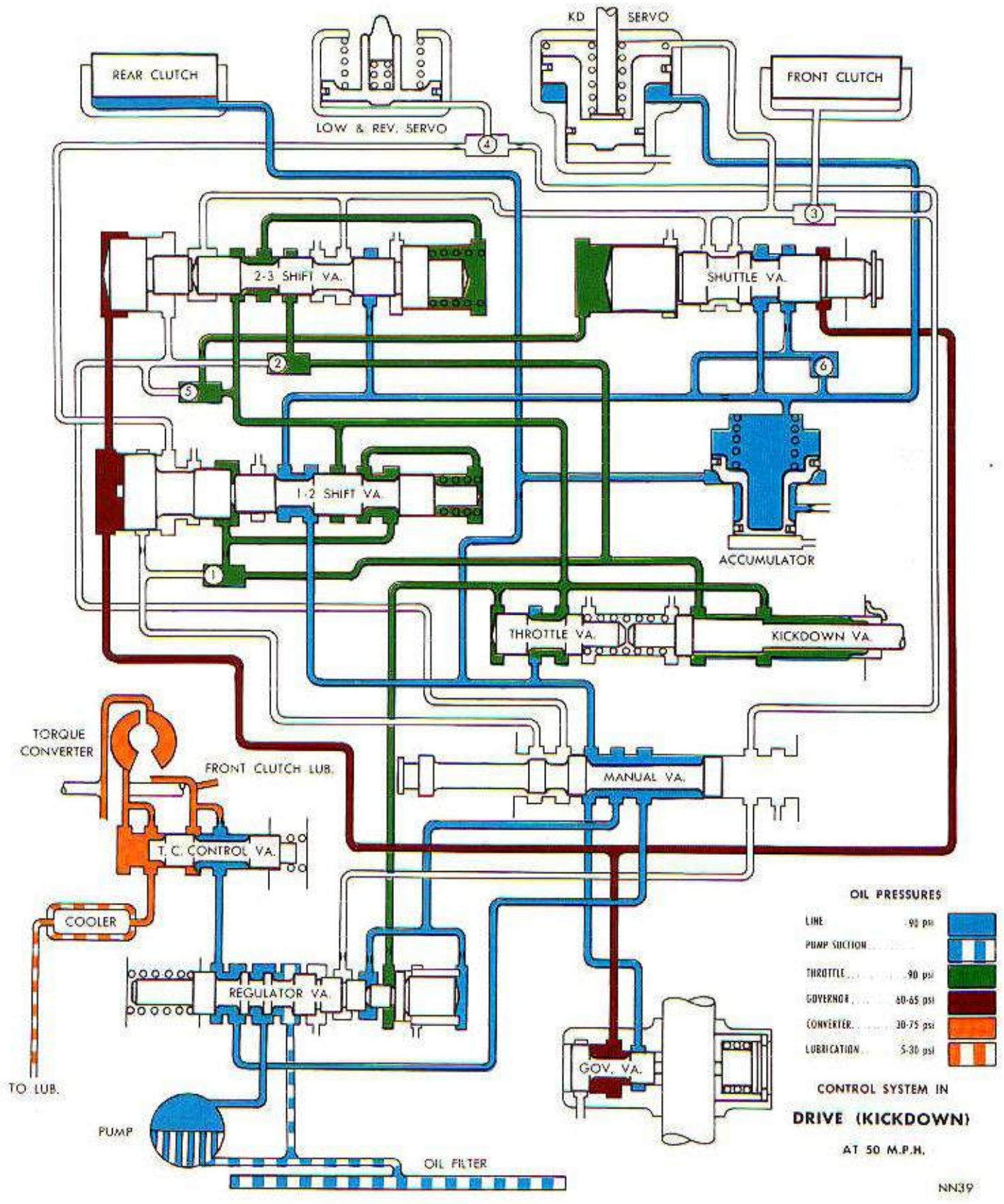
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Drive—Second Hydraulic Circuits



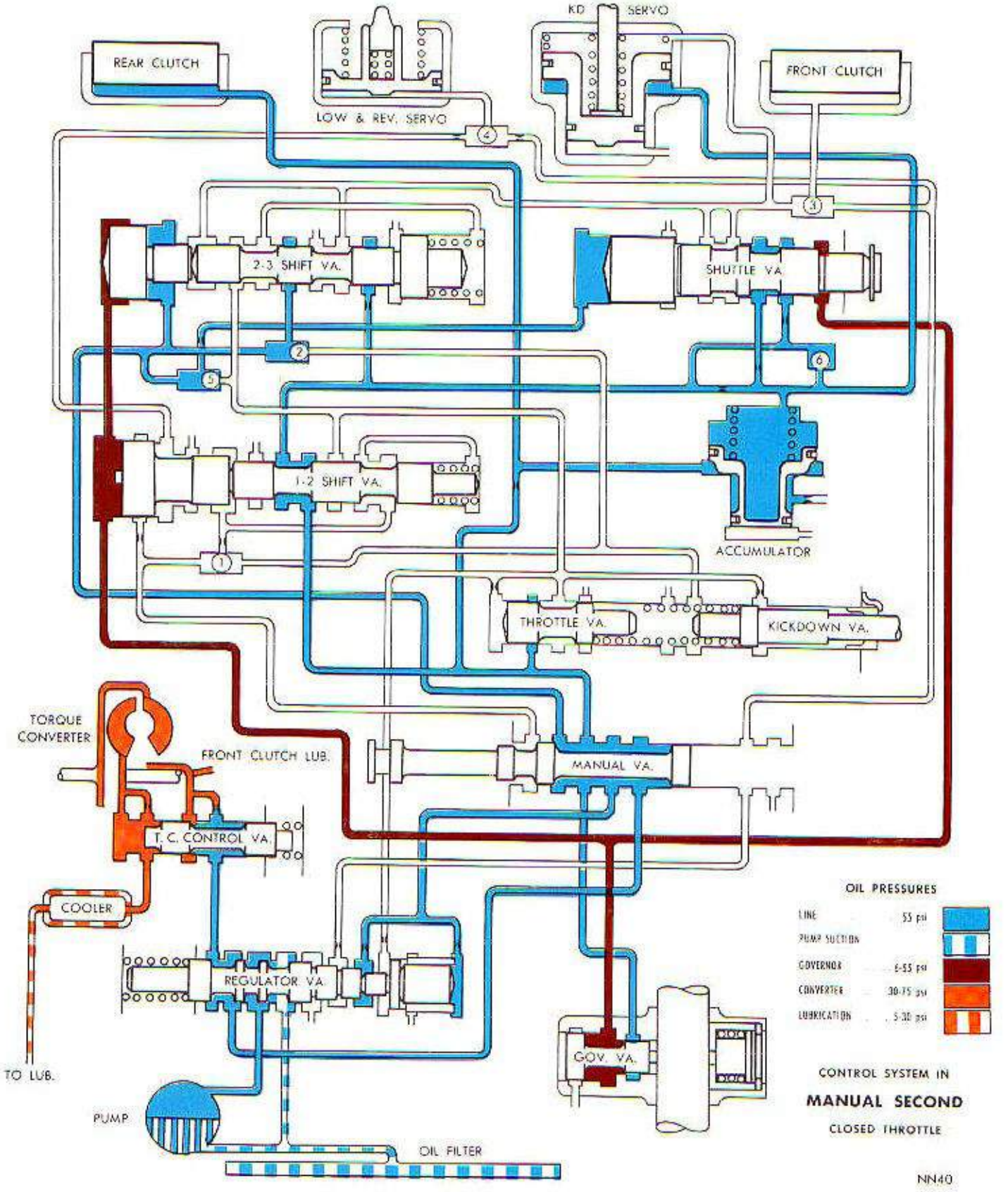
Drive—Direct Hydraulic Circuits

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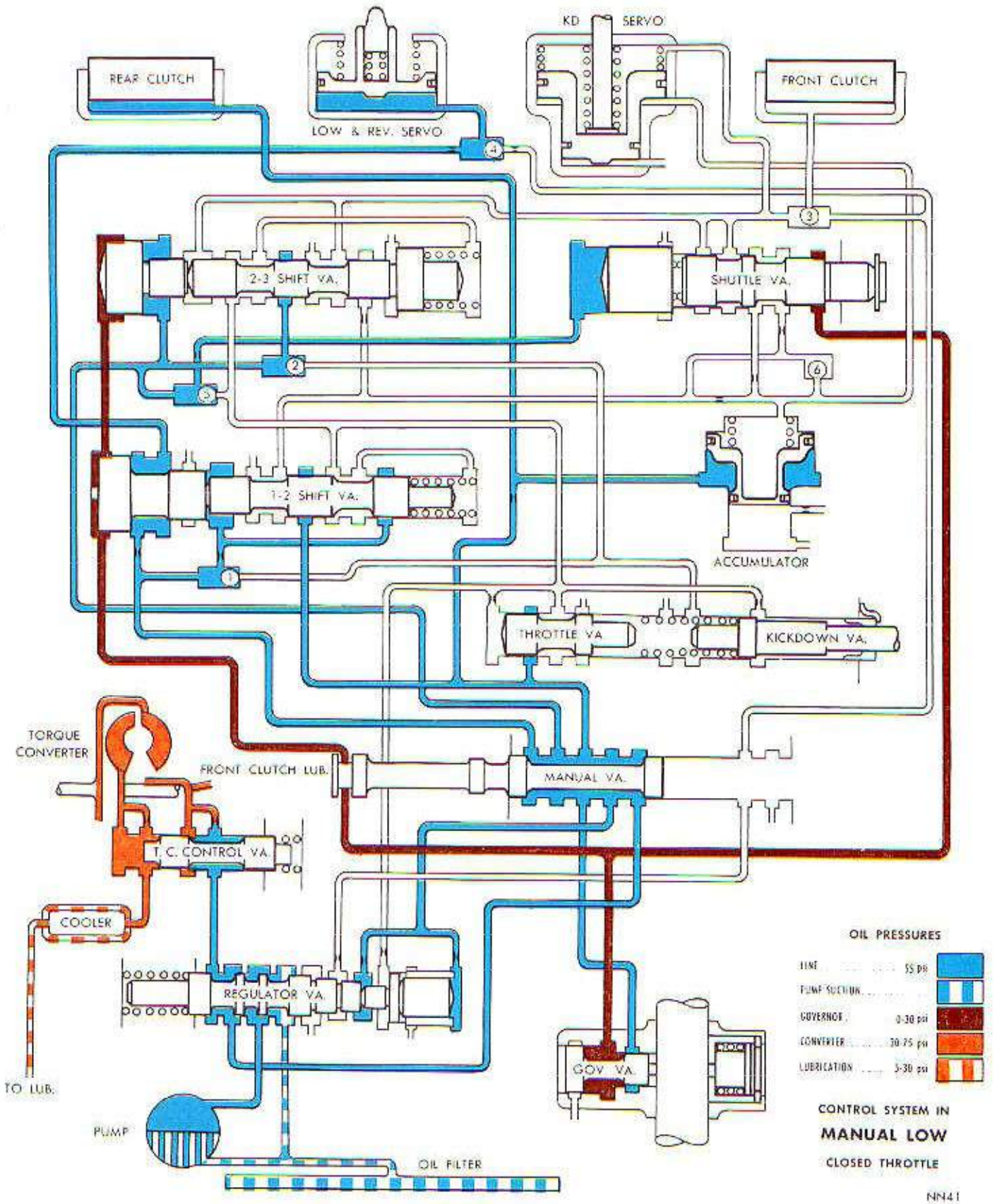
Drive—Kickdown Hydraulic Circuits

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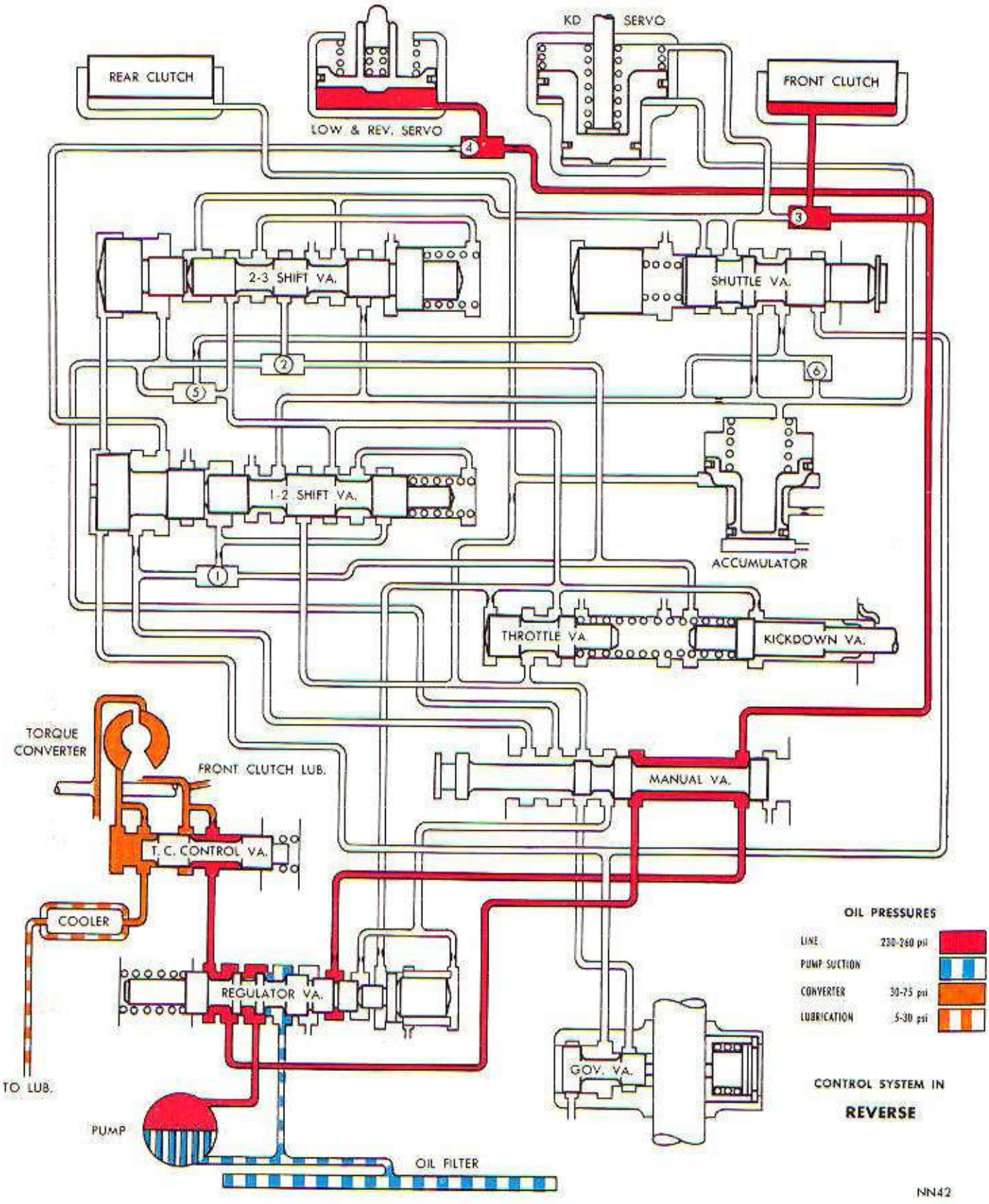
Selector Lever Second—Hydraulic Circuits

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Selector Lever Low—Hydraulic Circuits

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Reverse Hydraulic Circuits

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CLUTCH ENGAGEMENT AND BAND APPLICATION CHART

LEVER POSITION DRIVE-RATIO	FRONT CLUTCH	REAR CLUTCH	FRONT (KICKDOWN) BAND	REAR (LOW-REV) BAND	OVERRUNNING CLUTCH
N-NEUTRAL	DISENGAGED	DISENGAGED	RELEASED	RELEASED	NO MOVEMENT
D-DRIVE (Breakaway) 2.45 to 1	DISENGAGED	ENGAGED	RELEASED	RELEASED	HOLDS
(Second) 1.45 to 1	DISENGAGED	ENGAGED	APPLIED	RELEASED	OVER RUNS
(Direct) 1.00 to 1	ENGAGED	ENGAGED	RELEASED	RELEASED	OVER RUNS
KICKDOWN (To Second) 1.45 to 1	DISENGAGED	ENGAGED	APPLIED	RELEASED	OVER RUNS
(To Low) 2.45 to 1	DISENGAGED	ENGAGED	RELEASED	RELEASED	HOLDS
2-Second 1.45 to 1	DISENGAGED	ENGAGED	APPLIED	RELEASED	OVER RUNS
1-LOW 2.45 to 1	DISENGAGED	ENGAGED	RELEASED	APPLIED	PARTIAL HOLD
R-REVERSE 2.20 to 1	ENGAGED	DISENGAGED	RELEASED	APPLIED	NO MOVEMENT

The 1-2 shift valve automatically shifts the transmission from low to second or from second to low depending on the vehicle operation.

The 2-3 shift valve automatically shifts the transmission from second to direct or from direct to second depending on the vehicle operation.

The kickdown valve makes possible a forced downshift from direct to second-second to breakaway or direct to breakaway (depending on vehicle speed) by depressing the accelerator pedal past the detent "feel" near wide open throttle.

The shuttle valve has two separate functions and performs each independently of each other. The first is that of providing fast release of the kickdown band, and smooth front clutch engagement when the driver makes a "lift-foot" upshift from second to direct. The second function of the shuttle valve is to regulate the application of the kickdown servo and band when making direct to second kickdowns.

Clutches, Band Servos and Accumulator

The front and rear clutch pistons, and both servo pistons are moved hydraulically to engage the clutches and apply the bands. The pistons are released by spring tension when hydraulic pressure is released. On the 2-3 upshift, the kickdown servo piston is released by spring tension and hydraulic pressure.

The accumulator controls the hydraulic pressure on the apply side of the kickdown servo during the 1-2 shift; thereby, cushioning the kickdown band application at any throttle position.

GEARSHIFT AND PARKING LOCK CONTROLS

The transmission is controlled by a "lever type" gearshift incorporated within the steering column. The control has six selector lever positions: P (park), R (reverse), N (neutral), D (drive), 2 (second) and 1 (low). Some vehicles are equipped with a "lever type" console gearshift which has the same selector lever positions. The parking lock is applied by moving the selector lever past a gate to the P position.

CAUTION: Never apply the parking lock until the vehicle has stopped; otherwise, a severe ratcheting noise will occur.

OPERATING INSTRUCTIONS

The transmission will automatically upshift and downshift at approximately the miles per hour given in the Shift Pattern Summary Chart. **All shift speeds given in the "Shift Pattern Summary Chart" Page 26 may vary somewhat due to production tolerances and rear axle ratios. This is not too important; however, the quality of the shifts is very important. All shifts should be smooth, responsive, and with no noticeable engine runaway.**

Starting Engine

The engine will start with the selector lever in either the P (park) or N (neutral) positions.

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SHIFT PATTERN SUMMARY CHART

Condition	CAR SPEED TO AXLE RATIOS Newport 2.76:1	300 3.23:1	New Yorker 3.23:1	Imperial 2.93:1
Closed Throttle 1-2 Upshift	8-14	7-12	7-12	8-14
Closed Throttle 2-3 Upshift	13-19	11-16	11-16	13-19
Wide Open Throttle 1-2 Upshift	31-45	27-39	27-39	32-45
Wide Open Throttle 2-3 Upshift	69-81	60-71	60-71	69-82
3-2 Kickdown Limit	59-72	51-63	51-63	59-73
3-1 Kickdown Limit	30-39	26-34	26-34	30-39
Closed Throttle Downshift	5-13	4-11	4-11	5-13

(1) As a safety precaution when starting in the N (neutral) position, apply the parking or foot brake.

(2) Depress the accelerator pedal one-third of travel to insure proper choke operation.

(3) Turn the ignition key all the way to the right to START position. When the engine starts, release the key and it will return to the ON position.

NOTE: The TorqueFlite transmissions used on 1966 model vehicles will not permit starting the engine by pushing or towing.

Mountain Driving

When driving in the mountains with either heavy loads or when pulling trailers, the 2 (second) or 1 (low) position should be selected on upgrades which requires heavy throttle for ½ mile or more. Lower ratios reduces the possibility of overheating the transmission and converter under these conditions. 1 (low) position is for severe operation or to obtain better control.

TOWING VEHICLE

Transmission Inoperative: Tow the vehicle with a rear end pickup or remove the propeller shaft.

Transmission Operating Properly: The vehicle may be towed safely in N (neutral) with rear wheels on the ground at a speed not to exceed 30 mph. **If the vehicle is to be towed for extended distances, it should be done with a rear end pickup or the propeller shaft removed.** Because the transmission receives lubrication only when the engine is running, it is good practice to always tow a disabled vehicle with a rear end pickup or remove the propeller shaft.

SERVICE DIAGNOSIS

The transmission should not be removed nor disassembled until a careful diagnosis is made, the definite cause determined and all possible external corrections performed. In diagnosing any abnormal shift condition, always make the hydraulic pressure tests before disassembly or replacement of parts.

Condition	Possible Cause	Correction
HARSH ENGAGEMENT IN D, 1, 2 AND R	(a) Engine idle speed too high.	(a) Adjust the engine idle speed to 500 rpm. Re-adjust throttle linkage.
	(b) Hydraulic pressures too high or low.	(b) Inspect the fluid level, then perform hydraulic pressure tests and adjust to specifications.
	(c) Low-reverse band out of adjustment.	(c) Adjust the low-reverse band.
	(d) Valve body malfunction or leakage.	(d) Perform pressure tests to determine cause and correct as required.
	(e) Accumulator sticking, broken rings or spring.	(e) Inspect the accumulator for sticking, broken rings or spring. Repair as required.
	(f) Low-reverse servo, band or linkage malfunction.	(f) Inspect the servo for damaged seals, binding linkage of faulty band lining. Repair as required.
	(g) Worn or faulty front and/or rear clutch.	(g) Disassemble and inspect clutch. Repair or replace as required.
DELAYED ENGAGEMENT IN D, 1, 2 AND R	(a) Low fluid level.	(a) Refill to correct level with Automatic Transmission Fluid, AQ-ATF, Suffix A.
	(b) Incorrect gearshift control linkage adjustment.	(b) Adjust the control linkage.
	(c) Oil filter clogged.	(c) Replace the oil filter.

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Condition	Possible Cause	Correction
	(d) Hydraulic pressures too high or low.	(d) Perform the hydraulic pressure tests and adjust to specifications.
	(e) Valve body malfunction or leakage.	(e) Perform pressure tests to determine cause and correct as required.
	(f) Accumulator sticking, broken rings or spring.	(f) Inspect the accumulator for sticking, broken rings or spring. Repair as required.
	(g) Clutches or servos sticking or not operating.	(g) Remove the valve body assembly and perform air pressure tests. Repair as required.
	(h) Faulty oil pump.	(h) Perform the hydraulic pressure tests. Adjust or repair as required.
	(i) Worn or faulty front and/or rear clutch.	(i) Disassemble and inspect clutch. Repair or replace as required.
	(j) Worn or broken input shaft and/or reaction shaft support seal rings.	(j) Inspect and replace seal rings as required, also inspect respective bores for wear. Replace the parts as required.
	(k) Aerated fluid.	(k) Inspect for air leakage into the oil pump suction passages.
RUNAWAY OR HARSH UPSHIFT AND 3-2 KICKDOWN	(a) Low fluid level.	(a) Refill to correct level with Automatic Transmission Fluid, AQ-ATF, Suffix A.
	(b) Incorrect throttle linkage adjustment.	(b) Adjust the throttle linkage.
	(c) Hydraulic pressures too high or low.	(c) Perform the hydraulic pressure tests and adjust to specifications.
	(d) Kickdown band out of adjustment.	(d) Adjust the kickdown band.
	(e) Valve body malfunction or leakage.	(e) Perform pressure tests to determine cause and correct as required.
	(f) Governor malfunction.	(f) Inspect the governor and repair as required.
	(g) Accumulator sticking, broken rings or spring.	(g) Inspect the accumulator for sticking, broken rings or spring. Repair as required.
	(h) Clutches or servos sticking or not operating.	(h) Remove the valve body assembly and perform the air pressure tests. Repair as required.
	(i) Kickdown servo, band or linkage malfunction.	(i) Inspect the servo for sticking, broken seal rings, binding linkage or faulty band lining. Repair as required.
	(j) Worn or faulty front clutch.	(j) Disassemble and inspect the clutch. Repair or replace as required.
	(k) Worn or broken input shaft and/or reaction shaft support seal rings.	(k) Inspect and replace seal rings as required, also inspect the respective bores for wear. Replace parts as required.
NO UPSHIFT	(a) Low fluid level.	(a) Refill to correct level with Automatic Transmission Fluid, AQ-ATF, Suffix A.
	(b) Incorrect throttle linkage adjustment.	(b) Adjust the throttle linkage.
	(c) Kickdown band out of adjustment.	(c) Adjust the kickdown band.
	(d) Hydraulic pressures too high or low.	(d) Perform the hydraulic pressure tests and adjust to specifications.
	(e) Governor sticking.	(e) Remove and clean the governor. Replace parts if necessary.
	(f) Valve body malfunction or leakage.	(f) Perform pressure tests to determine cause and correct as required.
	(g) Accumulator sticking, broken rings or spring.	(g) Inspect accumulator for sticking, broken rings or spring. Repair as required.
	(h) Clutches or servos sticking or not operating.	(h) Remove the valve body assembly and perform the air pressure tests. Repair as required.

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Condition	Possible Cause	Correction
	(i) Faulty oil pump.	(i) Perform the hydraulic pressure tests, adjust or repair as required.
	(j) Kickdown servo, band or linkage malfunction.	(j) Inspect the servo for sticking, broken seal rings, binding linkage or faulty band lining. Repair as required.
	(k) Worn or faulty front clutch.	(k) Disassemble and inspect clutch. Repair or replace as required.
	(l) Worn or broken input shaft and/or reaction shaft support seal rings.	(l) Inspect and replace the seal rings as required, also inspect the respective bores for wear. Replace parts as required.
NO KICKDOWN OR NORMAL DOWNSHIFT	(a) Incorrect throttle linkage adjustment.	(a) Adjust the throttle linkage.
	(b) Incorrect gearshift control linkage adjustment.	(b) Adjust the control linkage.
	(c) Kickdown band out of adjustment.	(c) Adjust the kickdown band.
	(d) Hydraulic pressures too high or low.	(d) Perform the hydraulic pressure tests and adjust to specifications.
	(e) Governor sticking.	(e) Remove and clean the governor. Replace parts if necessary.
	(f) Valve body malfunction or leakage.	(f) Perform pressure tests to determine cause and correct as required.
	(g) Accumulator sticking, broken rings or spring.	(g) Inspect the accumulator for sticking, broken rings or spring. Repair as required.
	(h) Clutches or servos sticking or not operating.	(h) Remove the valve body assembly and perform the air pressure tests. Repair as required.
	(i) Kickdown servo, band or linkage malfunction.	(i) Inspect the servo for sticking, broken seal rings, binding linkage or faulty band lining. Repair as required.
	(j) Overrunning clutch not holding.	(j) Disassemble the transmission and repair the overrunning clutch as required.
SHIFTS ERRATIC	(a) Low fluid level.	(a) Refill to the correct level with Automatic Transmission Fluid, AQ-ATF, Suffix A.
	(b) Aerated fluid.	(b) Inspect for air leakage into the oil pump suction passages.
	(c) Incorrect throttle linkage adjustment.	(c) Adjust the throttle linkage.
	(d) Incorrect gearshift control linkage adjustment.	(d) Adjust the control linkage.
	(e) Hydraulic pressures too high or low.	(e) Perform the hydraulic pressure tests and adjust to specifications.
	(f) Governor sticking.	(f) Remove and clean the governor. Replace parts if necessary.
	(g) Oil filter clogged.	(g) Replace the oil filter.
	(h) Valve body malfunction or leakage.	(h) Perform pressure tests to determine cause and correct as required.
	(i) Clutches or servos sticking or not operating.	(i) Remove the valve body assembly and perform air pressure tests. Repair as required.
	(j) Faulty oil pump.	(j) Perform the hydraulic pressure tests, adjust or repair as required.
	(k) Worn or broken input shaft and/or reaction shaft support seal rings.	(k) Inspect and replace the seal rings as required, also inspect respective bores for wear. Replace the parts as required.
SLIPS IN FORWARD DRIVE POSITIONS	(a) Low fluid level.	(a) Refill to the correct level with Automatic Transmission Fluid, AQ-ATF, Suffix A.
	(b) Aerated fluid.	(b) Inspect for air leakage into the oil pump suction passages.
	(c) Incorrect throttle linkage adjustment.	(c) Adjust the throttle linkage.

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Condition	Possible Cause	Correction
	(d) Incorrect gearshift control linkage adjustment.	(d) Adjust the control linkage.
	(e) Hydraulic pressures too low.	(e) Perform the hydraulic pressure tests and adjust to specifications.
	(f) Valve body malfunction or leakage.	(f) Perform pressure tests to determine cause and correct as required.
	(g) Accumulator sticking, broken rings or spring.	(g) Inspect the accumulator for sticking, broken rings or spring. Repair as required.
	(h) Clutches or servos sticking or not operating.	(h) Remove the valve body assembly and perform air pressure tests. Repair as required.
	(i) Worn or faulty front and/or rear clutch.	(i) Disassemble and inspect clutch. Repair or replace as required.
	(j) Overrunning clutch not holding.	(j) Disassemble the transmission and repair the overrunning clutch as required.
	(k) Worn or broken input shaft and/or reaction shaft support seal rings.	(k) Inspect and replace the seal rings as required, also inspect the respective bores for wear. Replace parts as required.
SLIPS IN REVERSE ONLY	(a) Low fluid level.	(a) Refill to correct level with Automatic Transmission Fluid, AQ-ATF, Suffix A.
	(b) Aerated fluid.	(b) Inspect for air leakage into oil pump suction passages.
	(c) Incorrect gearshift control linkage adjustment.	(c) Adjust the control linkage.
	(d) Hydraulic pressures too high or low.	(d) Perform the hydraulic pressure tests and adjust to specifications.
	(e) Low-reverse band out of adjustment.	(e) Adjust the low-reverse band.
	(f) Valve body malfunction or leakage.	(f) Perform pressure tests to determine cause and correct as required.
	(g) Front clutch or rear servo, sticking or not operating.	(g) Remove the valve body assembly and perform air pressure tests. Repair as required.
	(h) Low-reverse servo, band or linkage malfunction.	(h) Inspect the servo for damaged seals, binding linkage or faulty band lining. Repair as required.
	(i) Faulty oil pump.	(i) Perform the hydraulic pressure tests, adjust or repair as required.
SLIPS IN ALL POSITIONS	(a) Low fluid level.	(a) Refill to the correct level with Automatic Transmission Fluid, AQ-ATF, Suffix A.
	(b) Hydraulic pressures too low.	(b) Perform the hydraulic pressure tests and adjust to specifications.
	(c) Valve body malfunction or leakage.	(c) Perform pressure tests to determine cause and correct as required.
	(d) Faulty oil pump.	(d) Perform the hydraulic pressure tests, adjust or replace as required.
	(e) Clutches or servos sticking or not operating.	(e) Remove the valve body assembly and perform air pressure tests. Repair as required.
	(f) Worn or broken input shaft and/or reaction shaft support seal rings.	(f) Inspect and replace the seal rings as required, also inspect respective bores for wear. Replace the parts as required.
NO DRIVE IN ANY POSITION	(a) Low fluid level.	(a) Refill to the correct level with Automatic Transmission Fluid, AQ-ATF, Suffix A.
	(b) Hydraulic pressures too low.	(b) Perform the hydraulic pressure tests and adjust to specifications.
	(c) Oil filter clogged.	(c) Replace the oil filter.

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Condition	Possible Cause	Correction
	(d) Valve body malfunction or leakage.	(d) Perform pressure tests to determine cause and correct as required.
	(e) Faulty oil pump.	(e) Perform the hydraulic pressure tests, adjust or repair as required.
	(f) Clutches or servos sticking or not operating.	(f) Remove the valve body assembly and perform air pressure tests. Repair as required.
NO DRIVE IN FORWARD DRIVE POSITIONS	(a) Hydraulic pressures too low.	(a) Perform the hydraulic pressure tests and adjust to specifications.
	(b) Valve body malfunction or leakage.	(b) Perform pressure tests to determine cause and correct as required.
	(c) Accumulator sticking, broken rings or spring.	(c) Inspect the accumulator for sticking, broken rings or spring. Repair as required.
	(d) Clutches or servos, sticking or not operating.	(d) Remove the valve body assembly and perform air pressure tests. Repair as required.
	(e) Worn or faulty rear clutch.	(e) Disassemble and inspect clutch. Repair or replace as required.
	(f) Overrunning clutch not holding.	(f) Disassemble the transmission and repair overrunning clutch as required.
	(g) Worn or broken input shaft and/or reaction shaft support seal rings.	(g) Inspect and replace the seal rings as required, also inspect the respective bores for wear. Replace parts as required.
NO DRIVE IN REVERSE	(a) Incorrect gearshift control linkage adjustment.	(a) Adjust the control linkage.
	(b) Hydraulic pressures too low.	(b) Perform the hydraulic pressure tests and adjust to specifications.
	(c) Low-reverse band out of adjustment.	(c) Adjust the low-reverse band.
	(d) Valve body malfunction or leakage.	(d) Perform pressure tests to determine cause and correct as required.
	(e) Front clutch or rear servo, sticking or not operating.	(e) Remove the valve body assembly and perform air pressure tests. Repair as required.
	(f) Low-reverse servo, band or linkage malfunction.	(f) Inspect the servo for damaged seals, binding linkage or faulty band lining. Repair as required.
	(g) Worn or faulty front clutch.	(g) Disassemble and inspect clutch. Repair or replace as required.
DRIVES IN NEUTRAL	(a) Incorrect gearshift control linkage adjustment.	(a) Adjust the control linkage.
	(b) Valve body malfunction or leakage.	(b) Perform pressure tests to determine cause and correct as required.
	(c) Rear clutch inoperative.	(c) Inspect the clutch and repair as required.
DRAGS OR LOCKS	(a) Kickdown band out of adjustment.	(a) Adjust the kickdown band.
	(b) Low-reverse band out of adjustment.	(b) Adjust the low-reverse band.
	(c) Kickdown and/or low-reverse servo, band, linkage malfunction.	(c) Inspect the servo for sticking, broken seal rings, binding linkage or faulty band lining. Repair as required.
	(d) Front and/or rear clutch faulty.	(d) Disassemble and inspect clutch. Repair or replace as required.
	(e) Planetary gear sets broken or seized.	(e) Inspect the condition of the planetary gear sets and replace as required.
	(f) Overrunning clutch worn, broken or seized.	(f) Inspect the condition of the overrunning clutch and replace parts as required.

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Condition	Possible Cause	Correction
GRATING, SCRAPING GROWLING NOISE	(a) Kickdown band out of adjustment.	(a) Adjust the kickdown band.
	(b) Low-reverse band out of adjustment.	(b) Adjust the low-reverse band.
	(c) Output shaft bearing and/or bushing damaged.	(c) Remove the extension housing and replace the bearing and/or bushing.
	(d) Governor support binding or broken seal rings.	(d) Inspect the condition of the governor support and repair as required.
	(e) Oil pump scored or binding.	(e) Inspect the condition of the pump and repair as required.
	(f) Front and/or rear clutch faulty.	(f) Disassemble and inspect clutch. Repair or replace as required.
	(g) Planetary gear sets broken or seized.	(g) Inspect the condition of the planetary gear sets and replace as required.
	(h) Overrunning clutch worn, broken or seized.	(h) Inspect the condition of overrunning clutch and replace parts as required.
BUZZING NOISE	(a) Low fluid level.	(a) Refill to the correct level with Automatic Transmission Fluid, AQ-ATF, Suffix A.
	(b) Pump sucking air.	(b) Inspect the pump for nicks or burrs on mating surfaces, porous casting, and/or excessive rotor clearance. Replace the parts as required.
	(c) Valve body malfunction.	(c) Remove and recondition the valve body assembly.
	(d) Overrunning clutch inner race damaged.	(d) Inspect and repair the clutch as required.
HARD TO FILL, OIL FLOWS OUT FILLER TUBE	(a) High fluid level.	(a) Drain the fluid to the correct level.
	(b) Breather clogged.	(b) Inspect and clean breather vent opening in oil pump housing.
	(c) Oil filter clogged.	(c) Replace the oil filter.
	(d) Aerated fluid.	(d) Inspect for air leakage into oil pump suction passage.
TRANSMISSION OVERHEATS	(a) Low fluid level.	(a) Refill to the correct level with Automatic Transmission Fluid, AQ-ATF, Suffix A.
	(b) Kickdown band adjustment too tight.	(b) Adjust the kickdown band.
	(c) Low-reverse band adjustment too tight.	(c) Adjust the low-reverse band.
	(d) Faulty cooling system.	(d) Inspect the transmission cooling system, clean and repair as required.
	(e) Cracked or restricted oil cooler line or fitting.	(e) Inspect, repair or replace as required.
	(f) Faulty oil pump.	(f) Inspect the oil pump for incorrect clearance, repair as required.
	(g) Insufficient clutch plate clearance in front and/or rear clutches.	(g) Measure the clutch plate clearance and correct with the proper size snap ring.
STARTER WILL NOT ENERGIZE IN NEUTRAL OR PARK	(a) Incorrect gearshift control linkage adjustment.	(a) Adjust the control linkage.
	(b) Faulty or incorrectly adjusted neutral starting switch.	(b) Test the operation of the switch with a test lamp. Adjust or replace as required.
	(c) Broken lead to neutral switch.	(c) Inspect the lead and test with a test lamp. Repair the broken lead.

SERVICE PROCEDURES

SERVICE IN VEHICLE

Various transmission components can be removed for repairs without removing the transmission from vehicle. The removal, reconditioning and installation procedures for these components are covered here, except valve body reconditioning, which is described on Page 53.

IMPORTANT: All transmissions have the sliding spline type output shaft. Whenever the propeller

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HELI-COIL INSERT			DRILL	TAP	INSERTING TOOL	EXTRACTING TOOL
Thread Size	Part No.	Insert Length	Size	Part No.	Part No.	Part No.
10-24	1185-3	.285"	13/64" (.203")	3 CPB	528-3N	1227-6
¼-20	1185-4	⅜"	17/64" (.265")	4 CPB	528-4N	1227-6
5/16-18	1185-5	15/32"	Q (.332")	5 CPB	528-5N	1227-6
⅜-16	1185-6	9/16"	X (.397")	6 CPB	528-6N	1227-6
7/16-14	1185-7	21/32"	29/32" (.453")	7 CPB	528-7N	1227-16

shaft front sliding yoke is removed from the transmission, it should be cleaned and relubricated as outlined in Group "O" of this Manual.

ALUMINUM THREAD REPAIR

Damaged or worn threads in the aluminum transmission case and valve body can be repaired by the use of Heli-Coils. Essentially, this repair consists of drilling out the worn or damaged threads, tapping the hole with a special Heli-Coil Tap, and installing a Heli-Coil Insert into the tapped hole. This brings the hole back to its original thread size.

The above chart lists the threaded hole sizes which are used in the aluminum case and valve body, and the necessary tools and inserts for the repair of damaged or worn threads. Heli-Coil tools and inserts are readily available from most automotive parts jobbers.

Some thread drag may occur in screwing a bolt into the installed Heli-Coil insert. Therefore, a torque reading should be taken of the thread drag with an inch-pound torque wrench and added to the specified bolt torque, so that all bolts securing a particular part will be tightened to the same torque.

LUBRICATION

The transmission fluid and filter should provide satisfactory lubrication and protection to the automatic transmission and no change is recommended in vehicles used in normal service. Regularly scheduled fluid and filter changes, therefore will not be required, except when the operation of the vehicle is classified as severe.

Fluid Level

Inspect fluid level every six months with engine and transmission at normal operating temperature. Refer to "Lubrication and Maintenance", Group O. The transmission should not be idled in gear for long periods.

Trailer Towing Service and Hard Usage

If vehicle is used for trailer towing or is used in hard or severe service, more frequent servicing is required as outlined.

Drain and refill transmission and replace filter initially at 36,000 miles or 3 years and every 12,000 miles or 12 months thereafter.

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Drain and Refill

(1) Raise vehicle on a hoist. Place a drain container with a large opening, under the transmission oil pan.

(2) Loosen pan bolts, tap pan to break it loose allowing fluid to drain, then remove the oil pan.

(3) Remove access plate from in front of converter, remove drain plug allowing the fluid to drain (Fig. 2). Install and tighten converter drain plug to 14 foot-pounds, and install the access plate.

(4) If necessary, adjust the reverse band. Refer to Page 38.

(5) Install a new filter on bottom of the valve body, and tighten retaining screws to 28 inch-pounds.

(6) Clean the oil pan, and reinstall using a new gasket, Tighten pan bolts to 150 inch-pounds.

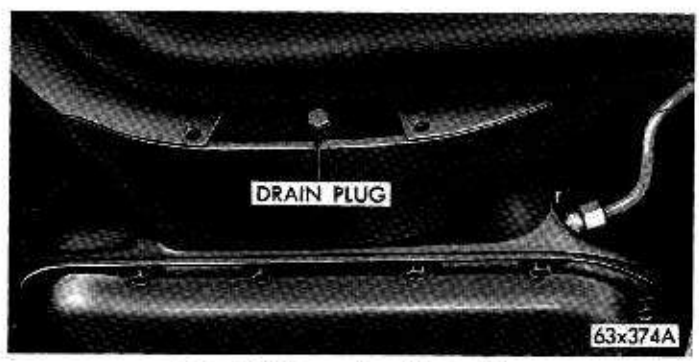


Fig. 2—Converter Drain Plug



Fig. 3—Dip Stick Markings

(7) Pour eight quarts of Automatic Transmission Fluid, AQ-ATF Suffix "A" into the transmission.

(8) Start engine and allow to idle for at least two minutes. With parking brake on, move selector lever momentarily to each position ending in the neutral position.

(9) Add sufficient fluid to bring fluid level to the "ADD ONE PINT" mark. (Approximately 2 quarts.)

(10) Recheck fluid level after transmission is at normal operating temperature. The level should be between the "FULL" mark and "ADD ONE PINT" mark (Fig. 3).

CAUTION: To prevent dirt from entering transmission, make certain that dip stick cap is fully seated onto the filler tube.

Periodic Adjustments

The following adjustments should be performed at 36,000 mile intervals or more frequent under abnormal operating conditions.

(1) Adjust the kickdown band. Refer to Page 38.

(2) Adjust the gearshift linkage. Refer to Page 36.

(3) Adjust the engine idle in neutral. Refer to the Fuel System, Group 14.

(4) Adjust transmission and carburetor throttle linkage to obtain proper shift pattern. Refer to Page 38.

STEERING COLUMN AND GEARSHIFT

Removal

(1) Disconnect negative (ground) cable from the battery.

(2) Disconnect shift linkage rod from lever at lower end of steering column.

(3) Remove heat shield from lower end of steering column. Drive roll pin out of the steering shaft to upper joint coupling.

(4) Disconnect turn signal and horn wires.

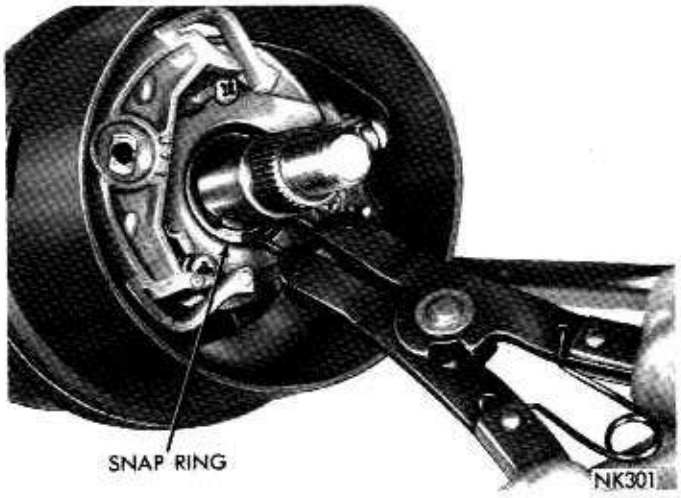


Fig. 4—Removing or Installing Steering Shaft Snap Ring

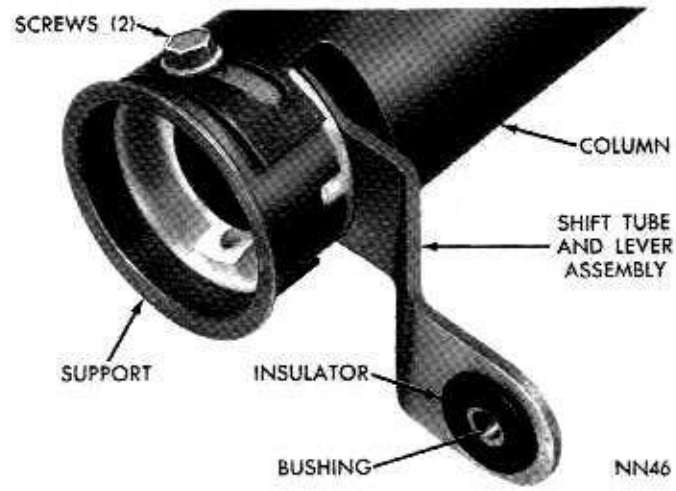


Fig. 5—Steering Column—Lower End

(5) Depress horn ring or horn ring ornament and rotate ¼ turn counterclockwise to remove. Disconnect horn wire at horn switch. Remove three screws and insulators, then remove horn ring and switch.

(6) Remove steering wheel retaining nut and washer. Remove steering wheel, using Tool C-3428A. Remove the turn signal lever.

(7) Remove floor plate to toe board attaching screws. Remove finish plate from under instrument panel to expose gearshift indicator link, and steering column bracket and clamp.

CAUTION: Be sure to disconnect gearshift indicator link or cable before removing steering column to instrument panel clamp.

(8) Remove screw that attaches gearshift indicator link (slotted end) to operating lever on the column.

Imperial Models: Remove one screw attaching gearshift indicator cable bracket to the column and disconnect cable loop from actuating lever pin. Move cable and bracket out of way to prevent it being damaged.

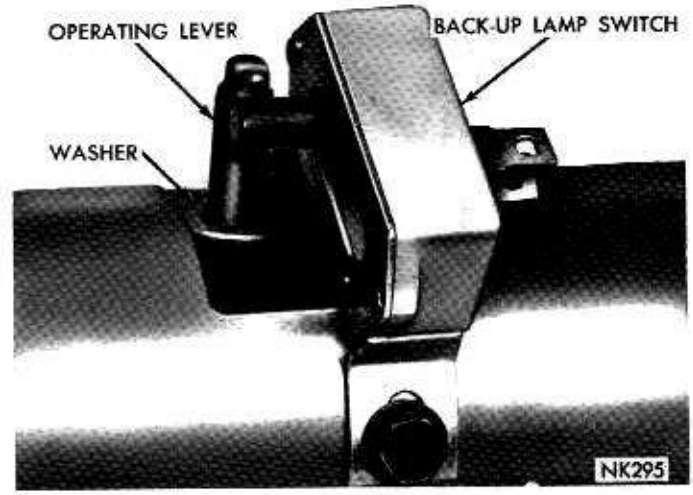


Fig. 6—Backup Light Switch and Operating Lever

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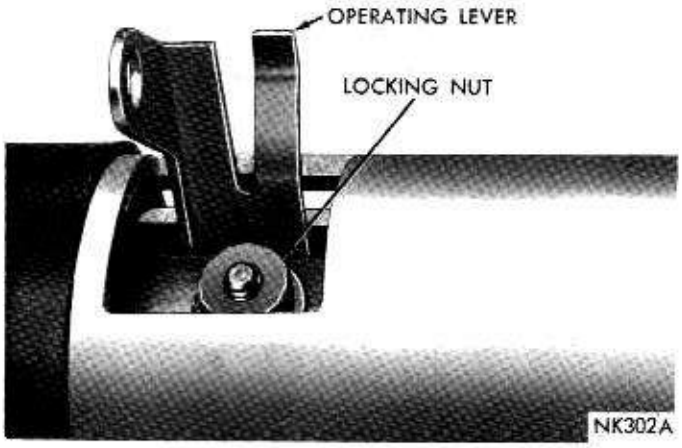


Fig. 7—Gearshift Indicator Operating Lever

Disassembly

(1) Remove snap ring from upper end of steering shaft. (Fig. 4).

(2) Tap steering shaft downward through upper column bearing, then remove shaft and lower bearing from the column.

(3) Remove two screws securing gearshift tube lever support in lower end of column (Fig. 5). Remove the support.

(4) Remove back-up lamp switch (Fig. 6). Lift washer off switch operating lever, then unsnap lever from the gearshift tube.

(5) Loosen locking nut on gearshift indicator operating lever, then slide lever out of slot in gearshift tube (Fig. 7).

(6) Support gearshift housing on a small socket, drive out roll pin and remove gearshift lever (Fig. 8).

(7) Remove turn signal switch retainer from bearing housing and lift switch upward out of way (Fig. 9). Remove four screws from inside bearing housing to separate it from shift lever gate. Slide gate out of the column jacket. If necessary, tap column bearing out of bearing housing.

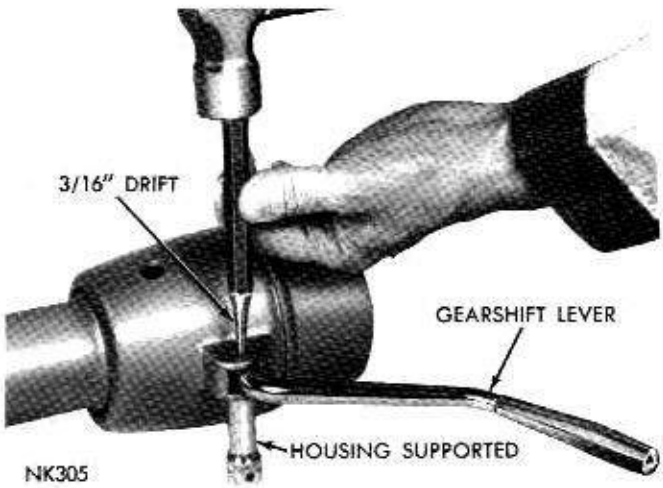


Fig. 8—Removing or Installing Gearshift Lever



Fig. 9—Disassembling or Assembling Upper End of Column

(8) Rotate gearshift housing to align opening with the lock screw (Fig. 10). Remove lock screw with an allen wrench, then carefully pull gearshift tube out of column jacket. If necessary, remove shift lever crossover spring load parts (Fig. 11).

(9) Remove floor plate assembly from the column jacket.

Inspection

After cleaning, inspect all parts for wear or damage. Note condition of bushing assembly in lower shift lever, shift lever gate and inner end of shift lever. Replace parts as required.

Inspect steering shaft bearings for smooth opera-

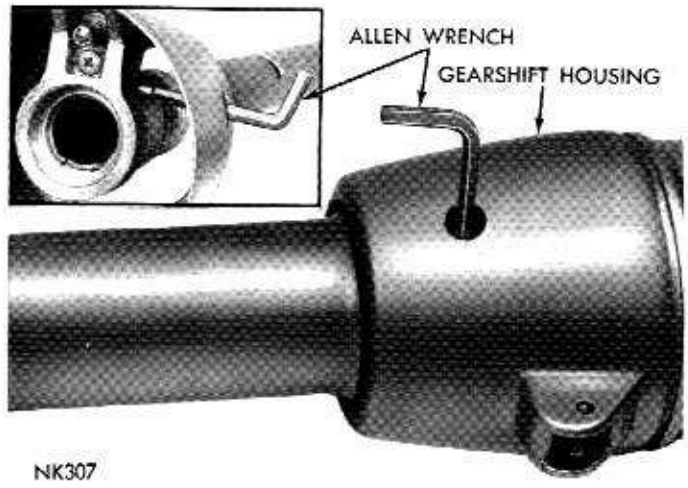


Fig. 10—Removing or Installing Gearshift Tube Lock Screw

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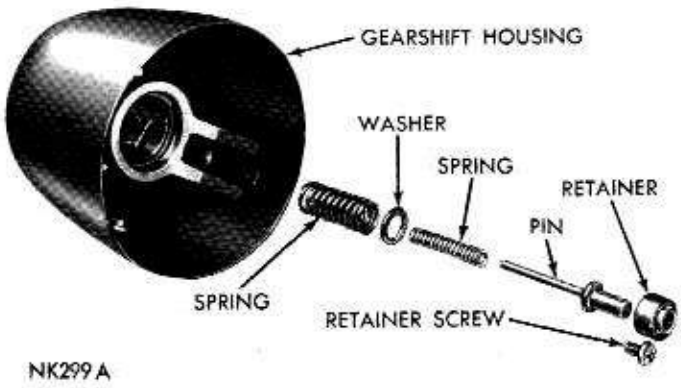


Fig. 11—Gearshift Housing—Disassembled

tion, and lubricate with Multi-Purpose Chassis Lubricant or similar lubricant. If bearing has any signs of roughness or wear, it should be replaced. Replacement bearings are pre-lubricated.

Assembly

(1) Lubricate floor plate O-ring with a soap solution or rubber lubricant and slide assembly on the steering column.

The floor plate assembly must be installed before installing shift tube and lever, since this cannot be done after shift tube and lever are in place in the steering column.

(2) Install shift lever crossover spring load parts in the gearshift housing (Fig. 11). Be sure all parts move freely in the bore, then install retaining screw.

(3) Install column upper bearing in bearing housing, make sure bearing is fully seated in the housing.

(4) With column jacket held upright, place gearshift and bearing housing on the jacket. Thread turn signal switch and horn wires through the two housings, down into column jacket and out through proper opening on side of the jacket.

(5) Raise bearing housing and slide shift lever gate into upper end of the column jacket (Fig. 9). Place four retaining screws in bearing housing (note screw lengths, Fig. 9). Lower bearing housing and progressively thread the screws into shift lever gate, then tighten screws securely.

(6) Slide spacer and felt washer on the gearshift tube. Insert gearshift tube into the column. Align upper end of the tube with gearshift housing and push tube firmly into the housing.

(7) Install gearshift tube lever support in lower end of column and start the two retaining screws (Fig. 5). Rotate support just enough to eliminate shift tube end play, then tighten screws to 30 inch-pounds.

(8) Rotate gearshift housing to align it so the lock screw can be installed with an allen wrench (Fig. 10). Tighten the screw securely.

(9) With gearshift housing in NEUTRAL position, insert gearshift lever. Support gearshift housing (Fig. 8) while driving shift lever roll pin into place.

(10) Position turn signal switch in bearing housing, install switch retainer plate, and secure with three screws.

(11) Place gearshift lever in NEUTRAL position and snap back-up lamp switch operating lever on lug provided on gearshift tube, slide washer down over lever to lock it in place (Fig. 6). Install and adjust switch so actuator arm is snug against operating lever, then tighten switch retaining screws.

(12) With gearshift lever in NEUTRAL position, slide gearshift indicator operating lever into slot provided in gearshift tube (Fig. 7), then tighten locking nut.

(13) Slide steering shaft and lower bearing assembly in the column. Tap shaft through upper bearing, then install snap ring (Fig. 4).

Installation

(1) Insert column assembly through floor pan opening, being careful not to damage paint or headlining.

(2) With master splines on upper joint coupling and steering shaft aligned, insert shaft into the coupling.

(3) Loosely fasten steering column to instrument panel bracket with clamp and screws. Be sure tab on clamp is entered in locating slot in the column jacket. Align roll pin grooves in coupling and steering shaft, then install a new roll pin. Install heat shield on lower end of column jacket.

(4) The steering shaft coupling must be centered at midpoint of its travel.

(5) Move column assembly up or down in instrument panel bracket so dimension between top of coupling and center of gauge hole (Fig. 12) is 13/16 inch. Tighten steering column bracket clamp screws securely.

Imperial Models: Position steering column assembly so that flexible coupling disc assumes an unstressed position, and column is properly aligned with instrument panel bracket, then tighten clamp bolts securely.

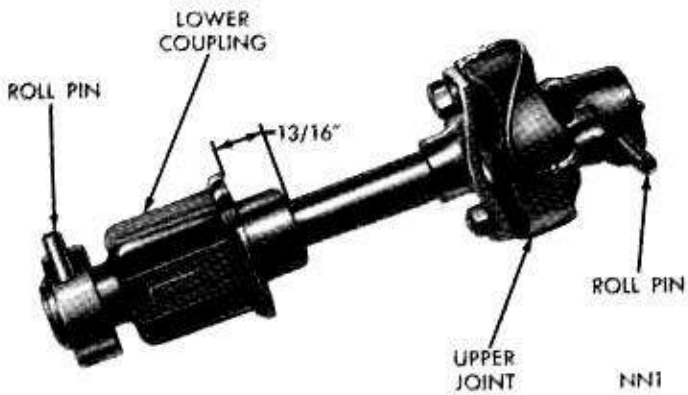


Fig. 12—Positioning Steering Shaft Coupling

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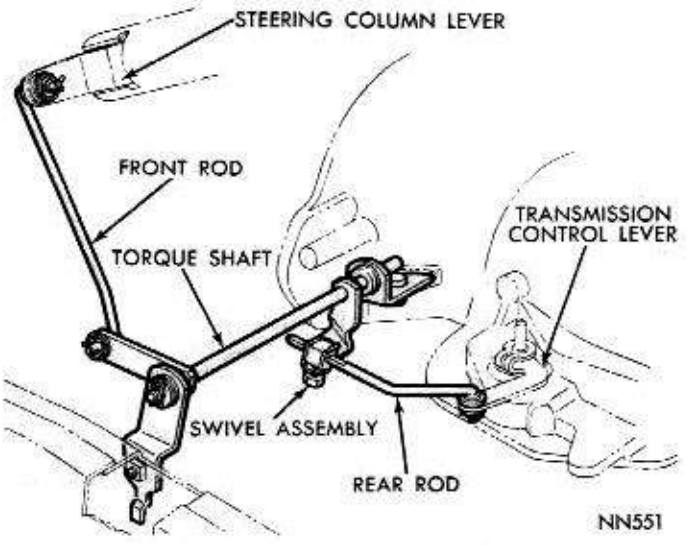


Fig. 13—Gearshift Linkage—Chrysler

(6) Connect gearshift indicator link (slotted end) to operating lever on column with screw in its approximate original location. Slowly move gearshift lever from "L" (low) to "P" (park) pausing briefly at each selector position. The indicator pointer must travel and align with each selector position in a positive manner without hesitation. If necessary, loosen the screw and re-adjust link to align pointer correctly.

Imperial Models: Place gearshift lever in the "N" (Neutral) position. Slide indicator cable loop on actuating lever pin, then attach indicator cable bracket to the column with one screw.

Shift gearshift lever from "N" (neutral) to "P" (park), then to "L" (low) and back to "N" (neutral). The indicator pointer should align with each selector position as gearshift lever is moved from one end of its travel to the other. If necessary, loosen cable clip screw and slide cable in or out of the clip to align pointer correctly, then tighten clip screw.

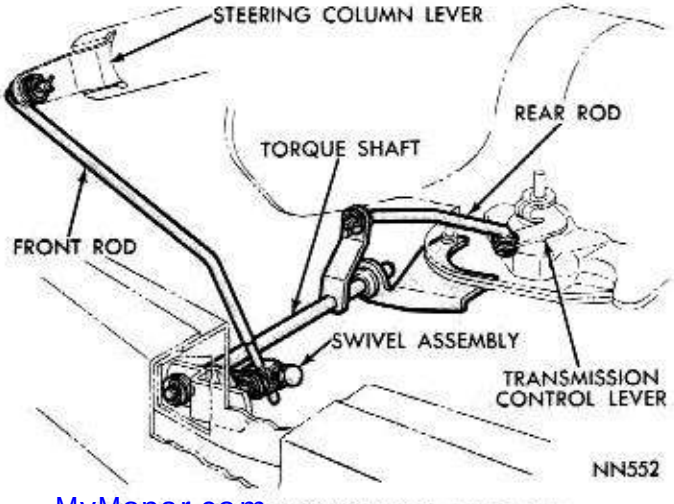


Fig. 14—Gearshift Linkage—Imperial

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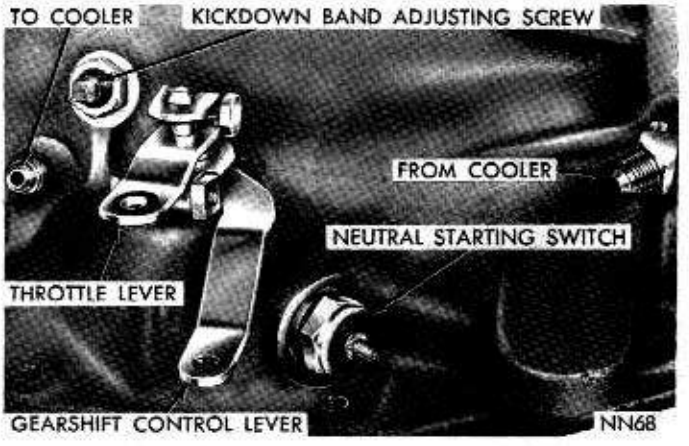


Fig. 15—External Controls and Adjustments

(7) Attach finish plate to bottom of instrument panel. Align and attach floor plate to toe board. Install turn signal lever.

(8) With master splines in steering wheel hub and steering shaft aligned, place steering wheel on the steering shaft. Install retaining nut and washer, tighten nut to 24 foot-pounds.

(9) Install horn switch parts previously removed from steering wheel, install horn ring or horn ring ornament.

(10) Connect turn signal and horn wires. Connect battery ground cable, test operation of the lights and horns.

(11) Connect and adjust gearshift linkage rod.

Linkage Adjustment

(1) Place gearshift selector lever in **PARK** position and loosen control rod swivel clamp screw a few turns (Fig. 13 or 14).

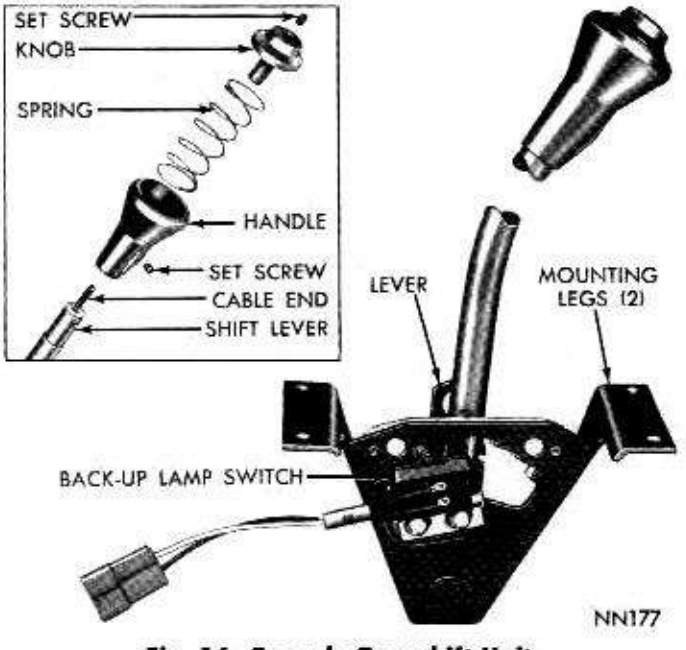


Fig. 16—Console Gearshift Unit

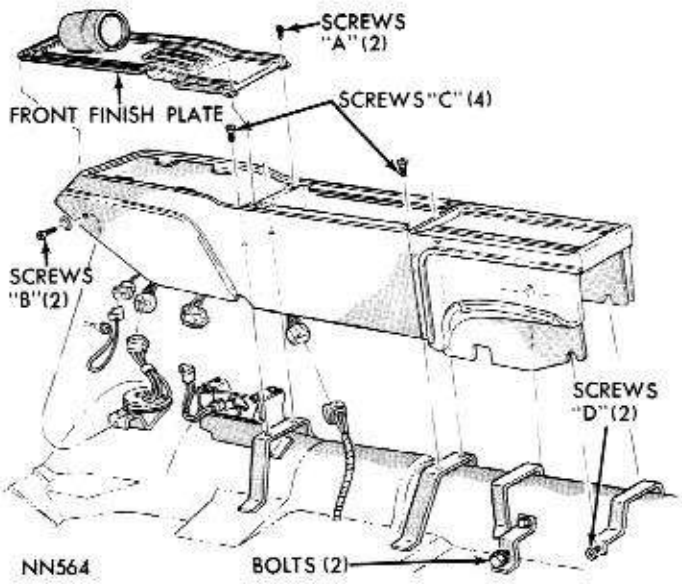


Fig. 17—Removing or Installing Console

(2) Move transmission control lever (Fig. 15), all the way to rear (in park detent).

(3) With control lever on transmission in park position detent and selector lever in **PARK** position, tighten swivel clamp screw securely.

CONSOLE GEARSHIFT

Removal

(1) Disconnect negative (ground) cable from the battery.

(2) Remove gearshift handle knob set screw with an allen wrench (Fig. 16). Unscrew knob from cable, then remove spring and handle.

(3) Remove two screws "A" from rear end of upper finish plate (Fig. 17.) Raise rear end of plate and work it rearward to disengage from front of console. Remove console retaining screws and bolts, raise console enough to disconnect dial lamp and other electrical connections, then lift off console assembly.

(4) Disconnect back-up lamp switch wires (Fig. 16).

(5) Disconnect upper rod from gearshift unit (Fig. 18.) Remove four gearshift to floor bracket bolts and remove unit.

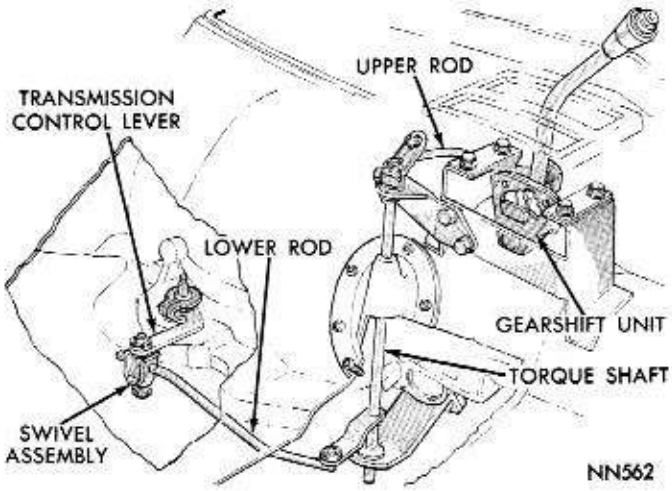


Fig. 18—Console Gearshift Linkage



Fig. 19—Neutral Starting Switch

Installation

(1) Install gearshift unit in its bracket, install and tighten four retaining bolts securely (Fig. 18). Attach upper rod to the unit and connect back-up lamp switch wires.

(2) Lower console down over shift lever, insert dial lamp in its housing, and connect all electrical connections.

(3) Position console over floor brackets and install retaining screws and bolts. Install upper finish plate.

(4) Install gearshift handle and spring, secure handle to lever with set screw (Fig. 16). With lever in **NEUTRAL**, install knob by threading it on cable end until serrated surface on knob is approximately 1/32 inch above top of handle. Secure knob with set screw.

Linkage Adjustment

(1) Place gearshift selector lever in **PARK** position and loosen lower rod swivel clamp screw a few turns (Fig. 18).

(2) Move transmission control lever (Fig. 15), all the way to rear (in park detent).

(3) With control lever on transmission in park position detent, and selector lever in **PARK** position, tighten swivel clamp screw or adjusting lever bolt securely.

(4) Connect battery ground cable.

NEUTRAL STARTING SWITCH

Adjustment and Test

The neutral starting switch (Fig. 19) should operate in both **PARK** and **NEUTRAL** selector lever positions.

(1) To test switch, disconnect wire from the switch.

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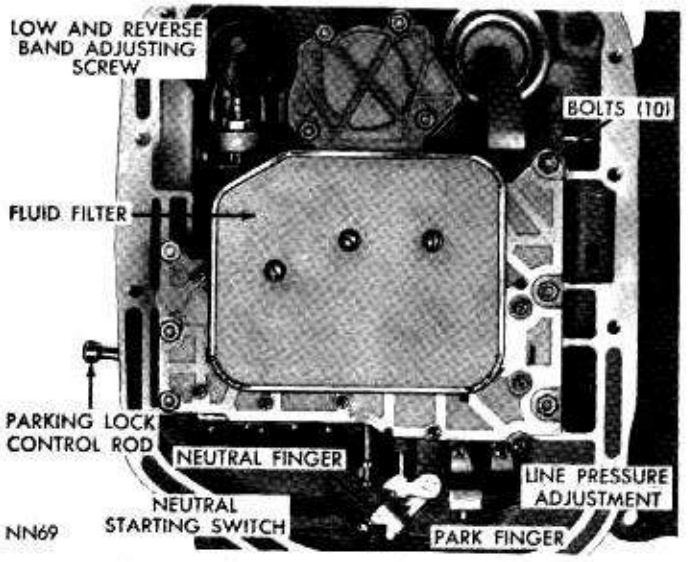


Fig. 20—Bottom View of Transmission (Pan Removed)

(2) Connect one lead of a test lamp to battery current and other lead to the switch terminal. If test lamp does not light, the switch may be faulty, out of adjustment, or the gearshift linkage may be improperly adjusted.

(3) Unscrew switch from transmission case allowing fluid to drain into a container. Move selector level. Refer to Page 32.

inspect to see that switch operating lever fingers are centered in switch opening in the case.

(4) Screw switch into transmission case and tighten 25 to 35 foot-pounds. Retest switch with test lamp.

(5) Add fluid to transmission to bring up to proper level. Refer to Page 32.

Test starter for operating in all selector lever positions. If it should operate in any position other than park and neutral, readjust the gearshift linkage. Refer to Page 36. In some cases it may be necessary to align the valve body neutral and/or park fingers with the switch plunger. Refer to page 46.

BAND ADJUSTMENTS

Kickdown Band

The kickdown band adjusting screw is located on left side of transmission case near the throttle lever shaft (Fig. 15).

(1) Loosen lock nut and back off approximately five turns. Inspect adjusting screw for free turning in the transmission case.

(2) Using wrench, Tool C-3380 with adapter C-3705, tighten band adjusting screw 47 to 50 inch-pounds. If adapter C-3705 is not used, tighten adjusting screw to 72 inch-pounds which is the true torque.

(3) Back off adjusting screw 2 turns. Hold adjusting screw in this position and tighten lock nut to 29 foot-pounds.

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Low and Reverse Band

(1) Raise vehicle, drain transmission fluid and remove oil pan.

(2) Loosen adjusting screw lock nut and back off nut approximately five turns (Fig. 20). Inspect adjusting screw for free turning in the lever.

(3) Using wrench, Tool C-3380 with adapter C-3705, tighten band adjusting screw to 47 to 50 inch-pounds. If adapter C-3705 is not used, tighten adjusting screw to 72 inch-pounds.

(4) Back off adjusting screw 3 turns. Hold adjusting screw in this position and tighten lock nut to 35 foot-pounds.

(5) Reinstall oil pan using a new gasket. Tighten oil pan bolts to 150 inch-pounds.

(6) Fill transmission with "Automatic Transmission Fluid AQ-ATF Suffix." Refer to page 32.

THROTTLE LINKAGE ADJUSTMENT

With engine at operating temperature and carburetor off fast idle cam, adjust idle speed of engine using a tachometer. Refer to "Fuel System" Group 14, for idle speed Specifications.

Automatic Transmission (Fig. 21)

(Chrysler Models with 383 or 440 Cu. In. Eng.)

(1) Apply a thin film of multi-purpose grease on both ends of accelerator shaft [1] where it turns in the bracket, nylon roller [2] where it contacts the pedal, pivot points of both upper [8] and lower [9] transmission linkage bellcranks, also the clipped ends of transmission linkage rod bearing areas [10] [11].

(2) Disconnect return spring and slotted transmission rod (6) from carburetor lever pin. Disconnect transmission intermediate rod ball socket [7] from upper bellcrank ball end.

(3) Disconnect choke [3] at carburetor or block choke valve in full open position. Open throttle slightly to release fast idle cam, then return carburetor to curb idle.

(4) With a 3/16 inch diameter rod [12] placed in the holes provided in upper engine mounted bellcrank and lever [8], adjust length of intermediate transmission rod [13] by means of threaded adjustment at upper end. The ball socket [7] must line up with ball end with rod held upward against transmission stop [14].

(5) Assemble ball socket [7] to ball end and remove 3/16 inch rod [12] from upper bellcrank and lever.

(6) Hold carburetor rod [15] forward against transmission stop [14] and adjust its length by means of the threaded adjustment so that rear end of slot in adjusting link [6] just contacts carburetor lever pin.

(7) Lengthen carburetor rod [15] two full turns by turning slotted link [6].

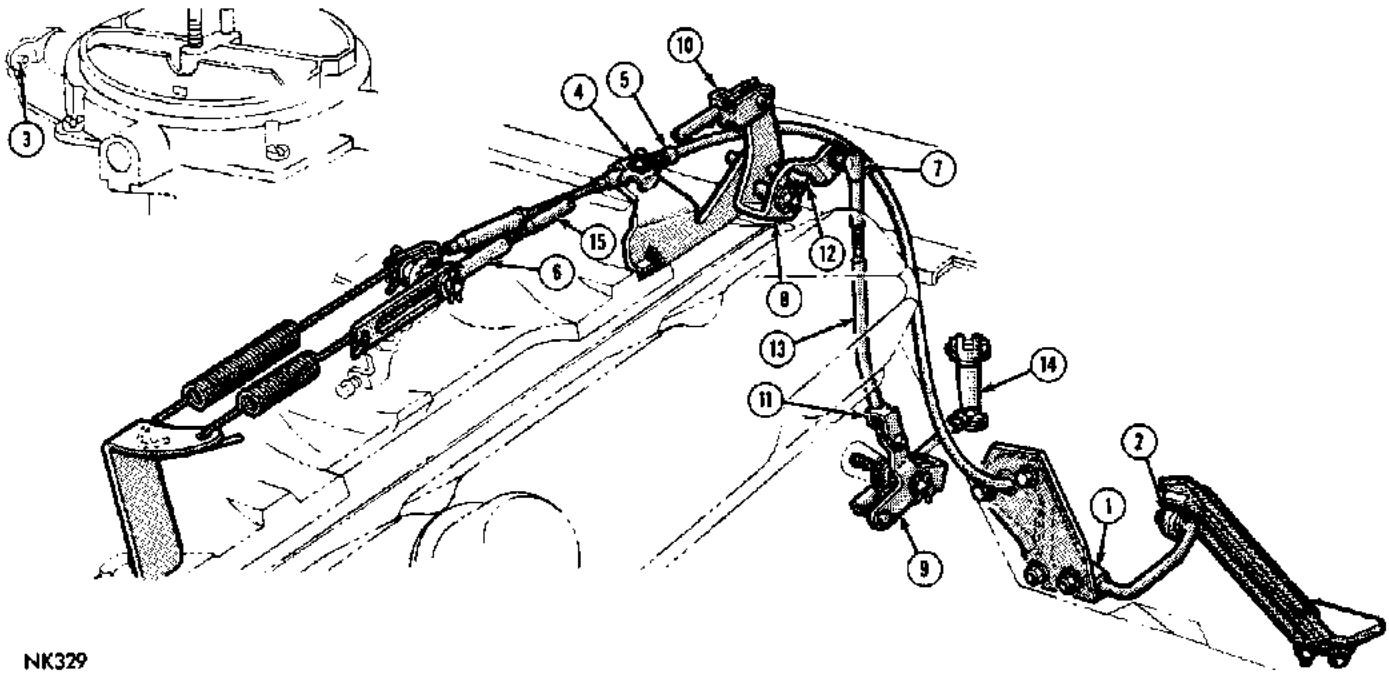


Fig. 21—Throttle Linkage Adjustment (Chrysler Models with 383 or 440 Cu. In. Eng.)

(8) Assemble slotted link [6] to the carburetor.

(9) Loosen cable clamp nut [4], then adjust position of cable housing ferrule [5] in the clamp so that all slack is removed from cable with carburetor at curb idle. To remove slack from cable, remove ferrule [5] in the clamp in direction **away** from carburetor lever.

(10) Bock off ferrule [5] ¼ inch. This provides ¼ inch cable slack at idle. Tighten cable clamp nut [4].

(11) Route cable so it does not interfere with carburetor rod [15] or upper bellcrank [8] throughout full throttle linkage travel.

(12) Connect choke rod [3] or remove blocking fixture.

Manual Transmission (Fig. 21) (Chrysler Models with 383 or 440 Cu. In. Eng.)

(1) Apply a thin film of multi-purpose grease on both ends of accelerator shaft [1] where it turns in the bracket, and nylon roller [2] where it contacts the

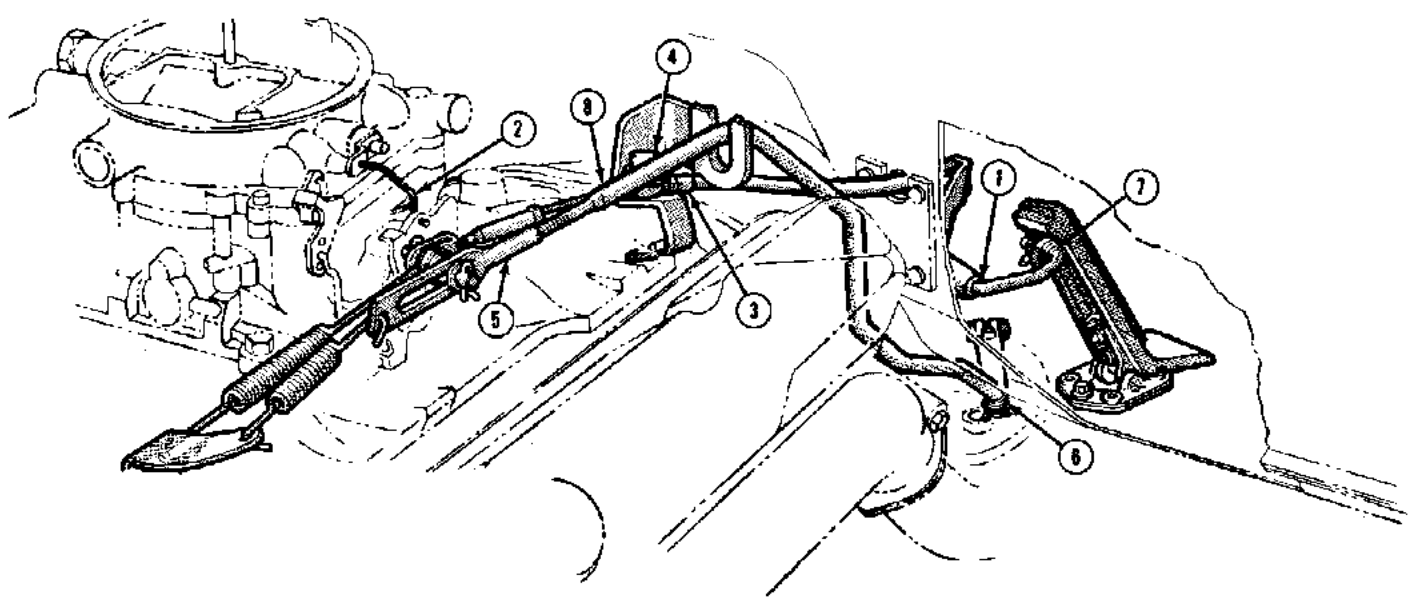


Fig. 22—Throttle Linkage Adjustment (Imperial)

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pedal.

(2) Disconnect choke [3] at carburetor or block choke valve in full open position. Open throttle slightly to release fast idle cam, then return carburetor to curb idle.

(3) Loosen cable clamp nut [4], then adjust position of cable housing ferrule [5] in the clamp so that slack is removed from cable with carburetor at curb idle. To remove slack from cable move ferrule [5] in the clamp in direction **away** from carburetor lever.

(4) Back off ferrule [5] ¼ inch. This provides ¼ inch cable slack at idle. Tighten cable clamp nut [4].

(5) Connect choke rod [3] or remove blocking fixture.

Automatic Transmission—Imperial (Fig. 22)

(1) Apply a thin film of multi-purpose grease on both ends of accelerator shaft [1] where it turns in the bracket, and nylon roller [7] where it contacts the pedal.

(2) Disconnect return spring and slotted transmission rod [5] from carburetor lever pin.

(3) Disconnect choke [2] at carburetor or block choke valve in full open position. Open throttle slightly to release fast idle cam, then return carburetor to curb idle.

(4) Hold transmission lever [8] forward against its stop (rod or lever must not be moved vertically while holding against stop) and adjust length of transmission rod by means of threaded adjustments [5] at upper end. The rear end of slot should contact carburetor lever pin without exerting any forward force.

(5) Lengthen rod by one full furn of the adjustment [5].

(6) Assemble slotted adjustment [5] to carburetor lever pin and install washer and retainer pin. Assemble transmission linkage return spring in place. To check transmission linkage freedom of operation, move slotted adjuster link [5] to full rearward position, then allow it to return slowly, making sure it returns to full forward position.

(7) Loosen cable clamp nut [4], then adjust position of cable housing ferrule [3] in the clamp so that all slack is removed from cable with carburetor at curb idle. To remove slack from cable, move ferrule [3] in the clamp in direction **away** from carburetor lever.

(8) Back off ferrule [3] ¼ inch. This provides ¼ inch cable slack at idle. Tighten cable clamp [4] nut.

(9) Route cable so that it does not interfere with transmission rod throughout its full travel.

(10) Connect choke rod [2] or remove blocking fixture.

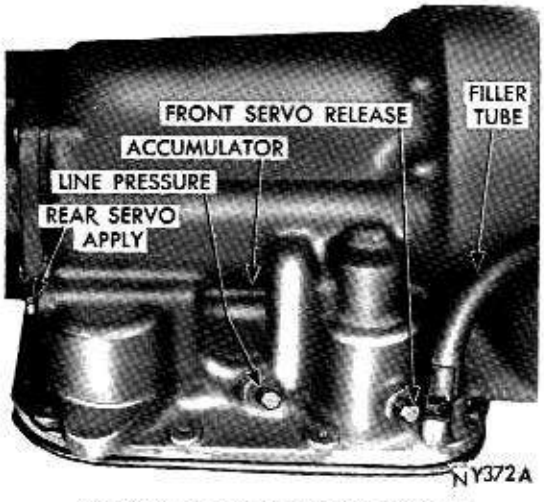


Fig. 23—Pressure Test Locations (Right Side of Case)

HYDRAULIC CONTROL PRESSURE TESTS

Line Pressure and Front Servo Release Pressure

Line pressure and front servo release pressure tests must be made in D (drive) position with rear wheels free to turn. The transmission fluid must be at operating temperature (150° F to 200° F).

(1) Install an engine tachometer, raise vehicle on a hoist and position tachometer so it can be read under the vehicle.

(2) Connect two 0-100 psi pressure gauges, Tool C-3292 to pressure take-off points at side of accumulator and at front servo release (Fig. 23).

(3) With control in D (drive) position, speed up engine slightly until transmission shifts into direct. (Front servo release will be pressurized in direct.) Reduce engine speed slowly to 1,000 rpm. Line pressure at this time (1,000 rpm) must be 54-60 psi, and front servo release pressure must not be more than 3 psi below line pressure.

(4) Disconnect throttle linkage from transmission throttle lever and move throttle lever gradually to full throttle position. Line pressure must rise to a maximum of 90-96 psi just before or at kickdown into low gear. Front servo release pressure must follow line pressure up to the kickdown point and should not be more than 3 psi below line pressure.

If line pressure is not 54-60 psi at 1,000 rpm, adjust pressure as outlined on Page 41.

If front servo release pressures are less than pressure specified and line pressures are within limits, there is excessive leakage in front clutch and/or front servo circuits. **Always inspect the external transmission throttle lever for looseness on the valve body shaft when making pressure tests.**

Lubrication Pressures

The lubrication pressure test should be made at same time that line pressure and front servo release pressures are tested.

(1) Install a "tee" fitting between cooler return line fitting and fitting hole in transmission case at rear

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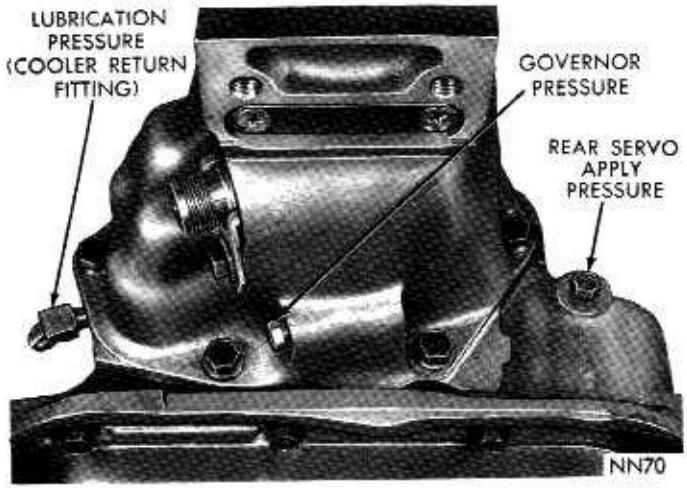


Fig. 24—Pressure Test Locations (Rear End of Case)

left side of the transmission case (Fig. 24). Connect a 0-100 psi pressure gauge, Tool C-3292 to the "tee" fitting.

(2) At 1,000 engine rpm, with throttle closed and transmission in direct, the lubrication pressure should be 5-15 psi. Lubrication pressure will be approximately doubled as throttle is opened to the maximum line pressure.

Rear Servo Apply Pressure

(1) Connect a 0-300 psi pressure gauge, Tool C-3293 to apply pressure take-off point at rear servo (Fig. 24)

(2) With transmission control in R (reverse) position and engine speed set at 1600 rpm, the reverse servo apply pressure should be 240-280 psi.

Governor Pressure

(1) Connect a 0-100 psi pressure gauge, Tool C-3292 to governor pressure take-off point, located at lower left side of extension near the mounting flange (Fig. 24).

(2) Governor pressures should fall within the limits given in the "Governor Pressure Chart."

If governor pressures are incorrect at the given vehicle speeds, the governor valve and/or weights are probably sticking.

Throttle Pressure

No provisions are made to test the throttle pressure. Incorrect throttle pressure should only be suspected if part throttle shift speeds are either very delayed or occur too early in relation to vehicle speeds. In which case, the throttle linkage should be adjusted before throttle pressure setting is adjusted. Refer to Page 42.

GOVERNOR PRESSURE CHART

VEHICLE SPEED TO AXLE RATIOS				PRESSURE
Newport 2.76-1	300 3.23-1	New Yorker 3.23-1	Imperial 2.93-1	LIMITS* PSI
19-22	17-19	17-19	19-22	15
42-51	36-44	36-44	43-51	50
70-78	61-68	61-68	71-78	75

*The governor pressure should respond smoothly to changes in m.p.h. and should return to 0 to 1½ psi when the vehicle is stopped. High pressure at standstill (above 2 psi) will prevent the transmission from downshifting.

HYDRAULIC CONTROL PRESSURE ADJUSTMENTS

Line Pressure

An incorrect throttle pressure setting will cause incorrect line pressure readings even though line pressure adjustment is correct. Always inspect and correct throttle pressure adjustment before adjusting the line pressure. **Before adjusting line pressure, measure distance between the manual valve (valve in 1-low position) and line pressure adjusting screw (Fig. 25). This measurement must be 1⅞ inches; correct by loosening spring retainer screws and repositioning the**

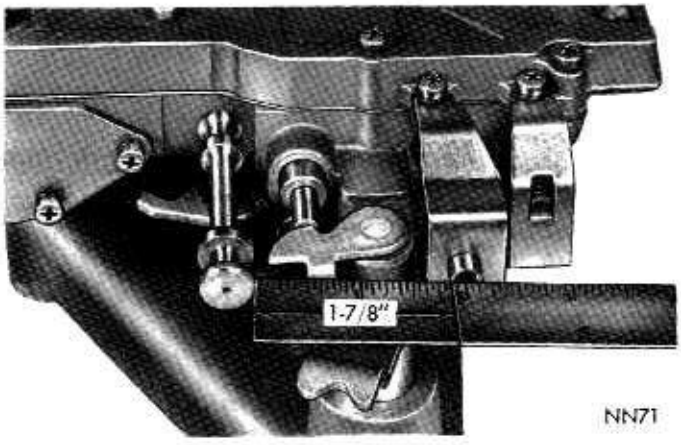


Fig. 25—Measuring Spring Retainer Location

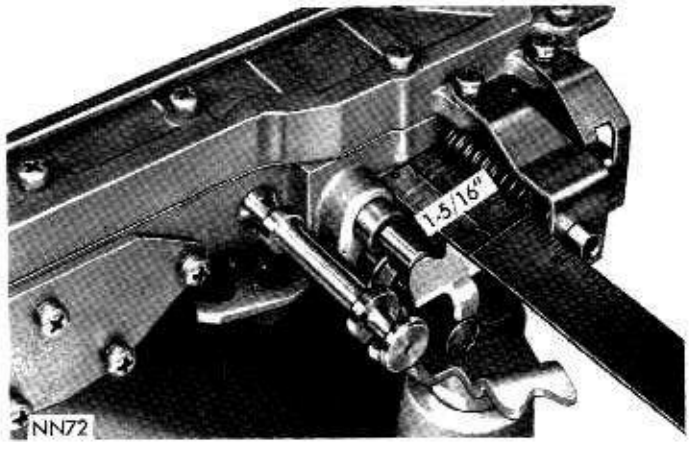


Fig. 26—Line Pressure Adjustment

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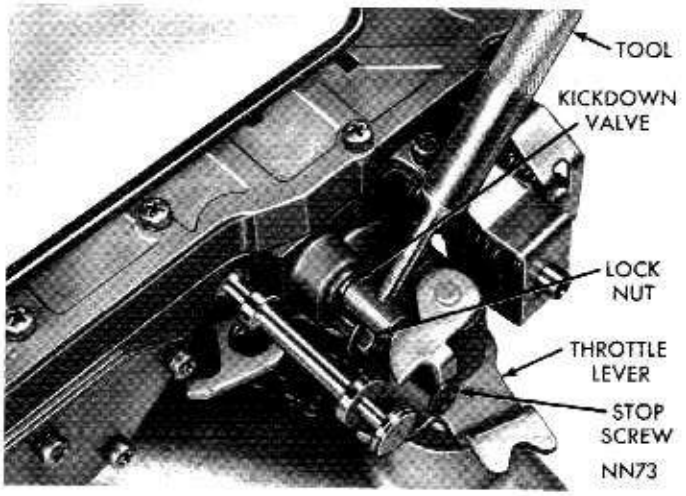


Fig. 27—Throttle Pressure Adjustment

spring retainer. The regulator valve may cock and hang up in its bore if spring retainer is out of position.

If line pressure is not correct, it will be necessary to remove valve body assembly to perform the adjustment. Refer to Page 46.

The approximate adjustment is 1-5/16 inches, measured from valve body to inner edge of the adjusting nut (Fig. 26). However, due to manufacturing tolerances, the adjustment can be varied to obtain specified line pressure.

The adjusting screw may be turned with an Allen wrench. One complete turn of adjusting screw changes closed throttle line pressure approximately 1⅔ psi. Turning adjusting screw counterclockwise increases pressure, and clockwise decreases pressure.

Throttle Pressure

Throttle pressure cannot be tested accurately: therefore, the adjustment should be measured if a malfunction is evident.

(1) Remove valve body assembly from transmission to perform adjustment. Refer to Page 46.

(2) Loosen throttle lever stop screw lock nut and back off approximately five turns (Fig. 27).

(3) Insert gauge pin of Tool C-3763 between the throttle lever cam and kickdown valve.

(4) By pushing in on the tool, compress kickdown valve against its spring so throttle valve is completely bottomed inside the valve body.

(5) As force is being exerted to compress spring, tighten throttle lever stop screw finger tight against throttle lever tang with throttle lever cam touching the tool and the throttle valve bottomed. **Be sure adjustment is made with spring fully compressed and valve bottomed in the valve body.**

(6) Remove tool and tighten stop screw lock nut securely.

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AIR PRESSURE TESTS

A "NO DRIVE" condition might exist even with correct fluid pressure, because of inoperative clutches or bands. The inoperative units, clutches, bands and servos can be located through a series of tests by substituting air pressure for fluid pressure (Fig. 28). The front and rear clutches, kickdown servo, and low-reverse servo may be tested by applying air pressure to their respective passage after valve body assembly had been removed. Refer to Page 46. To make air pressure tests, proceed as follows:

CAUTION: Compressed air supply must be free of all dirt or moisture. Use a pressure of 30 to 100 psi.

Front Clutch

Apply air pressure to front clutch "apply" passage and listen for a dull "thud" which indicates that rear clutch is operating. Hold air pressure on for a few seconds and inspect system for excessive oil leaks.

Rear Clutch

Apply air pressure to rear clutch "apply" passage and listen for a dull "thud" which indicates that rear clutch is operating. Also check for excessive oil leaks.

If a dull "thud" cannot be heard in clutches, place finger tips on clutch housing and again apply air pressure. Movement of piston can be felt as clutch is applied.

Kickdown Servo

Direct air pressure into front servo "apply" passage. Operation of servo is indicated by a tightening of the front band. Spring tension on servo piston should release the band.

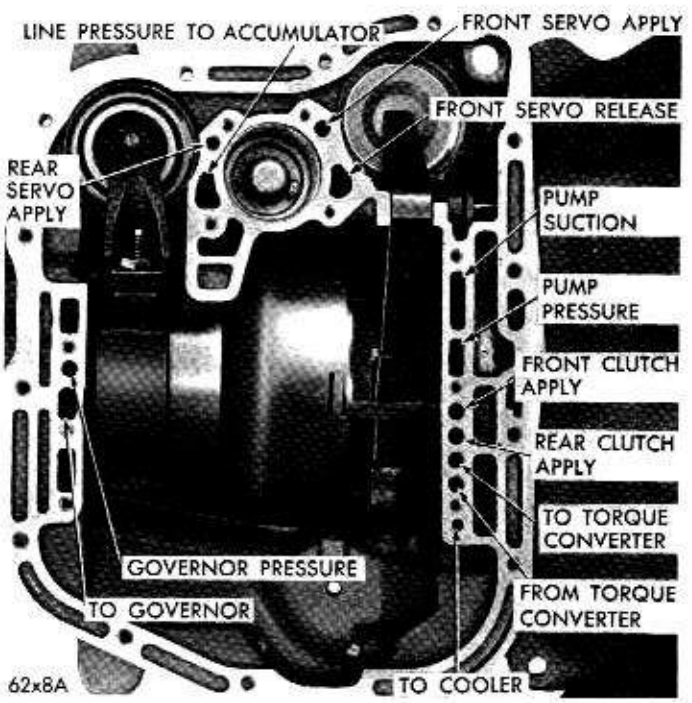


Fig. 28—Air Pressure Tests

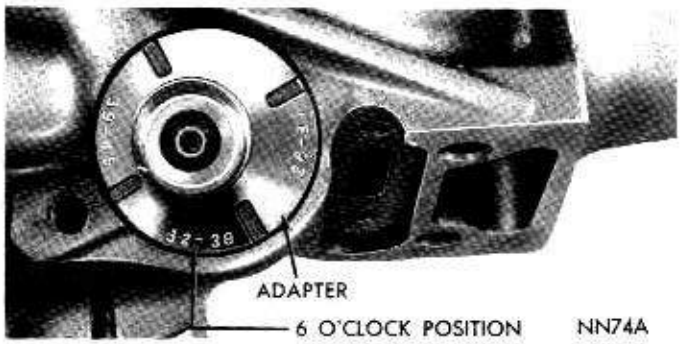


Fig. 29—Speedometer Pinion and Adapter—Installed (Retainer Removed for View)

Low and Reverse Servo

Direct air pressure into servo "apply" passage. Operation of servo is indicated by a tightening of the rear band. Spring tension on servo piston should release the band.

If clutches and servos operate properly; no upshift or erratic shift conditions indicate that malfunction exists in the control valve body assembly.

Governor

Governor operating failures can generally be diagnosed by a road test or hydraulic pressure tests. Refer to Page 40.

SPEEDOMETER PINION

Removal and Installation

Rear axle gear ratio and tire size determines pinion gear size requirements. Refer to 'Speedometer Pinion Chart' for pinion usage.

(1) Remove bolt and retainer securing speedometer pinion adapter in the extension housing (Fig. 29).

(2) With cable housing connected, carefully work adapter and pinion out of the extension housing.

(3) If transmission fluid is found in cable housing, replace seal in the adapter (Fig. 30).

CAUTION: Before installing pinion and adapter assembly make sure adapter flange and its mating area on extension housing are perfectly clean. Dirt or sand will cause mis-alignment resulting in speedometer pinion gear noise.

(4) Select pinion range numbers on outside of adapter to correspond with number of pinion teeth.

(5) Install adapter in pinion housing with pinion range numbers aligned with 6 o'clock position (Fig. 29).

(6) Install retainer and bolt, with retainer tangs in adapter positioning slots. Tap adapter firmly into the extension housing and tighten retainer bolt to 100 inch-pounds.

SPEEDOMETER PINION CHART
TORQUEFLITE—A727-B
OUTPUT SHAFT DRIVE GEAR—13 TEETH

Tire Size	Axle Ratios—Number of Pinion Gear Teeth and Color		
	Chrysler		Imperial
	2.76:1	3.23:1	2.93:1
8.25-14	27—White	32—Black	—
8.55-14	26—Red	31—Green	—
9.00-14	26—Red	31—Green	—
8.15-15	27—White	32—Black	—
8.45-15	26—Red	31—Green	—
9.15-15	—	—	27—White

EXTENSION HOUSING YOKE SEAL

Replacement

(1) Disconnect propeller shaft at rear universal joint. Carefully pull shaft yoke out of transmission extension housing.

CAUTION: Be careful not to scratch or nick ground surface on sliding spline yoke during removal and installation of the shaft assembly.

Imperial Models: Remove bolts attaching cross and roller bushing clamps to the transmission yoke. Disengage universal joint cross and roller bushings from transmission yoke and wire shaft out of the way.

Remove bolt from center of transmission yoke, then slide yoke off the output shaft.

(2) Remove the extension housing yoke seal (Fig. 31) with Tool C-3985.

(3) To install a new seal, position seal in opening of extension housing and drive it into housing with Tool C-3972 (Fig. 32).

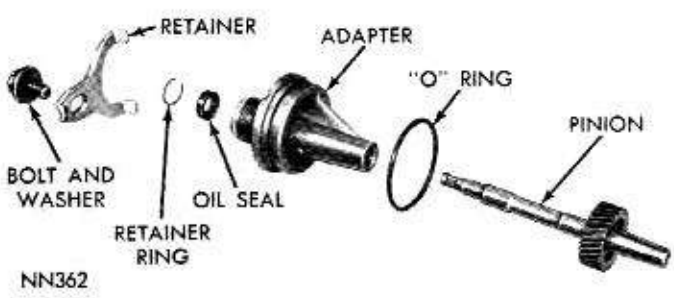


Fig. 30—Speedometer Drive—Disassembled

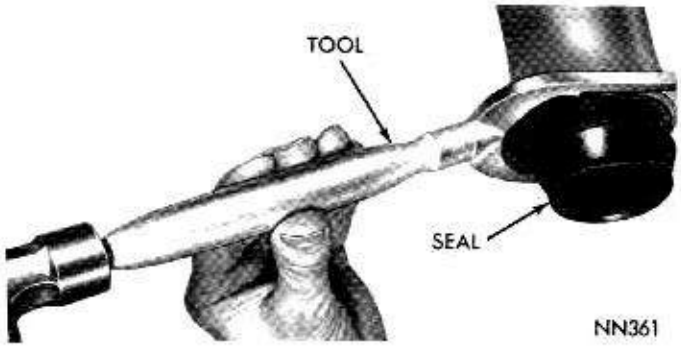


Fig. 31—Removing Extension Housing Yoke Seal

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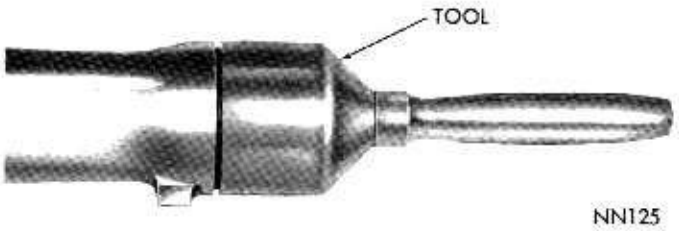


Fig. 32—Installing Extension Housing Yoke Seal

(4) Carefuly guide front universal joint yoke into extension housing and on the output shaft splines. Connect propeller shaft to rear axle pinion shaft yoke.

Imperial Models: Slide transmission yoke on the output shaft. Install retaining bolt and tighten to 100 foot-pounds.

Connect front universal joint to the transmission yoke. Install cross and rollers bushing clamps and retaining bolts. Tighten bolts to 170 inch-pounds.

EXTENSION HOUSING AND BEARING

Removal

(1) Disconnect propeller shaft at rear universal joint. Carefully pull shaft assembly out of the extension housing.

Imperial Models: Remove bolts attaching cross and roller bushing clamps to the transmission yoke. Disengage universal joint cross and roller bushings from transmission yoke and wire shaft out of the way.

Remove bolt from center of transmission yoke, then slide yoke off the output shaft.

(2) Remove speedometer pinion and adapter assembly (Fig. 29). Drain approximately two quarts of fluid from the transmission.

(3) Remove bolts securing extension housing to the crossmember. Raise transmission slightly with service jack Tool C-3203A, then remove center crossmember and support assembly.

(4) Remove the extension housing to transmission bolts.

Console Shift: Remove two bolts securing gearshift torque shaft lower bracket to the extension housing. Swing bracket out of way for extension housing removal.

IMPORTANT: In removing or installing the extension housing (step 5), the gearshift lever must be in "l" (low) position. This positions the parking lock control rod rearward so it can be disengaged or engaged with the parking lock sprag.

(5) Remove two screws, plate and gasket from bottom of extension housing mounting pad. Spread large snap ring from output shaft bearing with Tool C-3301 (Fig. 33). With snap ring spread as far as possible, carefully tap extension housing off output shaft bearing. Carefully pull extension housing rearward, to remove parking lock control rod knob past the parking sprag, then remove the housing.

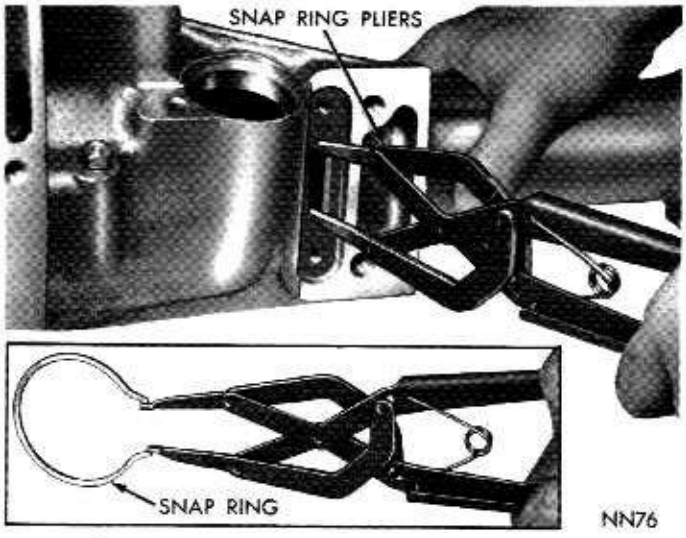


Fig. 33—Removing or Installing Extension Housing

Bearing Replacement

(1) Carefully unwind and slide yoke seal rear stop ring off the output shaft (Fig. 34). Slide yoke seal and front stop ring off the shaft.

(2) Remove output shaft bearing rear snap ring and remove bearing from the shaft.

(3) If removed, install snap ring in front groove on the output shaft. Install a new bearing on the shaft with ring groove on outer race toward front (Fig. 34). Install the rear snap ring.

(4) Carefully unwind and slide yoke seal front stop ring into place on the shaft. Install seal with seal lips toward rear (Fig. 34), then install rear stop ring on the shaft.

NOTE: To replace the extension housing bushing, refer to Page 56.

Installation

(1) Place a new extension housing gasket on the transmission case. Position output shaft bearing retaining snap ring in the extension housing. Slide extension housing on output shaft guiding parking lock control rod knob past the parking sprag. While spreading large snap ring in housing with Tool C-3301

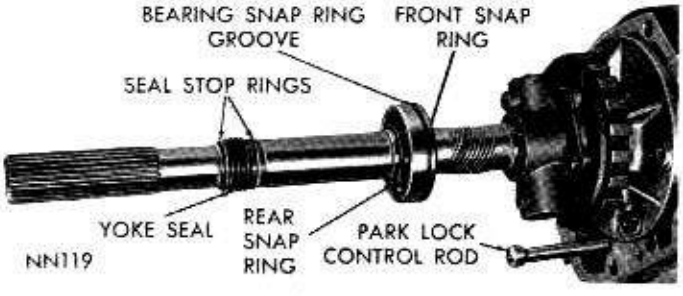


Fig. 34—Output Shaft Bearing and Yoke Seal

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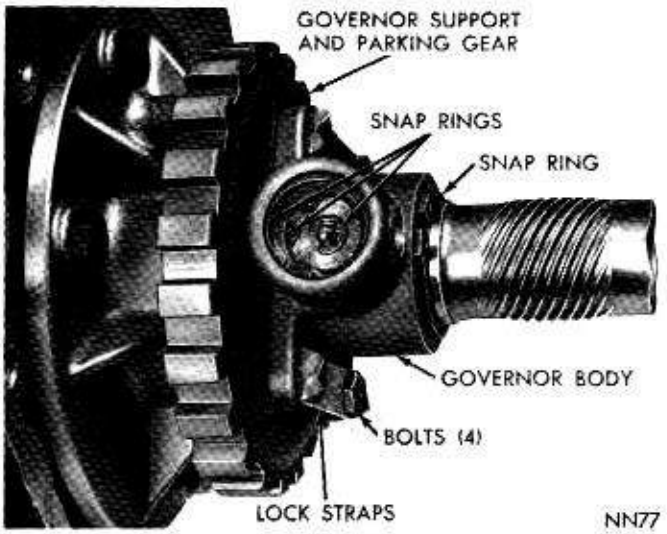


Fig. 35—Governor Shaft and Weight Snap Rings

(Fig. 33), carefully tap housing into place, then release snap ring. Make sure snap ring is fully seated in bearing outer race ring groove.

(2) Install the gasket, plate and two screws on bottom of extension housing mounting pad.

(3) Install and tighten extension housing bolts to 24 foot-pounds.

(4) Install center crossmember and rear mount assembly, tighten retaining bolts to 75 foot-pounds. Lower transmission, install extension housing to support bolts and tighten to 35 foot-pounds.

Console Shift: Align gearshift torque shaft lower bracket with the extension housing. Install the two retaining bolts and tighten securely.

(5) Install the speedometer pinion and adapter. Refer to Page 43.

(6) Carefully guide front universal joint joke into extension housing and on the output shaft splines. Connect propeller shaft to the rear axle pinion shaft yoke.

Imperial Models: Slide transmission yoke on the output shaft. Install retaining bolt and tighten to 100 foot-pounds.

Connect front universal joint to the transmission yoke. Install cross and roller bushing clamps and retaining bolts. Tighten bolts to 170 inch-pounds.

(7) Add fluid to transmission to bring up to proper level. Refer to Page 32.

GOVERNOR

Removal

(1) Remove extension housing and output shaft bearing. Refer to Page 44.

(2) Using a screw driver, carefully pry snap ring from weight end of governor valve shaft (Fig. 35). Slide valve and shaft assembly out of the governor body.

(3) Remove large snap ring from weight end of governor body, lift out governor weight assembly.

(4) Remove snap ring from inside governor weight, remove inner weight and spring from outer weight. Figure 36 shows a disassembled view of the governor assembly.

(5) Remove snap ring from behind governor body, then slide body and support assembly off the output shaft. If necessary, remove four bolts and separate governor from the support.

Cleaning and Inspection

The primary cause of governor operating failure is due to a sticking governor valve or weights. Rough surfaces may be removed with crocus cloth. Thoroughly clean all parts in clean colvent and inspect for free movement before assembly.

Installation

(1) Assemble governor body to the support (if disassembled) and tighten the bolts finger tight. Make sure oil passage of governor body aligns with passage in the support.

(2) Position support and governor assembly on output shaft. Align assembly so governor valve shaft hole in governor body aligns with hole in the output shaft, then slide assembly into place. Install snap ring behind governor body (Fig. 35). Tighten body to support bolts to 100 inch-pounds. Bend ends of lock straps over the bolt heads.

(3) Assemble governor weights and spring, and secure with snap ring inside large governor weight. Place weight assembly in governor body and install snap ring.

(4) Place governor valve on valve shaft, insert the assembly into body and through governor weights. Install valve shaft retaining snap ring. Inspect valve and weight assembly for free movement after installation.

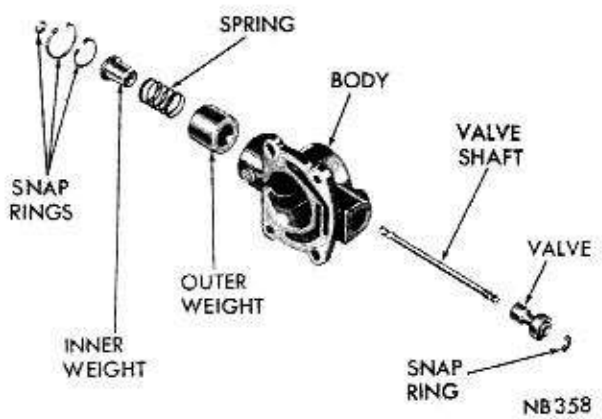


Fig. 36—Governor Assembly—Disassembled

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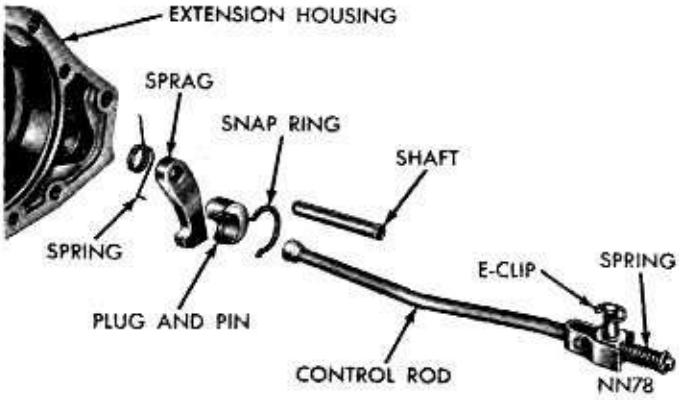


Fig. 37—Parking Lock Components—Disassembled

(5) Install output shaft bearing and extension housing, refer to Page 44. Connect the propeller shaft.

PARKING LOCK COMPONENTS

Removal

(1) Remove the extension housing. See Page 44.

(2) To replace the governor support and parking gear, refer to Page 45.

(3) Slide shaft out of extension housing to remove the parking sprag and spring (Fig. 37). Remove snap ring and slide reaction plug and pin assembly out of the housing.

(4) To replace the parking lock control rod, refer to "Valve Body—Removal and Installation," Page 46.

Installation

(1) Position sprag and spring in housing and insert the shaft (Fig. 37). Make sure square lug on sprag is toward the parking gear, and spring is positioned so it moves sprag away from the gear.

(2) Install reaction plug and pin assembly in the housing and secure with snap ring.

(3) Install extension housing and connect the propeller shaft.

VALVE BODY ASSEMBLY AND ACCUMULATOR PISTON

Removal

(1) Raise the vehicle on a hoist.

(2) Loosen oil pan bolts, tap pan to break it loose allowing fluid to drain, then remove the oil pan.

(3) Disconnect throttle and gearshift linkage from levers on the transmission. Loosen clamp bolts and remove the levers (Fig. 15).

(4) Remove E-clip (Fig. 38), securing parking lock rod to the valve body manual lever.

(5) Place a drain pan under transmission, then remove the ten hex-head valve body to transmission case bolts. Hold valve body in position while removing the bolts.

(6) While lowering valve body out of transmission case, disconnect parking lock rod from the lever.

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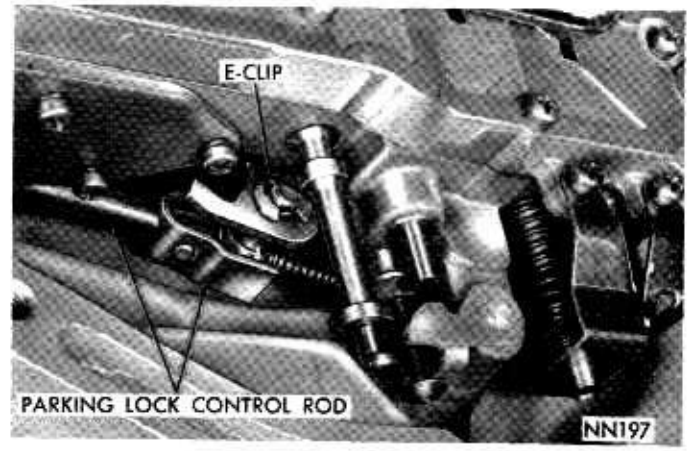


Fig. 38—Parking Lock Control Rod Retaining E-Clip

To remove parking lock rod, pull it forward out of the case. If necessary, rotate propeller shaft to align parking gear and sprag to permit knob on end of control rod to pass the sprag.

(7) Withdraw accumulator piston from transmission case. Inspect piston for scoring, and rings for wear or breakage. Replace as required.

(8) If valve body manual lever shaft seal requires replacement, drive it out of the case with a punch.

(9) Drive a new seal into the case with a 15/16 inch socket and hammer (Fig. 39).

Servicing the valve body assembly is outlined on Page 53.

Installation

(1) If parking lock rod was removed, insert it through the opening in rear of case with knob positioned against the reaction plug and sprag. Move front end of rod toward center of transmission while exerting rearward pressure on the rod to force it past the sprag. (Rotate propeller shaft if necessary.)

(2) Install accumulator piston in the transmission case.

(3) Position accumulator spring on the valve body.

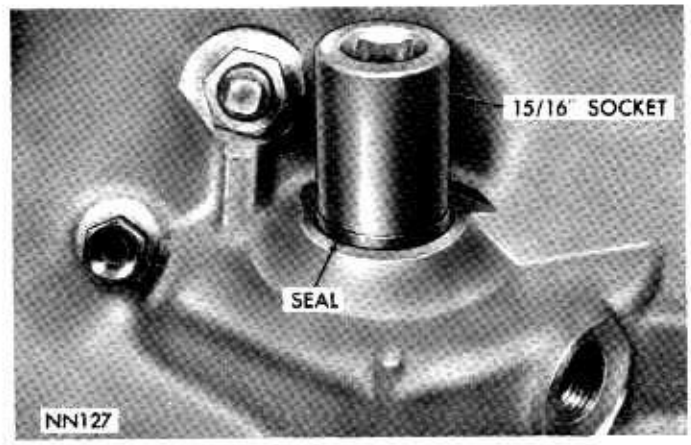


Fig. 39—Installing Valve Body Manual Lever Shaft Seal

(4) Place the valve body manual lever in **LOW** position. Lift valve body into its approximate position, connect parking lock rod to manual lever and secure with the E-clip. Position valve body in the case, install retaining bolts finger tight.

(5) With neutral starting switch installed, place manual valve in the neutral position. Shift valve body if necessary to center neutral finger over the neutral switch plunger. Snug bolts down evenly, then tighten to 100 inch-pounds.

(6) Install gearshift lever and tighten clamp bolt. Check lever shaft for binding in the case by moving lever through all detent positions. If binding exists, loosen valve body bolts and re-align.

(7) Make sure throttle shaft seal is in place, then install flat washer, lever and tighten the clamp bolt. Connect throttle and gearshift linkage and adjust as required.

(8) Install oil pan, using a new gasket. Add transmission fluid to bring it up to proper level. Refer to Page 32.

SERVICE OUT OF VEHICLE

TRANSMISSION AND CONVERTER REMOVAL

The transmission and converter must be removed as an assembly; otherwise, the converter drive plate, pump bushing, and oil seal will be damaged. The drive plate will not support a load; therefore, none of the weight of the transmission should be allowed to rest on the plate during removal.

(1) Connect a Remote Control Starter Switch, Tool C-763 to starter solenoid and position switch so engine can be rotated from under the vehicle.

(2) Disconnect secondary (high tension) cable, from the ignition coil.

(3) Remove cover plate from in front of converter to provide access to converter drain plug and mounting bolts.

(4) Rotate engine with Remove Control Switch to bring drain plug to "6 o'clock" position. Drain torque converter and transmission.

(5) Mark converter and drive plate to aid in reassembly. The crankshaft flange bolt circle, inner and outer circle of holes in drive plate, and four tapped holes in front face of converter all have one hole offset so these parts will be installed in original position. This maintains balance of the engine and converter.

(6) Rotate engine with Remote Control Switch to locate two converter to drive plate bolts at "5 and 7 o'clock" positions. Remove the two bolts, rotate engine with switch and remove the other two bolts. **Do not rotate converter or drive plate by prying with a screw driver or similar tool as the drive plate might become distorted. Also, starter should never be engaged if drive plate is not attached to converter with at least one bolt or if transmission case to engine block bolts have been loosened.**

(7) Disconnect negative (ground) cable from battery.

(8) Remove the starting motor assembly.

(9) Disconnect wire from the neutral starting switch.

(10) Disconnect gearshift rod from the transmission lever. Remove gearshift torque shaft from transmission housing and left side rail.

Console Shift: Remove two bolts securing gearshift torque shaft lower bracket to the extension housing. Swing bracket out of the way for transmission removal. Disconnect gearshift rod from the transmission lever.

(11) Disconnect throttle rod from bellcrank at left side of transmission bell housing.

(12) Disconnect oil cooler lines at transmission and remove oil filler tube. Disconnect the speedometer cable.

(13) Disconnect propeller shaft at rear universal joint. Carefully pull shaft assembly out of the extension housing.

Imperial Models: Remove bolts attaching cross and roller bushing clamps to the transmission yoke. Disengage universal joint cross and roller bushings from transmission yoke and wire the shaft out of the way.

Remove bolt from center of transmission yoke, then slide yoke off the output shaft.

(14) Remove rear mount to extension housing bolts.

(15) Install engine support fixture, Tool C-3487 and raise engine slightly.

(16) Remove crossmember attaching bolts and remove the crossmember.

(17) Place a transmission service jack under transmission to support the assembly.

(18) Attach a small "C" clamp to edge of converter housing to hold converter in place during removal of the transmission.

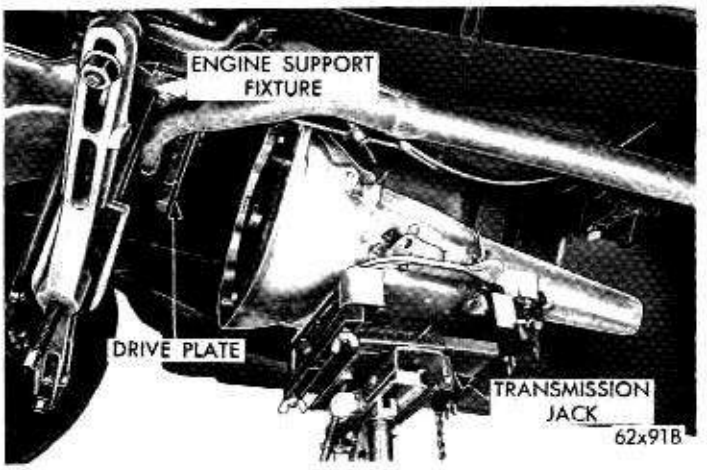


Fig. 40—Removing or Installing Transmission and Converter Assembly

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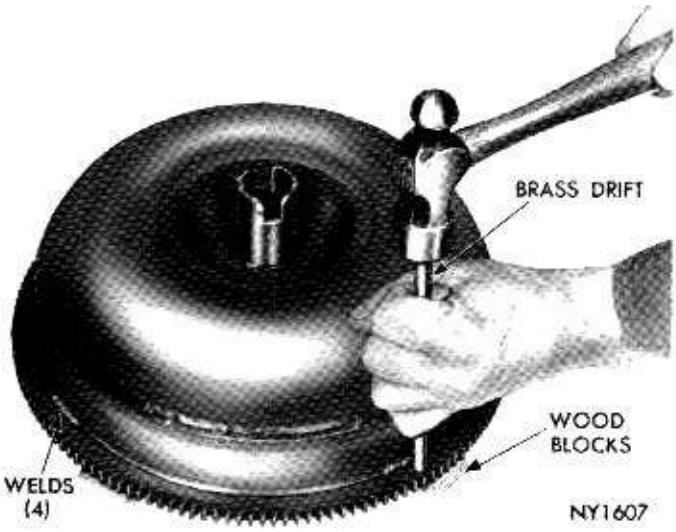


Fig. 41—Removing Starter Ring Gear

(19) Remove converter housing retaining bolts. Carefully work transmission rearward off engine block dowels and disengage converter hub from end of the crankshaft (Fig. 40).

(20) Lower transmission jack and remove transmission and converter assembly.

(21) To remove converter assembly, remove "C" clamp from edge of the housing, then carefully slide assembly out of the transmission.

STARTER RING GEAR REPLACEMENT

The starter ring gear is mounted directly on outer diameter of the torque converter front cover. With torque converter removed from vehicle, replacement of the gear is as follows:

Removal

(1) Cut through weld material at rear side of ring gear with a hack saw or grinding wheel (Fig. 41). Be careful not to cut or grind into the front cover stamping.

(2) Scribe a heavy line on front cover next to front face of ring gear to aid in locating the new gear.

(3) Support converter with the four lug faces resting on blocks of wood. **The converter must not rest on the front cover hub during this operation.** Using a blunt chisel or drift and hammer, tap downward on ring gear near welded areas to break any remaining weld material (Fig. 41). Tap around ring gear until it comes off the converter.

(4) Smooth off weld areas on the cover with a file.

Installation

Any of the following methods may be used to heat and expand starter ring gear for installation on the converter.

Oven: Place ring gear in Oven C-794 and set temperature at 200 degrees F. Allow ring gear to remain in oven for 15 to 20 minutes.

Boiling Water: Place ring gear in a shallow container, add water, and heat for approximately eight minutes after water has come to a boil.

Steam: Place ring gear on a flat surface and direct a steam flow around gear for approximately two minutes.

Flame: Place ring gear squarely on a flat surface. Using a medium size tip, direct a slow flame evenly around inner rim of the gear. **Do not apply flame to the gear teeth.** Place a few drops of water on face of gear at intervals during heating process.When gear is hot enough to just boil the water, installation of the gear on torque converter can be made.

(1) After ring gear is expanded by heating, place the gear in position on converter front cover. Tap gear on cover evenly with a plastic or rawhide mallet until front face of gear is even with scribed line (made during removal) on the front cover. Make sure gear is even with scribed line around full circumference of the front cover.

(2) Reweld ring gear to torque converter front cover, being careful to place, as nearly as possible, same amount of weld material in exactly same location as was used in the original weld. This is necessary in order to maintain proper balance of the unit. Place welds alternately on opposite sides of converter to minimize distortion.

(3) The following suggestions are offered as an aid in making the weld.

a. Do not gas weld.

b. Use a D.C. welder that is set at straight polarity or an A.C. welder if proper electrode is available.

c. Use a ⅛ inch diameter welding rod, and a welding current of 80 to 125 amps.

d. Direct the arc at intersection of gear and front cover from an angle of 45 degrees from rear face of the gear.

(4) Inspect gear teeth and remove all nicks where metal is raised, weld metal splatter, etc., in order to ensure quiet starter operation.

TORQUE CONVERTER FLUSHING

In the event that any part has failed in transmission, the torque converter should be flushed to insure that fine metal particles are not later transferred back into the reconditioned transmission.

The converter **must be removed** from vehicle for flushing, as converter should never be rotated by the starter with transmission removed.

(1) Place converter in an upright position and pour two quarts of new clean solvent or kerosene into converter through the impeller hub.

(2) Turn and shake converter so as to swirl solvent through the internal parts. Turning the turbine and stator with transmission input and reaction shafts will aid in dislodging foreign material.

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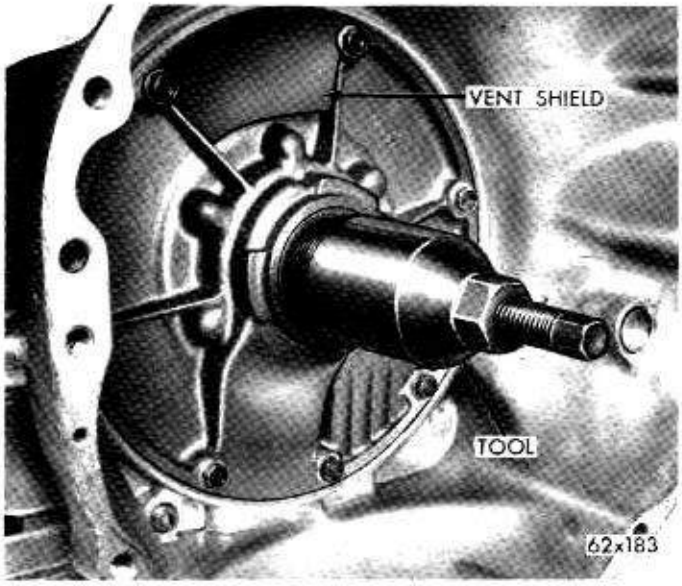


Fig. 42—Removing Pump Oil Seal

(3) Position converter in its normal operating position with drain plug at lowest point. Remove drain plug and drain the solvent. Rotate turbine and stator, and shake converter while draining to prevent dirt particles from settling.

(4) Repeat flushing operation at least once, or as many times as required until solvent or kerosene drained out is clear.

(5) After flushing, shake and rotate converter several times with drain plug out to remove any residual solvent and dirt. Flush any remaining solvent from converter with two quarts of new transmission fluid. This will prevent any adverse effect solvent may have on the transmission seals. Install drain plug and tighten to 14 foot-pounds.

PUMP OIL SEAL

Replacement

The pump oil seal can be replaced without removing pump and reaction shaft support assembly from the transmission case.

(1) Screw seal remover, Tool C-3861 into the seal (Fig. 42). Tighten screw portion of tool to withdraw the seal.

(2) To install a new seal, place the seal in opening of the pump housing (lip side facing inward). Using Tool C-3860, drive the seal into housing until tool bottoms (Fig. 43).

DISASSEMBLY—SUB-ASSEMBLY REMOVAL

Prior to removing transmission sub-assemblies, plug all openings and thoroughly clean exterior of the unit, preferably by steam. Cleanliness through entire disassembly and assembly cannot be over-emphasized. When disassembling, each part should be washed in a

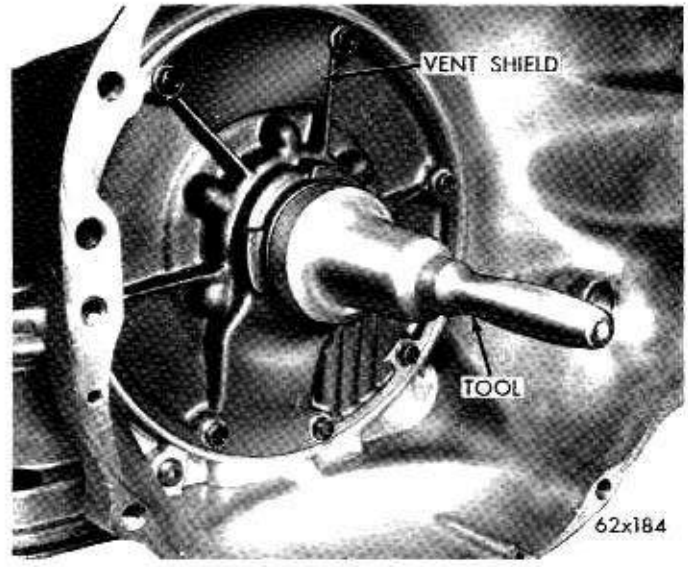


Fig. 43—Installing Pump Oil Seal

suitable solvent, then dried by compressed air. **Do not wipe parts with shop towels.** All mating surfaces in the transmission are accurately machined; therefore, careful handling of parts must be exercised to avoid nicks or burrs.

Drive Train End Play

Measuring drive train end play before disassembly, will usually indicate when a thrust washer change between the reaction shaft support and front clutch retainer is required, to properly adjust end play during assembly (except when major parts are replaced).

(1) Attach a dial indicator to transmission bell housing with its plunger seated against end of input shaft (Fig. 44).

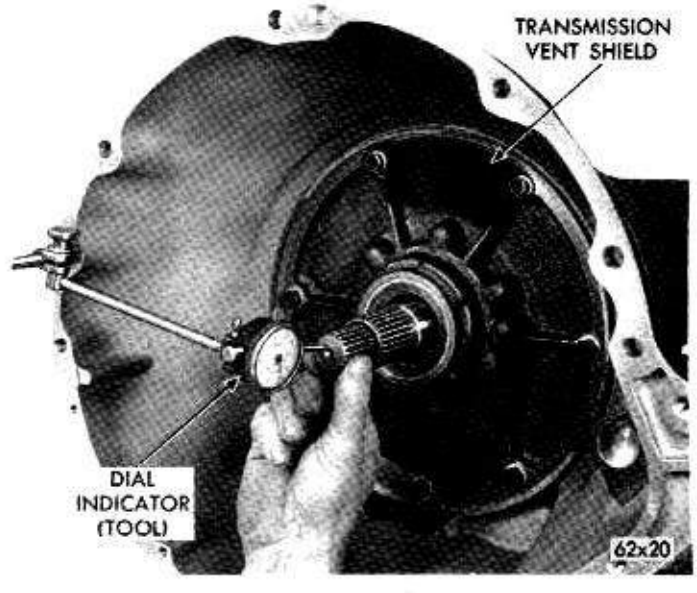


Fig. 44—Measuring Drive Train End Play

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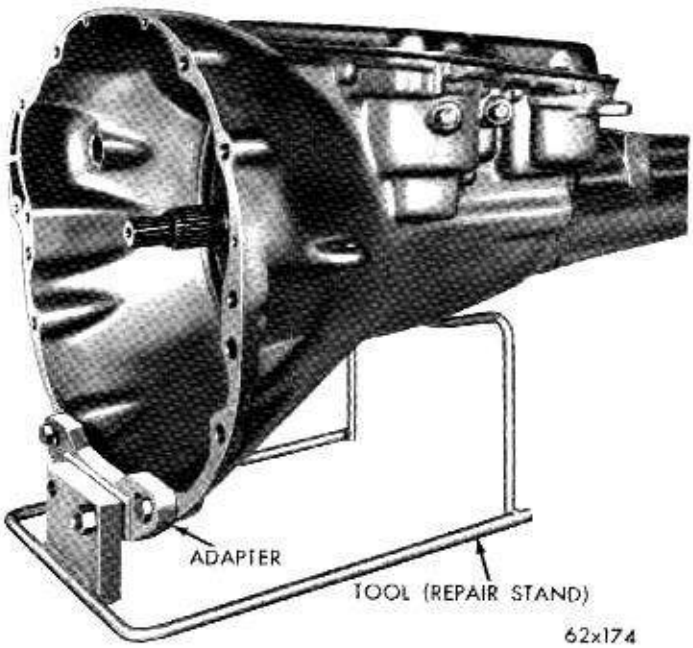


Fig. 45—Transmission Installed in Repair Stand

(2) **Chuck** input shaft in and out to obtain end play reading.

(3) Record the indicator reading for reference when reassembling the transmission. The end play specifications are .036-.084 inch.

Oil Pan

(1) Place transmission assembly in repair stand, Tool C-3750 with adapter C-3882 (Fig. 45).

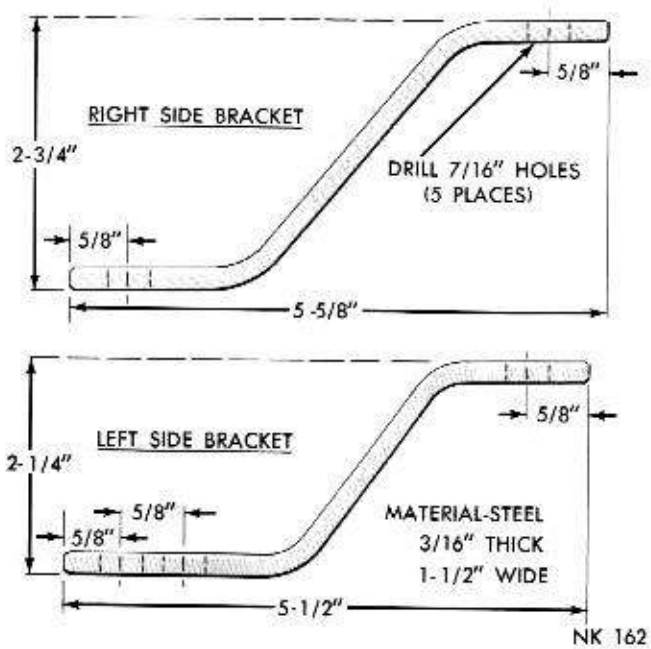


Fig. 46—Repair Stand Bracket Dimensions

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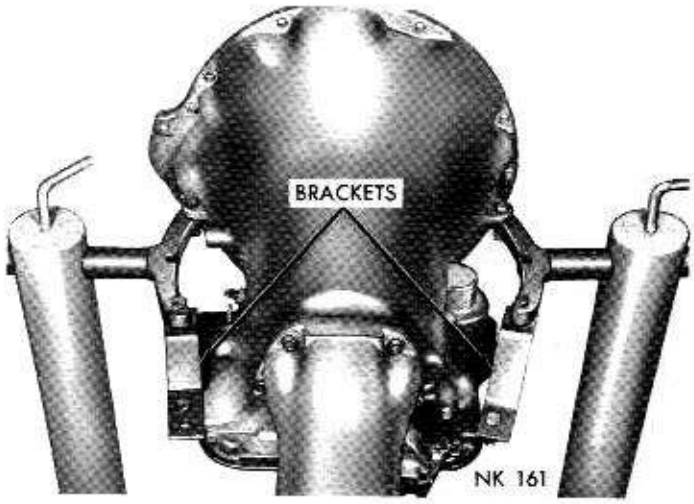


Fig. 47—Transmission Installed in Repair Stand (Tool DD-1014)

If repair stand DD-1014 is available, fabricate two attaching brackets (Fig. 46) and install transmission in the stand (Fig. 47), file out the 7/16 holes if necessary to obtain bracket alignment. This stand provides easier disassembly and assembly as transmission can be rotated as desired.

(2) Unscrew oil pan bolts and remove the pan and gasket.

Valve Body Assembly

(1) Loosen clamp bolts and remove throttle and gearshift levers from the transmission.

(2) Remove the ten hex-head valve body to transmission bolts. Remove E-clip securing parking lock rod to valve body manual lever (Fig. 38).

(3) While lifting valve body out of transmission case, disconnect parking lock rod from the lever.

Accumulator Piston and Spring

(1) Lift spring off accumulator piston and withdraw piston from the case.

Extension Housing and Output Shaft Bearing

Before removing extension housing, pull parking lock rod forward out of the case. Rotate propeller shaft if necessary to align parking gear and sprag to permit knob on end of control rod to pass the sprag.

(1) Remove speedometer pinion and adapter assembly.

(2) Remove extension housing to transmission bolts.

(3) Remove two screws, plate and gasket from bottom of extension housing mounting pad. Spread large snap ring from output shaft bearing with Tool C-3301A (Fig. 33). With snap ring spread as far as possible, carefully tap extension housing off the output shaft and bearing.

(4) Carefully unwind and slide yoke seal rear stop ring off the output shaft (Fig. 34). Slide yoke seal and front stop ring off the shaft.

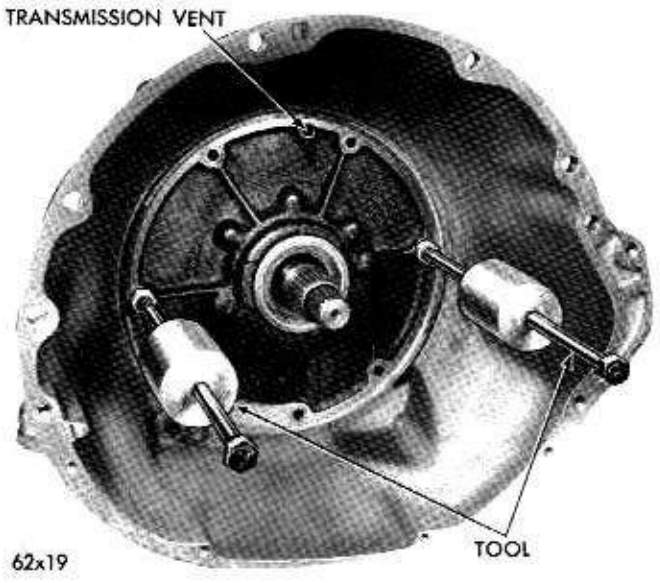


Fig. 48—Removing Oil Pump and Reaction Shaft Support Assembly

(5) Remove output shaft bearing rear snap ring. Remove bearing from the shaft, then remove front snap ring.

Governor and Support

(1) Using a screw driver, carefully pry snap ring from weight end of governor valve shaft (Fig. 35). Slide valve and shaft assembly out of the governor body.

(2) Remove snap ring from behind governor body, then slide governor body and support assembly off the output shaft.

Oil Pump and Reaction Shaft Support

(1) Remove oil pump housing retaining bolts.

(2) Tighten front band adjusting screw until band is tight on the front clutch retainer. This prevents clutch retainer from coming out with pump which might cause unnecessary damage to the clutches.

(3) Attach Tool C-3752 to the pump housing flange (Fig. 48), thread screws of tool into the flange holes at 9 and 3 o'clock locations.

(4) Bump outward evenly on the two "knocker weights" to withdraw pump and reaction shaft support assembly from the case.

Front Band and Front Clutch

(1) Loosen front band adjuster, remove band strut and slide band out of the case.

(2) Slide front clutch assembly out of the case.

Input Shaft and Rear Clutch

(1) Grasp input shaft, and slide input shaft and rear clutch assembly out of the case.

CAUTION: Be careful not to lose thrust washer located between rear end of input shaft and forward end of output shaft.

Planetary Gear Assemblies, Sun Gear, and Driving Shell

(1) While supporting output shaft and driving shell, carefully slide assembly forward and out through the case.

CAUTION: Be very careful not to damage ground surfaces on output shaft during removal.

Rear Band and Low-Reverse Drum

(1) Remove low-reverse drum, then loosen rear band adjuster, remove band strut and then remove band from the case.

Overrunning Clutch

(1) Note position of overrunning clutch rollers and springs before disassembly to assist in reassembly.

(2) Carefully slide out clutch hub and remove the rollers and springs. **If overrunning clutch cam and/or roller spring retainer are found damaged or worn, refer to Page 63 for replacement procedures.**

Kickdown Servo

(1) Compress kickdown servo spring by using engine valve spring compressor Tool C-3422, then remove snap ring (Fig. 49).

(2) Remove rod guide, springs and piston rod from the case. Be careful not to damage piston rod or guide during removal.

(3) Insert Tool C-484 inside piston and withdraw piston from the transmission case.

Low and Reverse Servo

(1) Compress low and reverse servo piston spring by using engine valve spring compressor Tool C-3422, then remove snap ring.

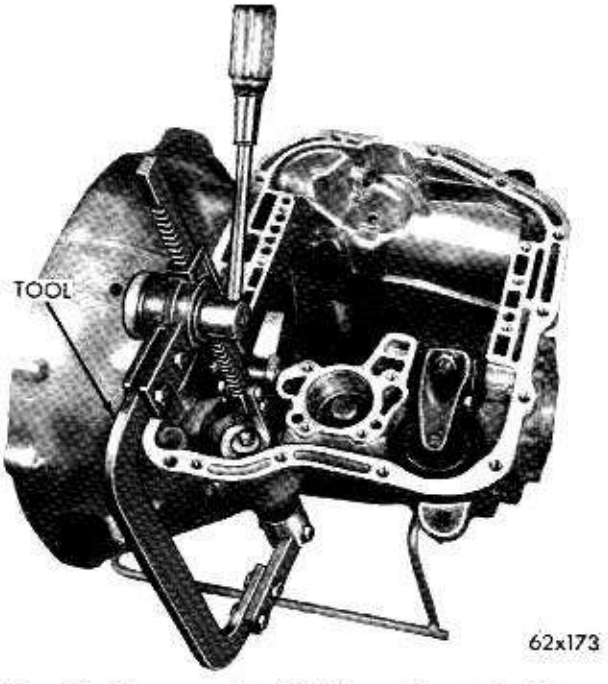


Fig. 49—Compressing Kickdown Servo Spring

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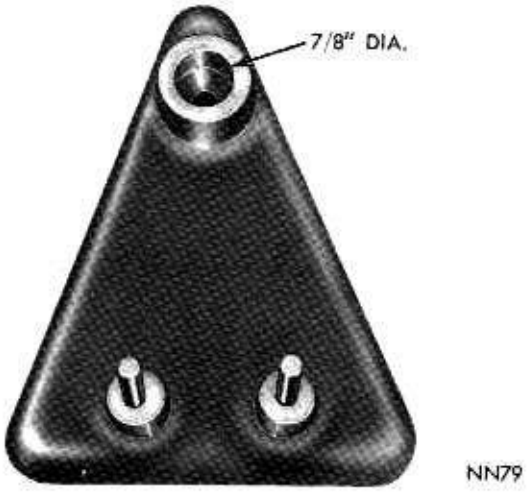


Fig. 50—Rework Valve Body Repair Stand

(2) Remove spring retainer, spring, and servo piston and plug assembly from the case.

RECONDITION SUB ASSEMBLIES

The following procedures cover disassembly, inspection, repair, and assembly of each sub-assembly as removed from transmission.

Heli-Coil inserts are recommended for repairing damaged, stripped or worn threads in aluminum parts. Refer to Page 32.

Pre-sized service bushings are available for replacement for most all bushings in the TorqueFlite transmission. The two bushings in sun gear are not serviced because of the low cost of the sun gear assembly. If bushings are found worn or scored, they should be replaced as outlined in the following reconditioning procedures.

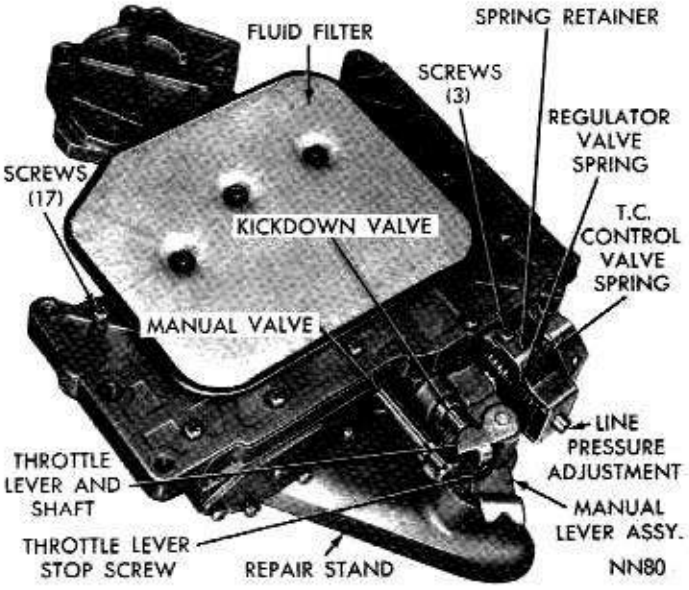
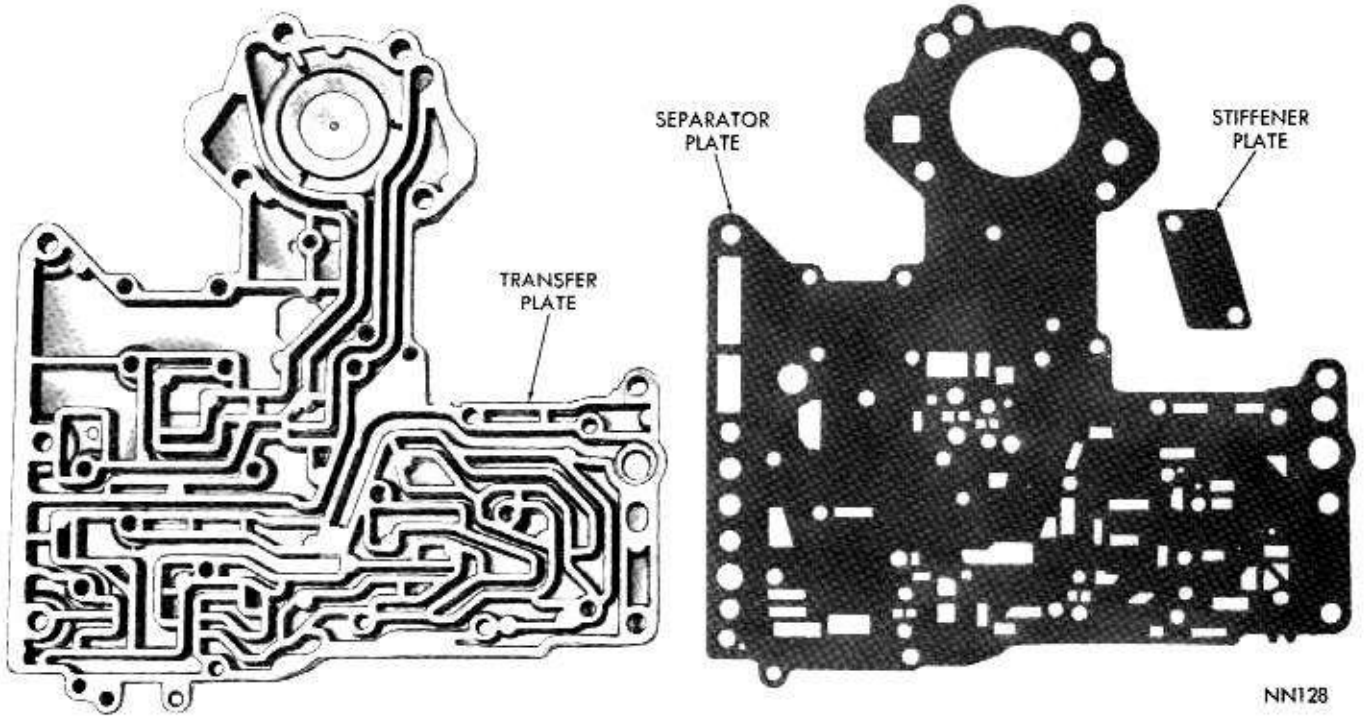


Fig. 51—Valve Body and Control Assembly

The bushing replacement tools listed by "SP" numbers are part of Tool Kit C-3887.

NOTE: The bushing in the oil pump has been relocated in the pump housing, thus requiring a new installing head. The new installing head for the A-727-A and B transmissions is SP-5118.

The use of crocus cloth is permissible where necessary, providing it is used carefully. When used on



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Fig. 52—Transfer and Separator Plate

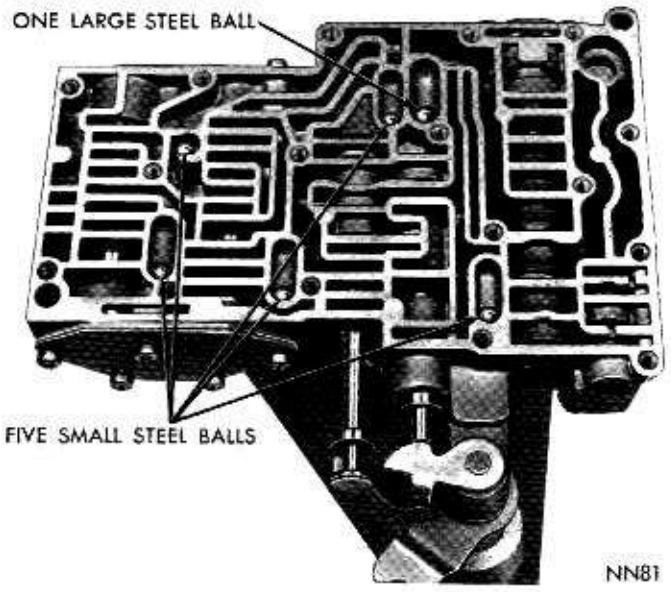


Fig. 53—Steel Ball Locations

valves, use extreme care to avoid rounding off the sharp edges. The sharp edge is vitally important to this type valve. Sharp edges prevent dirt and foreign matter from getting between the valve and body, thus reducing possibilities of sticking. When it becomes necessary to recondition the transmission, and vehicle has accumulated considerable mileage, install new seal rings on parts requiring their usage. **Coat each part with Automatic Transmission Fluid—AQ-ATF Suffix "A" during assembly.**

VALVE BODY ASSEMBLY

CAUTION: Never clamp any portion of valve body or transfer plate in a vise. Any slight distortion of the aluminum body or transfer plate will result in sticking valves, excessive leakage or both. When removing or installing valve or plugs, slide them in or out carefully. Do not use force.

Rework valve body repair stand, Tool C-3749, by drilling the 5/16" diameter hole to ⅞" and ¾" deep (Fig. 50). The stand can then be used with either the old or new type valve bodies.

Disassembly

(1) Place valve body assembly on repair stand, Tool C-3749, (Fig. 51). Remove three screws from fluid filter and lift off the filter.

(2) While holding spring retainer firmly against the spring force, remove the three bracket retaining screws (Fig. 51).

(3) Remove the spring retainer, torque converter control valve spring, and regulator valve spring with line pressure adjusting screw assembly. **Do not alter setting of line pressure adjusting screw and nut. The nut has an interference thread and does not turn easily on the screw.**

(4) Slide regulator valve out of valve body. Slide torque converter control valve out of valve body.

(5) Remove 17 transfer plate retaining screws. Carefully lift transfer plate and steel separator plate assembly off the valve body.

(6) Invert transfer plate assembly and remove the stiffener plate. Remove remaining screws securing separator plate to the transfer plate, and carefully lift off the separator plate (Fig. 52).

(7) Note location of the six steel balls in valve body, one of them is larger than other five and is in the larger chamber (Fig. 53). Remove the steel balls.

(8) Invert valve body and lay it on a clean cloth or paper. Remove E-clip and washer from throttle lever shaft (Fig. 54). Remove any burrs from shaft, then while holding manual lever detent ball and spring in their bore with Tool C-3765 or similar tool, slide manual lever off the throttle shaft. Remove the detent ball and spring.

(9) Remove manual valve, carefully slide it out of valve body with a rotating motion.

(10) Remove throttle lever and shaft from the valve body.

(11) Remove shuttle valve cover plate (Fig. 54). Remove E-clip from exposed end of the shuttle valve.

(12) Remove throttle lever stop screw assembly (Fig. 55), being careful not to disturb the setting any more than is necessary.

(13) Remove kickdown detent, kickdown valve, throttle valve spring and the throttle valve (Fig. 55).

(14) Remove the governor plug end plate (Fig. 55). Tip up valve body to allow shuttle valve throttle plug, spring, shuttle valve, and shift valve governor plugs to slide out into your hand.

Note longer stem on the 1-2 shift valve plug as a means for identification.

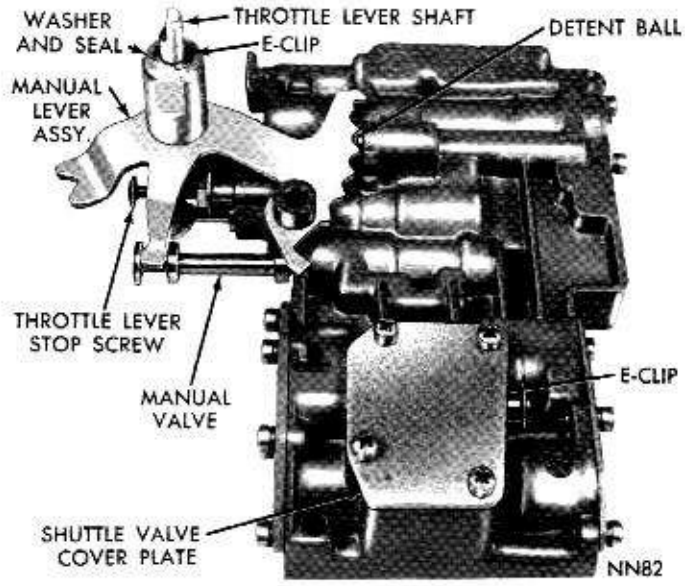


Fig. 54—Valve Body Controls (Assembled View)

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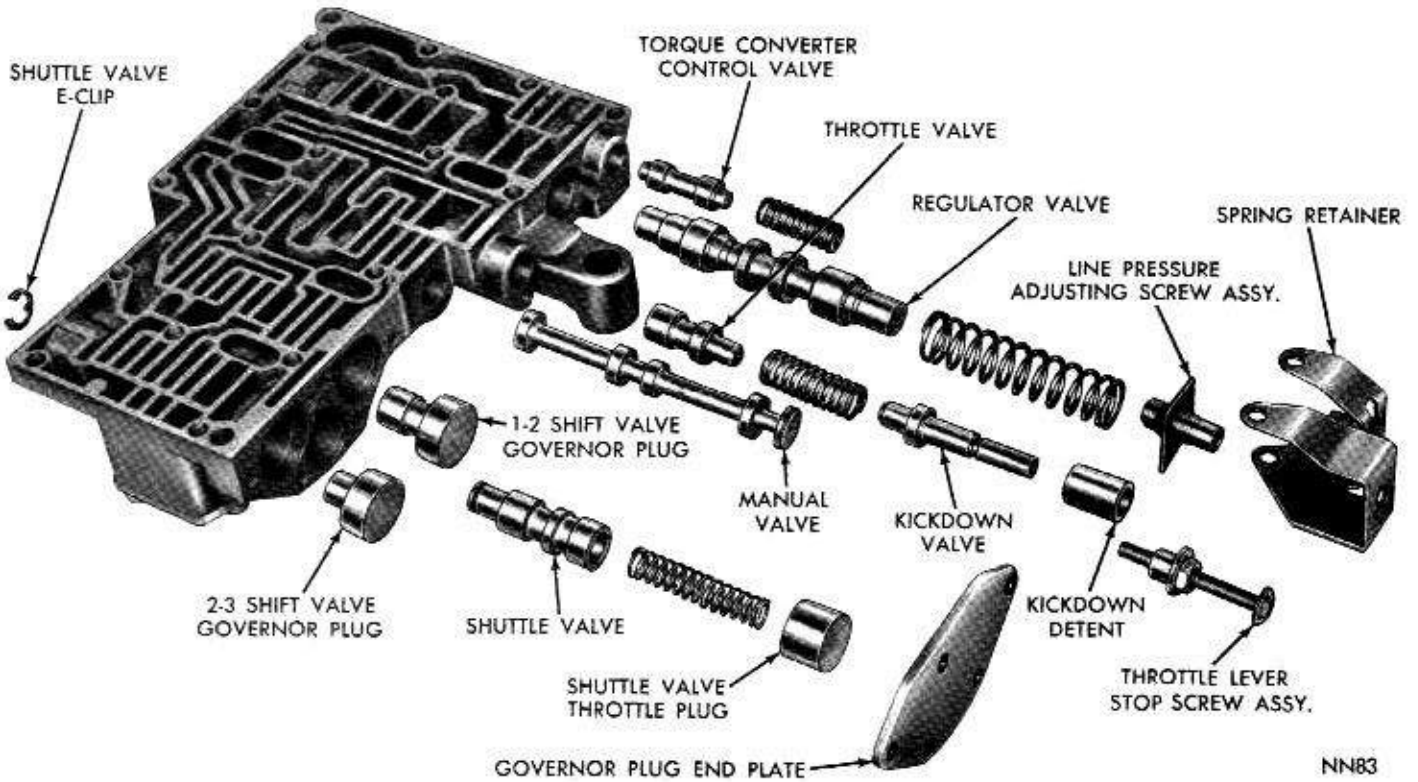


Fig. 55—Valve Body—Lever Side (Disassembled)

(15) Remove shift valve end plate (Fig. 56) and slide out the two springs and valves.

(16) Remove regulator valve end plate. Slide regulator valve line pressure plug, sleeve, and regulator valve throttle pressure plug out of valve body.

Cleaning and Inspection

Allow all parts to soak a few minutes in a suitable clean solvent. Wash thoroughly and blow dry with compressed air. Make sure all passages are clean and free from obstructions.

Inspect manual and throttle valve operating levers and shafts for being bent, worn or loose. If a lever is loose on its shaft, it may be **silver soldered** only, or the lever and shaft assembly should be replaced.

CAUTION: Do not attempt to straighten bent levers.

Inspect all mating surfaces for burrs, nicks and scratches. Minor blemishes may be removed with crocus cloth, using only a very light pressure. Using straightedge, Tool C-3335, inspect all mating surfaces for warpage or distortion. Slight distortion may be corrected, using a surface plate. Make sure all metering holes in the steel plate are open. Using a pen light, inspect bores in the valve body for scores, scratches, pits and irregularities.

Inspect all valve springs for distortion and collapsed coils. Inspect all valves and plugs for burrs, nicks and scores. Small nicks and scores may be removed with crocus cloth, providing extreme care is taken not to round off sharp edges. The sharpness of these edges is vitally important because it prevents foreign matter from lodging between the valve and valve body, thus reducing possibility of sticking. Inspect all valves and plugs for freedom of operation in valve body bores. When bores, valves and plugs are clean and dry, the valve and plugs should fall freely in the bores. **The valve body bores do not change dimensionally with use. Therefore, a valve body that was functioning properly when vehicle was new, will operate correctly if it is properly and thoroughly cleaned. There is no need to replace the valve body unless it is damaged in handling.**

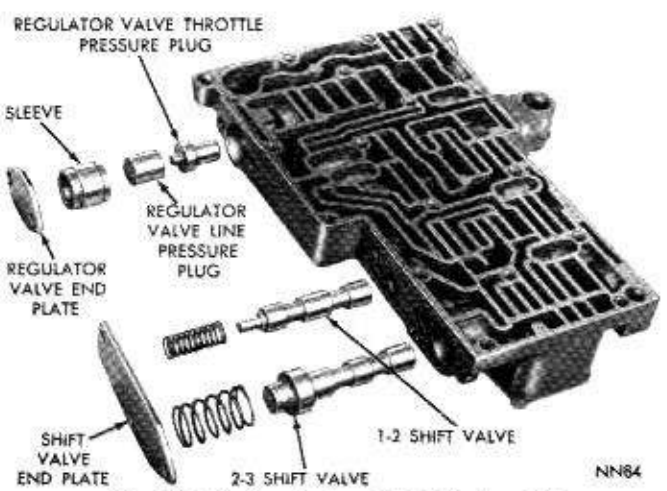


Fig. 56—Valve Body—Shift Valve Side (Disassembled)

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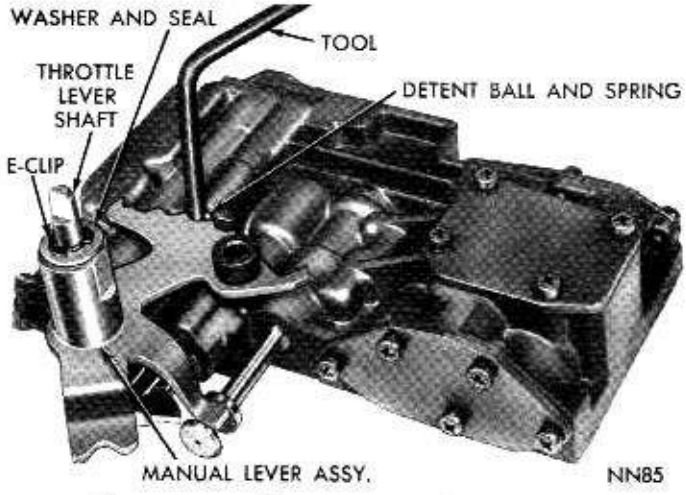


Fig. 57—Installing Detent Ball, Spring and Control Levers

Assembly

(1) Place separator plate on the transfer plate (Fig. 52). Install stiffener plate and retaining screws. Make sure all bolt holes are aligned; then tighten stiffener plate screws to 28 inch-pounds.

(2) Place 1-2 and 2-3 shift valve governor plugs in their respective bores (Fig. 55). Install shuttle valve, spring and shuttle valve throttle plug. Install governor plug end plate and tighten the five retaining screws to 28 inch-pounds.

(3) Install E-clip on end of the shuttle valve (Fig. 54). Install shuttle valve cover plate and tighten the four retaining screws to 28 inch-pounds.

(4) Install 1-2 and 2-3 shift valves and springs (Fig. 56). Install shift valve end plate and tighten the three retaining screws to 28 inch-pounds.

(5) Install regulator valve throttle pressure plug, sleeve, and the line pressure plug (Fig. 56). Install regulator valve end plate and tighten the two retaining screws to 28 inch-pounds.

(6) Install throttle valve and spring (Fig. 55). Slide kickdown detent on the kickdown valve (counterbore side of detent toward valve), then install assembly in the valve body.

(7) Install throttle lever stop screw (Fig. 55), and tighten lock nut finger tight.

(8) Install manual valve in the valve body (Fig. 55).

(9) Install throttle lever and shaft on the valve body (Fig. 57). Insert detent spring and ball in its bore in the valve body. Depress ball and spring with Tool C-3765 or similar tool and slide manual lever over throttle shaft so that it engages manual valve and detent ball. Install retaining washer and E-clip on the throttle shaft. (Fig. 54).

(10) Position valve body assembly on the repair stand.

(11) Place the six steel balls in valve body chambers (Fig. 53). Two go in the large chamber (Fig. 53).

(12) Position transfer plate assembly on the valve body. Install the 17 retaining screws, starting at center and working outward, tighten screws to 28 inch-pounds.

(13) Install the torque converter valve and regulator valve (Fig. 55).

(14) Position the torque converter valve spring and regulator valve spring over ends of their respective valves. Place line pressure adjusting screw assembly on end of regulator valve spring with long dimension of nut at right angles to the valve body (Fig. 55).

(15) Install spring retainer, making sure converter valve spring is engaged on the tang and position squarely in the retainer. Tighten the three retaining screws to 28 inch-pounds.

Measure and if necessary, align spring retainer as described on Page 41.

(16) Install the oil filter and tighten the three retaining screws to 28 inch-pounds.

(17) Attach parking lock control rod to the manual lever and secure with the E-clip.

After valve body has been serviced and completely assembled, adjust the throttle and line pressures as outline on page 41. However, if pressure were satisfactory prior to disassembly, use original settings.

ACCUMULATOR PISTON AND SPRING

Inspection

Inspect the two seal rings for wear and make sure they turn freely in piston grooves. It is not necessary to remove rings unless condition warrants. Inspect piston for nicks, burrs, scores and wear. Inspect piston bore in the case for scores or other damage and piston spring for distortion. Replace parts as required.

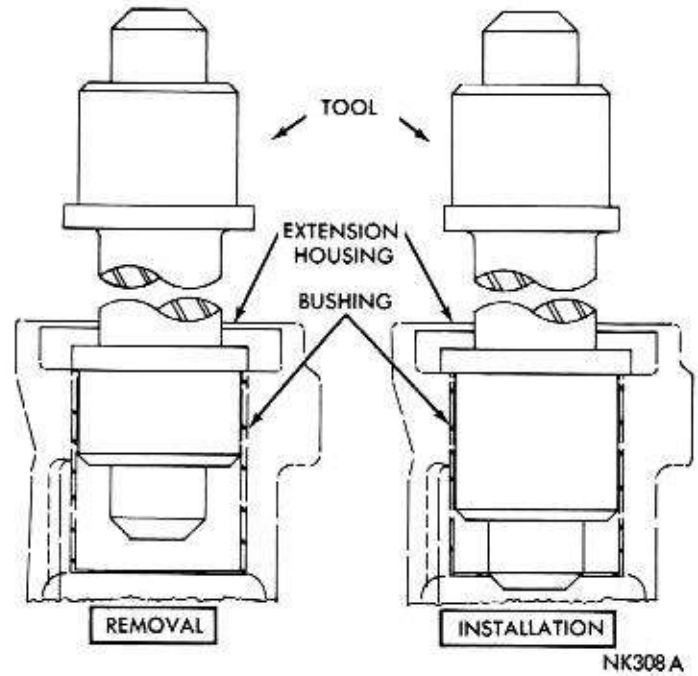


Fig. 58—Replacing Extension Housing Bushing

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EXTENSION HOUSING BUSHING AND OIL SEAL

Replacement

(1) Pry or drive oil seal out of extension housing with a long blunt drift. Be sure not to mar oil seal surface in the housing.

(2) Press or drive out bushing with Tool C-3974 (Fig. 58).

(3) Slide a new bushing on installing end of Tool C-3974. Align oil hole in bushing with oil slot in the housing, then press or drive bushing into place (Fig. 58).

(4) Position a new seal in opening of extension housing and drive it into the housing with Tool C-3972 (Fig. 32).

PARKING LOCK SPRAG

Disassembly

(1) Slide shaft out of extension housing to remove parking sprag and spring (Fig. 37). Remove snap ring and slide reaction plug and pin assembly out of the housing.

Inspection

Inspect sprag shaft for scores and free movement in the housing and sprag. Inspect sprag and control rod springs for distortion and tension. Inspect square lug on the sprag for broken edges, also lugs on the parking gear for damage. Inspect knob on end of control rod for nicks, burrs and free turning.

To replace the parking gear, refer to "Governor and Support-Disassembly and Assembly," Page 56.

Assembly

(1) Position sprag and spring in the housing and insert the shaft (Fig. 37). Make sure square lug on sprag is toward parking gear and spring is positioned so it moves sprag away from the gear.

(2) Install reaction plug and pin assembly in the housing and secure with snap plug.

GOVERNOR AND SUPPORT

Disassembly

(1) Remove large snap ring from weight end of governor body and lift out the weight assembly.

(2) Remove snap ring from inside governor weight, remove inner weight and spring from the outer weight.

(3) If the lugs on parking gear are damaged, removed the four bolts and separate support from the governor body.

Cleaning and Inspection

Figure 36 shows a disassembled view of the governor assembly.

Inspect all parts for burrs and wear. Inspect inner weight for free movement in the outer weight, and outer weight for free movement in the governor body. Inspect valve for free movement in the governor body. The weights and valve should fall freely in the bores when clean and dry. Rough surfaces may be removed with crocus cloth.

Inspect the governor weight spring for distortion. Inspect the lugs on parking gear for broken edges or other damage. Thoroughly clean all governor parts in

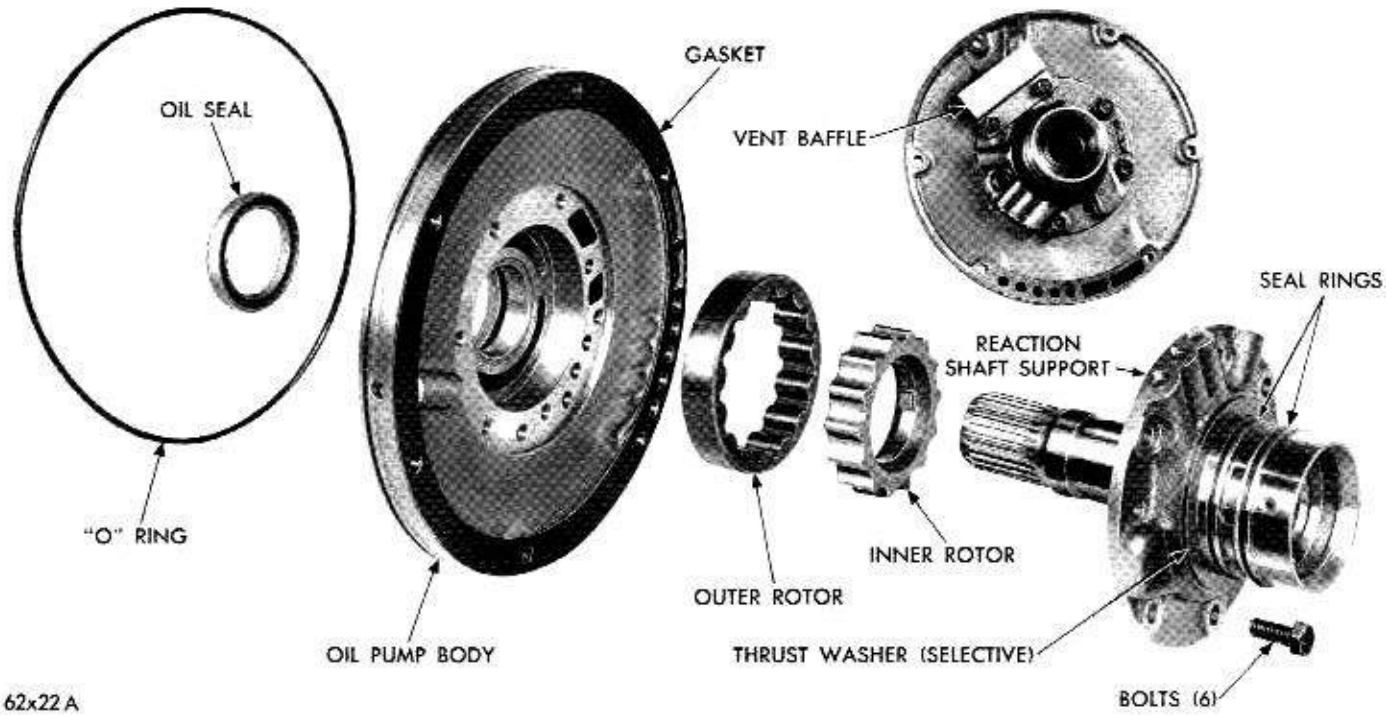


Fig. 59—Oil Pump and Reaction Shaft Support (Disassembled)

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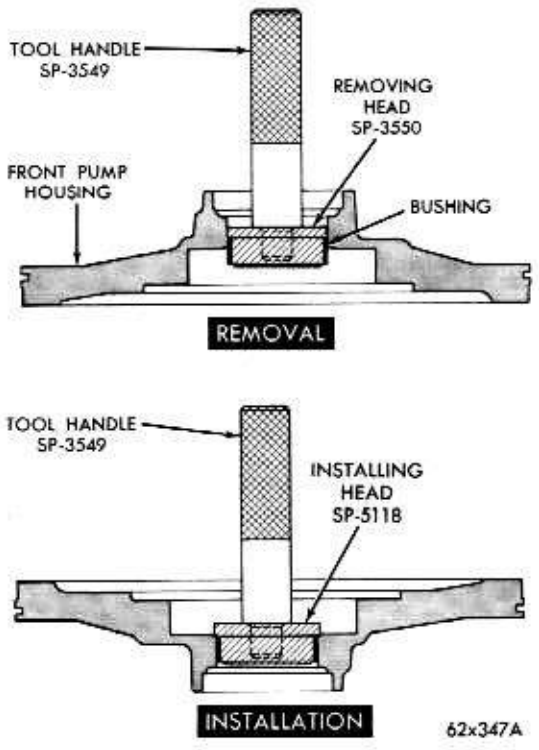


Fig. 60—Replacing Pump Bushing

clean solvent and inspect for free movement before assembly.

Assembly

(1) If the support was separated from governor body, assemble and tighten the bolts finger tight. Make sure oil passage of governor body aligns with passage in the support.

(2) Assemble governor weights and spring, and secure with snap ring inside of large governor weight. Place weight assembly in governor body and install snap ring.

OIL PUMP AND REACTION SHAFT SUPPORT

Disassembly

Figure 59 shows the oil pump and reaction shaft support disassembled.

(1) Remove bolts from rear side of reaction shaft support, remove vent baffle and lift the support off the pump.

(2) Remove rubber seal ring from pump body flange.

(3) Drive out the oil seal with a blunt punch.

Inspection

Inspect interlocking seal rings (Fig. 59) on reaction shaft support for wear or broken locks, make sure they turn freely in the grooves. Do not remove rings unless conditions warrant. Inspect pump body and reaction shaft support bushings for wear or scores. Inspect machined surfaces on pump body and reaction shaft support for nicks and burrs. Inspect pump rotors for scoring or pitting. With rotors cleaned and installed in the pump body, place a straightedge across face of rotors and pump body. Using a feeler gauge, measure clearance between straight edge and face of the rotors. Clearance limits are from .001 to .0025 inch. Also, with a feeler gauge, measure rotor tip clearance between inner and outer rotor teeth. Clearance limits are from .005 to .010 inch.

Pump Bushing Replacement

(1) Place pump housing on a clean smooth surface with the rotor cavity down.

(2) Place removing head Tool SP-3550 in the bushing, and install handle Tool SP-3549 in the removing head (Fig. 60).

(3) Drive bushing straight down and out of the bore. Be careful not to cock tool in the bore.

(4) Position a new bushing on the installing head Tool SP-5118.

(5) With pump housing on a smooth clean surface (hub end down), start bushing and installing head in the bushing bore. Install handle Tool SP-3549 in the installing head (Fig. 60).

(6) Drive bushing into housing until tool bottoms in the pump cavity. Be careful not to cock tool during installation.

(7) Stake bushing in place by using a blunt punch or similar tool (Fig. 61). A gentle tap at each stake slot location will suffice.

(8) Using a narrow-bladed knife or similar tool, remove high points or burrs around the staked area (Fig. 61). Do not use a file or similar tool that will remove more metal than is necessary.

(9) Thoroughly clean pump housing before installation.

Reaction Shaft Bushing Replacement

(1) Assemble remover Tool SP-3632, cup Tool SP-3633, and hex nut Tool SP-1191.

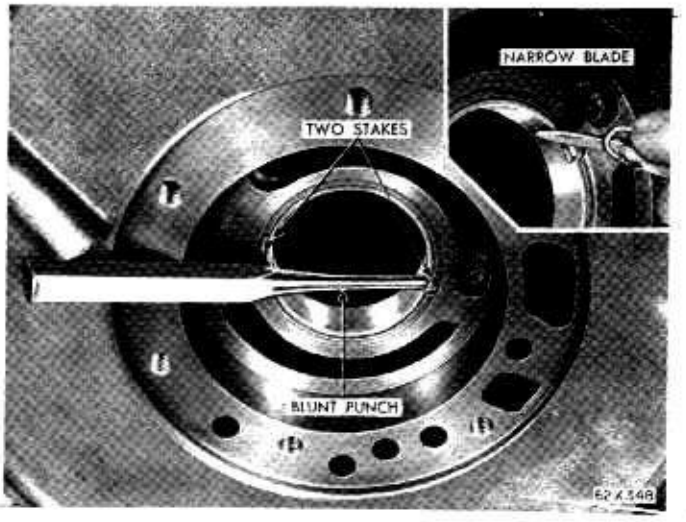


Fig. 61—Staking Pump Bushing

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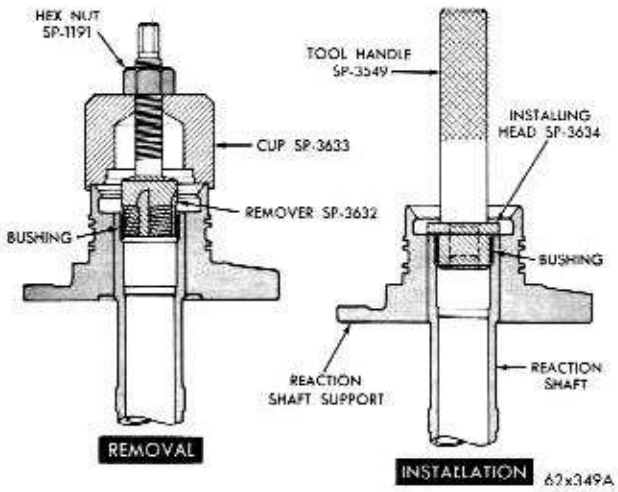


Fig. 62—Replacing Reaction Shaft Bushing

CAUTION: Do not clamp any part of reaction shaft or support in a vise.

(2) With cup held firmly against the reaction shaft, thread remover into bushing as far as possible by hand (Fig. 62).

(3) Using a rench, screw remover into bushing 3 to 4 additional turns to firmly engage threads in the bushing.

(4) Turn hex nut down against the cup to pull bushing from the reaction shaft. Thoroughly clean reaction shaft to remove chips made by the remover threads.

(5) Lightly grip bushing in a vise or with pliers and back tool out of the bushing. Be careful not to damage threads on the bushing remover.

(6) Slide a new bushing (chamfered end first) on installing head Tool SP-3634, and start them in bore of the reaction shaft.

(7) Support reaction shaft upright on a clean smooth surface and install handle Tool SP-3549 in the installing head (Fig. 62). Drive bushing into the shaft until tool bottoms.

(8) Thoroughly clean reaction shaft support assembly before installation.

Assembly

(1) Assemble pump rotors in the pump housing (Fig. 59).

(2) Install reaction shaft support and position vent baffle over the vent opening. Install retaining bolts and tighten to 150 inch-pounds.

(3) Place a new oil seal in opening of pump housing (lip of seal facing inward) using Tool C-3860 drive seal into housing until tool bottoms.

FRONT CLUTCH

Disassembly

Figure 63 shows a disassembled view of the front clutch assembly.

(1) Using a screw driver, remove large snap ring that secures pressure plate in the clutch piston retainer. Lift pressure plate and clutch plates out of the retainer.

(2) Install compressor, Tool C-3863 over the piston spring retainer (Fig. 64). Compress springs and remove snap ring, then slowly release tool until spring retainer is free of the hub. Remove tool, retainer and springs.

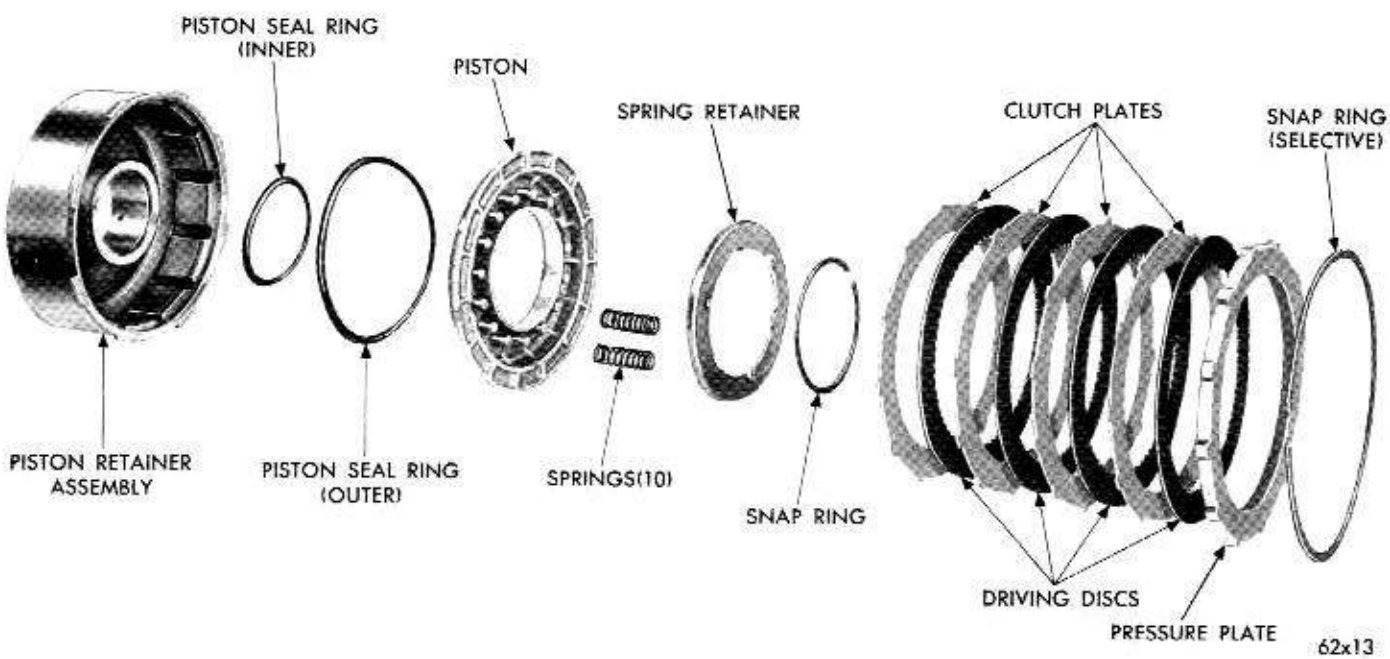


Fig. 63—Front Clutch Assembly (Disassembled)

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Fig. 64—Removing or Installing Front Clutch Spring Retainer Snap Ring

(3) Invert clutch retainer assembly and bump on a wood block to remove piston. Remove seals from piston and clutch retainer hub.

Inspection

Inspect facing material on all driving discs. Replace discs that are charred, glazed or heavily pitted. Discs should also be replaced if they show evidence of material flaking off or if the facing material can be scraped off easily. Inspect driving disc splines for wear or other damage. Inspect steel plate and pressure plate surfaces for burning, scoring or damaged driving lugs. Replace if necessary.

Inspect steel plate lug grooves in clutch retainer for smooth surfaces, plates must travel freely in the grooves. Inspect band contacting surface on clutch retainer for scores. Note ball check in clutch retainer, make sure ball moves freely. Inspect seal surfaces in clutch retainer for nicks or deep scratches, light scratches will not interfere with sealing of neoprene rings. Inspect clutch retainer bushing for wear or scores.

Inspect inside bore of piston for score marks, if light, remove with crocus cloth. Inspect seal grooves for nicks and burrs. Inspect neoprene seals for deterioration, wear, and hardness, and the piston springs, retainer and snap ring for distortion.

Front Clutch Retainer Bushing Replacement

(1) Lay clutch retainer (open end down) on a clean smooth surface and place removing head Tool SP-3629 in the bushing. Install handle Tool SP-3549 in removing head (Fig. 65).

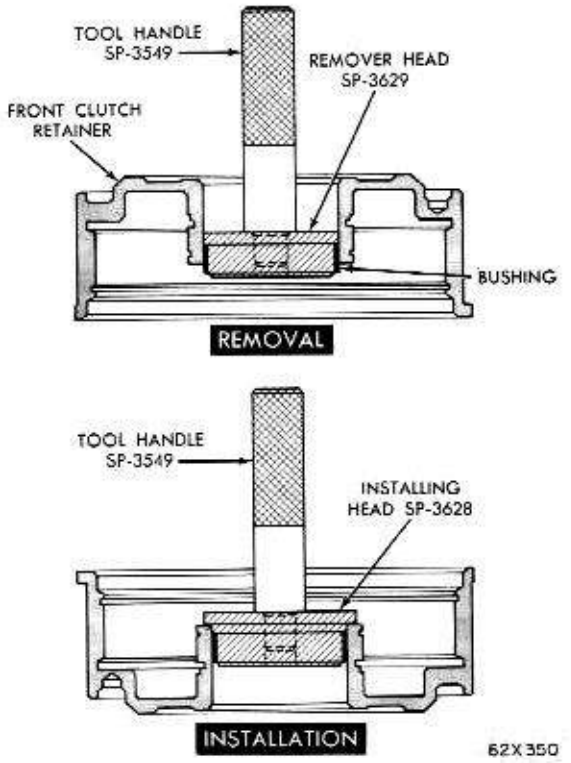


Fig. 65—Replacing Front Clutch Retainer Bushing

(2) Drive bushing straight down and out of clutch retainer bore. Be careful not to cock tool in the bore.

(3) Lay clutch retainer (open end up) on a clean smooth surface. Slide a new bushing on installing head Tool SP-3628, and start them in clutch retainer bore.



Fig. 66—Frong Clutch Piston Return Springs—Location

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Fig. 67—Measuring Front Clutch Plate Clearance

(4) Install handle Tool SP-3549 in the installer (Fig. 65). Drive bushing into clutch retainer until tool bottoms.

(5) Thoroughly clean clutch retainer before assembly and installation.

Assembly

(1) Lubricate and install inner seal on hub of the clutch retainer. Make sure lip of seal faces down and is properly seated in the groove.

(2) Install outer seal on the clutch piston, with lip of seal toward bottom of the clutch retainer. Apply a coating of wax type lubricant or Door Ease to outer edge of seal for easier installation of the piston assembly. Place piston assembly in retainer and carefully seat piston in bottom of the retainer.

(3) Place the 10 springs on piston hub exactly as shown in Figure 66. Position spring retainer and snap ring on the springs. Compress springs with Tool C-3863 (Fig. 64), and seat snap ring in the hub groove. Remove compressor tool.

(4) Lubricate all clutch plates, install one steel plate followed by a lined plate until all plates are installed. Install pressure plate and snap ring. Make sure snap ring is properly seated.

(5) With front clutch complete assembled, insert a feeler gauge between pressure plate and snap ring (Fig. 67). The clearance should be .024 to .123 inch. If not, install a snap ring of proper thickness to obtain specified clearance. **Snap rings are the same as that used in rear clutch and are available in .060-.062, .074-.076 and .088-.090 inch thickness.**

REAR CLUTCH

Disassembly

Figure 68 shows a disassembled view of the rear clutch assembly.

(1) Using a screw driver, remove large snap ring that secures pressure plate in the clutch retainer. Lift pressure plate, clutch plates, and inner pressure plate out of the retainer.

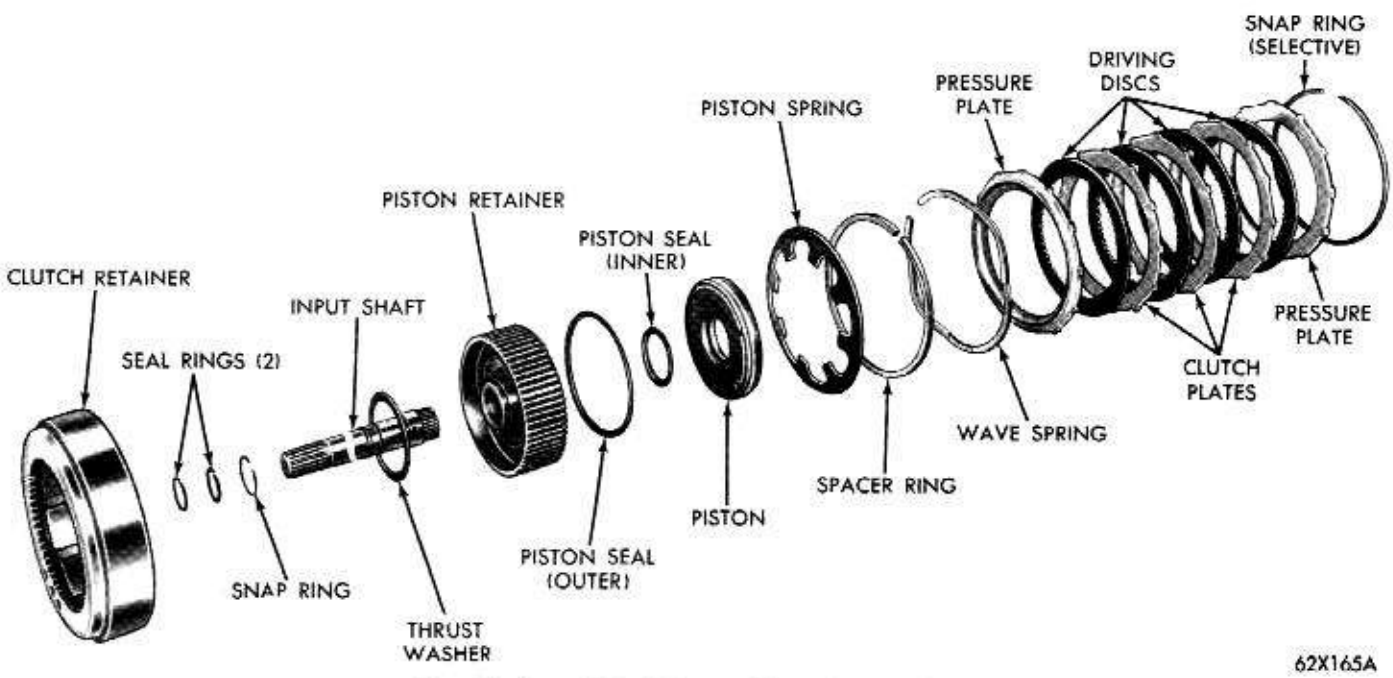


Fig. 68—Rear Clutch Assembly (Disassembled)

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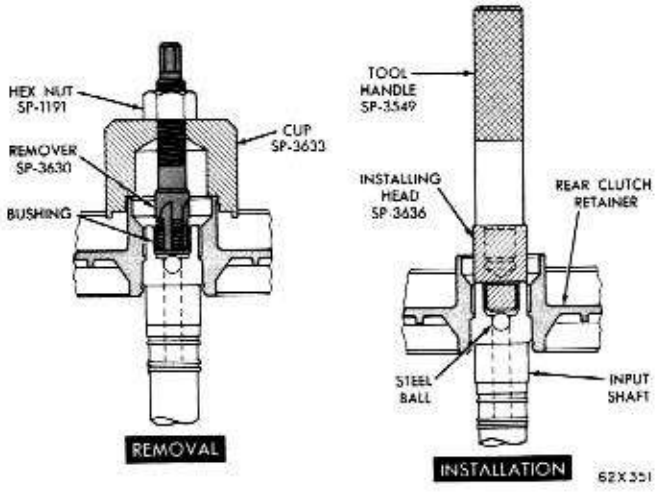


Fig. 69—Replacing Input Shaft Bushing

(2) Carefully pry one end of wave spring out of its groove in the clutch retainer, then remove wave spring, spacer ring and clutch piston spring.

(3) Invert clutch piston retainer assembly and bump on a wood block to remove the piston. Remove seals from the piston.

(4) If necessary, remove snap ring and press input shaft from the clutch piston retainer.

Inspection

Inspect facing material on all driving discs. Replace discs that are charred, glazed or heavily pitted. Discs should also be replaced if they show evidence of material flaking off or if facing material can be scraped off easily. Inspect driving disc splines for wear or other damage. Inspect steel plate and pressure plate surfaces for burning, scoring or damaged driving lugs. Replace if necessary.

Inspect steel plate lug grooves in clutch retainer for smooth surfaces, plates must travel freely in grooves. Note ball check in the piston, make sure ball moves freely. Inspect seal surfaces in clutch retainer for nicks or deep scratches, light scratches will not interfere with sealing of neoprene seals. Inspect neoprene seals for deterioration, wear, and hardness. Inspect piston spring, wave spring, and spacer for distortion or breakage.

Inspect interlocking seal rings (Fig. 68) on input shaft for wear or broken locks, make sure they turn freely in the grooves. Do not remove rings unless conditions warrant. Inspect bushing in the input shaft for wear or scores. Inspect rear clutch to front clutch thrust washer for wear. Washer thickness should be .061 to .063 inch, replace if necessary.

Input Shaft Bushing Replacement

(1) Clamp input shaft in a vise with soft jaws, being careful not to clamp on seal ring lands or journals.

(2) Assemble remover Tool SP-3630, cup Tool SP-3633, and hex nut Tool SP-1191.

(3) With cup held firmly against clutch piston retainer, thread remover into bushing as far as possible by hand (Fig. 69).

(4) Using a wrench, screw remover into bushing 3 to 4 additional turns to firmly engage threads in the bushing.

(5) Turn hex nut down against cup to pull bushing from the input shaft.

(6) Thoroughly clean input shaft to remove chips made by removed threads. Make certain small lubrication hole next to ball in end of shaft is not plugged with chips. Be sure no chips are lodged next to the steel ball.

(7) Slide a new bushing on installing head Tool SP-3636, and start them in bore of the input shaft.

(8) Stand input shaft upright on a clean smooth surface and install handle Tool SP-3549 in the installing head (Fig. 69). Drive bushing into shaft until tool bottoms.

(9) Thoroughly clean input shaft and clutch piston retainer before assembly and installation.

Assembly

(1) If removed, press input shaft into clutch piston retainer and install snap ring.

(2) Lubricate and install inner and outer seal rings on the clutch piston. Make sure lip of seals face toward head of clutch retainer, and are properly seated in the piston grooves.

(3) Place piston assembly in retainer and, with a twisting motion, seat piston in bottom of the retainer.

(4) Position clutch retainer over piston retainer splines and support the assembly so clutch retainer remains in place.

(5) Place clutch piston spring and spacer ring on top of piston in clutch retainer, make sure spring and

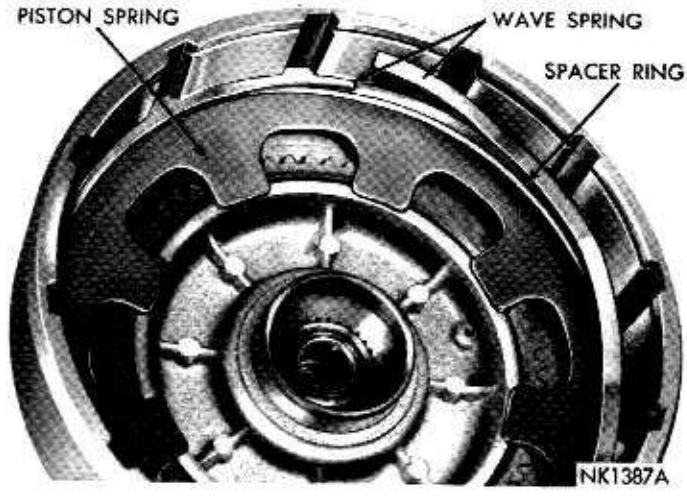


Fig. 70—Installing Rear Clutch Spring, Spacer Ring and Wave Spring

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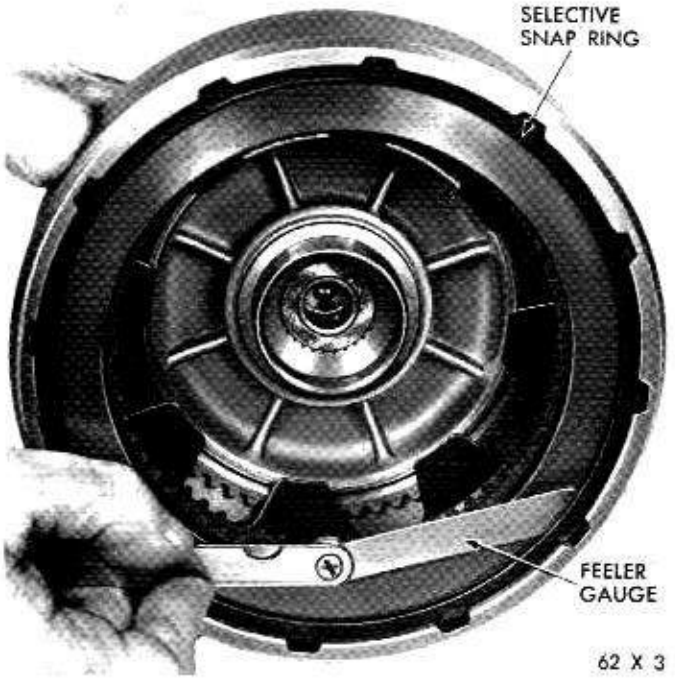


Fig. 71—Measuring Rear Clutch Plate Clearance

spacer ring are positioned in retainer recess. Start one end of wave spring in the retainer groove (Fig. 70), then progressively push or tap spring into place making sure it is fully seated in the groove.

(6) Install inner pressure plate in clutch retainer with raised portion of plate resting on the spring.

(7) Lubricate all clutch plates, install one lined plate followed by a steel plate until all plates are installed. Install outer pressure plate and snap ring.

(8) Measure rear clutch plate clearance by having an asssistant press downward firmly on the outer pressure plate, then insert a feeler gauge between plate and snap ring (Fig 71). The clearance should be between .037 to .060 inch. If not, install a snap ring of proper thickness to obtain specified clearance. Low limit clearance is desirable. **Rear clutch plate clearance is very important in obtaining proper clutch operation. The clearance can be adjusted by the use of various thickness outer snap rings. Snap rings are available in .060-.062, .074-.076, .088-.090 and .106-.108 inch thickness.**

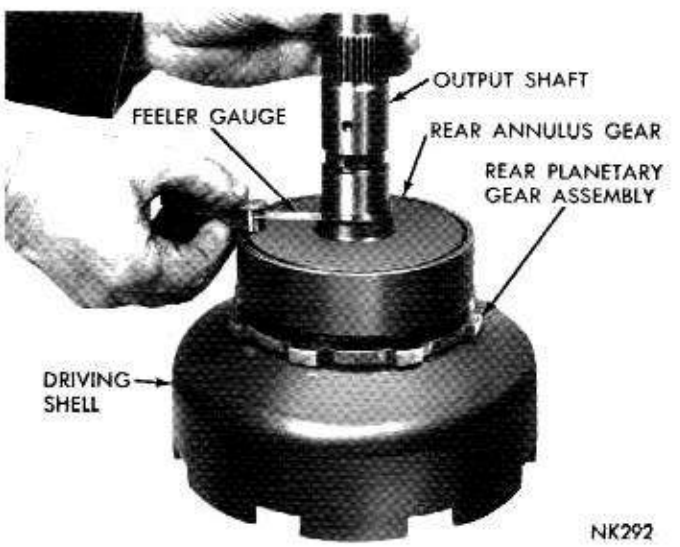


Fig. 72—Measuring End Play of Planetary Gear Assembly, Sun Gear and Driving Shell

PLANETARY GEAR ASSEMBLIES, SUN GEAR AND DRIVING SHELL

Measure end play of planetary gear assemblies, sun gear and driving shell before removing these parts from the output shaft. With the assembly in an upright position, push rear annulus gear support downward on the output shaft. Insert a feeler gauge between rear annulus gear support hub and shoulder on the output shaft (Fig. 72). The clearance should be .010 to .039 inch. If clearance exceeds specifications, replace thrust washers and/or necessary parts.

Disassembly

(1) Remove thrust washer from forward end of the output shaft (Fig. 73).

(2) Remove selective snap ring from forward end of output shaft, then slide front planetary assembly off the shaft.

(3) Slide front annulus gear off the planetary gear set (Fig. 73). Remove thrust washer from rear side of the planetary gear set.

(4) Slide sun gear, driving shell and rear planetary assembly off the output shaft.

(5) Lift sun gear and driving shell off rear planetary gear assembly. Remove thrust washer from inside the driving shell. Remove snap ring and steel washer from sun gear (rear side of driving shell) and slide sun gear out of the shell. Remove front snap ring from the sun gear if necessary. Note that front end of sun gear is longer than the rear.

(6) Remove thrust washer from forward side of rear planetary gear assembly, remove planetary gear set and thrust plate from the rear annulus gear.

Inspection

Inspect bearing surfaces on output shaft for nicks, burrs, scores or other damage. Light scratches, small nicks or burrs can be removed with crocus cloth or a fine stone. Inspect speedometer drive gear for any nicks or burrs, and remove with a sharp edge stone. Make sure all oil passages in the shaft are open and clean.

Inspect bushings in sun gear for wear or scores, replace sun gear assembly if bushings are damaged. Inspect all thrust washers for wear and scores, replace if damaged or worn below specifications. Inspect thrust faces of planetary gear carriers for wear, scores or other damage, replace as required. Inspect planetary gear carrier for cracks and pinions for broken or

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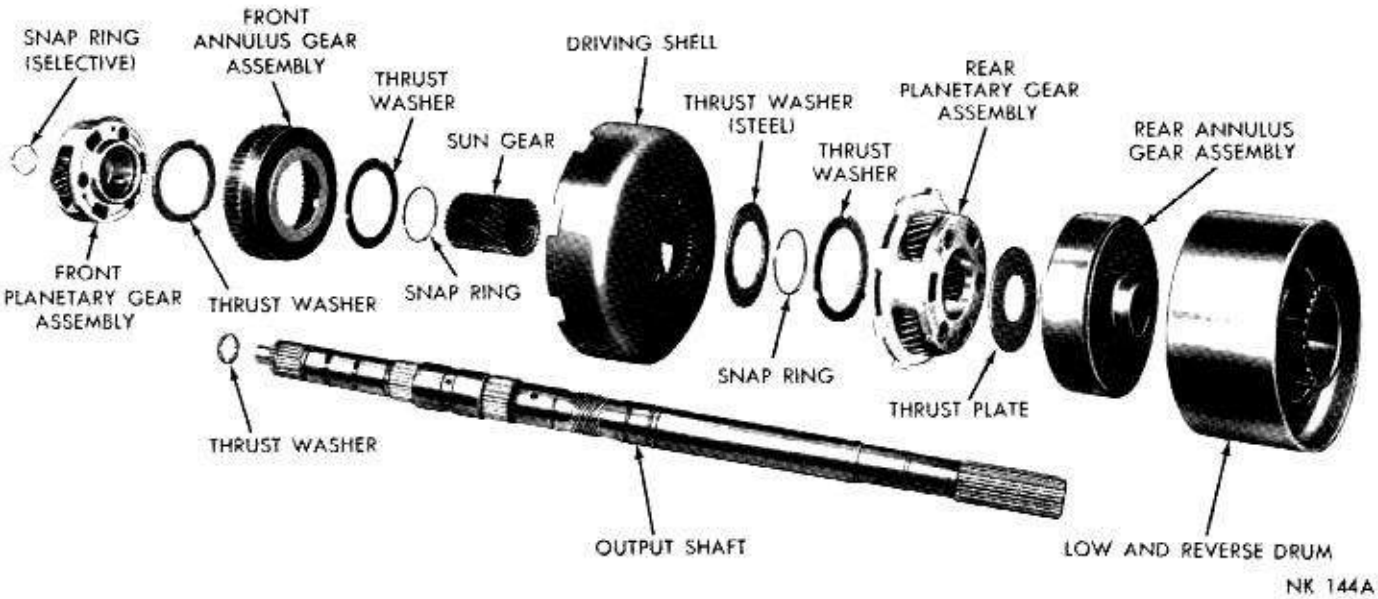


Fig. 73—Planetary Gear Assemblies, Sun Gear, Driving Shell, Low-Reverse Drum and Output Shaft

worn gear teeth and for broken pinion shaft lock pins. Inspect annulus gear and driving gear teeth for damage. Replace distorted lock rings.

Assembly

Refer to Figure 73 for parts reference.

(1) Install rear annulus gear on the output shaft. Apply a thin coat of grease on thrust plate, place it on the shaft and in the annulus gear making sure teeth are over the shaft splines.

(2) Position rear planetary gear assembly in rear annulus gear. Place thrust washer on front side of the planetary gear assembly.

(3) Install snap ring in front groove of sun gear (long end of gear). Insert sun gear through front side of driving shell, install rear steel washer and snap ring.

(4) Carefully slide driving shell and sun gear assembly on the output shaft, engaging sun gear teeth with rear planetary pinion teeth. Place thrust washer inside front of the driving shell.

(5) Place thrust washer on rear hub of front planetary gear set, then slide assembly into front annulus gear.

(6) Carefully work front planetary and annulus gear assembly on the output shaft, meshing planetary pinions with the sun gear teeth.

(7) With all components properly positioned, install selective snap ring on front end of the output shaft. Re-measure end play of the assembly. **The clearance can be adjusted by the use of various thickness snap rings. Snap rings are available in .048-.052, .055-.059 and .062-.066 inch thickness.**

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OVERRUNNING CLUTCH

Inspection

Inspect clutch rollers for smooth round surfaces, they must be free of flat spots and chipped edges. Inspect roller contacting surfaces in the cam and race for brinelling. Inspect roller springs for distortion, wear or other damage. Inspect cam set screw for tightness. If loose, tighten and restake case around the screw.

Overrunning Clutch Cam Replacement

If overrunning clutch cam and/or roller spring retainer are found damaged, replace cam and spring retainer in the following manner:

(1) Remove set screw from case below the clutch cam.

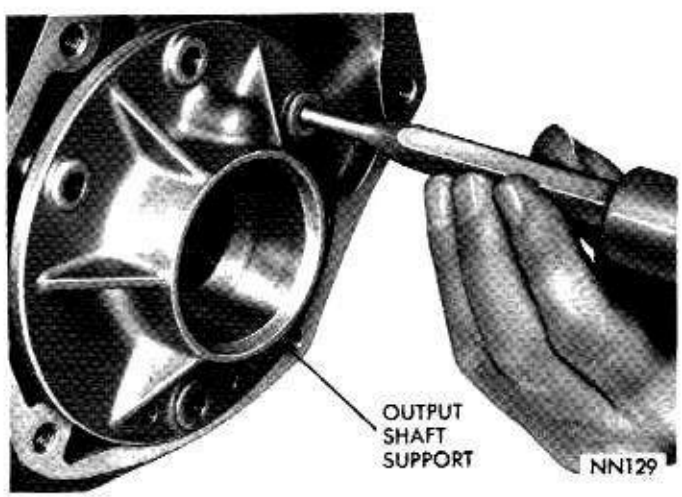


Fig. 74—Removing Overrunning Clutch Cam

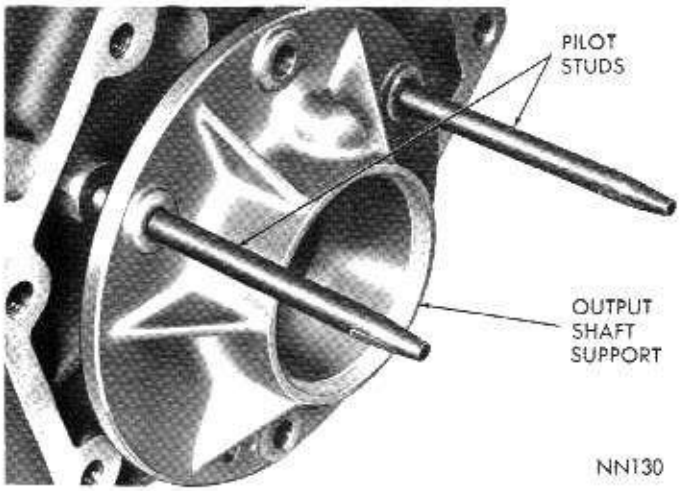


Fig. 75—Installing Output Shaft Support

(2) Remove four bolts securing output shaft support to rear of the transmission case. Insert a punch through the bolt holes and drive cam from the case (Fig. 74). Alternate the punch from one bolt hole to another so cam will be driven evenly from the case.

IMPORTANT: The output shaft support must be in the case to install the overrunning clutch cam.

If the support required replacement, drive it rearward out of the case with a wood block and hammer. To install, screw two C-3288 pilot studs into the case (Fig. 75), then drive support firmly into the case with a wood block and hammer.

(3) Clean all burrs and chips from cam area in the case.

(4) Place spring retainer on the cam, making sure retainer lugs snap firmly into notches on the cam.

(5) Position cam in the case with cam serrations aligned with those in the case. Tap cam **evenly** into the case as far as possible with a soft mallet.

(6) Install Tool C-3863 and Adapter SP-5124 as shown in Figure 76, tighten nut on tool to seat cam into the case. Make sure cam is firmly bottomed, then install cam retaining set screw. Stake case around set screw to prevent it coming loose.

(7) Remove cam installing tool. Install and tighten support retaining screws to 140 inch-pounds. Stake case around the cam in six places with a blunt chisel (Fig. 77).

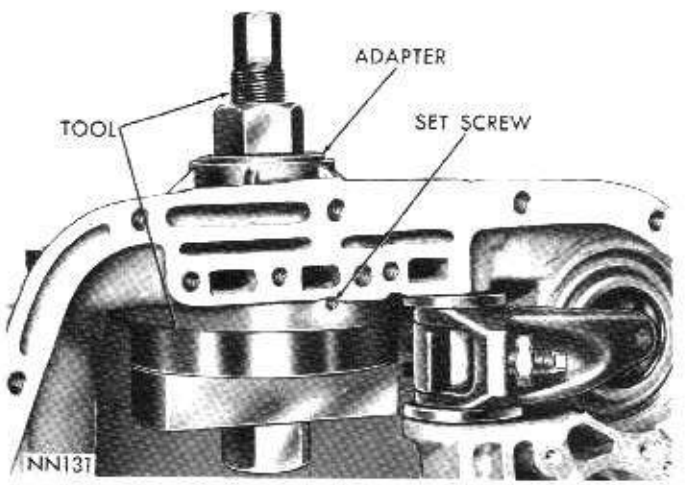


Fig. 76—Installing Overrunning Clutch Cam

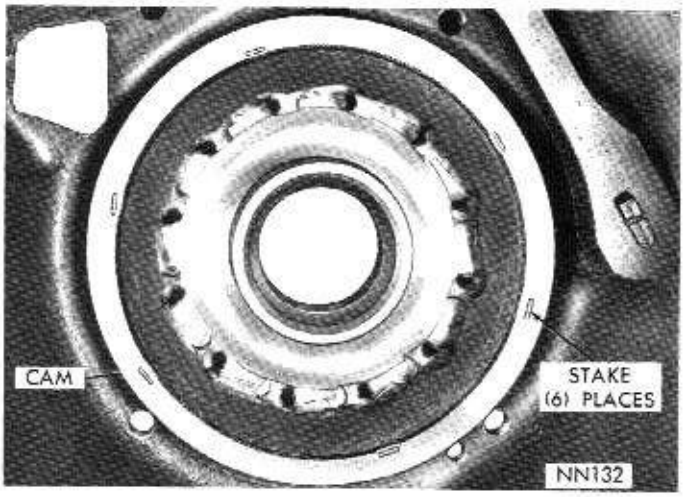


Fig. 77—Overrunning Clutch Cam Stake Locations

KICKDOWN SERVO AND BAND

Inspection

Figure 78 shows a disassembled view of the kickdown servo assembly **The large outer spring shown in Figure 78 is not used in transmissions with "Hi-Performance" engines.**

Inspect piston and guide seal rings for wear, and make sure they turn freely in the grooves. It is not necessary to remove seal rings unless conditions warrant. Inspect piston for nicks, burrs, scores and wear and piston bore in the case for scores or other damage. Inspect fit of guide on piston rod and piston spring for distortion.

Inspect band lining for wear and bond of lining to band and lining for black burn marks, glazing, non-

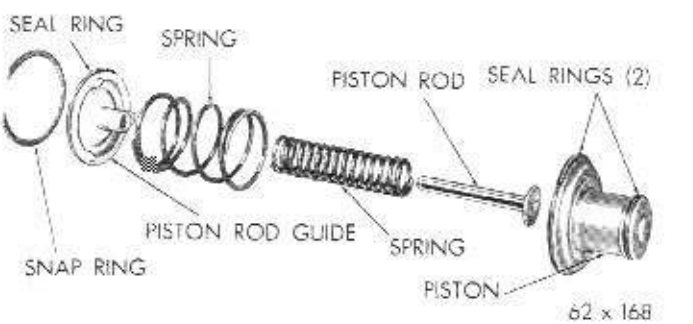


Fig. 78—Kickdown Servo (Disassembled)

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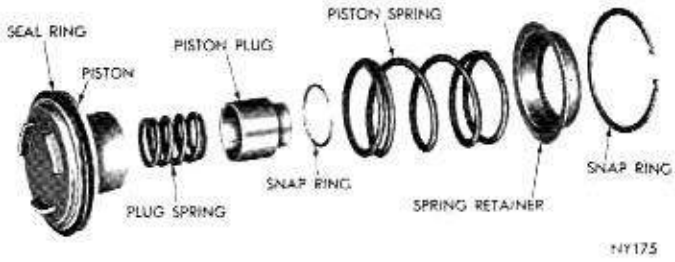


Fig. 79—Low and Reverse Servo (Disassembled)

uniform wear pattern and flaking. If lining is worn so grooves are not visible at ends or any portion of band, replace the band. Inspect band for distortion or cracked ends.

LOW—REVERSE SERVO AND BAND

Disassembly

(1) Remove snap ring from piston and remove the piston plug and spring (Fig. 79).

Inspection

Inspect seal for deterioration, wear and hardness and piston and piston plug for nicks, burrs, scores and wear; piston plug must operate freely in the piston. Inspect piston bore in the case for scores or other damage and springs for distortion. Inspect band lining for wear and bond of lining to the band. If lining is worn so grooves are not visible at ends or any portion of band, replace the band. Inspect band for distortion or cracked ends.

Assembly

(1) Lubricate and insert piston plug and spring in the piston, and secure with snap ring.

ASSEMBLY—SUB-ASSEMBLY INSTALLATION

The assembly procedures given here include installation of sub-assemblies in the transmission case and adjusting drive train end play. Do not use force to assemble mating parts. If parts do not assemble freely, investigate cause, and correct the trouble before proceeding with assembly procedures. Always use new gaskets during assembly operations.

IMPORTANT: Use only Automatic Transmission Fluid AQ-ATF Suffix "A" to lubricate transmission parts during assembly.

Overrunning Clutch

(1) With transmission case in an upright position, insert clutch race inside the cam. Install overrunning clutch rollers and springs exactly as shown in Figure 80.

Low—Reverse Servo and Band

(1) Carefully work servo piston assembly into the case with a twisting motion. Place spring, retainer and snap ring over the piston (Fig. 79).

(2) Compress low and reverse servo piston spring by using engine valve spring compressor Tool C-3422,

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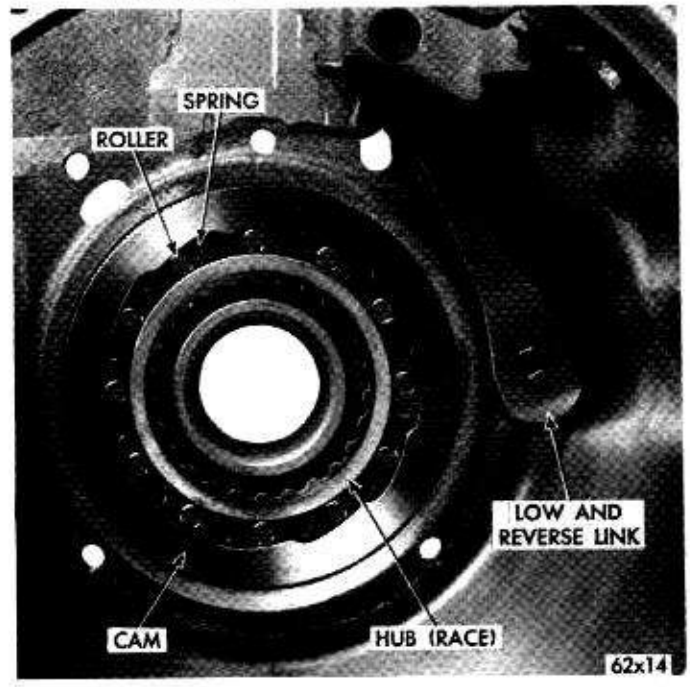


Fig. 80—Overrunning Clutch, Low and Reverse Band Link

then install snap ring.

(3) Position rear band in the case, install short strut, then connect long link and anchor to the band (Fig. 81). Screw in band adjuster just enough to hold strut in place. Be sure long link and anchor assembly is installed, as shown in Figure 80 to provide a running clearance for the low and reverse drum. Install the low-reverse drum.

Kickdown Servo

(1) Carefully push servo piston into the case bore. Install piston rod, two springs and the guide (Fig. 78).

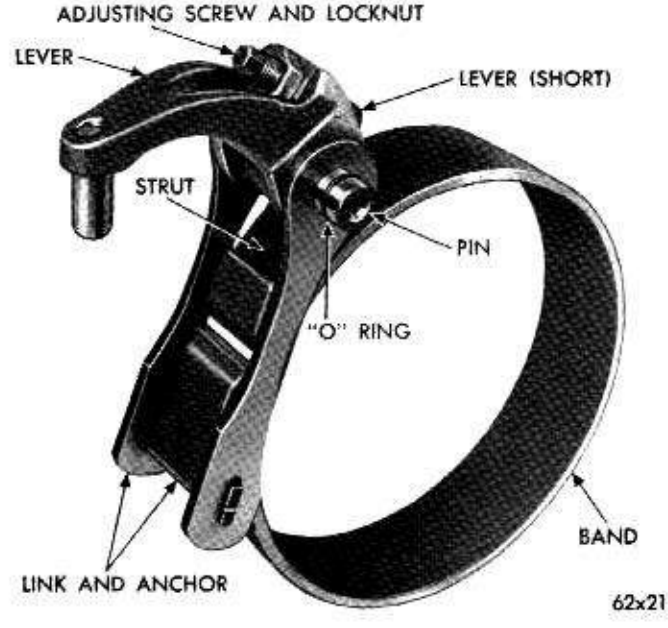


Fig. 81—Low-Reverse Band and Linkage

The transmission used with "HI-Performance" engines, use only one small inner spring in the kickdown servo.

(2) Compress kickdown servo springs by using engine valve spring compressor Tool 3422, then install snap ring.

Planetary Gear Assemblies, Sun Gear and Driving Shell

(1) While supporting assembly in the case, insert output shaft through the rear support. Carefully work assembly rearward engaging rear planetary carrier lugs into the low-reverse drum slots.

CAUTION: Be very careful not to damage ground surfaces on output shaft during installation.

Front and Rear Clutch Assemblies

The front and rear clutches, front band, oil pump and reaction shaft support are more easily installed with transmission in an upright position.

If transmission repair stand DD-1014 was not available to support transmission, an alternate method is outlined in Steps 1 and 2.

(1) Cut a 3½ inch diameter hole in a bench, in the end of a small oil drum or a large wooden box strong enough to support transmission. Cut or file notches at the edge of the 3½ inch hole so output shaft support will fit and lay flat in the hole.

(2) Carefully insert output shaft into the hole to support the transmission upright, with its weight resting on flange of the output shaft support.

(3) Apply a coat of grease on the input to output shaft thrust washer (Fig. 73), and install the washer on front end of the output shaft.

(4) Align front clutch plate inner splines, and place assembly in position on the rear clutch. Make sure front clutch plate splines are fully engaged on the rear clutch splines.

(5) Align rear clutch plate inner splines, grasp input shaft and lower the two clutch assemblies into the transmission case.

(6) Carefully work clutch assemblies in a circular motion to engage rear clutch splines over splines of the front anulus gear. Make sure front clutch drive lugs are fully engaged in slots in the driving shell.

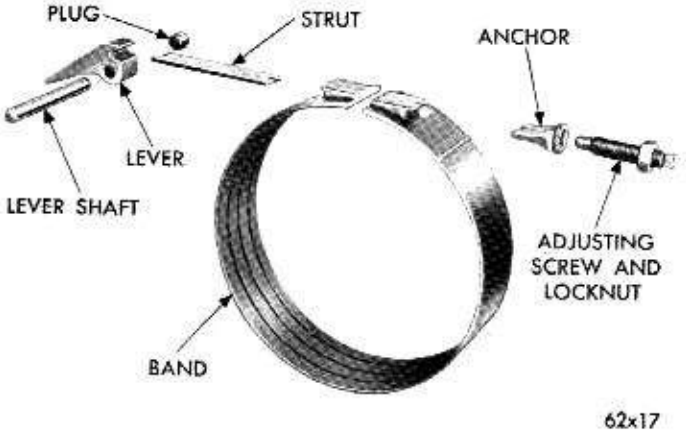


Fig. 82—Kickdown Band and Linkage (Disassembled)

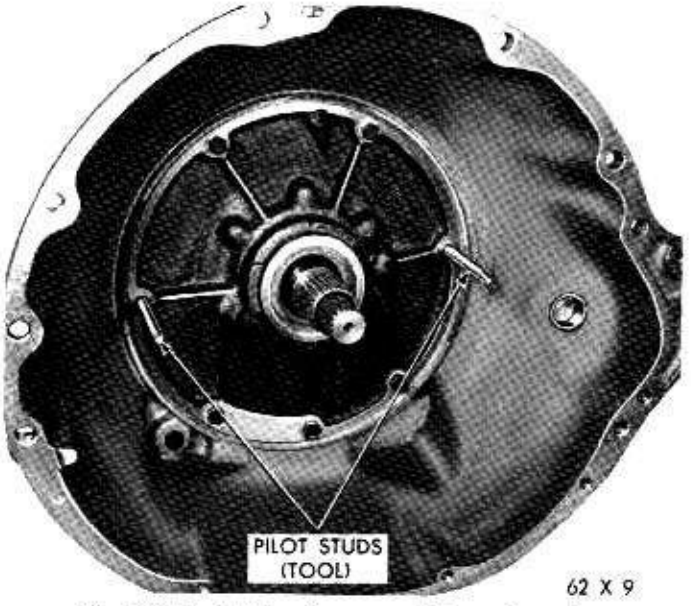


Fig. 83—Installing Pump and Reaction Shaft Support Assembly

Front Band

Figure 82 shows disassembled view of the kickdown band assembly.

(1) Slide the band over front clutch assembly.

(2) Install the band strut, screw in adjuster just enough to hold strut and anchor in place.

Oil Pump and Reaction Shaft Support

If difficulty was encountered in removing the oil pump assembly due to an exceptionally tight fit in the case, it may be necessary to expand the case with heat during pump installation. Using a suitable heat lamp, heat the case in area of the pump for a few minutes prior to installing pump and reaction shaft support assembly.

If drive train end play was not within specifications (.036-.084 inch) when measured on Page 49, replace the thrust washer on reaction shaft support hub with one of proper thickness (Fig. 59).

The following selective thrust washers are available:

Thickness	Color
.061-.063 inch	Green
.084-.086 inch	Red
.102-.104 inch	Yellow

(1) Screw two pilot studs, Tool C-3288 in oil pump opening in the case (Fig. 83). Install a new gasket over the pilot studs.

(2) Place a new rubber seal ring in the groove on outer flange of pump housing. Make sure seal ring is not twisted. Coat seal ring with grease for easy installation.

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(3) Install pump assembly in the case, tap it lightly with a soft mallet if necessary. Place the deflector over vent opening and install four pump body bolts. Remove pilot studs, install remaining bolts and snug all bolts down evenly.

Rotate input and output shafts to see if any binding exits, then tighten bolts to 150 inch-pounds. Check shafts again for free rotation.

Governor and Support

(1) Position support and governor body assembly on the output shaft. Align assembly so governor valve shaft hole in governor body aligns with hole in the output shaft, then slide assembly into place. Install snap ring behind the governor body. Tighten housing to support bolts to 100 inch-pounds. Bend ends of lock straps against the bolt heads.

(2) Place governor valve on valve shaft, insert the assembly into the body and through governor weights. Install valve shaft retaining snap ring.

Output Shaft Bearing and Extension Housing

(1) Install a snap ring in the innermost groove on the output shaft. Install bearing on the shaft with its outer race ring groove toward the front (Fig. 34). Press or tap bearing tight against front snap ring, then install rear snap ring.

(2) Carefully unwind and slide yoke seal front stop ring into place on the shaft. Install seal with seal lips toward rear, then install rear stop ring on the shaft.

(3) Place a new extension housing gasket on the transmission case. Position output shaft bearing retaining snap ring in the extension housing. Spread snap ring as far as possible (Fig. 33), then carefully tap extension housing into place. **Make sure snap ring is fully seated in the bearing grove.**

(4) Install gasket, plate and two screws on bottom of extension housing mounting pad.

(5) Install and tighten extension housing bolts to 24 foot-pounds.

IMPORTANT: Measure drive train end play as described on Page 49. Correct if necessary.

Imperial Models: Slide transmission yoke on the output shaft. Install retaining bolt and tighten to 100 foot-pounds.

Valve Body Assembly and Accumulator Piston

(1) Clean mating surfaces and inspect for burrs on both the transmission case and valve body steel plate.

(2) Install accumulator piston in transmission case and place piston spring on the accumulator piston.

(3) Insert parking lock rod through opening in rear of case with knob positioned against the reaction plug and sprag. Move front end of rod toward center of transmission while exerting rearward pressure on rod to force it past the sprag (rotate output shaft if necessary).

(4) Place valve body manual lever in **LOW** position. Place valve body in its approximate position in the case, connect parking lock rod to the manual lever and secure with the E-clip. Align valve body in the case, install retaining bolts finger tight.

(5) With neutral starting switch installed, place manual valve in the neutral position. Shift valve body if necessary to center the neutral finger over the neutral switch plunger. Snug bolts down evenly, then tighten to 100 inch-pounds.

(6) Install gearshift lever and tighten clamp bolt. Check lever shaft for binding in the case by moving lever through all detent positions. If binding exists, loosen valve body bolts and re-align.

(7) Make sure throttle shaft seal is in place, then install flat washer, lever and tighten the clamp bolt. Connect throttle and gearshift linkage and adjust as required.

(8) Adjust the kickdown, and low-reverse bands as described on Page 38.

(9) Install oil pan, using a new gasket. Add transmission fluid to bring it up to proper level. Refer to Page 32.

TRANSMISSION AND CONVERTER INSTALLATION

The transmission and converter must be installed as an assembly; otherwise, the converter drive plate, pump bushing, and oil seal will be damaged. The drive plate will not support a load; therefore, none of the weight of the transmission should be allowed to rest on the plate during installation.

(1) Rotate pump rotors with Tool C-3881 until the two small holes in handle of Tool are vertical (Fig. 84).

(2) Carefully slide converter assembly over the input shaft and reaction shaft. Make sure converter impeller shaft slots are also vertical and fully engage the

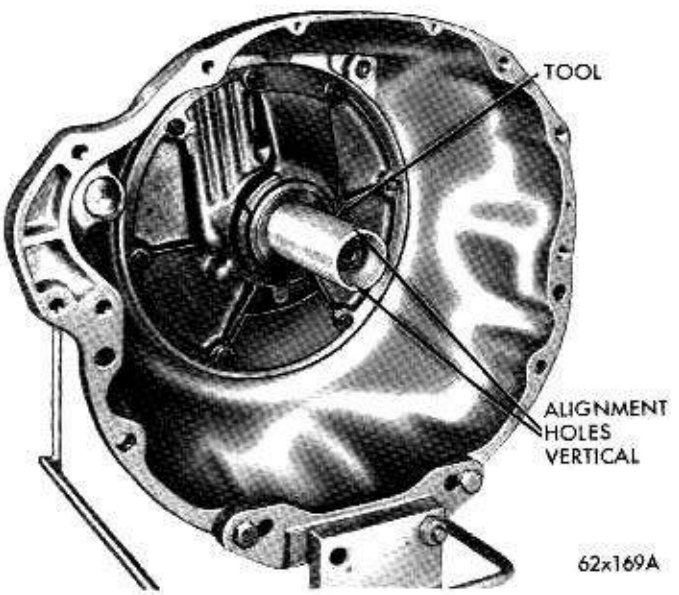


Fig. 84—Aligning Pump Rotors

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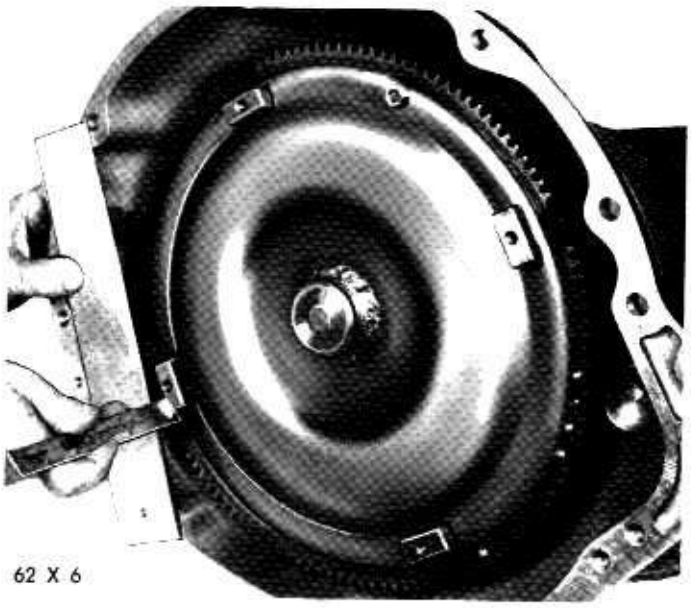


Fig. 85—Measuring Converter for Full Engagement in Transmission

front pump inner rotor lugs.

Inspect for full engagement by placing a straightedge on face of the case (Fig. 85). The surface of converter front cover lug should be at least ½ inch to rear of straightedge when converter is pushed all way into the transmission.

(3) Attach a small "C" clamp to edge of converter housing to hold converter in place during transmission installation.

(4) Inspect converter drive plate for distortion or cracks and replace if necessary.

(5) Coat converter hub hole in crankshaft with wheel bearing lubricant. Place transmission and converter assembly on a service jack and position assembly under vehicle for installation. Raise or tilt as necessary until transmission is aligned with the engine.

(6) Rotate converter so mark on converter (made during removal) will align with mark on drive plate. The offset holes in plate are located next to the ⅛ inch hole in the inner circle of the plate. A stamped V mark identifies offset hole in the converter front cover (Fig. 86). Carefully work transmission forward over engine block dowels with converter hub entering the crankshaft opening.

(7) After transmission is in position, install converter housing bolts and tighten 25 to 30 foot-pounds.

(8) Install two lower drive plate to converter bolts and tighten to 270 inch pounds.

(9) Install starting motor and connect battery ground cable.

(10) Rotate engine with Remote Control Switch and install the other two drive plate to converter bolts. Tighten bolts to 270 inch-pounds.

(11) Install crossmember and tighten attaching

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Fig. 86—Converter and Drive Plate Markings

bolts securely. Lower transmission so extension housing is aligned and rests on rear mount. Install bolts and tighten to 35 foot pounds.

(12) Install gearshift torque shaft and connect gearshift rod to the transmission lever.

Console Shift: Align gearshift torque shaft lower bracket with the extension housing. Install the two retaining bolts and tighten securely. Connect gearshift rod to the transmission lever.

(13) Clean and relubricate front universal joint sliding yoke splines as outlined in Group "O".

Carefully guide sliding yoke into extension housing and on the output shaft splines. Then connect propeller shaft to the rear axle pinion shaft yoke.

Imperial Models: Slide transmission yoke on the output shaft. Install retaining bolt and tighten to 100 foot-pounds.

Connect front universal joint to the transmission yoke. Install cross and rollers bushing clamps and retaining bolts. Tighten bolts to 170 inch-pounds.

(14) Connect oil cooler lines to the transmission. Install the oil filler tube. Connect the speedometer cable.

(15) Connect throttle rod to bellcrank at left side of transmission bell housing.

(16) Connect wire to the neutral starting switch.

(17) Install cover plate in front of the converter assembly.

(18) Refill transmission with Automatic Transmission Fluid, AQ-ATF Suffix "A".

To completely adjust throttle linkage, gearshift linkage and neutral starting switch, refer to Pages 36, 37 and 38.

SPECIFICATIONS

ENGINE DISPLACEMENT (CU. IN.)	383, 440
Trans. Models	A-745 3 Speed
Gear Ratio	
First	2.55
Second	1.49
Third	1.00
Fourth	—
Reverse	3.34
Downspeed Speed Limits	
4th to 3rd	—
3rd to 2nd	40 to 10 mph
2nd to 1st	Zero mph

	383, 440
Lubricant	
Capacity	Approx. 6 Pts.
Type	Auto. Trans. Fluid "AQ-ATF" Suffix "A"
Gear Type	Helical
Tolerances	
Second Speed Gear End Play	.004" to .014"
Countershaft Gear End Play	.0045" to .028"
Clutch Housing Face Run-Out	.006" Max.
Clutch Housing Bore Run-Out	.008" Max.
Synchronizer Float	.050" to .090"

TRANSMISSION MODEL	A-727-B
TYPE	Automatic Three Speed with Torque Converter
TORQUE CONVERTER	
Diameter	11¾ inches
OIL CAPACITY—TRANSMISSION AND TORQUE CONVERTER	18½ pts. Automatic Transmission Fluid "AQ-ATF" Suffix "A"
COOLING METHOD	Water-Heat Exchanger
LUBRICATION	Pump (Rotor Type)
CLUTCHES	
Number of Front Clutch Plates	4
Number of Front Clutch Discs	4
Number of Rear Clutch Plates	3
Number of Rear Clutch Discs	4
GEAR RATIOS	
1—Low	2.45 to 1
2—Second	1.45 to 1
D—Drive	1 to 1
R—Reverse	2.20 to 1
N—Neutral	—
PUMP	
Type	Gear (Rotary)
End Clearance (Rotor)	.001 to .0025 inch
DRIVE TRAIN END PLAY	.036 to .084 inch
CLUTCH PLATE CLEARANCE	
Front Clutch	.024 to .123 inch
Rear Clutch	.037 to .060 inch

SNAP SPRINGS	
Front and Rear Clutches	
Rear Snap Ring (Selective)	.060 to .062 inch .074 to .076 inch .088 to .090 inch
Output Shaft (Forward End)	.048 to .052 inch .055 to .059 inch .062 to .066 inch
THRUST WASHERS	
Reaction Shaft Support to Front Clutch Retainer (Selective)	.061 to .063 inch (Green) .084 to .086 inch (Red) .102 to .104 inch (Yellow)
Output Shaft to Input Shaft	.062 to .064 inch
Sun Gear Driving Shell Thrust Plate (Steel)	.034 to .036 inch
Rear Planetary Gear to Driving Shell	.062 to .064 inch
Front Planetary Gear to Annulus Gear Support	.062 to .064 inch
Front Annulus Gear Support to Driving Shell	.062 to .064 inch
Front Clutch Retainer to Rear Clutch Piston Retainer	.061 to .063 inch (Green)

TIGHTENING REFERENCE

Manual A-833 4-Speed	POUNDS FOOT	POUNDS INCH
Extension Housing Bolts	50	
Front Bearing Retainer Bolts	35	
Gearshift Operating Lever Nuts	20	
Transmission to Clutch Housing Bolts	50	
Transmission Cover Retaining Bolts	15	
Transmission Drain Plug	30	
TORQUEFLITE A-727-B		
Cooler Line Fitting	—	75
Converter Drain Plug	14	—

	POUNDS FOOT	POUNDS INCH
Converter Drive Plate to Crankshaft Bolt	55	—
Converter Drive Plate to Torque Converter Bolt	—	270
Extension Housing to Transmission Case Bolt	24	—
Extension Housing to Insulator Mounting Bolt	35	—
Extension Housing—Crossmember to Frame Bolt	75	—

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	POUNDS FOOT	POUNDS INCH
Governor Body to Support Bolt	—	100
Kickdown Band Adjusting Screw Lock Nut	29	—
Kickdown Lever Shaft Plug	—	150
Neutral Starter Switch	25-30	—
Oil Filler Tube Bracket Bolt	—	150
Oil Pan Bolt	—	150
Oil Pump Housing to Transmission Case Bolt	—	150
Output Shaft Support Bolt	—	140
Overrunning Clutch Cam Set Screw	—	40
Pressure Test Take-off Plug	—	75
Reaction Shaft Support to Oil Pump Bolt	—	150
Reverse Band Adjusting Screw Lock Nut	35	—
Speedometer Drive Clamp Screw	—	100
Transmission to Engine Bolt	25-30	—
Valve Body Screw	—	28
Valve Body to Transmission Case Bolt	—	100
U-Joint Yoke Bolt (Imperial)	—	100

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WHEELS–BEARINGS–TIRES

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GENERAL INFORMATION

The safety rim wheel (Fig. 1) has raised sections between the rim flange and the rim well. Initial inflation of the tire forces the beads over these raised sections and in the event of a blowout, tend to hold the tire in position on the wheel, until the vehicle is brought to a safe stop.

Wheel covers should only be removed and installed in the recommended manner to eliminate possible damage.

Front wheel bearing lubricant should be changed at the recommended intervals or at the time of a normal brake reline. Lubricant should not be added to that already in the bearings.

The original equipment normal service 4 ply rating tubeless type tires are designed and tested to meet the normal operation requirement of the vehicle. For continuous operation at "MAXIMUM LOAD CAPACITY" (see Vehicle Load and Tire Pressure Chart) or other heavy duty operations, optional oversize and/or heavy service 8 ply rating tires are available. Refer to Page 2.

TIRE WEAR PATTERNS

The various tire wear patterns illustrated in (Fig. 2) show the type of wear under normal vehicle operation, the normal cause of a particular wear pattern



Fig. 1—Safety Type Rim

CONDITION	RAPID WEAR AT SHOULDERS	RAPID WEAR AT CENTER	CRACKED TREADS	WEAR ON ONE SIDE	FEATHERED EDGE	BALD SPOTS
CAUSE	UNDER INFLATION	OVER INFLATION	UNDER-INFLATION OR EXCESSIVE SPEED	EXCESSIVE CAMBER	INCORRECT TOE	WHEEL UNBALANCED
CORRECTION	ADJUST PRESSURE TO SPECIFICATIONS WHEN TIRES ARE COOL			ADJUST CAMBER TO SPECIFICATIONS	ADJUST FOR TOE-IN 1/8 INCH	DYNAMIC OR STATIC BALANCE WHEELS

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Fig. 2—Tire Wear Patterns

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VEHICLE LOAD AND TIRE PRESSURES

MODEL	VEHICLE LOAD (POUNDS)			
	AVERAGE RATED LOAD	FULL RATED LOAD SEDAN-HARDTOP CONVERTIBLE	FULL RATED LOAD 2 SEAT STATION WAGON (TOWN AND COUNTRY)	FULL RATED LOAD 3 SEAT STATION WAGON (TOWN AND COUNTRY)
	 UP TO AND INCLUDING 5-PASSENGERS	 6-PASSENGERS (PLUS LUGGAGE)	 6-PASSENGERS (PLUS LUGGAGE)	 8-PASSENGERS (OR EQUIVALENT)
CHRYSLER	750	1100	1200	1200
IMPERIAL	750	1100	—	—

RECOMMENDED TIRE PRESSURES (PSI)

For sustained driving above 60 M.P.H., cold inflation pressures should be increased 4 PSI above those indicated below, but not to exceed the maximum pressures of Item 1. Front to rear differential pressure should be maintained.

MODEL APPLICATION	AVERAGE RATED LOAD		FULL RATED LOAD SEDAN-HARDTOP CONVERTIBLE		FULL RATED LOAD 2 SEAT STATION WAGON		FULL RATED LOAD 3 SEAT STATION WAGON	
	FRONT COLD	REAR COLD	FRONT COLD	REAR COLD	FRONT COLD	REAR COLD	FRONT COLD	REAR COLD
CHRYSLER—EXCEPT WAGON	24	24	28	30	—	—	—	—
CHRYSLER—WAGON	24	28	—	—	26	32	26	32
IMPERIAL—EXCEPT CONVERTIBLE	22	22	26	28	—	—	—	—
IMPERIAL—CONVERTIBLE	24	24	28	30	—	—	—	—

1. **Cold inflation pressures** must not exceed 32 PSI for 4 ply rating and 40 PSI for 8 ply rating tires. Pressure build-up during driving is normal. Do not reduce pressure of warm tires.
2. **Over-sized tires** use the same pressure as standard tires.
3. **Trailer towing** packages provide oversize or heavy service tires. When these tires are 8 ply rating tires, operating pressures (cold) should be increased 4 PSI front and rear.
4. **Snow tires** should be operated with rear tire pressures 4 PSI above standard but must not exceed the maximum pressures of Item 1.

NN609A

Vehicle Load and Tire Pressure Chart

and the normal corrective measures.

Underinflation

When a tire is underinflated, the side walls and shoulder edges of the tread carry the load while the center of the tread folds in or compresses and causes the shoulders to wear faster than the center of the tread.

Overinflation

When a tire is overinflated the outer shoulder is forced up and away from the road surface, causing the center of the tread to wear faster than the shoulders.

Cracked Treads

This is a combination of under inflation and/or

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high speed which causes the cracking of the rubber between the tire tread pattern.

Excessive Camber

Excessive wheel camber, causes the tire to run at an angle to the road surface so one side of the tire tread wears faster.

Incorrect Toe

Incorrect toe in or toe out will usually produce a tapered or feathered edge on the ribs of the tire tread.

Wheel Unbalance

Wheel unbalance normally causes cupping, scalloping and bald spotting of tires. This type of wear usually appears on a vehicle that is mostly driven at highway speeds without the recommended tire rotation and with unbalanced conditions.

SERVICE PROCEDURES

TIRES

PRESSURE CHECKS

For best performance, keep all tires inflated to the recommended pressure. An increase in tire pressure while driving is normal. Reducing pressure to compensate for this increase will adversely affect vehicle stability and increased tire wear will also develop. Tire pressures should **only** be checked when they are **cold.**

TIRE ROTATION

With increased road speeds and faster cornering abnormal tire wear may exist on certain wheels. By rotating tires at recommended intervals and in the recommended sequence (Fig. 3) tire life will be prolonged. Rotate tires at every second oil change.

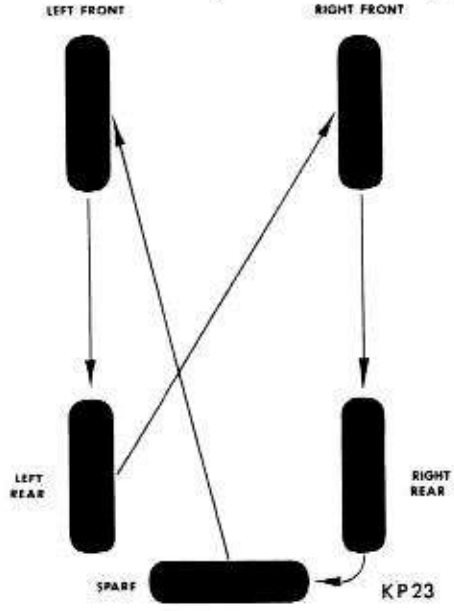


Fig. 3—Tire Rotation

REPAIRING LEAKS

Leaks between the tire and wheel require the removal of the tire. Leaks in the tire can often be repaired without removing the tire. Always follow the equipment manufacturers recommendations.

Tools used for dismounting and mounting tires must be smooth, free from sharp edges or projections which could damage the tire or tire rim.

The tire must be completely deflated before the tire beads are removed from the seats. Before mounting the tire on the wheel, make sure all rust scale is removed from the inside wheelrim and all roughness has been removed from the butt weld in the tire contact area. A mild soap solution applied to both tire bead surfaces will aid in installation. Either a commercial type bead expander or a rope tourniquet can be used to seat the tire .

When installing wheel on vehicle, progressively tighten wheel nuts in sequence shown in (Fig. 4) and to proper specifications.

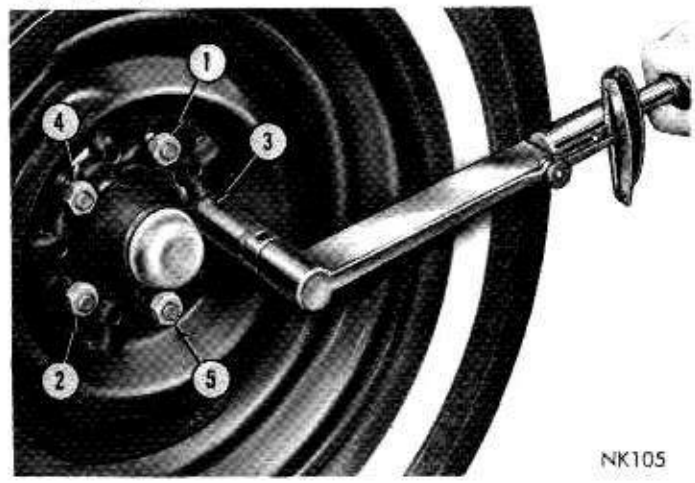


Fig. 4—Wheel Stud Nut Tightening Sequence

WHEELS

FRONT WHEEL BEARING LUBRICATION

Removal (without Disc Brakes)

(1) Raise vehicle so front wheels are free of the floor.

(2) Remove wheel cover, grease cap, cotter pin, nut lock and bearing adjusting nut.

(3) Remove thrust washer and outer bearing cone.

(4) Slide wheel, hub and drum assembly off spindle.

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(5) Drive out inner oil seal and remove bearing cone.

Removal (with Disc Brakes)

Perform steps 1 through 5 in same manner for those vehicles equipped with Disc Brakes.

Cleaning and Inspection

(1) Clean the hub and drum assembly and the bearings in kerosene, mineral spirits or other similar cleaning fluids. **Do not dry the bearings by air spinning.**

(2) Examine bearing cups for pitting, brinnel marks or other imperfections. If cups are damaged, remove them from the hub with a soft steel drift positioned in the slots in the hub.

(3) Bearing cup areas in the hub should be smooth without scored or raised metal which could keep the cups from seating against shoulders in hub.

(4) The bearing cones and rollers should have smooth, unbroken surfaces without brinnel marks. The ends of the rollers and both cone flanges should also be smooth and free from chipping or other damage.

Installation (without Disc Brakes)

(1) If the bearing cups were removed, start the new cups into hub evenly, driving them flush with hub using a soft steel block and hammer. Seat cups against shoulders of hub, using a soft steel drift and hammer.

(2) Fill hub grease cavity (Fig. 5) with recommended wheel bearing lubricant. Lubricant should be even with inner diameter of bearing cups.

(3) Force lubricant between bearing cone rollers or repack using a suitable bearing packer.

(4) Install inner cone and a new seal, with lip of seal facing inward. Using Tool C-3893, position seal flush with end of hub. The seal flange may be damaged if tool is not used.

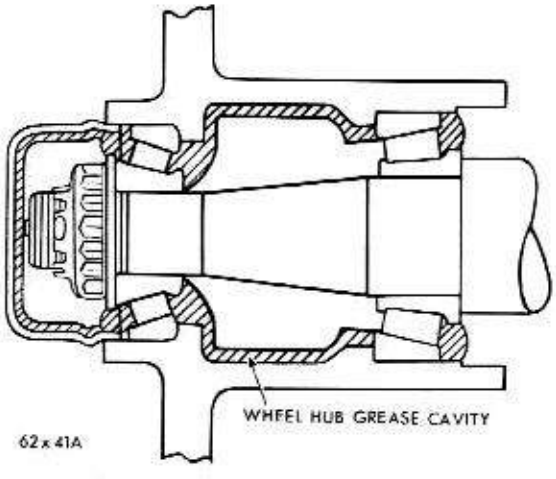


Fig. 5—Wheel Hub Grease Cavity

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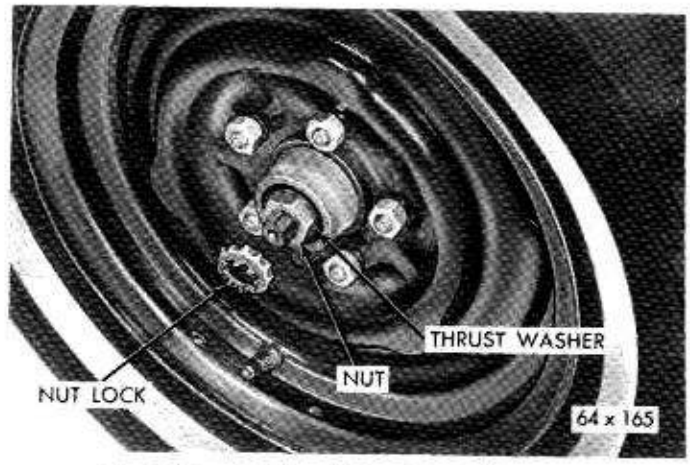


Fig. 6—Front Wheel Bearing Adjustment

(5) Clean the spindle and apply a light coating of wheel bearing lubricant over the polished surfaces.

(6) Install wheel tire and drum assembly on spindle.

(7) Install outer bearing cone, thrust washer and adjusting nut.

Installation (with Disc Brakes)

Perform steps 1 through 7 in same manner for those vehicles equipped with Disc Brakes.

Adjustment

(1) Tighten wheel bearing adjusting nut to 90 inch pounds while rotating wheel.

(2) Position nut lock (Fig. 6) on nut with one pair of slots in line with cotter pin hole.

(3) Back off adjusting and nut lock assembly one slot and install cotter pin. **The resulting adjustment should be zero (no preload) to .003 inch end play.**

(4) Clean the grease cap, coat inside with wheel bearing lubricant (do not fill) and install.

(5) Install wheel covers and lower vehicle to floor.

WHEEL BALANCE

The need for balancing the wheels is indicated by heavy vibration of the steering wheel of the car when driving at speeds above 40 miles an hour over a smooth straight highway.

Static (still) balance is equal distribution of the weight of the wheel and tire around the spindle, in such a manner that the wheel assembly has no tendency to rotate by itself, regardless of its position. A wheel that has a heavy spot is statically out of balance, resulting in a "hopping" or bouncing action.

A wheel and tire, to be in dynamic balance, must first be in static balance and also be in balance from side to side when the wheel is at a 90 degree angle to the axis of rotation. A wheel not in dynamic balance tends to wobble or shimmy.

Correction for static unbalance is made by first finding the location of the heavy spot, then adding sufficient weight to counterbalance it at a location

opposite the heavy section. (Follow the equipment manufacturers recommendations.)

WHEELS AND TIRE RUNOUT

Wheels and tires may be measured for both radial and lateral runout. Radial runout (eccentricity) is the difference between the high and low points on the tread of the tire; while lateral runout is the "wobble" of the wheel and/or tire.

Prior to measuring wheel and tire for runout, the face of the hub at the mounting bolts should be measured for runout. The car should be driven a short distance before the measurement is made so that "flat-spotting" of the tire (from being parked) does not affect the runout measurement.

(1) Attach dial indicator C-3339 to a firm base so it will be held steady while taking runout readings.

(2) Place plunger of dial indicator against one of the center ribs of tire tread and rotate wheel slowly to measure radial runout. This measurement should not exceed .060 inch.

(3) To measure lateral runout (wobble), position dial indicator against side of tire. This measurement should not exceed .080 inch.

Rotating tire on wheel may reduce runout or it may be necessary to take dial indicator measurements of the wheel itself in order to determine which unit has the excessive runout. Since the exterior surfaces of the wheel rim may have paint runs or bubbles scratches or other imperfections it is better to dial indicate the protected areas "A" and "B" (Fig. 7). **Under no circumstances should point indicated by "C" be used for measuring runout as this metal has been sheared in the manufacturing process and is not an even surface.** The radial runout, "A" should not exceed .035 inch. The lateral runout (wobble), "B" should not exceed .045 inch.

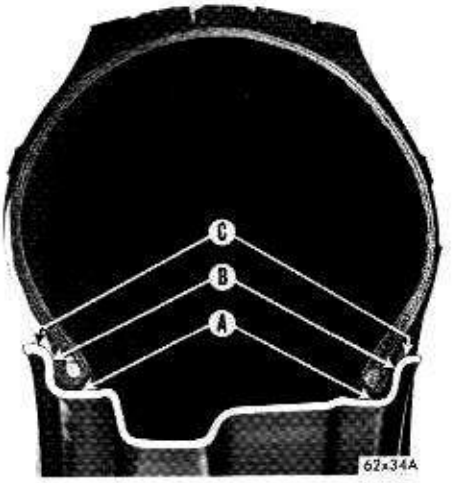


Fig. 7—Runout Checking Area

WHEEL COVERS

To avoid damaging the wheel covers during removal and installation, care should be used to be sure the forces are applied to the correct areas. **Do not remove wheel cover at valve stem hole.** The covers are structurally stronger at the outer circumference to withstand the force required for removal and installation. Use a rubber mallet when installing the covers.

TIGHTENING REFERENCE

	POUNDS FOOT	POUNDS INCH
WHEEL BEARING NUT (With Wheel Spinning)		
Chrysler (all Models)		90
Imperial		90
WHEEL STUD NUT		
Chrysler (all Models)	65	
Imperial	65	

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SPECIFICATIONS

	Newport	300	New Yorker	Imperial
WHEELS				
Type		Steel Disc		
Rim		Drop Center—Safety Wheel		
Size—Standard	14x5-1/2JK	14x6JK	14x6JK	15x6L
—Station Wagon	14x6-1/2K	—	—	—
—Disc Brakes	15x6K	15x6K	15x6K	—
No. of Wheel Nuts	5	5	5	5
Stud Size	1/2"-20	1/2"-20	1/2"-20	9/16"-18
Stud Hole Circle	4-1/2"	4-1/2"	4-1/2"	5-1/2"
Wheel Nut Torque	65 ft-lbs.	65 ft-lbs.	65 ft-lbs.	65 ft-lbs.
Bearing Nut Torque (Wheel Spinning)	90 in-lbs.	90 in-lbs.	90 in-lbs.	90 in-lbs.
TIRES				
Type			Tubeless	
Size—Sedans	8.25-14	8.55-14	8.55-14	9.15-15
—With 440 Cu. In. Engine and Air Cond.	8.55-14			
—Convertibles	8.25-14	8.55-14	—	9.15-15
With 440 Cu. In. Engine and Air Cond.	8.55-14			
—Station Wagon (All)	9.00-14	—	—	—
DISC BRAKES				
—Sedans and Convertibles	8.15-15			
—With Air Cond. 383 Cu. In. or Air Cond. 440 Cu. In. Engine	8.45-15			
—Station Wagon	8.45-15 Heavy Service			
—Sedans and Convertibles		8.45-15		
—Sedans			8.45-15	

For Vehicle Load and recommended Tire Pressures see Chart on Page 2 of this section.

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BODY AND FRAME

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"UNIBODY" CONSTRUCTION

The featured "Unibody" type construction is one in which the body shell and the underbody (frame) are welded together into one unit.

To achieve greater rigidity and overall strength of the body-shell, two additional heavy-duty crossmembers, one under the rear seat area and the other at the extreme rear end of the body are welded to the box side rails.

Heavy duty roof bows are used providing greater strength to the roof panel. The front door hinge pillar is one continuous piece from the roof rail to the body sill. Sheet metal seams overlap for improved sealing. Metal cages, welded to the outside of the cowl side panels, enclose the retaining nuts for attaching fenders and hood hinge supports. Inner hinge reinforcements assure door alignment and maintain proper door adjustment.

The radiator support, fender wheelhousings and cowl panels are attached to the body, adding structural strength to the fore-structure and the body assembly.

An integral fore-structure assembly, extending forward of the front passenger compartment, is bolted to the "Unibody" with ten body bolts. Eight of these lie in a fore-and-aft position and two in a transverse position.

MAINTENANCE AND CARE

(APPEARANCE—DRAIN HOLES—LUBRICATION)

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GENERAL INFORMATION

The procedures for maintaining the "new car" appearance of the materials covered in the APPEARANCE section are those most generally used. The final results may vary due to the application of the agents by persons inexperienced at this work and also from the type of foreign element on the material. For satisfactory results, appearance maintenance should be performed by qualified experienced personnel using the recommended agents and established service procedures.

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APPEARANCE

CONVERTIBLE

Top—Frequent brushing and vacuuming will keep the top free of abrasive dust and dirt. When washing, convertible top material should be thoroughly wet. **For scrubbing, use only a soft, natural bristle hand scrub brush. Use warm water and naptha bar type soap as the cleaning agent. Do not wash in direct sunlight.** Scrub the top with soap suds, starting in the center and gradually working toward the edges. Rinse with plenty of clean water to remove all traces of soap. Allow to dry completely before lowering.

CAUTION: Never lower a wet top. Dampness may cause formation of mildew, and damage to the fabric will result.

Backlight—The backlight (rear window) is made from a flexible vinyl plastic material.

To clean the window, rinse with a cold water spray to remove grit and dirt. Lather the surface with suds of a mild soap, using the palm of hand. Rinse thoroughly and allow to air dry. **Do not use a towel, sponge or chamois to apply the suds or dry the window. Otherwise, the surface may be scratched.**

If this procedure does not clean the window thoroughly, a solution of 40 per cent rubbing alcohol and 60 per cent clear water should be used. Apply with palm of hand and rub surface of window with circular motion. Use the rubbing alcohol and water slution generously.

Top Boot and Well—Remove all abrasive dust and dirt from the boot and well by brushing or vacuuming. For scrubbing, use only a soft, natural bristle, hand scrub brush. Use warm water and naptha type bar soap. Make certain the drain is open in the well. Rinse with plenty of clean water to remove all traces of soap. Use a soft absorbent towel to dry the material.

VINYL ROOF COVERING

Wash the top covering with mild soap and lukewarm water, lathering well with a soft brush, cloth, or sponge. Avoid heavy brushing. Rinse all traces of suds away with clear water. Rinse all soap suds from the paint finish.

CAUTION: Do not use volatile cleaners or solvents on the top covering.

INTERIOR TRIM

Most stains can be removed quite easily from fabrics while they are fresh and have not hardened and set into the fabric. An exception is mud or clay, which should be allowed to dry so that most of it can be brushed off. It is also very helpful, though often not possible, to know the nature of the staining matter so the correct cleaning agent may be used.

General Instructions: Use a piece of clean cotton cheesecloth approximately 3" x 3". Squeeze most of the liquid from the fabric and it is less likely to leave a ring. Wipe the soiled fabric very lightly with a lifting motion. Always work from the outside toward the center of the spot. Turn the cheesecloth over as soon as one side becomes stained to prevent working the stain matter back into the cleaned portion of the fabric. Use a new piece of cheesecloth as soon as both sides become stained.

Testing For Type of Material—Natural cloth will burn like string, slow and smoky. Synthetic material such as nylon, burns fast and "balls up" into a hard mass. Sample material for testing can be found under the seat cushion, sun visor and dome light brackets, or back of the trim panels. Another method of testing is to rub the back of a fingernail over the surface of the material. Synthetic materials appear to "whistle" when this is done.

Spots and Stains—Before cleaning seats, door panels, headliner, etc., remove as many spots as possible.

IMPORTANT: When using water to remove a spot, be sure to wash entire section after spot has been removed to avoid water stains.

Use a pocket knife or putty knife to break up and remove any encrusted foreign matter. Vacuum thoroughly.

Apply the recommended spot removing agent with a clean cloth or sponge. Work in a wide circle to prevent making a ring and work toward center.

Surface Spots—May be brushed out with a small hand brush. Exercise extreme care not to damage the fabric when brushing.

Deep Penetrating Spots—Work the spot removing agent in by brushing. When the spot is thoroughly worked and saturated, use high air pressure to blow the dirt down through material. In extreme cases the entire spot may not be removed and it will then be necessary to cover the area with a light application of dye.

Water Stains—Water stains in fabric materials can be removed with a cleaning solution made from one cup of ordinary table salt and one quart of water. Vigor ously scrub the solution into the stain, then wash with clean water. Water stains in nylon and other synthetics should be removed with commercial type spot remover, compounded for the specific material being cleaned.

Mildew—Clean area around mildew with warm suds. Rinse with cold water, soak mildew area with solution of one part common table salt and two parts water, then wash with the recommended upholstery cleaner.

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Rust Stains—Dampen the stained area with water. Apply a commercial rust remover solution, available at dry cleaning supply or chemical supply houses.
CAUTION: Keep rust remover solution away from your skin. Wash hands immediately if exposed. Clean extra well under fingernails. Read instructions on the bottle before using.

Sponge with clean water to clean rust from upholstery buttons. **Wrap a small strip of cloth around each button to avoid leaving a ring on upholstery material.** Moisten button with a few drops of water applied with a small piece of sponge or cloth. Apply one or more drops of rust remover. Fast dry clean areas with heat lamps.

Chewing Gum and Tar—Avoid using spotting or cleaning solution that will dissolve or soften gum or tar. Place a cube of ice on gum or tar to harden it. Remove as much of the gum or tar as possible with a dull knife when it is in this hardened state. Moisten remainder with cleaning fluid and scrub clean. In some cases soak with cleaning fluid and blow the stain through using high air pressure.

Ice Cream and Candy—Use a dull edged pocket knife or putty knife to remove as much substance as possible from the surface of upholstery. Be careful not to damage fibers of upholstery. Most candy has a sugar base and can be removed by rubbing area with a cloth wrung out in warm water. An **oily type of candy,** after using warm water, should be cleaned with an upholstery type cleaner that will emulsify with the oil. Rinse with water and remove the remaining stains with cleaning fluid.

Bloodstains—In removing bloodstains **never use warm or hot water.** Use a clean cloth wrung out in cold water and rub the stain. If this does not completely remove the stain, use spot remover or vinyl cleaner and apply it with a brush.

Wine or Alcohol—Scrub the stain with a cloth moistened in luke warm water. **Avoid use of soap,** as it has a tendency to set the stain. The remaining stains can be removed with a regular cleaning solution.

Shoe Polish—Scrub area with a cloth saturated with cold water. Remove wax base polishes by sponging with spot remover.

Grease, Oil, Lipstick and Related Stains—Use spot remover to avoid leaving a "ring." Start cleaning operation from outside of spot and work toward the center. When the spot has been removed, dry fabric with a clean cloth.

Headliners—Cloth Type—Mix a cleaning solution of water and a foaming type upholstery cleaner (as shown on the container) to produce thick suds. Use **only** foam when cleaning headliner as saturation with liquids may result in streaks, spots or shrinking.

On nap type, lay down nap, usually left to right. Do not stop, when washing a headliner. Complete the entire operation using the same solution.

Starting in the left rear corner, clean only one or two sections at a time. Thoroughly work suds into the cloth with a natural spongs. Use circular or short back and forth strokes to remove all the dirt. The amount of dirt determines the effort needed. When headliner appears clean and the sponge glides easily, leaving an even distribution of foam, finish cleaning with sweeping motions in one direction.

Hard Board Type—Apply a solution of upholstery cleaner and water with a sponge. Use a circular or short back and forth stroke, wipe clean with a cloth. If this type of headliner is extremely dirty, wash with vinyl cleaner using the same procedure.

Vinyl Type—Apply vinyl cleaner with a sponge (or if extremely dirty scrub with a brush) wipe clean with a dry clean cloth.

Seats and Door Panels—Mix one pint of upholstery cleaner to one gallon of water. If seats or door panels are extremely dirty, add more upholstery cleaner to mix.

Apply cleaning solution with a scrub brush or sponge. Scrub thoroughly only one section at a time. Avoid over soaking the material. Frequently stains that show when material is damp will disappear when dry. Use care not to injure the fabric being cleaned by attempting to brush out "stubborn" spots. Spots should be removed before washing. After each part has been scrubbed, remove loosened dirt by rubbing down the area briskly with a clean cotton towel or soft rag. Make final strokes in one direction. **Do not soak around buttons.**

Nylon or Synthetic Fabrics—For average conditions use methods and materials as used in washing cloth upholstery. When material is extremely dirty, use multi-purpose cleaner full strength and a stiff scrub brush. Scrub thoroughly in all directions. Wipe off dirt and excess cleaner with a clean cotton towel or soft rags.

Leather, Leatherette or Vinyl Fabric—Use multi-purpose cleaner full strength and a stiff scrub brush. Apply to surface to be cleaned, let soak for two (2) minutes then scrub thoroughly, making sure to clean between all seams and in all cracks and underneath beading. Wipe dirt and excess material off with clean cotton toweling or soft rags.

Package Shelf-Hard Board Type—Clean using a solution of upholstery cleaner. **Wipe dry immediately.** Avoid water logging the backing.

Vinyl Type—Clean using multi-purpose cleaner. Wipe dry with clean toweling or rags.

Kick Pad Panels—Leather—Vinyl—Metal Types—Use multi-purpose cleaner full strength. Use a stiff brush and apply cleaner to surface. Allow cleaner to set (2) two minutes, then scrub thoroughly. Clean all seams, cracks and beneath beading. Wipe dry with a clean soft towel or rags.

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Glove Compartment—Vacuum thoroughly. Clean with upholstery cleaner or vinyl cleaner. **Caution: Some glove compartments are made of a cardboard type material. Do not waterlog.**

Floor Covering—Rubber Mat—Vacuum throughly. Clean mat with upholstery cleaner or multi-purpose cleaner. Use toweling or rags to wipe up dirt and excess cleaners.

Carpeting—Thoroughly vacuum. Mix one pint of upholstery cleaner to one gallon of water. If carpet is faded, discolored or spotted, add upholstery tint to this solution. To determine the right color shade, pour a small amount of tint at time. Check by dipping a white rag into solution, ring out and see if that is the right shade. Remember, the dye will dry a shade or two darker. With a stiff brush use the solution to scrub the carpet vigorously. Lay the nap down in one direction. When carpets are dry, fluff them up by rubbing with a brush.

Salt Stains can be removed by first vacuuming the carpet thoroughly to remove as much salt and dirt as possible. Mix a solution of ordinary table salt and water. Use a heavy concentration of salt. Soak the stained area to loosen the embedded salt (use a wire brush, if necessary). Wash the entire carpet with the recommended cleaner. More than one washing may be necessary to effect a satisfactory result.

Luggage Compartment—Remove the spare wheel-tools, floor covering and all other items. Vacuum the area thoroughly. Use a steel brush to loosen rust and caked dirt. Wash with upholstery cleaner or multi-purpose cleaner. Wipe dry with clean toweling or rags.

Cargo-Area (Town and Country) Follow same procedure used for Luggage Compartment.

Color Restoration or Change—In those instances in which stains persist, after cleaning, or a change in color is desired on trim material, dyes or tints can be applied. **The instructions for mixing and applying the color must be followed precisely.** Not all tints and dyes give satisfactory results. Use only those recommended for the exact material being worked on. To accomplish the "new car" appearance, tints and dyes should be applied by reliable experienced personnel.

Leather and Vinyl Sealers—Used for repairing holes or tears on seats, arm rests, cargo area of station wagons, etc. To repair, cut a piece of leather or vinyl about ½ inch larger than the area being repaired. Position the patch under the hole and apply sealer to the contacting areas. Place a piece of masking tape over the tear to hold the torn edges in place until the sealer dries. After sealer has dried, remove the tape and trim all visible rough edges. Fill any visible cracks with sealer. **Use a step application procedure in filling deep cracks.** After sealer has thoroughly dried, sand lightly with #400 grade sandpaper until the surface is smooth. Apply the desired shade of color to the repaired area.

POLISHING—Acrylic Finishes—To retain the "new car" look of the car exterior surface, the acrylic finish should be polished at least twice a year to remove all film. When polishing use one pad made from folded cheesecloth or an old "turkish" towel to apply the polish and another pad to remove the dried film. Test the polished area by rubbing with the fingers. If surface is not thoroughly cleaned, smears of the polish will show where the fingers were rubbed.

Sand Scratches—Overspray—Foreign Material—Minor conditions such as these can be removed from the acrylic finish using the following procedure:

1) Oil sand (oleum spirits, mineral spirits or kerosene) the affected surface by hand with No. 600 grit paper.

2) Remove all sanding sludge.

3) Machine polish the sanded surface using rubbing compound until the surface is completely free of sand scratch marks. Blend with adjacent areas.

4) Buff the surface with a clean lambs wool pad using a liquid type final polish. If the appearance of the polished area is noticeably different than adjacent areas, completely buff the adjacent panels, and if necessary, the complete side or horizontal surfaces to assure uniform appearance.

5) Use a clean, soft, cotton cloth to hand clean all inaccessible areas. **Do not use cheesecloth.**

6) Remove all traces of polish or rubbing compound from mouldings, medallions, nameplates or any other exterior ornamentation.

Bright Metals—Such as bumpers, grilles, exterior mouldings, wheel covers, mirrors and etc. should be thoroughly cleaned at least twice a year to maintain a new look condition. The recommendations of the cleaner product manufacturer should always be followed. Remove all materials used to protect the bright metal. **Use care not to allow the removing agent to come into contact with the acrylic finish.** Clean the bright metal thoroughly and remove all traces of cleaner from corners, etc. After cleaning thoroughly, apply and rub out a coat of good body wax to the bright metal. During the winter months and in areas in which salt is used on the roads, do not rub out the wax.

Frequent washing of bright metals, by steam, will necessitate more frequent applications of the protective wax.

When cleaning anodized aluminum, use care not to rub through the anodized coating.

TIRES

White sidewall tires should be cleaned using a stiff bristle brush and white sidewall cleaner or multipurpose cleaner. After washing, rinse with clean water. **Do not clean** tires with scouring powder, steel wool or

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other abrasive type cleaners. Scuff marks can be dressed down by sanding lightly with #400 sand paper.

GLASS

Interior glass surfaces should be thoroughly cleaned weekly to remove all traces of smoke and other films resulting from fingers, exhaust fumes, dusts, moisture, etc.

Exterior glass surfaces having an oily film are easily and best cleaned with the use of a commercially made cleaner compounded for that particular application. **Do not** scrape off smears from bugs, road tars or other similar objects, use warm water or the necessary type solvent to remove.

During the winter months, snow, ice and frost can be removed with a plastic or rubber type scraper, or with a commercially made solvent. Do not remove ice or other objects from the glass by chlipping. **Do not** use putty knives, razor blades, steel wool or any other metal object to remove deposits from the glass.

DRAIN HOLES

The drain holes in the bottom of the cowl plenum chamber, doors and floor sills (rocker panels) should be inspected regularly to insure drainage. Road tars, mud and similar other foreign matters should be removed immediately. Should bare metal be exposed, surface treat the metal and refinish as necessary.

The drain holes in the quarter panel well areas are sealed with a removable plastic plug. The plugs should only be removed whenever it is necessary to clean or drain fluids from the well area.

LUBRICATION

To maintain ease of operation, the hood, door, deck lid and tail gate hinges should be lubricated at the recommended intervals with the recommended lubricants. Refer to the Lubrication and Maintenance Group for the type of lubricant to be used and the lubrication points.

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SHEET METAL—DOORS—EXTERIOR MOULDINGS

	Page Chrysler	Imperial
ALIGNMENT		
Deck Lid	51	51
Doors	13	13
Fenders	10	10
Grille	13	13
Hood	7	7
Tail Gate	45	
BUMPERS—Front	12	12
Rear	12	12
COWL PANEL	6	6
DECK LID		
Alignment	51	51
Hinge	52	52
Lock	51	51
Replacement	51	51
Torsion Bars	52	52
Weatherstrip	52	52
DOORS		
Alignment—Front	13	13
Rear	15	15
Arm Rests	16	16
Glass	29	29
Convertible	29	29
Adjustments	29	29
Regulators	30	30
Replacement	30	30
Run Channel	30	30
Hardtop	29	29
Adjustments	29	29
Regulators	30	30
Replacement	30	30
Run Channel	30	30
Sedan—Front	24	31
Adjustments	24	31
Regulators	25	32
Replacement	25	32
Run and Channel	28	33
Vent Wing	25	31
Sedan—Rear	28	35
Adjustments	28	35
Regulators	29	36
Replacement	28	35
Runs	29	36
Stationary Glass	44	44
Handles—Inside	16	16
Outside	21	21
Hinge	16	16
Lock	17	17
Remote Control	17	17
Replacement	15	15
Striker and Rotor	15	15
Trim Panels	17	17
Watershields	17	17
Weatherstrips	22	22
Windcords	22	22
EXTERIOR MOULDINGS	52	52
FENDERS	10	10
GRILLE	13	13
HOOD	7	7
Alignment	7	7
Hinge	9	10
Lock	9	9
Replacement	8	8

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	Page Chrysler	Page Imperial
Torsion Bars	9	9
MOULDINGS—EXTERIOR	52	52
Convertible	52	52
Hardtop	52	52
Sedan	52	52
Town and Country	52	52
QUARTER PANELS	37	37
GARNISH MOULDINGS	37	37
Glass	41	42
Convertible	41	42
Adjustments	41	42
Regulators	41	43
Replacement	41	43
Stabilizer Channel	42	44
Track—Front	42	42
Weatherstrip	38	38
Hardtop	38	42
Adjustments	38	42
Regulators	39	43
Replacement	39	43
Track—Rear	40	43
Sedan		
Adjustments	44	44
Replacement	44	44
Run and Channels	45	45
Town and Country	45	45
Handles	38	38
Trim Panels	38	38
Watershields	38	38
Weatherstrips	38	38
RADIATOR CORE SUPPORT		
Air Shield and Cross Bar	12	12
Replacement	11	11
TAIL GATE		
Alignment	45	
Glass	47	
Adjustments	47	
Regulators	48	
Replacement	47	
Run Channels	49	
Handles	46	
Lock	46	
Replacement	45	
Torsion Bar	49	
Trim Panel	46	
Weatherstrips and Seals	49	

SHEET METAL—DOORS—EXTERIOR MOULDINGS

COWL PANELS

GRILLE PANEL—OUTER

Removal

(1) Remove windshield wiper arm and blade assemblies.

(2) Remove windshield lower moulding.

(3) Remove cowl grille attaching screws (center cap on Imperial) (Figs. 1 and 2) and grille.

Installation

(1) Inspect grille panel seating area for foreign material. Inspect plenum chamber inner seams, using a mirror and light, to make sure all seams are sealed.

(2) Position grille panel on cowl, align attaching holes and install screws loosely.

(3) When tightening screws, use care not to overtighten.

(4) Install windshield lower moulding.

(5) Install wiper arm and blade assemblies. Test for correct positioning.

TRIM PANEL—SIDE COWL

The side cowl inner trim panel (Fig. 3) is attached to the panel with screws and at the rear lower edge under the floor sill stop plate. A silencer pad is used between the trim panel and cowl panel.

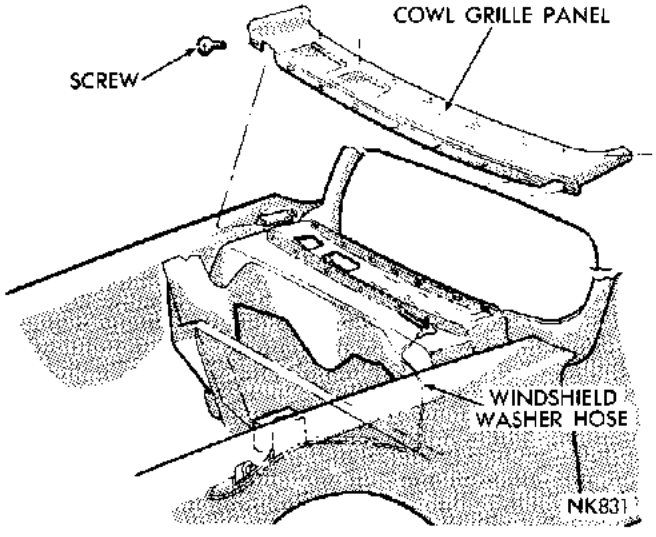


Fig. 1—Cowl Grille Panel (Chrysler)

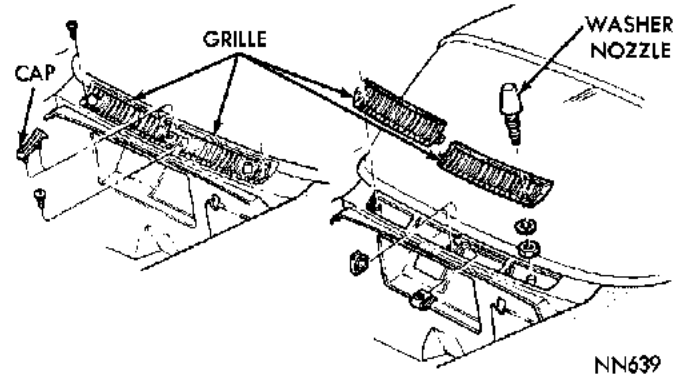


Fig. 2—Cowl Grille Panel (Imperial)

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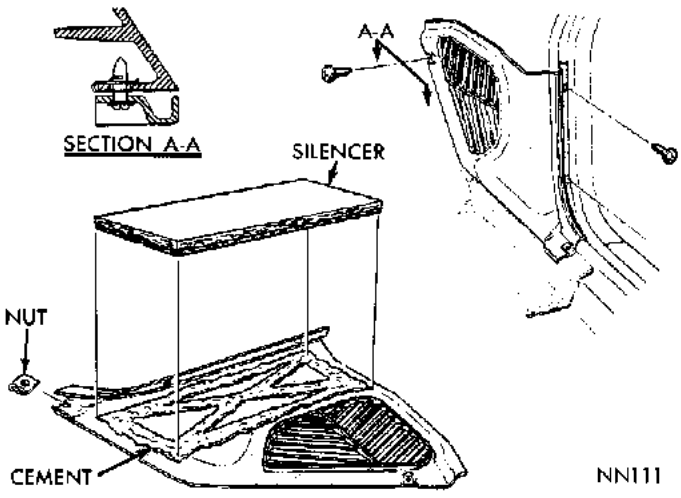


Fig. 3—Side Cowl Trim Panel

CONTROL CABLE

Replacement

The fresh air cowl vent control cable, housing and knob (Fig. 4) is serviced as an assembly. The cable housing shank has two flat edges which index with corresponding edges in the panel (Fig. 4) and is retained on the panel with a nut at the rear. The housing is attached to the vent door bracket with a clip and the coiled cable end is positioned over a pin on the door (Fig. 5).

Adjustment

Adjustment of the door is controlled by the positioning of the control cable housing on the door bracket (Fig. 5). Loosen the clip screw attaching the housing to the door bracket and push control cable knob to the fully closed position. Hold the vent door closed and pull cable housing slack out of the door flange. Tighten the clip screw after all housing slack has been removed and test the operation of the cable and door.

VENT DOOR

Removal (Fig. 5)

(1) Remove cowl side trim panel and silencer.

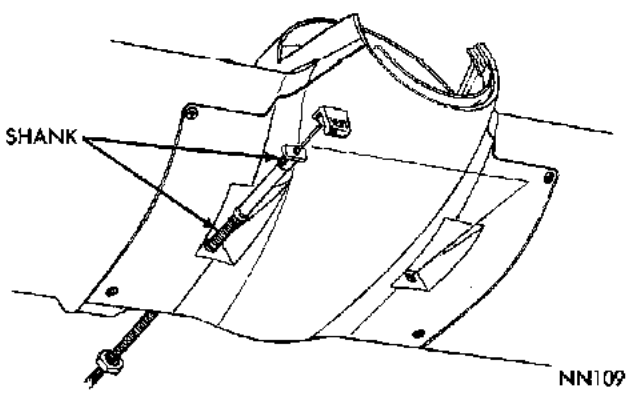


Fig. 4—Vent Door Control (Chrysler)

(2) Remove clip attaching actuator cable housing to door bracket.

(3) Slide cable coiled end off of pin on door.

(4) Slide cable out of door frame flange.

(5) Remove screws attaching door to cowl side panel.

(6) Remove door and seal assembly.

(7) Inspect seal for damage.

Installation

(1) Install spring nut to bottom of fresh air door housing, if removed.

(2) Position seal in line with outer edge of housing flange (Fig. 5).

(3) Position fresh air door on cowl side panel and align attaching holes.

(4) Install attaching screws and tighten progressively.

(5) Insert actuator cable assembly through hole in door frame flange and install coiled end of cable over pin on door.

(6) Position clip over cable and attach to door bracket. Pull out cable slack and tighten attaching screw securely.

(7) Test operation of door and actuator cable.

(8) Install trim panel and silencer.

HOOD

Alignment

Prior to making any hood adjustment inspect clearances and alignment of hood sides in relation to cowl, fenders and grille. The cowl adjustment must be made first.

Hood to Cowl

(1) Inspect alignment at cowl for tightness, looseness, uneven gap and high or low elevation at corners.

(2) Scribe hinge position on hood.

(3) Loosen hood attaching bolts (Figs. 6 and 7) and move hood to desired position to correct alignment at cowl.

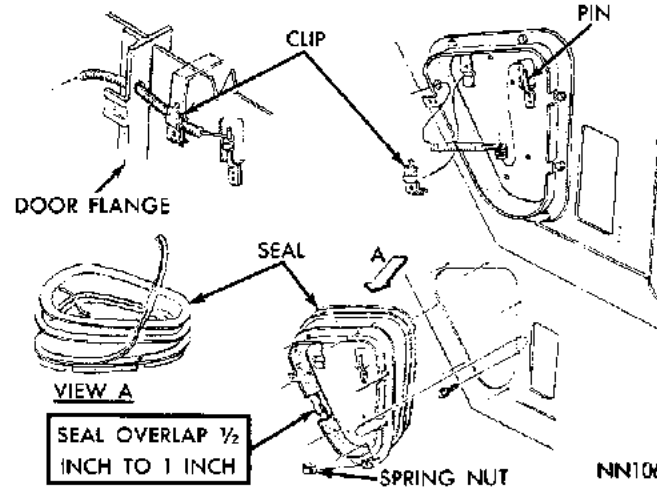


Fig. 5—Fresh Air Door (Chrysler)

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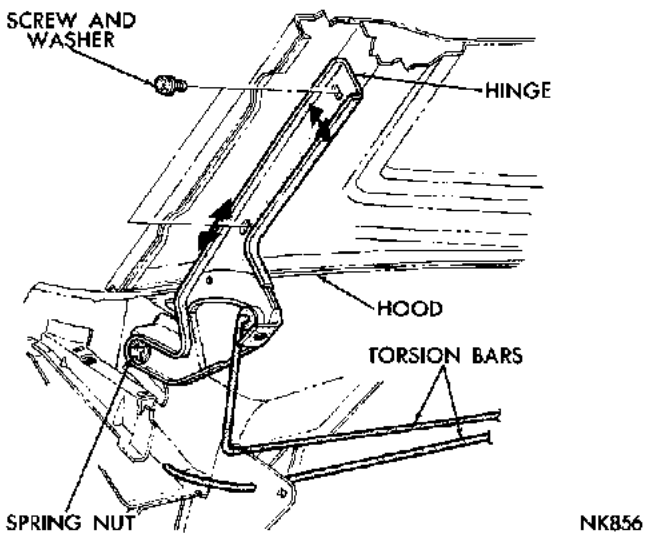


Fig. 6—Hood Adjustment (Chrysler)

(4) Tighten attaching bolts 180 inch-pounds.

(5) After Step 4, if rear of hood and fender are not flush, reset fender to align with cowl and hood.

Hood to Fender

After completing previous step 5, inspect the front of the hood to fender clearance. This clearance is adjusted by removing the hood bumper and turning the adjusting screw in or out (Fig. 8). It may also be necessary to loosen the fender attaching bolts and move the fender up or down to the desired position.

Unequal Spacing Between Rear of Hood and Fenders

(1) Loosen four hinge-to-hood attaching bolts on each side of hood.

(2) Shift hood (at rear) in direction of wide space, until spacing appears to be equal on each side.

(3) Tighten hinge-to-hood bolts, lower hood and inspect fit. When spacing is correct on one side only, loosen the hood to hinge bolts on side to be adjusted. If the hood needs to be moved out, insert a large screwdriver between the upper hinge plate and the hood flange. Force the hood out as required. While holding pressure on screwdriver, tighten bolts securely.

To move the hood in apply pressure on the outside edge of hood, then tighten bolts securely. Lower hood and inspect fit.

Hood Projects Beyond Front of Fender

If hood projects beyond front fender, and fender to door spacing is close, the fender can be shifted forward to correct this condition.

Hood Side Contour Does Not Follow Fender

When the side contour of the hood does not follow curve of the fender, the hood should be reshaped.

(1) Insert a small block of wood (about 1 inch square) between fender flange and hood, just opposite the low spot on the hood.

(2) Close hood slowly. With hands placed just ahead of block, gently apply pressure to hood.

(3) Repeat this operation about every six inches until contour of fender and hood conform evenly.

REPLACEMENT

Removal

(1) Place a protective covering over cowl and fender area.

(2) Mark outline of hinges on hood to aid in installation.

(3) With an assistant, remove hinge-to-hood attaching bolts and remove hood assembly. Use extreme care not to permit hood to slide rearward and damage painted surfaces of the cowl and fender areas.

Installation

(1) With an assistant, position hood on hinges and install hinge to hood bolts. Do not tighten.

(2) Align scribe markings on hood with hinge and tighten screws lightly.

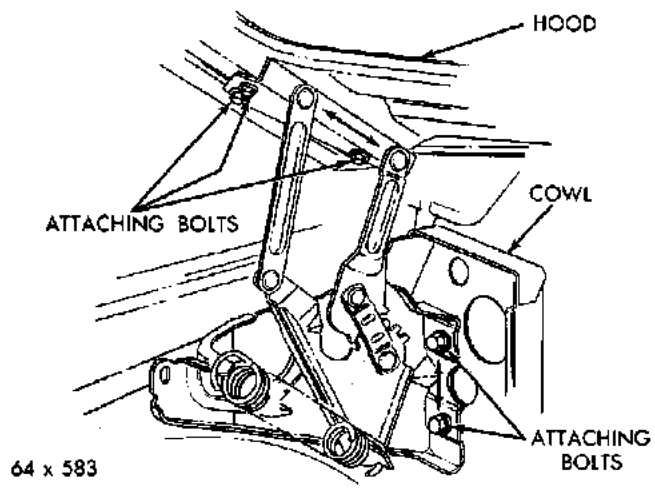


Fig. 7—Hood Adjustment (Imperial)

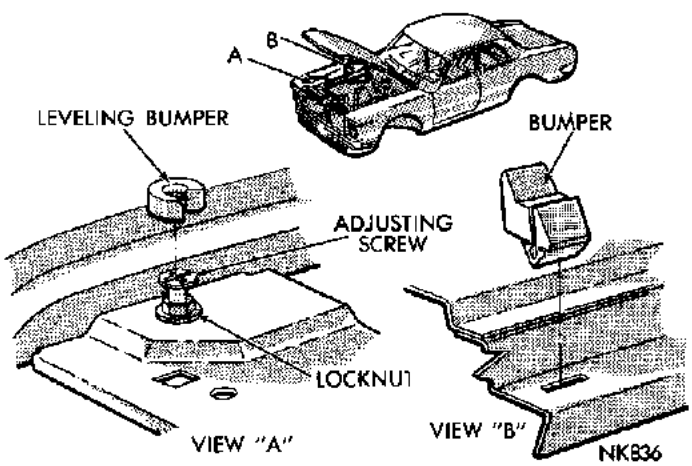


Fig. 8—Hood Leveling Adjustment

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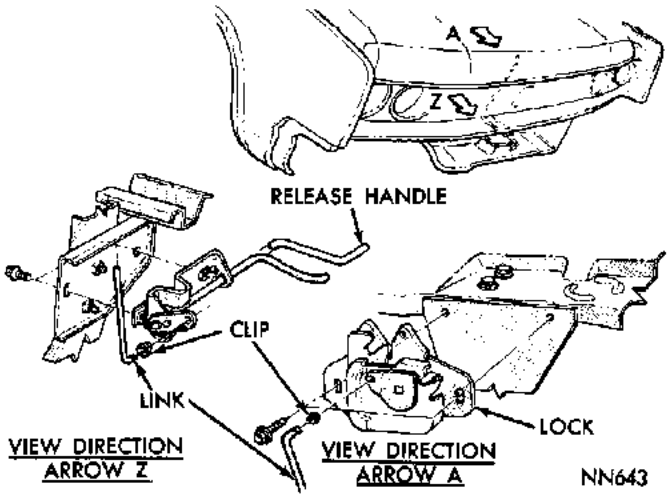


Fig. 9—Hood Lock Assembly (Chrysler)

(3) Close hood and inspect hood alignment.

(4) Align as necessary and tighten the hood to hinge bolts 180 inch-pounds.

(5) Remove protective covering from cowl and fender area.

LOCK

To adjust the lock (Figs. 9 and 10) loosen the attaching screws and raise or lower until the correct adjustment has been obtained. After making any adjustment that requires shifting the hood, always inspect the hood striker and the lock plate assembly for alignment.

TORSION BAR REPLACEMENT

(1) Disengage torsion bar roller (Fig. 11) from its seat on hood hinge by forcing the roller end of bar to the rear and raising hood fully.

(2) Disengage left hand torsion bar roller from hood hinge.

(3) Remove hood assembly.

(4) Remove torsion bars from center support and remove bars from end reinforcements.

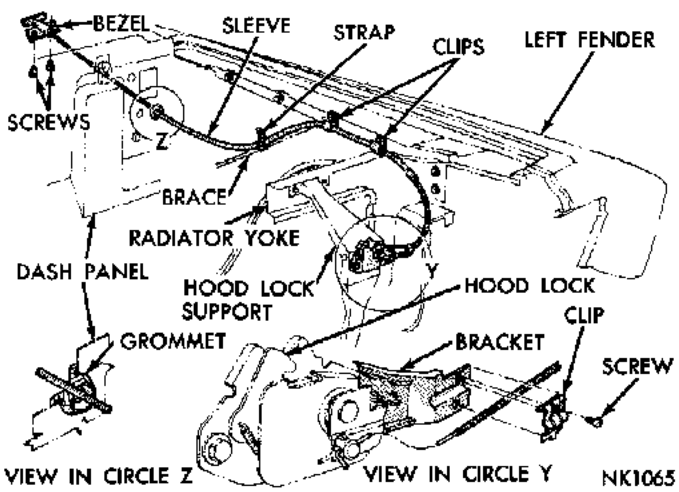


Fig. 10—Hood Lock Assembly (Imperial)

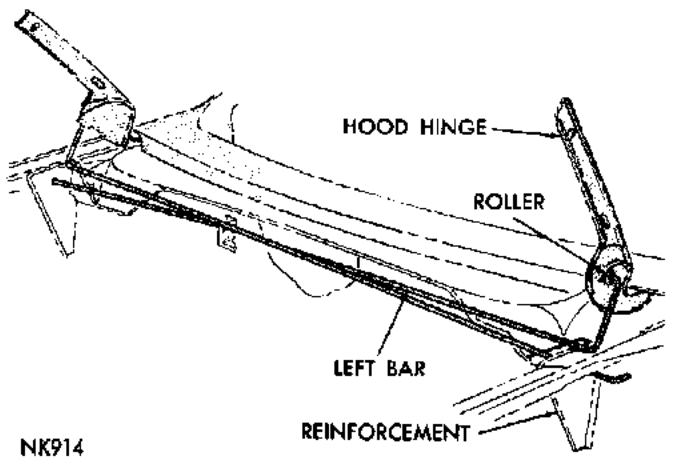


Fig. 11—Hood Torsion Bars

(5) Lubricate torsion bar rollers and install on hinges.

(6) Install and align hood.

HINGE REPLACEMENT CHRYSLER MODELS

(1) Disengage torsion bar roller from hood hinge (Fig. 12).

(2) Scribe hinge location on hood and remove hinge to hood screws.

(3) Support hood at hinge area.

(4) Remove the cowl grille panel (Fig. 1).

(5) Remove hinge pivot nut from pivot and remove hinge.

(6) Lubricate hinge pivot area with lubriplate and position hinge on pivot.

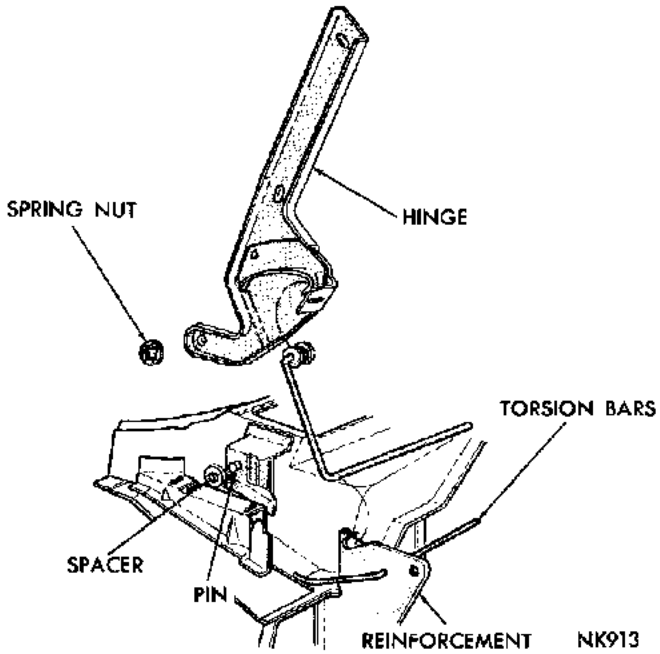


Fig. 12—Hood Hinge (Chrysler)

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(7) Using a socket with putty placed on end, position a new spring nut on putty and position on pivot. Press spring nut on pivot using a screw driver.

(8) Install cowl grille panel, lower windshield moulding and windshield wiper arm and blade.

(9) Remove hood support and position hinge on hood.

(10) Install hinge to hood screws and tighten to 180 inch pounds after alignment has been accomplished.

(11) Engage torsion bar roller with hood hinge.

Imperial Models

(1) Prop hood open to relieve tension on hinge springs and scribe hinge location on hood.

(2) Remove bolts attaching hood to the hinge plate (Fig. 7).

(3) Remove hinge to cowl attaching bolts.

(4) Remove hinge to fender shield bolt and remove hinge assembly.

(5) Do not remove hood support prop until hinge has been completely installed and tightened in place.

FENDERS

ALIGNMENT (Figs. 13 and 14).

Fender to Cowl

Raise the hood and loosen the fender top screws. Force the rear edge of the fender away from the cowl with a screw driver. Retighten the fender screws.

Fender Too Low at Sill Panel

Loosen the fender-to-cowl attaching screws. Position a floor jack under the bottom rear edge of the fender. **Protect fender edge with a cloth pad.** Raise jack until the bottom edge of fender is in line with the bottom edge of the sill panel. Tighten the fender attaching screws and remove jack.

Fender To Door Spacing

If hood projects beyond front fender, and fender to door spacing is too close, the fender can be shifted slightly forward.

(1) Loosen screws attaching front fender to cowl side panel and move fender forward.

(2) When spacing between door and fender is correct, and hood is even with front end of fender, tighten fender to cowl screws securely.

Fender Too Far Forward at Door

Loosen fender-to-cowl attaching screws. Apply pressure to forward section of fender until correct alignment is obtained. Tighten fender-to-cowl attaching screws.

Fender Below Level of Hood

If hood has been properly adjusted and one fender is still below level of hood at front, the fender should be raised.

(1) Raise hood, loosen screws attaching fender to radiator support.

(2) Place a wood block or cloth pad on lifting pad of a jack and install under front lower corner of fender.

(3) Raise jack slowly until fender is in alignment. Leave jack in place and tighten fender screws securely.

(4) Lower jack, close hood and inspect alignment.

(5) Adjust hood bumpers as required.

REPLACEMENT

Removal

(1) Disconnect battery ground strap.

(2) Tape leading edge of front door and cowl to fender area to avoid damaging paint.

(3) Remove front bumper assembly.

(4) Disconnect head lamp wires and remove nuts attaching grille extension to fender.

(5) Remove nuts and screws attaching fender to cowl, floor sill, wheelhouse, splash shields and radiator yoke (Figs. 13 and 14).

(6) Remove fender assembly and if necessary remove fender mouldings, ornamentation and head light assemblies.

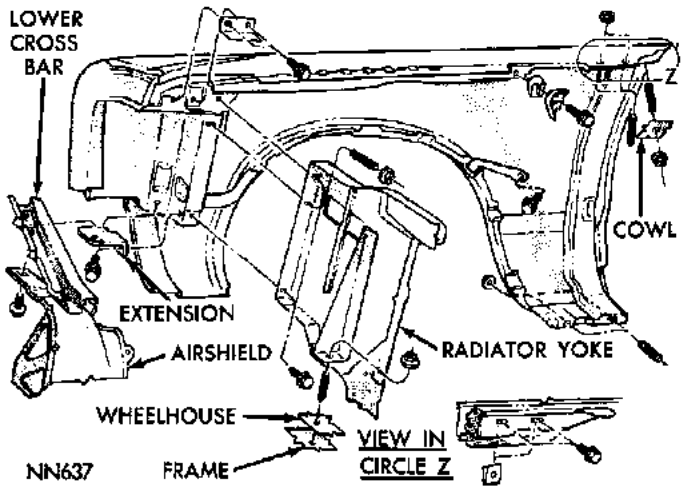


Fig. 13—Fender Assembly (Chrysler)

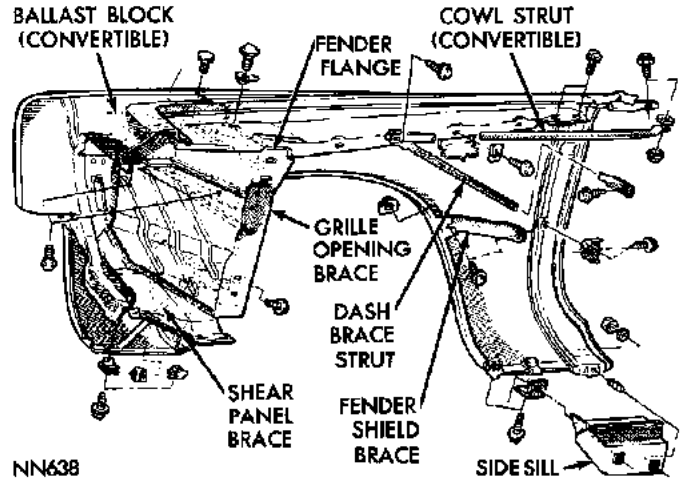


Fig. 14—Fender Assembly (Imperial)

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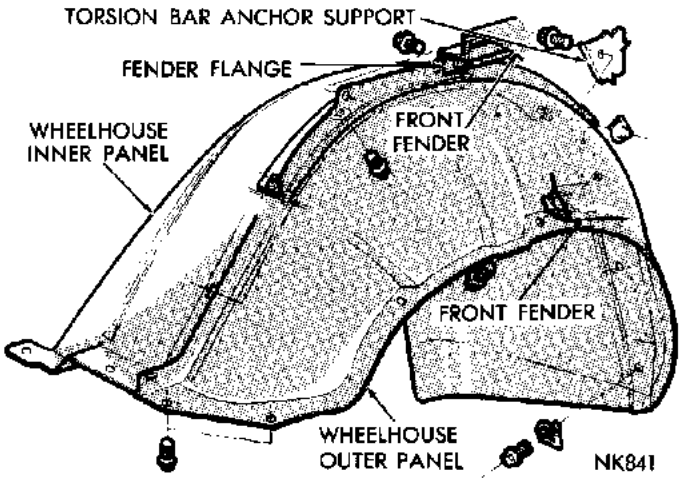


Fig. 15—Wheelhouse Assembly

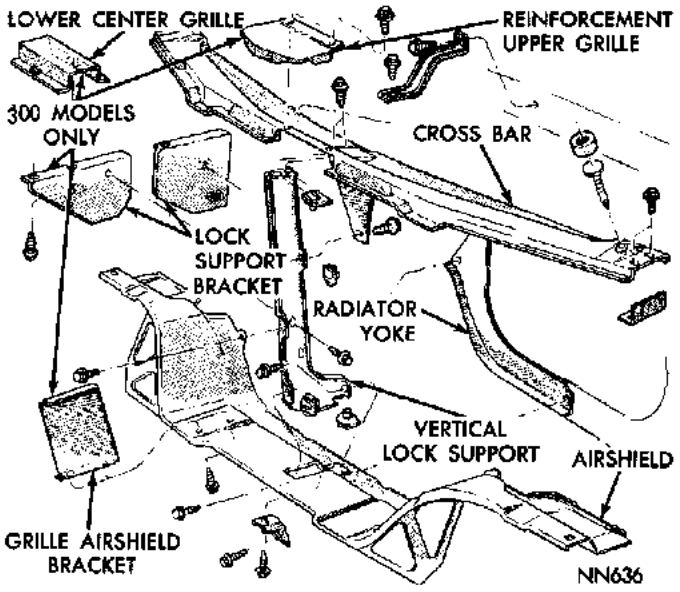


Fig. 16—Air Shield and Cross Bar (Chrysler)

Installation

(1) Install head lights, mouldings and ornamentation if removed.

(2) Carefully position fender on studs at cowl side area and align fender with mounting holes in radiator yoke. Install all mounting screws and retainer nuts.

(3) With fender correctly positioned, tighten all screws and nuts securely making certain fender is aligned at cowl and hood areas.

(4) Connect head lamp wires and install grille to fender nuts. Connect battery ground strap.

WHEELHOUSE

To remove the wheelhouse assembly (Fig. 15) it is first necessary to remove the bumper and fender assembly. The wheelhouse, at the front end, is attached between the frame and radiator yoke. When installing the wheelhouse make sure it is correctly aligned before tightening the screws.

RADIATOR CORE SUPPORT

REPLACEMENT

Removal

(1) Drain radiator and remove hoses from radiator.

(2) Remove the radiator.

(3) Remove hood lock striker bar, horn and head-

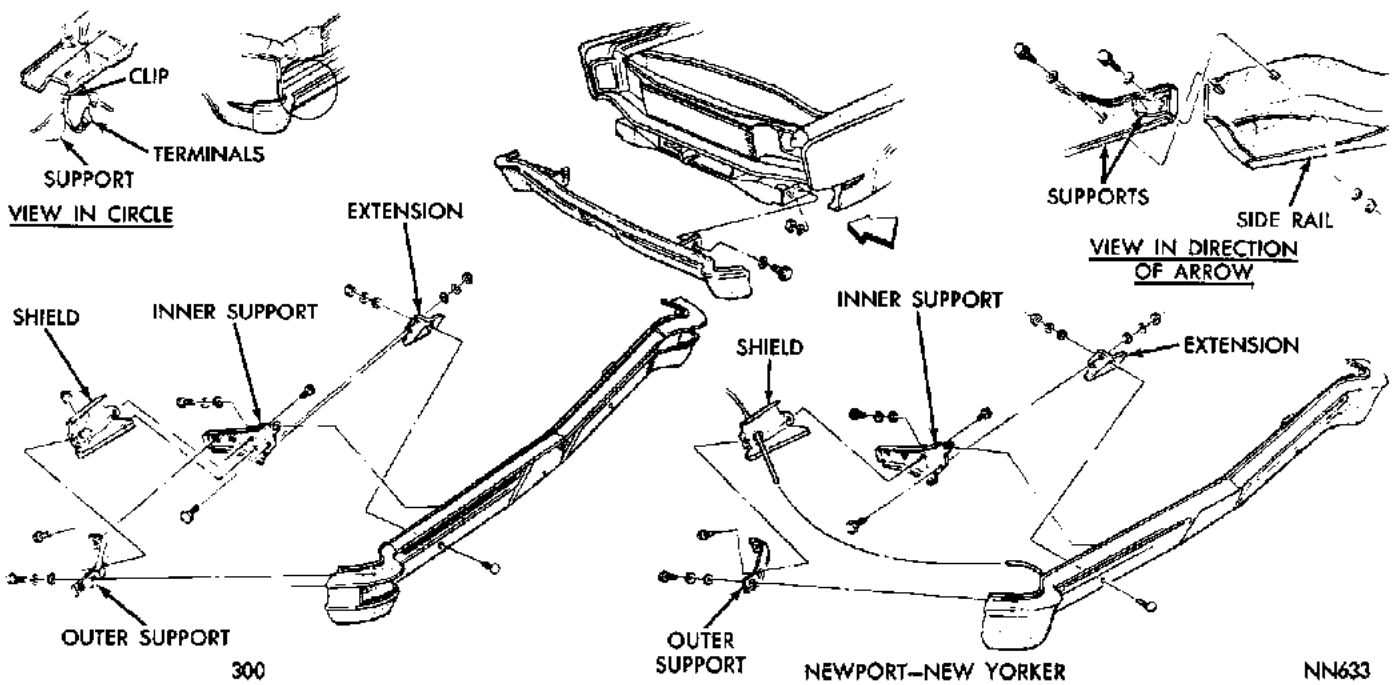


Fig. 17—Front Bumper (Chrysler)

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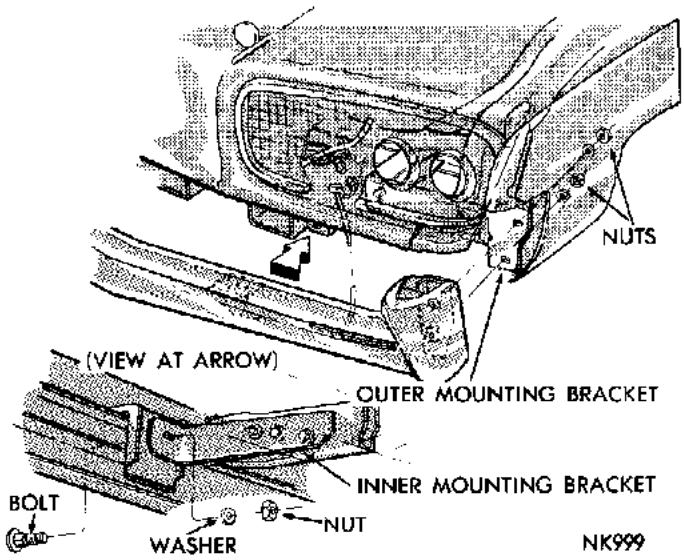


Fig. 18—Front Bumper (Imperial)

light wiring from core support.

(4) From under the fenders remove screws.

(5) Remove support to frame attaching screws.

Installation

(1) Position core support into the engine compartment. Install the frame to core support screws finger tight.

(2) From under the fenders, install splash shield to core support screws finger tight only.

(3) When all attaching screws have been installed, tighten them progressively.

(4) Attach the horn and light wires to the core support with the plastic straps.

(5) Install the radiator and hoses. Fill cooling system and inspect for leaks.

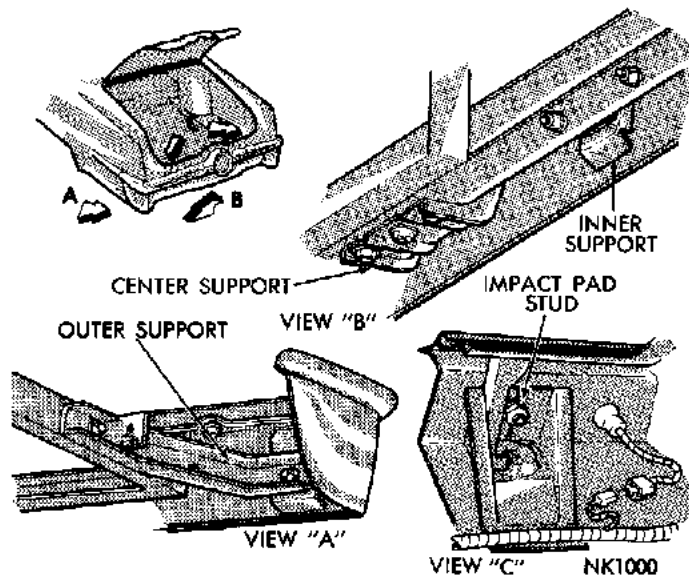


Fig. 20—Rear Bumper (Imperial)

AIR SHIELD AND CROSS BAR

Refer to (Fig. 16) for the air shield and cross bar attaching points.

BUMPERS

FRONT BUMPER

Refer to (Figs. 17 and 18) for front bumper attaching points.

REAR BUMPER

Refer to (Figs. 19 and 20) for rear bumper attaching points.

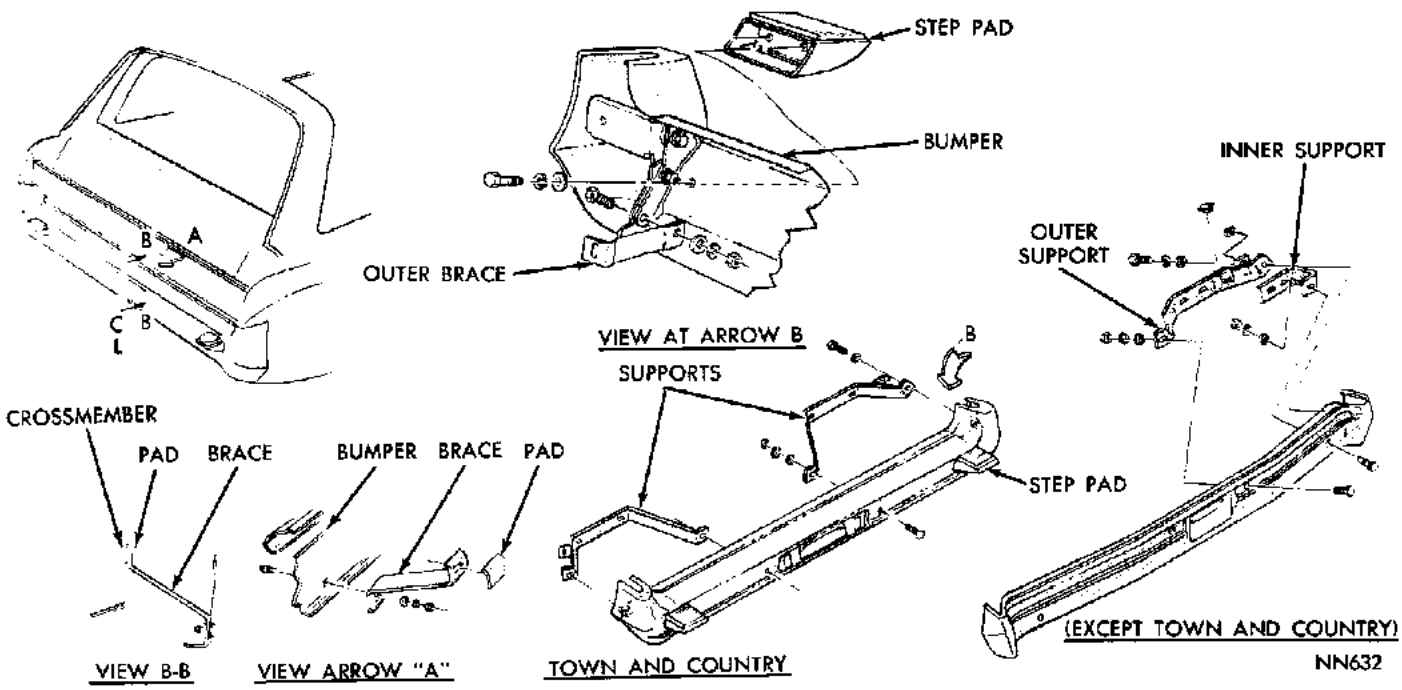


Fig. 19—Rear Bumper (Chrysler)

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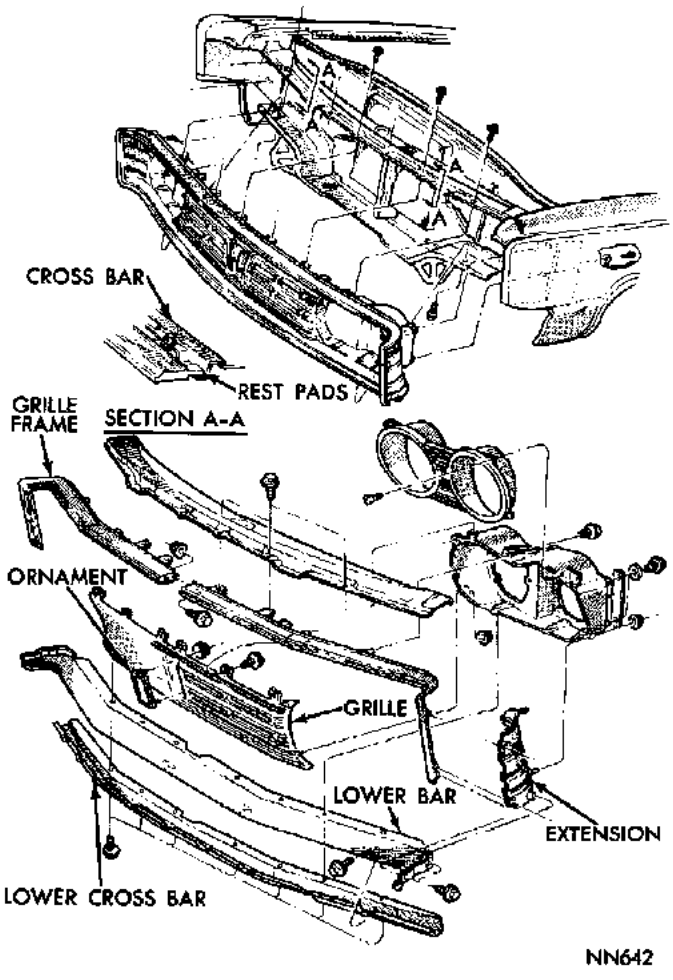


Fig. 21—Grille Assembly (Newport)

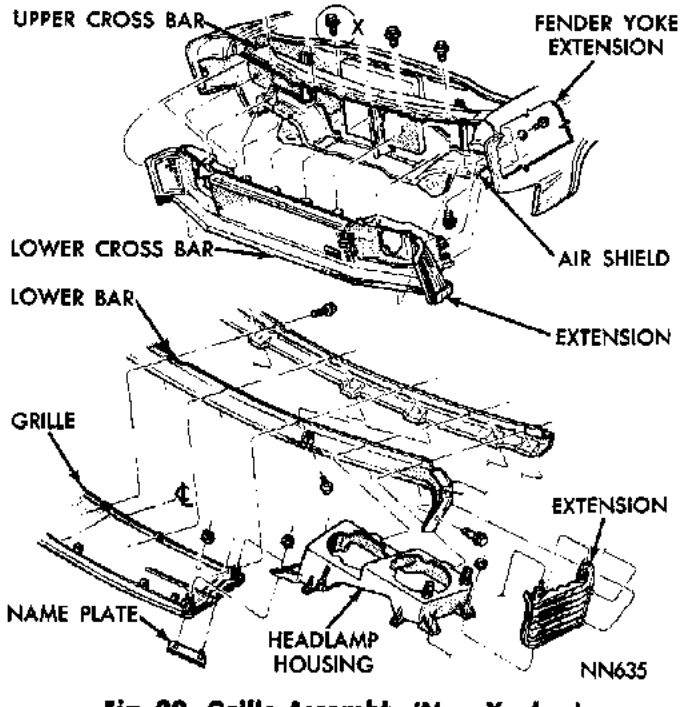


Fig. 22—Grille Assembly (New Yorker)

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GRILLE

ALIGNMENT AND REPLACEMENT

Refer to (Figs. 21, 22, 23 and 24) for grille attaching points. When assembling grille, install screws into points marked "X" on the left side first to laterally align grille to frame opening. The grille must be held against the front face of the fenders at the outer edges to avoid stressing or fracturing the die cast metal.

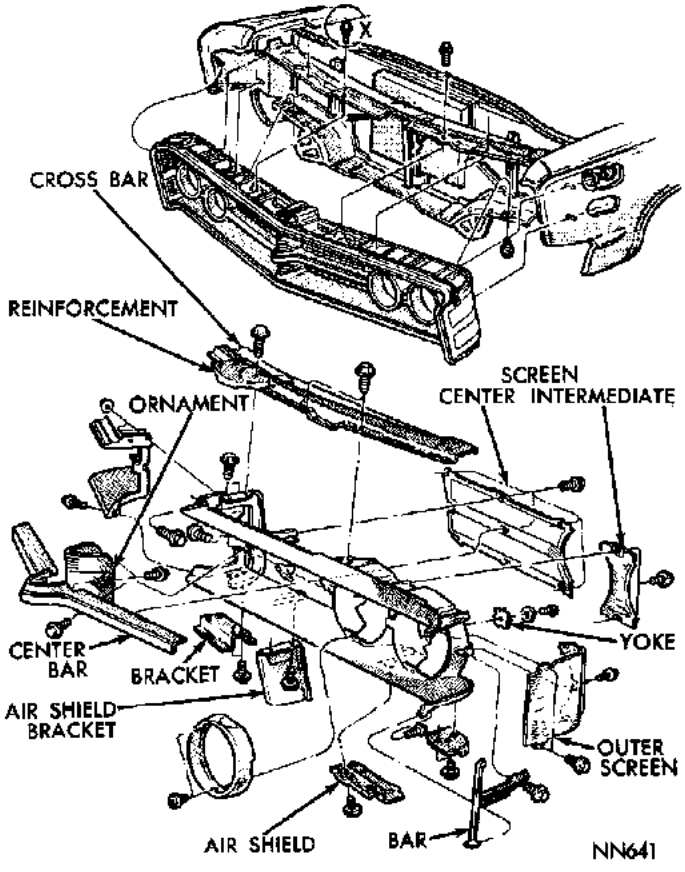


Fig. 23—Grille Assembly (300)

DOORS

The service procedures for internal door components do not include obvious operations, such as removing door or quarter panel trim panels, testing operation of windows or inspecting glass fit after adjustments or replacement have been performed.

ALIGNMENT
FRONT DOOR

Up and Down

"Up" or "down" adjustment of the door can be made at the front pillar or in the door itself (Figs. 25 and 26).

(1) Scribe a line around upper and lower hinge straps.

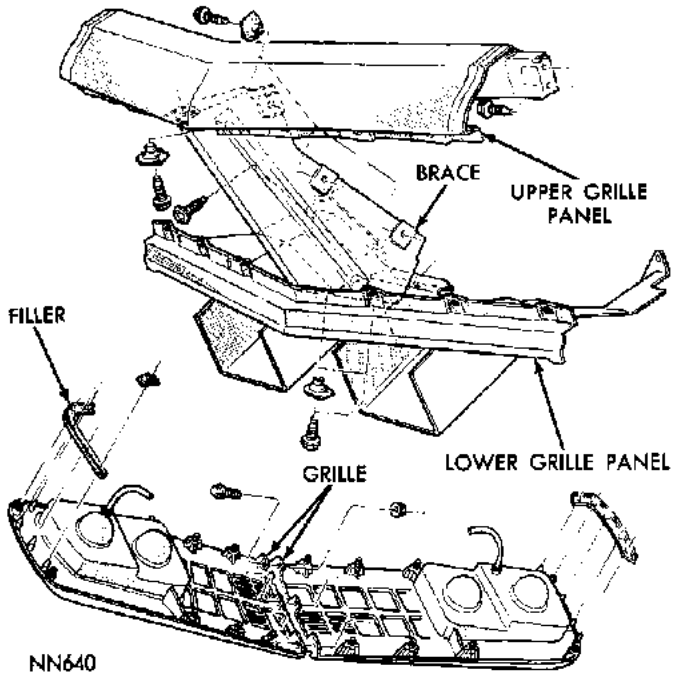


Fig. 24—Grille Assembly (Imperial)

(2) Place a wooden block on lifting plate of a floor jack and position it under door (Support door near center of balance when atttaching bolts are loosened).

(3) Loosen upper and lower door hinge attaching bolts.

(4) Observing scribe mark, raise or lower jack until door is in the desired position.

(5) Tighten attaching bolts and remove jack.

(6) Open and close door several times and inspect clearance around all edges of door.

(7) Repeat steps 5, 6 and 7 until door is centered in door opening.

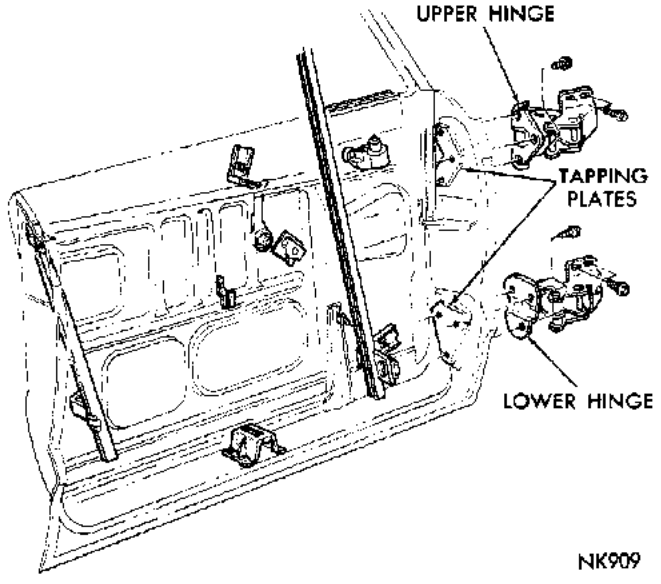


Fig. 25—Front Door Alignment (Chrysler)

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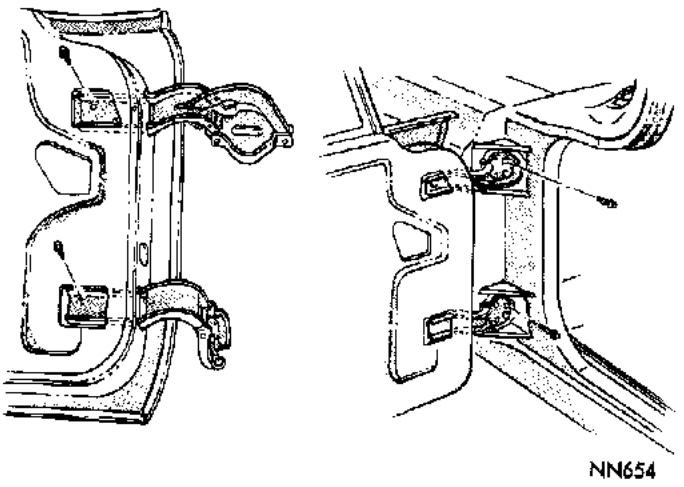


Fig. 26—Front Door Alignment (Imperial)

Fore and Aft

(1) With door in a full open position (trim panel removed) scribe a line around upper and lower hinge straps.

(2) Place a wooden block on lifting plate of floor jack and position it under outer end of door.

(3) Loosen upper door hinge attaching bolts only.

(4) Observe scribe marks and raise or lower door to the desired position (Raising outer end of door moves upper part of door forward when in closed position).

(5) Tighten attaching bolts.

(6) Loosen lower door hinge attaching bolts and raise or lower door to desired position (Lowering end of door moves lower part of door forward when in closed position).

(7) Tighten attaching bolts.

(8) Open and close door several times and inspect clearance around all door edges.

(9) Repeat steps 4, 5, 6 and 7 until door is centered in door opening.

(10) Adjust the door lock striker.

In and Out

(1) With door in a full open position, place a wooden block on lifting plate of a floor jack and position it under outer edge of door.

(2) Loosen upper hinge to pillar attaching bolts.

(3) Raise or lower jack until upper part of door has moved in or out desired amount (Raising outer end of door will move upper part of door into door opening).

(4) Tighten upper hinge to pillar attaching bolts.

(5) Loosen lower hinge to pillar attaching bolts.

(6) Raise or lower jack until lower part of door is in desired position (Lowering jack moves door into door opening).

(7) Tighten attaching bolts.

(8) Close door and observe alignment of door panel with body sill, fender, cowl and "B" post.

(9) Adjust the door lock striker.

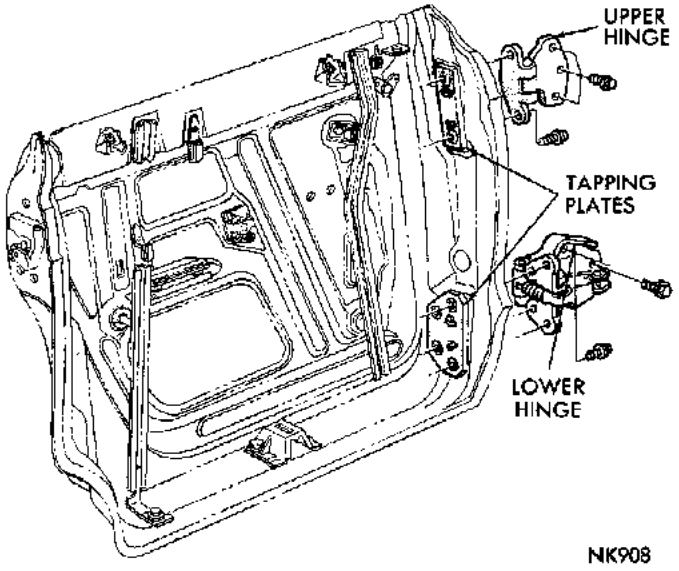


Fig. 27—Rear Door Alignment (Chrysler)

REAR DOOR

Up and Down

(1) With rear door fully closed and front door open, scribe the location of both the upper and lower hinges on frame of door (Figs. 27 and 28).

(2) With door slightly ajar, position a floor jack under center of door.

(3) Loosen hinge to door attaching bolts.

(4) Observe scribe marks and raise or lower door to desired position.

(5) Tighten attaching bolts. Close door and inspect alignment in door opening.

(6) Adjust the door lock striker.

Fore and Aft

(1) Remove "B" post trim panel and scribe around pillar post hinge plate.

(2) Loosen both upper and lower pillar post hinge screws.

(3) With rear door slightly ajar, push door forward or back to desired position.

(4) Tighten pillar post hinge screws.

(5) Close door and inspect alignment in door opening.

(6) Adjust door lock striker and install "B" post trim panel.

In and Out

(1) Scribe a mark on door around door hinge plate.

(2) Loosen upper hinge attaching bolts.

(3) Grasp front edge of door at the hinge and push door in or pull out to the desired position.

(4) Tighten hinge attaching bolts. **Adjust one hinge at a time to prevent door from dropping in door opening.**

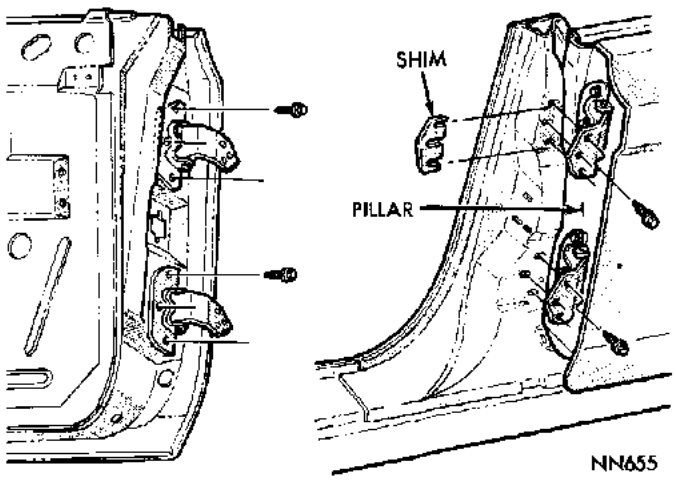


Fig. 28—Rear Door Alignment (Imperial)

ROTOR AND STRIKER

The door strikers (Fig. 29) are attached to the pillars through oversize holes permitting movement of the striker up and down and in and out. Fore and aft movement can be made by adding or subtracting shims between the striker and the post. The striker plate should be adjusted to lift the door slightly.

(1) Scribe position of striker on pillar.

(2) Loosen striker screws and reposition striker.

(3) Lubricate striker with stainless stick lubricant.

DOOR REPLACEMENT

Front Door (All Models)

Removal

(1) With door wide open place a jack, with a block of wood or pad on lifting plate of jack, as near hinge as possible (This will hold weight of door as hinge bolts are loosened).

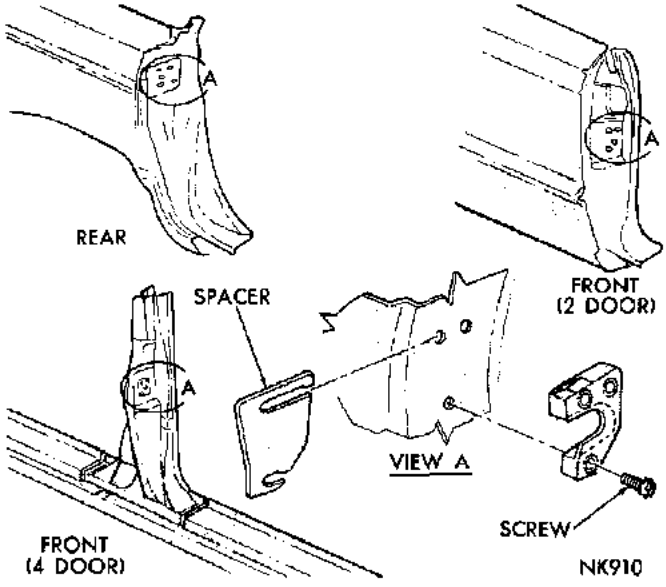


Fig. 29—Rotor and Striker

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(2) Remove door interior trim and hardware.

(3) Scribe a line around upper and lower hinge plates on door panel.

(4) Remove hinge attaching screws from door and remove door for further disassembly if necessary. **On vehicles with electric windows, disconnect wires from window regulator motor and remove from door assembly.**

Installation

(1) With door inner hardware installed, place door in position in door opening, supported by a padded jack.

(2) Locate door hinge plates on door panel and install hinge attaching screws finger tight only.

(3) Adjust jack to align hinge plate scribe marks and tighten attaching screws.

(4) Complete door aligning procedure, and install door interior trim and hardware.

Prior to this installation, on electric window lifts, install wiring in doors and attach to motor and control switch.

Rear Door (All Models)

Removal

Prior to door removal on vehicles with electric window lifts, disconnect wires from motor and switch and remove from door.

(1) Open rear door and place a padded jack under door near the hinges.

(2) Remove door interior trim and hardware.

(3) Scribe aligning marks around hinge plates on door frame.

(4) Remove hinge attaching screws from door and remove door from the body.

Installation

(1) With rear door inner hardware installed, support door on a padded jack and position door on hinges.

(2) Install attaching bolts finger tight.

(3) Align hinges with scribe marks.

(4) Tighten attaching screws and test door for alignment.

(5) Install door interior trim and hardware.

On vehicles with electric window lift, insert wiring into the door and attach wiring to motor and control switch prior to installation of trim panel.

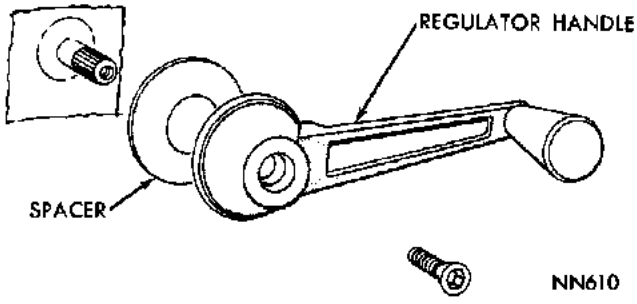


Fig. 30—Window Regulator Handle

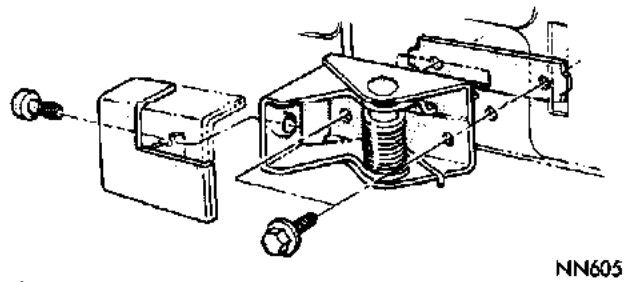


Fig. 31—Remote Control Handle (Newport-300)

HINGE REPLACEMENT

The door hinges (Figs. 25, 26, 27 and 28) are attached to the doors by screws accessible from outside. The front door hinges are each attached to the "A" post by three screws.

The rear door upper hinges (on hardtop and station wagon models), are attached to the "B" post by three screws accessible from the outside (Figs. 26 and 28). On sedan models, the screws are accessible through an access hole in the "B" post.

INSIDE HANDLES

Window Regulator Handle

The window regulator handles are retained on the shaft with an allen set screw (Fig. 30).

Remote Control Handle

The remote control handle (Figs. 31 and 32) is attached to the control unit with a screw at the rear inner end.

ARM RESTS

The arm rests (Fig. 33) are retained by two metal screws inserted at the bottom of the arm rest base. The pad and base can be separated and if necessary, the pad may be recovered.

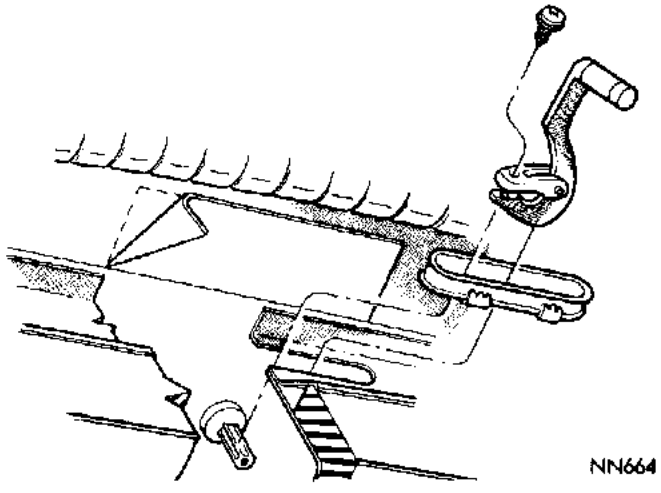


Fig. 32—Remote Control Handle (New Yorker-Imperial)

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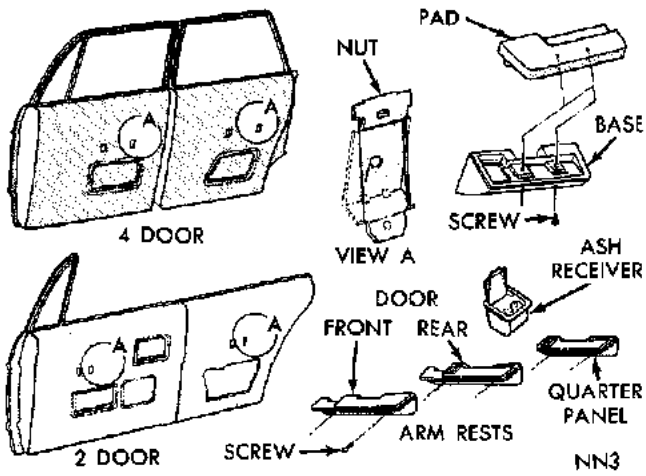


Fig. 33—Arm Rest Applications

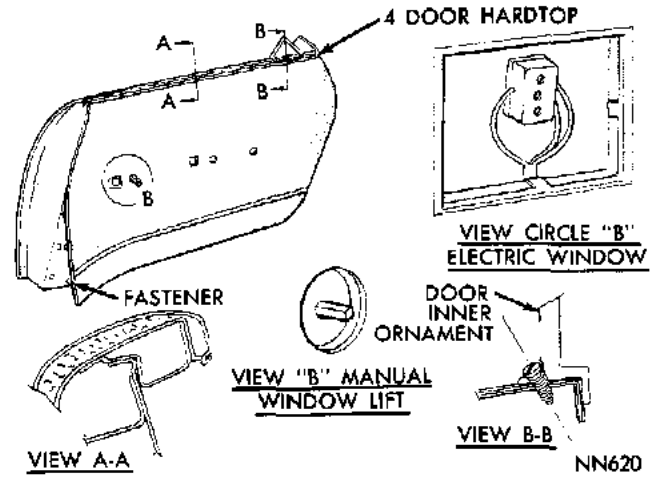


Fig. 35—Rear Door Trim Panel (Chrysler)

TRIM PANELS

Door Trim Panel Replacement

(1) Remove inside handles and arm rests.

(2) Remove screws attaching trim panel to door inner panel (Figs. 34, 35 and 36).

(3) Insert a wide blade screw driver between trim panel and door frame next to the retaining clips and snap retaining clips out of door panel. Remove trim panel.

(4) Before installing the door trim panel, inspect condition of watershield (Figs. 37 and 38).

(5) Align trim panel retaining clips with holes of door frame and bump into place with heel of hand.

(6) Install trim panel to door screws.

(7) Install escutcheon washer, handles and arm rest.

WATERSHIELDS

Refer to Figures 37 and 38 for the sealing area and applications of the watershields. The lower edge of the shield must be inserted into the slots in the bottom of the inner panels.

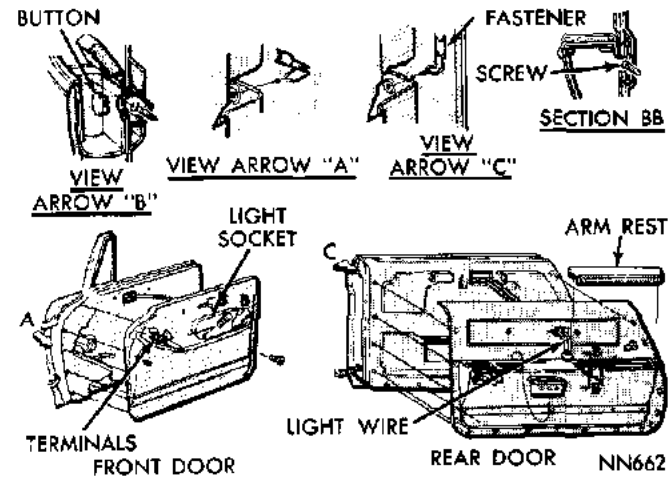


Fig. 36—Door Trim Panels (Imperial)

LOCK ASSEMBLY

Remote Control (Manual)

Removal

(1) Raise door glass.

(2) Remove screws attaching remote control base to

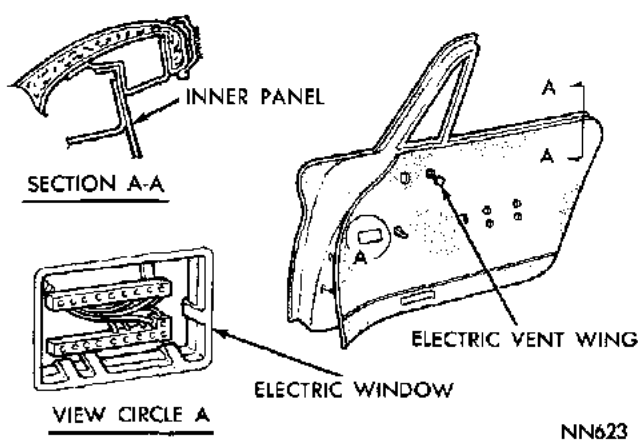


Fig. 34—Front Door Trim Panel (Chrysler)

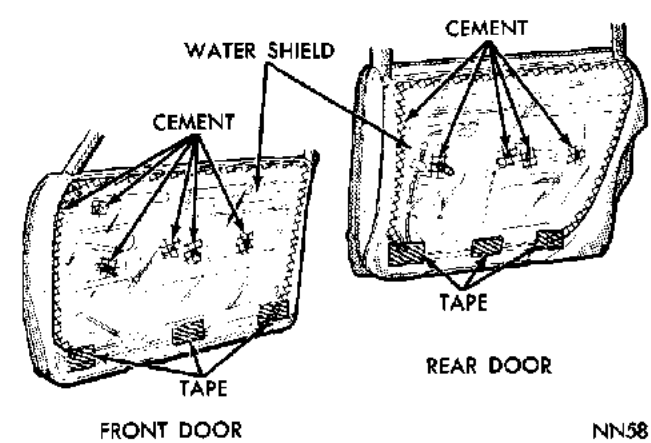


Fig. 37—Door Watershields (Chrysler)

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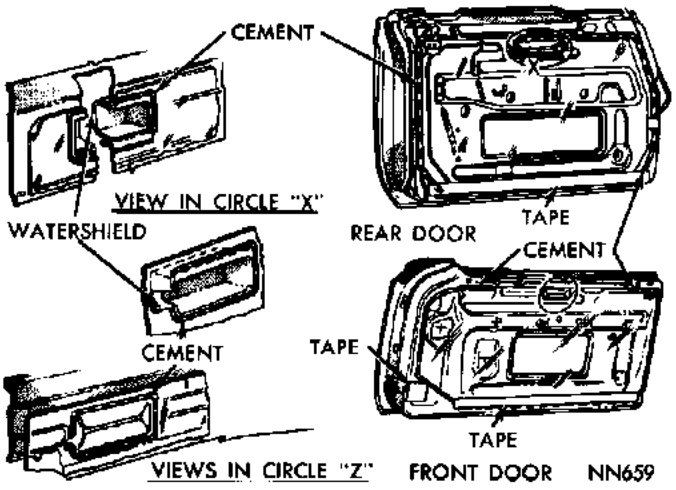


Fig. 38—Door Watershields (Imperial)

door panel (Figs. 39, 40, 41 and 42).

(3) Remove link from remote control lever.

(4) Remove control through large opening in door.

Installation

(1) When installing the remote control assembly, coat parts with lubriplate.

(2) Install assembly through door opening and connect link to the control lever.

(3) Install attaching screw and test operation of control.

Lock Replacement

Removal

(1) Disconnect handle to lock link (Figs. 39 to 42) from lock by pulling link outward at lock.

(2) Disconnect locking lever rod (front door only) from the lock assembly.

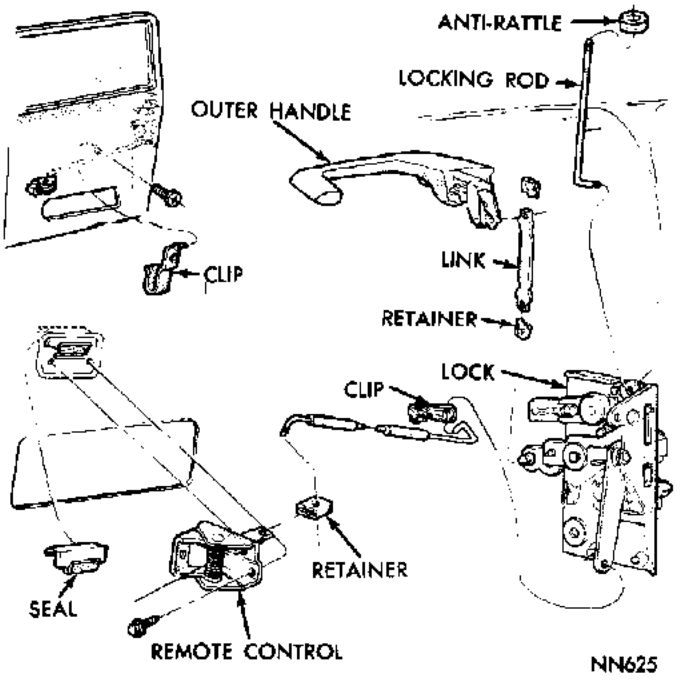


Fig. 39—Front Door Locking Mechanism (Chrysler)

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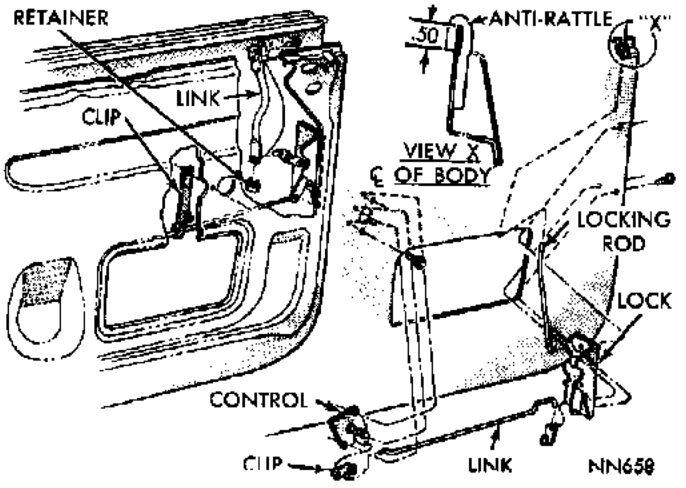


Fig. 40—Front Door Locking Mechanism (Imperial)

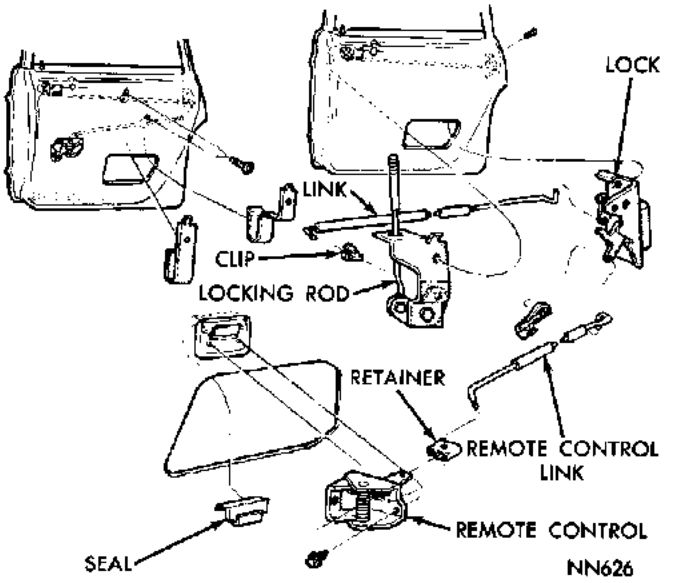


Fig. 41—Rear Door Locking Mechanism (Chrysler)

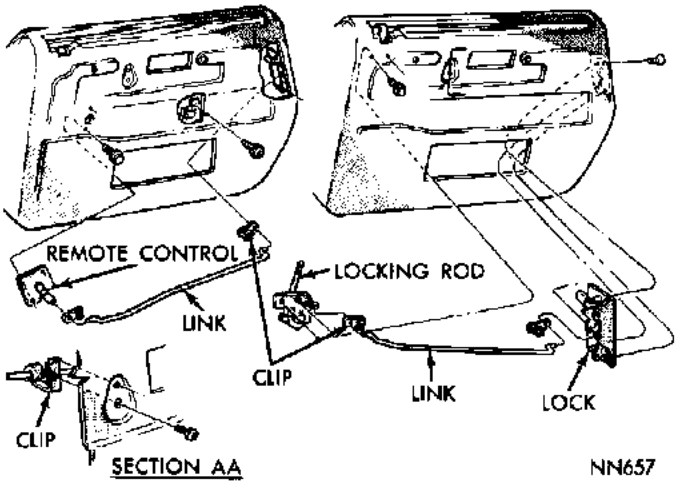


Fig. 42—Rear Door Locking Mechanism (Imperial)

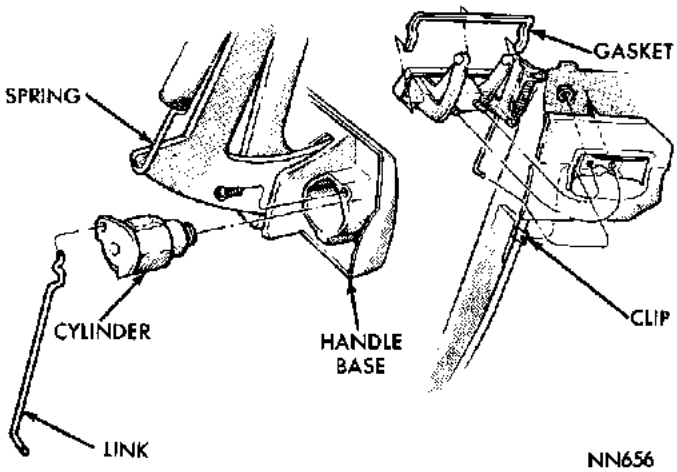


Fig. 43—Door Handle and Lock Cylinder (Imperial)

(3) Disconnect lock control rod from lock assembly.
(4) Remove screws attaching lock assembly to door.
(5) Rotate lock assembly and disconnect remote control link when removing lock.
(6) Lubricate all moving points of lock assembly.

Installation

(1) Position lock assembly in door and connect remote control link to lock lever.
(2) Install lock retaining screws.
(3) Connect handle to lock link.
(4) Connect locking lever rod (front door only) to lock assembly.
(5) Connect locking lever rod and remote control link to lock.

Lock Cylinder

Removal

(1) With window in the up position, disconnect cylinder link (Figs. 43 and 44) from clip on lock lever (4 door only) and from cylinder.
(2) On 2 door Chrysler models (Fig. 44), disconnect lock link from clip on lock lever, remove link control

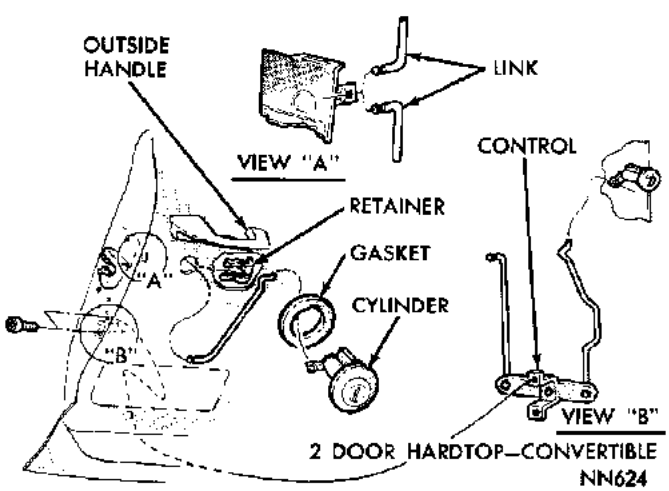


Fig. 44—Door Lock Cylinder (Chrysler)

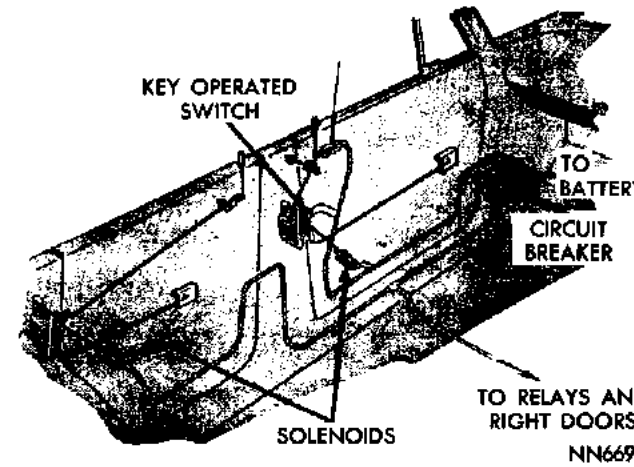


Fig. 45—Electric Door Lock System

bracket mounting screws and remove cylinder link from cylinder.
(3) Remove retainer from cylinder body on Chrysler models or screw from handle base on Imperial models. Remove cylinder.

Installation

(1) Position cylinder in door and install retainer on cylinder body.
(2) Connect the cylinder link to the cylinder arm and to clip on lock lever (4 door models).
(3) On 2 door Chrysler models (Fig. 44), connect cylinder link to cylinder, position link bracket on door face and install attaching screws. Connect lock link to lock.

Electric Door Locks (Fig. 45)

All doors may be locked or unlocked either mechanically or electrically. To lock mechanically, push the front door handle to the forward position and depress the rear door locking button. To lock electrically, depress the switch to the lock position.

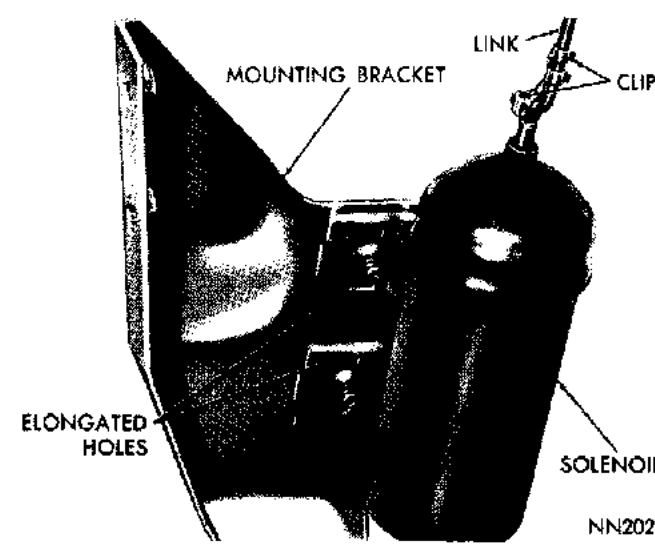


Fig. 46—Solenoid Adjustment

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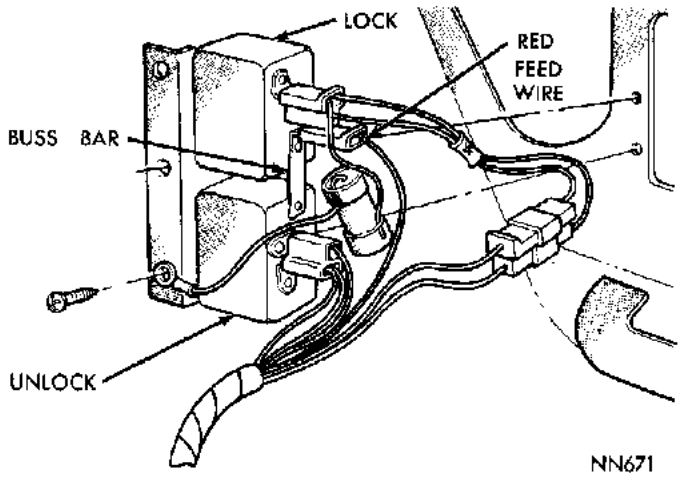


Fig. 47—Door Lock Relay

Adjustment

(1) Loosen solenoid to mounting bracket screws (Fig. 46).

(2) Push lock lever to down position and slide solenoid to full down position in mounting bracket.

(3) Raise lock lever to up position, extending solenoid rod to maximum up position.

(4) Tighten solenoid to mounting bracket screws and test operation of lock.

Testing

The battery must be fully charged before testing. Make certain the solenoids are correctly adjusted before the circuits are tested. The circuit breaker is located behind the left side cowl trim panel and the relay is located behind the right side cowl trim panel.

Connect one lead of a voltmeter to the red feed wire terminal at the circuit breaker. Connect the other voltmeter lead to a good ground. The voltage should read 12.6 volts with no load and 11.4 volts when the locks are activated. Should no reading be obtained, inspect for a broken wire, or a loose connection at the ammeter.

If voltage is correct at the circuit breaker, test voltage at the red feed wire terminal of the relay. Connect one lead of voltmeter to buss bar connecting two relays and the other voltmeter lead to a good ground (Fig. 47). With no load, voltage should be 12.6 volts and when locks are activated, voltage should be 9.4 volts. A lower voltage reading indicates a shorted solenoid and a higher voltage reading indicates an "open" circuit.

To determine which solenoid is faulty, disconnect the solenoid connectors one at a time, while trying the door lock switch. When the faulty solenoid is disconnected, the remaining door locks will operate.

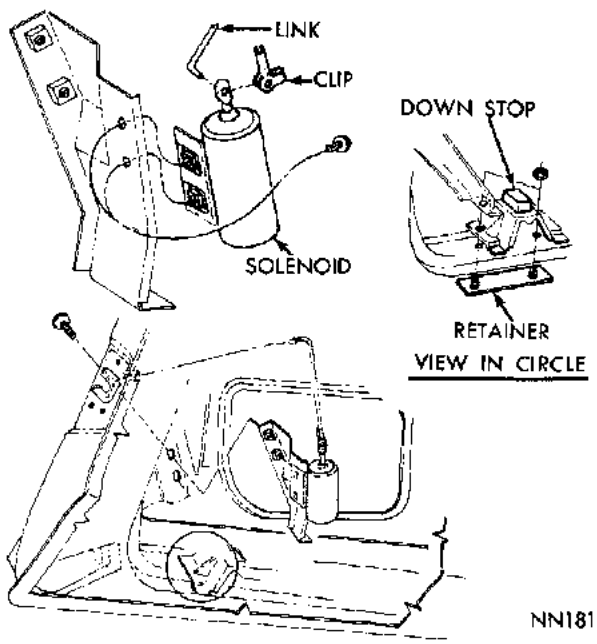


Fig. 48—Solenoid Attachment (Front Door)

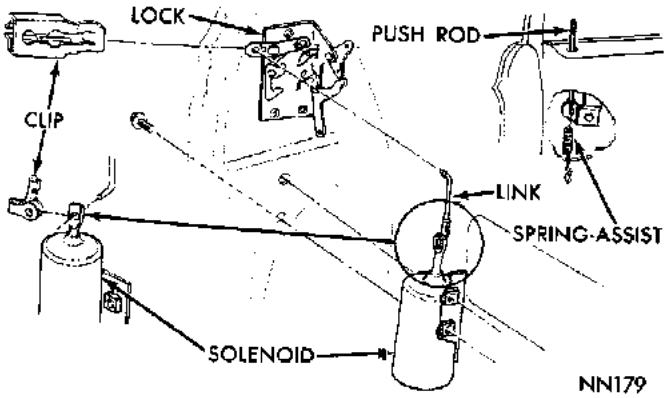


Fig. 49—Solenoid Attachment (Rear Door)

Solenoid Replacement

Removal

(1) Disconnect solenoid link at solenoid (Figs. 48 and 49).

(2) Remove solenoid lead wires.

(3) Remove solenoid to mounting bracket screws and remove solenoid assembly.

Installation

(1) Position solenoid on mounting bracket and install mounting screws. **DO NOT TIGHTEN.**

(2) Connect link to solenoid rod and connect wires.

(3) Adjust lock assembly.

Lock and Switch Replacement (Fig. 50)

Removal

(1) Disconnect lock switch wires (front door only).

(2) Disconnect solenoid link at door lock lever.

(3) Remove screws attaching lock and switch assembly to inner face of door and remove from door.

(4) Remove key actuated switch from lock assembly.

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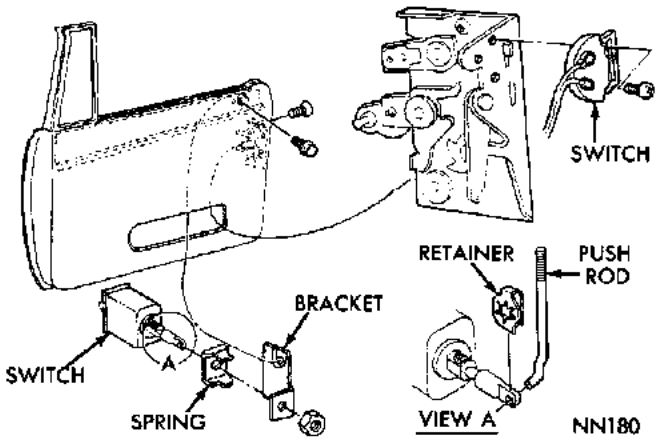


Fig. 50—Door Lock Switch

Installation

(1) Position key actuated on lock assembly and install mounting screw.

(2) Position lock and switch assembly on door inner face and install mounting screws.

(3) Connect solenoid link to door lock lever.

(4) Connect lock switch wires (front door only) and test operation of lock assembly.

Remote Control Switch Replacement

The remote control switch (front doors only) (Fig. 50) is attached to the door inner face with one screw. the remote control push rod is attached to the switch with a "push-on" type retainer.

Wiring Diagram

Refer to Figure 51 for the door lock wiring diagram.

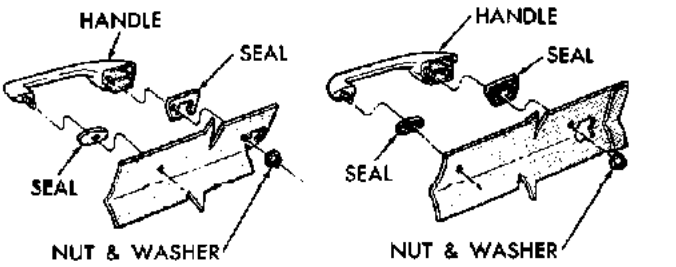


Fig. 52—Front Door Handle (Chrysler)

Outside Handle—Front Door

Removal

(1) With door glass in up position, remove door handle attaching nuts from mounting studs (Figs. 43 and 52) and link from handle to lock.

(2) Lift handle up and remove from door.

Installation

(1) Install handle into door opening. Engage link from handle to lock.

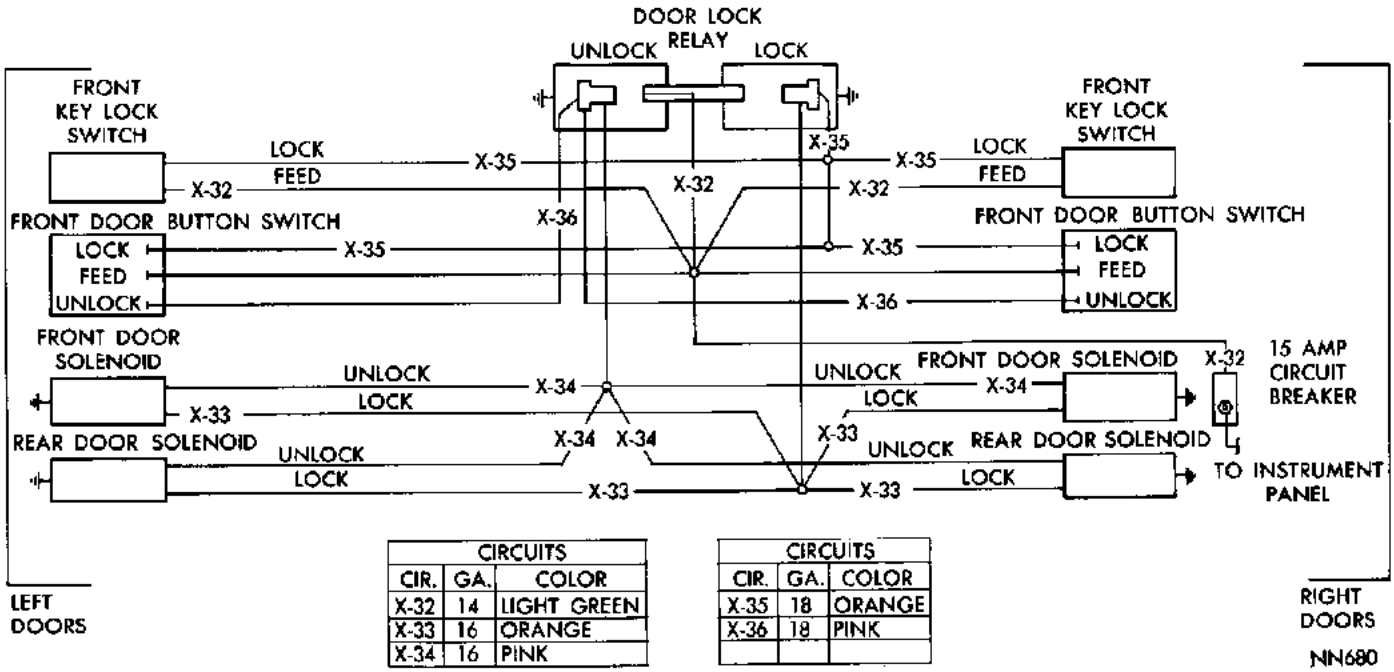
(2) Attach retaining nuts and test operation of the handle.

Rear Door

Removal

(1) With door open and glass in up position remove retainer from link at handle connector.

(2) Depress outside handle release button (Chrysler Models) and remove link from handle connector.



CIRCUITS		
CIR.	GA.	COLOR
X-32	14	LIGHT GREEN
X-33	16	ORANGE
X-34	16	PINK

CIRCUITS		
CIR.	GA.	COLOR
X-35	18	ORANGE
X-36	18	PINK

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Fig. 51—Door Lock Wiring Diagram

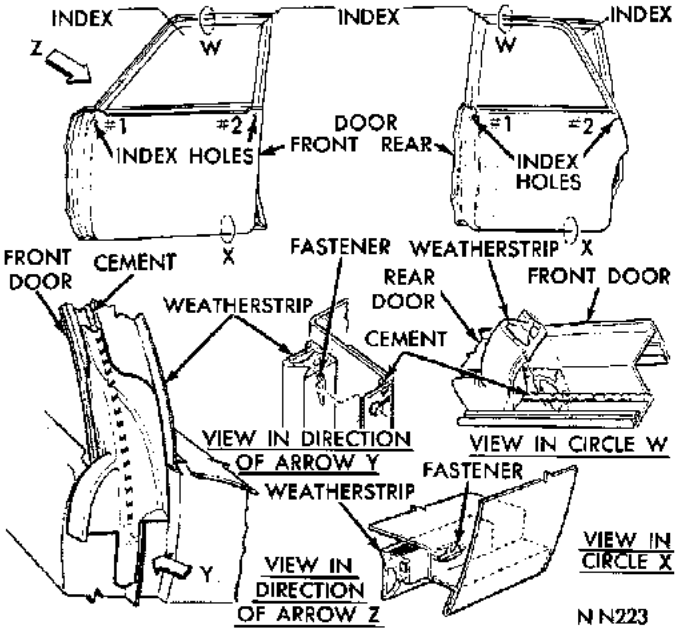


Fig. 53—Door Weatherstrips (Chrysler—Sedan—Town & Country)

(3) Remove nuts attaching handle to door and remove handle.

Installation

(1) Position handle in door and install mounting nuts.

(2) Depress handle button (Chrysler Models) and position link over connector on handle.

(3) Install retainer over link and connector.

WEATHERSTRIPS AND WINDCORDS

Door Weatherstrips

Make sure all old weatherstrip particles and cement are removed.

Sedan and Station Wagon Models (Fig. 53).

(1) Apply lower half of weatherstrip, starting at number one index hole and using fasteners for locating and ending at number 2 index hole.

(2) Apply a ⅛ inch bead of cement to weatherstrip seating area on door upper half.

(3) Install upper half of weatherstrip on door, indexing at the upper corners.

(4) Work weatherstrip from index points to a point midway between them. **Avoid puckering or stretching of weatherstrip.**

Hardtop—Convertible Models (Fig. 54)

Front Door

(1) Apply a ⅛ inch bead of cement on weatherstrip as illustrated.

(2) Position the moulded end of weatherstrip and attach with fasteners.

(3) Index and install weatherstrip on door, using fasteners as a locating point and working from hinge pillar side of door completely around to lock pillar.

(4) Make sure lip of weatherstrip dovetails into groove of lock pillar seal and install seal on lock pillar.

Hardtop Rear Door

(1) Index and install weatherstrip on door by inserting fasteners in door and install from top of hinge pillar side of door completely around to lock pillar.

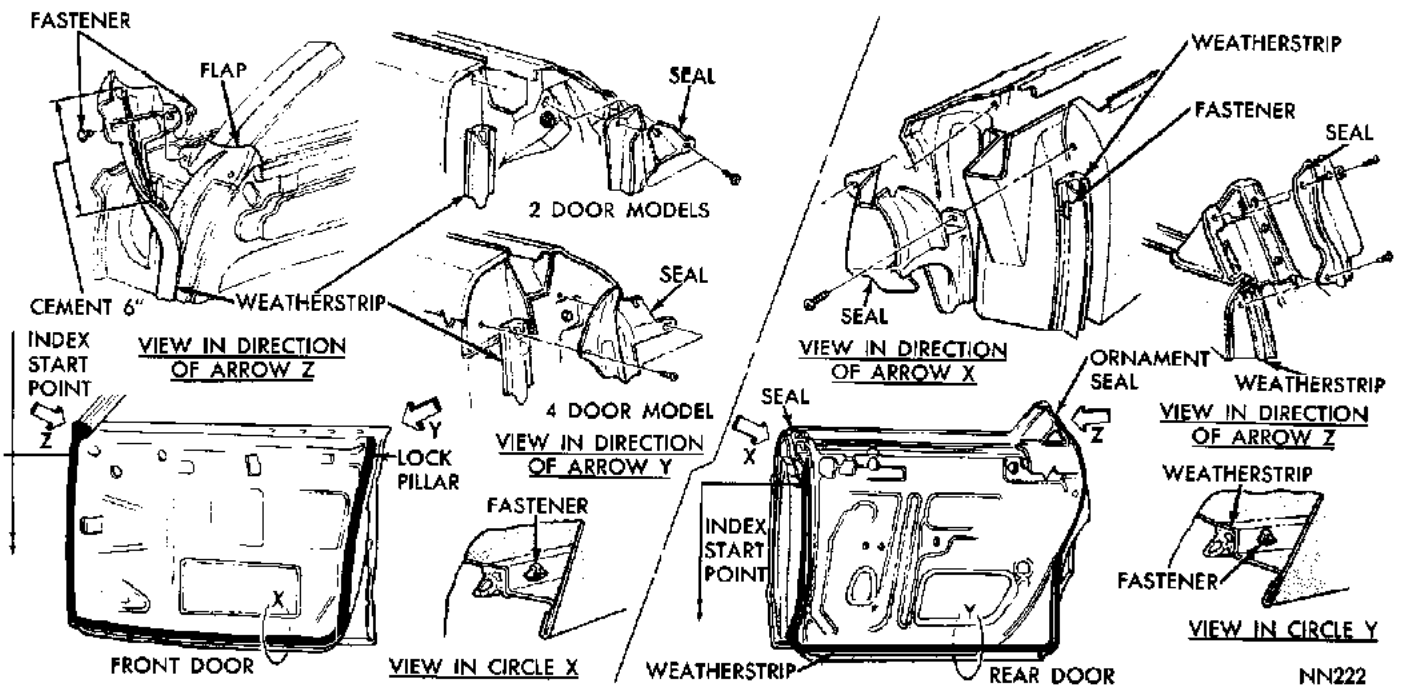


Fig. 54—Door Weatherstrip (Chrysler—Hardtop—Convertible)

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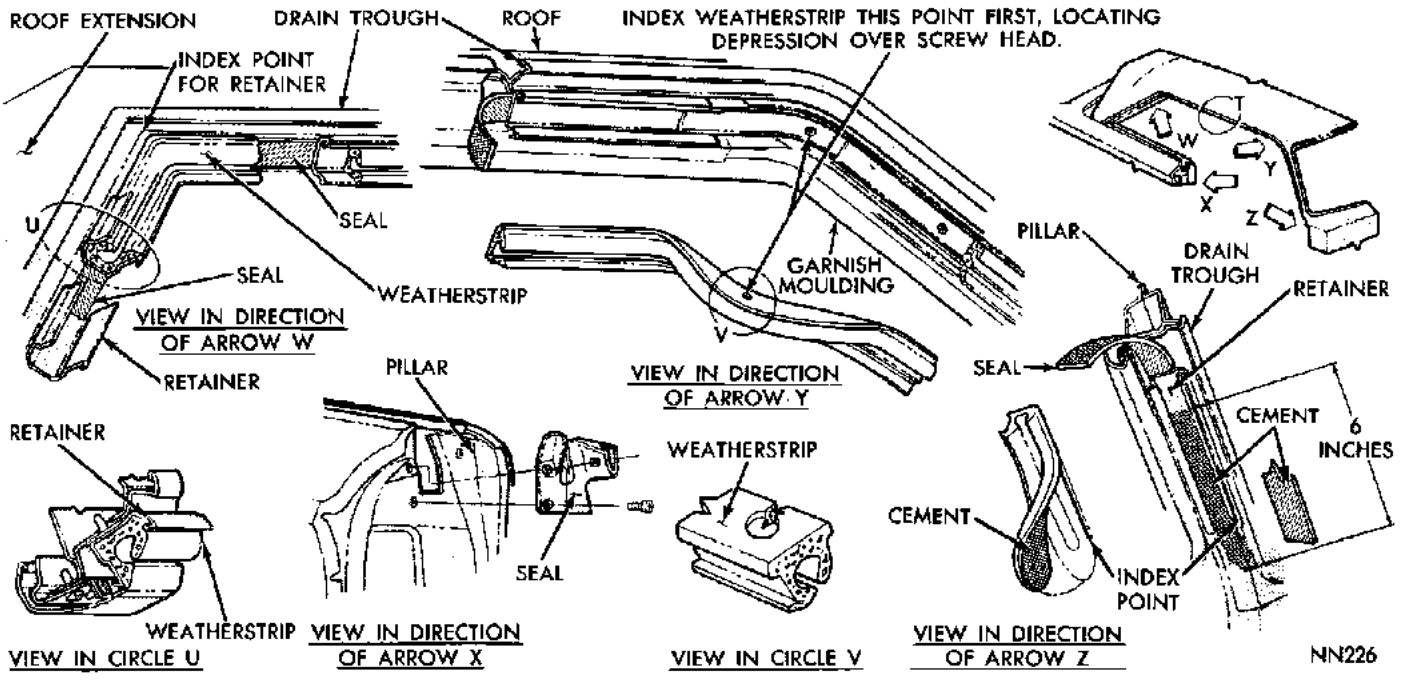


Fig. 55—Roof Rail Weatherstrips (2 Door)

(2) Make sure lip of weatherstrip dovetails into groove of hinge pillar seal and install seal.

(3) Make sure lip of weatherstrip dovetails into groove of door upper ornament seal and install seal.

Roof Rail Weatherstrip

Refer to Figures 55 and 56 for the attaching points and methods of cementing.

The weatherstrip retainers are adjustable through the use of elongated attaching holes. The weatherstrip can be moved in or out for the best possible fit and seal along the top edge of the vent frame, door glass and quarter glass.

The glass up-stop must be adjusted so the fully raised glass just curls the outer lip of weatherstrip against the inner lip.

When the up-stop, roof rail weatherstrip and glass are properly adjusted, the outer lip of weatherstrip will seal along the top edge of the glass and the inner lip of weatherstrip will seal along the upper inside edge of glass.

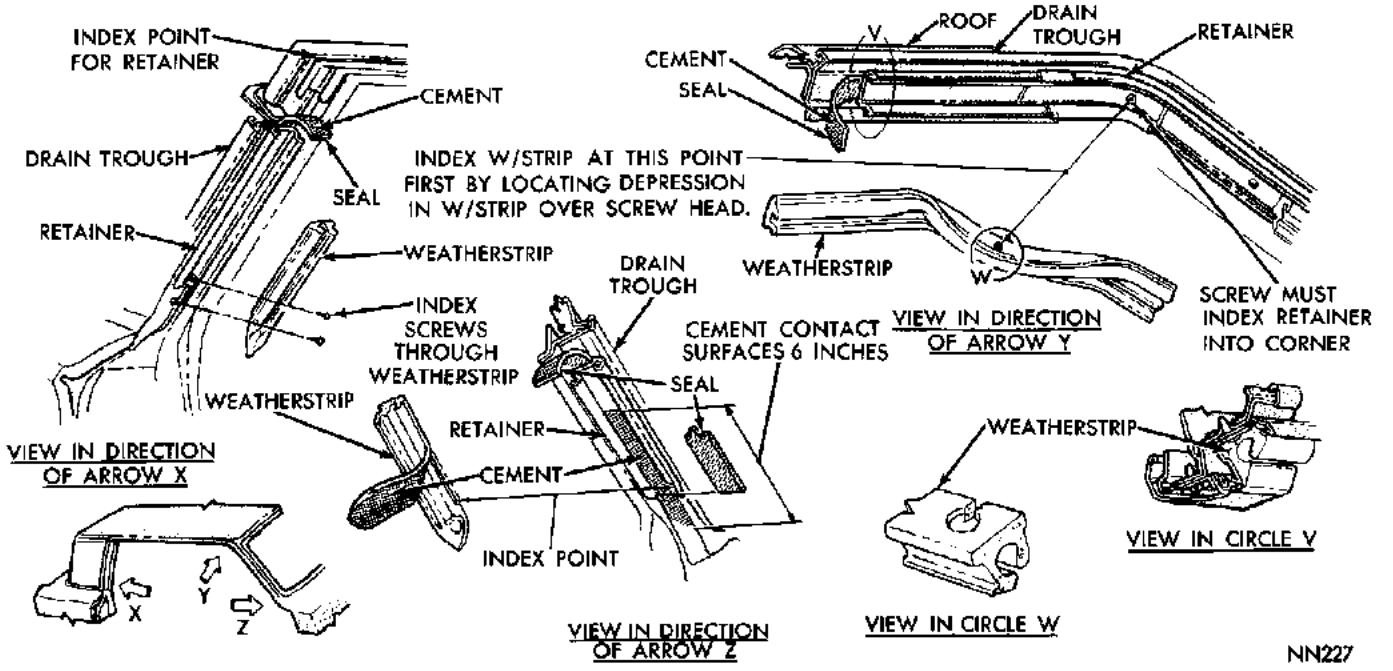


Fig. 56—Roof Rail Weatherstrips (4 Door)

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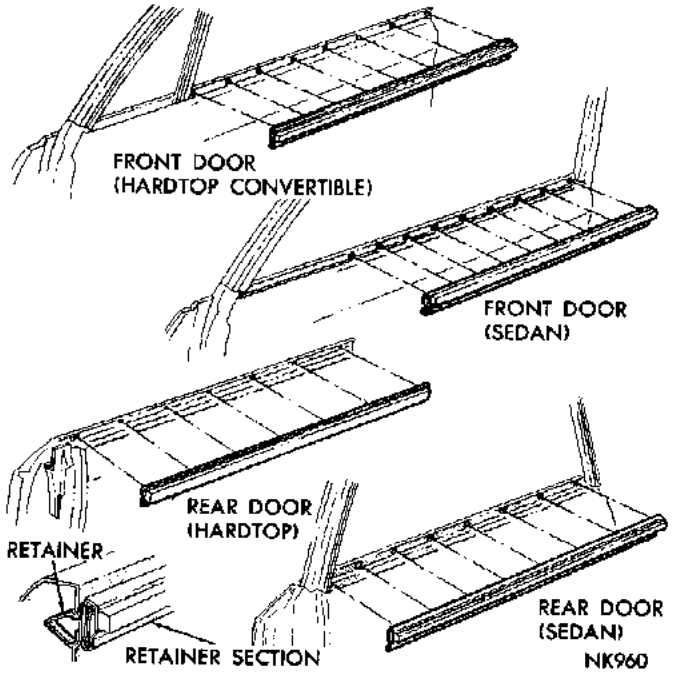


Fig. 57—Outer Belt Weatherstrips (Chrysler)

Outer Belt Weatherstrip

The door outer belt weatherstrips are retained in the door panel with spring type retainers (Figs. 57 and 58).

Windcords

Refer to Figures 59 and 60 for the starting points and method of attachment for the windcords.

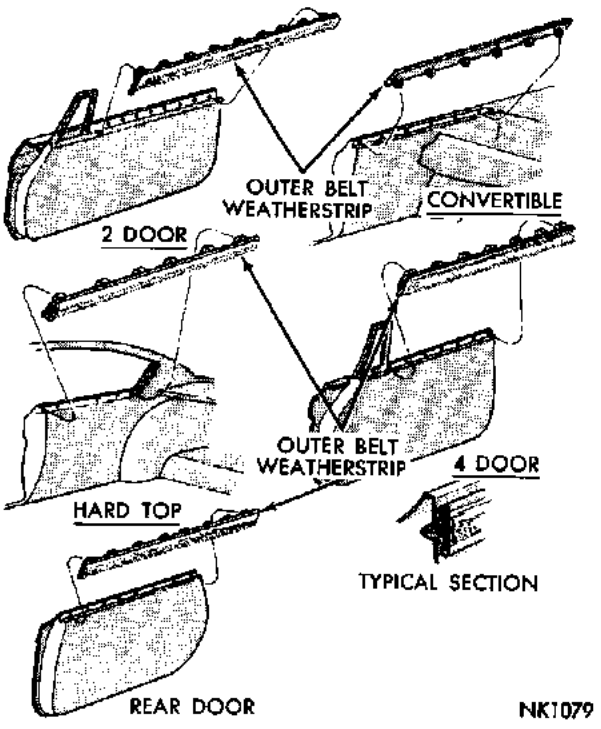


Fig. 58—Outer Belt Weatherstrip (Imperial)

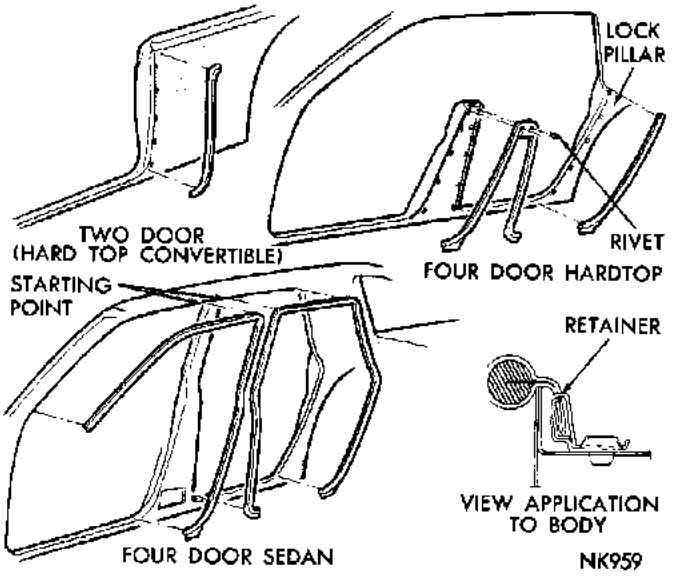


Fig. 59—Door Windcords (Chrysler)

GLASS ADJUSTMENTS

Sedan Models—Chrysler

Front Door Glass and Vent Wing Adjustments

Refer to Figure 61 for adjustment points and methods of adjustment for door glass and vent wing assembly.

(1) Open door and lower window approximately halfway.

(2) Adjust glass run retainer screw at bottom so glass moves in run freely.

(3) Run window down so top of glass is even or slightly below belt line of door outer panel.

(4) On manually operated windows, position stop on regulator place against stop on regulator sector.

(5) On electrically operated windows, reach through major access hole and position down stop against bumper.

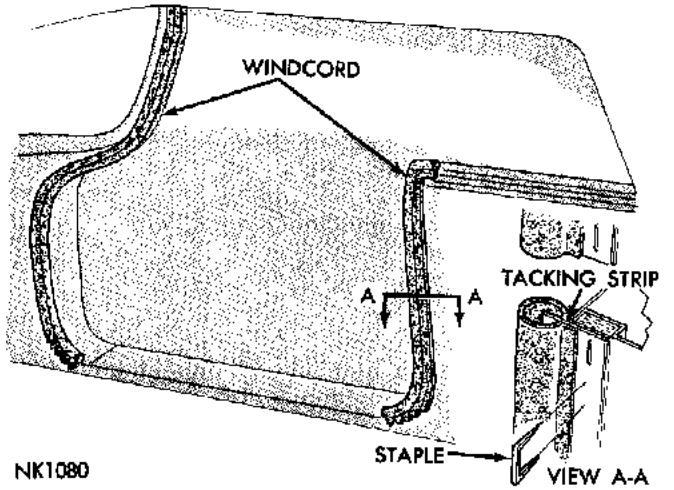


Fig. 60—Door Windcords (Imperial)

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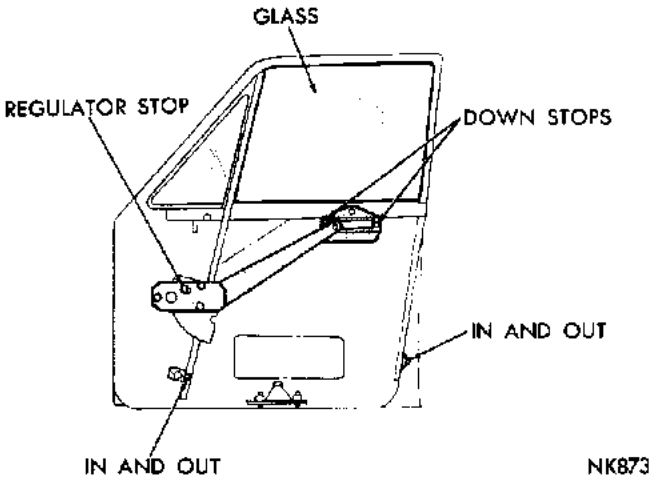


Fig. 61—Front Door Glass Adjustments (Chrysler Sedan)

Glass Replacement

Vent Wing

To remove vent wing glass or weatherstrip after vent wing assembly has been removed it is necessary for the swivel assembly to be removed from the regulator pivot (Fig. 62).

Removal

(1) Lower door glass fully and remove approximately four (4) inches of glass run at forward end (Fig. 62).

(2) Remove screws attaching vent wing to end facing of door and to belt line.

(3) Move glass forward and disengage regulator arm from the lift bracket and guide assembly.

(4) Remove screw attaching vent wing swivel to vent wing regulator.

(5) Remove glass and vent wing assembly.

(6) Remove cotterpin from lower end of division channel (Fig. 62) and separate door glass and vent wing assembly.

(7) Remove plastic rivet attaching lift bracket and guide assembly to glass and remove assembly (Fig. 63).

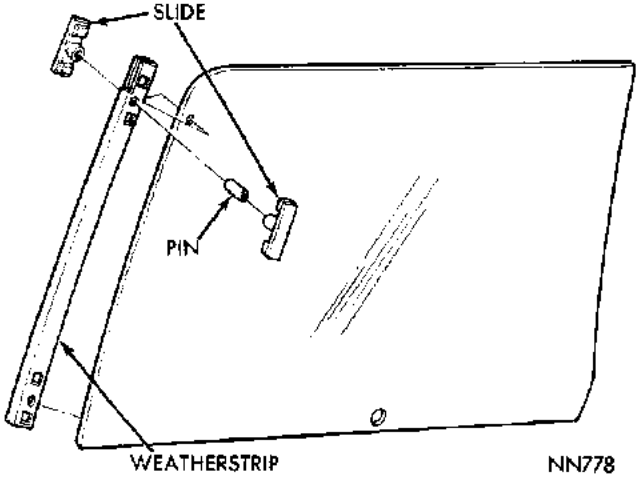


Fig. 62—Glass Attachment (Chrysler)

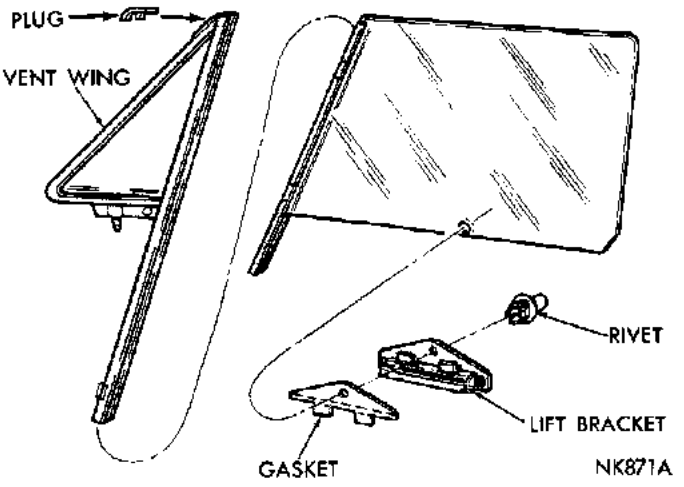


Fig. 63—Glass Lift Bracket (Chrysler)

Installation

(1) Position lift bracket and gasket on door glass and install retaining rivet (Fig. 63).

(2) Assemble door glass to vent wing assembly and install cotter pin at lower end of division channel.

(3) Lubricate sliding surfaces of lift bracket.

(4) With regulator in fully down position, install vent wing and door glass assembly into door and position vent wing pivot swivel assembly into vent wing regulator.

(5) Position regulator arm roller into glass lift bracket and move glass rearward into glass run channel.

(6) Install vent wing attaching screws at face and belt line areas of door.

(7) Install vent wing pivot swivel to regulator screw.

(8) Install front end of glass run at forward end.

(9) Adjust door glass.

Regulator Assembly Replacement

Door Glass—Manual and Electric

The regulator assemblies are attached to the door inner panels by screw and washer assemblies (Fig. 64). When removing a regulator, the door glass should be fully lowered. Slide the regulator rearward to disengage it from the lift bracket and guide assembly. Lubricate the tooth area of the regulator when reinstalling.

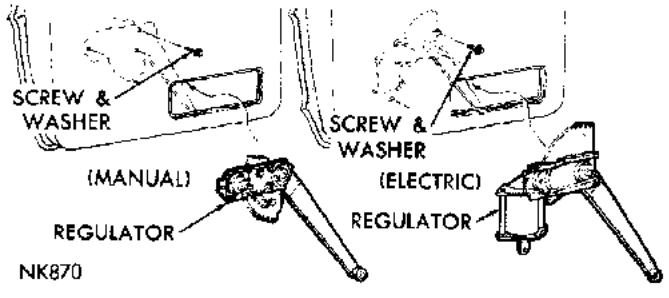


Fig. 64—Front Door Regulators (Chrysler)

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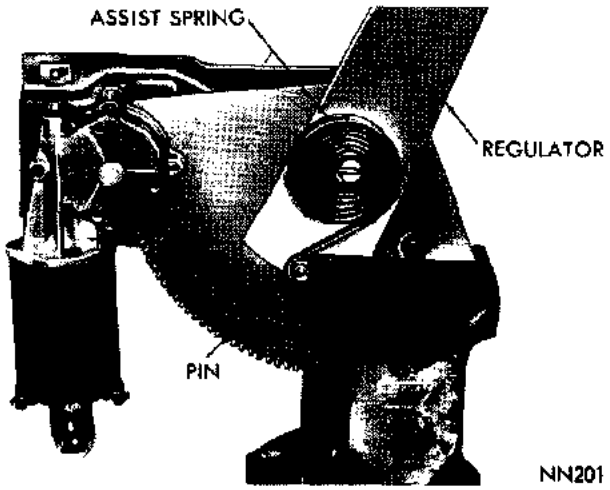


Fig. 65—Locking Regulator Linkage in Position

Regulator Motor Replacement

Whenever it is necessary to remove the motor from the regulator, it is imperative that the linkage be clamped in a vise (Fig. 65) to lock it in place. Failure to do this allows the assist spring to drive the mounting bracket around the lift pivot.

Tests (Figs. 65A and 65B)

Electric window lift motors are of the permanent magnet type. Direction of rotation is determined by polarity of the leads to the motor. The door switches control the polarity and thus the direction of rotation. All motors are grounded through the master switch by a black wire attached to the left cowl panel.

Before any tests are performed, the battery should be fully charged and the terminals clean and tight. The wire connections at the ammeter and accessory circuit breaker (mounted on the left cowl panel) should be tight. Continuity of the wiring and switches should be tested with an ohmmeter or test light.

Circuit Breaker

Connect one lead of a test light to the output terminal of the circuit breaker and the other lead to a good ground. The test bulb should light. If the bulb does not light and the wire continuity has been established, replace the circuit breaker.

Switch

Slide a thin blade behind the switch housing (front and back), to depress retaining clips, and pull switch out from trim panel. Carefully separate the multiple terminal block from the switch body. Connect one lead of a test light to the black wire terminal and touch the other lead to the tan wire terminal. The test bulb should light. If the bulb fails to light, test the wires for an open circuit.

To test the continuity of "Up" or "Down" circuits, it is necessary to use two jumper wires. Connect one lead of a jumper wire to the tan lead and the other lead to the "Up" or "Down" terminal (opposite of position of the glass). Connect one lead of the second jumper to a good ground and connect the other end of the jumper to the opposite terminal (Fig. 65A). The motor should run. If the motor fails to run, test continuity of the wiring. Should continuity be established

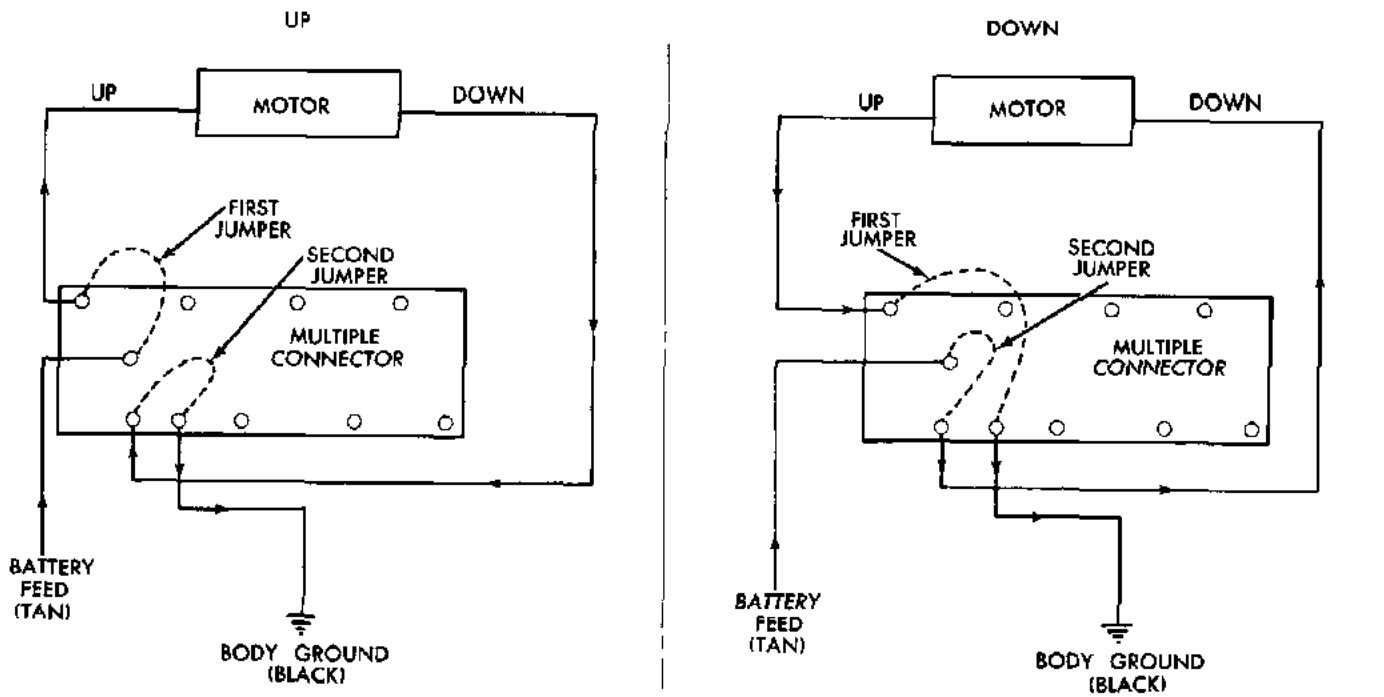


Fig. 65A—Testing the Switch

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CIRCUITS		
CIR.	GA.	COLOR
W1	12	TAN
W1A	12	TAN
W1B	14	TAN
W2	14	YELLOW
W2A	12	YELLOW
W2B	14	YELLOW
W3	14	YELLOW
W4	14	YELLOW
W4A	14	YELLOW
W8	12	BLACK
W11	14	DARK BLUE
W12	14	PINK
W12A	14	PINK
W13	14	ORANGE
W14	14	GRAY
W14A	14	GRAY
W14B	14	GRAY
W21	14	BROWN
W22	14	VIOLET
W22A	14	VIOLET
W23	14	RED
W24	14	DARK GREEN
W24A	14	DARK GREEN
W24B	14	DARK GREEN
W30	14	DARK BLUE
W30A	14	DARK BLUE
W31	14	RED
W40	14	WHITE
W40A	14	WHITE
W41	14	DARK GREEN
X32	14	LIGHT GREEN
X32A	14	LIGHT GREEN
X32B	18	LIGHT GREEN
X32C	18	LIGHT GREEN
X32D	18	LIGHT GREEN
X32E	18	LIGHT GREEN
X32F	14	LIGHT GREEN
X32G	18	LIGHT GREEN
X33	14	ORANGE
X33A	14	ORANGE
X33B	14	ORANGE
X33C	14	ORANGE
X33D	14	ORANGE
X33E	14	ORANGE
X33F	16	ORANGE
X34	14	PINK
X34A	14	PINK
X34B	14	PINK
X34C	14	PINK
X34D	14	PINK
X34E	14	PINK
X34F	16	PINK
X35	18	ORANGE
X35A	18	ORANGE
X35B	18	ORANGE
X35C	18	ORANGE
X35D	18	ORANGE
X35E	18	ORANGE
X35F	18	ORANGE
X36	18	PINK
X36A	18	PINK

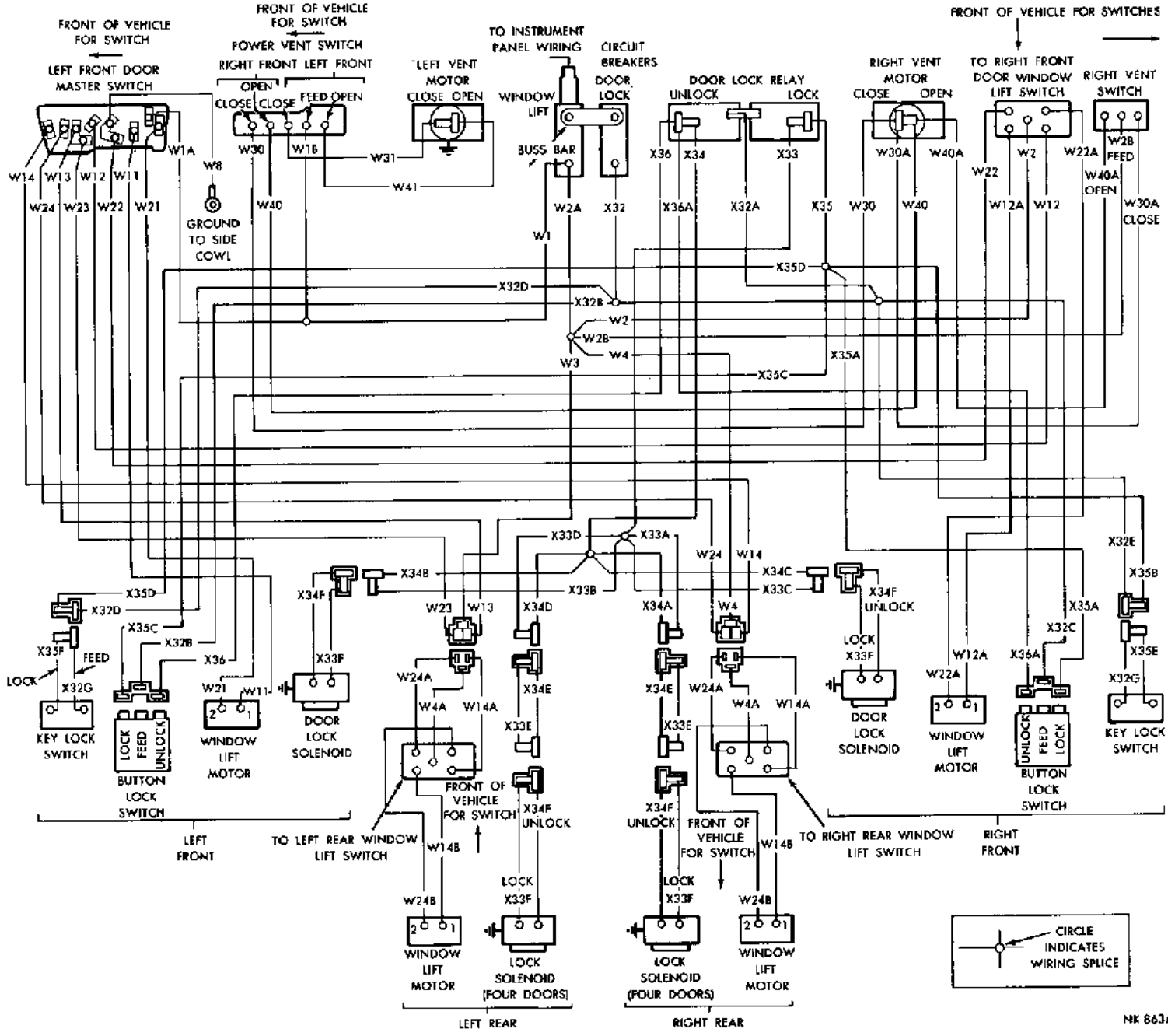


Fig. 65B—Window Lift Wiring Diagram

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and motor still does not run, replace the motor.

If the motor operates, install the switch body on the multiple connector and activate the switch. Should the motor still fail to run, replace the switch body. Test each switch in the same manner.

Motor Bench Test

Connect a jumper from the positive terminal of a test battery to one of the motor leads. Connect another jumper from the test battery negative terminal to the other motor lead. The motor should run. To reverse the direction of the motor rotation, switch the leads of the jumper wires at the test battery terminals.

Vent Wing Regulator

The vent wing regulator is attached to the door inner panel by three screw and washer assemblies and to the pivot swivel assembly by one screw (Fig. 62).

Glass Run and Channel

The glass run (Fig. 66) is a press fit in the door frame and lower run channel. The index notch at the door upper corner should be positioned first to assure correct installation of the run. The lower run channel (Fig. 66) is positioned over the window opening frame from inside the door through the large access opening.

REAR DOORS (Sedan Models)

Adjustments

(1) Run window up to approximately ⅛ inch below door frame.

(2) Adjust regulator pivot bracket (Fig. 67) so gap between top of glass and door frame is the same along the entire length. To raise front of glass, lower front of pivot bracket and to lower front of glass, raise front of pivot bracket.

(3) On manually operated regulators, run window down so top of glass is even or slightly below belt line.

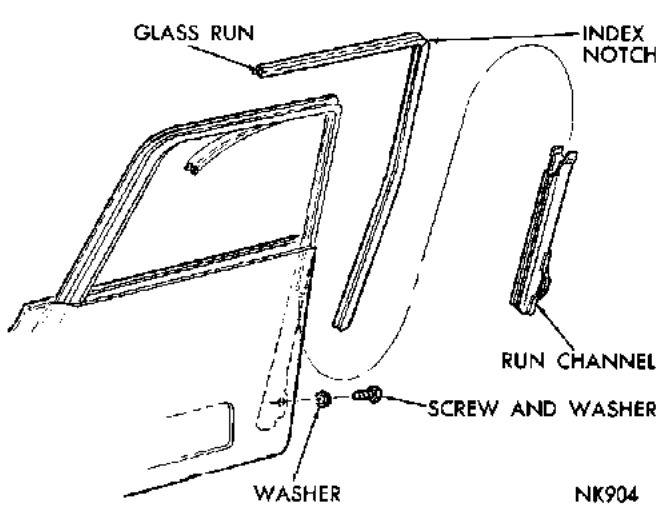


Fig. 66—Glass Run and Channel

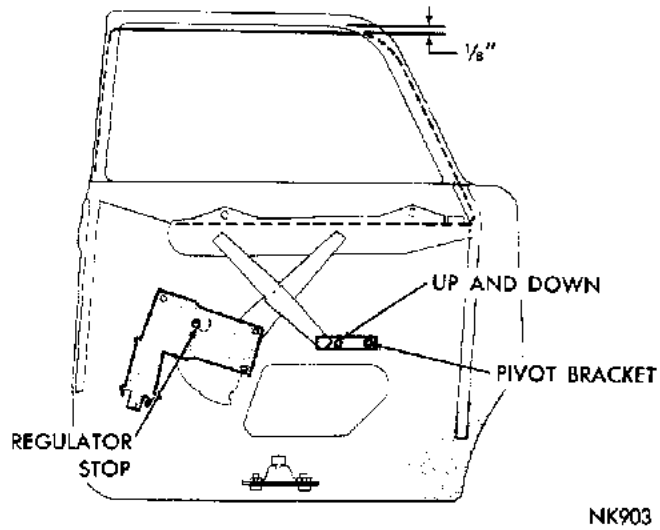


Fig. 67—Rear Door Glass Adjustments (Sedan)

(4) Position stop on regulator plate against stop on the regulator sector and tighten nut.

Glass Replacement

(1) Remove door inside handles, trim panel and watershield.

(2) Remove spring nut (Fig. 68) securing rear arm of regulator to glass lower frame.

(3) Remove regulator arm stud from roller in lower glass frame and remove roller.

(4) Rotate glass rearward (Fig. 68) and disengage slot of lower glass frame from roller on front regulator arm.

(5) Remove glass and frame assembly from door.

(6) Before installing glass and frame assembly, lubricate roller areas of frame. The rollers should be inspected for damage or excessive wear.

Glass Lower Frame Attachment

The rear door glass lower frame (Fig. 69) is attached to the glass with plastic rivets. Gaskets are

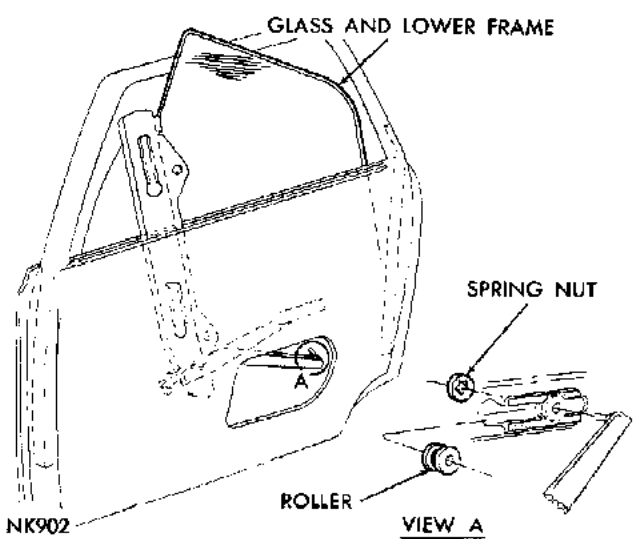


Fig. 68—Rear Door Glass Replacement (Sedan)

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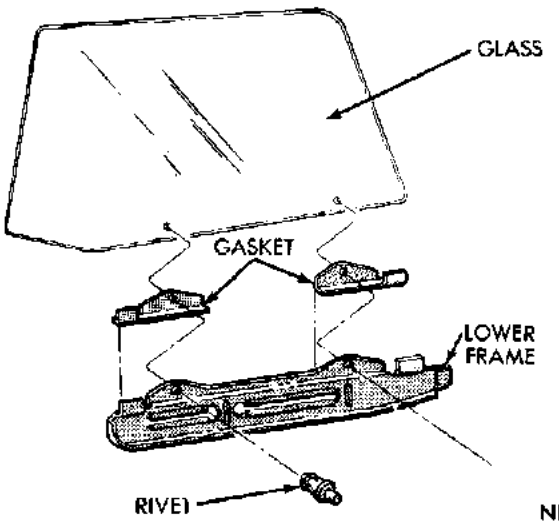


Fig. 69—Rear Door Glass Attachment (Sedan)

used between the frame and glass. Lubricate roller areas of the frame before installing.

Regulator Replacement (Manual and Electric)

The regulator (Fig. 70) is attached to the door inner panel by screw and washer assemblies. Support the glass assembly when removing regulator. The roller on the regulator front arm is retained by a spring nut. Lubricate outboard side of regulator sector gear tooth contact area approximately ½ inch wide along entire length of arc and studs on front and rear arms before installing.

Regulator Motor

The regulator motor is removed in the same manner as for front door.

Rear Door Glass Run

The glass run (Fig. 71) is a press fit into the door panel. When installing glass run, the index point notch should be installed first to assure correct alignment of run.

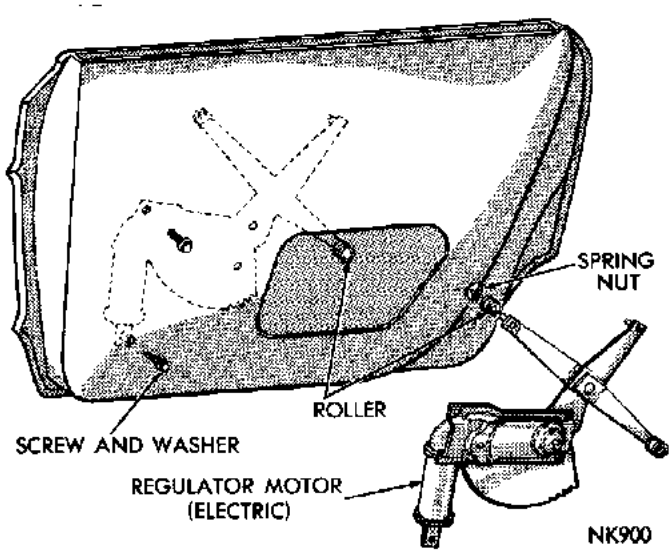


Fig. 70—Rear Door Glass Regulator (Sedan)

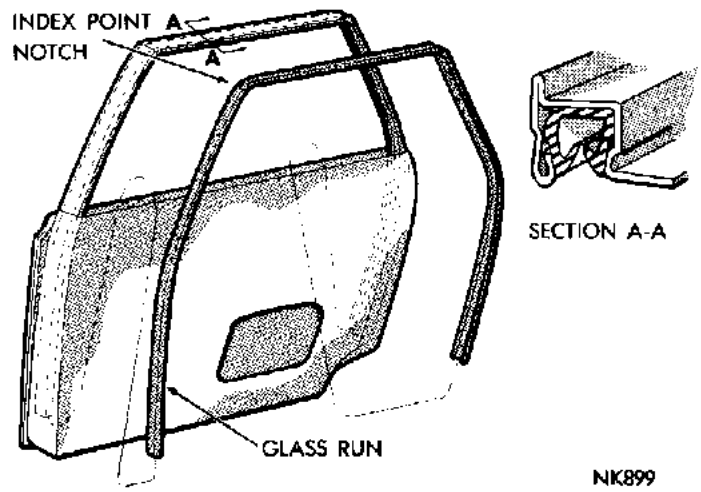


Fig. 71—Rear Door Glass Run (Sedan)

HARDTOP-CONVERTIBLE (Chrysler Models)

Front Door Glass

Adjustments

Refer to Figure 72 for adjusting points of the vent wing and door glass assembly.

(1) Open door and run window approximately 2/3 way up.

(2) Adjust upper attachment of rear run channel so window is centered between inner and outer belt weatherstrips.

(3) Close door and loosen vent wing belt line screws. Run window completely up and tighten belt line screws.

(4) Adjust vent wing leg so boss of adjusting stud is against support and top of vent wing and door glass are inboard against roof rail weatherstrip.

(5) Position up stop down against regulator arm

(6) Adjust vent wing division bar attachment at bottom to allow alignment with glass.

(7) With door open, run glass ½ way down.

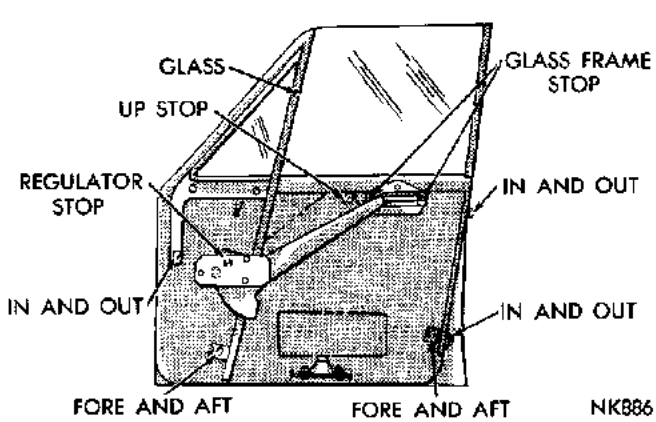


Fig. 72—Front Door Glass Adjustments (Chrysler Hardtop—Convertible)

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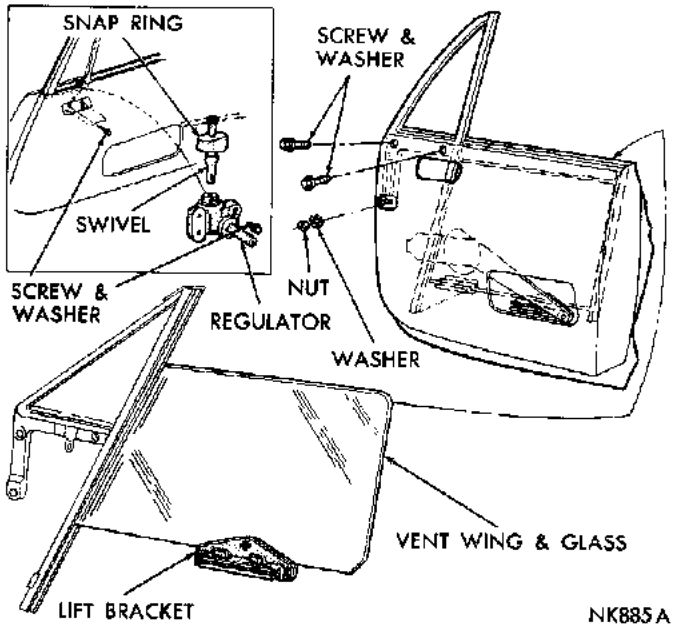


Fig. 73—Vent Wing and Door Glass Attachment (Chrysler)

(8) Adjust rear lower track attachment to allow alignment with glass.

(9) Run glass down so top of glass is even or slightly below belt line of door outer panel.

(10) On manually operated windows, position stop on regulator place against stop on regulator sector.

(11) On electrically operated windows, reach through major access hole and position glass lower frame stop against bumper.

Removal

To remove the vent wing glass or weatherstrip after vent wing has been removed, it is necessary to first remove the swivel assembly (Fig. 73).

(1) Remove nut and washer from stud on lower end of vent wing leg.

(2) Remove screw and washer assemblies attaching vent wing to belt line.

(3) Remove vent wing leg stud from slot in hinge pillar support.

(4) Remove vent wing swivel to regulator screw.

(5) Move door glass forward disengaging it from rear run channel.

(6) Slide glass lift bracket off of regulator arm and remove door glass and vent wing assembly from door.

(7) Separate door glass from vent wing division bar (Fig. 74).

(8) Remove plastic rivet attaching lift bracket to glass and remove bracket and gasket.

Installation

(1) Position lift bracket and gasket on glass and install plastic rivet.

(2) Assemble door glass and frame to vent wing division bar.

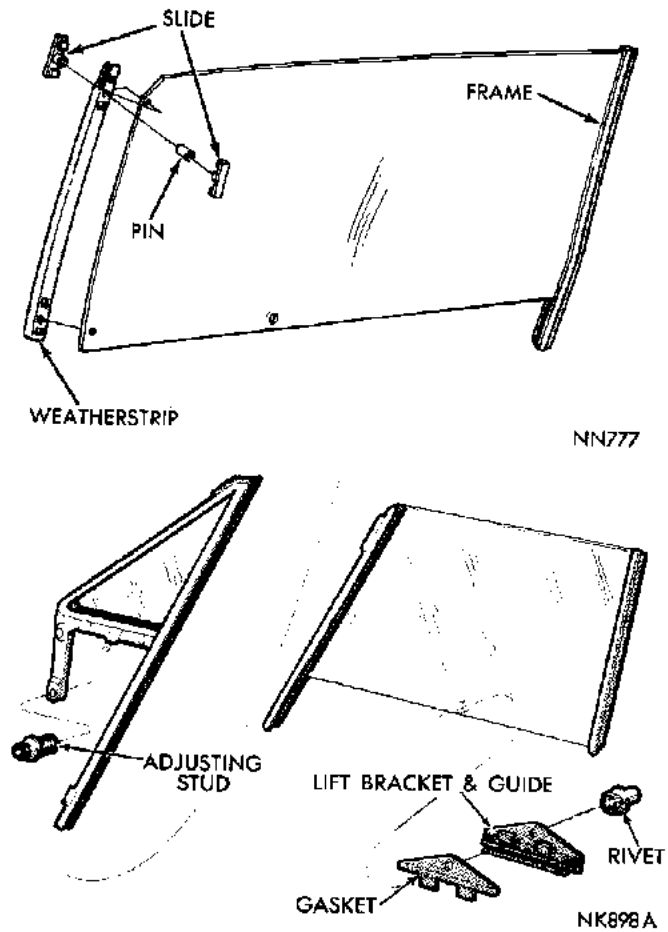


Fig. 74—Glass Attachment (Chrysler)

(3) Lubricate slide area of lift bracket guide.

(4) With regulator in down position, install door glass and vent wing assembly into door and position vent wing pivot swivel into regulator assembly.

(5) Position glass lift bracket on regulator arm and move glass rearward into rear run channel.

(6) Position vent wing leg adjusting stud into slot in hinge pillar support.

(7) Install vent wing swivel to regulator screw.

(8) Install vent wing to belt line screws.

(9) Install nut and washer on vent wing adjusting stud.

(10) Adjust vent wing and door glass.

Regulator Assembly

The service procedures for the front door and vent wing regulators are the same as sedan models.

Glass Run Channel (Chrysler 2 Door)

Removal (Fig. 75)

(1) Loosen vent attaching screws and adjusting stud nut and move glass forward out of run channel.

(2) Remove run channel reinforcement plate and screw from upper end of run channel door face.

(3) Disengage support on bottom of channel from door panel and remove channel.

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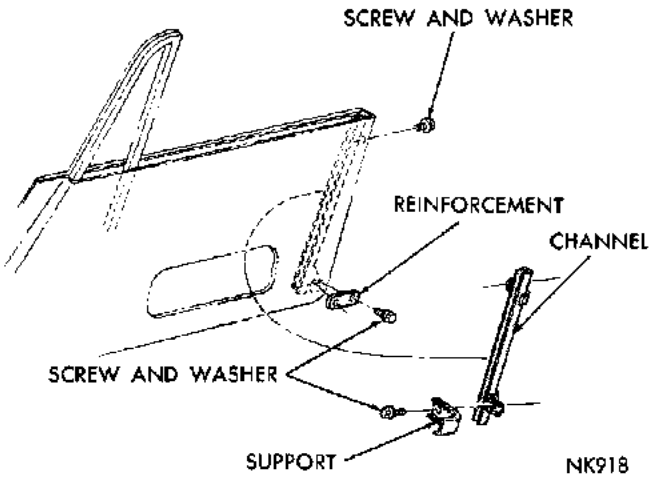


Fig. 75—Glass Run Channel (Chrysler 2 Door)

Installation

(1) Position run channel and support into the door assembly and install upper attaching screw at door face (Fig. 75).

(2) Position support at bottom of channel to inside panel and insert tab into slot.

(3) Install reinforcement plate at lower end of rear channel.

(4) Move door glass rearward and engage it in run channel.

(5) Tighten vent wing attaching screws and stud nut.

(6) Adjust door glass and vent wing assembly.

Glass Run Channel (Chrysler 4 Door Hardtop)

The front door rear glass run channel used on four door hard top models is attached to the door face by screw and washer assemblies (Fig. 76).

Front Door Glass—Imperial Adjustment (Figs. 77 and 78)

Align the front door with the "A" post and cowl prior to making any adjustments to the vent wing frame.

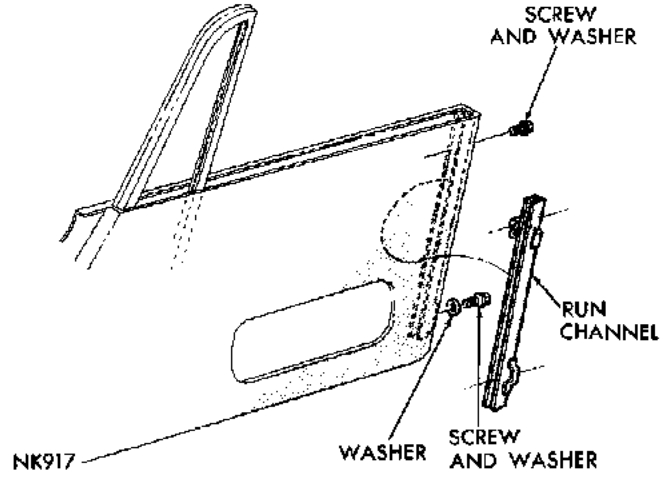


Fig. 76—Glass Run Channel (Chrysler 4 Door Hardtop)

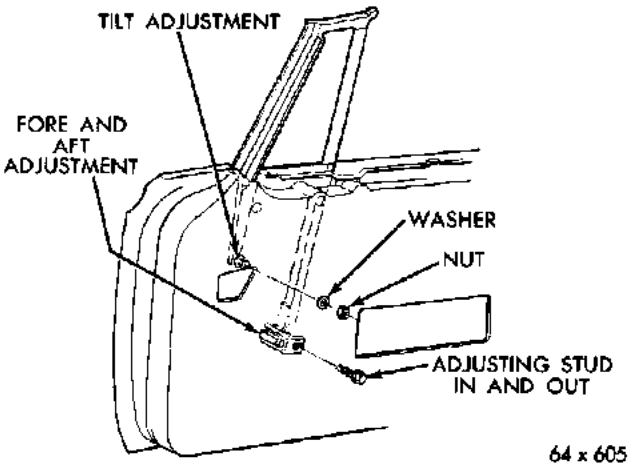


Fig. 77—Vent Wing Adjustments

(1) Close door and observe direction the vent frame must be moved to align frame with the "A" post and also make a good weather seal at the roof rail weather seal.

(2) Loosen forward attaching screws and division bar adjusting stud locking nut and washer (Fig. 77).

(3) Run glass to the down position and move vent wing fore or aft to for correct alignment with the "A" post.

(4) Holding vent frame in position, tighten two forward adjusting screws.

(5) To move top of vent frame inboard, turn division bar lower adjusting stud counterclockwise. To move top of vent frame outboard turn adjusting stud clockwise.

(6) With vent frame in position at "A" post tighten division bar adjusting stud lock nut.

(7) Turn upper rear roller track sleeve nut until rear of glass touches lightly on belt line weatherstrip.

(8) Raise window fully against roof rail weatherstrip and with top of glass flush with top of vent wing, adjust lower frame parallel to belt line of door outside panel.

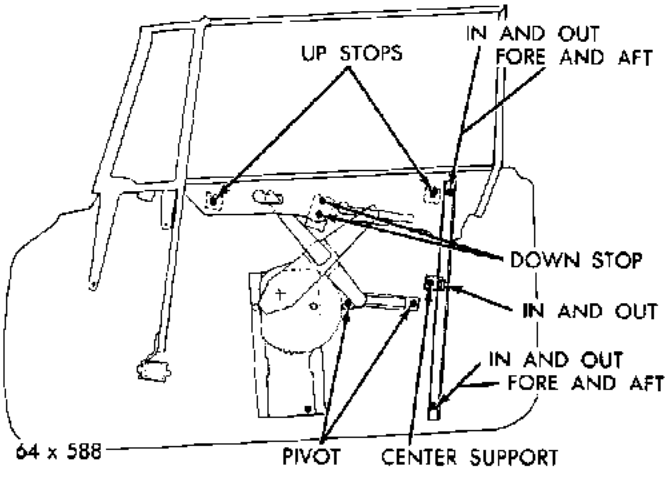


Fig. 78—Door Glass Adjustments

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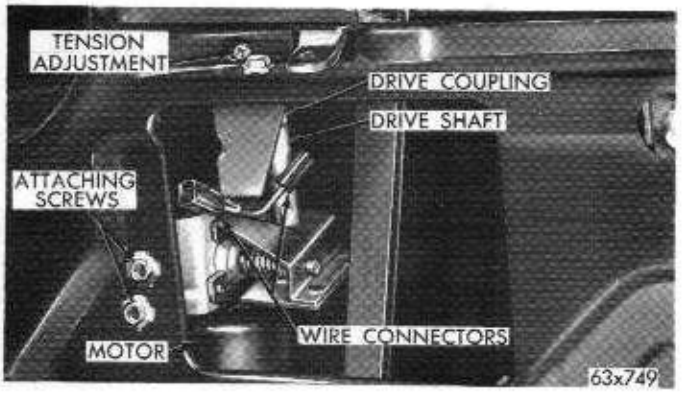


Fig. 79—Electric Vent Wing

(9) Tighten pivot bracket screws securely.

(10) Adjust up stops down against window lower frame.

(11) Adjust upper rear roller track forward so glass is seated in vent wing channel.

(12) Lower window fully.

(13) Adjust lower rear roller track sleeve nut until its boss is against outboard side of door inner panel.

(14) Move track forward until glass is seated in vent frame channel and tighten nut.

(15) Adjust down stops so glass is slightly below belt line.

(16) Loosen center support to roller track screw and move support against inside panel. Tighten the support screw securely.

Vent Wing Removal

Electrically operated vent wings (Fig. 79) are connected to the drive motor by a rubber coupling. It is not necessary to remove the motor to remove and replace the vent wing assembly.

(1) Remove vent wing frame adjustment lock nut and washer, at lower end of run channel (Fig. 80).

(2) Remove vent wing frame attaching screws.

(3) Run door glass down, tilt vent wing to the rear and up out of door.

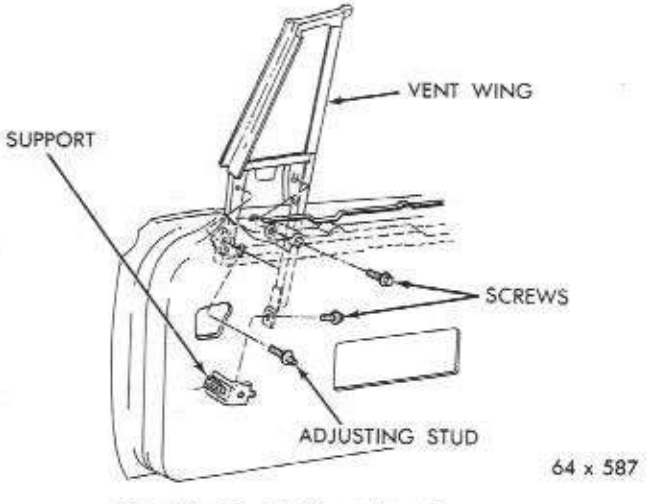


Fig. 80—Vent Wing Attachment

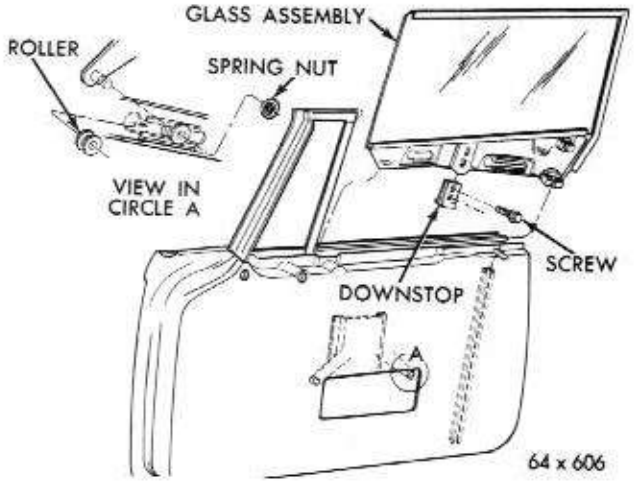


Fig. 81—Door Glass and Frame

Installation

(1) Insert vent wing assembly into door frame.

(2) Install attaching screws finger tight.

(3) Install lower adjusting screw lock nut and washer.

(4) Adjust vent wing and door glass.

Door Glass Replacement

Removal

(1) Run door glass to down position and remove up stop brackets (Fig. 78).

(2) Remove spring nuts from regulator studs and remove studs from glass lower frame rollers (Fig. 81).

(3) Raise glass up and out of run channels.

(4) Remove rollers from glass lower frame.

Installation

(1) Install rollers in roller tracks of glass lower frame.

(2) Lubricate rollers and roller run channels.

(3) Install rollers into run channel and lower the glass into door.

(4) Install regulator arm studs into rollers and install spring nuts.

(5) Install up stops finger tight.

(6) Close door and run glass up to the aligning position with the vent wing frame and roof rail weather seal.

(7) Set up stops in this position and adjust door glass.

Regulator Assembly Replacement

Door Glass—Manual and Electric

The regulator assemblies are attached to the door inner panels by screw and washer assemblies (Fig. 82). When removing a regulator, the door glass should be fully lowered. Slide the regulator rearward to disengage it from the lift bracket and guide assembly. Lubricate the tooth area of the regulator when reinstalling.

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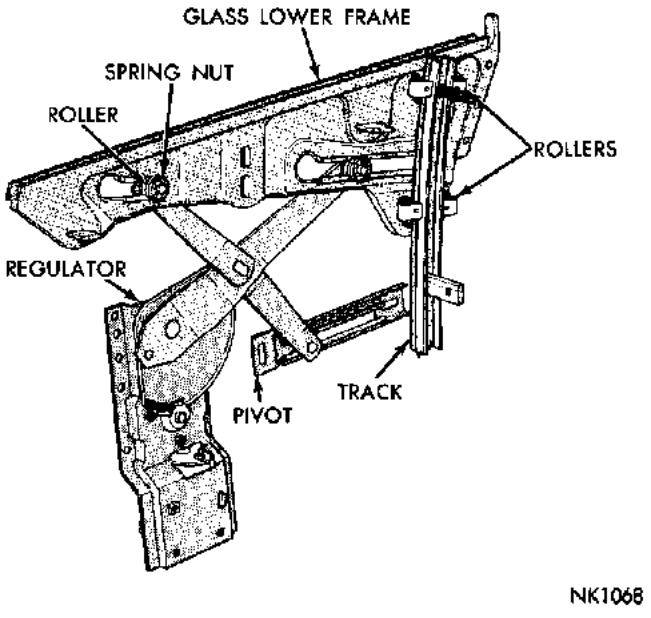


Fig. 82—Door Glass Regulators

Regulator Motor Replacement

Whenever it is necessary to remove the motor from the regulator, it is imperative that the linkage be clamped in a vise (Fig. 65) to lock it in place. Failure to do this allows the assist spring to drive the mounting bracket around the lift pivot.

Vent Wing Regulator and Motor

The vent wing regulator and motor assembly (Fig. 83) is mounted to the vent wing frame with two screws. The coupling sleeve of the regulator is a slip fit over the pivot of the vent wing.

Door Glass Guide Track

The door glass guide track (Fig. 84), controls the in and out movement of the door glass at the rear, and the forward movement of the glass into the vent wing division channel. The glass lower frame rear roller assembly is positioned in the guide track.

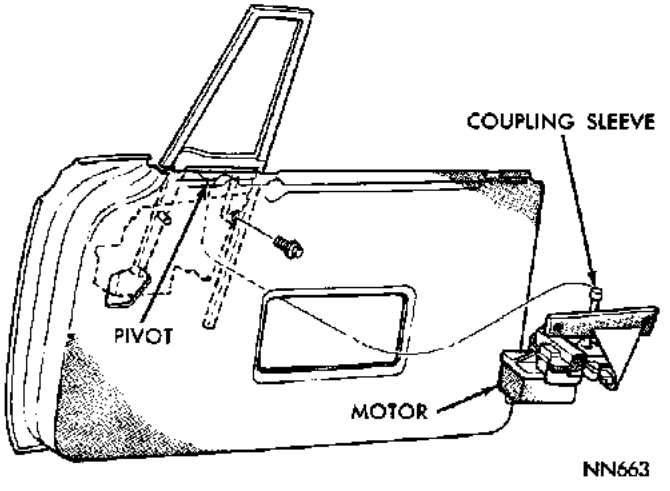


Fig. 83—Vent Wing Regulator

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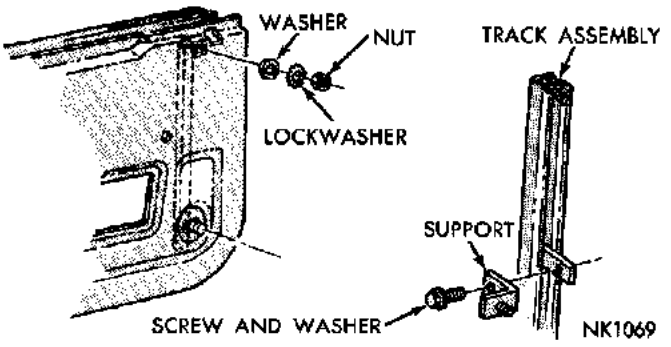


Fig. 84—Door Glass Guide Track

Rear Doors—Chrysler Hardtop

Adjustments

(1) Raise window and seat top of glass against roof rail weatherstrip and front of glass flush with top of front door glass.

(2) Adjust front track lower attachment (Fig. 85) so front of glass is aligned with rear of front door glass at roof rail. Turn adjusting sleeve nut counterclockwise to move glass inboard and clockwise to move glass outboard.

(3) Adjust pivot bracket so front edge of glass is parallel to rear edge of front door glass.

(4) Move front track upper attachment forward so window weatherstrip is against front door window.

(5) Position front and rear up stops down against lower frame of glass assembly.

(6) Run window ½ way down and tighten lower rear roller track attaching screw.

(7) Run window down until top of glass is even or slightly below belt line.

(8) Position stop on regulator plate against stop on regulator sector and tighten nut.

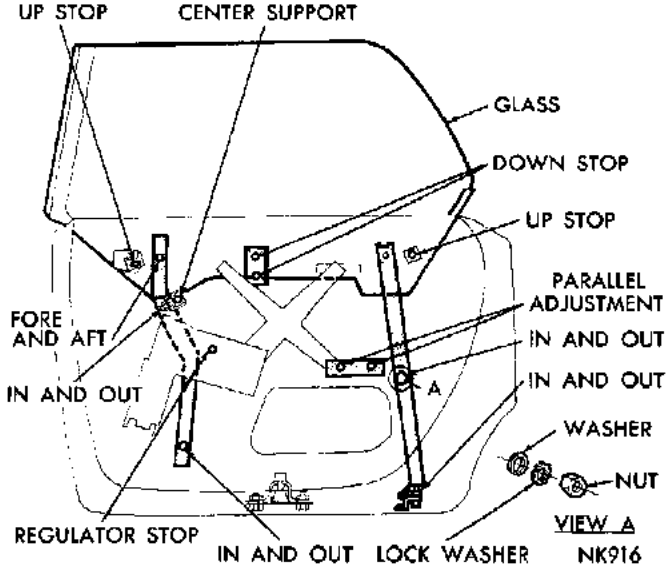


Fig. 85—Rear Door Glass Adjustments (Chrysler Hardtop)

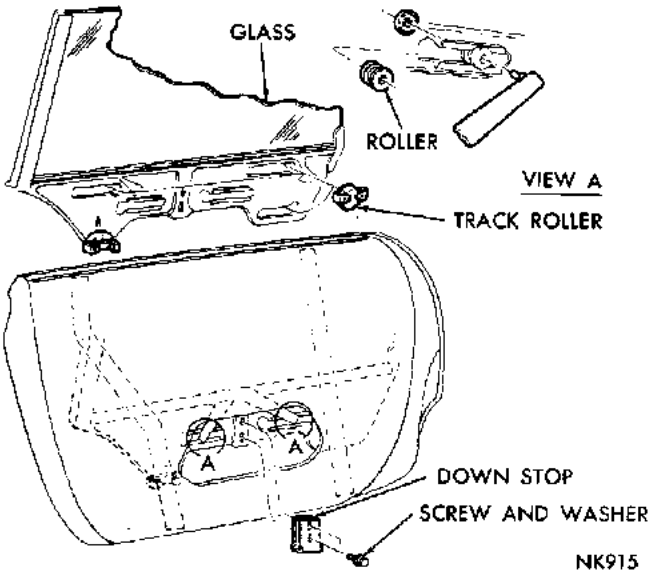


Fig. 86—Rear Door Glass Installation

(9) Move down stop on lower frame down against the bumper and tighten the screws.

(10) Run window to fully up position.

(11) Loosen center support front track screw and move support inboard against inside panel. Tighten screw.

(12) Adjust center rear track until "boss' is against outboard side of inside panel.

Glass Replacement

Removal

(1) Remove down stop from glass lower frame (Fig. 86).

(2) Remove spring nuts from regulator arm studs.

(3) Support window assembly and remove regulator studs from glass lower frame.

(4) Remove glass and lower frame assembly from door.

(5) Inspect roller assemblies for damage and excessive wear.

Installation

(1) Lubricate regulator arm roller and track roller slots in lower frame of door glass.

(2) Insert roller assemblies (Fig. 86) into slots of glass lower frame with spring loops down on top rollers and up on bottom rollers.

(3) Insert glass assembly into door, positioning rollers on lower frame onto front and rear roller tracks.

(4) Lower glass to regulator arms and insert a roller into each arm stud roller slot in lower frame.

(5) Insert regulator studs into rollers and install spring nuts.

(6) Lower glass, install down stop and adjust glass.

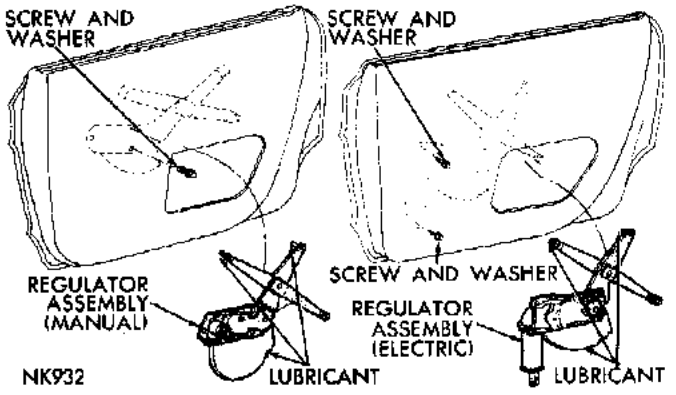


Fig. 87—Rear Door Glass Regulators

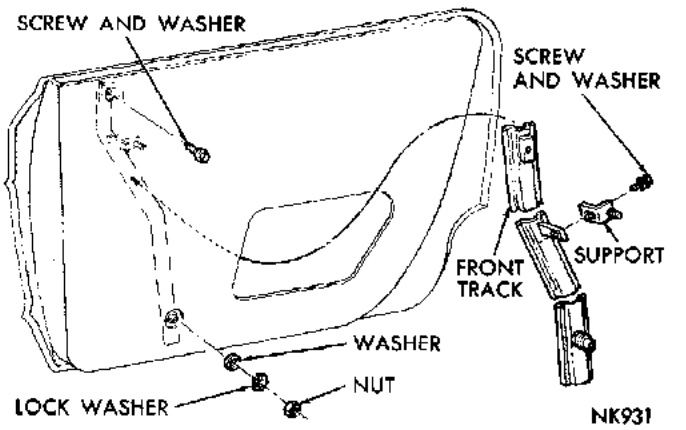


Fig. 88—Rear Door Glass Rear Track

Regulator Assembly (Manual and Electric)

The regulators are attached to the door inner panel by screw and washer assemblies (Fig. 87). Spring nuts attach the regulator arm studs to the door glass lower frame and roller assembly. Lubricate tooth contact area approximately ½ inch wide along entire length of area on outboard side of sector and studs on front and rear arms (Fig. 87).

Regulator Motor

The procedures for removing the regulator motor are the same as for sedan front doors.

Front Track Assembly

Removal

(1) Remove door glass assembly.

(2) Remove nut and washers attaching track assembly to lower part of door inside panel (Fig. 88).

(3) Remove screw and washer assembly attaching track at the belt line.

(4) Remove track assembly through large access opening in door inner panel.

(5) Remove center support assembly from track.

Installation

(1) Install center support bracket to plate of track (Fig. 88).

(2) Position track assembly into door, through large access opening, and position top end to attaching slot

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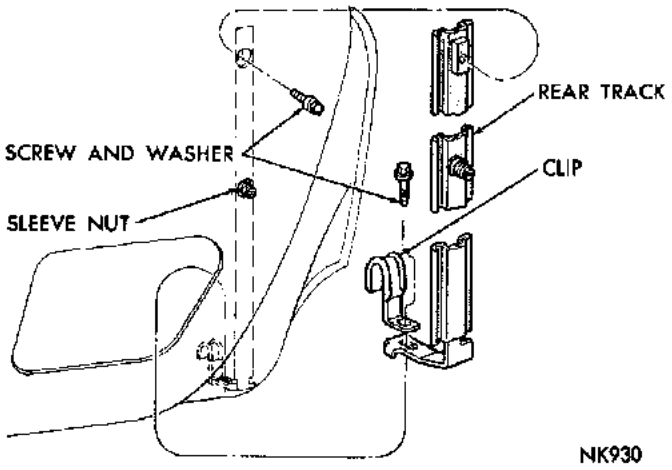


Fig. 89—Rear Door Glass Rear Track

in belt reinforcement.

(3) Install screw and washer assembly but do not tighten.

(4) Insert stud on bottom of track through attaching hole in inside door panel and install nut and washers finger tight only.

(5) Install door glass and adjust.

Rear Track Assembly

Removal

(1) Remove door glass assembly.

(2) Remove screw and washer assembly attaching lower part of the track to door. Remove door lock wiring clip if used (Fig. 89).

(3) Remove adjusting sleeve nut from stud at center of track.

(4) Remove screw and washer assembly attaching track to belt reinforcement.

Installation

(1) Insert track assembly into door through large access opening in door inner panel (Fig. 89).

(2) Align upper attaching screw hole in track with attaching hole in belt line and hole in lower track support with bottom while inserting stud on center of track through hole in door inner panel.

(3) Install screw and washer assembly at top finger tight only.

(4) Install screw and washer assembly, and wiring clip if used, to bottom support finger tight only.

(5) Install sleeve adjusting nut on track stud.

(6) Install and adjust door glass.

Rear Door Glass—Imperial

Adjustments (Fig. 90)

(1) Loosen lock nut of both upper guide track adjusters.

(2) Raise door glass approximately three-fourths of way up.

(3) Turn upper track attachment nut until rear of

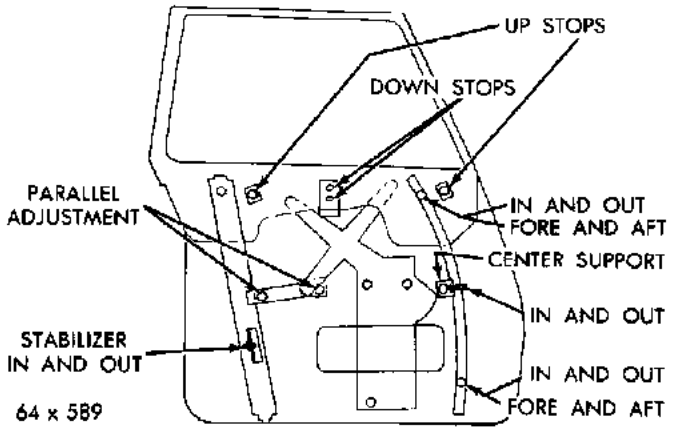


Fig. 90—Rear Door Glass Adjustments—Imperial

glass touches belt line weatherstrip lightly at door outside panel side.

(4) Raise window fully and adjust lower stabilizer (in or out) so front of glass is aligned with rear of front door glass at roof rail area.

(5) Adjust regulator pivot bracket so front edge of glass is parallel to rear edge of front door glass.

(6) Adjust upper track attachment forward until glass weatherstrip is forward against front door glass.

(7) Adjust door glass up stops.

(8) Lower window until top edge of glass is slightly below belt line of door outside panel.

(9) Adjust lower track until boss of track sleeve nut is against inside panel.

Glass Replacement

Removal

(1) Run door glass to the down position and remove regulator arm stud nuts (Fig. 91).

(2) Disengage regulator arms from glass lower channel.

(3) Remove glass stops and raise glass and channel out of door.

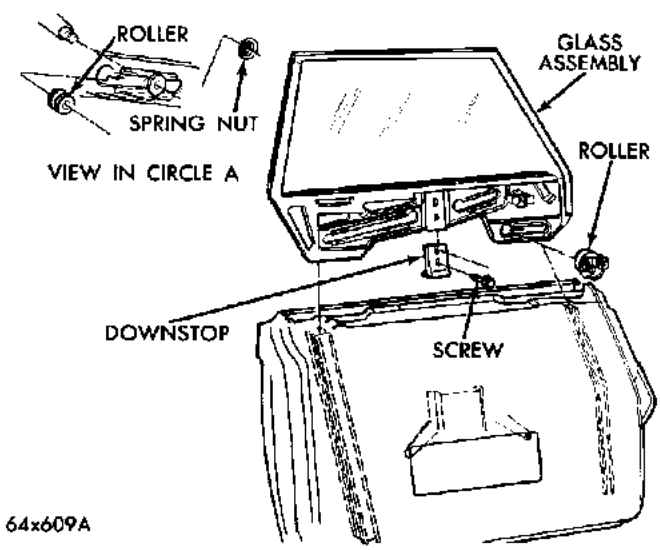


Fig. 91—Rear Door Glass Replacement

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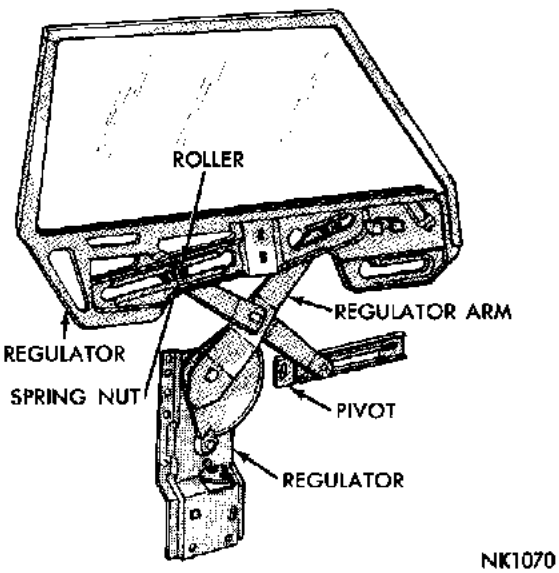


Fig. 92—Rear Door Glass Regulator

Installation

(1) Lubricate the guides and rollers, and lower the glass into door.

(2) Engage regulator arm studs into glass lower channel and install spring nuts.

(3) Close door and raise glass to the sealing position with roof rail weatherstrip.

(4) Install up stops and adjust glass.

Regulator Assembly (Manual and Electric)

The regulator assembly (Fig. 92) is attached to the door inner panel with screw and washer assemblies. Spring nuts attach the regulator arm studs to the rollers.

Regulator Motor

The procedures for servicing the motor are the same as for front doors.

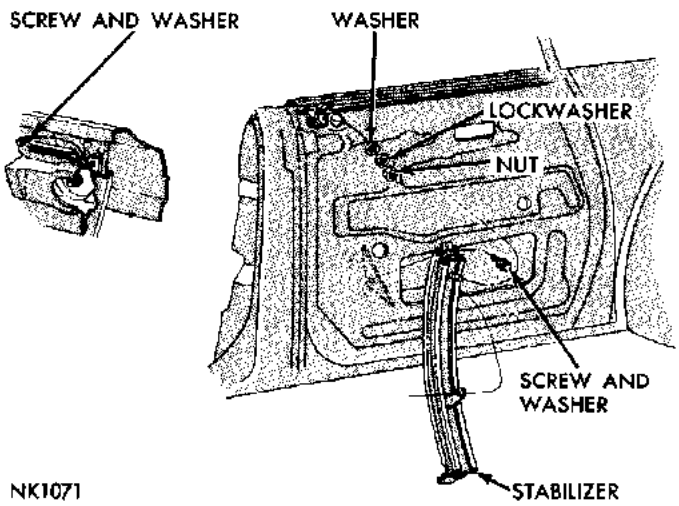


Fig. 93—Rear Door Stabilizer

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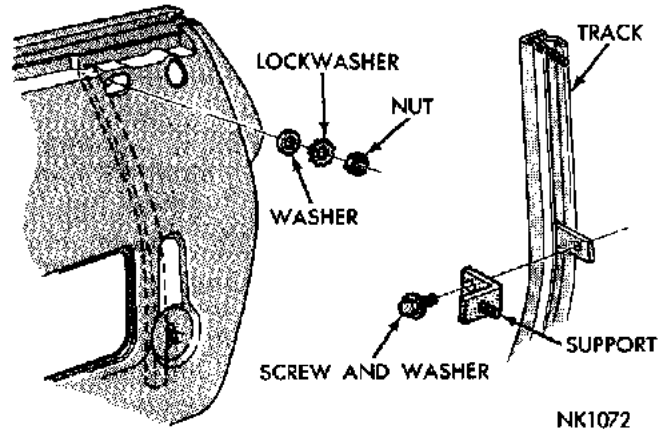


Fig. 94—Rear Door Rear Roller Track

Stabilizer Channel

Removal

(1) Remove door glass assembly.

(2) Remove nut and washers attaching inner stabilizer stud to door inner panel (Fig. 93).

(3) Remove screw and washer attaching outer stabilizer to support at outside panel belt line (Fig. 93).

(4) Remove screw and washer attaching bracket on inner stabilizer to bracket on inside panel.

(5) Remove stabilizer assembly through large opening in door panel.

Installation

(1) Insert stabilizer into door and insert stud on inner stabilizer into attaching hole in door inner panel (Fig. 93).

(2) Install nut and washers on stud. **Do not tighten.**

(3) Position outer stabilizer to attaching hole in outside panel support and install screw and washer assembly securely.

(4) Position bracket on inner stabilizer to front of bracket on inside panel and install screw and washer assembly. **Do not tighten.**

(5) Install and adjust the rear door glass.

Rear Door Rear Track Assembly

Removal

(1) Remove the door glass.

(2) Remove nuts and washers attaching track assembly (Fig. 94) to upper and lower portions of door inner panel.

(3) Remove nut and washer attaching track center support to door inner panel.

(4) Remove track assembly through large hole in panel.

(5) If track assembly is to be replaced, remove the center support assembly.

Installation

(1) Position center support on plate of track assembly (Fig. 94) and install retaining screw and washer assembly.

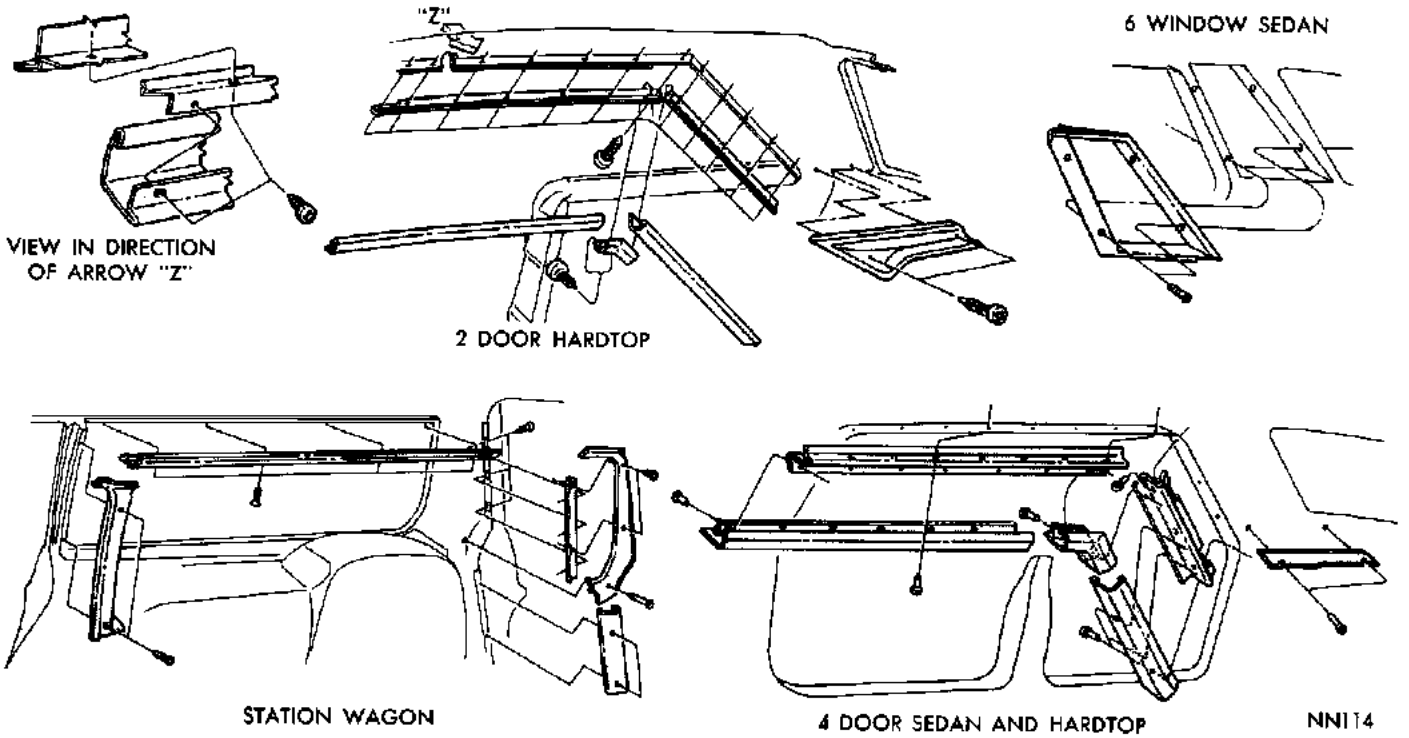


Fig. 95—Quarter Window Garnish Mouldings (Chrysler)

(2) Insert track assembly into door and position studs into holes in door panel at top and bottom edges and at center support area.

(3) Install attaching nuts and washers at upper, center and lower studs. **Do not tighten.**

(4) Install and adjust the door glass.

QUARTER PANELS

GARNISH MOULDINGS

The garnish mouldings (Fig. 95) should be held in position when tightening to assure satisfactory alignment. Do not over-tighten the mounting screws, or the moulding will become damaged by metal stretching.

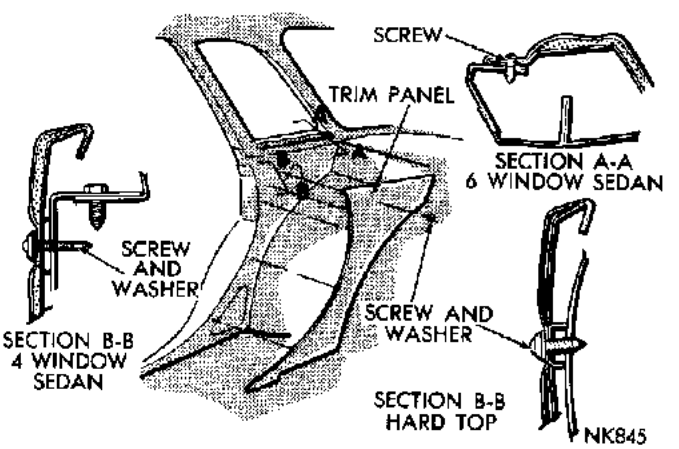


Fig. 97—Quarter Trim Panels (4 Door) Chrysler

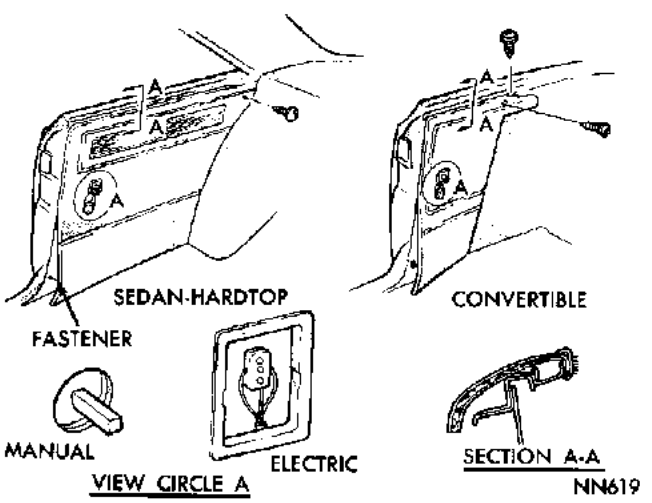


Fig. 96—Quarter Trim Panels (2 Door) Chrysler

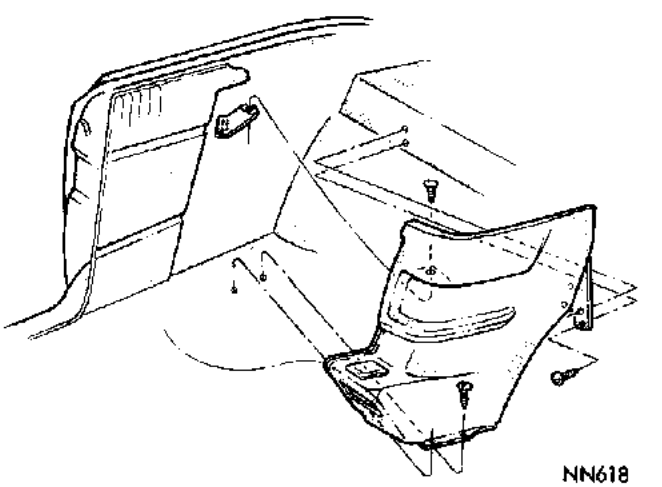


Fig. 98—Quarter Trim Panel (Convertible) Chrysler

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TRIM PANELS

To remove the quarter window trim panel (Figs. 96, 97, 98 and 99) it is first necessary to remove the rear seat cushion and back. The quarter window trim panels are retained with screws and clips. When installing the trim panel, make certain the watershield (Figs. 100 and 101) is properly cemented and positioned.

HANDLES

The regulator handle is attached with an allen head screw.

WATERSHIELDS

Refer to Figures 100 and 101 for the sealing areas and application of the watershields.

WEATHERSTRIPS—BELT LINE

The quarter window belt line weatherstrip is retained on the outer panel with spring type retainers (Figs. 58 and 102).

GLASS—Chrysler Hardtop

Adjustments

Refer to Figure 103 for the glass adjustment points.

(1) Close door and adjust upper rear track attachments so rear of window lightly touches the belt line weatherstrip. To move window inboard, turn sleeve nut clockwise and to move outboard turn sleeve nut counterclockwise.

(2) Run window up, seating top of glass fully against roof rail weatherstrip and front of window flush with top of front door window.

(3) Adjust upper front track attachment so front of window is aligned with rear of front door window at belt line. Turn sleeve nut clockwise to move window in and counterclockwise to move window out.

(4) Adjust lower front track attachment so front of window is aligned with rear of front door window at roof rail. Turn sleeve nut counterclockwise to move window in and clockwise to move window out.

(5) Adjust pivot bracket so top of window is fully against and parallel to roof rail weatherstrip. To raise front of window, lower front of pivot bracket.

(6) Move upper front track attachment forward so weatherstrip of window is against front door window.

(7) Position up stops against lower frame of the window.

(8) Run window down so top of glass is even with or slightly below the belt line.

(9) Adjust lower rear track attachment so "boss" is against outboard side of inside panel.

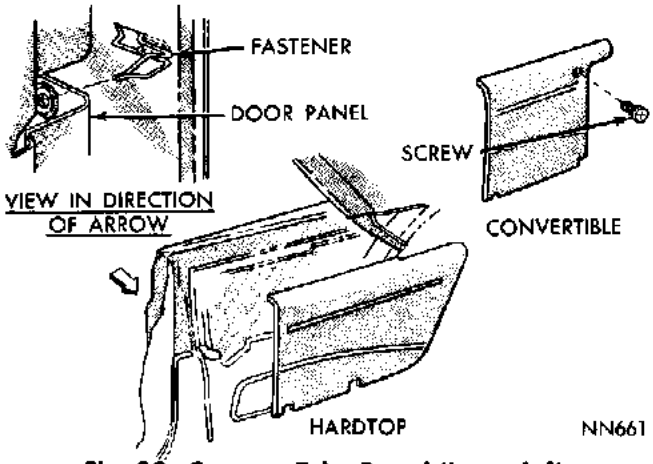


Fig. 99—Quarter Trim Panel (Imperial)

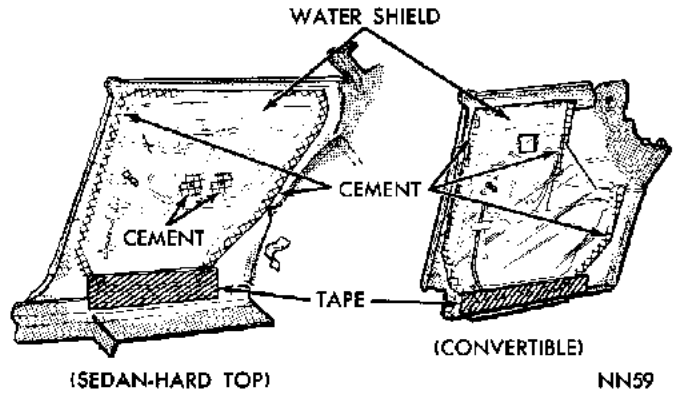


Fig. 100—Quarter Panel Watershields (Chrysler)

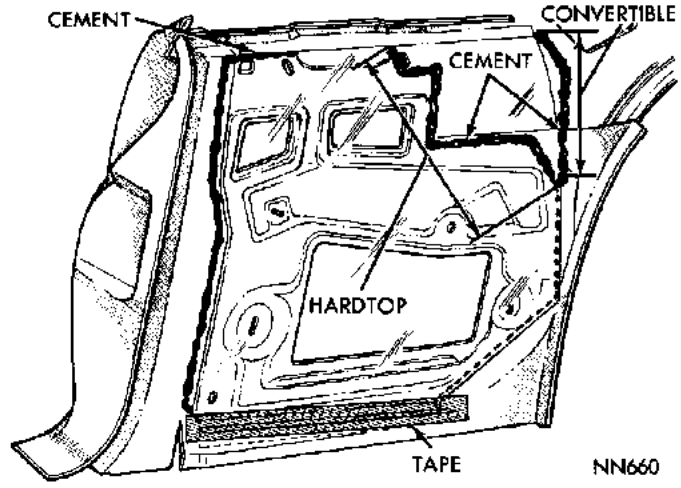


Fig. 101—Quarter Panel Watershields (Imperial)

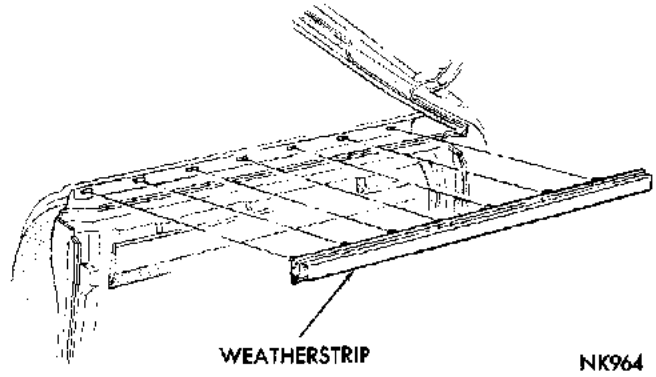


Fig. 102—Belt Line Weatherstrips

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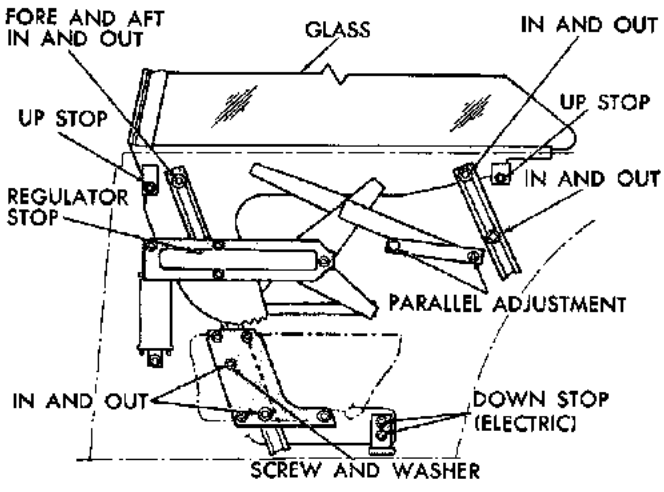


Fig. 103—Quarter Window Adjustments (Hardtop)

(10) On manually operated regulators, position stop on regulator plate against stop on regulator sector. On electrically operated regulators, position stop against bumper (Fig. 103).

(11) Move front track center support so it is positioned against brace and tighten screw securely.

GLASS REPLACEMENT

Removal

(1) Remove down stop assembly from glass lower frame (Fig. 104).

(2) Remove spring nuts from regulator arm studs.

(3) Support window assembly and remove regulator studs from roller assemblies.

(4) Remove rollers from regulator arm slots in glass lower frame.

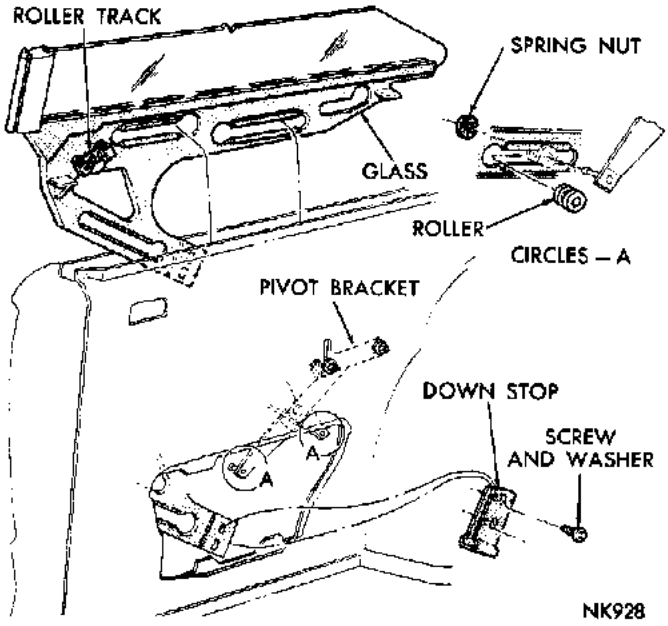


Fig. 104—Quarter Window Replacement (Hardtop)

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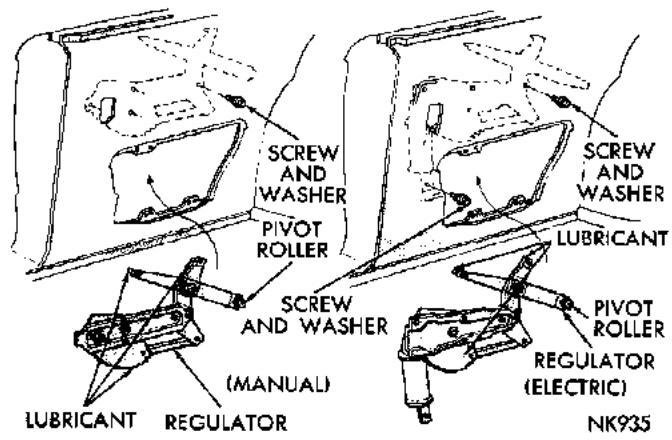


Fig. 105—Quarter Window Regulators (Hardtop)

(5) Remove glass and lower frame assembly from quarter panel.

Installation

(1) Inspect front and rear track roller assemblies for damage or excessive wear.

(2) Apply lubricant to regulator arm roller slots, track slide roller slot and bracket and roller assembly slot in glass lower frame.

(3) Position window assembly into quarter panel, engaging track roller assemblies.

(4) Insert regulator arm rollers in glass lower frame slots and position regulator arm studs into rollers, securing in place with spring nuts (Fig. 104).

(5) Install down stop assembly on glass lower frame and adjust glass.

REGULATOR ASSEMBLY (MANUAL AND ELECTRIC)

The regulator assembly (Fig. 105) is attached to the door inner panel with screw and washer assemblies. The regulator arm studs are retained in the glass lower frame rollers with spring nuts. Lubricate the regulator tooth contact area approximately ½ inch

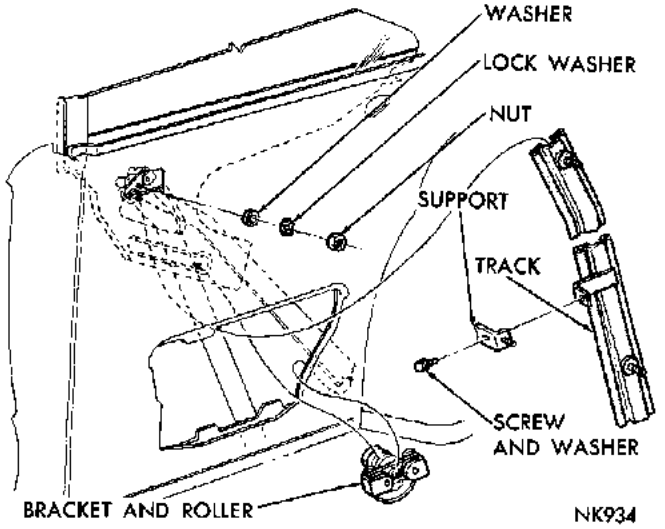


Fig. 106—Quarter Window Front Track (Hardtop)

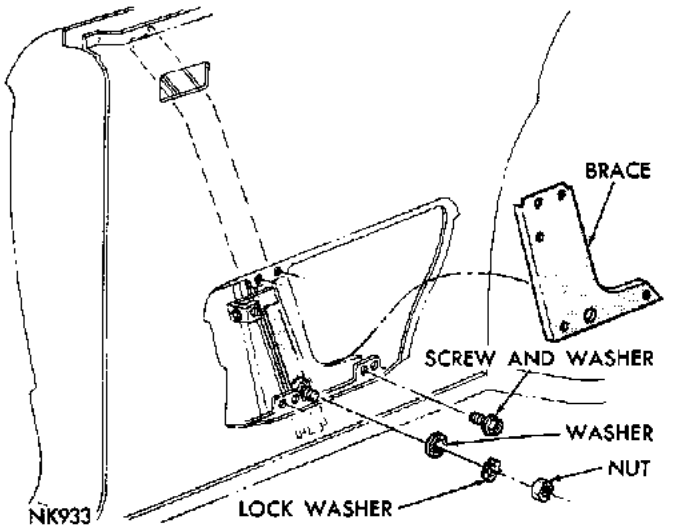


Fig. 107—Quarter Window—Front Track Brace (Hardtop)

wide along the entire length of the arc on the outboard side of the sector and to the front and rear arm roller studs.

Regulator Motor

The method for removing the regulator motor is the same as for sedan models.

FRONT TRACK

Removal

(1) Remove nut and washers attaching track to belt line (Fig. 106).

(2) Remove nut and washers attaching track brace to stud on track (Fig. 107) and screw and washer assemblies attaching brace to inside panel.

(3) Remove track roller assembly from slot in glass lower frame.

(4) Slide track assembly down off of roller assembly on glass lower frame and out through large access opening in the door.

(5) Remove track support assembly.

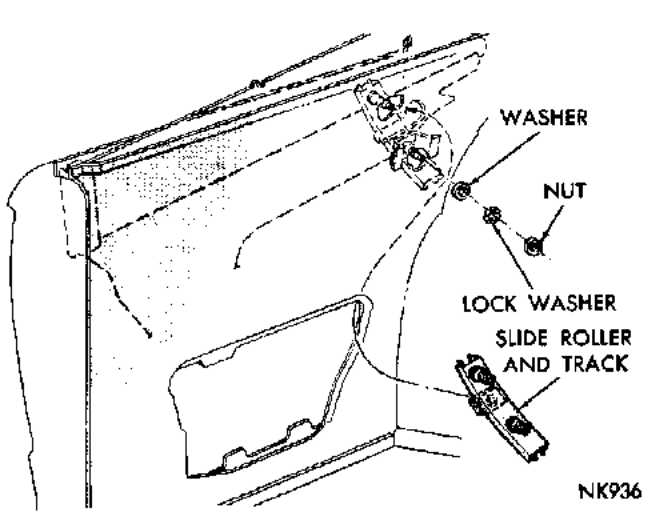


Fig. 108—Quarter Window Rear Track (Hardtop)

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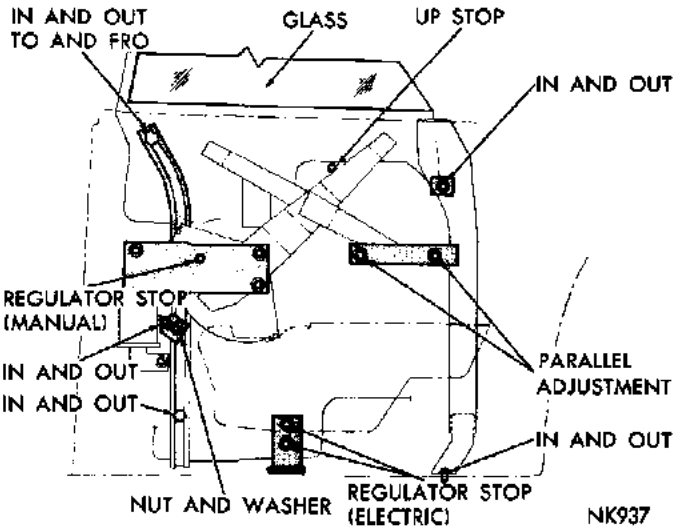


Fig. 109—Quarter Window Adjustments (Convertible)

Installation

(1) Inspect roller assemblies for damage for excessive wear.

(2) Install support on track assembly.

(3) Insert track assembly into door and engage top of track into roller assembly on glass lower frame.

(4) Assemble bracket and roller assembly to bottom of track and slide roller up track and insert into slot on glass lower frame.

(5) Insert track upper stud into slot at belt line and install nut and washers.

(6) Position brace on inside panel attaching holes and install screw and washer assemblies.

(7) Insert lower stud, on track, through hole in brace. Install nut and washers, and adjust glass.

REAR TRACK ASSEMBLY

Removal

(1) Remove nuts and washers attaching rear track assembly to belt line reinforcement (Fig. 108).

(2) Remove lower sleeve nut from hole in support on inside panel, top sleeve nut of track from belt reinforcement and roller from slot in glass lower frame.

(3) Remove track assembly from door through large access opening.

Installation

(1) Position track assembly into door.

(2) Insert roller assembly into slot in glass lower frame.

(3) Insert track top sleeve nut into hole in belt reinforcement and lower sleeve nut into hole in support on inside panel.

(4) Install nut and washers attaching track to belt reinforcement and adjust glass.

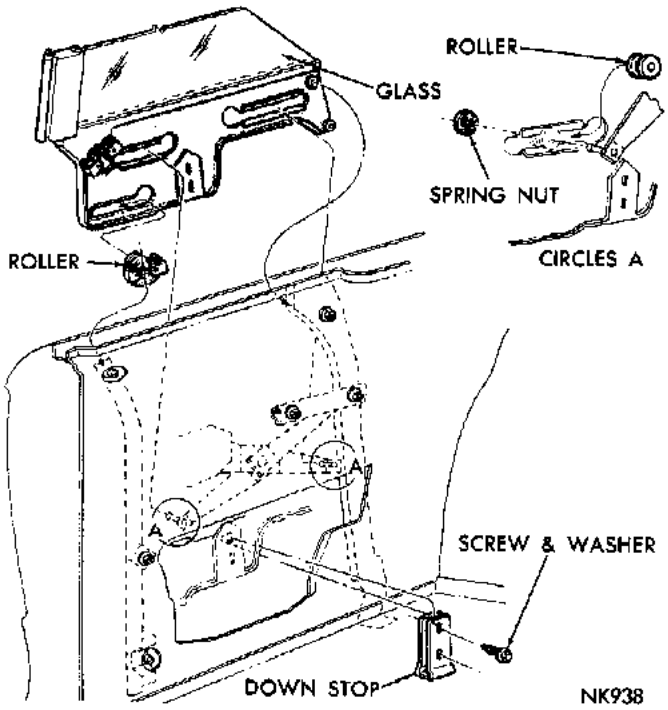


Fig. 110—Quarter Window Replacement (Convertible)

CONVERTIBLE MODELS

Adjustments

Refer to Figure 109 for the adjusting points.

(1) With front door closed, run window approximately ¾ way up.

(2) Adjust upper stabilizer so rear of window touches lightly on belt line weatherstrip.

(3) Run window up fully so front of quarter window is flush with top of front door window and setting lower frame parallel to belt line of quarter outside panel.

(4) Adjust upper track attachment so front of window is aligned with rear of door window at belt line. To move window in, turn sleeve nut clockwise, and to move window out, turn sleeve nut clockwise.

(5) Adjust lower track attachment so front window is aligned with rear of front door window at top. To move window in, turn sleeve nut counterclockwise and to move window out, turn sleeve nut clockwise.

(6) Adjust pivot bracket so window is parallel to rear of front door window at front and bottom parallel to quarter outside panel at belt line. Lower pivot bracket to raise glass and raise the bracket to lower the glass.

(7) Move upper track attachment forward so the weatherstrip is against front door window.

(8) Position up stop down against rear arm of the regulator.

(9) Run window down so top of glass is level with or slightly below belt line of the quarter outside panel.

(10) Adjust lower stabilizer attachment in or out as necessary.

(11) On manually operated windows, position stop on regulator plate against stop on regulator sector. On electrically operated windows adjust down stop against bumper.

(12) Adjust center support inboard against inside panel.

GLASS REPLACEMENT

Removal

(1) Remove spring nuts from regulator arm studs (Fig. 110) and studs from rollers.

(2) Remove rollers from glass lower frame slots.

(3) Raise glass and lower frame assembly out of quarter panel.

(4) Inspect regulator arm stud rollers, and glass track rollers for damage or excessive wear.

Installation

(1) Lubricate glass lower frame regulator arm roller slots and track roller slot.

(2) Install track roller assembly into track slot of lower frame with spring loop up.

(3) Position glass assembly into door and install regulator arm stud rollers into glass lower frame slots.

(4) Position regulator arm studs into rollers and install spring nuts and adjust glass.

REGULATOR ASSEMBLY (MANUAL AND ELECTRIC)

The regulators (Fig. 111) are attached to the quarter inside panel with screw and washer assemblies. When installing a regulator, lubricate the tooth contact area approximately ½ inch wide along the entire length of the arc on the outboard side of the sector and studs on the front and rear studs.

REGULATOR MOTOR

The method of removing the regulator motor is the same as for sedan models.

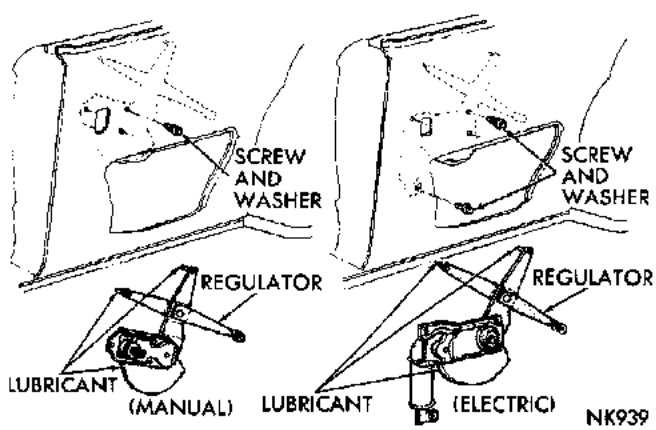


Fig. 111—Quarter Window Regulator (Convertible)

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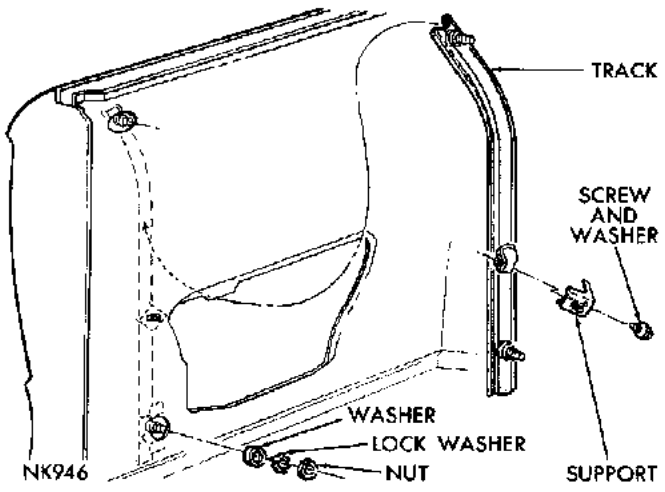


Fig. 112—Quarter Window Front Track (Convertible)

FRONT TRACK

Removal

(1) Remove glass and lower frame assembly.

(2) Remove adjusting stud nut and washers from lower end of track (Fig. 112).

(3) Remove center support nut and washer.

(4) Remove track upper adjusting stud nut and washers.

(5) Remove track and center support assembly out of quarter panel through large access opening.

Installation

(1) Position track and center support assembly into quarter panel through large access opening and insert studs into openings in inner panel (Fig. 112).

(2) Install track upper adjusting stud nut and washers finger tight only.

(3) Install center support nut and washer finger tight only.

(4) Install track lower adjusting stud nut and washers finger tight only.

(5) Install and adjust the quarter glass.

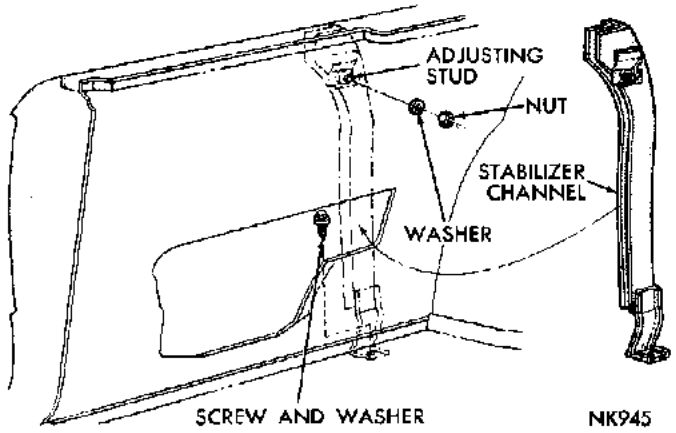


Fig. 113—Quarter Window Stabilizer

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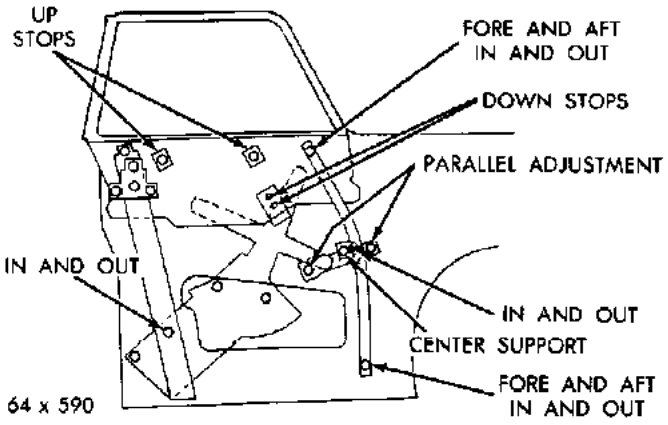


Fig. 114—Quarter Window Adjustments—Imperial

Stabilizer Channel

The quarter glass stabilizer channel assembly is attached to the quarter inner panel at the upper end and to the side sill outer panel and reinforcement at the lower end (Fig. 113). The adjusting stud at the upper end of the stabilizer allows in and out movement to position the top edge of the glass against the belt line weatherstrip. The attachment at the lower end permits in and out adjustment.

QUARTER WINDOW-IMPERIAL

Adjustments

Refer to Figure 114 for the quarter glass adjustment points.

(1) Close door and raise quarter window to the three quarter closed position.

(2) Adjust upper track attachment until rear of glass touches lightly on the outside panel belt line weatherstrip.

(3) Raise window fully and adjust lower frame so it is parallel to belt line of quarter outside panel.

(4) Adjust lower stabilizer attachment until front of

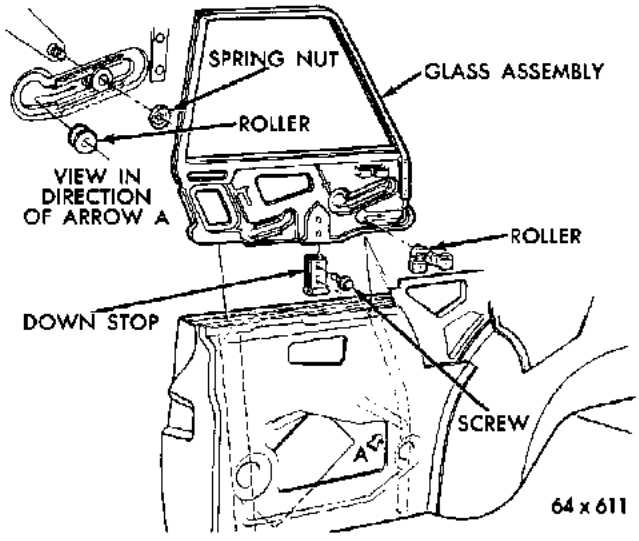


Fig. 115—Quarter Window Attachment

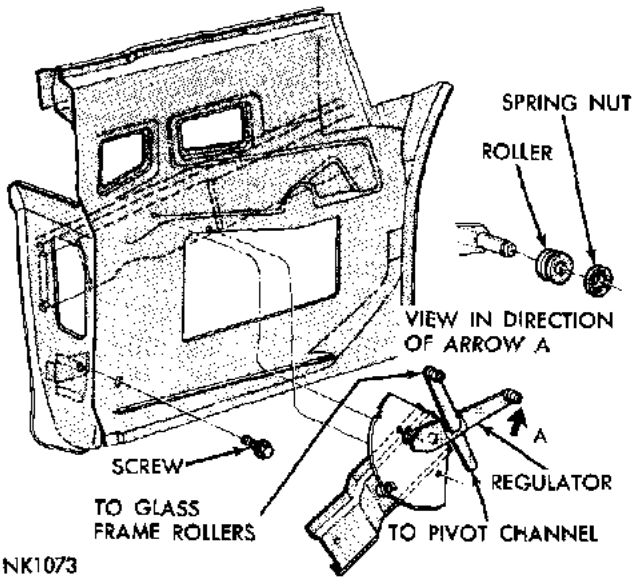


Fig. 116—Quarter Window Regulator

glass is aligned with rear of front door glass at the roof rail.

(5) Adjust regulator pivot bracket (up or down) so top of glass is fully against and parallel to the roof rail weatherstrip.

(6) Adjust up stops against lower window frame.

(7) Lower window until top edge of glass is slightly below belt line.

(8) Adjust lower track attachment until boss of sleeve nut is against inside panel.

(9) Adjust center support at roller track, against inside panel.

GLASS REPLACEMENT

Removal

(1) Lower window and remove spring nuts from ends of regulator arm studs in rollers of glass lower frame (Fig. 115).

(2) Remove glass up and down stops.

(3) Remove rear track assembly.

(4) Remove regulator arm studs from rollers.

(5) Remove glass assembly from quarter panel.

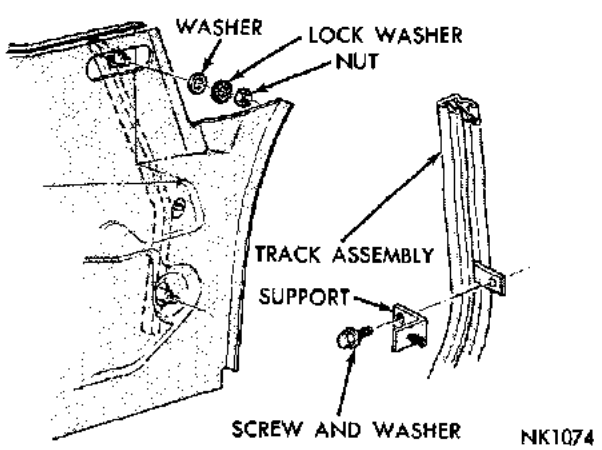


Fig. 117—Quarter Window Rear Roller Track

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Installation

(1) Lubricate regulator arm roller slots and rear track roller slot of lower frame.

(2) Lower glass to bottom of quarter panel.

(3) Raise rear portion of glass against regulator arm, aligning arm studs with rollers.

(4) Insert studs into rollers and install spring nuts.

(5) Install rear track on roller assembly in glass frame.

(6) Install rear track stud retaining screws and washers.

(7) Install glass up and down stops and adjust glass.

REGULATOR REPLACEMENT

Removal

(1) Remove spring nuts attaching regulator arm studs in the roller assemblies (Fig. 116).

(2) Support window assembly and remove regulator arm studs from rollers.

(3) Remove screw and washer assemblies attaching regulator mounting bracket to front support and body lock pillar mounting reinforcement.

(4) Remove regulator arm from pivot channel.

(5) Remove regulator assembly.

Installation

(1) Apply lubricant to tooth contact area of regulator approximately half inch wide along entire length of arc on inboard side of sector.

(2) Apply lubricant to pivot channel slide area and to roller slot areas of glass lower frame.

(3) Insert regulator into quarter panel, position mounting plate to holes in front support and body lock pillar mounting reinforcement and install screw and washer assemblies.

(4) Remove support from window and insert regulator arm studs into roller assemblies in glass lower frame.

(5) Install spring nuts on studs.

REGULATOR MOTOR

Service and test procedures for the electric regulator motor are the same as outlined for door regulators.

REAR ROLLER TRACK

Removal

(1) Remove nuts and washers attaching rear track assembly to inner panel (Fig. 117).

(2) Remove nut and washers attaching center support to inner panel.

(3) Slide track assembly off of roller assembly on glass lower frame.

(4) Remove track assembly.

Installation

(1) Position rear track assembly into quarter panel and insert top of track into roller assembly.

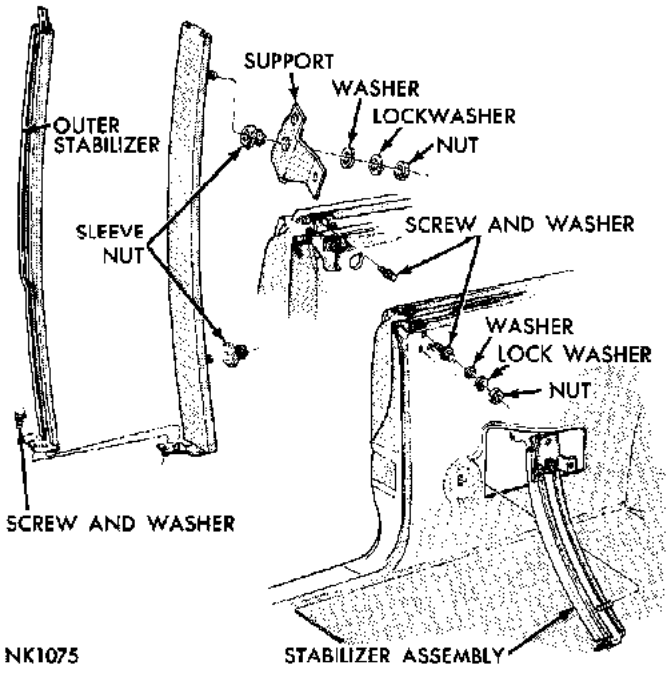


Fig. 118—Quarter Window Stabilizer Channel

(2) Position track studs and support bracket stud into openings in quarter panel.

(3) Install retaining nuts and washers on studs finger tight only.

(4) Adjust quarter window.

STABILIZER ASSEMBLY

Removal

(1) Remove screws and washers attaching support assembly to belt reinforcement (Fig. 118).

(2) Remove nuts and washers attaching stabilizer stud to quarter inner panel.

(3) Remove stabilizer assembly.

(4) Remove nut and washers attaching support assembly to inner stabilizer and remove support.

(5) Remove sleeve nuts from inner stabilizer studs.

(6) Remove screw and washer attaching inner stabilizer to outer stabilizer.

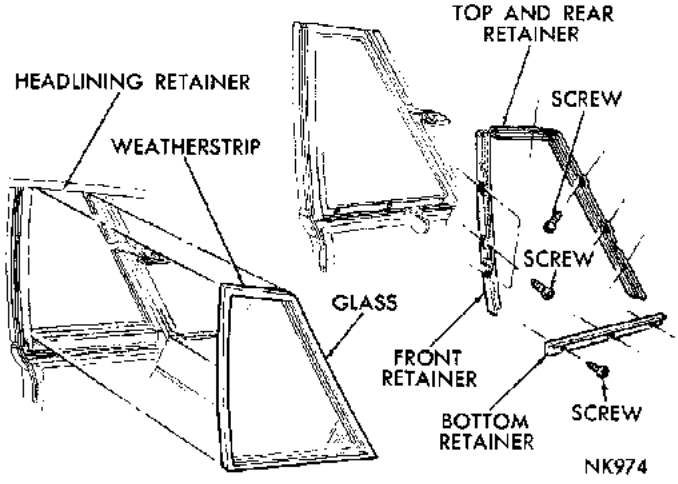


Fig. 119—Stationary Quarter Window

Installation

(1) Position inner stabilizer on outer stabilizer and install attaching screw and washer assembly at lower end (Fig. 118).

(2) Install sleeve nuts on inner stabilizer studs.

(3) Position support assembly on top sleeve nut and install retaining nut and washers.

(4) Insert stabilizer assembly into quarter panel.

(5) Position stabilizer to attachment holes on upper reinforcement and inside panel.

(6) Insert bottom stud through hole in quarter inner panel and install retaining washers and nut loosely.

(7) Position outer stabilizer on outer support, run window ¾ of the way down and install attaching screw and washer assembly securely.

(8) Adjust quarter window.

STATIONARY QUARTER WINDOW

FOUR-DOOR SEDAN

Removal

(1) Remove garnish mouldings at quarter window.

(2) Remove screws attaching front retainer (Fig. 119) to window opening and remove retainer.

(3) Remove screws attaching top and rear retainer to window opening and remove retainer.

(4) Remove belt retainer screws and retainer.

(5) From outside car, apply pressure to lower portion of window while supporting it on inside and force glass and weatherstrip out of opening.

(6) Remove weatherstrip from glass.

Installation

(1) Position weatherstrip on quarter glass, making certain it is fully seated.

(2) Insert top edge of glass and weatherstrip under headlining retainer and seat the bottom portion of glass assembly at belt area.

(3) Install retainer at belt area.

(4) Install top and rear retainer.

(5) Install front retainer.

(6) Install quarter window garnish mouldings.

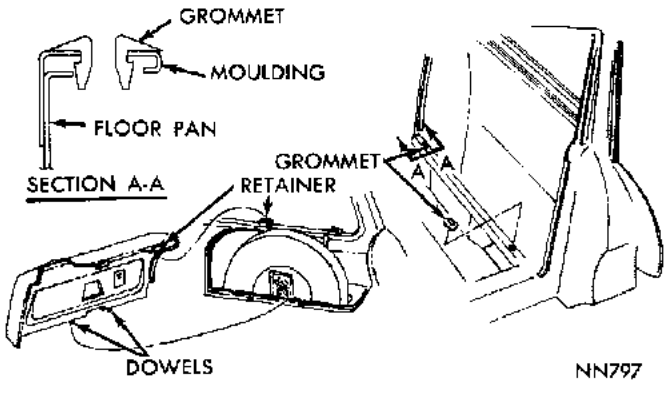


Fig. 120—Spare Tire Well Cover

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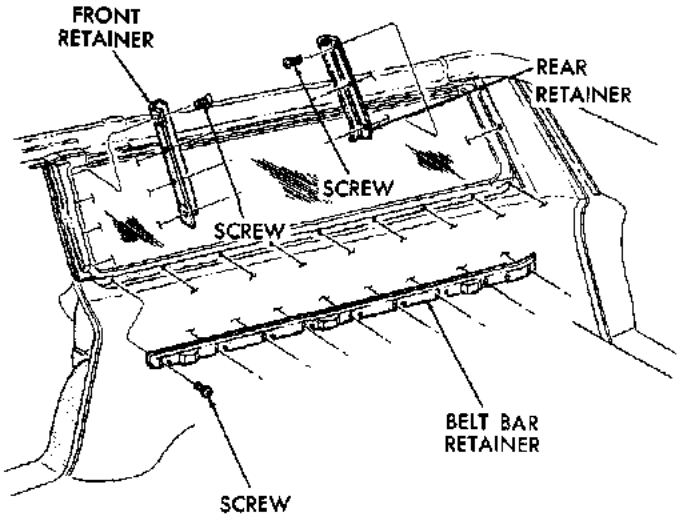


Fig. 121—Pillar and Belt Bar Retainers

STATION WAGON (Town and Country)

Removal

(1) Pull spare tire cover outward to release retaining clips on cover (Fig. 120) from clips on inner wheelhouse panel.

(2) Lift cover until dowels in bottom of cover are out of the rubber grommets.

(3) Remove quarter window garnish mouldings.

(4) Remove front upper pillar glass and weatherstrip lock retainer screws and retainer (Fig. 121).

(5) Remove rear upper pillar glass and weatherstrip retainer screws and retainer.

(6) Remove glass and weatherstrip belt bar retainer screw and retainer.

(7) Remove roof side rail support retainer from quarter window area (Fig. 122).

(8) Remove quarter window and weatherstrip assembly from opening (Fig. 123) from inside vehicle.

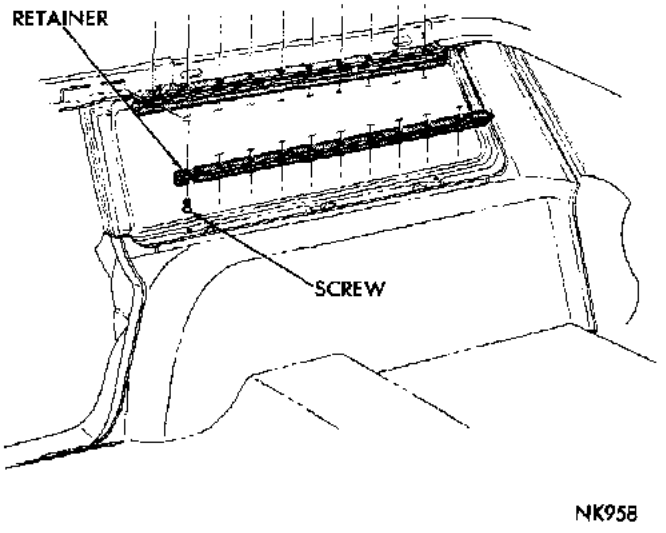


Fig. 122—Quarter Window Retainers

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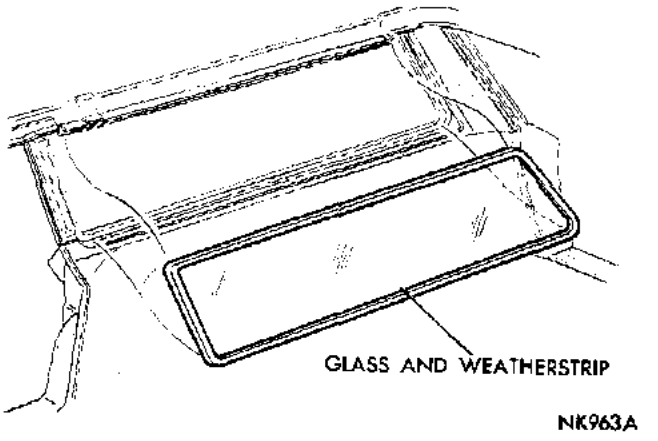


Fig. 123—Quarter Window Replacement

(9) Remove weatherstrip from glass.

(10) Inspect polyethylene seal.

Installation

(1) Install new polyethylene seals as necessary.

(2) Install weatherstrip on quarter glass.

(3) Position glass and weatherstrip assembly in window opening from inside vehicle (Fig. 123).

(4) Position roof side rail retainer (Fig. 122) to mating under surface of side rail support and install retaining screws.

(5) Position wheelhouse belt bar retainer to belt bar and install retaining screws (Fig. 121).

(6) Position rear pillar upper retainer on end of belt bar retainer and rear pillar. Install retaining screws.

(7) Position body lock upper front pillar retainer on end of belt bar retainer and pillar. Install retainer screws.

(8) Install garnish mouldings.

(9) Position dowels in bottom of spare tire cover (Fig. 120) into rubber grommets on floor panel.

(10) Seat dowels fully and push cover top area inward until retaining clips on cover engage clips on inner wheelhouse panel.

TAIL GATE

Alignment

Vertical adjustment and in and out adjustment are made at the hinge plate. In and out alignment of the top of the tail gate is adjusted by moving the striker in or out to permit ease of entry of the glass into the upper run channel. Lateral adjustment to center the tail gate in the body opening is controlled at the hinge (Fig. 124).

REPLACEMENT

Removal

On cars with an electric window regulator, remove trim panel and disconnect terminals at control switch on left edge of tail gate.

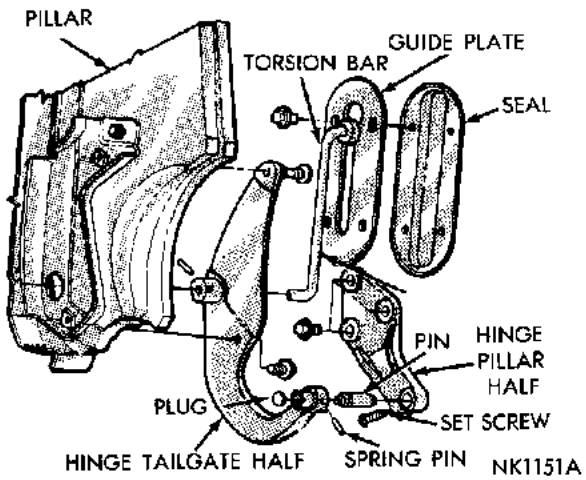


Fig. 124—Tail Gate Alignment

(1) Remove rear bumper face bar to enable tail gate to be removed down and out of body opening.
(2) Remove check arm and torsion bar guide from pillar guide plates.
(3) Support tail gate on jacks or stands.
(4) Loosen hinge pivot pin locking screws (Fig. 124).
(5) Use a pencil and outline hinge plate position on pillar post for future assembly.
(6) Remove hinge plate attaching bolts from pillar post (Fig. 124).
(7) Slide hinge plate and torsion bar in through guide toward center of tail gate.
(8) Lower tail gate down and out of body opening.

Installation

(1) With torsion bar and hinge plates pushed in toward center of tail gate, engage hinge plates into lower opening of body.
(2) Attach hinge plate attaching bolts into pillar posts and locate hinge plates in relation to previous marked positions.
(3) Tighten attaching bolts firmly enough to hold position and inspect alignment.

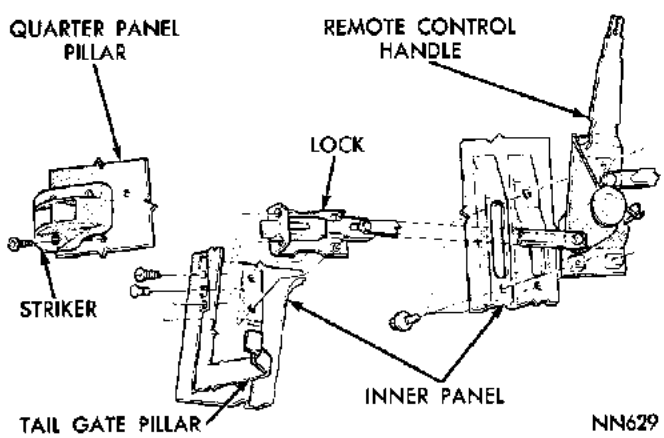


Fig. 125—Tail Gate Lock

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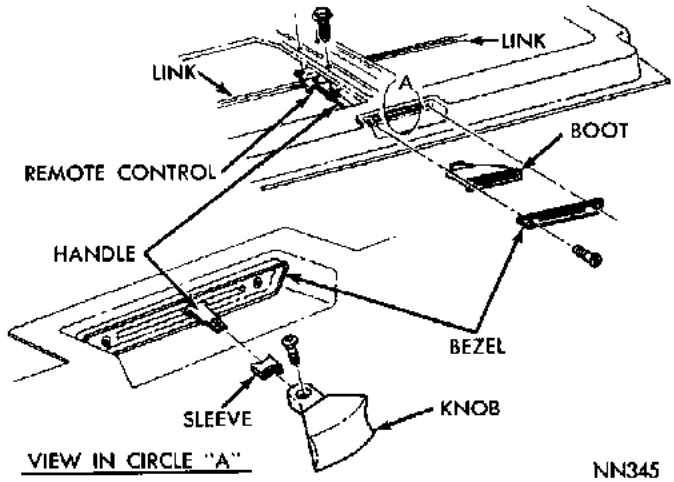


Fig. 126—Tail Gate Remote Control Handle

(4) Close tail gate and center in opening.
(5) Attach torsion bar bracket to pillar post.
(6) Open tail gate and tighten locking screws on hinge pivot pin.
(7) Connect wires to control switch and install trim panel.
(8) Operate tail gate window and inspect alignment.
(9) Install bumper face bar.

TRIM PANEL

The tail gate trim panel is attached with metal screws. Clean all foreign material from the seating area of the trim panel before installing.

LOCK

To replace the lock assembly (Fig. 125), remove trim panel and raise glass. The lock assembly is retained on the tail gate by screws accessible at ends of tail gate.

Lock Cylinder

To replace the lock cylinder it is first necessary to remove the glass and regulator to gain access to the lock cylinder retainer (horseshoe type).

HANDLES

Adjustments—Inside

Tail gate inside handle adjustment (Figs. 125 and 126) can be made by removing the plug located near the rotor in the lock facing of the tail gate. Loosen the hex bolt in the lock assembly and adjust the ratchet levers to allow the lock rotor to spin freely when the actuator rod is in the open position. Tighten the hex bolt after the adjustment has been made. This adjustment must be made on both sides.

Outside Handle

With the tail gate handle in the unlocked position remove the tail gate inner panel and remove the three nuts attaching the handle to the door.

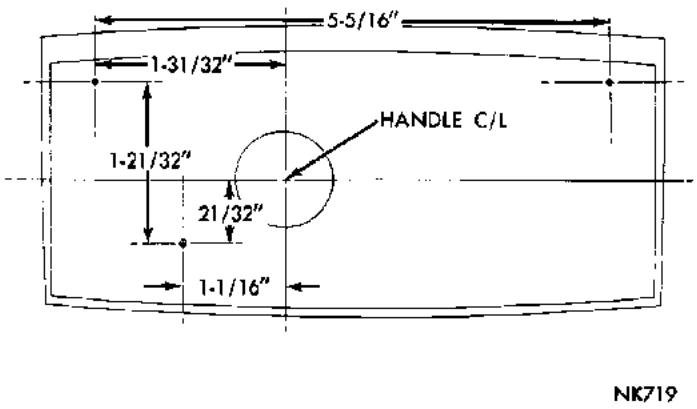


Fig. 127—Tail Gate Handle Stud Locations

To remove a handle which is inoperative and the vehicle is fully loaded, prohibiting access to the tail gate inner panel, it will be necessary to remove the three mounting studs from the handle by drilling through the handle. Refer to Figure 127 for the location of the drilling points.

GLASS

Adjustments

Refer to Figure 128 for the tail gate glass adjusting points.

(1) Loosen regulator and run channel attaching screws and nuts.

(2) With tail gate open, adjust upper attachments of lower run channels so glass lightly touches the belt line weatherstrip.

(3) From inside vehicle and with tail gate closed, run glass ½ way closed.

(4) Adjust upper run channel for proper alignment with glass and tighten two top screws.

(5) Tighten lower nut on bottom of lower run channels.

(6) Run glass up to approximately ⅛ inch below glass run.

(7) Adjust regulator so top of glass is parallel to glass run. To raise or lower left or right side of glass, raise or lower regulator on that side.

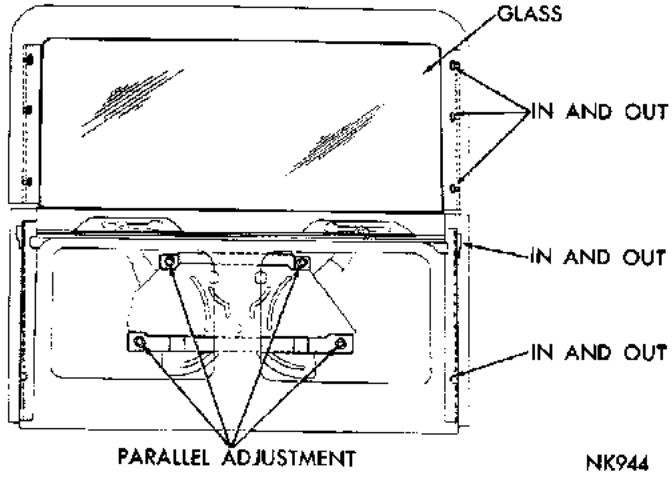


Fig. 128—Tail Gate Glass Adjustments

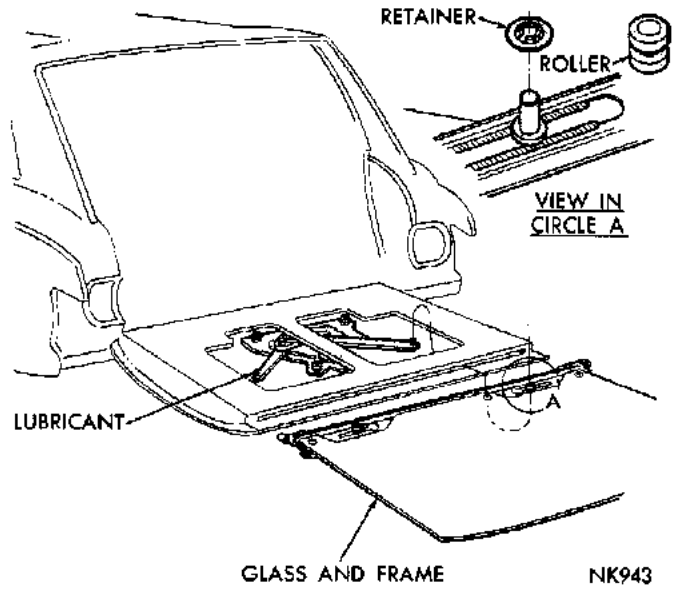


Fig. 129—Tail Gate Glass Replacement

REPLACEMENT

Removal

(1) Remove retainers (Fig. 129) from ends of regulator arm studs.

(2) Remove regulator arm studs from rollers in glass lower frame.

(3) Remove tail gate glass assembly from tail gate.

(4) Remove rollers from glass lower frame.

(5) Remove washers, spacers and screws attaching glass lower frame and weatherstrip to glass (Fig. 130) and remove frame and weatherstrip.

Installation

(1) Position outer belt weatherstrip on lower glass frame.

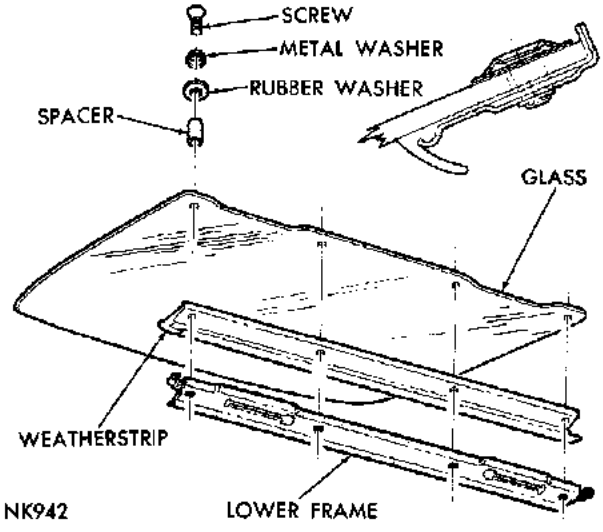


Fig. 130—Glass Attachment

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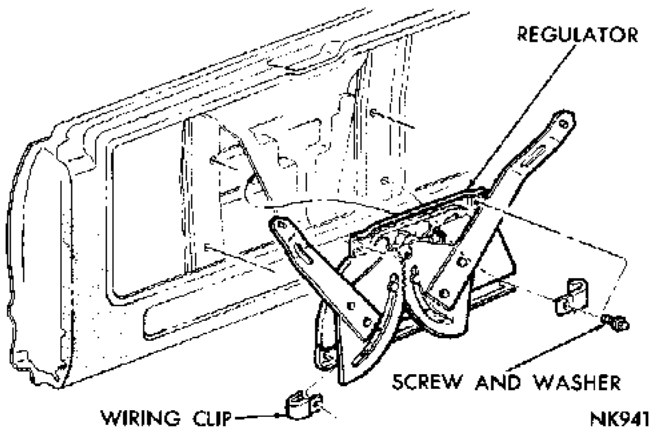


Fig. 131—Regulator Attachment

(2) Position tail gate glass on weatherstrip and lower frame, and install washers, spacers and retaining screws.

(3) Apply lubricant to regulator arm studs and to glass lower frame studs.

(4) Position rollers into slots of glass lower frame.

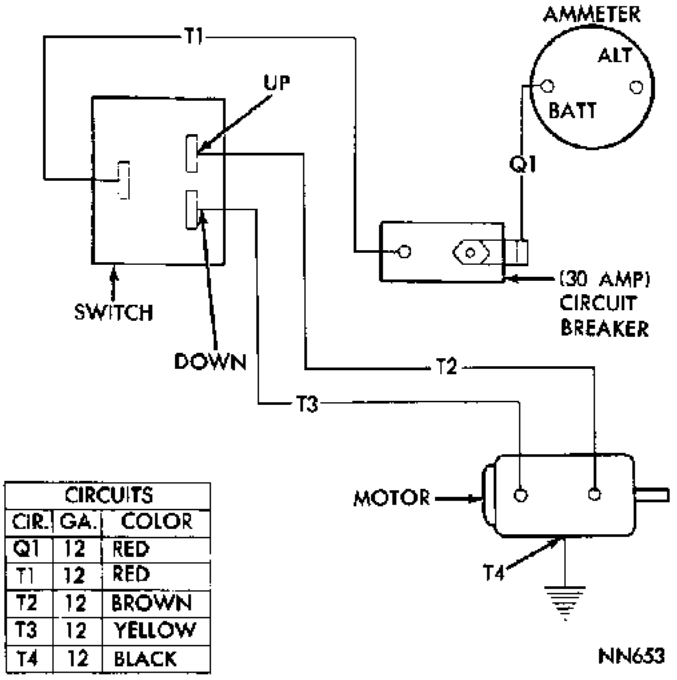
(5) With tail gate in vertical position, insert glass assembly into tail gate.

(6) Position regulator arm studs in rollers and install retainers on the ends of studs.

(7) Adjust tail gate glass panel.

REGULATOR REPLACEMENT

The regulator assembly (Fig. 131) controls the parallel adjustment on the tail gate glass. The regulator assembly is attached to mounting brackets on the tail gate inner panel by screw and washer assemblies.



CIRCUITS		
CIR.	GA.	COLOR
Q1	12	RED
T1	12	RED
T2	12	BROWN
T3	12	YELLOW
T4	12	BLACK

Fig. 132—Tail Gate Regulator Wiring Diagram

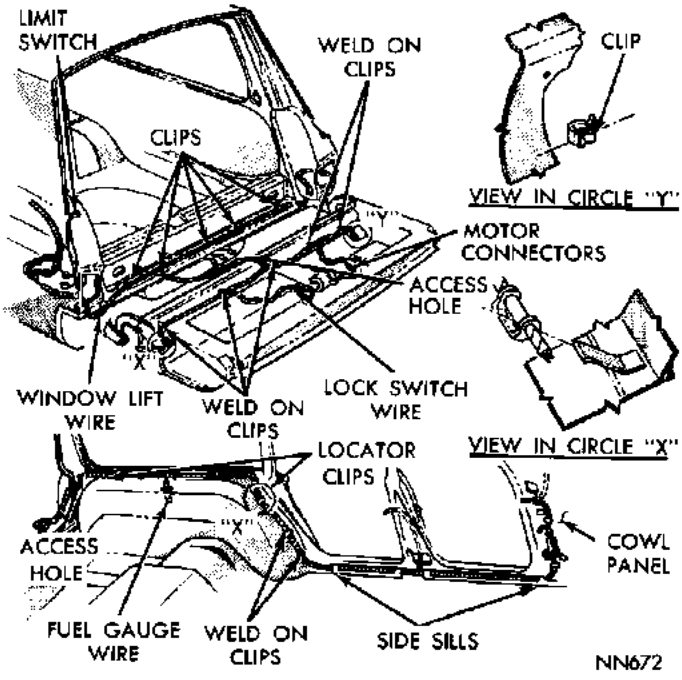


Fig. 133—Wire Harness Routing

Tests—Regulator Motor

A tail gate glass may not move when the control switch is actuated due to a binding condition between the glass and run channels.

Control Switch

Disconnect the black wire at control switch (Fig. 132) and hold firmly against yellow wire terminal on control switch. The glass (if raised) should start to lower. Repeat this test with the brown wire. The glass (in lowered position) should start to rise. If glass operates during these tests, but fails to operate when the control switch lever is moved to "UP" or "DOWN" position, the switch is at fault. If glass fails to operate during these tests, perform the wire harness tests.

Wire Harness (Fig. 132)

Disconnect wire harness connector at motor. Connect one wire of a test light to brown and the other to a good body ground. Position instrument panel switch in the "UP" position. The bulb should light. Repeat test with the yellow wire, but position switch in the "DOWN" position. If bulb fails to light either time, and all wire terminals are tight, replace the circuit breaker.

Should the test light illuminate on one wire but not the other, inspect wire harness (Fig. 133) for a broken wire. If the bulb lights in both tests, place one wire of the test light to the black wire terminal on the motor and the other wire to a good body ground. Position the switch in either "UP" or "DOWN" position. If bulb should light inspect for a bad ground connection or broken black wire. If test bulb does not light and the wire harness test is positive, replace the motor.

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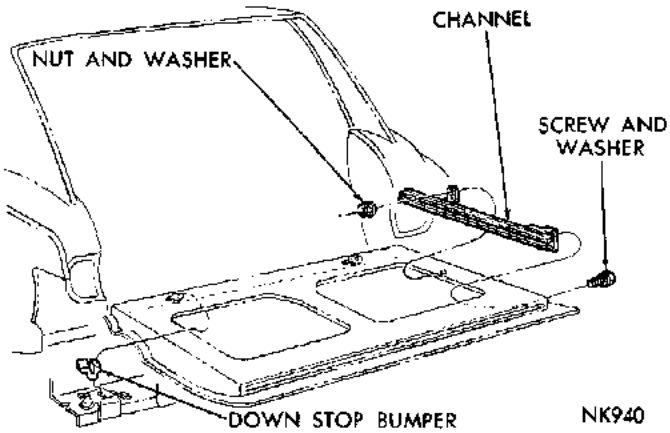


Fig. 134—Glass Run Channel

Run Channel

Removal

(1) Remove tail gate glass assembly.

(2) Remove screw and washer assembly from upper end of glass run channel (Fig. 134).

(3) Remove nut and washer attaching glass run at lower mounting bracket.

(4) Remove glass run channel assembly.

Installation

(1) Insert glass lower run channel into tail gate.

(2) Position lower bracket of channel over stud on hinge reinforcement and install washer and nut finger tight only.

(4) Install and adjust tail gate glass.

TORSION BAR

Removal

(1) Remove tail gate assembly and place on a cover, to protect paint surface.

(2) Remove trim panel from tail gate.

(3) Remove screws attaching torsion bar clamp to tail gate pillar (Fig. 135) and remove clamp.

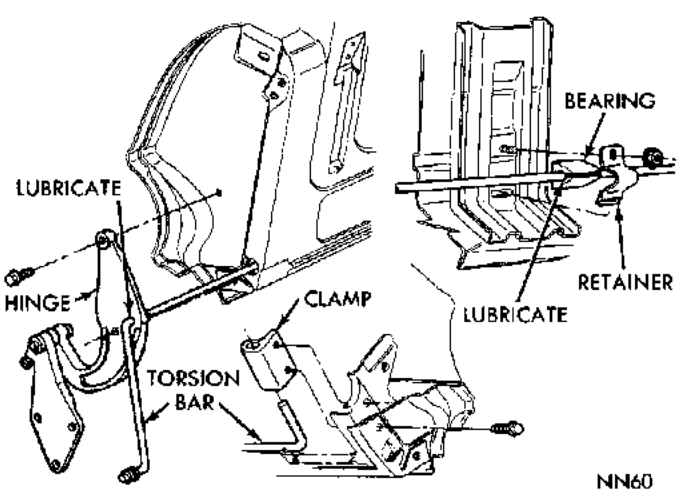


Fig. 135—Tail Gate Torsion Bar

(4) Remove torsion bar bearing retainer and bearing (Fig. 135).

(5) Remove screws attaching torsion bar and hinge to tail gate.

(6) Remove torsion bar from hinge.

Installation

(1) Lubricate torsion bar at right hinge area and at torsion bar bearing area.

(2) Install hinge on torsion bar and insert torsion bar into tail gate.

(3) Position hinge to tail gate and install mounting screws. Tighten screws 30 foot-pounds.

(4) Install bearing and bearing retainer on torsion bar (Fig. 135). Tighten retainer nut 95 inch-pounds.

(5) Position clamp over end of torsion bar and from outside end of tail gate install attaching screws. Tighten to 200 inch-pounds.

(6) Install tail gate trim panel and tail gate assembly.

WEATHERSTRIPS AND RUNS

Weatherstrip—Tail Gate and Opening

Prior to installing the weatherstrip (Figs. 136 and 137) make certain the seating area is free of all old weatherstrip, sealer and other foreign material.

Apply an even continuous coat of cement, starting at the belt line, down one side, across the bottom and up the opposite side of the lower opening. Install the weatherstrip and seal the area at the belt line.

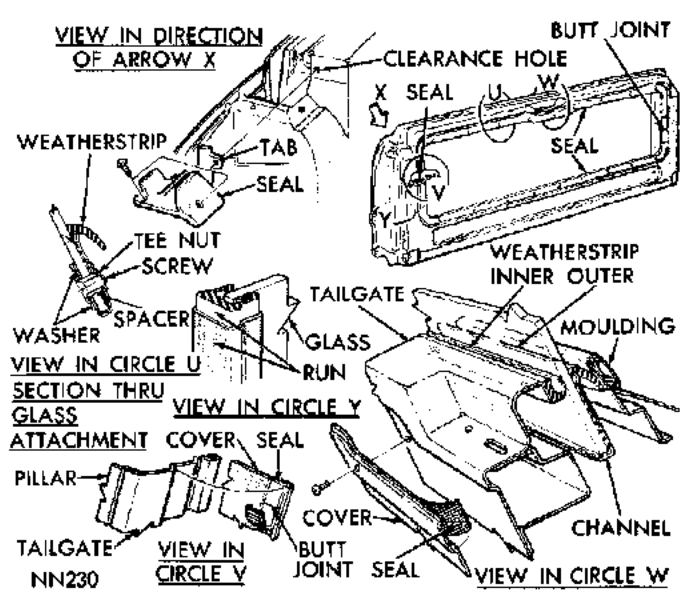


Fig. 136—Tail Gate Weatherstrip

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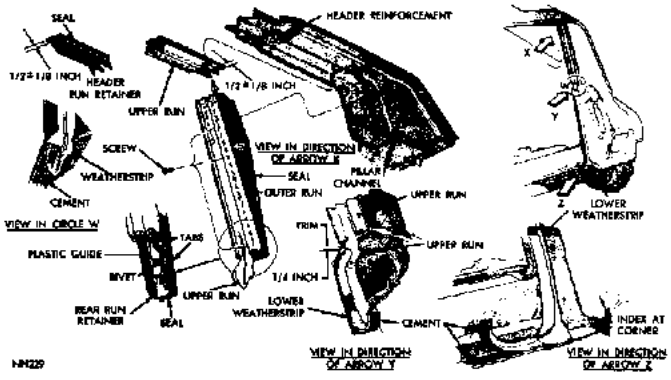


Fig. 137—Tail Gate Opening Weatherstrip

Upper Run Retainer and Seal

Removal

(1) Remove screws attaching the glass run retainer to roof rear header and remove retainer (Fig. 138).

(2) Remove seal assembly from roof rear header.

(3) Remove headlining rear corner retainer, if necessary.

(4) Remove roof headlining rear retainer from roof panel rear header outer reinforcement, if necessary.

Installation

(1) Position roof headlining rear retainer to roof panel rear header outer reinforcement, if removed, and install retaining screws.

(2) Install roof headlining rear corner retainer over end of headlining retainer, if removed, and install retainer screw.

(3) Using a new glass run retainer seal, start at lower edge of upper pillar and apply seal up and across roof header and down opposite pillar.

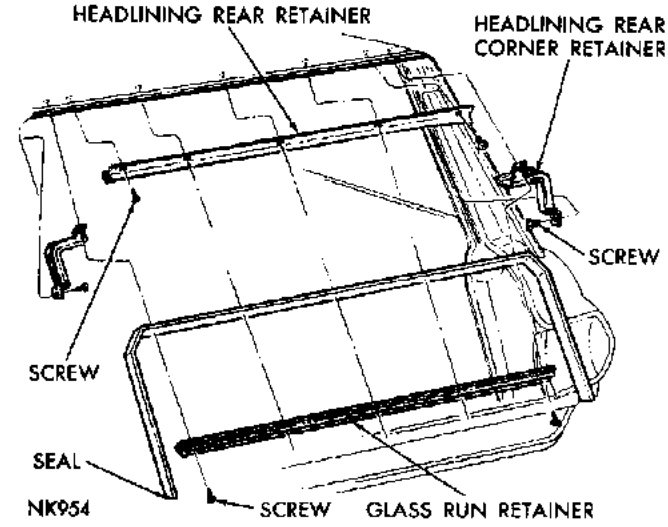


Fig. 138—Upper Run Retainer and Seal

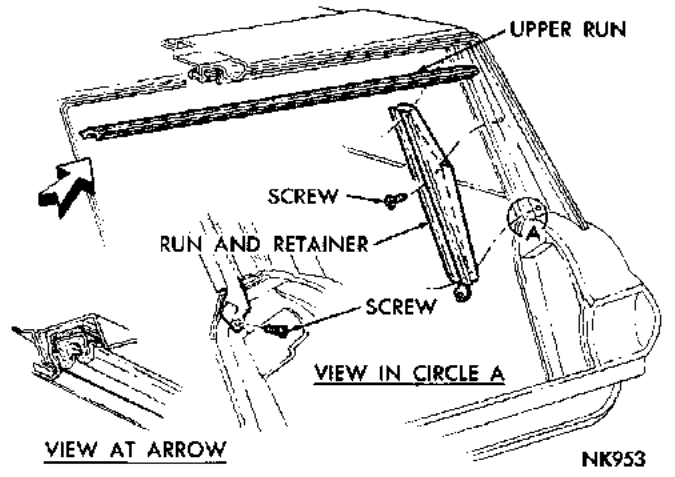


Fig. 139—Upper and Pillar Runs

(4) Position roof rear header tail gate glass run retainer on seal and install retaining screws.

Upper Run and Pillar Run

Removal

(1) Remove upper run from run retainer (a press fit into retainer) (Fig. 139).

(2) Remove screw attaching pillar run to upper end of tail gate lower opening weatherstrip.

(3) Remove three screws attaching pillar run and retainer to pillar and remove run and retainer assembly.

Installation

(1) Position pillar glass run and retainer on pillar, inserting upper end into end of roof header glass run retainer and install retaining screws.

(2) Install screw attaching lower end of retainer over lower opening weatherstrip.

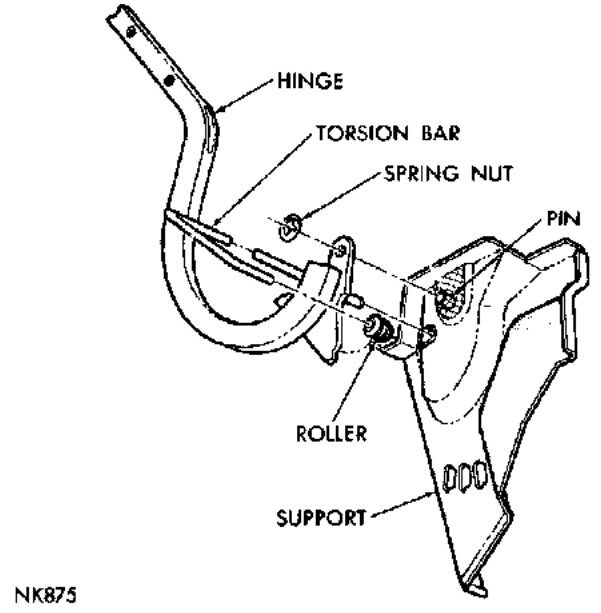


Fig. 140—Deck Lid Hinge and Torsion Bars

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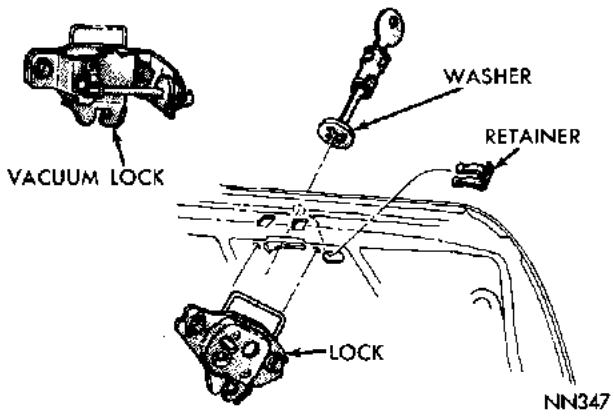


Fig. 141—Deck Lid Lock

(3) Starting at center line of roof rear header glass run retainer, install upper run by pressing it into retainer.

(4) Adjust the pillar glass runs.

DECK LID

Adjustment

The deck lid hinge (Fig. 140) to lid attaching holes are slightly oversize, allowing slight to and fro, and, in and out adjustment striker and lock are adjustable.

Replacement

The deck lid is attached to the hinges by two screws on each side. An assistant's aid is recommended when replacing the deck lid to prevent it from sliding rearward and damaging the paint and also to aid in the aligning of the hinge screw holes when it is installed.

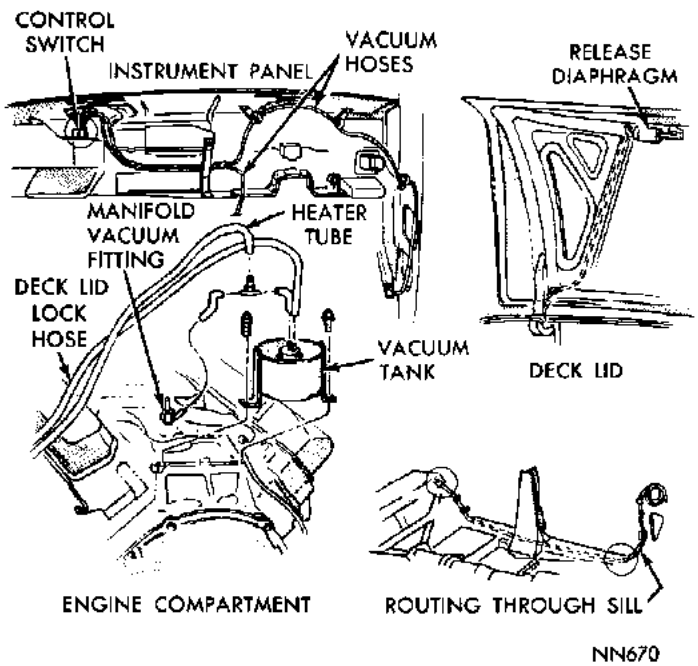


Fig. 142—Vacuum Actuated Lock Release

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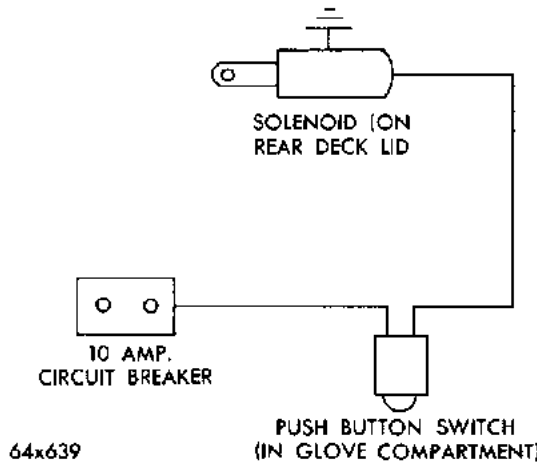


Fig. 143—Electric Deck Lid Lock Wiring

LOCK

Replacement

The deck lid lock assembly (Fig. 141) is attached to the deck lid by two screws. Scribe the location of the lock mounting flanges to air in installation. On vacuum actuated units, disconnect vacuum tube.

Adjustment

Vertical adjustment of the deck lid lock is made at the lock attaching screws. The side adjustment is made at the deck lid striker attaching bolt.

Cylinder Replacement

The deck lid lock cylinder is retained in the body by a spring steel "U" shaped clip attached from within the body.

Vacuum Actuated Lock Release

The vacuum actuated deck lid lock release system (Fig. 142) consists of a vacuum tank mounted on the rear of the engine, a push button control switch in the glove box and a vacuum actuated diaphragm assembly connected to the lock.

Vacuum is supplied to the system from the intake manifold. Rubber hoses are used to connect the component units.

A vacuum leak in the system will cause a noticeable rough engine idle. To determine if the release system is leaking, remove the hose from the manifold fitting tube and plug the end of the tube. Engine idle will smooth out if the release system is leaking.

When testing the system for failure to unlock, a vacuum gauge reading of 16 inches or more indicates the system is satisfactory at the point being tested. Testing the switch at the outlet side or testing the diaphragm assembly hose at the outlet end requires the control switch being operated.

Electric Actuated Lock Release

The electric actuated deck lid lock system (Fig. 143) consists of a push button control switch in the glove

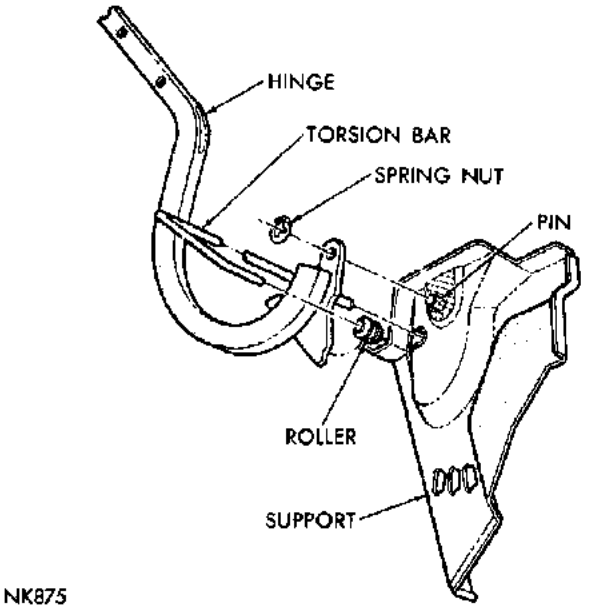


Fig. 144—Deck Lid Hinge and Torsion Bar

box, a 10 amp circuit breaker located behind the left side cowl trim panel and the lock release solenoid connected to the lock.

The deck lid can also be open with the deck lid lock key.

Tests

Should the deck lid lock fail to open when the switch is operated, inspect wire connections at the switch, circuit breaker and solenoid to make certain good contact is made. With good wire connections, test switch for electrical continuity. If switch is satisfactory, test for "open" or "grounded" wires in the system. Test the solenoid.

HINGE

Removal

(1) Remove deck lid assembly.

(2) Disengage torsion bar from hinge (Fig. 144) being removed.

(3) Remove spring nut retaining hinge to hinge bracket and remove hinge.

Installation

(1) Position hinge on hinge pin and using a new spring type nut, lock hinge into position.

(2) Install deck lid assembly and connect torsion bar.

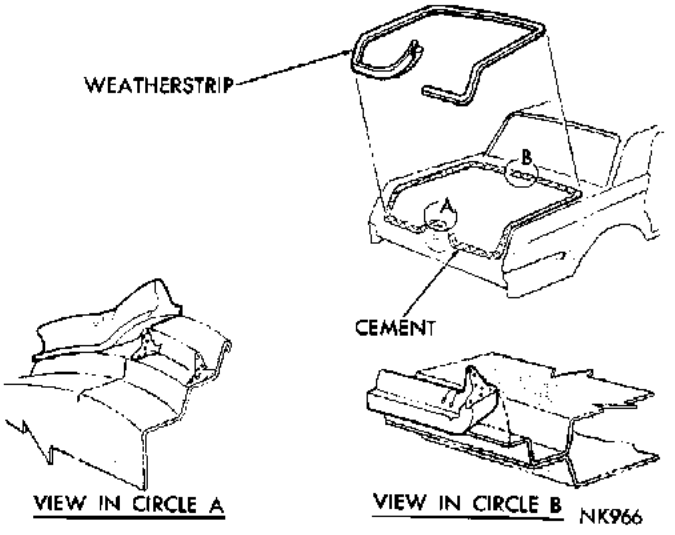


Fig. 145—Deck Lid Weatherstrip

TORSION BAR

Removal

(1) Remove torsion bar (Fig. 144) from adjustment slot. Use care when removing torsion bar as it is under a load.

(2) Unwind torsion bar.

(3) Unhook torsion bar from support bracket.

(4) Push torsion bar out of roller in hinge arm and remove torsion bar from hinge support.

Installation

(1) Install torsion bar, insert bar into hinge support.

(2) Insert end of torsion bar into roller in hinge arm.

(3) Hook torsion bar into support bracket.

(4) Wind torsion bar and insert end of bar into first adjusting slot.

(5) Place deck lid in various open positions and test tension of torsion bars.

(6) Adjust torsion bars progressively until deck lid stays in open position.

WEATHERSTRIPS

Apply an even continuous coat of cement to entire weatherstrip contact surface of deck lid opening (Fig. 145) and install weatherstrip. Make sure molded corners of weatherstrip are correctly positioned.

EXTERIOR MOULDINGS

APPLICATION OF MOULDINGS

The reference numbers on Figures 146, 147 and 148 refer to the type of retainer, illustrated in Figure 149 used at those areas. The reference retainers are typical of the type used.

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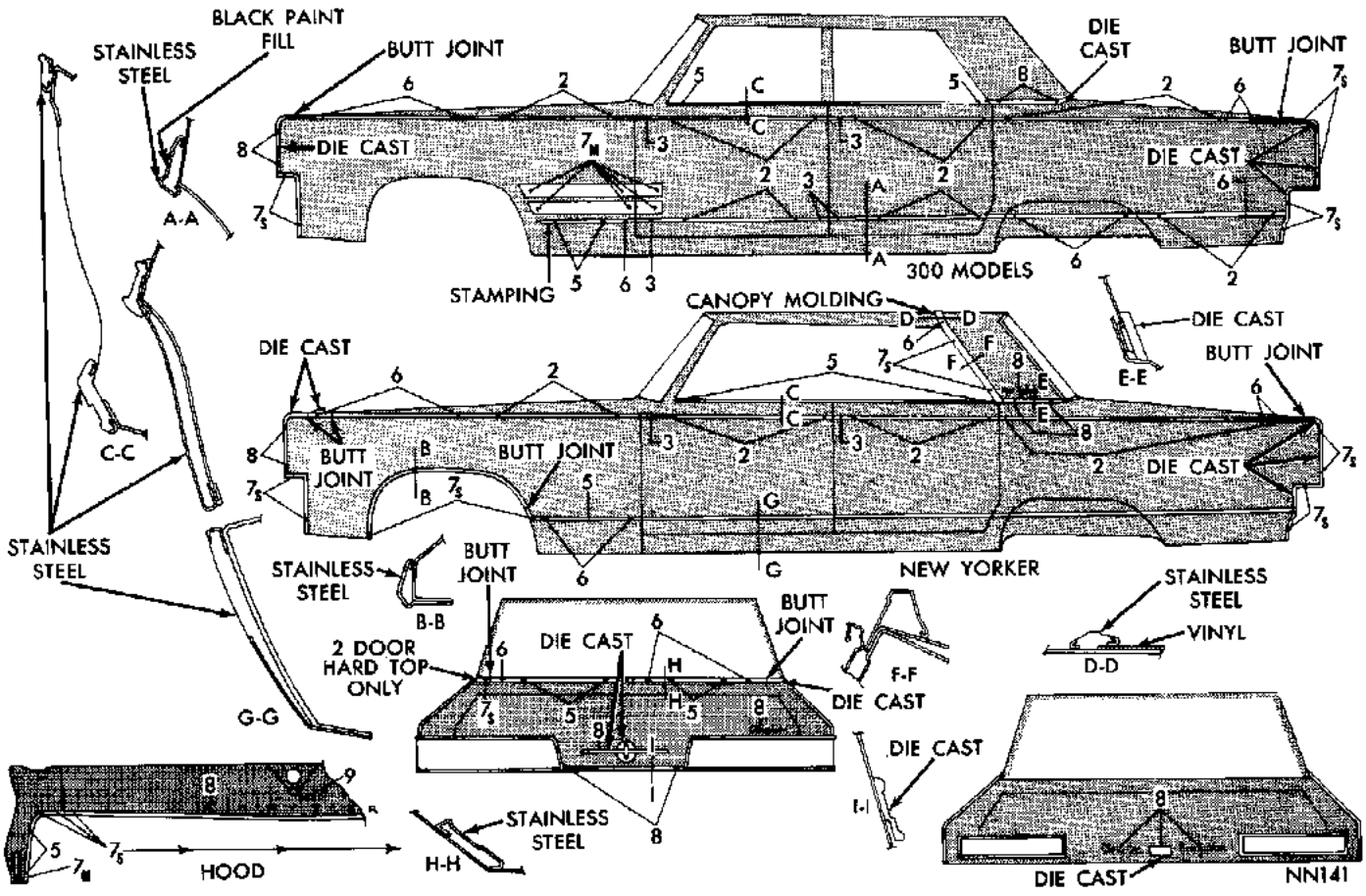


Fig. 146—Exterior Mouldings (300-New Yorker)

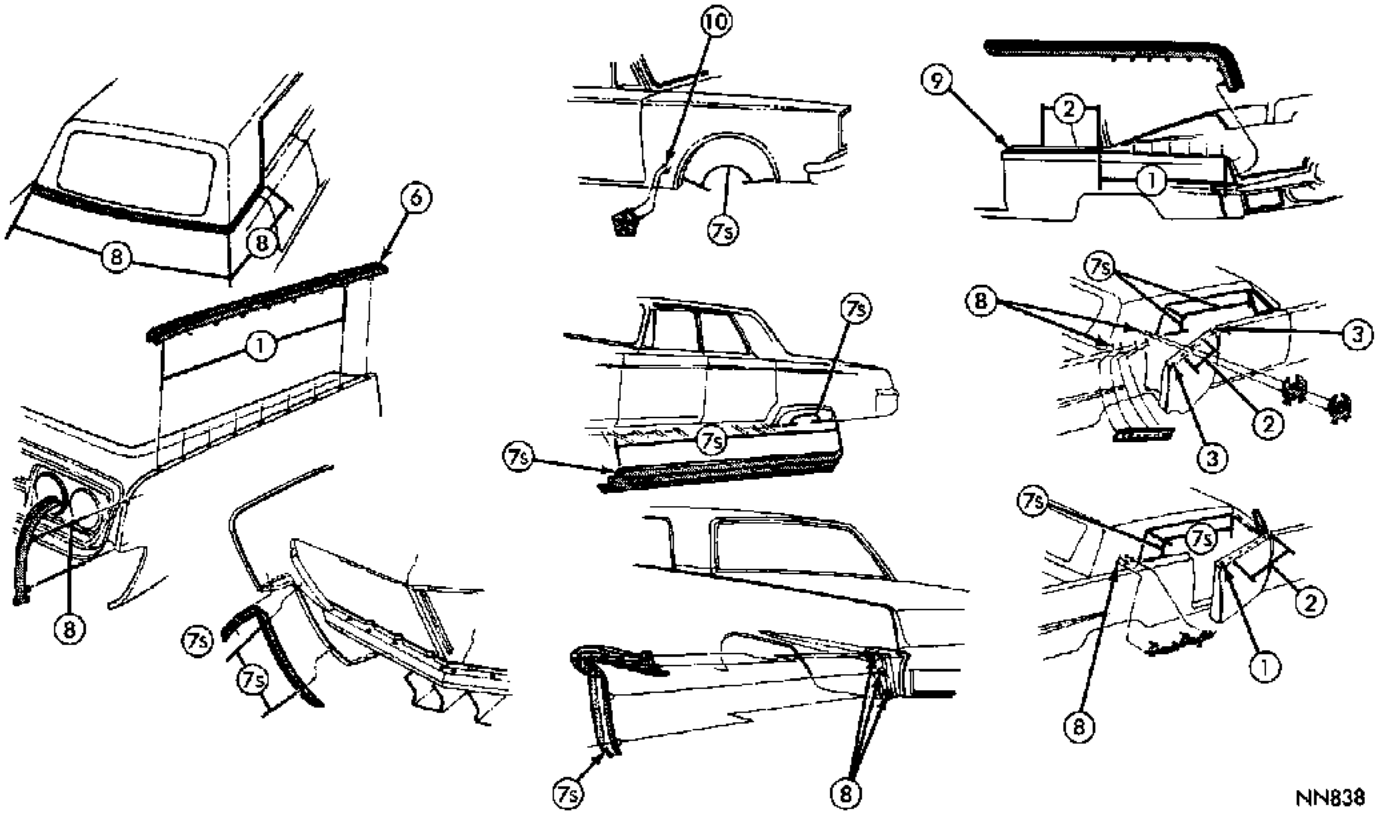


Fig. 147—Exterior Mouldings (Imperial)

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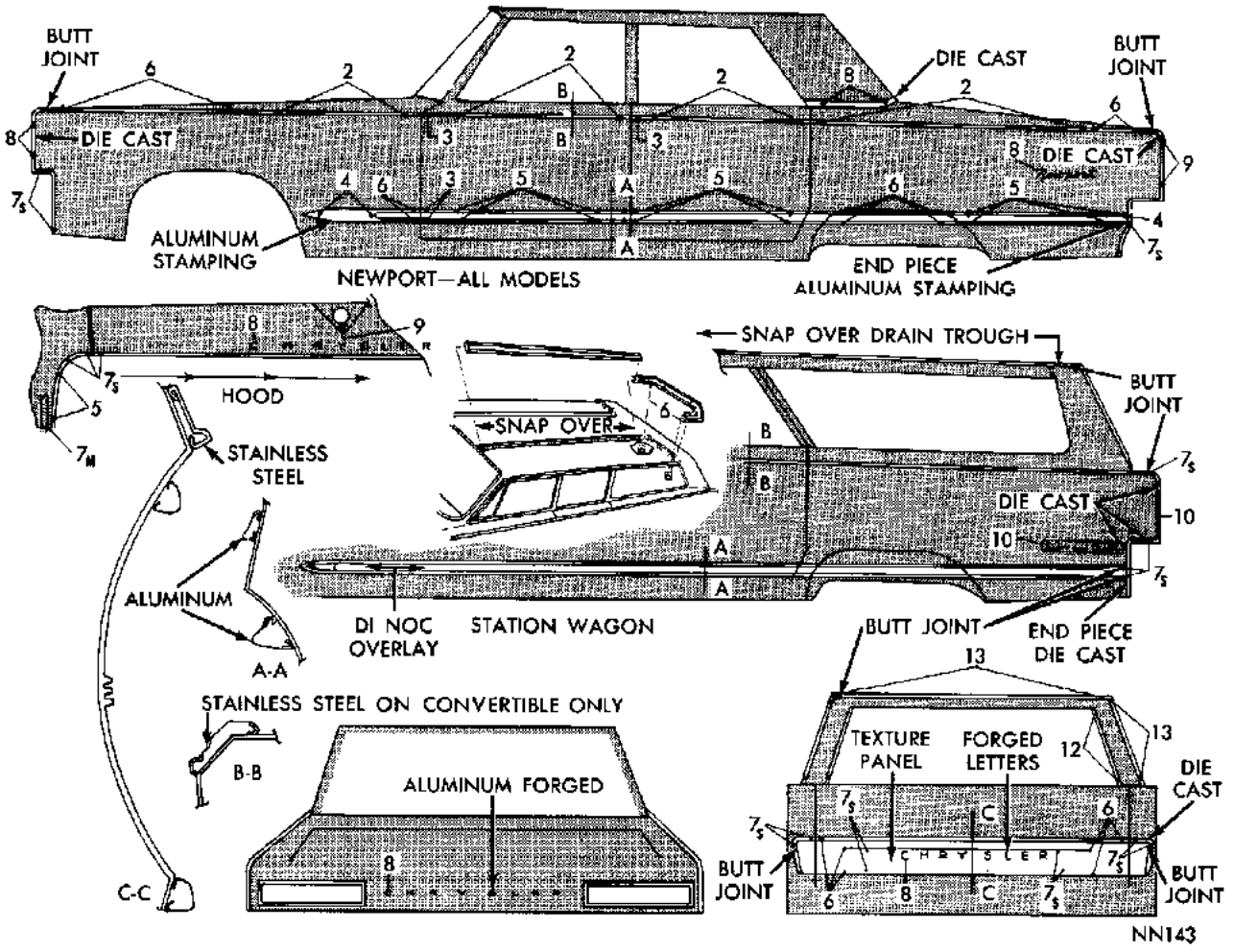


Fig. 148—Exterior Mouldings (Newport)

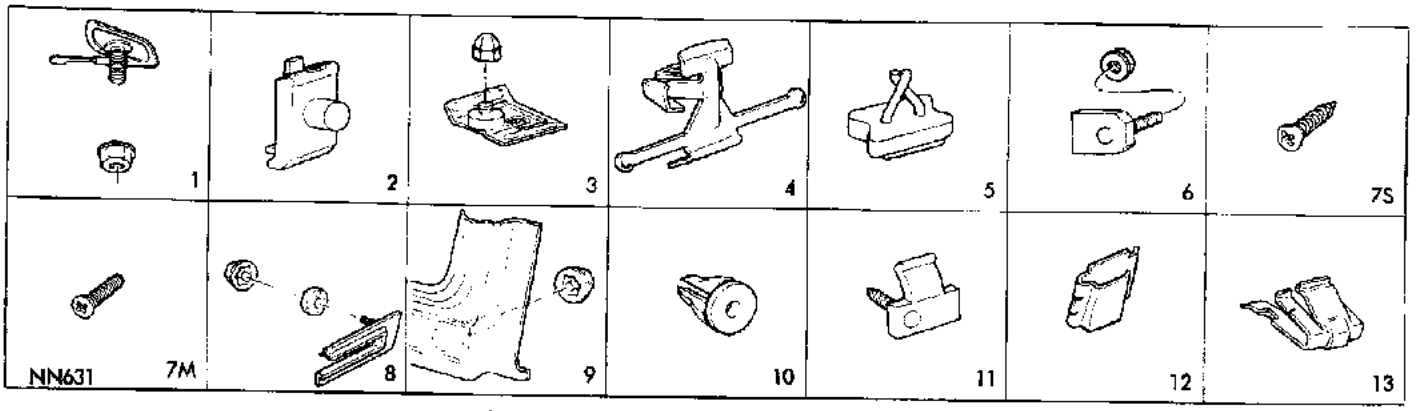


Fig. 149—Ornamentation Retainers

(1) Cam-In Metal or Plastic Retainer w/Stud & Nut
(2) Plastic Drive-Pin Retainer (Snap-Over)
(3) Plastic or Metal Tie Plate Retainer w/Stud & Cap Nut (Door End)
(4) Metal "W" Prong Retainer
(5) Wire Form Retainer
(6) Plastic or Metal Retainer w/Stud & Nut
(7s) Screw (Sheet Metal Thread)
(7m) Screw (Machine Thread)
(8) Die Cast or Aluminum Stud w/Thread Cutting Nut
(9) Driven Stud w/Machine Nut
(10) Die Cast or Aluminum Stud w/Barrel Clip
(11) Plastic or Metal Retainer w/Screw
(12) Metal Retainer w/Pinch Leg (Snap-Over)
(13) Retainer w/Barbs (For Pinch Weld Application)

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INTERIOR TRIM AND SEATS

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INTERIOR TRIM

SERVICE PROCEDURES

GARNISH MOULDINGS

When removing a garnish moulding that is positioned under the end of the adjoining moulding, loosen the end attaching screw to prevent possible damage to both mouldings.

To assure correct alignment when installing the mouldings; install the screws finger tight, align the moulding at each end and tighten the screws. **Use care not to draw the screws down too much or the moulding will be damaged by metal stretching at the screws holes.**

INSTRUMENT PANEL TRIM PAD

The instrument panel trim pads (Figs. 1 and 2) are attached to the instrument panel with stud type retainers at the top edge, screws and retainers at the instrument cluster housings and by mouldings at the lower edges. Make certain the pad is correctly aligned before tightening screws and nuts.

CONSOLE

The consoles (Fig. 3) are attached to welded brackets on the floor pan tunnel with screws and bolts. To loosen the rear mountings, raise the carpet lower edges to expose the screw and bolt. All other attaching screws are accessible from within the console.

FLOOR COVERING

Scuff Plates

The scuff plates and extensions (Fig. 4) are retained to the floor sills, quarter inner panels and support brackets with metal screws. When replacement of a sill scuff plate is required, a continuous ¼ inch bead of sealer should be applied at the ends and outer edge (Fig. 4).

Floor Covering

To remove the rear floor covering (Fig. 5) it is necessary to remove the front seat assembly and the rear seat cushion. The front seat mounting brackets are positioned on top of both front and rear floor covers. The rear floor covering is positioned under the front covering.

On four door hardtop models, when installing a new carpet, use the slits in the jute at the "B" post area (Fig. 5) as a template and cut carpet tabs on each side. Remove the jute from the tab areas.

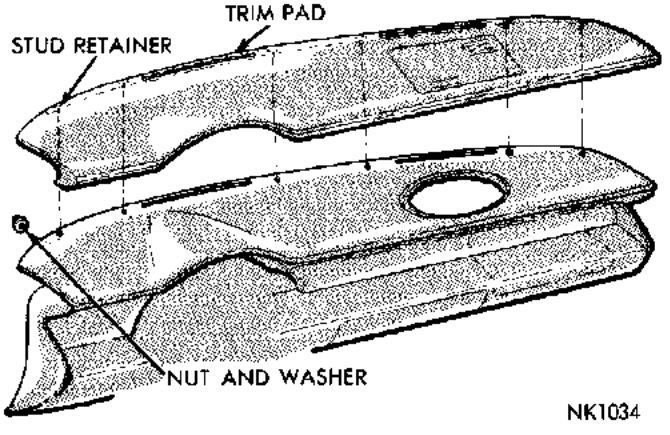


Fig. 1—Instrument Panel Trim Pad (Chrysler)

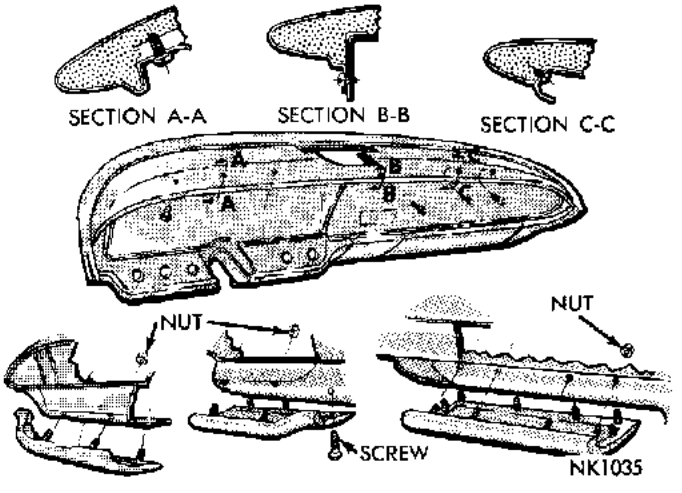


Fig. 2—Instrument Panel Trim Pad (Imperial)

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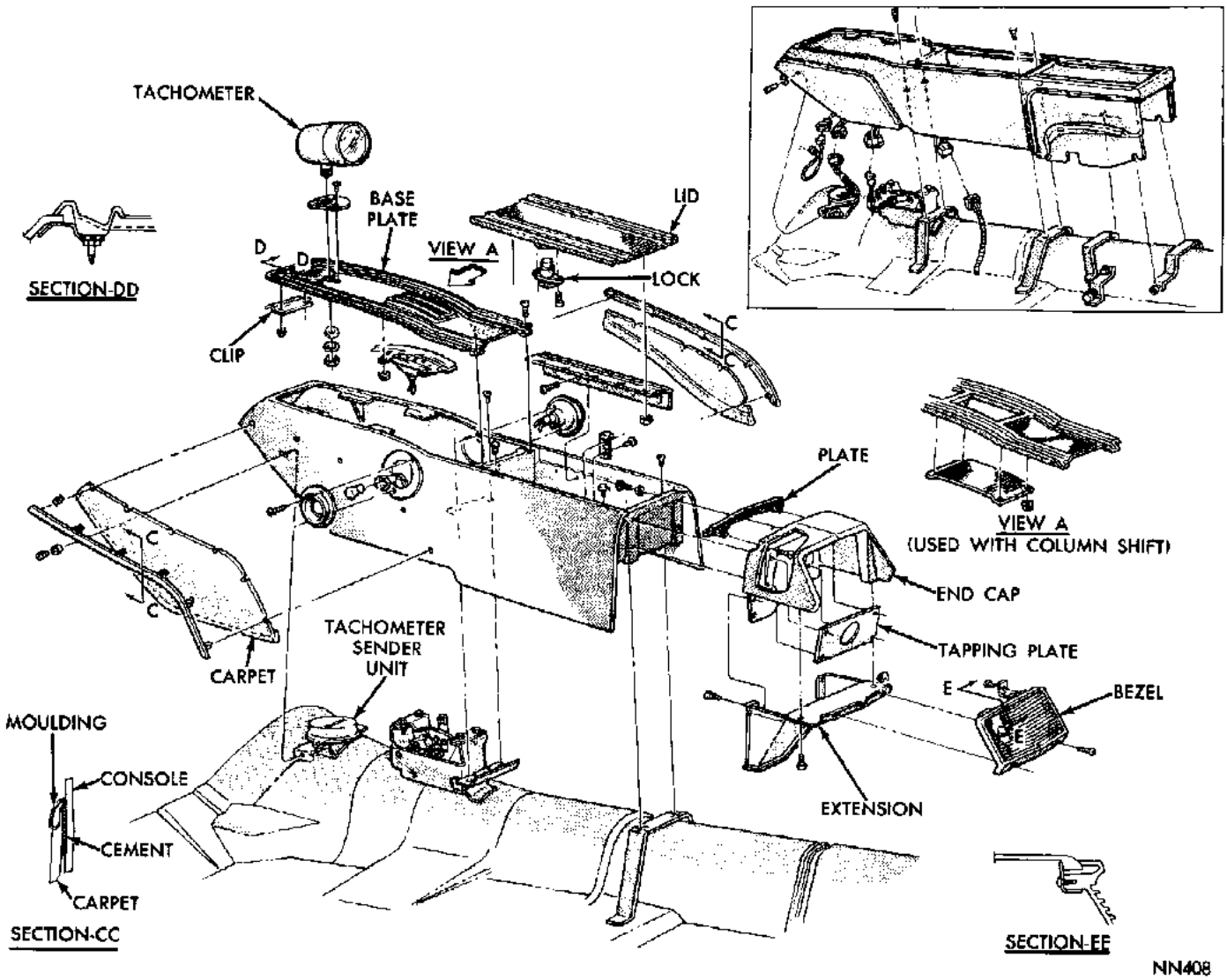


Fig. 3—Console Attachment

HEADLINING

Removal—Fabric Type

(1) Remove rear seat cushion, dome light, bezel and lense, sun visors, rear view mirror and coat hooks.

(2) Remove headlining from cemented areas at windshield header and rear window opening.

(3) Remove headlining from under shelf panel and from quarter panels.

(4) Using a dull bladed putty knife, disengage fabric from side rail retainers (Fig. 6), by gently forcing material up and off of retainers with putty knife and while maintaining pressure on fabric pull the disengaged portion down and out. Work only small areas at a time.

(5) Remove headlining at windshield header.

(6) Remove listing wires from side rail retainers and support wire from rear listing wire (Fig 6).

(7) Remove all foreign material and cement from windshield header area and rear window opening areas.

(8) Remove listing wires from headlining and insert in comparable listing of new liner.

Installation

(1) Trim excess listing material even with edges of headlining.

(2) Locate centerline of lining and at front and rear ends, cut a small notch as an aid in maintaining headlining alignment during installation.

(3) Locate and mark with chalk the centerline points of windshield and rear window.

(4) Center headlining at rear window and insert rear listing wire to retainer clips on roof rail extensions.

(5) Hook rear listing wire to wire supports (Fig. 6) and stretch material sufficiently to remove all wrinkles while maintaining front to rear alignment. The same amount of material should hang down at both sides.

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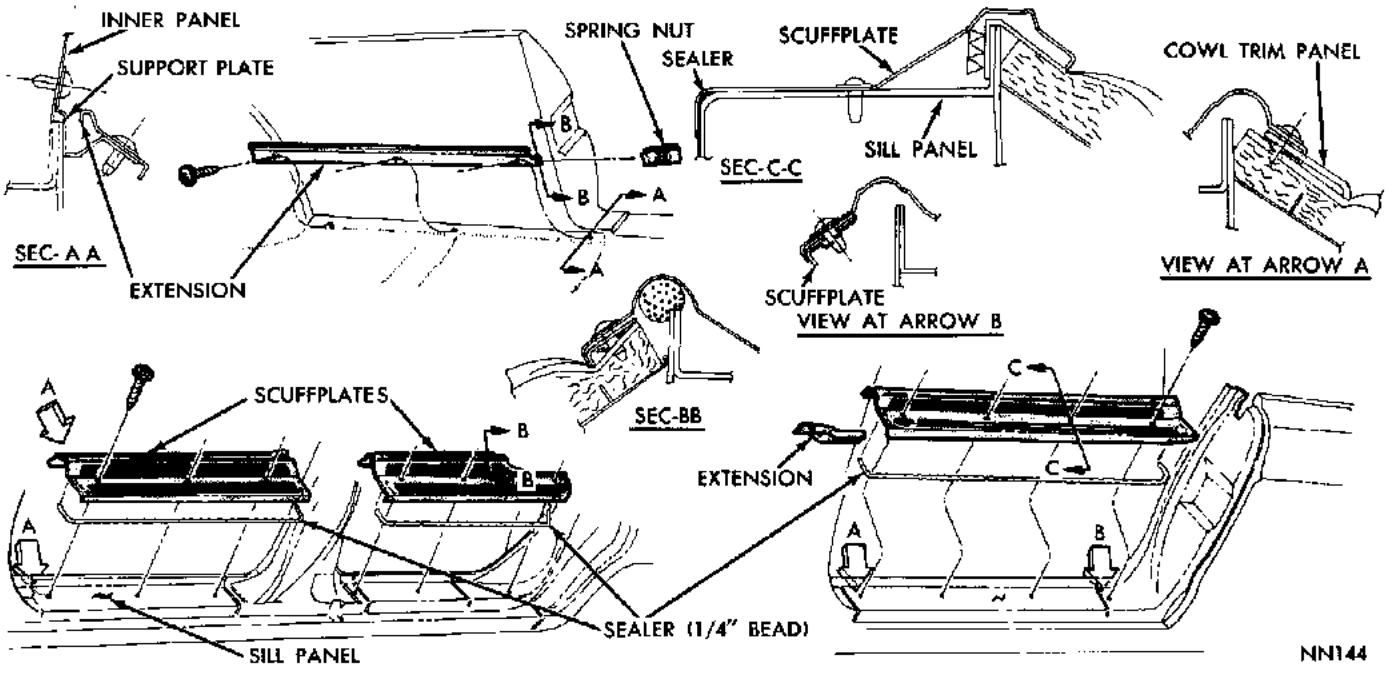


Fig. 4—Scuff Plates and Extensions

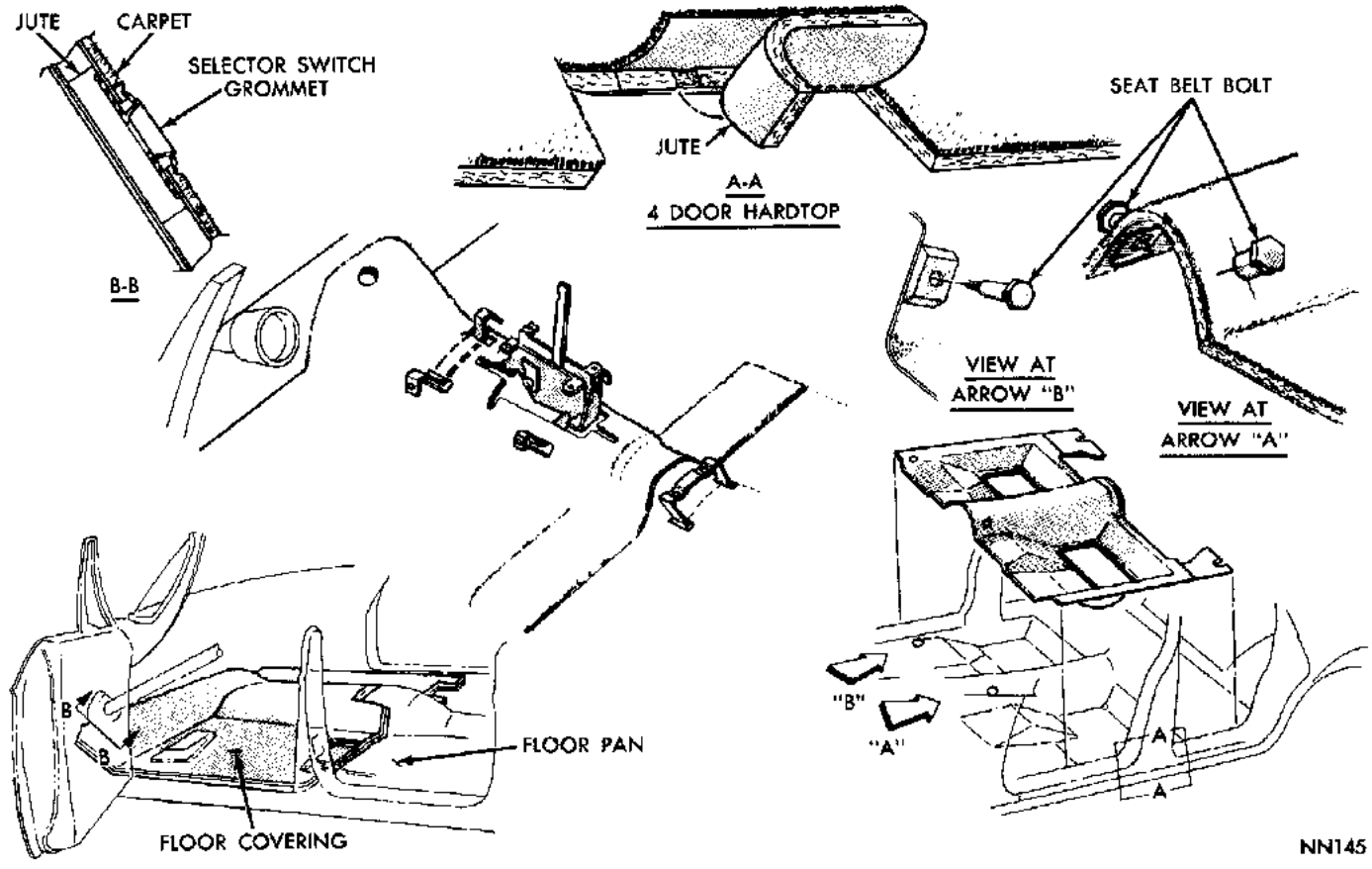


Fig. 5—Floor Covering

(6) Insert remaining listing wires into roof side rail retainers following same cautions as in step 5.

(7) When cement at windshield header area becomes tacky, start at centerline area of windshield and position headlining to cemented area.

(8) Using a dull putty knife, secure liner on barbs at header area, **do not install material at top of windshield posts,** making sure there are no wrinkles and

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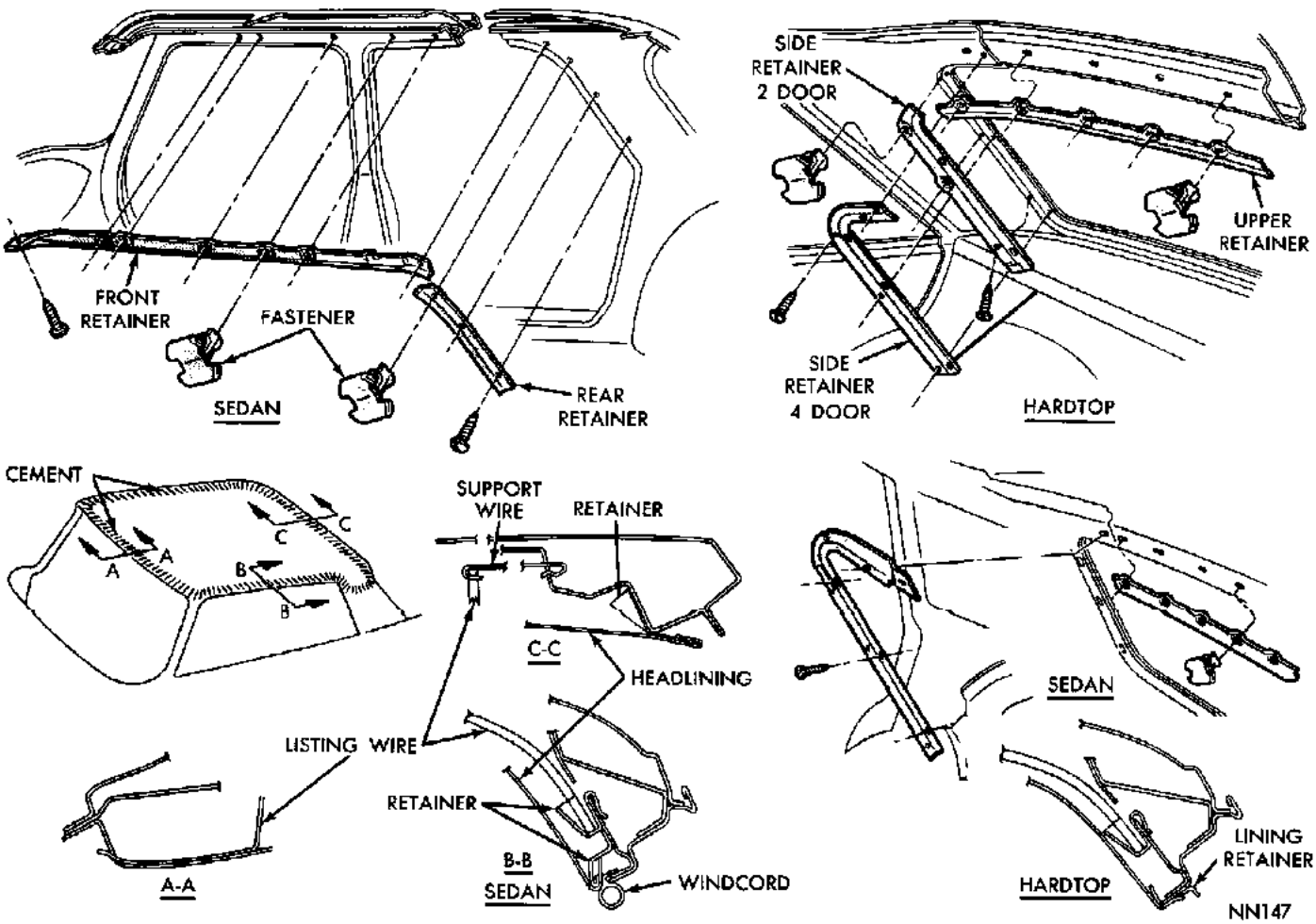


Fig. 6—Headlining Retainers

the fabric seam is straight.

(9) Locate sun visor mounting bracket screw holes in header and cut holes in headlining slightly larger than attaching screws.

(10) Install sun visors and tuck in corners of headlining at top of windshield posts.

(11) Locate rear visor mirror bracket screw holes, cut holes in fabric slightly larger than screws and install mirror.

(12) When installing headlining at side rail retainers, work only a small section at one time to make certain seams are straight and material is free of wrinkles.

(13) Using a dull putty knife and working alternately from side to side, install headlining on side rail retainers.

(14) Apply cement to rear window opening and to quarter panel area, and after cement becomes tacky, install headlining at rear window area, starting at top center and working outward, down the sides.

(15) Install rear seat cushion and coat hooks.

(16) Locate dome light opening and cut out sufficient material for correct lighting. Install dome lamp bezel and lense.

HARD BOARD LINING

Retainer Moulding Replacement

The individual hard board headlining sections are held in position with semi-flexible type plastic moulding (Fig. 7) forced over the retainer sections of the roof bows. Starting at either outer end, remove the end cap and pry the moulding off the retainer. When installing the moulding make certain it is fully seated and evenly spaced from side to side. Install the end caps in the headliner retainer and over the moulding ends.

LINING SECTION

To remove either the front or rear headlining sections, remove the windshield or rear window garnish mouldings and the one moulding at the inner edge, all inner sections require only the outer edge mouldings be removed.

Removal

(1) Remove plastic mouldings (Fig. 7) at edges of section being removed.

(2) Using a fibre tool force liner section off of roof bow and out of side retainers.

(3) Inspect liner section for damaged edges.

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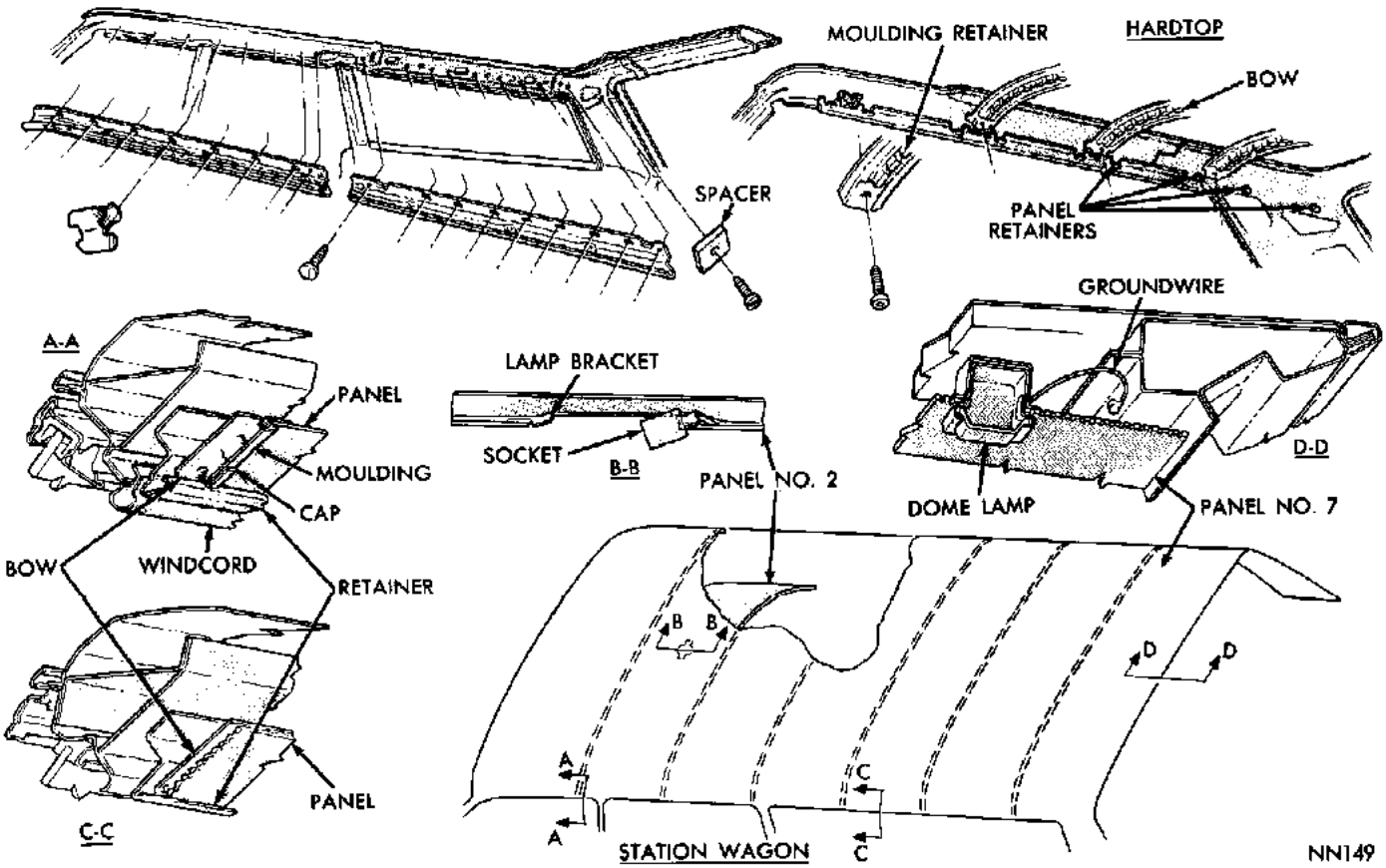


Fig. 7—Hardboard Headlining Attachment

Installation

(1) Position liner section on side retainers and in alignment with mating surface of roof bow.

(2) Push section up at center to seat it in side retainers.

(3) Align edges of section with moulding retainer on roof bows.

(4) Install mouldings on bow retainers and caps over ends.

(5) Install any garnish mouldings removed.

GLOVE BOX

Removal (Chrysler)

(1) Remove glove box door and disconnect deck lid vacuum switch lines at switch.

(2) Remove screws attaching glove box to instrument panel (Fig. 8) and remove glove box assembly.

(3) Remove glove box map drawer and housing (Fig. 8).

(4) Remove screws attaching upper glove box half to lower half.

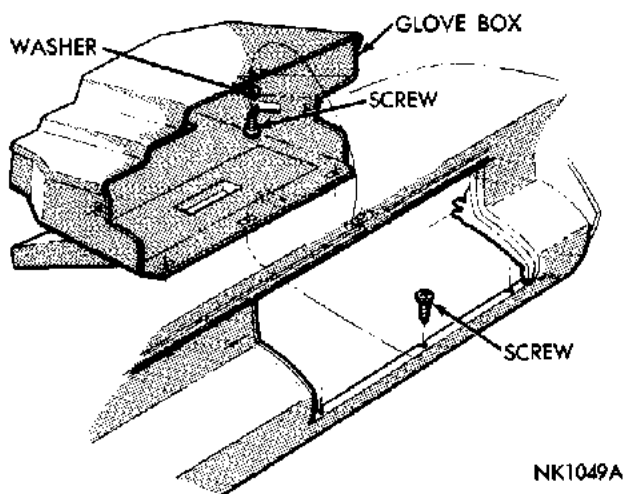


Fig. 8—Glove Box Replacement (Chrysler)

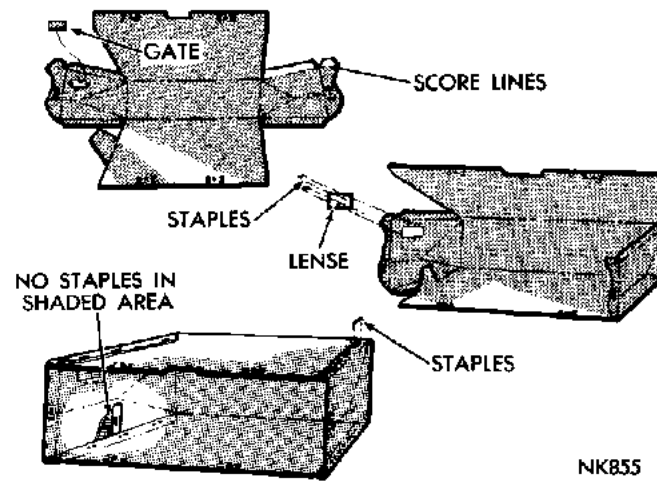


Fig. 9—Assembling Glove Box (Chrysler)

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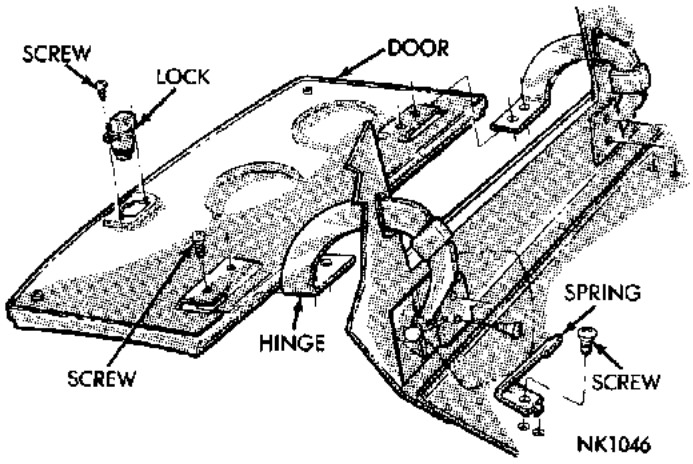


Fig. 10—Glove Box Door (Imperial)

(5) Remove tissue container retainer screw and map drawer screws.

(6) Remove nut attaching vacuum switch to mounting bracket (Fig. 9).

(7) Remove screws attaching switch mounting bracket to glove box upper half and remove bracket.

Installation (Chrysler)

(1) In new cover, drill necessary holes for vacuum switch attachment. The large hole is a one (1) inch diameter and the three smaller holes are a 7/32 inch diameter (Fig. 9).

(2) Position switch mounting bracket on glove box upper half and install retaining screws and washers.

(3) Position vacuum switch in mounting bracket and install retaining screws and nuts.

(4) Position glove box map drawer housing on glove box lower half and install attaching screws.

(5) Set glove box upper half in position on lower half and install attaching screws.

(6) Install tissue container retainer.

(7) Position map drawer in housing and push into place.

(8) Install glove box drawer and connect vacuum lines to switch.

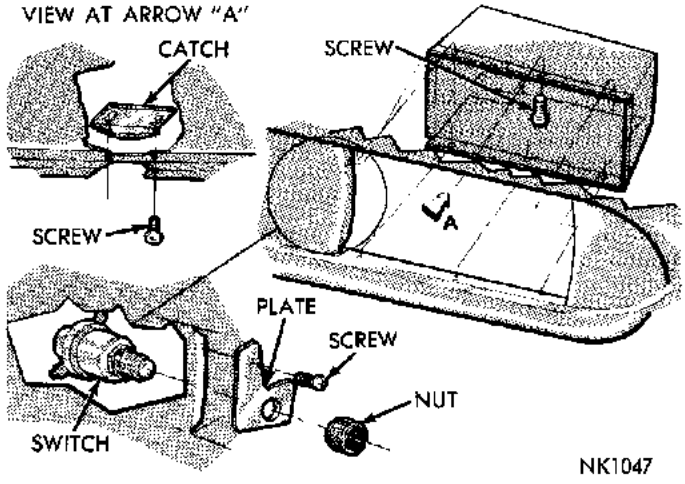


Fig. 11—Glove Box Replacement (Imperial)

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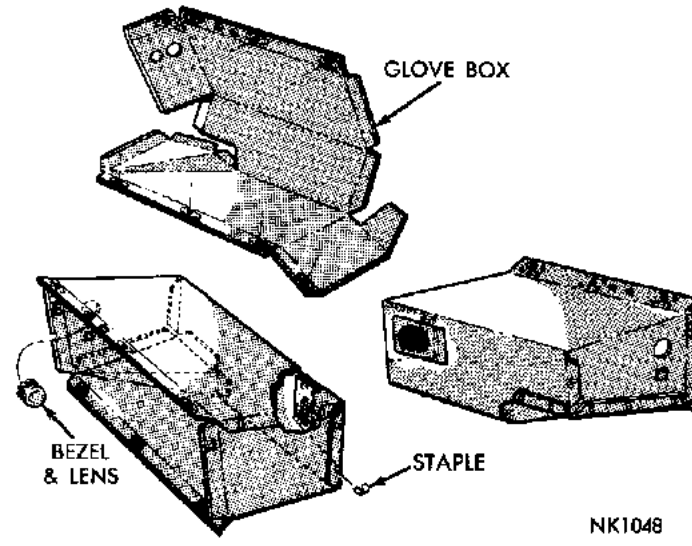


Fig. 12—Assembling Glove Box (Imperial)

Removal (Imperial)

(1) Remove glove box door (Fig. 10) from hinges.

(2) Remove screws attaching glove box assembly (Fig. 11) to opening in instrument panel.

(3) Remove nut attaching deck lid remote switch to glove box.

(4) Remove glove box assembly from opening.

Installation (Imperial)

(1) Fold new glove box along scored lines and staple overlapped areas (12 places) (Fig. 12).

(2) Punch out material from glove box side for installation of deck lid remote switch.

(3) Position glove box in instrument panel opening and install attaching screws, except at remote switch area.

(4) Insert remote switch into opening in glove box side panel and position mounting plate over end of switch (Fig. 11).

(5) Install mounting plate screw and switch mounting nut.

(6) Install glove box door (Fig. 10).

(7) Adjust glove box door lock catch to effect a secure closing.

SEATS

ADJUSTMENT

The horizontal slots (Fig. 13) allow a fore or aft movement of 1⅝ inches. The vertical slots allow up, down, or tilt movement of 1⅛ inches.

Loosen the four adjusting bolts (two in each seat base) and after positioning the seat as desired, tighten the bolts to lock it in place. Each seat track is attached to the seat by two studs and nuts.

REPLACEMENT

Front Seat

The bench type front seat cushion (Fig. 14) is an integral part of the seat frame. All seat frames are

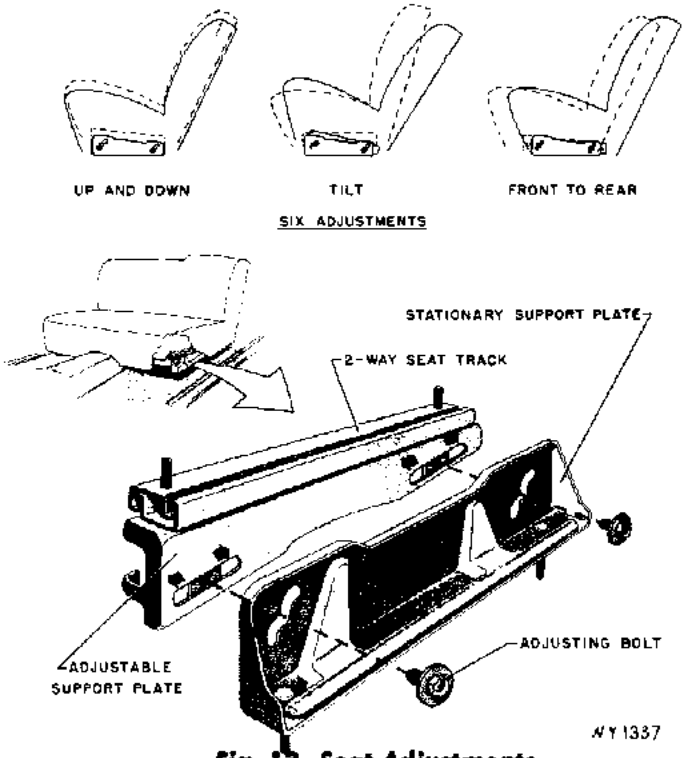


Fig. 13—Seat Adjustments

attached to the adjusting track, by studs and nuts, which in turn is attached to the stationary plate by bolts. To remove the seat assembly, remove the nuts, from under the floor pan, attaching the stationary plates to the floor pan.

Rear Seat Cushion

The rear seat cushion (Fig. 15) is held in place by inserting the rear edge of the seat cushion under the lower edge of the seat back. The front lower frame of the seat engages into a slotted bracket welded to the floor pan. **On cars equipped with a rear seat heater, extreme care must be used to make certain the heater nozzles (mounted under the cushion) are IN COMPLETE ALIGNMENT with the floor mounted air ducts (Fig. 16) to eliminate possible damage.**

Rear Seat Back

The rear seat back (Fig. 15) is held in place by tangs of the upper edge of the seat frame being positioned over hangers on the shelf panel. The lower edge of the seat back incorporates two metal straps which are attached to mounting brackets welded to the rear floor pan.

Town and Country—Second Seat Back

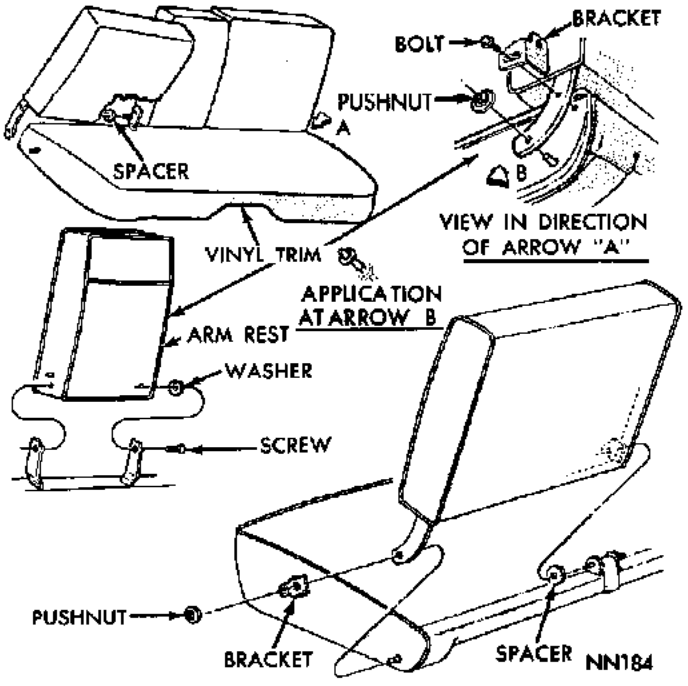
Removal

(1) Remove screws attaching second seat back to hinge assemblies (Fig. 17).

(2) Release catch from seat back and remove seat back assembly.

Installation

(1) Position second seat back on hinge assemblies.



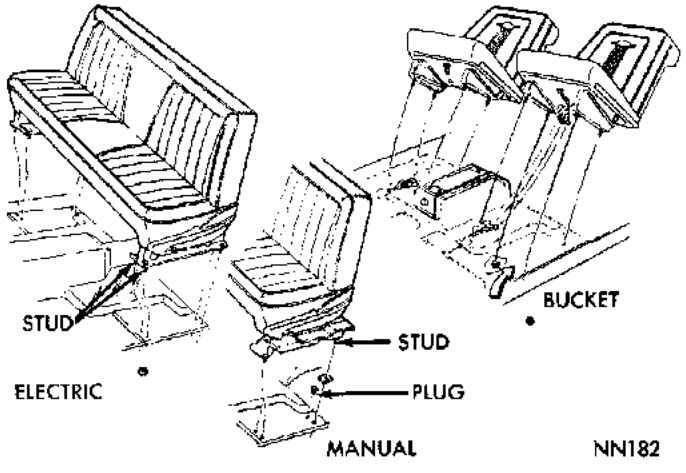


Fig. 14—Front Seat Attachment

(2) Install hinge to seat back screws and tighten to 80-120 inch pounds.

(3) Test engagement of seat back catches on seat back and adjust as necessary.

Second Seat Cushion

Removal

(1) Raise rear floor hinged panel at rear of seat cushion assembly (Fig. 18) to expose seat cushion to floor pan attaching screws.

(2) Remove screws attaching seat cushion to floor pan.

(3) Move seat cushion slightly rearward to disengage locking bars at front bottom side of seat cushion from floor brackets.

(4) Remove seat cushion assembly.

Installation

(1) Place seat cushion in position, making certain locking bars at bottom of front seat cushion are engaged in brackets on floor pan.

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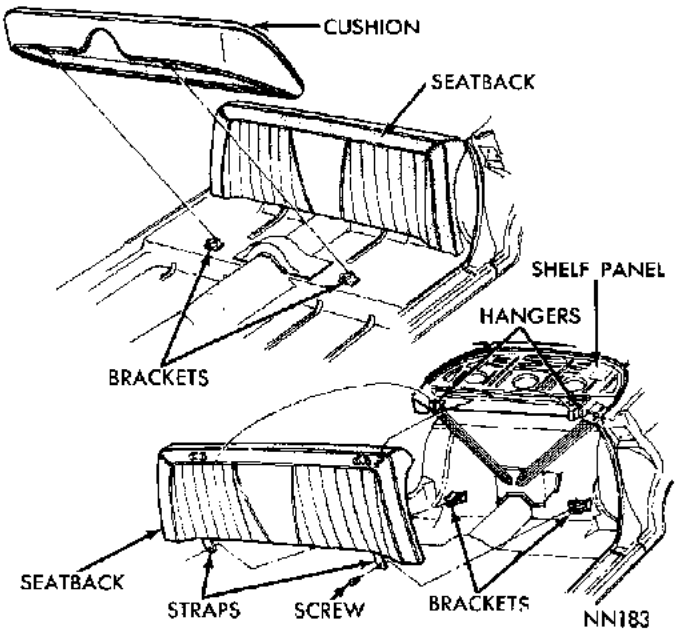


Fig. 15—Rear Seat Attachment

(2) Raise hinged portion of rear floor, at rear of seat cushion, and install screws attaching seat cushion mounting straps to floor pan.

Third Seat Back

Removal

(1) With third seat back in UP (Fig. 19) position, remove screws from seat hinge links.

(2) Remove seat back and support panel assembly.

(3) The seat back cushion is retained to seat back panel (Fig. 19) with screws.

Installation

(1) Position seat back cushion on seat back panel and install retainer screws.

(2) Position seat back and support panel assembly on hinge links and install retaining screws.

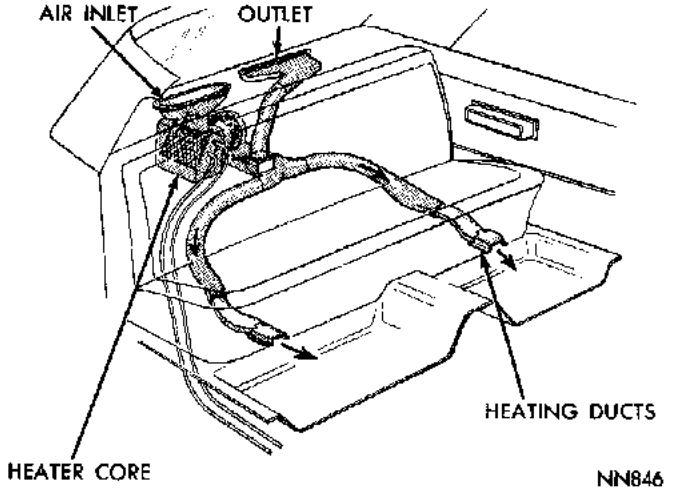


Fig. 16—Rear Seat Heater Air Ducts

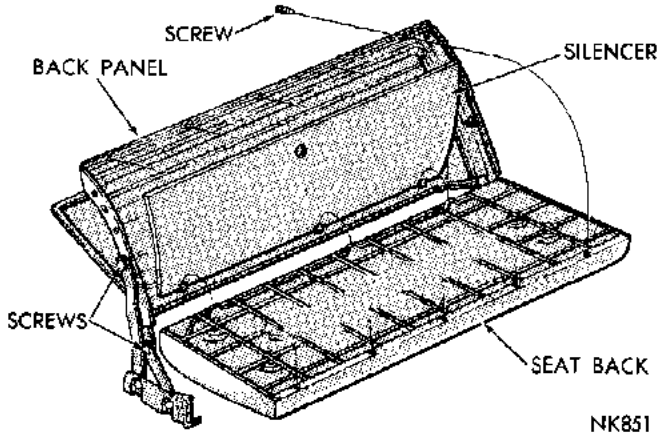


Fig. 17—Second Seat Back

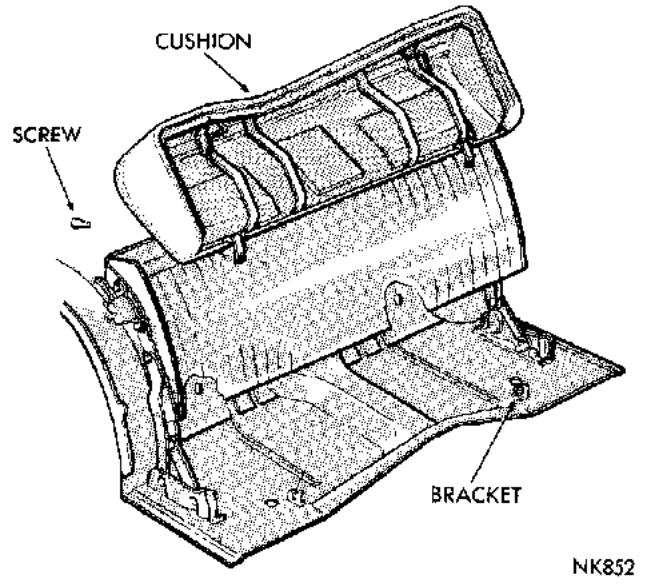


Fig. 18—Second Seat Cushion

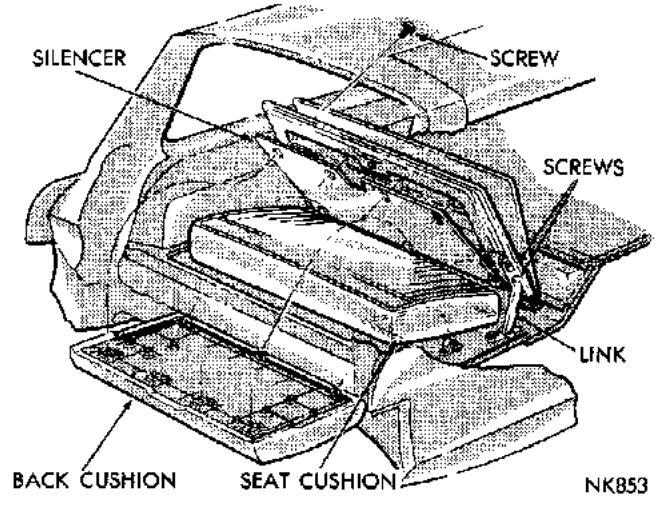


Fig. 19—Third Seat Back and Cushion

Cushion

Removal

(1) The third seat cushion is attached to hinges

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which in turn are attached to quarter inner panels by screws.

(2) Remove screws attaching hinges to quarter inner panel.

(3) Remove rear seat cushion assembly.

Installation

(1) Position cushion assembly on rear floor pan.

(2) Install hinges on quarter inner panel and tighten securely.

(3) Test operation of seat and inspect fit and alignment.

(4) Adjust by loosening hinges and moving seat as required.

RECLINING SEAT MECHANISM

For ease of assembling, the following procedures should be performed in sequence as listed.

Bucket Type (Fig. 20)

(1) Insert adjuster assembly into rear of seat back with clevis end of adjuster over the bracket and rod end protruding through hole in bottom facing of seat back.

(2) Align holes of adjuster clevis end with holes in bracket on seat back and secure with spring pin.

(3) Push release handle shaft, from inside, through hole in seat back.

(4) Hook release handle on release wire and position assembly on handle shaft.

(5) Install spring washer and retaining ring on release shaft.

(6) Position pivot brackets on seat back into stanchions on base assembly and secure with spring pins.

(7) Position rod end of adjuster in base assembly stanchion and secure in place with spring pin.

(8) Assemble seat back, cushion, back stop bumper and outer shield.

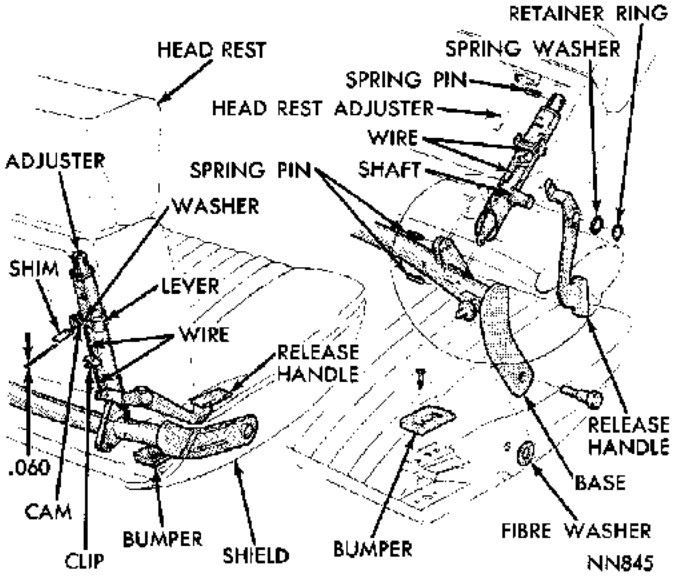


Fig. 20—Reclining Seat Mechanism (Bucket Type)

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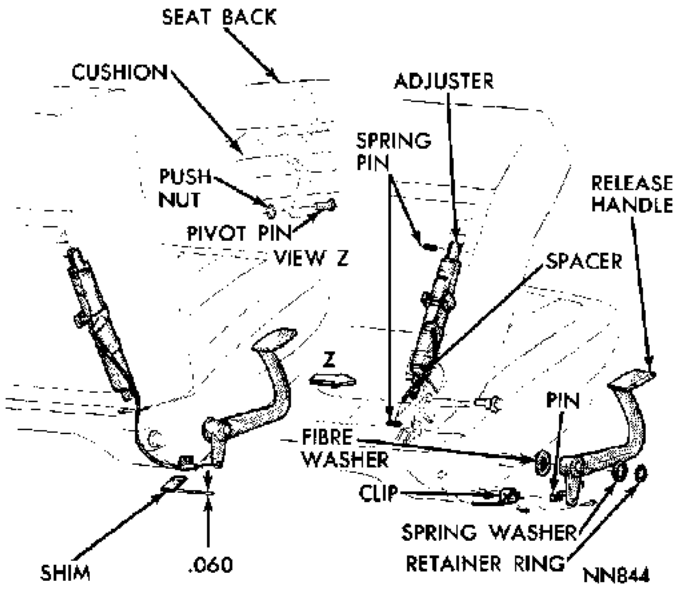


Fig. 21—Reclining Seat Mechanism—Imperial 4 Door Hardtop

(9) With seat back in upright position, compress adjusting clip to free release spring, press release handle down as far as possible.

(10) Insert a .060 inch shim between the cam and adjuster washer and pull release lever down until cam presses shim against adjuster washer.

(11) Release adjusting clip and remove shim.

(12) Test operation of mechanism.

(13) Push seat back forward and pull seat material flap over base and attach with a hog ring to back of seat.

Imperial 4 Door Hardtop

Make certain spacer is installed on rod end of adjuster assembly (Fig. 21), otherwise seat cannot be assembled.

(1) Insert adjuster and cable assembly into rear of seat back, with clevis end on bracket and rod end protruding through hole in bottom facing of seat back.

(2) Route cable between edge of bottom facing and back spring frame of seat back. **Do not use hole for adjuster rod.**

(3) Position adjuster clevis end in bracket on seat back and secure with spring pin.

(4) Position seat back on cushion, with shoulder bolt on right side and pivot pin and push nut on left side.

(5) Position cable to rear of seat cushion.

(6) Position adjuster rod end in cushion bracket and secure with spring pin.

(7) Slide fibre washer, release handle and spring washer over release shaft and secure in place with retaining ring.

(8) Push retainer pin through hole in release handle, slide eye of adjuster cable over pin and fasten with cotter pin.

(9) Slide retaining clip over cable housing and fasten to side of seat cushion with two screws finger tight only.

(10) Insert .060 inch shim between release handle and bottom of seat cushion. Push release handle down firmly against shim and pull cable housing through retaining clip (away from handle) to remove all slack.

(11) Tighten screw to lock sheath in retaining clip and remove shim.

(12) Raise seat back to upright position and remove spacer from rod end of adjuster.

(13) Test operation of mechanism.

SEAT BUILD-UP

The illustrations being used as references for the seat cushion and back build-up procedures contain circles in which numerals are inserted. These circles also have a reference line to certain areas of the unit. The numerals within the circles designate the area referred to by the procedure step number being read. The illustrations and procedures cover the basic methods of build up.

Normally, only the cover will be replaced. In those instances make certain the spring pad (where used) and pad cover are centered on the spring and are attached correctly.

Attachment of the various components should be performed in the following sequence:

Front Seat Cushion—Chrysler Bench Type (Fig. 22)

(1) Spring pad to the 3rd vertical bar of the 1st, 3rd and 5th intermediate element with [6] hog rings—front.

(2) Spring pad to the 2nd vertical bar of center elements with [2] hog rings—front.

(3) Spring pad to top rim with [6] hog rings—(3) each side equally spaced.

(4) Spring pad and cover pad to the 10th bar of each intermediate element with [11] hog rings—rear.

(5) Spring pad and cover pad to the 8th bar of each center element with [3] hog rings—rear.

(6) Cover to each slot in frame assembly with [12] hog rings—front, [6] hog rings—right side, [7] hog rings—left side (electric seat).

(7) Cover to each trim tab in frame assembly with [14] hog rings [7] each side (manual seat), [2] hog rings [1] each side (electric seat).

(8) Cover listings to the 12th bar of each intermediate element with [11] hog rings—rear.

(9) Cover listing to the 8th bar of each center element with [3] hog rings—rear.

(10) Cover to the 12th bar of each intermediate element with [11] hog rings—rear.

(11) Cover to the 8th bar of each center element with [3] hog rings—rear.

(12) Front seat back side facing to slots or trim tabs to cushion frame-outer with [6] hog rings [3] each side (4 door only).

(13) Lower side facing to bottom slot in cushion frame-inner with [2] hog rings [1] each side.

(14) Lower side facing to the 12th bar of the 1st element with [2] hog rings [1] each side (4 door only).

(15) Silencer to 3rd horizontal and vertical bar of the 1st element with [4] hog rings, [2] per silencer.

Bucket Seat Cushion—All (Fig. 23)

(1) Pad support to 2nd bar of end and 1st intermediate elements with [4] hog rings—front.

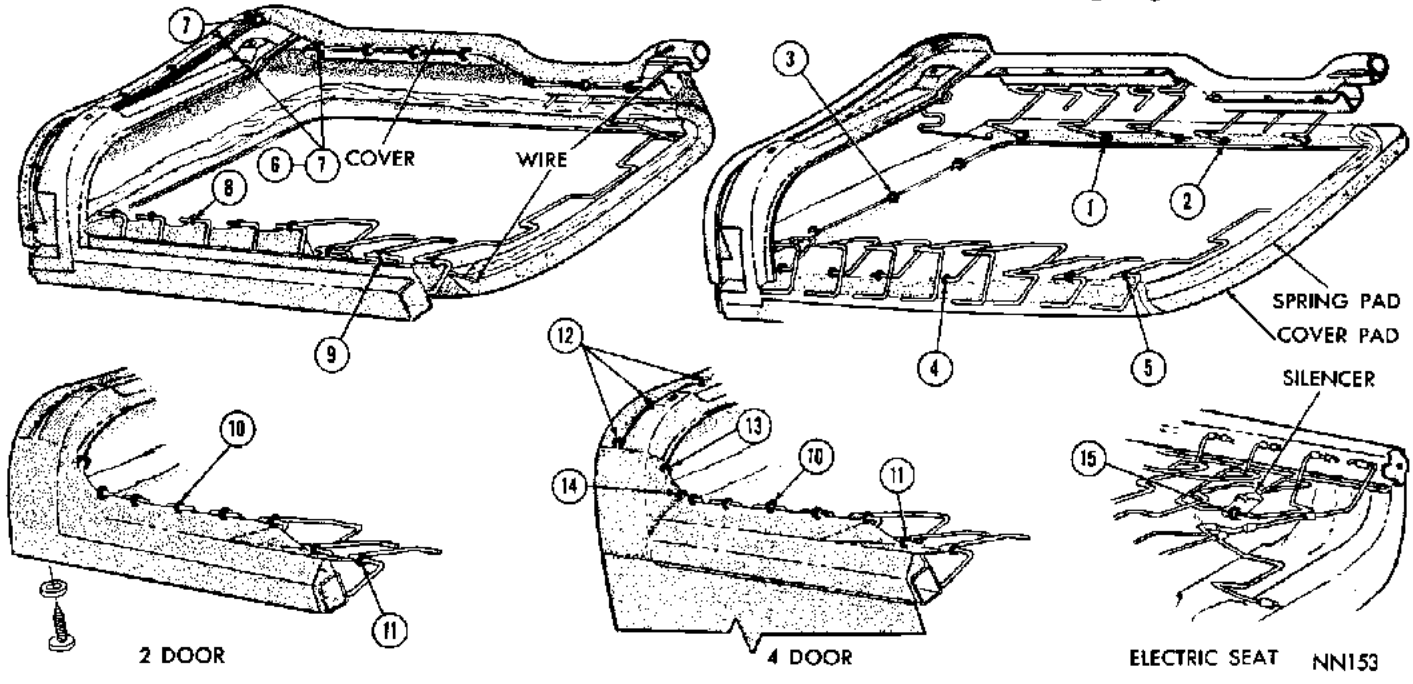


Fig. 22—Front Seat Cushion (Chrysler Bench Type)

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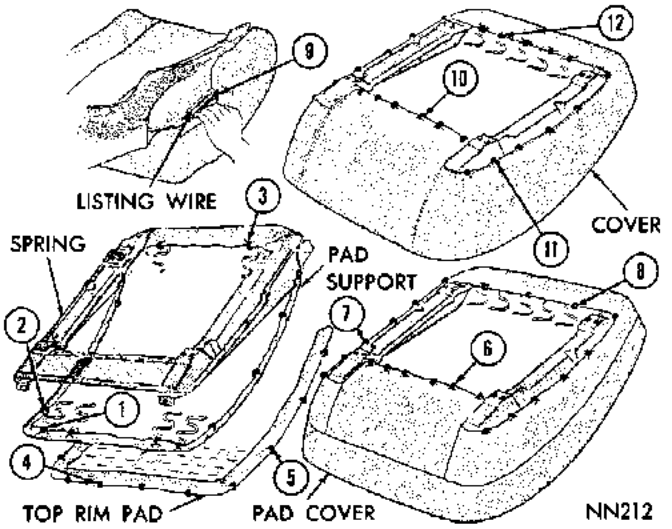


Fig. 23—Bucket Seat Cushion (all models)

(2) Pad support to top rim with [6] hog rings equally spaced—sides.

(3) Pad support to 3rd bar of 1st intermediate element with [2] hog rings—rear.

(4) Top rim pad to top rim with [4] hog rings equally spaced—front.

(5) Top rim pad to top rim with [8] hog rings, [4] each side, equally spaced.

(6) Cover pad to holes in frame with [6] hog rings —front.

(7) Cover pad to holes and tabs with [7] hog rings —sides.

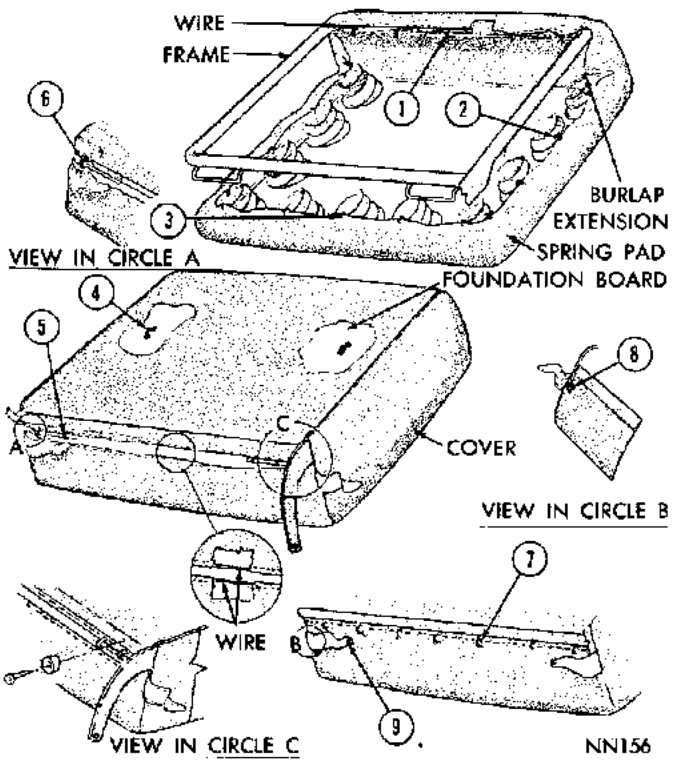


Fig. 24—Front Seat Back—Two Door (Chrysler)

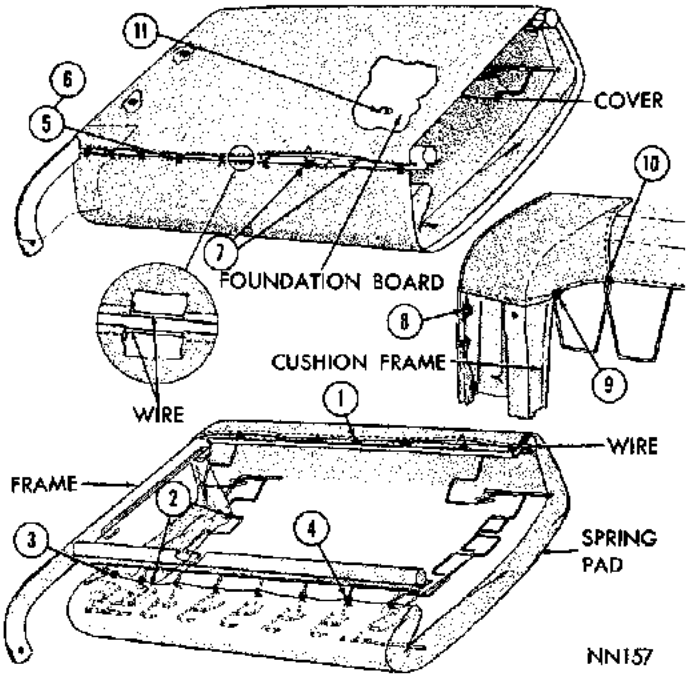


Fig. 25—Front Seat Back—Four Door (Chrysler)

(8) Cover pad to 4th bar of 1st, 3rd and 5th intermediate elements with [3] hog rings—rear.

(9) Cover listings with [6] hog rings, [3] each side.

(10) Cover to frame holes with [6] hog rings—front.

(11) Cover to frame and tabs with [7] hog rings —side.

(12) Cover to 4th bar of the intermediate elements with [5] hog rings—rear.

Front Seat Back

Two-Door Chrysler (Fig. 24)

(1) Spring pad to listing and trim brace with [5] hog rings equally spaced—top.

(2) Spring pad to 3rd turn of #1 and 5 coils of each row with [8] hog rings [4] each side. Twist burlap extension and attach firmly to suitable coil turn with [2] hog rings [1] each side.

(3) Spring pad to 3rd turn of each coil in bottom row with [5] hog rings.

(4) Foundation board to brace "X" with [2] hog rings.

(5) Cover rear to semi-bottom rim with [4] hog rings [2] each side.

(6) Inside tab to semi-bottom rim with [1] hog ring.

(7) Cover front to cover rear with [7] hog rings equally spaced—bottom.

(8) Cover rear welt to cover front with [2] hog rings [1] each side.

(9) Side facing extension flap to cover front and rear wires with [2] hog rings [1] each side—bottom.

4 Door—Chrysler (Fig. 25)

(1) Spring pad to trim tabs in upper retainer with [9] hog rings—top.

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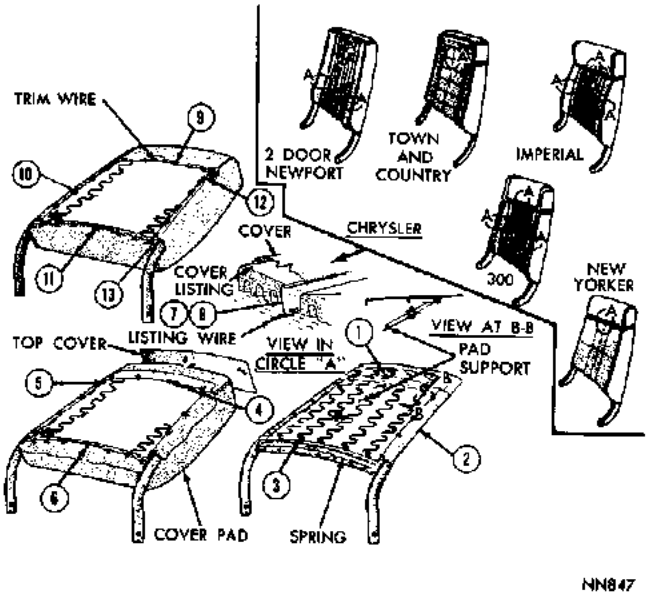


Fig. 26—Bucket Seat Back—(All Models)

(2) Spring pad to 3rd, 5th, and 7th bar of formed wire element with [6] hog rings—[3] each side.

(3) Spring pad to 9th loop of jack spring with [2] hog rings—[1] each end—front.

(4) Spring pad to 1st vertical wire of every lower spring element with [11] hog rings—front.

(5) Cover to 4th slot of lower right retainer with [1] hog ring—bottom rear.

(6) Cover to 4th and 7th slot of lower left retainer with [2] hog rings—bottom rear.

(7) Cover to each slot of lower right and left retainer with [13] hog rings—bottom front.

(8) Cover side facing to trim tab in cushion frame with [6] hog rings [3] each side.

(9) Back of front seat lower extension to bottom slot in cushion frame with [2] hog rings [1] each side.

(10) Back of front seat lower extension to the 12th bar of the 1st element with [2] hog rings [1] each side.

(11) Foundation board to spring with [5] hog rings.

Bucket Seat Back (Fig. 26)

(1) Pad support with [5] hog rings to spring wires —rear.

(2) Pad support with [8] hog rings to trim wires, [4] each side.

(3) Pad support with [5] hog rings to trim wires —bottom.

(4) Cover pad with [4] hog rings to spring retainer slots—top.

(5) Cover pad with [8] hog rings to trim wires, [4] each side.

(6) Cover pad with [8] hog rings to spring retainer slots—bottom.

(7) Cover listing with [8] hog rings to the vertical bolster wires.

(8) Cover listing with [3] hog rings to the horizontal bolster wires.

(9) Cover with [4] hog rings to spring retainer slots —front.

(10) Cover with [10] hog rings to trim wires [5] each side.

(11) Cover with [8] hog rings to spring retainer slots —bottom.

(12) Listing reinforcement with [2] hog rings to trim wires, [1] each side.

(13) Cover welt with [2] hog rings to bottom spring retainer slots [1] each end.

Rear Seat Cushion (Fig. 27)

Prior to installation of spring pad attach insulator to the 10th and 15th bar of center elements with [4] hog rings. See view at "A".

(1) Spring pad to 6th bar of elements in 4th, 6th, 8th and 10th row with [8] hog rings—front.

(2) Spring pad to top rim with [6] hog rings [3] each side equally spaced.

(3) Spring pad to each slot in rear retainer with [15] hog rings.

(4) Cover to each slot in bottom frame with [29] hog rings—front and sides.

(5) Cover to each slot in rear retainer with [17] hog rings.

Rear Seat Back (Fig. 28)

(1) Spring pad to trim brace with [12] hog rings equally spaced—top.

(2) Burlap listing to each slot in J-rim with [6] hog rings required [3] each side.

(3) Spring pad to top rim with [14] hog rings equally spaced—bottom.

(4) Cover to trim brace with [12] hog rings equally spaced—top.

(5) Cover to each slot in J-rim with [14] hog rings [7] each side.

(6) Cover to each slot in lower retainer with [17] hog rings—bottom.

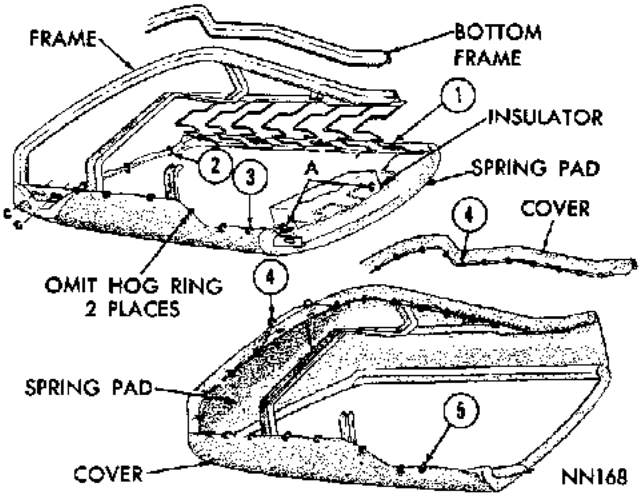


Fig. 27—Rear Seat Cushion (Chrysler)

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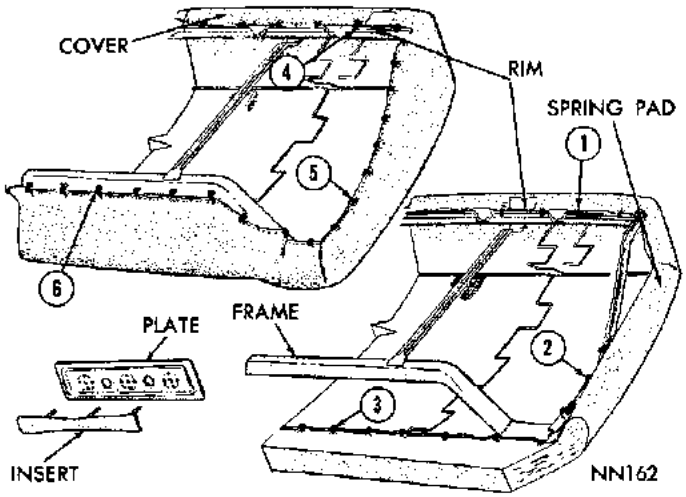


Fig. 28—Rear Seat Back (Chrysler)

Town and Country

2nd Seat Cushion (Fig. 29)

(1) Pad support to top rim with [5] hog rings equally spaced—front.

(2) Pad support to top rim with [6] hog rings [3] each side.

(3) Pad support and cover pad to each slot in rear retainer (one operation) with [18] hog rings—rear.

(4) Top rim pad to top rim with [9] hog rings equally spaced—front.

(5) Top rim pad to top rim with [8] hog rings [4] each side equally spaced.

(6) Cover to each slot in bottom frame with [27] hog rings—front and sides.

(7) Cover to retainer with [4] hog rings—front.

(8) Cover to each slot in retainer with [18] hog rings—rear.

(9) Insulator—center to the 4th and 16th loop of the 8th element from rear with [4] hog rings.

3rd Seat Cushion (Fig. 30)

(1) Pad support to top rim with [4] hog rings —front, [4] hog rings—[2] each side and [4] hog rings —rear.

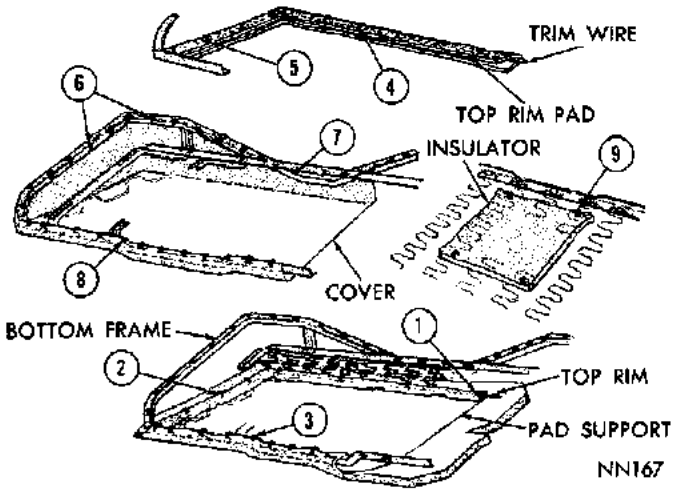


Fig. 29—2nd Seat Cushion

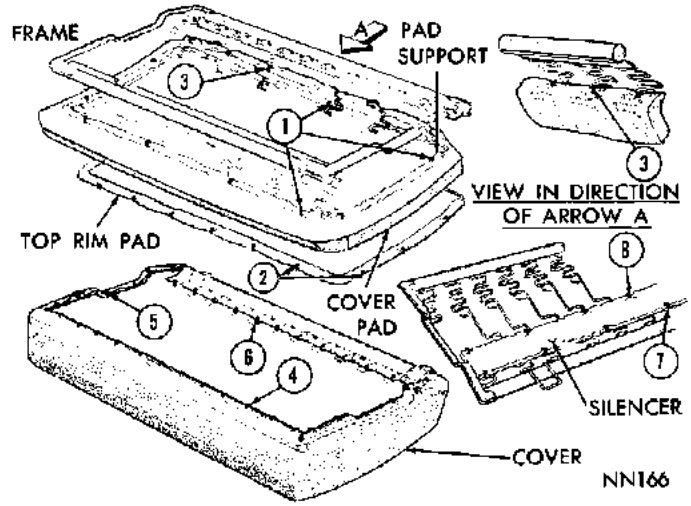


Fig. 30—3rd Seat Cushion

(2) Top rim pad to top rim with [7] hog rings—front and [6] hog rings—[3] each side equally spaced.

(3) Cover pad to the 9th loop of the 1st, 3rd and 5th element with [6] hog rings—rear.

(4) Cover to each slot in bottom retainer with [12] hog rings—front.

(5) Cover to each slot in J-rim with [12] hog rings [6] each side.

(6) Cover to 3rd loop of each element with [12] hog rings—rear.

(7) Silencer to the 4th loop of every other element with [7] hog rings —rear.

(8) Silencer to the 2nd bar of the 1st, 3rd and 5th element with [5] hog rings—front.

2nd Seat Back (Fig. 31)

(1) Spring pad to trim brace wire with [11] hog rings equally spaced—top.

(2) Spring pad to top rim with [8] hog rings [4] each side equally spaced and [11] hog rings equally spaced —bottom.

(3) Cover to trim brace wire with [15] hog rings equally spaced—top and [14] hog rings [7] each side equally spaced.

(4) Cover to bottom rim wire with [15] hog rings equally spaced—bottom.

3rd Seat Back (Fig. 31)

(1) Spring pad to each slot in J-rim upper with [14] hog rings—top.

(2) Spring pad to top rim with [8] hog rings equally spaced—bottom and [6] hog rings [3] each side equally spaced.

(3) Cover to each slot in J-rim with [14] hog rings —top, [12] hog rings—[6] each side and [14] hog rings—bottom.

POWER SEATS

The power seat can be moved six ways—forward, back, up, down, tilt forward and tilt rearward. The horizontal travel is five inches and horizontal plane of

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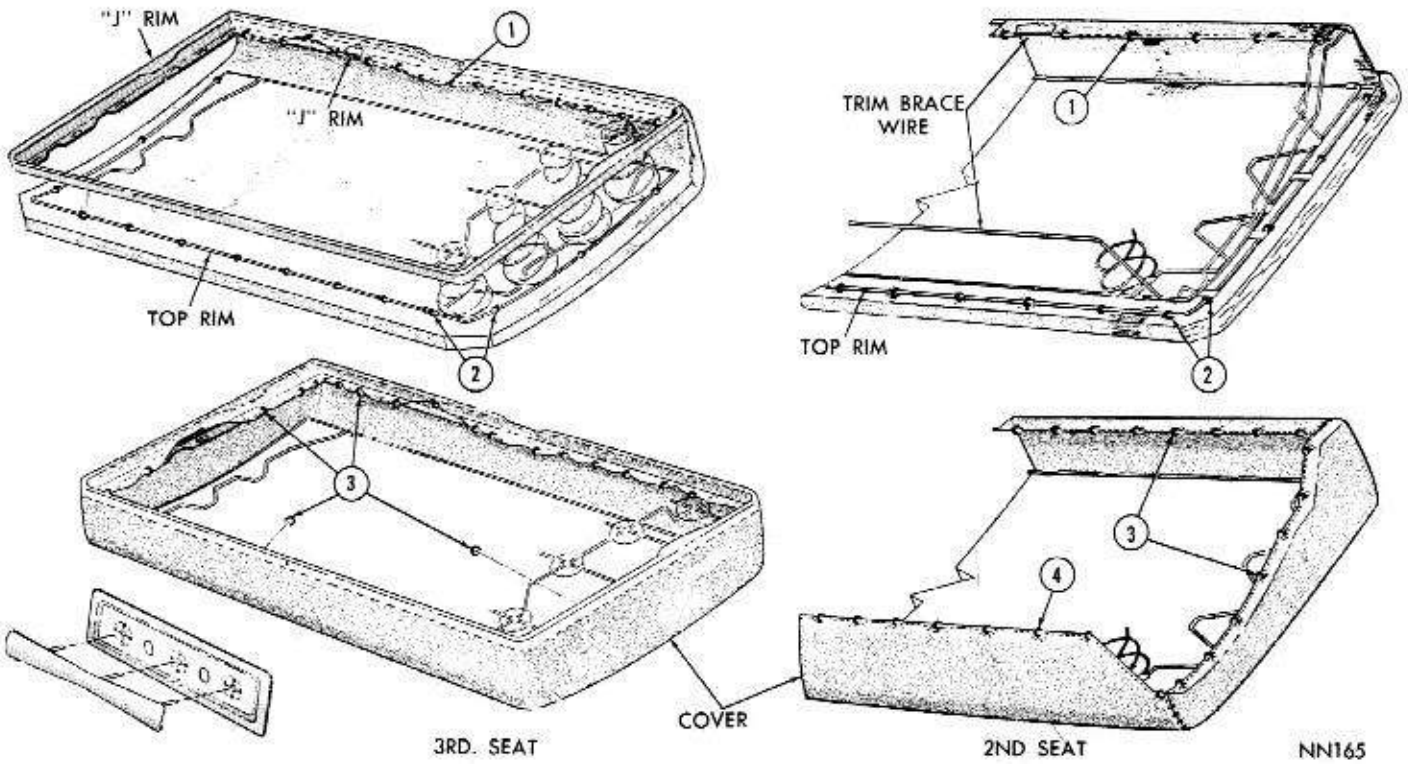


Fig. 31—2nd and 3rd Seat Backs

seat track is inclined eleven degrees. The vertical travel is 1½ inches at front and rear. The available tilt is 8 degrees forward and 7½ degrees rearward from neutral.

The motor operates a gear drive train which supplies power to the jack units, located in the seat tracks, through flexible cables. The control switch is on the left side of front seal and is wired through a relay to a 30 ampere circuit breaker, located above the left cowl panel.

The wire from the bulkhead disconnect supplies power to the circuit breaker.

Power is supplied to the relay from the circuit breaker.

Six wires go to the switch. One used for power, two for motor field current, which also actuates the relay

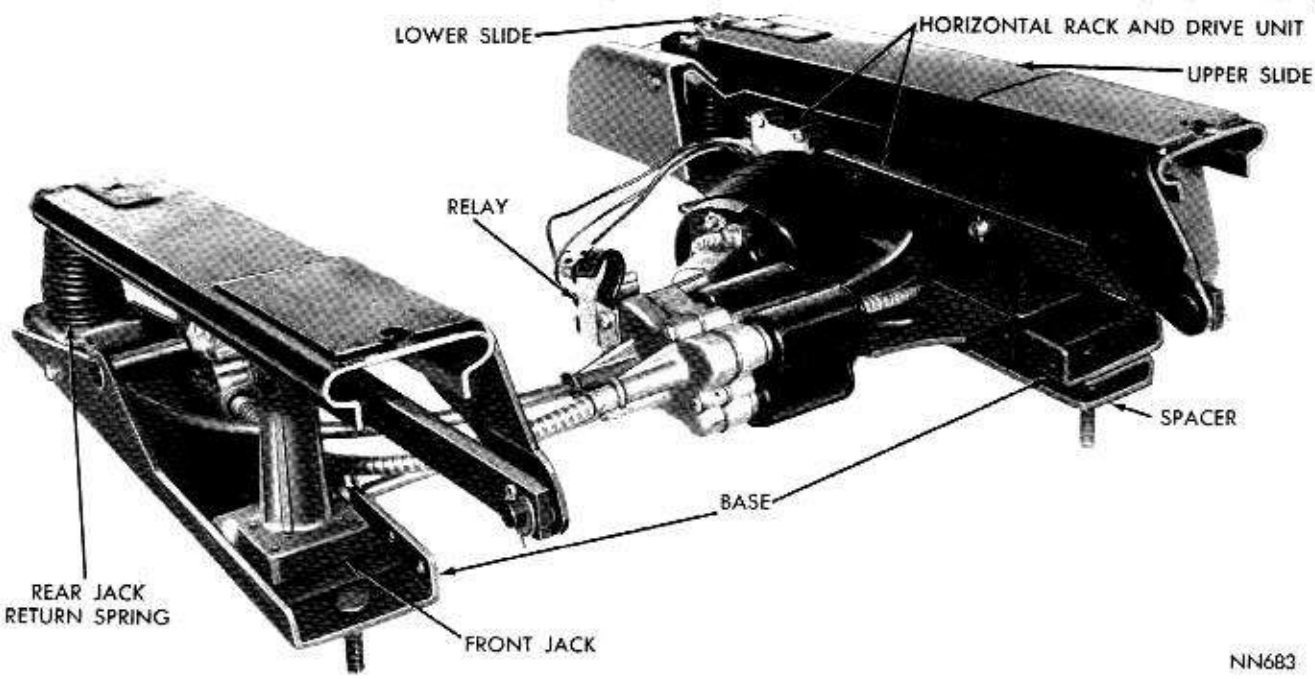
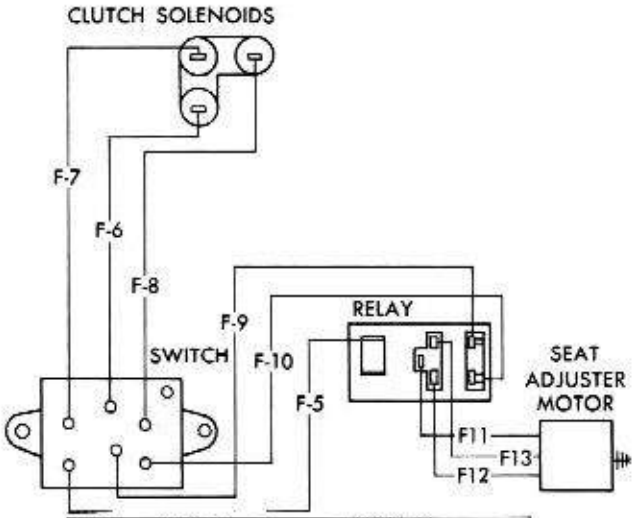


Fig. 32—Power Seat Assembly

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NO.	COLOR	CIRCUIT
F-5	RED	FEED
F-6	BROWN	FRONT ELEVATOR
F-7	DARK BLUE	HORIZONTAL
F-8	YELLOW	REAR ELEVATOR
F-9	BLACK	DOWN AND REARWARD
F-10	DARK GREEN	UP AND FORWARD
F-11	RED	MOTOR FEED
F-12	DARK GREEN	UP AND FORWARD
F-13	BLACK	DOWN AND REARWARD

64 x 416A

Fig. 33—Power Seat Wiring

for motor armature current and three wires attach to solenoids controlling the movement of the front riser, rear riser and horizontal movement (Fig. 32).

Electrical Tests (Fig. 33)

Before any tests are performed, the battery must be fully charged and continuity of the wiring and switch be established.

Connect one lead of a voltmeter to a good ground and the other lead to the terminal of the red feed-in wire at the relay. The voltage should be 12.6 volts. If no reading is obtained, test the circuit breaker or check for loose connections from the ammeter to the accessory circuit breaker.

Motor and Relay

Disconnect the red, black and green motor wires from the relay. Connect a jumper wire from the red motor wire to either the black or green motor wires. Connect another jumper to the red feed-in wire on the relay. If the motor does not run, the motor is faulty and should be replaced. If the motor runs, the relay should be replaced.

Solenoid and Switch

Remove the leads from the solenoids and connect a jumper wire from the red feed-in lead to each of the solenoid terminals, one at a time. If a distinct "click" is not heard, the solenoid is burned out. If all the solenoids "click" when the terminal is touched with the jumper wire, the switch is faulty and should be replaced.

Relay

Using a test prod on a jumper wire, connect the jumper from the red feed-in wire to either the green or black wire terminal on the relay. Motor should run. If motor doesn't run replace the relay.

Front Seat and Adjuster

Removal

(1) Disconnect battery ground cable.

(2) Remove four mounting screws which hold front seat to adjuster and tilt complete seat back assembly forward.

(3) Disconnect switch control wires.

(4) Remove front seat and cushion assembly.

(5) Disconnect seat adjuster red feed wire.

(6) Remove seat guide attaching stud nuts and remove adjuster.

Installation

(1) Install adjuster and seat guide stud nuts.

(2) Connect seat adjuster red feed wire.

(3) Install front seat assembly.

(4) Connect control wires to switch and tighten mounting screws securely.

(5) Connect battery ground cable.

Flexible Cables or Tubes

To replace a broken cable, it will be necessary to remove the tube also. The seat mounting nuts must be removed from under the vehicle and the seat tipped back.

Horizontal Drive Cable

Removal

(1) Remove 2 screws from cable mounting bracket at the motor drive assembly. To remove left cable, remove motor drive assembly and pull cable from housing.

(2) Remove cotter pins from the rack pivot pins, drive horizontal drive gear pin out and remove drive rack assembly.

(3) Remove 6 drive rack cover plate screws, remove plate and lift cable from horizontal gear housing (Fig. 34).

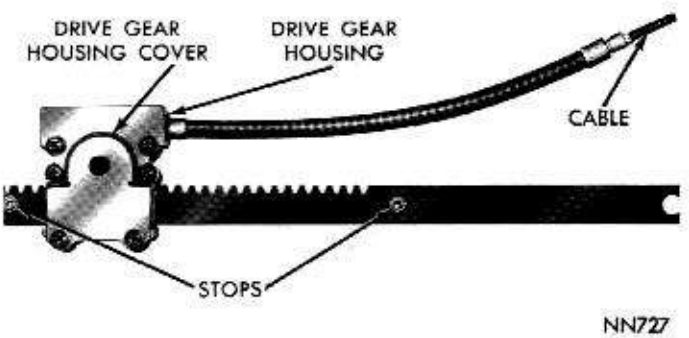


Fig. 34—Horizontal Drive Gear and Rack

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Installation

(1) Engage square end of cable in drive gear in horizontal gear housing and seat cable in housing.

(2) Install housing cover and 5 retaining screws.

(3) Position drive rack on upper slide pivot pin. Carefully drive pin through horizontal drive gear housing. Install the washer and cotter pins.

The horizontal racks must be synchronized. Turn the horizontal drive cable to move upper slide forward or rearward as necessary.

(4) Install cable in motor drive unit and install cable mounting bracket (right side) or the motor drive assembly (left side).

Jack Cable Tubes

To remove the right rear cables, remove the cable mounting bracket at the motor drive assembly. The left cable tubes are removed by separating the motor drive assembly from the bracket. Next, remove the cable tube retainer screw and gently pull tube from the base of the jack.

Front Jack

Put the seat in the far rearward position and remove the 4 jack retaining screws from the under base.

On the left side, the 2 screws retaining the spacer to the base must be removed first (Bucket Seats only.)

Remove cotter pin and washer from upper slide and drive the upper retaining clevis pin from the lower slide. Remove the 4 screws from under the base plate and carefully pull jack forward to disengage front drive cable and tube, being careful to hold the plate under the jack to keep the worm and bushings from falling out. When installing jack, turn the worm shaft with a small screw driver to run jack up or down as necessary to index the clevis pin holes in the lower slide. Drive the clevis pin in partially and locate the washers on either side of jack before tapping the clevis pin all the way through the lower slide. Install washer and cotter pin.

Rear Jack

Removal

The seat track assembly must be removed from the vehicle, separated and mounted in a vise. Fasten a 10 inch "C" clamp from the base to the upper slide just tight enough to keep in in place (Fig. 35) **Do not over tighten.**

Drive the roll pin out of slide assembly and remove the 4 jack mounting screws from under the base. Slowly loosen and remove the "C" clamp and tip upper slide up. Remove the spring from between the slide and base.

Installation

Before installing jack, turn the worm shaft with a small screw driver to run jack up or down as necessary to index the roll pin holes. Slide the jack assembly onto the base, indexing the cable end in the worm shaft. Install the 4 screws from under the base. Raise the slide and position the spring over the jack. Install the "C" clamp and collapse the spring till the roll pin holes index. Drive the roll pin in partially and locate the washers on either side of the jack head before tapping roll pin all the way through the slide assembly. Lubricate slides and rack with Lubriplate or an equivalent and install track assembly in vehicle.

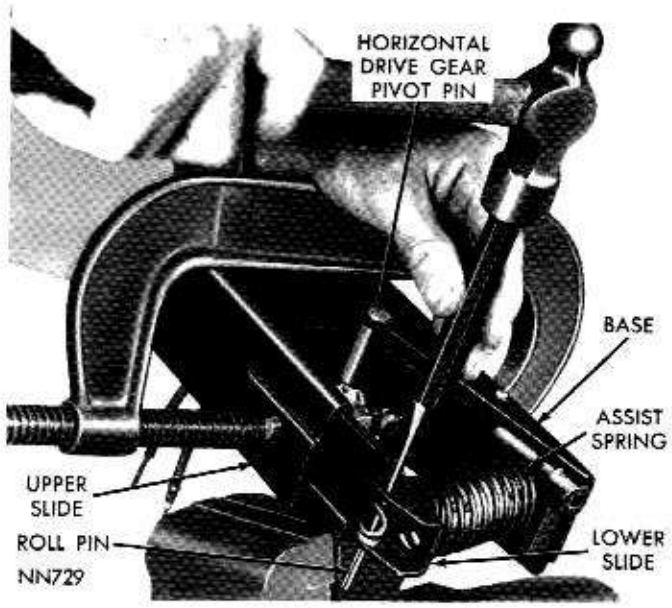


Fig. 35—Removing Rear Jack Roll Pin

Rear Jack Assist Spring

To replace the rear jack assist spring the procedure is the same as the rear jack replacement except that the jack is not removed from the base. See "Rear Jack Removal and Installation."

The jacks must be synchronized. Turn the cable to raise or lower jack as necessary.

Switch

Removal

(1) Remove seat mounting screws and tip seat forward.

(2) From under the seat, disconnect wire terminals from relay solenoid terminals.

(3) Remove 2 mounting nuts from studs and remove switch.

Installation

(1) Position switch on mounting studs and install the 2 nuts.

(2) Connect the wire terminals to the solenoid terminals and relay (Fig. 33).

(3) Position the seat on the riser and secure with the mounting screws.

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Fig. 36—Motor Assembly

Motor (Fig. 36)

Removal

(1) Remove two screws that hold left side of front seat to seat adjuster.

(2) Prop-up left side of seat cushion approximately six inches.

(3) Remove two nuts that attach motor to drive unit.

(4) Remove motor and rubber coupling from drive unit.

(5) Disconnect motor wires from relay.

Installation

(1) Connect motor wires to relay.

(2) Install motor and rubber coupling to drive unit. Install two attaching nuts.

(3) Remove prop from left side of seat cushion. Position seat on seat adjuster and install two screws.

Drive Unit and Solenoid Assembly

Disassembly

(1) Remove drive unit from seat assembly. See "Removal of Flexible Cables."

(2) Remove two screws holding plate and solenoids to drive unit (Fig. 37).

(3) Remove plate and solenoid assembly. Be careful not to lose three springs under solenoid.

(4) To remove solenoid coils, bend back on tabs of solenoid cover. Unsolder coil ground wire at cover tab and remove coil cover from coil.

(5) Remove screws holding cover on drive unit.

(6) Remove cover and lift out clutch lever and shaft.

Assembly

(1) Install clutch lever and shaft. Make sure lever is properly seated on collar.

(2) Install cover and screws.

(3) Install coil in coil cover with coil ground wire next to one of cover tabs.

(4) Position cover tabs in slots on coil plate.

(5) Bend over tabs and resolder coil ground wire to tab and plate.

(6) Install three solenoid springs and position solenoids over springs.

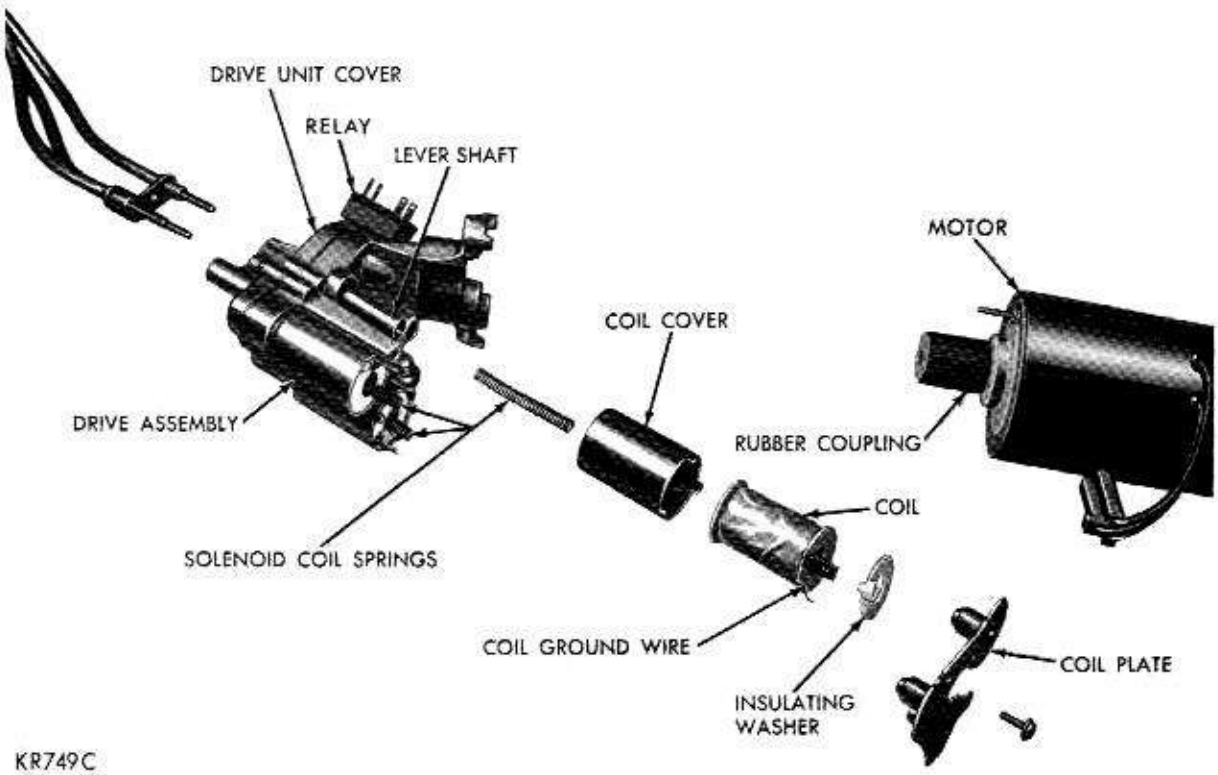


Fig. 37—Solenoid and Coil

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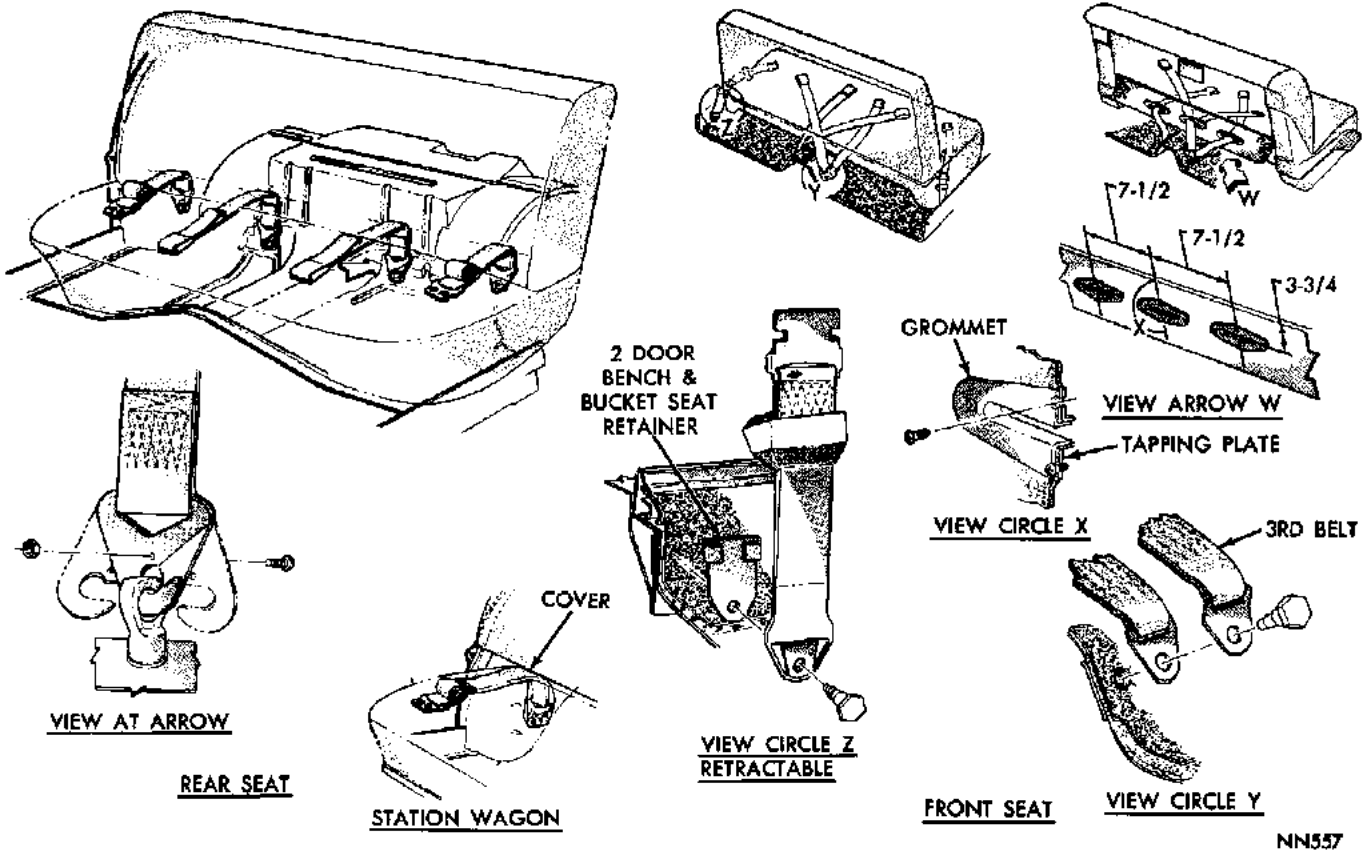


Fig. 38—Seat Belt Applications

Seat Belts

Refer to Figure 38 for methods of seat belt attachment.

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WINDSHIELD AND REAR WINDOW

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WINDSHIELD

GLASS REPLACEMENT

Removal (Chrysler)

(1) Cover cowl, hood and fender areas with a protective covering.

(2) Remove windshield wiper arms and blades.

(3) Remove outside windshield mouldings (Fig. 1) and inside garnish mouldings (Fig. 2).

(4) Remove cowl grille panel.

(5) Using a fibre wedge, loosen weatherstrip from fence at top and sides on inside and outside areas.

(6) With an assistant supporting glass on outside, exert hand pressure on glass at one of upper corners to force glass and weatherstrip off of fence and seal.

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(7) Lift glass and weatherstrip up and out of opening to clear the windshield wiper pivots.

(8) Inspect polyethylene seal on windshield opening for damage.

(9) Inspect fence area for burrs or misalignment and correct as necessary.

(10) If original weatherstrip is to be reinstalled, use extreme care and remove from glass.

(11) Remove all cement and sealer from weatherstrip and glass.

Seals and Sealers (Chrysler)

(1) Apply a ¼ inch bead of sealer down both windshield side frames to upper end of lower corners (Fig. 3).

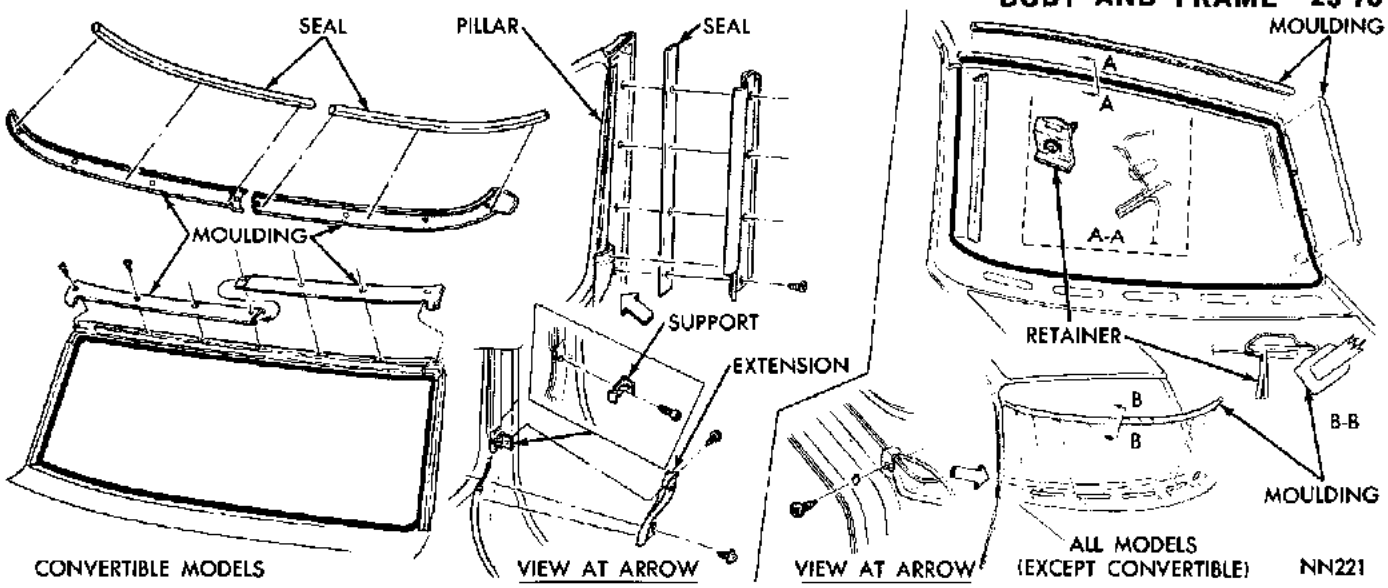


Fig. 1—Windshield Outer Mouldings

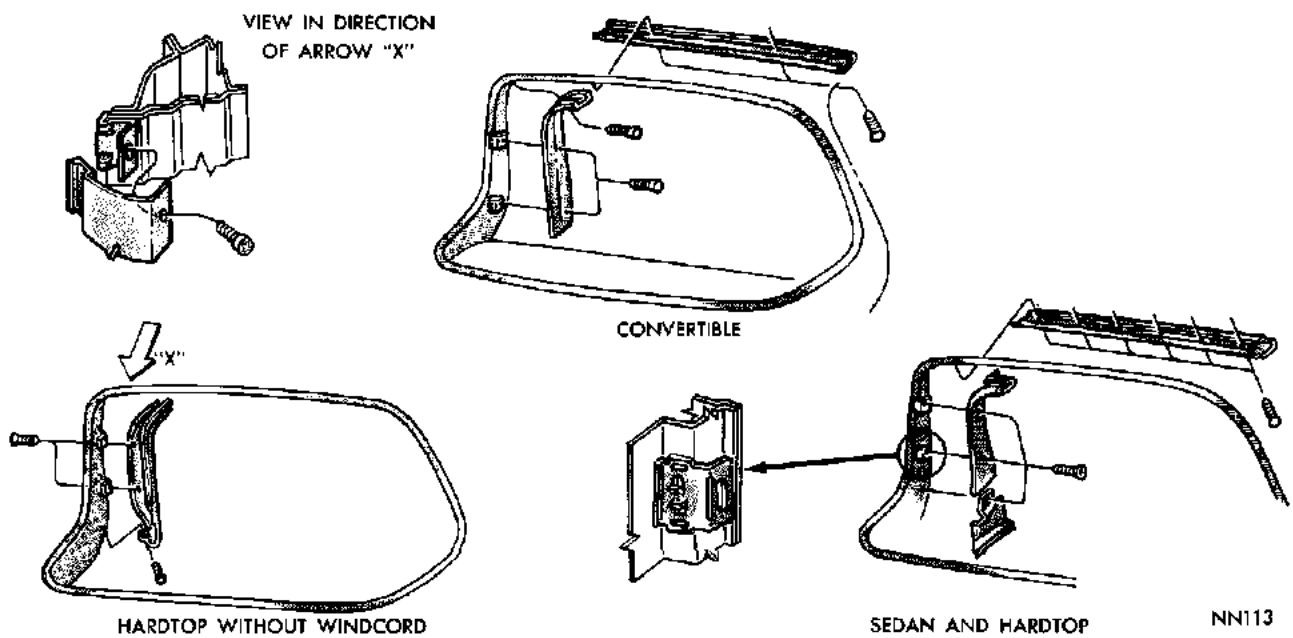


Fig. 2—Windshield Garnish Mouldings

(2) Apply polyethylene seal, if removed, to windshield opening fence starting at lower fence center, up the left side and across top to fence center.

(3) Pressurize seal to fence with hand pressure.

(4) Apply opposite seal starting with a bolt joint at lower fence.

(5) When seal is completely installed, seal should overlap lower seal at right hand side by one inch (maximum).

(6) If overlap is greater than two inches, trim off excess squarely (Fig. 3).

(7) Hand pressurize seals to eliminate all wrinkles or puckers.

(8) Apply a ⅜ inch bead of cement across cowl top panel at bottom of upstanding flange of windshield opening.

Installation (Chrysler)

(1) Apply sealer on each lip of glass groove in weatherstrip and position glass in weatherstrip.

(2) Insert a twine, starting at top center of weatherstrip, into fence groove portion of weatherstrip, across top and down both sides (Fig. 4).

(3) With an assistant position glass and weatherstrip on windshield opening.

(4) With pressure being applied against glass from outside, enter car and starting at one of lower corners, alternately pull ends of twine halfway up sides seating weatherstrip on fence.

(5) Applying constant hand pressure to glass sides, seat balance of weatherstrip on fence.

(6) Pressurize weatherstrip to seal with hand pressure to insure proper seating in opening.

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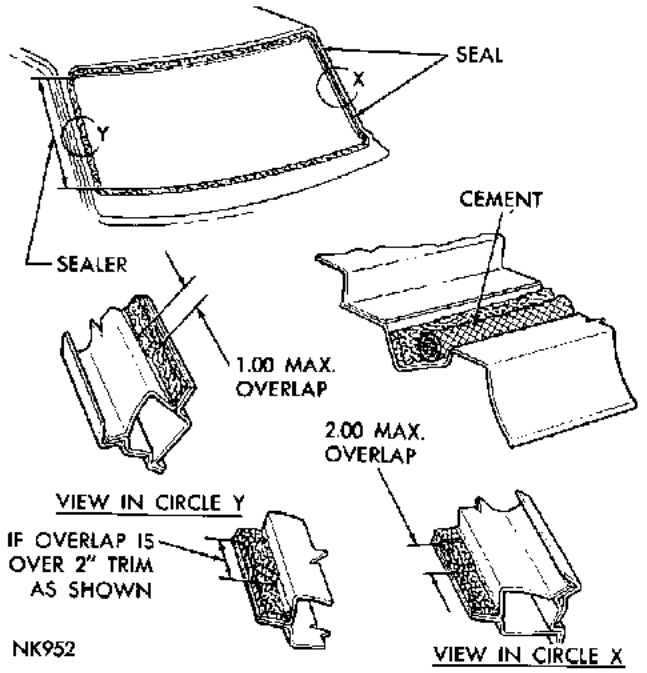


Fig. 3—Seals and Sealers

(7) Remove all excess sealers and cements from glass.

(8) Water test windshield area.

(9) Install cowl grille panel windshield outside mouldings, wiper arms and blades and inside garnish mouldings.

(10) Remove protective covering.

Removal (Imperial)

(1) Cover adjacent cowl, hood and fender area with a protective covering.

(2) Remove windshield outside mouldings (Fig. 5) and inside garnish mouldings.

(3) Carefully loosen sealing compound from around weatherstrip and body opening.

(4) Pry lips of weatherstrip apart, using fibre tool, twist slightly to unlock, while moving tool across cowl, over top and around sides of weatherstrip to completely unlock tab (Fig. 6).

(5) With an assistant supporting glass on outside, from inside vehicle and starting at one corner, exert pressure to force windshield out of weatherstrip and carefully remove from vehicle.

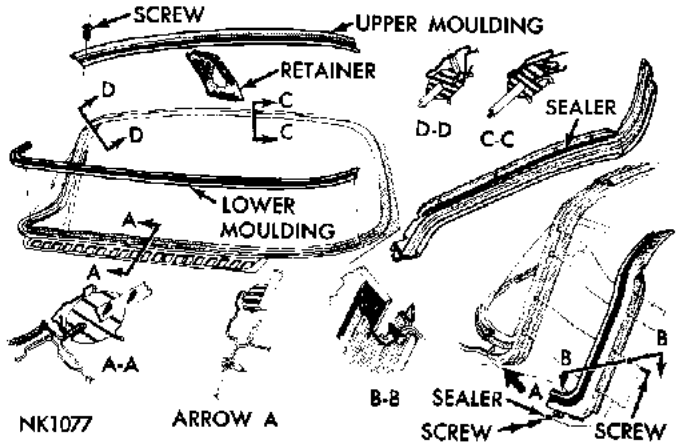


Fig. 5—Windshield Mouldings—Imperial

(6) Remove weatherstrip from fence.

(7) Remove all cement and sealers from weatherstrip and fence.

(8) Inspect fence area for high spots, bends and correct alignment.

(9) Inspect moulding retainers and if satisfactory, install sealer around area where retainer is connected to sheet metal.

(10) Inspect seam joints between roof panel and fence for proper sealing.

Installation

(1) Apply a continuous bead of sealer to fence groove area of weatherstrip. Groove should be approximately one half full.

(2) Position weatherstrip on fence, making sure it is fully seated.

(3) With an assistant, position glass in weatherstrip upper groove and using a fibre tool, slide weatherstrip outer lip over glass at sides and bottom.

(4) Pound glass with palm of hand to seat it fully in weatherstrip.

(5) Apply sealer between glass and weatherstrip, both inner and outer sides, approximately ⅜ inch down into weatherstrip. Remove excess sealer from glass and weatherstrip.

(6) Secure glass in weatherstrip by forcing locking tab (Fig. 6), with a fibre tool, into weatherstrip.

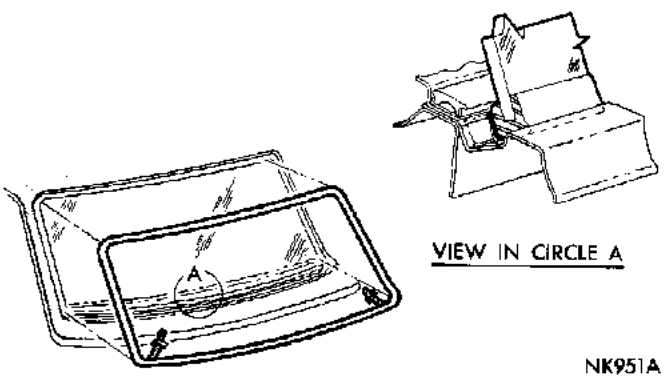


Fig. 4—Installing Windshield

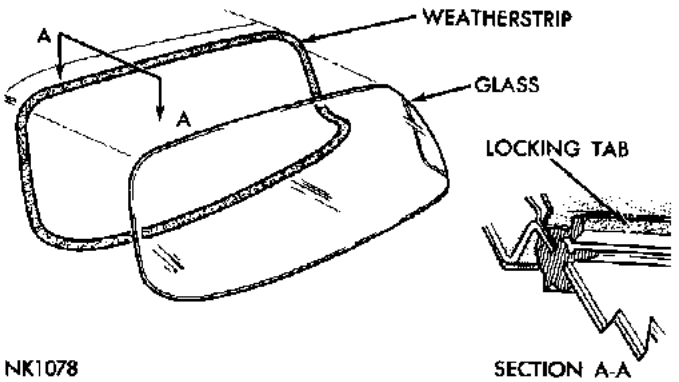


Fig. 6—Windshield Replacement

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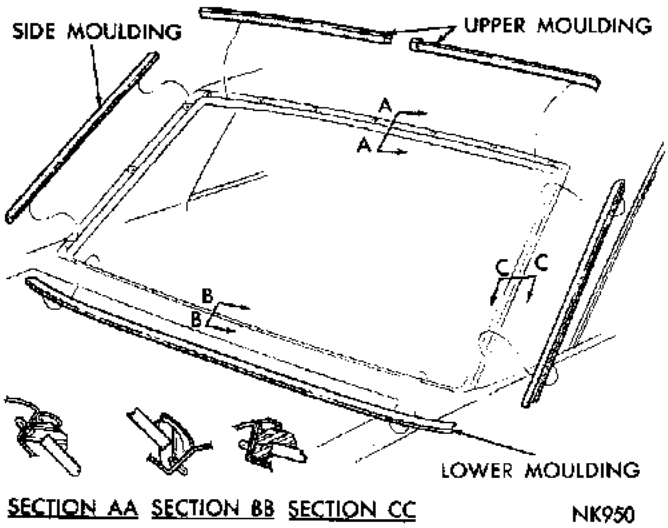


Fig. 7—Rear Window Mouldings—Chrysler

(7) Water test window area and install mouldings.
(8) Remove protective covering.

REAR WINDOW

GLASS REPLACEMENT

Removal

(1) Place a protective covering over deck panel, quarter panel and rear window areas.

(2) Remove outside mouldings (Fig. 7) and inside garnish mouldings. On Imperial Models, remove deck lid upper panel (Fig. 8).

(3) Using a fibre wedge, loosen weatherstrip at fence area at inside and outside areas.

(4) With an assistant steadying rear window, apply pressure from inside, at one of upper corners and force rear window and weatherstrip off of fence.

(5) Remove rear window from opening.

(6) Inspect polyethylene seal for damage and remove if necessary.

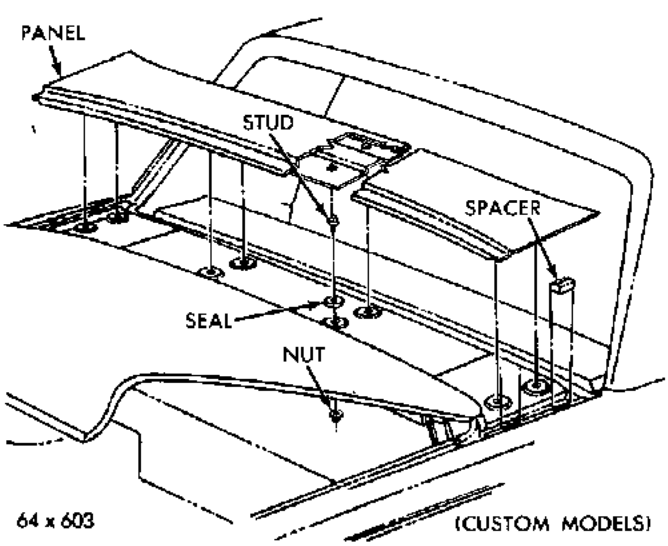


Fig. 8—Deck Lid Upper Panel—Imperial

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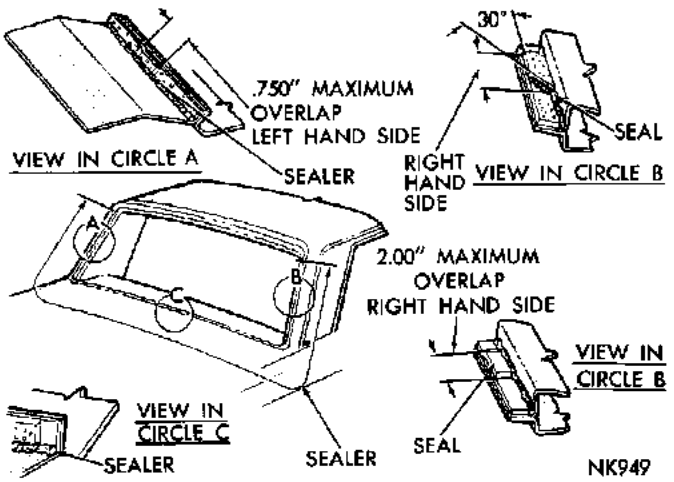


Fig. 9—Seals and Sealers

(7) Remove weatherstrip from glass.

(8) If removed weatherstrip is to be reused, remove all sealers and cements from groove areas.

(9) Remove all sealers and cements from rear window.

Seals and Sealers

When replacing polyethylene seal (Fig. 9) it is necessary that fence area is free of all cement, sealers and other foreign material. Inspect fence areas for burrs and misalignment.

(1) Apply a ¼ inch bead of sealer across bottom of rear window opening and up both sides to lower edge of upper corners (Fig. 9).

(2) Position one polyethylene seal to window opening fence at lower section first, above sealer applied in step 1.

(3) Hand pressurize seal to sealer.

(4) Apply upper seal starting with a ¾ inch overlap (maximum) at left hand side.

(5) Apply balance of seal and when fully installed, seal should overlap lower seal at right side by two inches (maximum).

(6) If overlap is greater than two inches, trim off excess amount at approximately a 30 degree angle (Fig. 9).

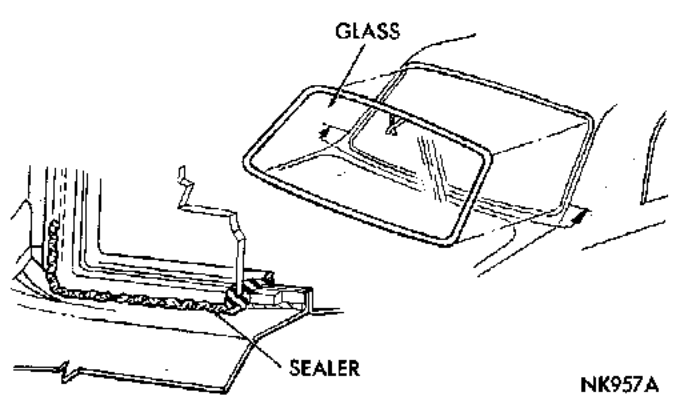


Fig. 10—Rear Window Installation

(7) Hand pressurize both seals to avoid wrinkles and puckers.

Installation

(1) Apply sealer cement to each lip of weatherstrip glass groove.

(2) Install weatherstrip on glass, making sure it is fully seated.

(3) Install a twine into fence groove area of weatherstrip starting at top center of weatherstrip.

(4) With an assistant, position glass and weatherstrip in window opening.

(5) With glass being supported on outside, enter car and seat weatherstrip on fence by pulling twine (Fig. 10) downward and toward center of glass.

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(6) Seat glass in weatherstrip using hand pressure.

(7) Apply a 3/8 inch bead of sealer (Fig. 10) across full width and up sides to lower portion of weatherstrip and fence at top corners.

(8) Remove all excess sealer and cement from glass.

(9) Place the Imperial deck opening upper panel and seals (Fig. 8) into position in opening and from inside luggage compartment install retaining nuts.

(10) Water test rear window area.

(11) Install inside garnish mouldings and outside window moulding.

(12) Remove all protective covering.

CONVERTIBLE

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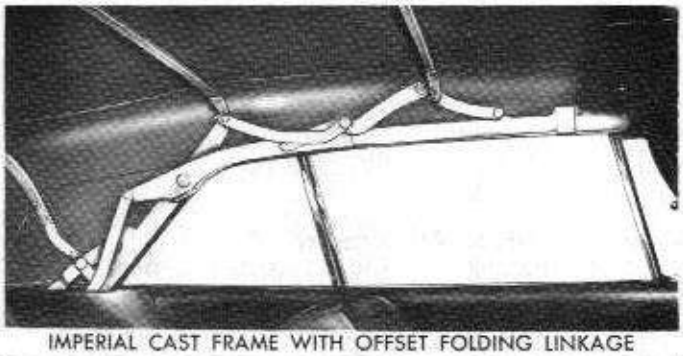
SERVICE DIAGNOSIS

Condition	Possible Cause	Correction
TOP AND WINDSHIELD HEADERS NOT MEETING AT CORRECT ANGLE	(a) Incorrect front and rear side rail adjustment.	(a) With top in up position and header locked in, turn square head screw at front side rail hinge and set screw at rear side rail hinge until they contact head. (Chrysler Models at front hinge only.)
"JACK KNIFING" OF SIDE RAILS	(a) Improper alignment of side rails to top of window glass.	(a) Adjust by moving serrated adjustment plate up or down to hold side rails in their correct relationship to window frame. Adjust both sides to same height to maintain parallelism of side rails (Imperial Only).
IMPROPER MEETING (fore and aft) OF TOP HEADER WITH WINDSHIELD HEADER	(a) Improper adjustment of power link.	(a) Adjust power link "fore or aft" across serrated plate. Adjustment is in direction of movement desired. Chrysler Models adjust power cylinder mounting bracket assembly.
TOP HEADER NOT IN ALIGNMENT WITH GUIDE DOWELS	(a) Improper adjustment of folding top header.	(a) Adjust folding top header "fore or aft" until alignment with guide dowels is accomplished.
TOP FABRIC TOO LOOSE OR TIGHT	(a) Improper adustment of number 1 roof bow.	(a) Adjust roof bow up or down on bow support (Imperial Only).
LEAKS AT WINDSHIELD HEADER	(a) Folding top header torsion bar not properly adjusted.	(a) Adjust folding top header torsion bar to accomplish a 30 pound locking handle effort.

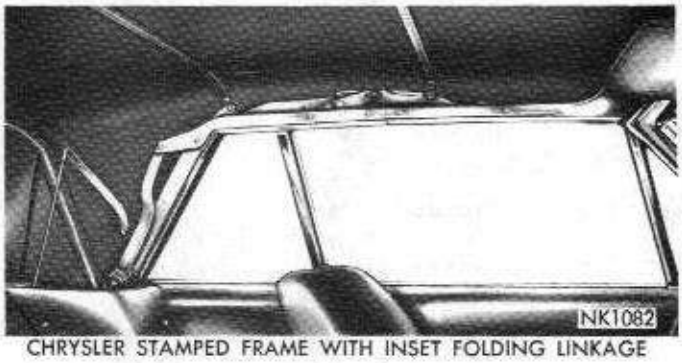
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SERVICE PROCEDURES

The folding top structure of the Chrysler Models are constructed from stampings and have inset folding linkage. Imperial Models top structures incorporate a cast frame and offset folding linkage (Fig. 1).



IMPERIAL CAST FRAME WITH OFFSET FOLDING LINKAGE



CHRYSLER STAMPED FRAME WITH INSET FOLDING LINKAGE

Fig. 1—Folding Top Structures

OPERATING THE TOP

RAISE OR LOWER THE TOP ONLY WHEN THE VEHICLE IS STANDING STILL. It is advisable to raise and lower the top at least once a month to keep the top mechanism in working condition.

To Lower the Top

Release the safety catch on the locking handle located in the center of the header, pull the handle down and to the rear. Push the header free of the windshield. Be sure the top well compartment is free of articles. Unzip the rear window and position carefully in the well. Make sure all wrinkles are removed. Operate the engine in neutral at a speed slightly above idle. Turn control switch to the right. As the top is being lowered, push upward on the stay pads, between the roof bows to make certain the material folds are outboard of the bows, or stop the folding mechanism approximately two feet from the stacked position and push the top material and stay pads out from between the bows. Lower the top completely. Fasten the top boot over the compartment snapping it at the sides and rear.

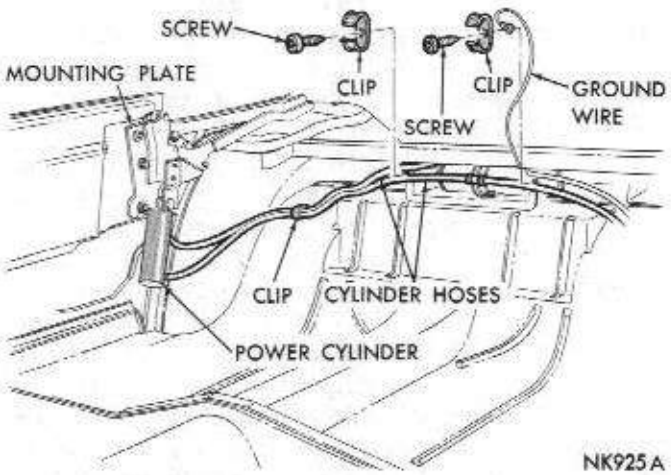


Fig. 2—Top Mechanism (Chrysler)

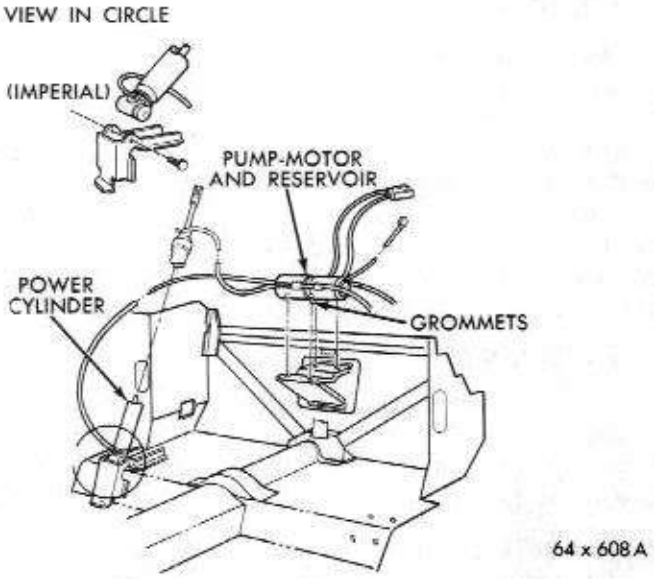


Fig. 3—Top Mechanism (Imperial)

To Raise Top

Unsnap the top boot at the sides and rear and fold into the storage compartment. Turn the top control switch to the left and hold in this position until the header rests on the windshield. Zip up the rear curtain. Pull the top down firmly on the top header. Push the locking handle all the way forward until the safety catch engages.

RESERVOIR

Insufficient fluid in the system may cause the top to raise slowly or cause noise in the pump and motor during operation. Measure the fluid level in the reservoir. If low, look for a leak due to a broken line or a loose connection. Replace the line or tighten the connection as necessary. Fill the reservoir until the fluid, AQ-ATF Suffix "A" type transmission fluid, runs out of the filler holes.

After filling the reservoir, raise and lower the top several times to force out the air that may be trapped

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in the system. Always measure the fluid level when the top is lowered.

FOLDING TOP MECHANISM

The electric-hydraulic top folding mechanism (Figs. 2 and 3) consists of two cylinders, a piping system, an electric motor, a pump and reservoir assembly, and a double-throw rotary switch. The wiring and motor are protected by a separate circuit breaker.

The cylinders are serviced only as an assembly. The reservoir end plate "O" ring is replaceable. The pump cover plate is serviced as an assembly and the rotors are serviced as a package with the "O" rings.

ADJUSTMENTS

Convertible top adjustments are of two general classifications—minor and major. The minor adjustments are easily accessible and can be made without any major disassembly.

Minor Adjustments

The minor adjustments are provided to assist in aligning the top header in relation to the windshield header to prevent water and air leakage into this area; to improve top frontal area appearance and assure ease of operation in raising and lowering the top. They are also provided to assure correct alignment of the roof side rails with door and quarter glass to prevent air and water leakage. Adjustments are also provided to eliminate wrinkles in the top material.

Major Adjustments

The major adjustments are at the prop control link bracket and the power cylinder mounting brackets. These adjustments are necessary to improve roof side rail alignment if minor hinge and header adjustment do not completely correct the condition.

Body Alignment—Imperial Only

Before any adjustments are performed to correct the door or the top misalignment, be sure that all the body bolts are tightened to 18 foot pounds.

In some cases, it may be advisable to loosen the body bolts and drive the vehicle a short distance to permit the body to settle evenly on the frame. Then, tighten the bolts to the specified torque.

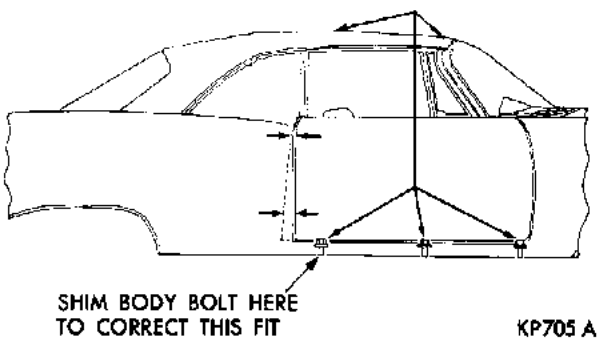


Fig. 4—Body Shimming (Imperial)

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If body shimming is necessary to obtain the proper door alignment, this should be done before attempting to make the adjustments of the top linkage.

Figure 4 illustrates how to correct a door fit which is tight at the top and open at the bottom. If the door fit is open at the top and closed at the bottom, it is necessary to add shims at the body mounting near the front and rear of the door. In some instances, add shims on the right side of the car and remove them on the left side or vice versa. The important thing, however, to keep in mind is that shimming of the body as illustrated changes the fitting of the top header at the windshield frame.

Door and Glass Alignment

Before making any top adjustments, doors, vent wings and door and quarter glass must be properly aligned. Misalignment in any of these areas make it impossible to obtain satisfactory results from top adjustments alone. Glass up-stop adjustments should be made after the correct roof side rail alignment to limit the upward travel of the glass and to assure effective sealing between the roof side rail weatherstrip and glass.

Latching Mechanism

Good weather sealing at the header area is dependent upon proper positioning of the top header on the windshield header. The header locating dowels are cast into the latching mechanism housings and engage the sockets in the windshield header to correctly position the header.

The amount of pressure exerted by the weatherstrip against the finish moulding is controlled by the top latching mechanisms attached to the top header.

The locking and unlocking effort of the latching mechanisms are adjustable to control the pressure on the weatherstrip.

Header Adjustments

Inspect the top linkage and mouldings for sharp edges, burrs or screws that are too long which may damage the top material. File them down.

The top header is adjustable at the front roof side rails to permit fore-or-aft and lateral movement. The header is attached to the side rails by two header-to-side rail screws on each side (Fig. 5).

Incorrect alignment between the top header and the windshield finish mouldings may result in air or water leakage. Inspect the clearance between the header and the finish moulding for uniformity. If the top header is too far forward at one end or all across the finish moulding, the interference between the header and the finish moulding may prevent proper pressure on the weatherstrip when the top header is latched. This condition will also cause objectionable high locking and unlocking effort. The misalignment may also result in making it difficult to engage the top header locating dowels in their sockets.

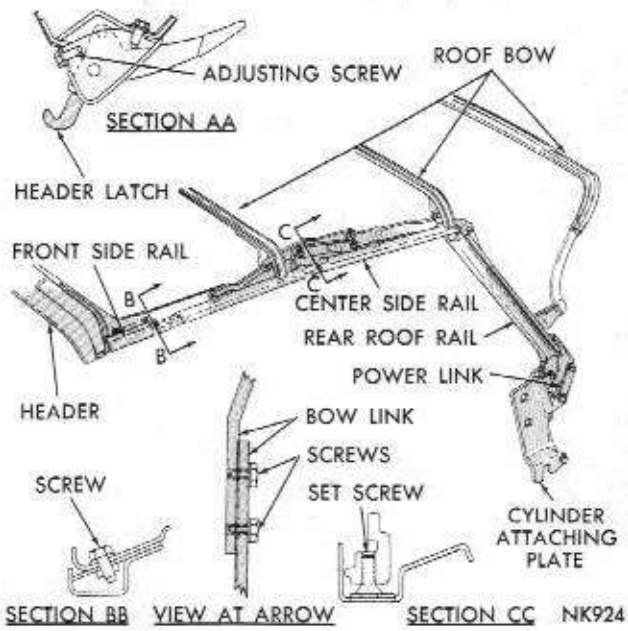


Fig. 5—Side Rail Structure (Chrysler)

To eliminate the interference between the header and the finish moulding, loosen the header-to-side-rail screws (Fig. 5) and adjust the header, as required, to provide the proper clearance.

Forward movement of the header will be limited by the amount of top material. Inspect the top header dowel engagement and if there is interference between the dowels and sockets, adjust the header.

Roof Side Rail Alignment

The roof side rail structures (Fig. 1) consist of three separate rails, hinged together to enable the top to fold into the well when not in use. Hinges are provided between the front and center rails and the center and rear rails. The rails must be in good alignment and parallel to the top edges of the vent wings, door and quarter glass to provide a good weatherseal. On Chrysler Models alignment of the rails is controlled by the power link assemblies (side rail) structure mounting support assembly (Fig. 6) the main control prop link and the front hinge set screw.

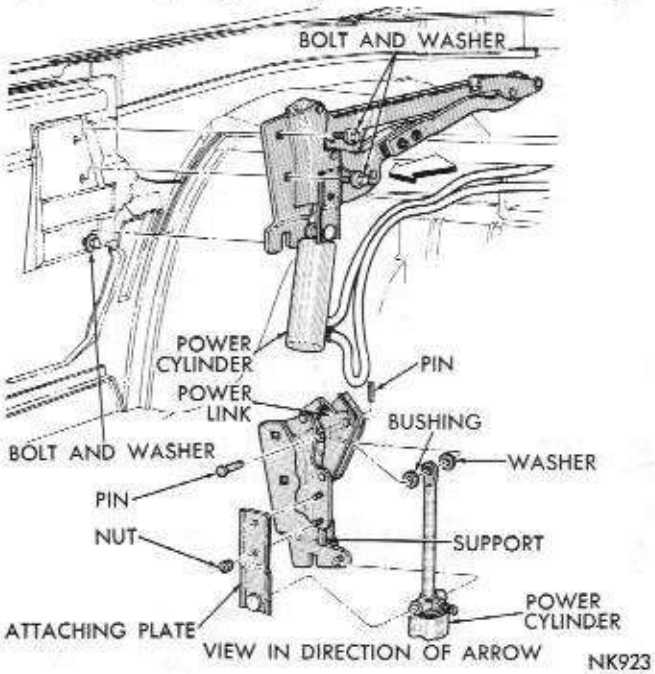


Fig. 6—Power Cylinder

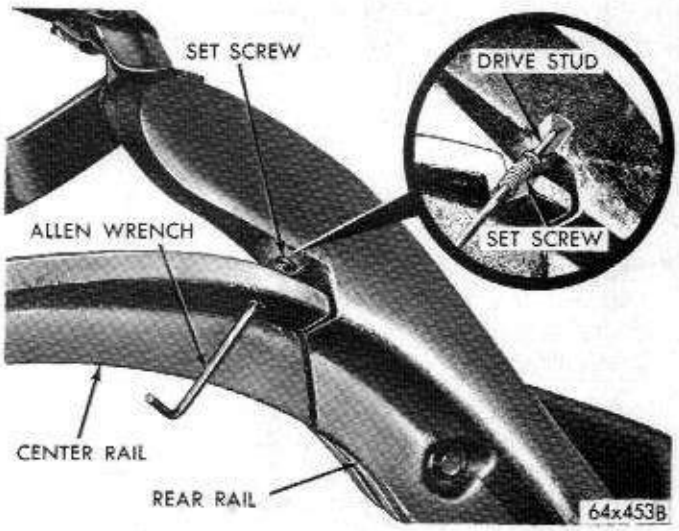


Fig. 7—Rear Hinge (Imperial)

On Imperial Models, the rear hinge is also adjustable.

On Chrysler Models, the front hinge set screw (Fig. 5) is accessible from the bottom surface of the front rail and center rail directly below the hinge. Very little adjustment is possible at the hinge. The set screw is also used as a means of eliminating noise at the front hinge by progressively tightening until the noise disappears.

On Imperial Models, the front hinge set screw is accessible from the top surface of the front rail and angles downward to the rear. It contacts the steel drive stud in the center rail to open or close the hinge, as required.

Front Hinge

To avoid stripping the set screw threads, unfasten the top header latches to relieve tension on the linkage before adjusting the set screws.

Leakage between the top and door or quarter glass may be caused by poor contact between the roof side rail weatherstrip and the glass or only a partial contact between the roof rails and the top edge of the glass. If inspection shows the leakage is due to incorrect side rail alignment at the front hinge, adjust the hinge set screw until the front and center side rails are parallel.

Rear Hinge—Imperial Only

Inspect the center and rear roof side rail alignment at the quarter glass. If additional clearance is noted in

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this area, as indicated by the hinge being jack-knifed open, again unfasten the top header. Remove the side rail weatherstrip and retainer and adjust the rear hinge set screw (Fig. 7) from the underside of the center rail until proper alignment and clearance is obtained.

Adjusting the two hinge set screws will normally correct any roof side rail alignment problems, however, if an alignment problem still exists, and additional leveling of the roof side rails is required, the linkage through the main control prop link bracket can be adjusted.

Main Control Prop Link

The main control prop link incorporates serrated adjusting links on both sides. Loosen screws just enough to permit moving links up or down.

Lengthening link causes the center rail to rotate on its pivot in the rear rail, lowering the front and center rails to improve weatherstrip fit with door and quarter glass.

Stack Height

(1) Remove rear seat cushion, back and quarter trim panels.

(2) Adjust the main control prop link.

(3) Lower top assembly into well and loosen the lower two of three mounting bolts.

(4) Force lower portion of mounting plates to rotate toward front of car as far as possible while exerting pressure downward on both sides at top of side rails.

(5) Tighten bolts and inspect stack height. In some instances, it may not be possible to gain correct stack height due to interference at the wheelhouse. In those instances, modifications at the wheelhouse will be necessary.

(6) Install rear seat back, cushion and quarter trim panels.

Top Shifts To One Side

If it is necessary to pull top to one side to engage locating dowels in their sockets or the top shifts to one side when raising top header from the windshield header, inspect positions of main control prop links. Links not adjusted uniformly, change operating angle of linkage causing top to twist when it is raised. When one link has been adjusted, inspect the link on other side for correct positioning.

POWER LINK ADJUSTMENT

It should not be necessary to adjust the power links (Fig. 6) (side rail structure mounting supports) unless the top assembly has been removed for servicing or replacement of linkage parts. When this is done, be sure both sides are adjusted to provide identical travel of the piston rods.

The power links are part of the folding top frame, which when loosened, permit fore or aft movement. It is important that the links on both sides be in the same position rearward, otherwise it would cause the power piston rod on one side to start to actuate the linkage slightly ahead of the piston rod on the opposite side. This can cause one side of the top to twist slightly.

The rearward position of the link also increases the travel of the power piston rod, resulting in a small amount of overtravel when the top is fully raised. When the power is turned off, the power piston assumes its normal position due to leak-back in the hydraulic system.

Rear Bow Tension Cable

Two steel cables attached to the rear bow and the top well are provided to keep the number 3 bow from moving forward and wrinkling the top material. They also prevent excessive tension on the backlight zipper. The upper end of the cables are attached to the bow by screws. The lower end is threaded into a clinch nut attached to a bracket at the top well which permits the cables to be shortened or lengthened to increase or decrease tension (Fig. 8). **Before attempting to adjust the cables, unfasten the top header latches to relieve tension on the linkage.**

Testing Cable Adjustment

On the inside of the car, locate the centerline of the top on the rear bow and the ledge of the top well. From the centerline, measure the specified distances (refer to the rear bow tension cable chart), each side of the centerline at the bow and the ledge. These are locating points for backlight depth dimensions that govern the cable tension.

Measure down from the rear edge of the rear bow to the top well ledge on each side.

If the spacings between the bow and the ledge are not to specifications, the cables must be adjusted. With an assistant holding a tape measure at one location, remove one cable attaching screw. While holding the top bow in the measured position, turn the upper

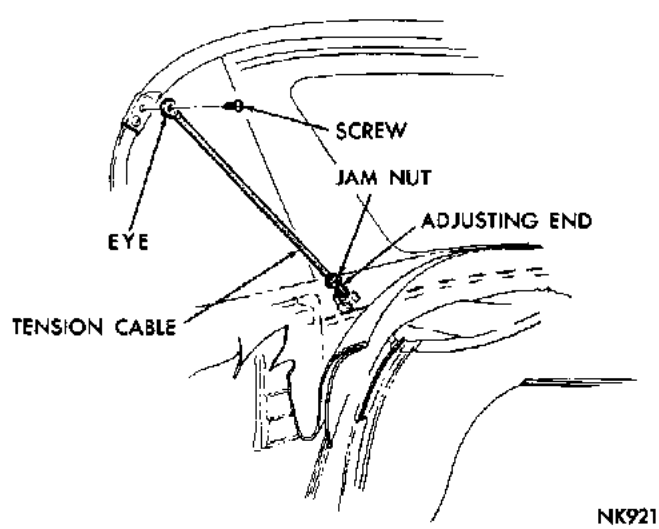


Fig. 8—Rear Bow Tension Cable

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end of the cable in the proper direction until the eye of the cable is in line with the screw hole. Install the screw. Repeat the procedure, if required, on the opposite cable.

REAR BOW TENSION CABLE CHART

Model	Each Side of Centerline (Inches)	Bow to Ledge (Inches)
Chrysler	20	26-3/4
Imperial	20	24-1/2

Front Top Bow Adjustment—Imperial Only

If the top material at the front bow appears to hang down too low and interferes with the top edge of the door glass when the door is closed, adjust the number one top bow at the adjusting plate attached to the outer ends of the top bow (Fig. 9). This permits the bow to be moved up or down, as required.

If the roof side rails are exposed below the top material, the bow can be lowered. To adjust the bow, loosen the screw at each end and move the bow up or down, as required.

Wrinkles in Backlight

Cable adjustment may cause wrinkles in the backlight area. To correct this condition, it will be necessary to remove the mouldings and retainers and relocate the backlight and quarter trim.

Before removing the moulding screws, place a strip of masking tape on the deck, directly behind the mouldings. Mark the screw locations on the tap to aid in reassembly.

Remove the moulding screws, moulding, retainer screws and retainer. Stretch the backlight and quarter trim to remove the wrinkles. Trim off excess backlight and quarter trim material that extends beyond the retainer. Install the retainers and mouldings.

ELECTRICAL TESTS

Circuit Breaker

Disconnect the wire harness connector at the motor (Fig. 10) and connect one wire of a test light to brown wire and the other to a good body ground. Position the instrument panel switch in the "UP" position. The bulb should light. Repeat this test with the yellow wire but position the switch in the "DOWN" position. If the bulb fails to light either time, and all wire terminals are tight, replace the circuit breaker.

Control Switch

Disconnect red wire at switch (Fig. 6) and hold it firmly against yellow wire terminal on switch. The top (if raised) should start to lower. Repeat this test with the brown wire. The top (in lowered position) should start to rise. If top operates during these tests, but

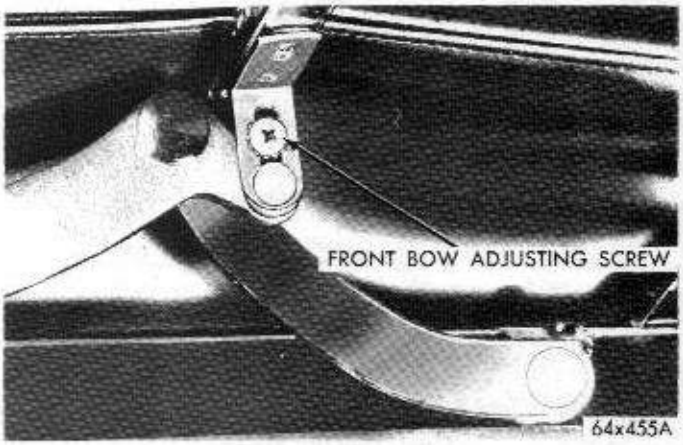
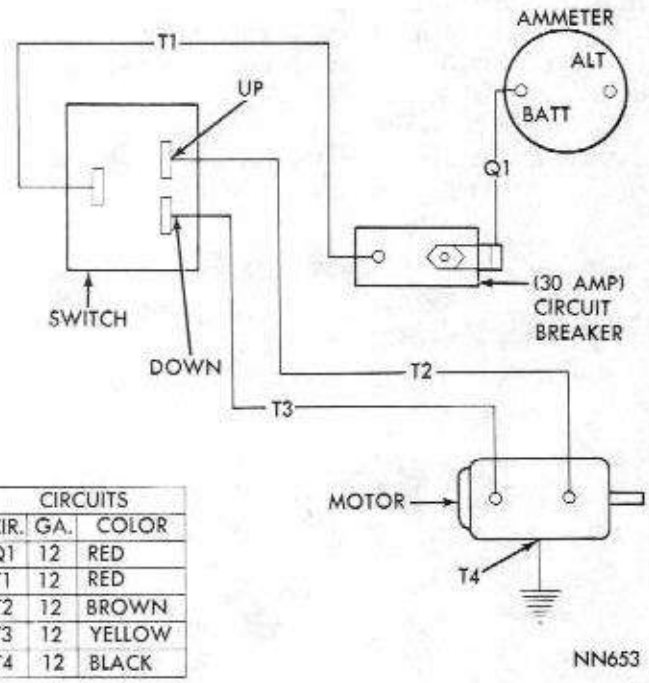


Fig. 9—Front Bow Adjustment (Imperial)

fails to operate when the control switch lever is moved to "UP" or "DOWN" position, the switch is at fault and should be replaced. If the top fails to operate during these tests, inspect and test wires between switch and motor.

Pump Motor

Should the test bulb light on one wire but not the other, inspect wire harness for a broken wire. If the bulb lights in both tests, place one wire of the test light to the black wire terminal (ground) on the motor and the other wire to a good body ground. Position the switch in either "UP" or "DOWN" position. If bulb should light inspect for a poor ground connection or broken black wire. If the bulb does not light and the wire harness test is positive, replace the motor.



CIRCUITS		
CIR.	GA.	COLOR
Q1	12	RED
T1	12	RED
T2	12	BROWN
T3	12	YELLOW
T4	12	BLACK

Fig. 10—Folding Top Wiring Diagram

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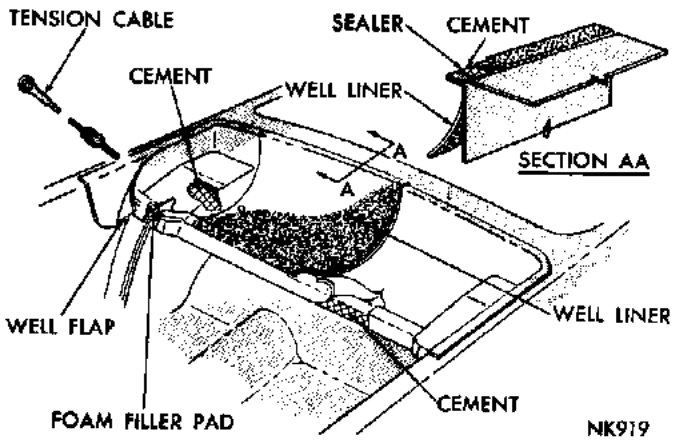


Fig. 11—Well Liner

WELL LINER (Fig. 11)

Removal

(1) Place a protective cover on deck lid upper panel and quarter panel areas.

(2) Place masking tape below lower edges of backlight and quarter panel belt mouldings and remove mouldings.

(3) Remove well flap retainers from inner quarter panel (Fig. 12) and disconnect rear bow tension cable (Fig. 8) at lower bracket.

(4) Mark location of moulding retainer screw holes on masking tape and remove retainers.

(5) Mark position of curtain and top cover screw holes on masking tape and remove screws.

(6) Remove well liner, seals and sealers.

(7) Clean sealing and cementing areas thoroughly to assure good adhesion on new liner.

Installation

(1) Install a strip of sealer cement, 120 inches long, to top of quarter outside panels and deck opening upper panel (at belt area).

(2) Apply an even coat of cement over sealer cement and adjacent metal surfaces. The width of cement should not exceed width of well liner.

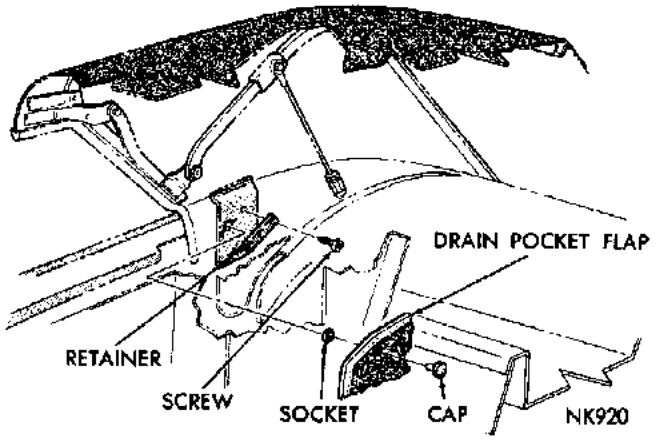


Fig. 12—Well Flap Retainers

(3) Apply an even coat of cement to rear seat back support and well liner attaching surfaces on wheelhousings.

(4) Apply a double sided adhesive foam pad to wheelhouse caps at rear seat back supports.

(5) Install drain tube connector and retainer to liner attaching edges.

(6) Install an even coat of cement to bottom edge of liner attaching edges.

(7) Position new well liner in well and press attaching surfaces to cemented surfaces.

(8) Slit liner (2 places) on rear seat back support for tension cables and attach tension cables.

(9) Apply polyethylene seals to belt areas on quarter outside panels and to deck upper panel over installed well liner.

(10) Pierce seals and liner cover at retainer screw holes, using reference marks on masking tape.

(11) Position drain hose in floor pan plug and install on liner connector.

(12) Position top cover and rear curtain ends to alignment marks and install retaining screws.

(13) Install moulding retainers and mouldings.

(14) Adjust tension cables and install well flap retainers (Fig. 12).

(15) Remove masking tape and protective covers.

WEATHERSTRIPS

Roof Side Rail

After the roof side rails have been aligned, inspect the side rail weatherstrip (Fig. 13) to make sure it is providing a good seal at the top of the door and quarter glass.

If the weatherstrip is not sealing properly, the retainer and weatherstrip can be adjusted to improve the seal. The retainer has elongated attaching screw holes which permit the retainer and weatherstrip to be moved in or out.

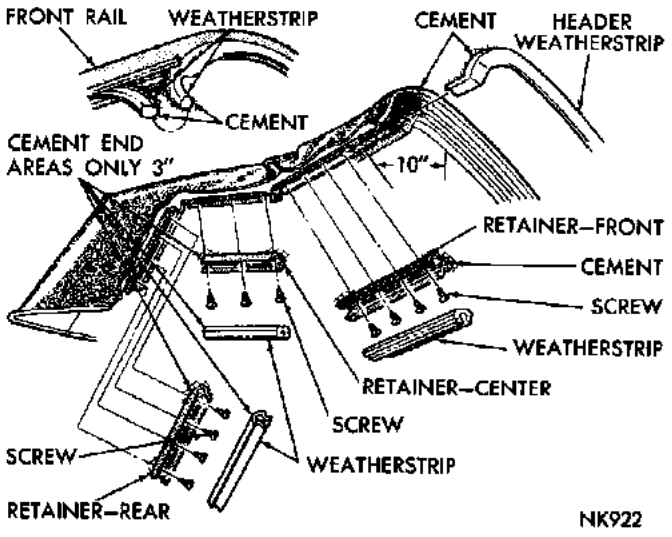


Fig. 13—Roof Rail Weatherstrips

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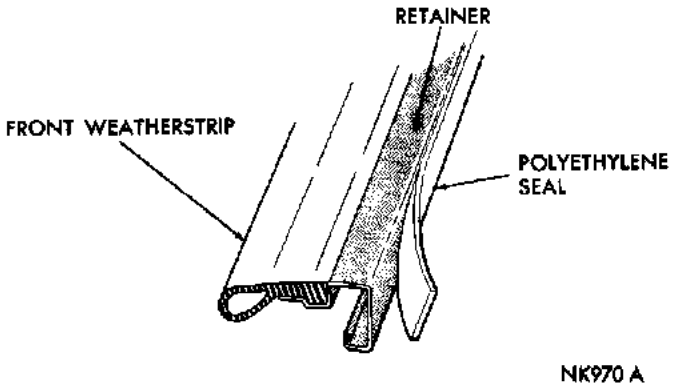


Fig. 14—Top Header Weatherstrip

Raise the glass until top edge curls the outer lip of the weatherstrip inward just enough to contact the inner lip. Adjust up-stops to limit further upward travel of glass.

Top Header Front Weatherstrip

The entrace of water and air between the top header and windshield header is eliminated by a tube type weatherstrip (Fig. 14) secured to the underside of the top header. The forward edge of the weatherstrip contacts the windshield header outside finish moulding.

Seals and Sealers

When replacing or repairing a seal or weatherstrip at the header or pillar area (Fig. 15) care should be exercised to see that the seals and weatherstrips are firmly seated in correct alignment and are free of twists. Clean all areas thoroughly before installing the weatherstrips and seals.

COVER REPLACEMENT

Removal

Use care not to damage the top material if the

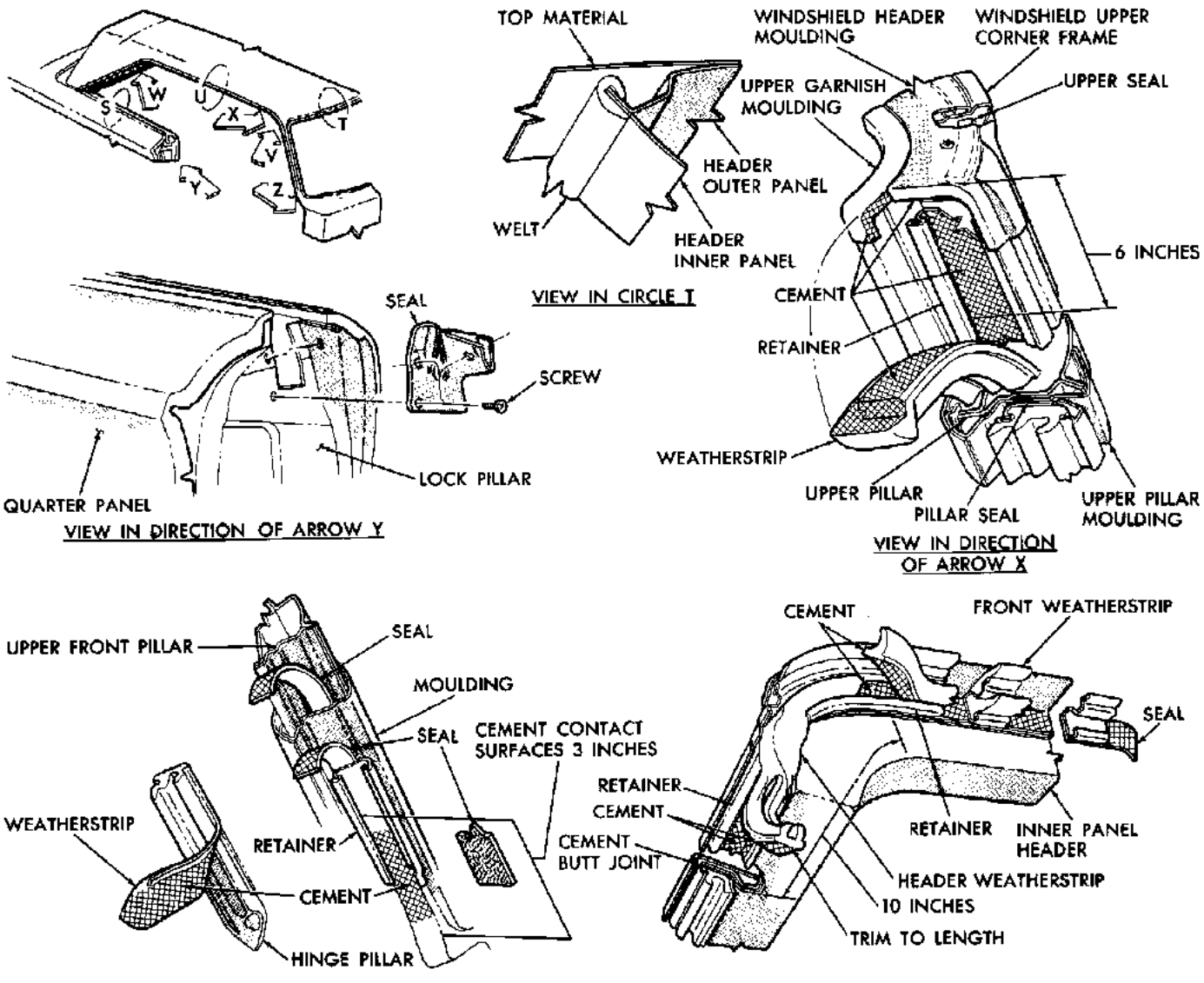


Fig. 15—Lock Pillar—Seals and Sealers

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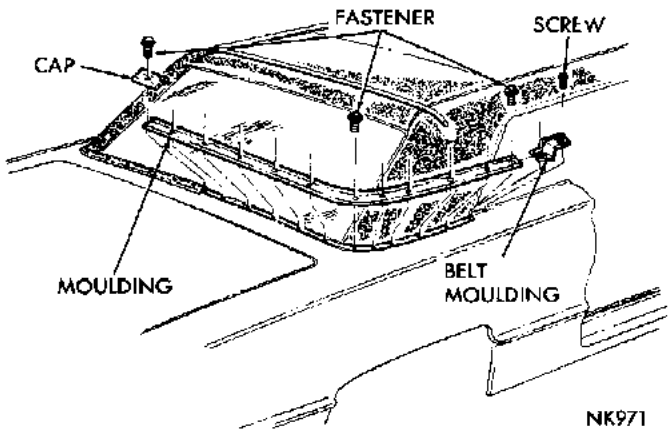


Fig. 16—Rear Curtain and Mouldings

original cover is to be reinstalled. In some instances the staples ends may have become peened over and if excessive effort is required to remove them, it is advisable to cut the heads off the staples and remove the pieces after the top cover has been removed, otherwise damage to the top material may result.

Make a visual inspection of the weatherstrips for damage or excessive wear before removing the top cover. Test the adjustment of the rear tension cables. Inspect the top cover cables to make sure they are correctly connected. Inspect the top cover stay pads for excessive wear or moisture stains.

(1) Place protective covers over deck lid, deck lid upper panel, hood and cowl areas.

(2) Apply masking tape directly below mouldings at rear quarter panels and rear window.

(3) Remove mouldings at quarter panel belt area and from bottom of rear window (Fig. 16).

(4) Mark location of moulding retainer screws on masking tape at quarter panel areas and first two screws at each side of rear window moulding retainer.

(5) Mark location of top cover ends at rear window on masking tape.

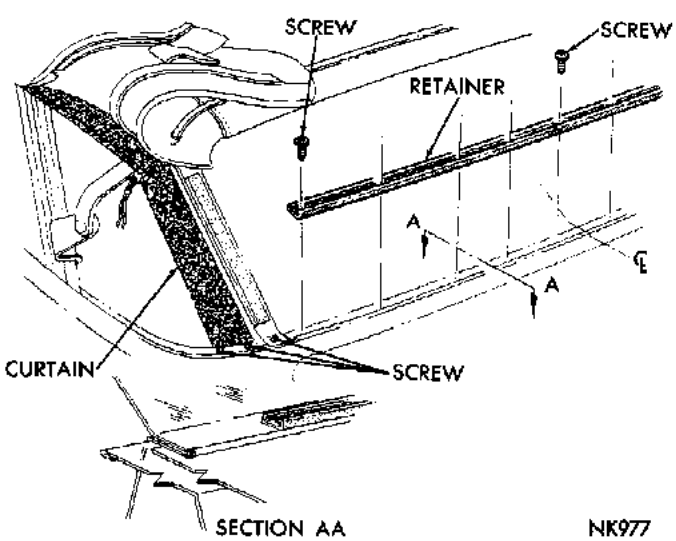


Fig. 17—Curtain Lower End Attachment

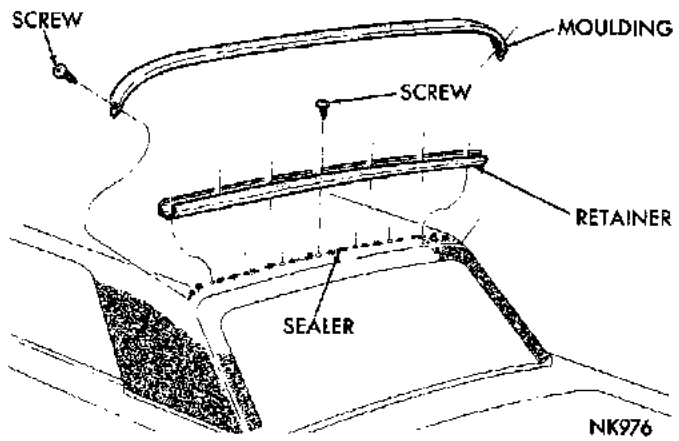


Fig. 18—Rear Bow Moulding and Retainer

(6) Remove retainers at quarter panels and at corners.

(7) Mark location of rear curtain material end and three end attaching screws (Fig. 17) on masking tape at quarter panels and rear window areas.

(8) Remove screws from ends of moulding on rear boss (Fig. 18).

(9) Remove screws attaching moulding retainer to roof bow and remove retainer.

(10) Using a sharp pointed tool remove staples and tacks at rear bow.

(11) Remove staples and tacks (one tack used on each side at binding areas attaching top cover to rear bow).

(12) Unsnap top boot and lay it over rear seat back.

(13) Unzip rear window and lay it in top well making sure all wrinkles and bends are removed.

(14) Prop top off of windshield header and remove moulding from top header. The moulding attaching screws are located under weatherstrip.

(15) Raise top to ½ open position and remove rear roof rail weatherstrip (Fig. 13). Mark location of retainer screws on roof rail to aid in reassembling, and remove retainer.

(16) Remove top and rear curtain material from roof rail.

(17) Raise top completely and remove quarter panel trim in well area to permit removal of top material retainers in well area at quarter panels (Fig. 12).

(18) Remove staples, drive nails and tacks attaching top material to header.

(19) Mark location of top material bead on ends of the cover pads.

(20) Loosen vent wing seals at corners.

(21) Remove front screws from front roof rail weatherstrip retainers and remove locking flaps (Fig. 19) from between retainer and roof rail.

(22) Remove cover tension cables and attaching bracket assembly (Fig. 20) at front roof rail and number 3 roof bow. If original cover is to be reinstalled,

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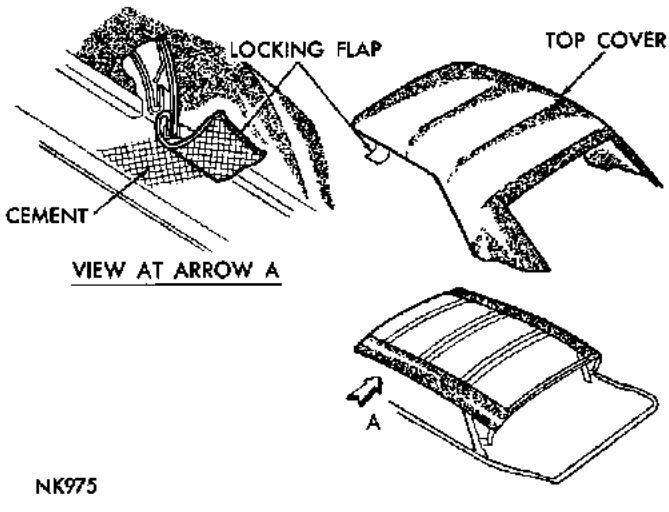


Fig. 19—Front Locking Flaps

tie a cord to one end of cables prior to removing. When cables are removed the cord should be left in the listing to aid in reinstalling cables.

(23) Remove top cover.

Installation

Prior to installing the top cover, inspect the roof bow felt pads for moisture or damage. The pads are a press fit in the roof bows. The cover stay pads should be inspected for damage and moisture. The stay pads are attached to the header and roof bows with staples. The rear window zipper top half is attached to the rear bow with staples.

(1) Inspect cables in cover listings. Use cords to install cables in original cover.

(2) Locate and mark center line on top header, rear bow, and at each end of new cover.

(3) Position cover on folding top and align center line marks.

(4) Install backlight on cover and connect zipper.

(5) Block top header off of windshield header approximately four inches, to relieve tension on cover when being installed on inner quarter panel in well area.

The procedure for installing a new cover differs slightly from that of reinstalling the original cover. When installing a new cover, the procedures outlined in steps 6, 7, 9, 10, 11, 14 and 16 should be performed on both sides, whereas the procedures for reinstalling the original cover in steps 6, 7, 9, 10, 11, 14 and 16 should be performed on one side only.

(6) Position top cover on inner quarter panel in well area and install retainers (Fig. 12). Do not tighten.

(7) Install screws attaching rear curtain to quarter panel making sure center line marks on rear bow and cover end are in alignment.

(8) Make certain center line at front end of cover is in alignment with center line on header and press cover on header.

(9) At backlight area, align end of window curtain

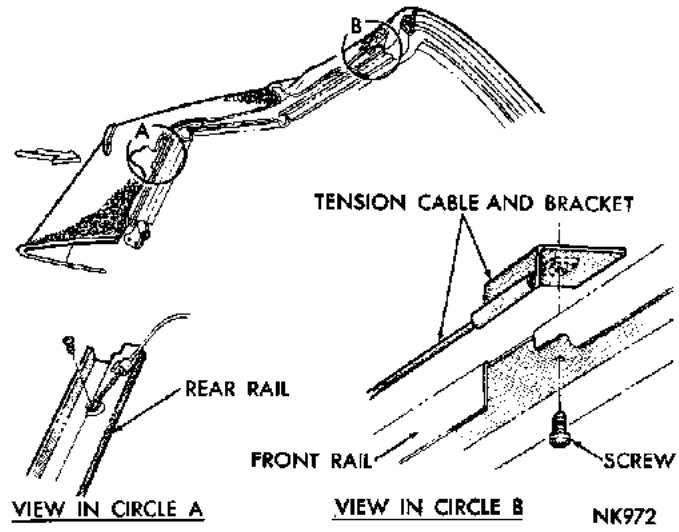


Fig. 20—Cover Tension Cables

with mark on masking tape and install retaining screw.

(10) Align end of top cover with alignment mark on masking tape. Position backlight moulding retainer over cover and install retaining screw. On new covers, use a sharp pointed tool to penetrate material over screw hole.

(11) Install retainers over material at corners of quarter panels.

(12) Pull material into position at corner of windshield header and align cover bead with alignment mark on pad end.

(13) Tack cover into position at corner and bead area only. Space tacks approximately one half inch apart.

(14) With cover in position at rear quarter panel and center line marks of cover and rear bow in alignment, tack cover to corner and bead area only of roof bow.

(15) Repeat steps 10, 11, 12, 13 and 14 on opposite side.

(16) Connect cover tension cables and mounting brackets (Fig. 20) at both sides.

(17) Lock header in place and inspect fit at rear roof bow and at top header.

(18) Install moulding retainers at quarter panels.

(19) Raise top to one half open position. Apply a bead of rope type sealer to back of rear roof rail weatherstrip retainers.

(20) Apply cement to rear roof rail and between rear curtain and top cover material at area where they fit on roof rail and position on rear pillar.

(21) Position weatherstrip retainers on roof rails and using a sharp pointed tool align screw holes in curtain and cover material with screw holes in roof rails. On new covers use tool to make holes in cover.

(22) Install retainer screws and weatherstrips (Fig. 13).

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(23) Raise top completely and lock in position on header.

(24) Open and close both front doors several times noting fit of top cover in relation to top of door glass and vent wings. Should either vent wing or door glass contact beading on edge of cover on one side, the top material may be loosened at the header and moved slightly toward opposite side until clearance is obtained at door glass. Should contact at both doors be made, it will be necessary to build up cover pads on both sides to eliminate interference.

(25) While keeping center line of cover and header in alignment, tack one half of cover to header. Space tacks approximately one inch apart.

(26) Install drive nail at lower front edge of cover and one long tack through cover beading to header.

(27) At rear roof bow on same side, make certain center line marks of cover and roof bow are in alignment and tack cover into position spacing tacks approximately ¼ inch apart.

(28) Install a large tack through roof beading at rear bow.

(29) Repeat steps 27 and 28 for opposite side.

(30) Inspect alignment of top cover and if satisfactory, complete tacking operation of cover at header. Tacks should be installed approximately ⅛ inch apart. **Make sure all wrinkles are removed at the header during the tacking operation. Do not allow the cover material to lap over.**

(31) Position locking flaps at front outer edge of cover (Fig. 19) between roof rail retainers and rail. Install retaining screws and weatherstrips.

(32) Apply cement across top cover tacking area, making sure each tack is completely covered. **Use care not to allow cement outside of tacking strip area.**

(33) Apply cement between outer edge of cover and header. Press cover firmly down on header.

(34) Position header moulding retainer on header. Align moulding retainer clips with screw holes in header and install retainer screws.

(35) Apply cement to vent wing seals and press into place.

(36) Apply cement to header weatherstrip, where loosened to expose header moulding attaching screws, and press firmly into place.

(37) Apply cement to tacking strip area on rear roof bow making certain each tack is completely covered. Use care not to allow cement to extend outside of tacking area.

(38) Using sealing tape the same color as cover material and slightly narrower than width of moulding retainer, apply across entire tacking area. Press firmly into place.

(39) Install moulding retainer (Fig. 19) over sealing tape.

(40) After retainer has been completely installed, press moulding on to retainer and install moulding end screws.

(41) Position mouldings on quarter panels and rear window moulding retainers and install snap retainer and screw assemblies. Do not overtighten.

(42) Test operation of top assembly and inspect fit at windshield header, door and quarter window areas.

(43) Remove masking tape and protective covers.

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SEALING

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SERVICE PROCEDURES

The procedures for weatherstrip sealing and replacement are incorporated with the procedures of the component unit.

The sealing illustrations used in this section show the area sealed during manufacture of the vehicle. These areas should be considered when testing for leaks.

TESTING

Water Method

Normally a visual inspection of an area will indicate the area for sealing. When testing with water, use a spray simulating rain or a garden hose without the nozzle and regulate the pressure to an approximate 3 inch stream. All water tests must be made starting at the bottom of the door opening or weatherstrip and slowly moving up the joint, seam or suspected area.

Powder Method

To test the sealing between the body and the weatherstrips, it is advisable to use trace powder and a test bulb. When the powder is sprayed at the point where a leak is suspected it will leave a trace line through the point of leakage.

In hard to reach points, such as the dog leg at the "A" post, blue carpenter's chalk applied to the weatherstrip will transfer to the "A" post when the door is closed if a good contact exists.

SEALERS AND COMPOUNDS

Super Rubber Cement—May be used where a strong bonding of rubber parts to painted or unpainted steel surfaces is desired, attachment of weatherstrip on doors and luggage compartment lid or for attachment of felt pads.

Windshield Rubber Sealer—A heavy viscosity, rubber expander. Sealer can be used where rubber is confined between a glass and metal channel, such as on the windshield and rear window glass assembled in one-piece type weatherstrips. Sealer will not harm paint or chrome finish and can easily be removed with a cloth before it sets.

Body Seam Sealers—For External Sealing along welded joints, exterior roof rails, exterior belt lines, B-post welds, weatherstrips and floor seams. Upon drying, the sealer forms a tough skin which can be painted with a touch-up brush.

Heavy Sealing Putty (For Interior Sealing)—A heavy, fibrous, putty-like compound, which can be formed or rolled into pellets or long string shapes.

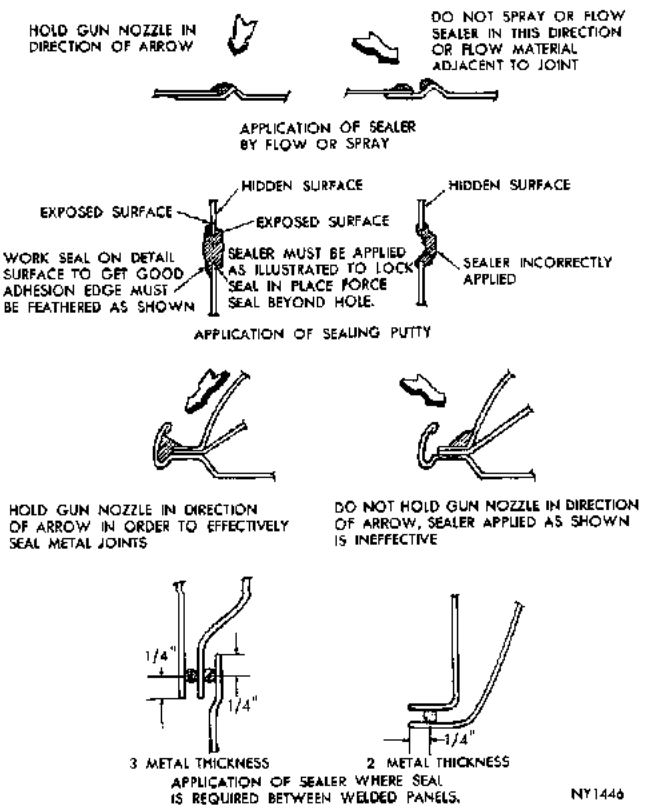


Fig. 1—Methods of Applying Sealers

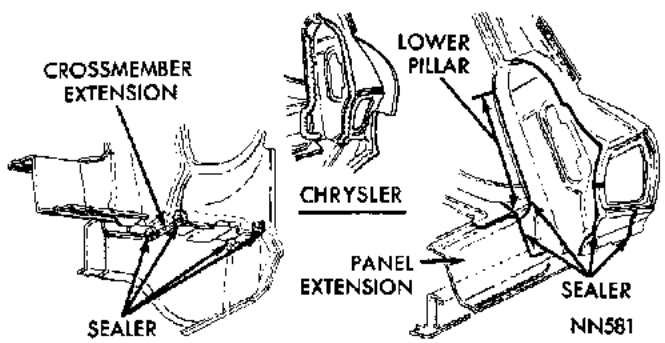


Fig. 2—Tail Gate and Tail Lamp Opening

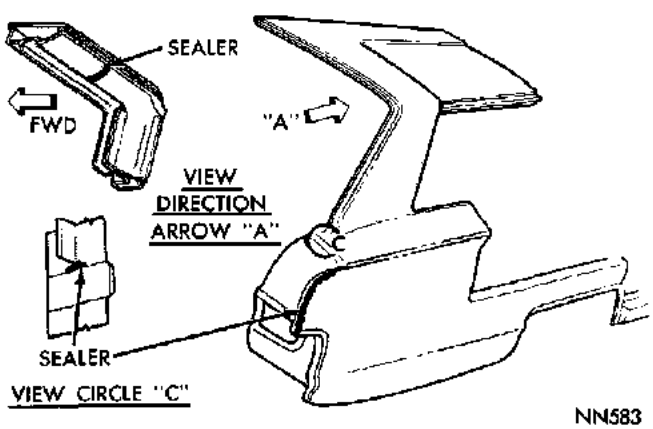


Fig. 3—Tail Gate Opening and Pillars

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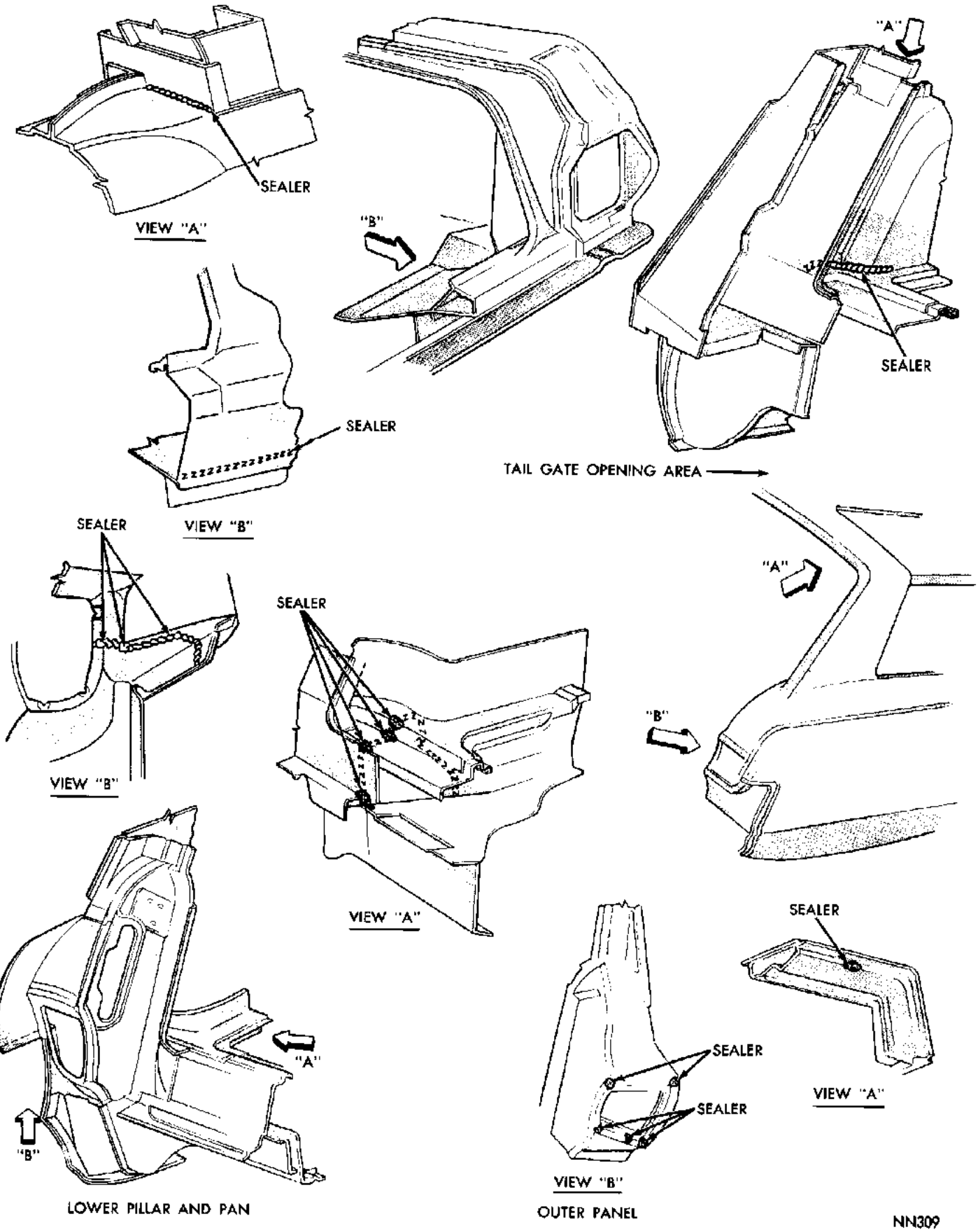


Fig. 4—Wheelhouse and Tail Gate Opening (Chrysler)

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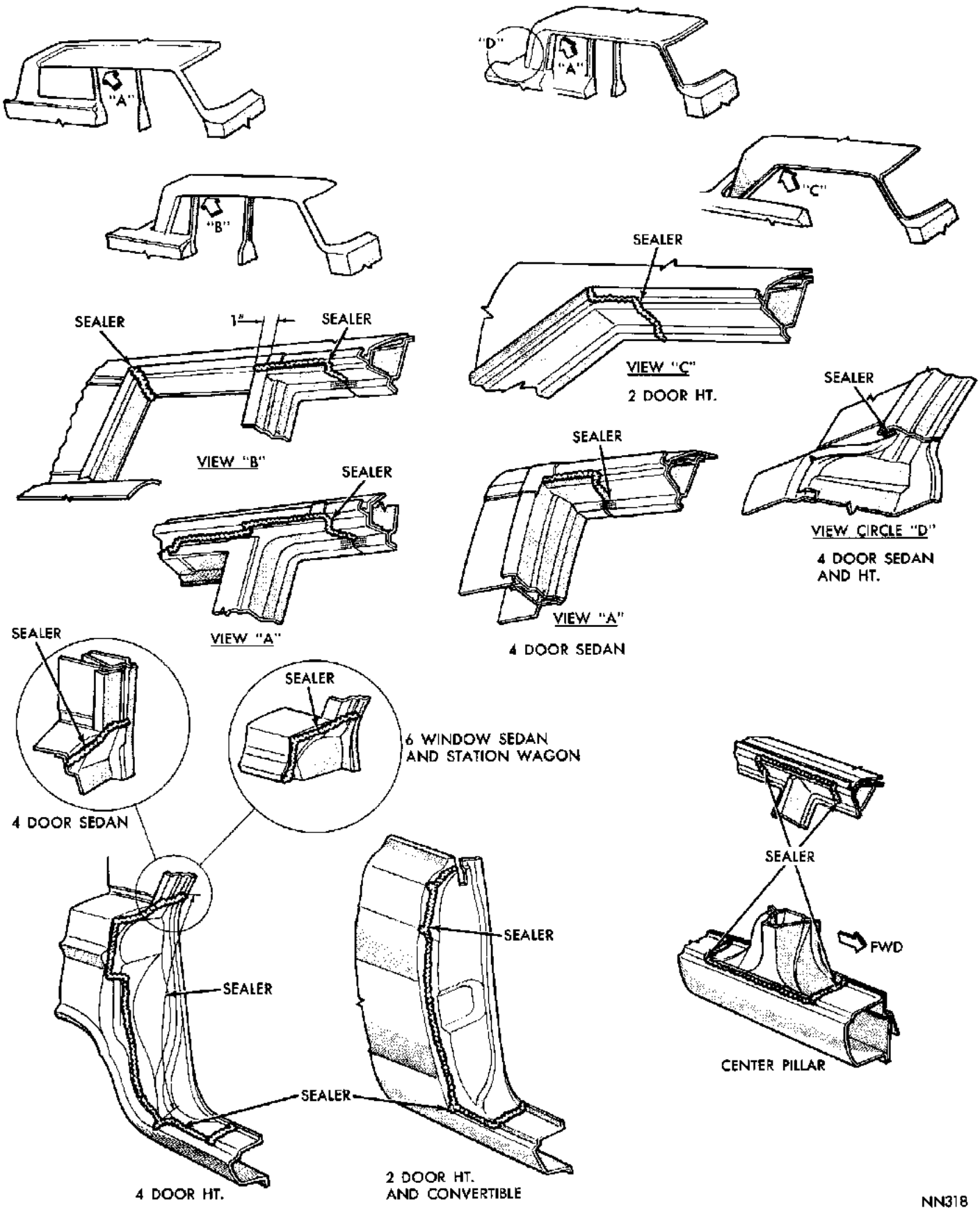


Fig. 5—Lock Pillars and Drain Trough (Chrysler)

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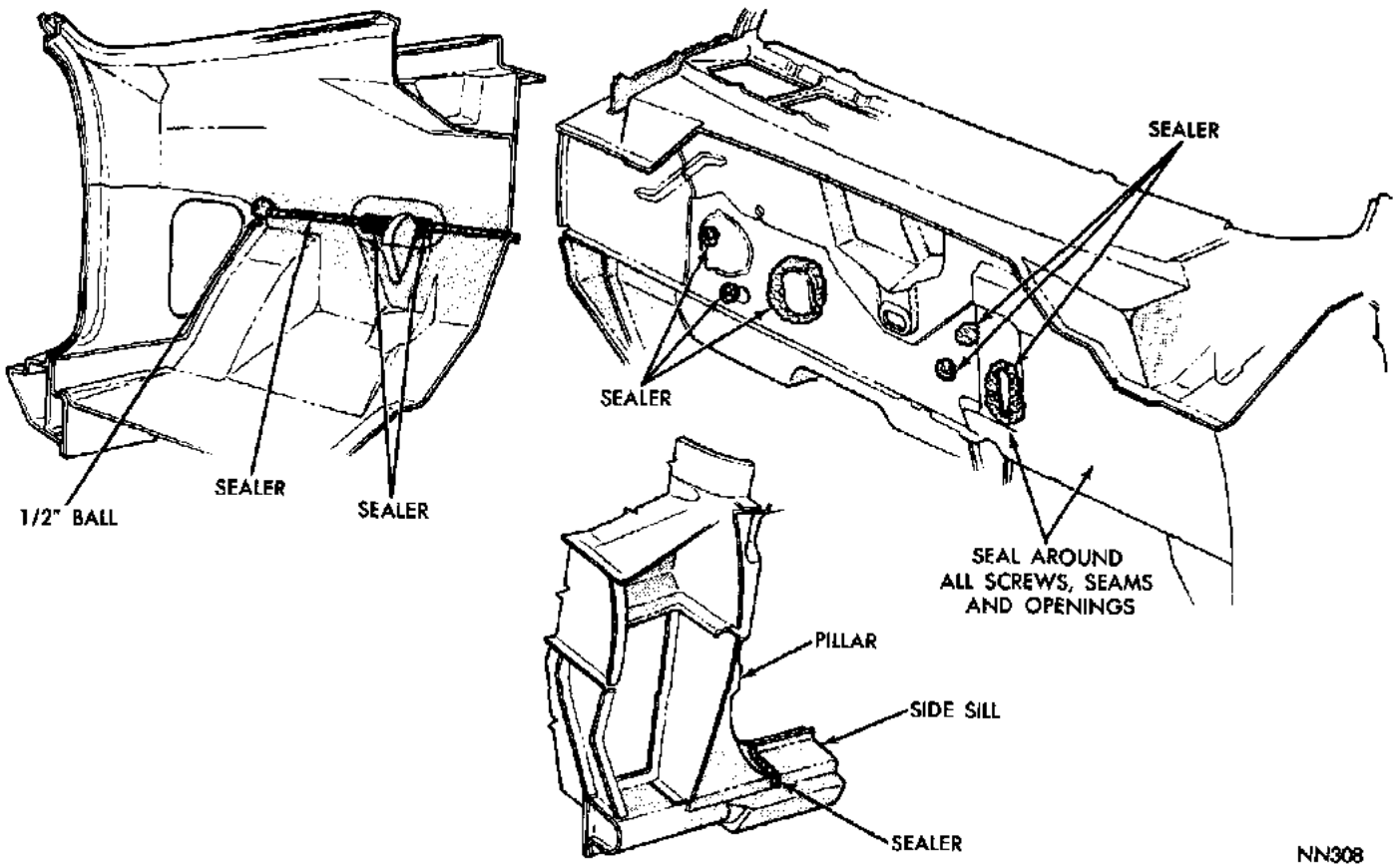


Fig. 6—Cowl—Dash Panel—Floor Pan and Side Sill (Chrysler)

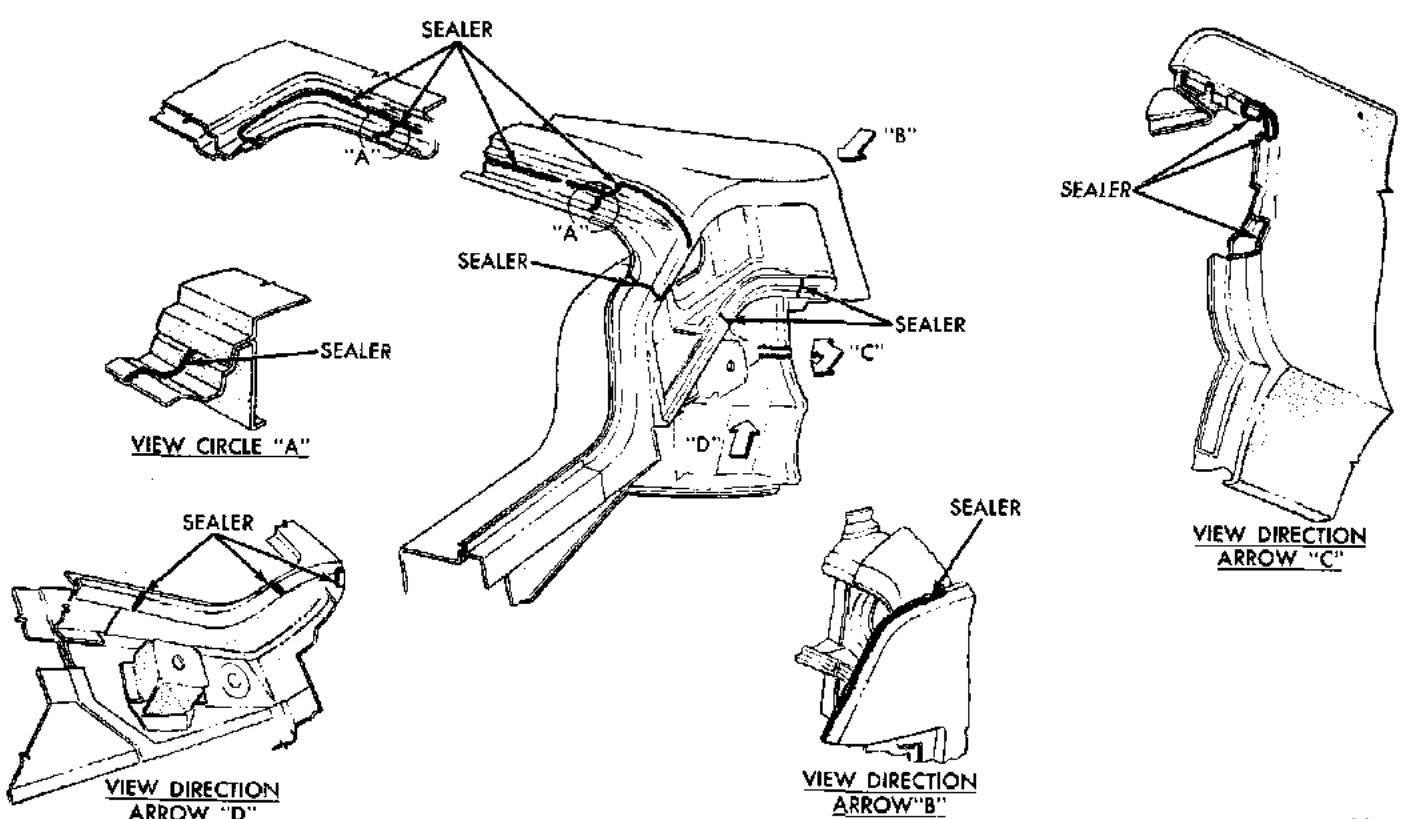


Fig. 7—Deck Opening Seams (Chrysler)

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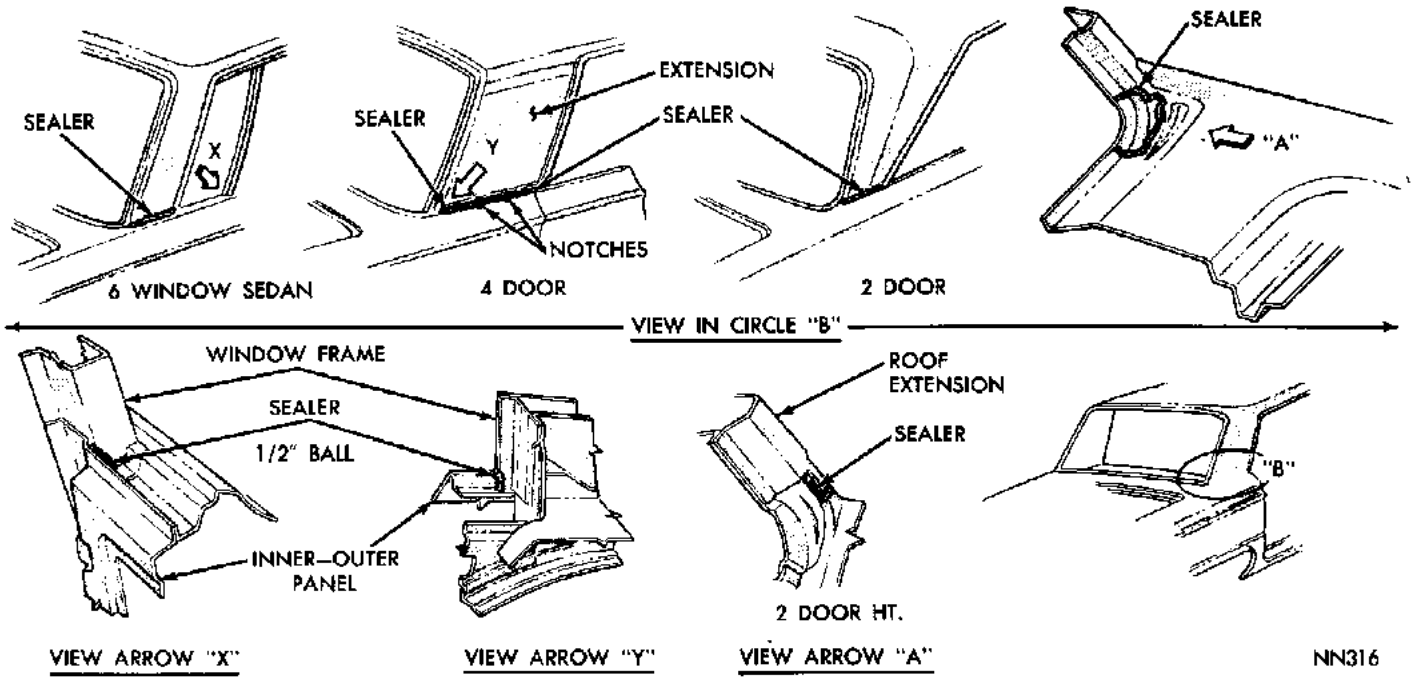


Fig. 8—Quarter Outside Panel and Roof Extension (Chrysler)

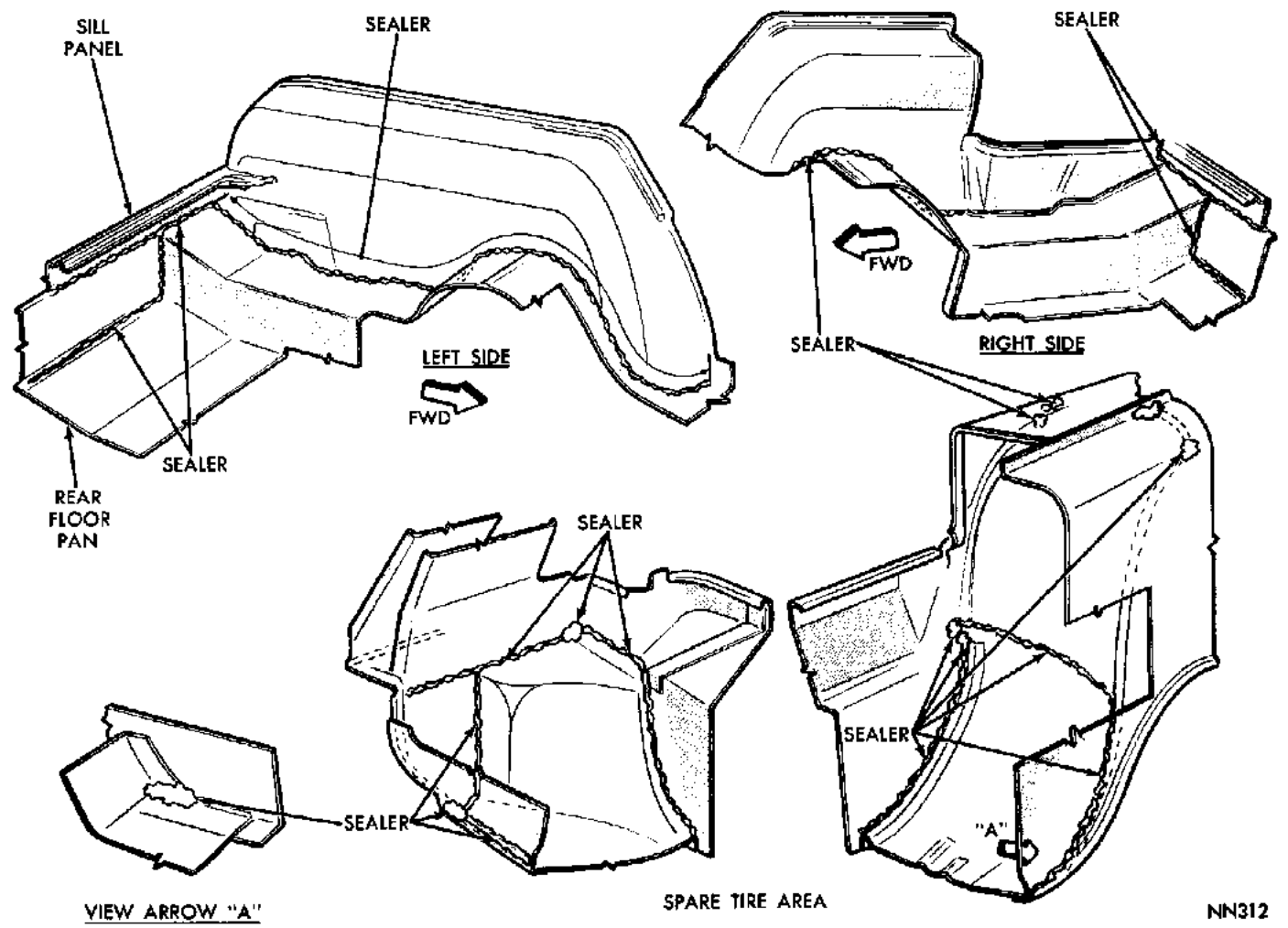


Fig. 9—Wheelhouse and Spare Tire Compartment (Chrysler)

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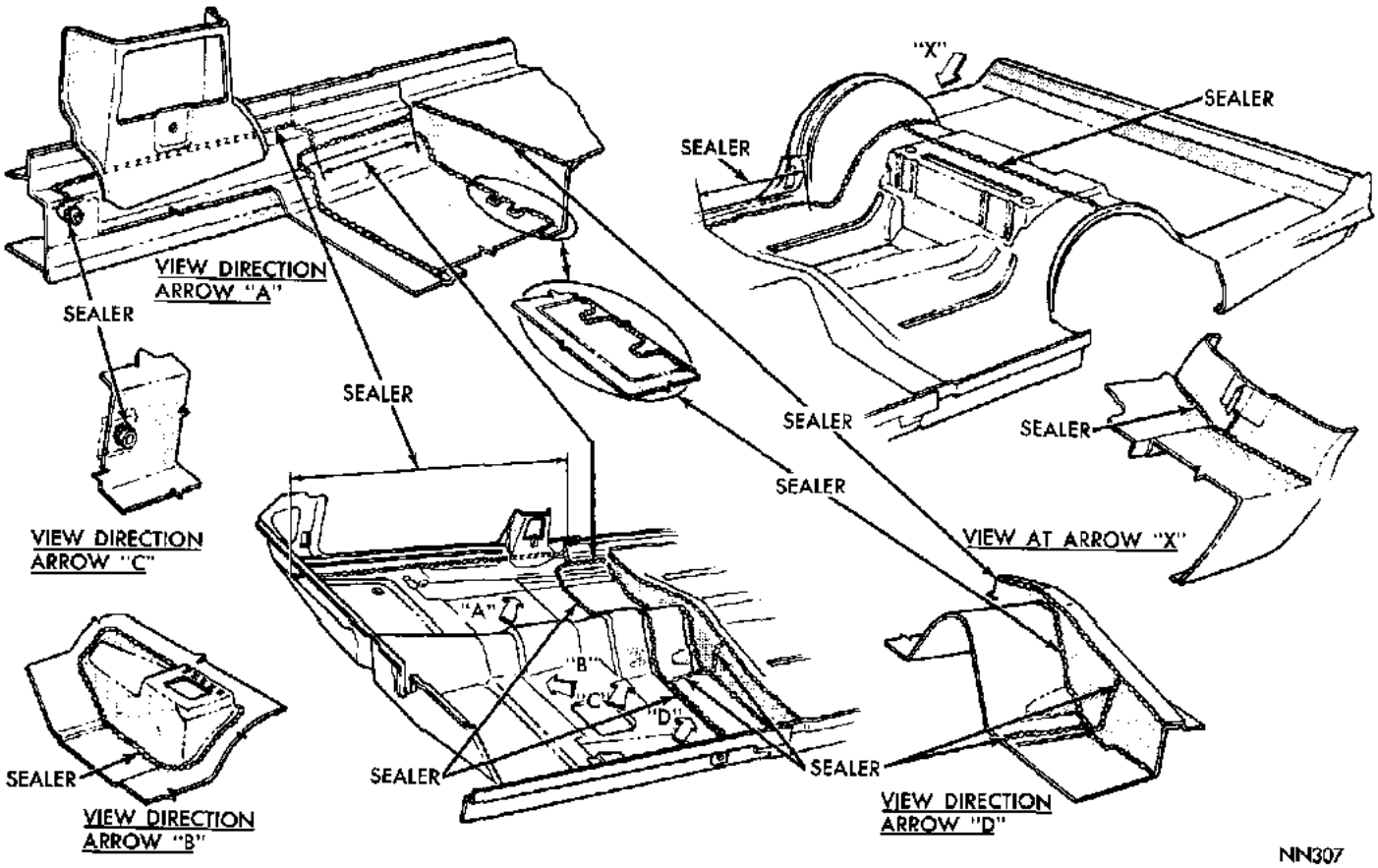


Fig. 10—Floor Pan and Side Sill Area (Chrysler)

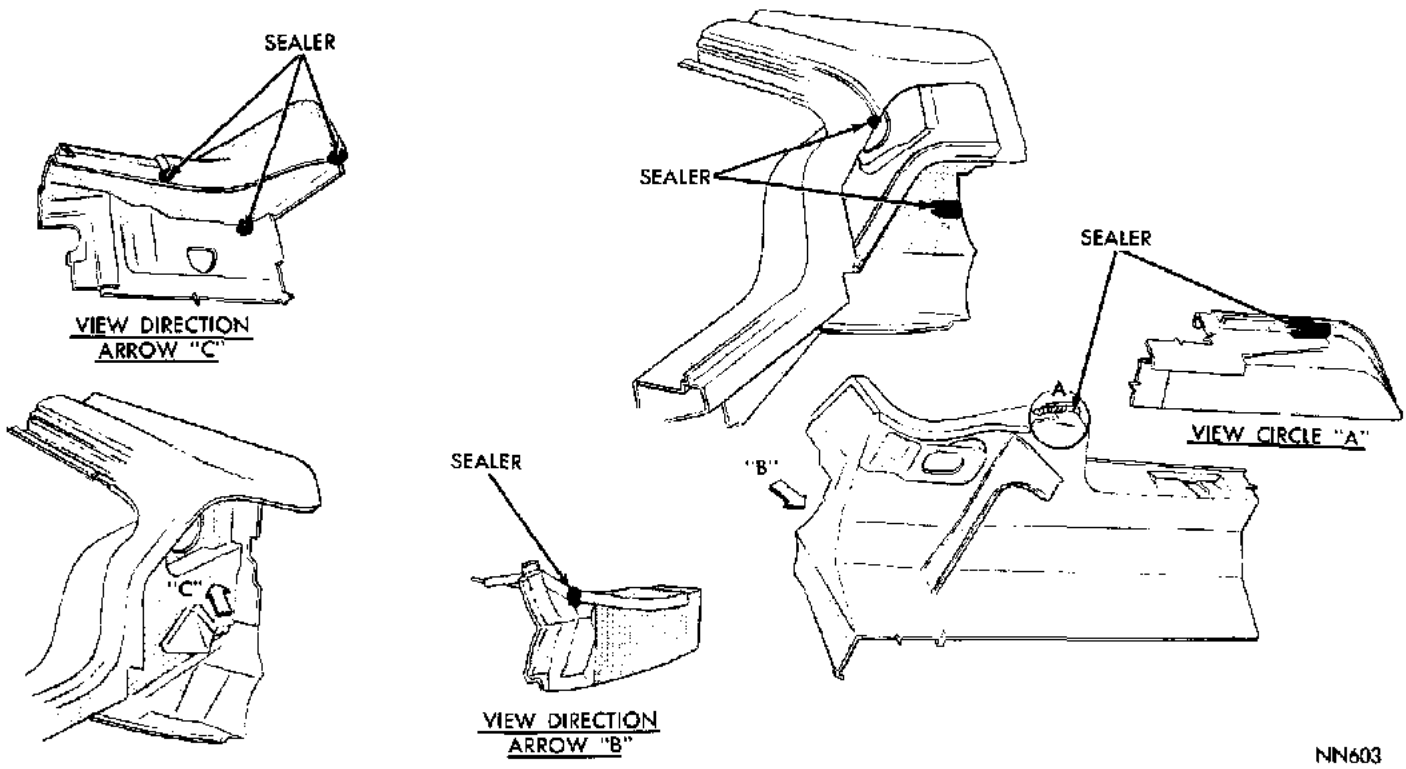


Fig. 11—Deck Drain Trough (Chrysler)

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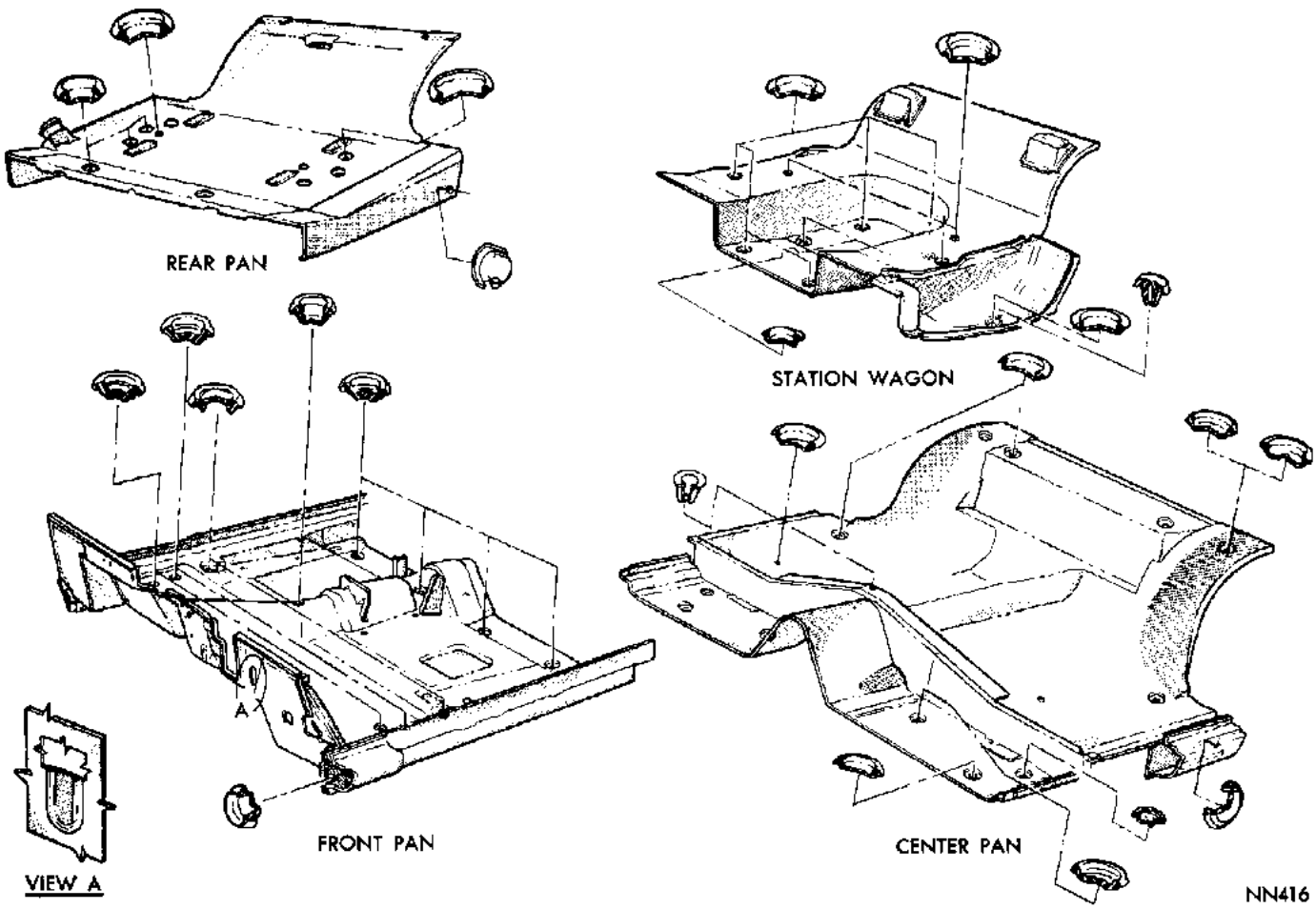


Fig. 12—Floor Pan Plugs (Chrysler)

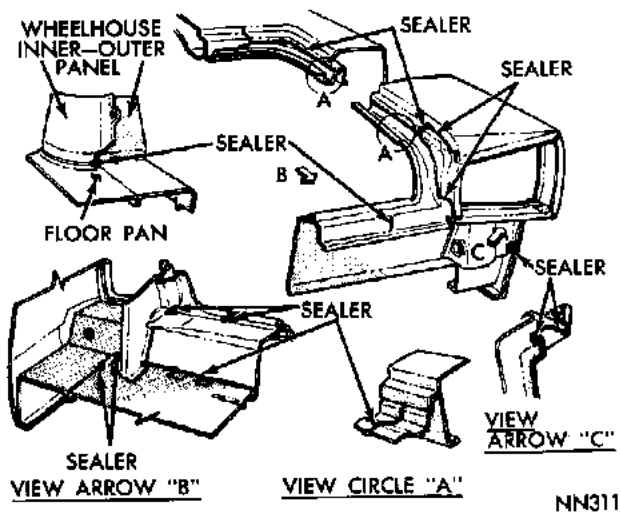


Fig. 13—Tail Light and Deck Drain Trough (Chrysler)

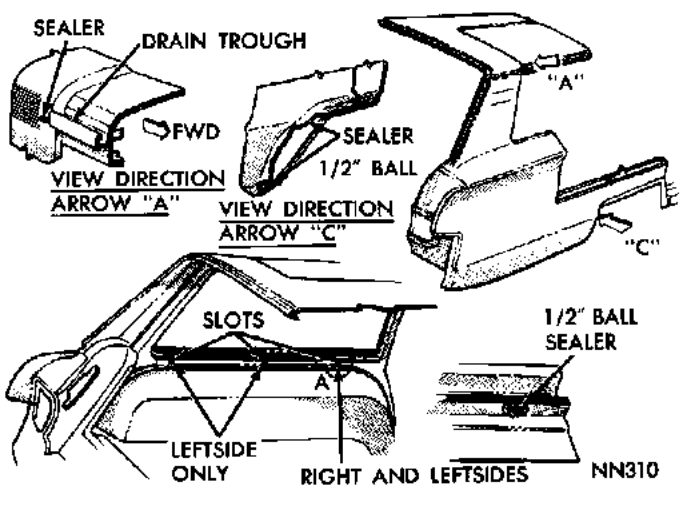


Fig. 14—Wheelhouse Outer Opening and Inner Panels (Chrysler)

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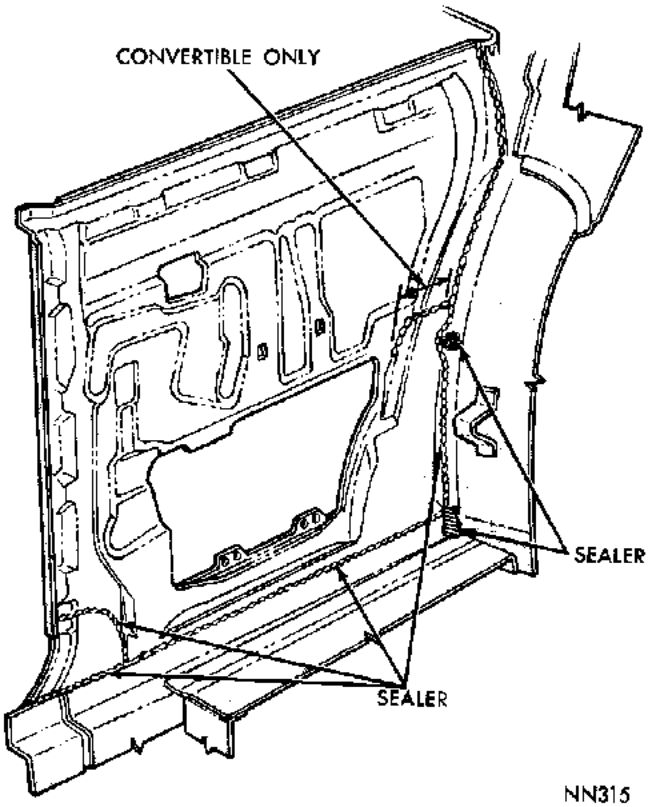


Fig. 15—Inside Quarter Panels (Chrysler)

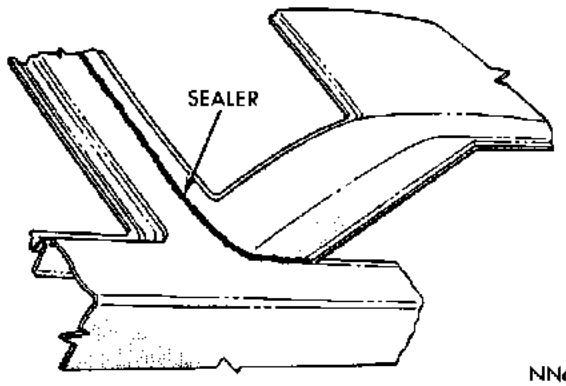


Fig. 16—Deck Opening Upper Panel Seams (Chrysler)

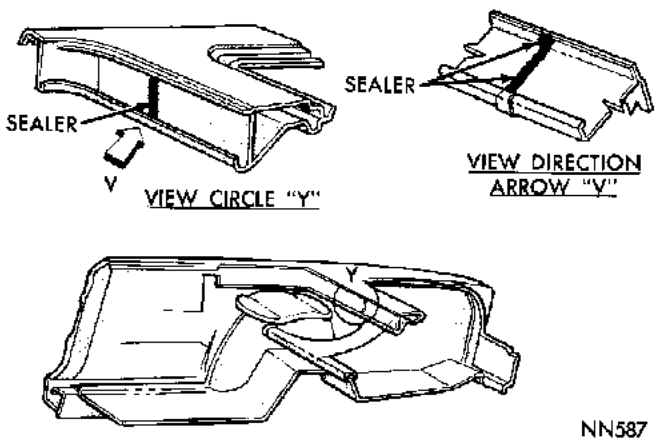


Fig. 17—Convertible Wheelhouse and Belt Bar

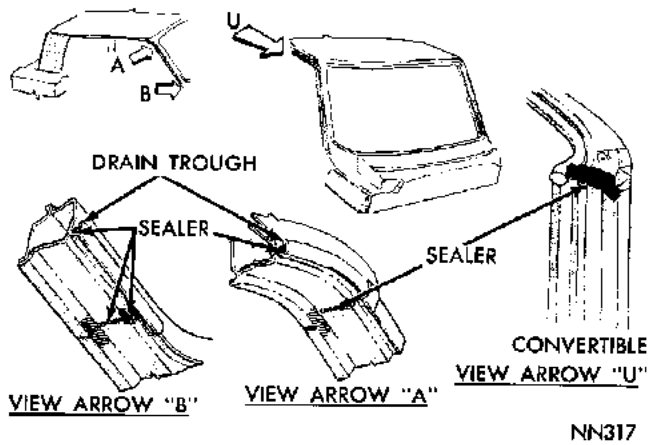


Fig. 18—Front Pillar Area (Chrysler)

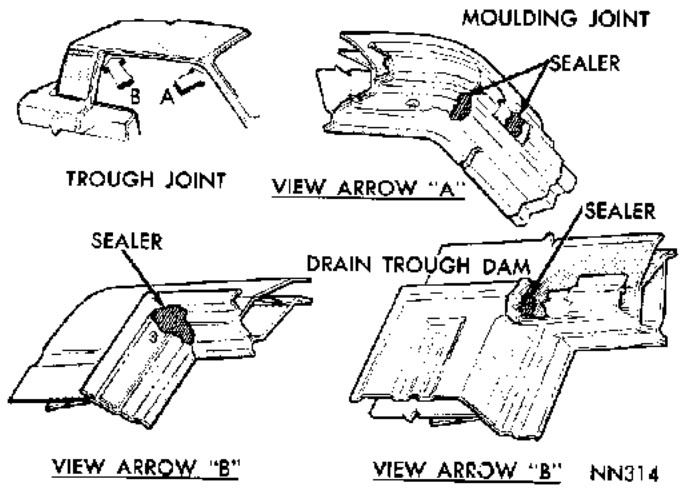


Fig. 19—Rear Roof Rail Areas (Chrysler)

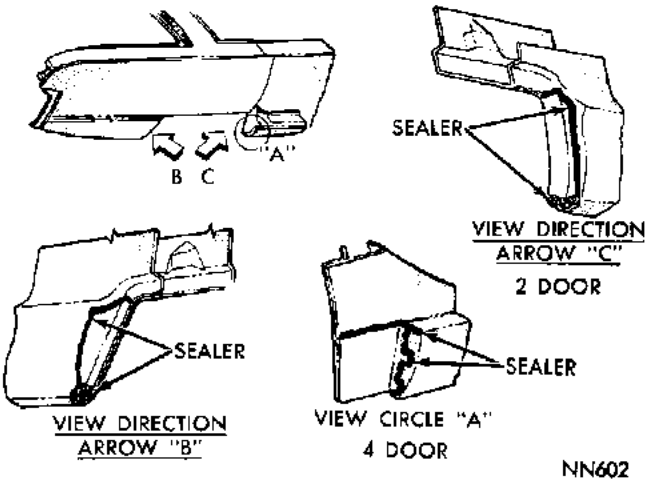


Fig. 20—Wheelhouse Opening Flanges (Chrysler)

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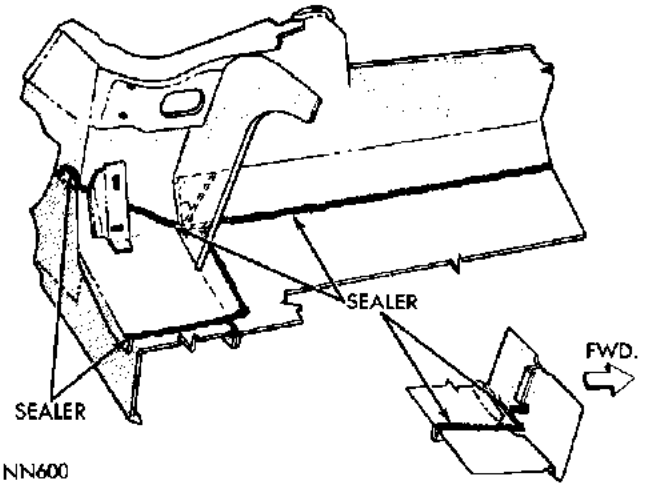


Fig. 21—Rear Floor Pan and Lower Panel (Chrysler)

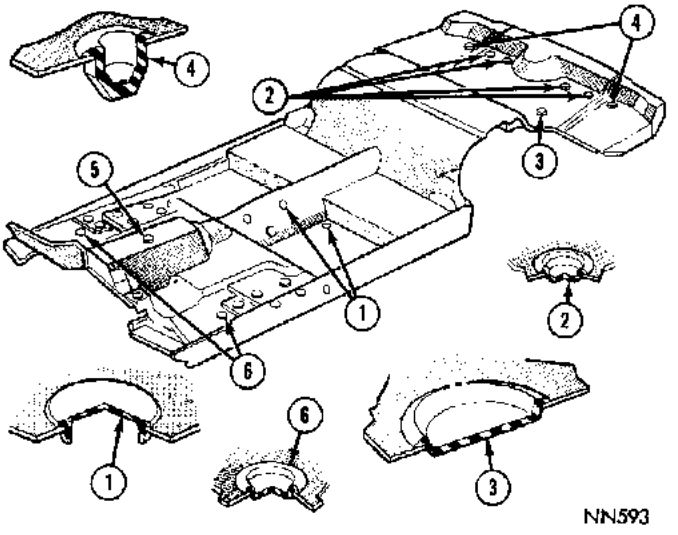


Fig. 24—Floor Pan Plugs (Imperial)

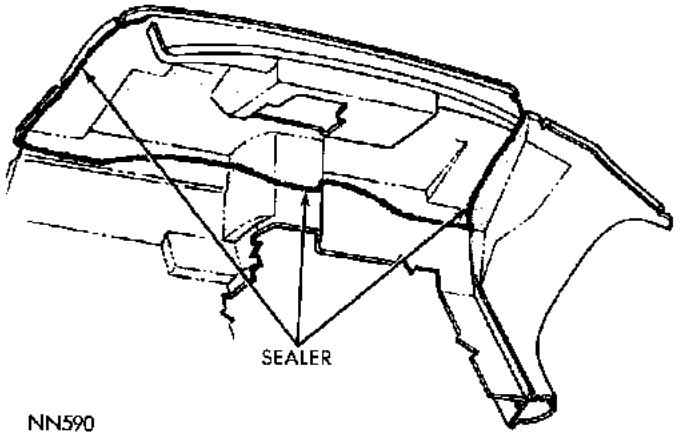


Fig. 22—Floor Pan and Cowl Area (Imperial)

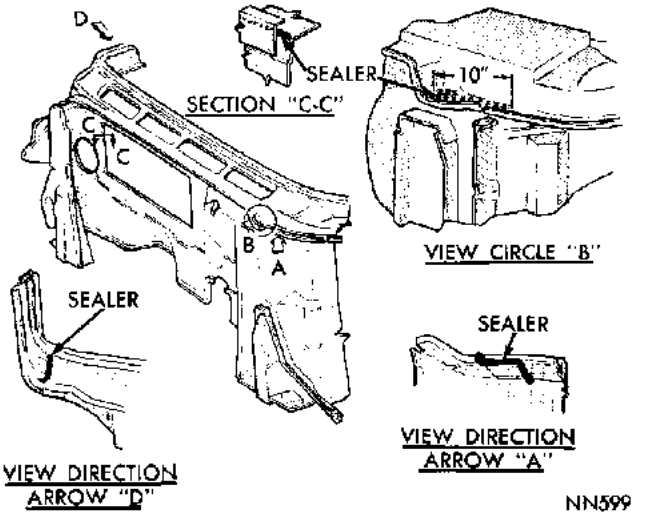
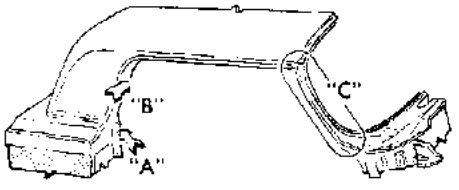


Fig. 25—Dash and Cowl Top Panels (Imperial)



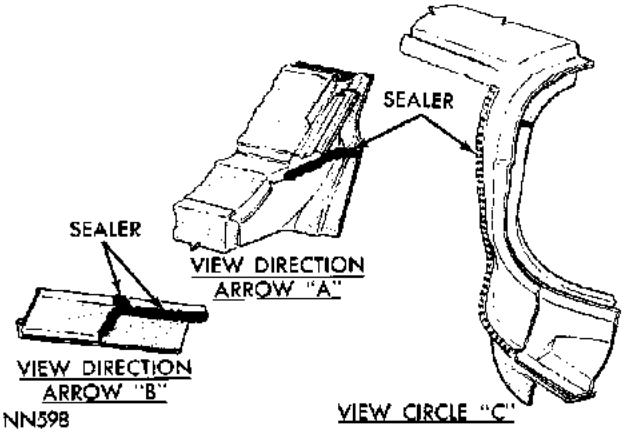


Fig. 23—Drain Trough Area (Imperial)

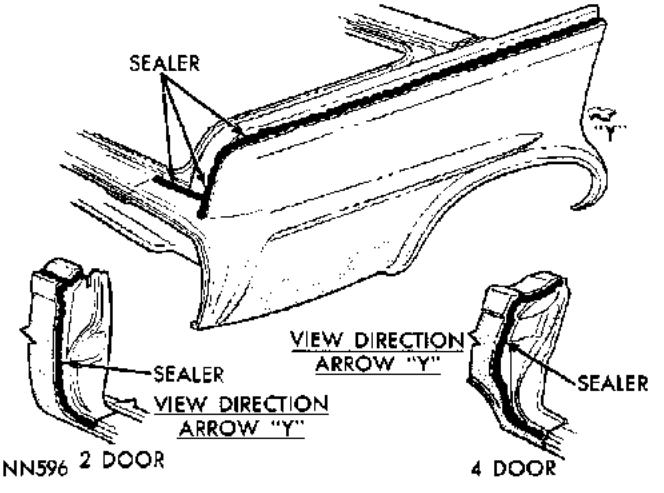


Fig. 26—Outside Quarter Panel and Pillars (Imperial)

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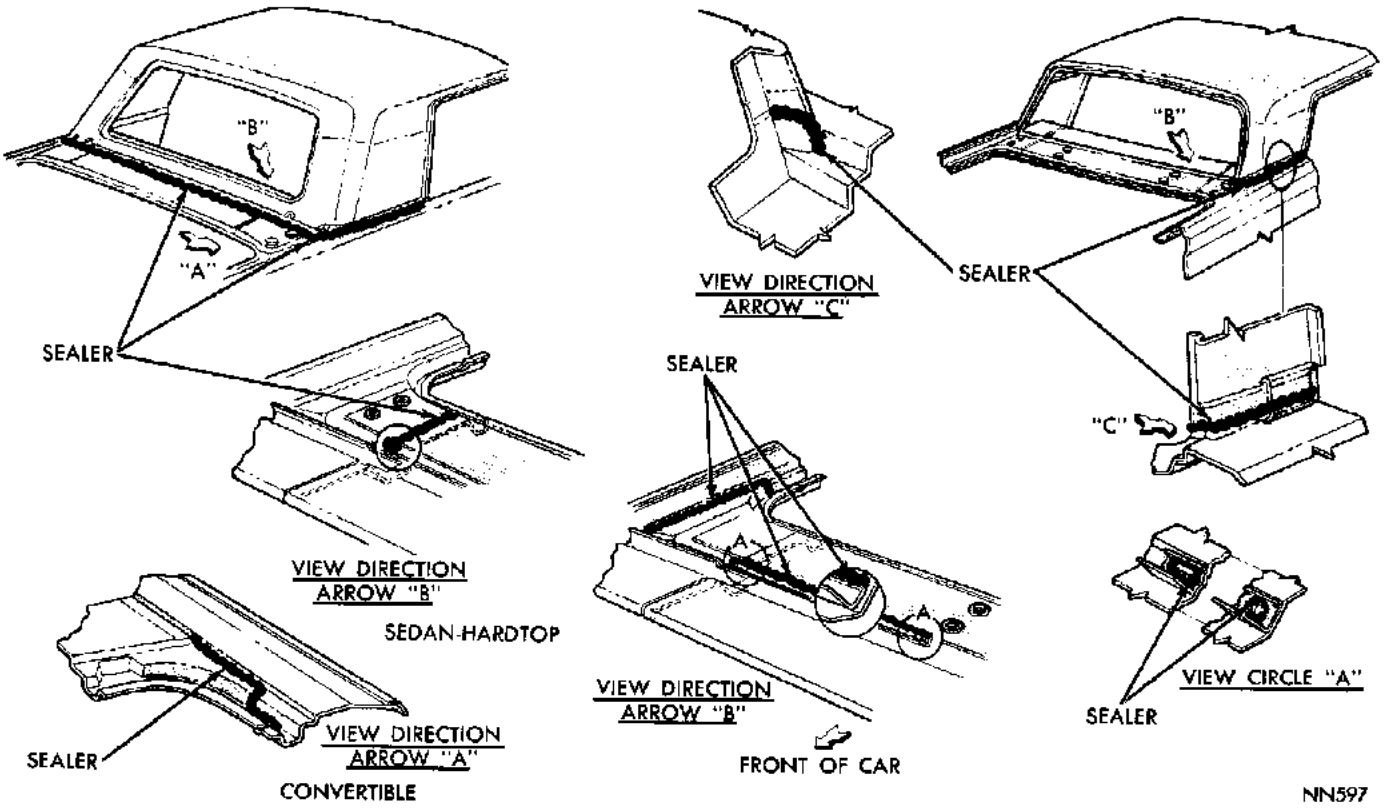


Fig. 27—Deck Opening Upper Panel (Imperial)

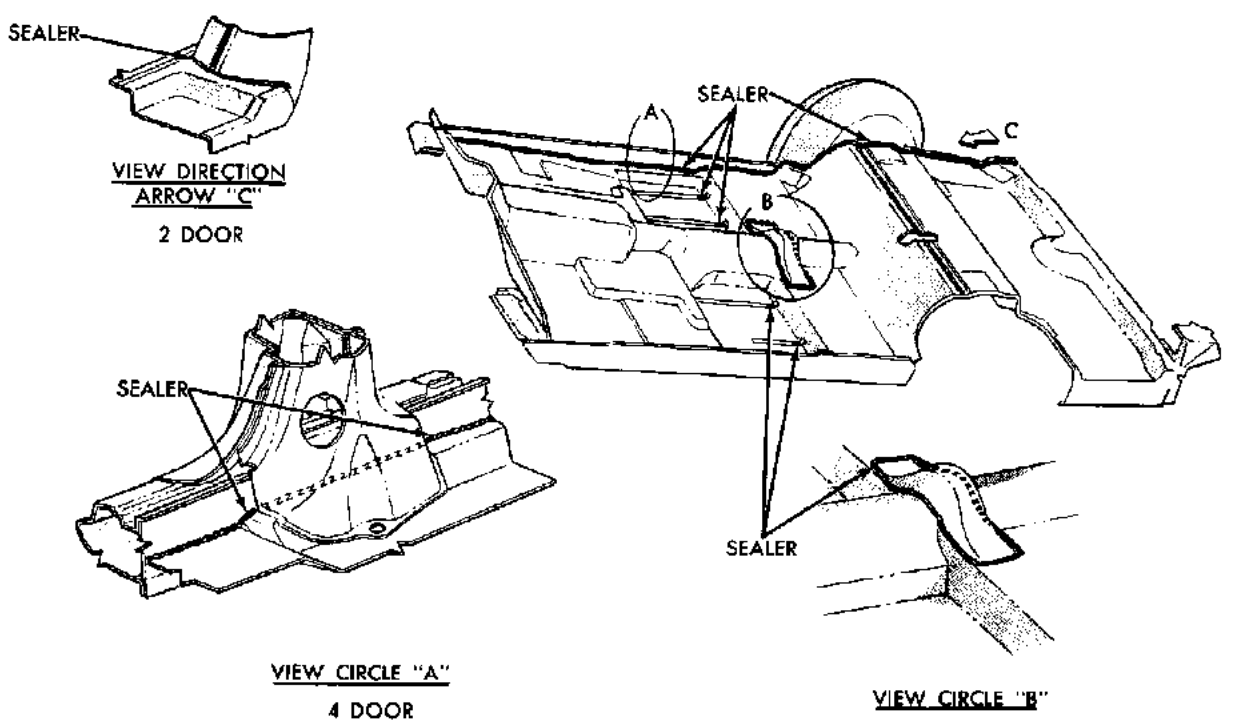
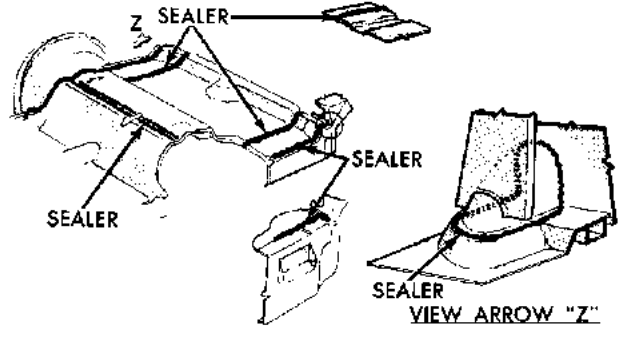


Fig. 28—Floor Pan and Side Sills (Imperial)

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Fig. 29—Deck Opening Lower Panel (Imperial)

VINYL ROOF COVERING

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SERVICE PROCEDURES

COVER REPLACEMENT

Removal

If solvents are used to remove the old covering and cement, care must be used to prevent damage to the surrounding areas. Use a well vented area. The entire roof panel surface must be clean and smooth.

The body should be masked at all areas next to the outer edges of the cover application.

Depending upon type of cover application, remove mouldings at windshield and rear window, drain trough, roof panel extension, and roof areas. Remove sealer from drain trough, windshield and rear window reveals, roof and panel extensions. Remove retainers from drain trough and roof areas.

Installation

Imperial Models

(1) Locate and mark centerline of roof panel and vinyl cover at front and rear ends. Mark moulding clip hole locations on masking paper to aid in installation.

(2) Apply a thin film of cement to center four inches of roof panel and vinyl cover.

(3) When cement becomes tacky but not wet to the touch, position vinyl cover on roof, aligning the centerline marks.

(4) Apply cement to one half of roof panel and extension and to cover half on same side (Fig. 1).

(5) When cement becomes tacky but not wet to the touch, position cover on roof.

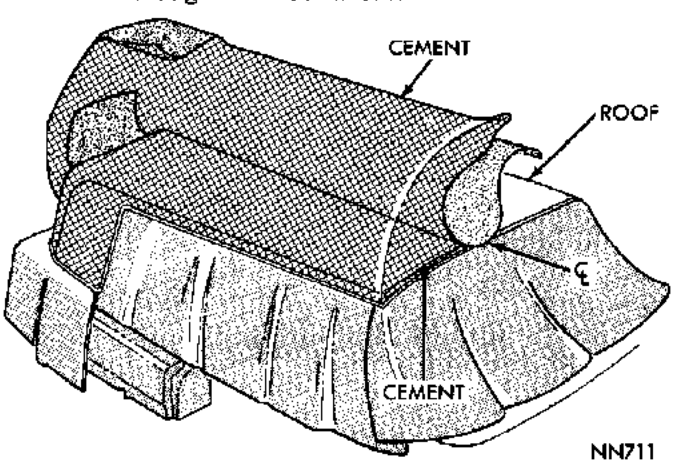


Fig. 1—Positioning Cover to Roof (Imperial)

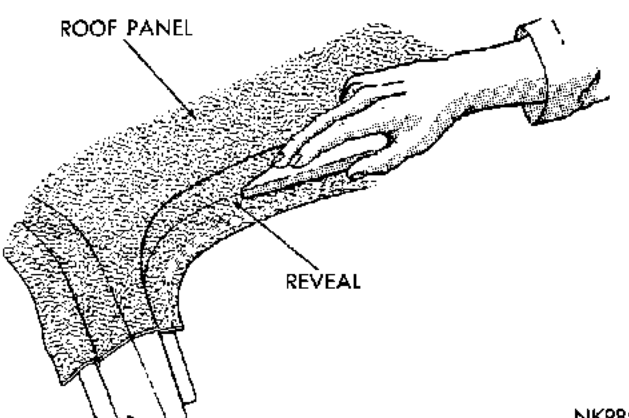


Fig. 2—Positioning Cover at Window Reveals

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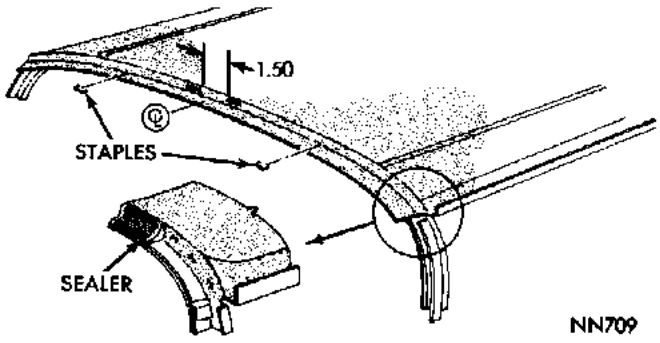


Fig. 3—Stapling and Sealing Cover to Windshield Reveal (Imperial)

(6) Repeat steps 5 and 6 for the opposite side.

(7) Using a new paint roller, pressurize cover to roof, working from center area toward the drain troughs.

(8) Press cover into the windshield and rear window reveals and drain troughs using a dull pointed fiber tool (Fig. 2).

(9) Starting at top center, secure cover to windshield reveal using staples spaced 1½ inches apart (maximum) or tacks spaced ½ inch apart (Fig. 3).

(10) Starting at top center, secure cover to rear window reveal using staples spaced 1½ inch apart (maximum) or tacks spaced ½ inch apart (Fig. 4).

(11) Trim fabric at base of windshield and rear window reveals and at upper "A" post ends.

(12) Apply a bead of sealer to edge of cover and blend upward to form a seal over staples and edge of cover. Extend sealer across trimmed edge of cover on "A" post (Figs. 3 and 4).

(13) Apply a ¼ inch head of sealer along entire edge of cover at lower edge of roof panel.

(14) Position roof cover side retainers in drain trough and after aligning screw holes in retainers with holes in body panel, secure in place using body clamps (Fig. 5).

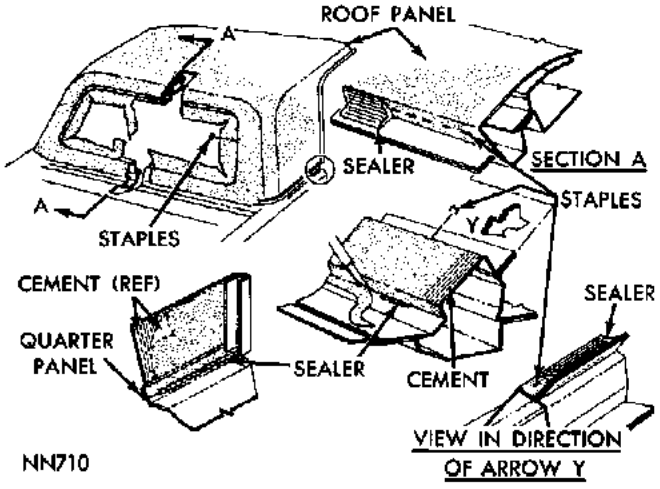


Fig. 4—Stapling Cover to Rear Window Reveal (Imperial)

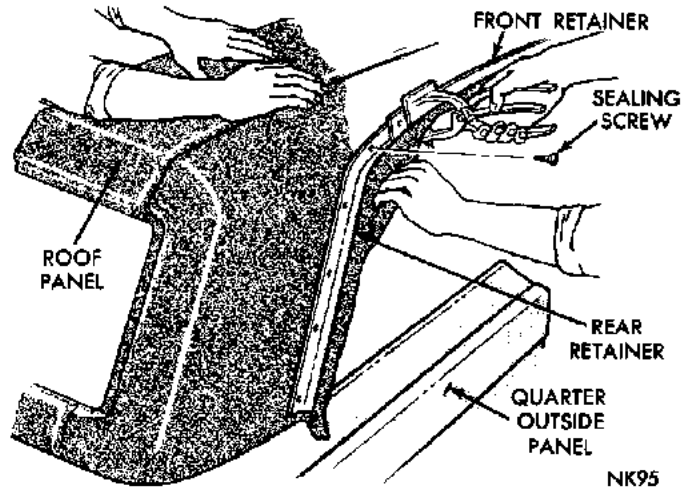


Fig. 5—Positioning Side Retainers (Imperial)

(15) Install sealing screws, 15 per side, and remove clamps.

(16) Trim cover along drain trough using the inboard face of drain trough as a guide (Fig. 6).

(17) Apply a bead of sealer in drain trough, sealing the edge of retainer and cover.

(18) Apply ¼ inch balls of sealer to studs of roof panel extension medallion and install medallion.

(19) Install moulding retainers, and mouldings.

(20) Inspect cover for air bubbles.

(21) Remove masking tape and paper.

New Yorker Models (Roof Rear Applique)

(1) Locate and mark centerline of roof panel and cover at front and rear.

(2) Mask across roof panel forward of retainer attaching holes (Fig. 1) and at other body areas adjacent to surfaces where cement is to be applied.

(3) Apply a thin film of cement to ½ of roof panel and cover.

(4) When cement becomes tacky but not wet when lightly touched, position fabric (Fig. 2) to roof and stretch tight.

(5) Work out wrinkles from centerline toward bottom of roof panel side extension at belt line and toward front and rear.

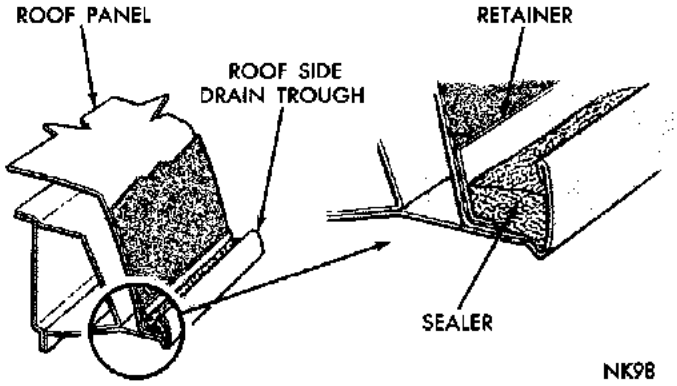


Fig. 6—Installing Sealer to Drain Trough (Imperial)

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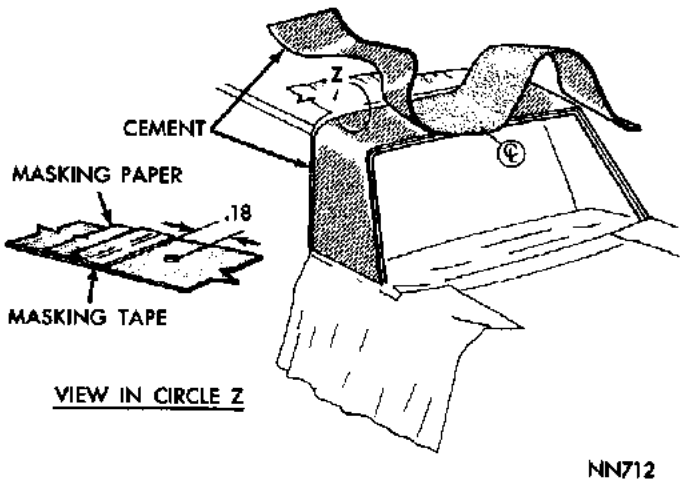


Fig. 1—Positioning Cover to Roof (New Yorker)

(6) Press fabric into rear window reveal (Fig. 2) using a dull pointed tool.

(7) Wrap material into "C" pillar face.

(8) Pressurize complete cover to roof panel using a clean paint roller (Fig. 2).

(9) Starting at rear window upper center, secure cover material to rear window opening with staple spaced approximately 1 to 1½ inches or tacks spaced ½ inch apart (Fig. 3).

(10) Trim fabric at base of rear window reveal and at roof extension belt line.

(11) Locate and punch belt moulding holes through fabric.

(12) Position rear roof cover retainer on cover. Locate screw holes in roof panel and install sealing screws.

(13) Trim excess material forward of retainer using edge of retainer as guide.

(14) Trim excess material at inside corner of "C" pillar face and blend upper trimmed edge to join trimmed edge of cover at drain trough area.

(15) Apply a bead of sealer along trimmed edge forward of retainer. Press sealer to retainer so after roof moulding is installed, sealer will not be exposed (Fig. 4).

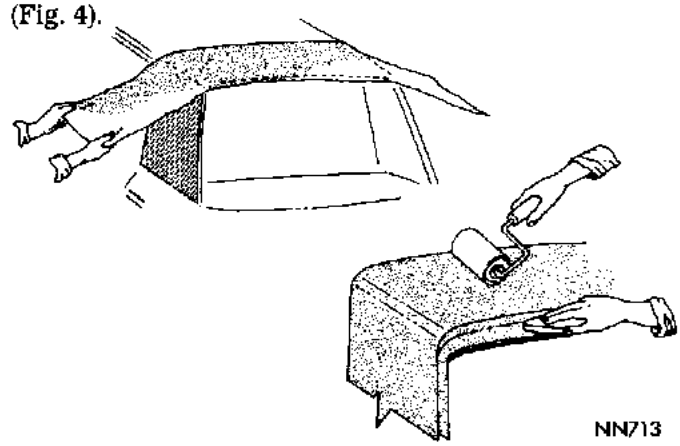


Fig. 2—Positioning Cover in Window Reveal (New Yorker)

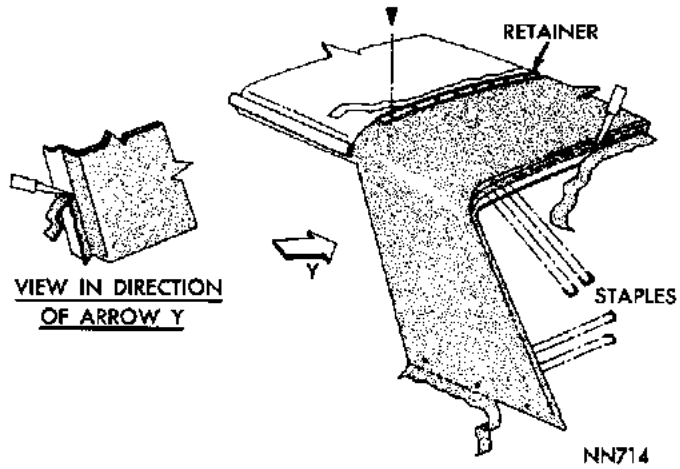


Fig. 3—Stapling Cover in Reveal (New Yorker)

(16) Sealer along edge of fabric outboard of retainer to drain trough and also around and under roof on top of exposed edge of material from roof to upper inside corner of "C" pillar.

(17) Apply bead of sealer to edge of fabric and blend upward to form a seal covering staples and edge of fabric at rear window area.

(18) Apply a bead of exposed sealer covering the full length of edge of trimmed fabric at base of roof panel side extension at belt line. Sealer to be extended to cover fabric edge at base of "C" pillar and also at rear where edge turns over into the rear window reveal at the belt line.

(19) Apply ball of sealer to all nameplate studs prior to installation.

Chrysler Models

(1) Mask body (Fig. 1) from edge of drain trough across upper "A" pillar, across windshield and rear window reveal, across top of deck upper and bottom of roof panel at the belt line.

(2) Locate and mark center line of roof panel and vinyl cover at front and rear ends.

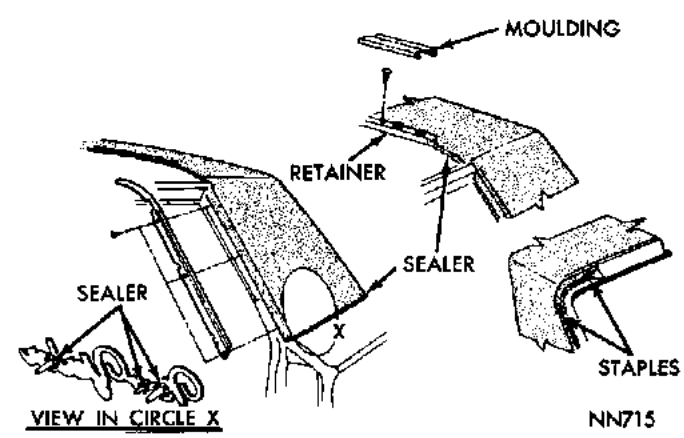


Fig. 4—Sealing Cover Edges (New Yorker)

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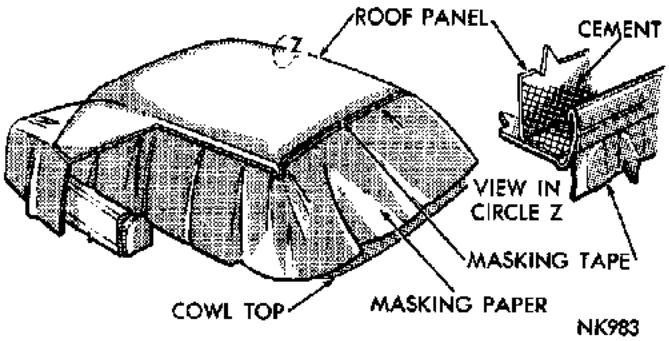


Fig. 1—Masking the Body (Chrysler)

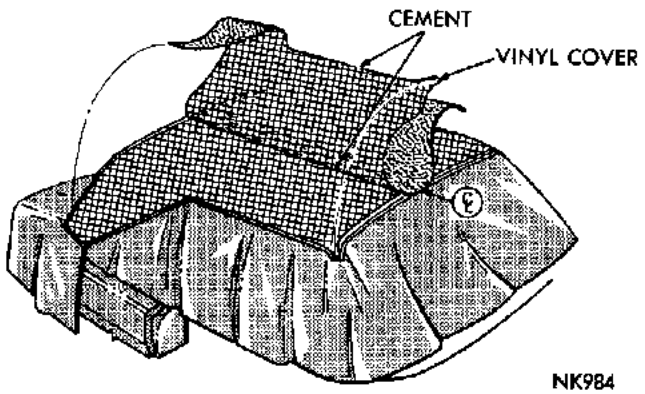


Fig. 2—Positioning Cover to Roof Panel (Chrysler)

(3) Apply a thin film of cement to the center four inches of roof panel and vinyl cover.

(4) When cement becomes tacky but not wet to the touch, position vinyl cover on roof, aligning the centerline marks.

(5) Apply cement to one half of roof panel and extension and to the vinyl cover half on same side (Fig. 2).

(6) When cement becomes tacky but not wet to the touch, position cover on roof.

(7) Repeat steps 5 and 6 for opposite side.

(8) Using a new paint roller, pressurize cover to the roof, working from center area toward drain troughs.

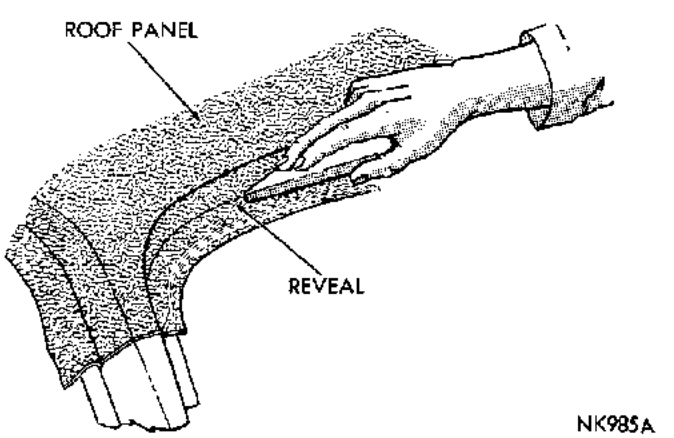


Fig. 3—Positioning Cover in Window Reveal (Chrysler)

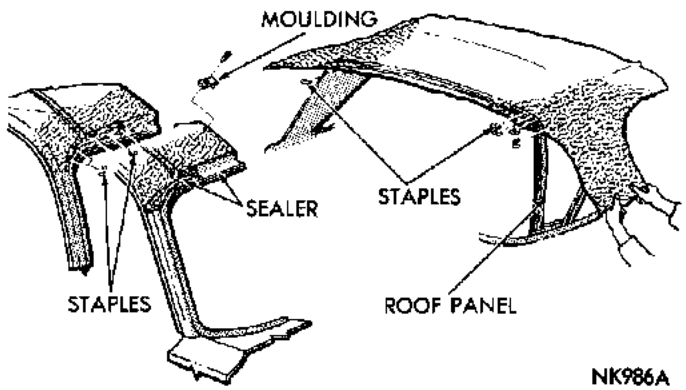


Fig. 4—Stapling Cover at Window Reveal (Chrysler)

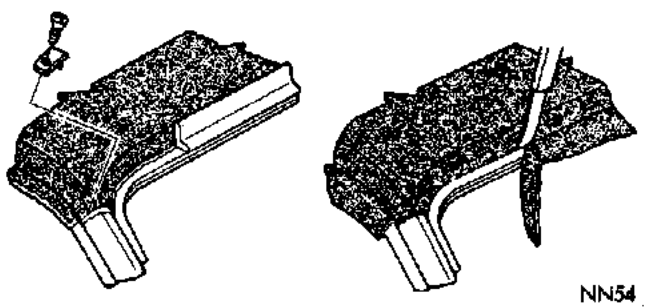


Fig. 5—Trimming and Sealing at Window Reveal (Chrysler)

(9) Press cover into the windshield and rear window reveals using a dull pointed fibre tool (Fig. 3).

(10) Starting at the top center, secure cover to windshield reveal using staples spaced 1½ inches apart (maximum) or tacks spaced ½ inch apart (Fig. 4).

(11) Position cover to the roof panel extension making certain all wrinkles are removed.

(12) Starting at the top center, secure cover to rear window reveal using staples spaced 1½ inch apart (maximum) or tacks spaced ½ inch apart (Fig. 4).

(13) Trim fabric at base of windshield reveal, halfway between upper and lower edges of pillar moulding (Fig. 5).

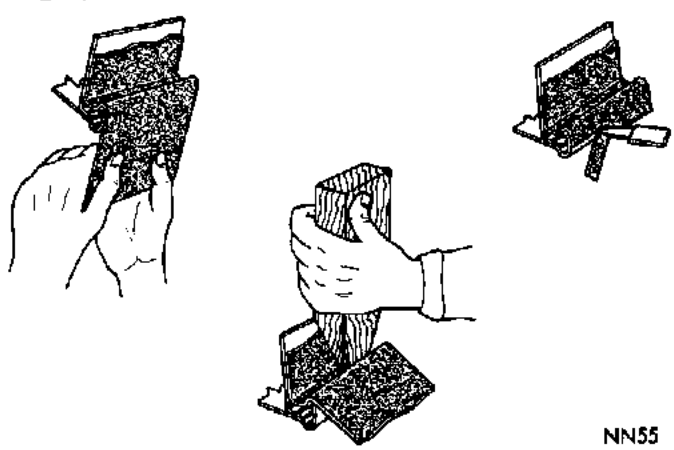


Fig. 6—Positioning Cover at Drain Trough (4 Door) (Chrysler)

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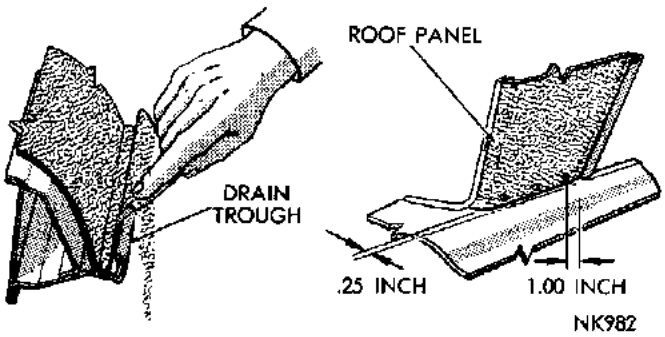


Fig. 7—Trimming Cover at Drain Trough (2 Door) (Chrysler)

(14) Trim fabric at base of rear window reveal.

Steps 15 through 18 (4 Door Models)

(15) Using a dull pointed tool, press fabric into the drain trough to achieve maximum contact of roof cover material to drain trough (Fig. 6).

(16) Grasp the outboard edge of cover and while pulling material outward and down, use the upper edge of drain trough flange as a breakover for draping material on to the outboard drain trough flange face (Fig. 6). **Care must be taken to avoid pulling loose the cover material** applied to base of drain trough.

(17) Press material against drain trough flange face for the full length of outboard sides of roof cover.

(18) Trim excess material hanging below drain trough flange about ⅛ inch above lower edge of the flange (Fig. 6).

Steps 19 through 22 (2 Door Models)

(19) Trim the cover along the drain trough using the inboard face of the drain trough as a guide (Fig. 7).

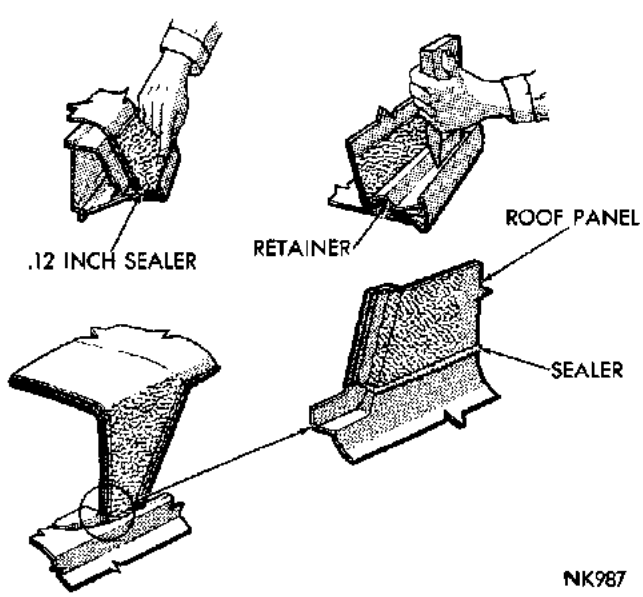


Fig. 8—Installing Retainers at Drain Trough (2 Door) (Chrysler)

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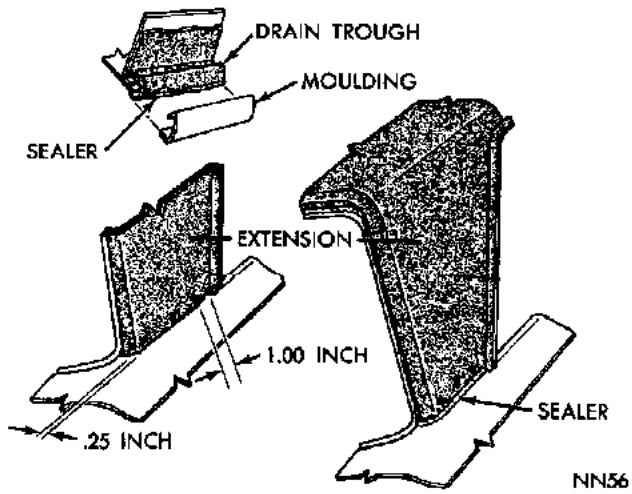


Fig. 9—Sealing Cover at Drain Trough and Roof Extension (Chrysler)

(20) Apply a bead of sealer in the drain trough and smooth out to seal the edge of the cover (Fig. 8).

(21) Snap in the front roof panel cover side retainers, making sure they are firmly seated.

(22) Snap in the rear roof panel cover side retainers, making sure they are firmly seated.

(23) On original installations, locate and drill index hole for front pillar moulding upper locating boss (Fig. 5).

(24) Apply a bead of sealer to edge of cover and blend upward to form a seal over staples and edge of cover. Extend sealer across trimmed edge of cover on the "A" post (Fig. 5).

(25) Locate and punch holes in cover at the roof extension belt line.

(26) Trim cover on a line ¼ inch below the belt line moulding holes and curving upward to meet drain trough (Fig. 9).

(27) Apply a bead of sealer to the trimmed edge of cover at the roof panel and smooth out to form a seal (Fig. 9).

(28) Install sealer along the entire length of outboard trimmed edges of cover material to seal exposed edge adjacent to drain trough flange.

(29) Apply a ¼ inch ball of sealer to the index studs of pillar mouldings.

(30) Position moulding by inserting a locating pin in index hole and align moulding.

(31) On original installations, using hole in moulding as a guide, drill a .120 diameter hole in pillar and fasten in place with a screw.

(32) Install side drain trough mouldings (Fig. 9).

(33) Install windshield and rear window mouldings.

(34) Remove masking tape and masking paper.

(35) Inspect cover for air bubbles.

STATION WAGON MODELS

Removal

The removal procedures for the Station Wagon Models is the same as for the 2 Door Model front and side areas, plus the removal of the roof mouldings and retainers.

Installation

(1) Mask body (Fig. 1) along top edge of drain trough, across windshield upper flange and adjacent to break lines of roof normal surface and depressed surface.

(2) Apply a thin coat of cement to roof panel and to viny covering.

(3) When cement becomes tacky but not wet to the touch, lower the covering (two men) to the roof and stretch tight (Fig. 2).

(4) Work all wrinkles out, starting from center and working toward drain trough.

(5) Press fabric into windshield reveal (Fig. 2) using a dull pointed tool.

(6) Position the front, rear and outside moulding retainers to the roof panel (Fig. 3) and install sealing screws.

(7) Trim excess material at retainers (Fig. 3) at inboard and rear sides by cutting along the inboard faces of retainers.

(8) Trim cover as close as possible to retainer face at front and rear retainers to provide a good sealing surface.

(9) Attach and seal cover at the windshield reveal (steps 9 and 10 Chrysler Models).

(10) Install sealer and cover retainer in drain trough (steps 19, 20, 21 and 22) (2 Door Models).

(11) Install windshield and roof mouldings.

(12) Inspect cover for air bubbles.

(13) Remove masking tape and masking paper.

AIR BUBBLE REMOVAL

(1) Place strips of masking tape over the surface of the bubble.

(2) Using a No. 19 hypodermic needle and suitable syringe, insert 3M Vinyl Trim Adhesive No. 8064 (or equivalent) into the bubble area. **Extreme care must be used to avoid depositing any adhesive on the top surface of the vinyl cover.** The perforation must be made in the center of the bubble, through the masking tape and vinyl top material. Approximately 0.5 mil of adhesive per square inch should be used.

(3) Remove the needle and work the adhesive to cover the affected area by pressing the vinyl to the roof carefully. This will also transfer some of the adhesive to the surface of the vinyl cover.

(4) Allow the cement to dry 5 minutes at room temperature.

(5) Heat the bubble area with relative low heat (150°-160°F.) until the bubble area begins to enlarge in circumference. Infra-red heat lamps provide a suitable source of heat.

(6) Remove the heat source and allow the cover to cool. A method of rapid cooling will be beneficial.

(7) Using a **DRY** No. 19 hypodermic needle, puncture the vinyl cover 4 times equidistant around the

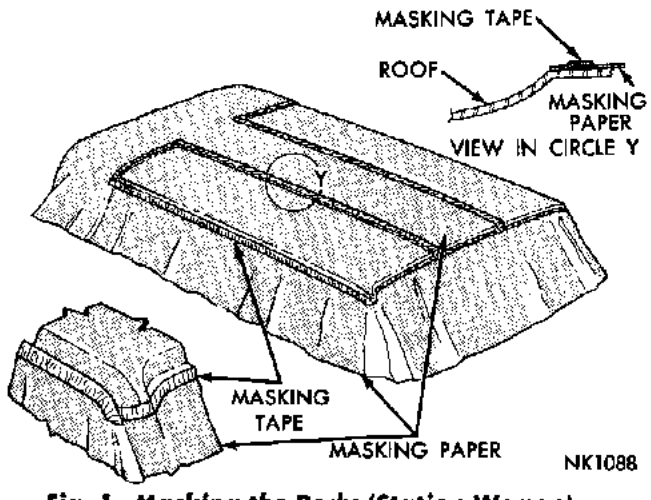


Fig. 1—Masking the Body (Station Wagon)

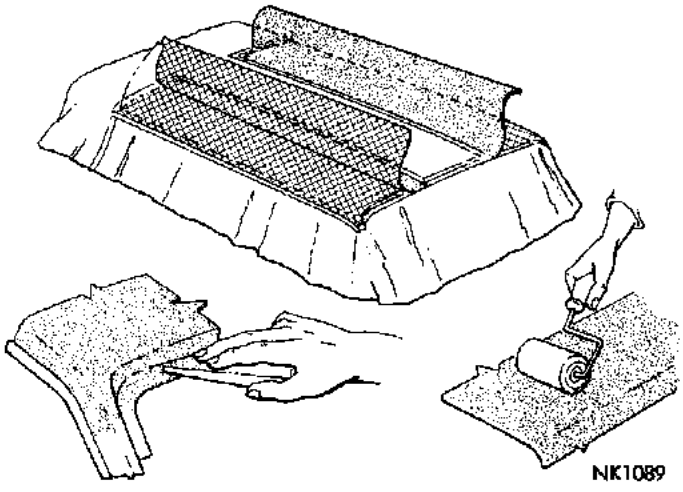


Fig. 2—Positioning the Cover (Station Wagon)

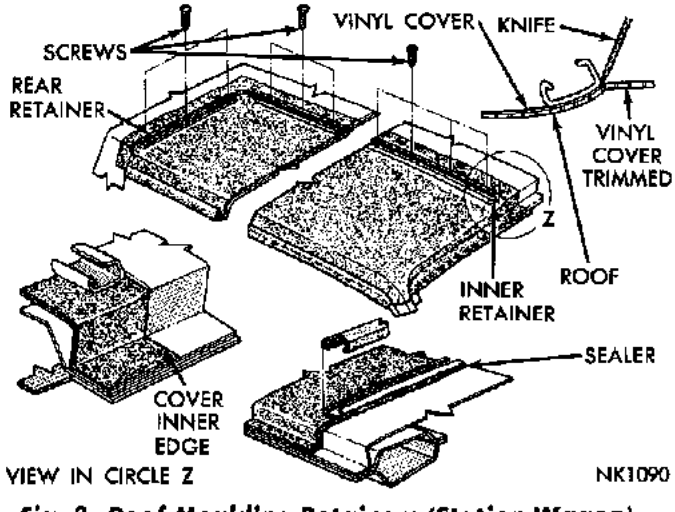


Fig. 3—Roof Moulding Retainers (Station Wagon)

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outer circumference of the bubble to provide an escape route for entrapped solvent and air.

(8) After the bubble collapses, press the vinyl cover to the metal surface, starting from one side of the bubble and working toward the opposite side until it conforms to the metal surfaces and all raised surfaces disappear.

(9) Keep car from hot sunlight and other direct heat sources.

(10) Examine the top after the 24 hour period, and, if necessary, repeat the procedure.

WOOD GRAIN OVERLAY

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SERVICE PROCEDURES

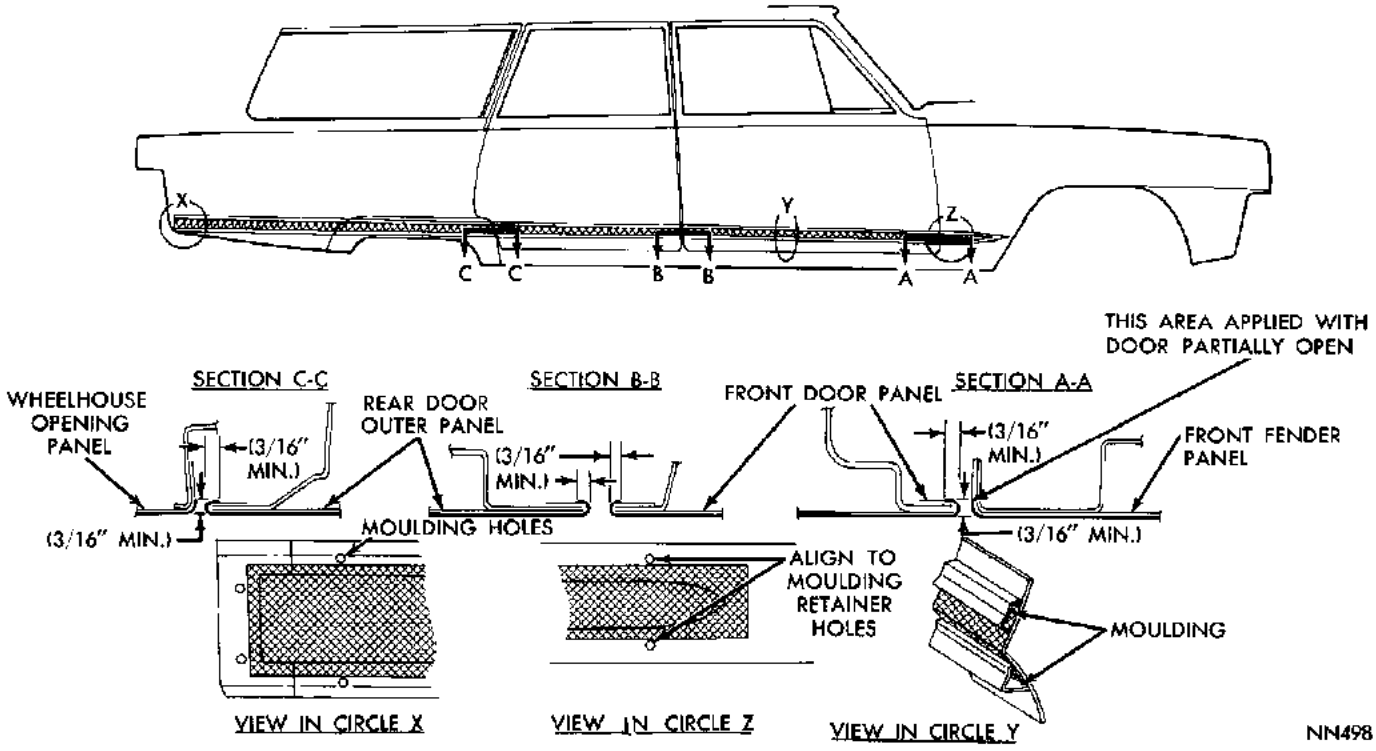


Fig. 1—Wood Grain Overlay

SURFACE PREPARATION

With the surface having been previously prepared and primed, sand all areas to be covered with the overlay with No. 600 paper which has been soaked in water or mineral spirits. The area to be sanded should be approximately ¼ inch larger in all dimensions than the actual overlay so the bond coat and clear coat will extend beyond the edges of the overlay for good adhesion and sealing. **Tack off all dust and dirt particles** from the sanded areas. Mask the areas next to the sanded area to prevent overspray of the bond coat application from depositing on the painted surfaces.

Bonding Coat Application

Apply the bonding coat by spray, to all areas (Fig. 1) that have been sanded and also around the edges of the doors, fenders, tail gate, headlamp openings and tail lamp openings. The bonding coat should exceed the size of the overlay transfer film by ¼ inch in all directions and should also be applied around and on back side of edges for a minimum of ¼ inch. This is to take care of the transfer film edges to be turned. The color of the bonding coat should match the general tone of the transfer film. Allow the bonding coat to dry for a minimum of fifteen minutes. Scuff with No. 600 paper and wash with clean water. Leave wet for application of the transfer film.

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Transfer Film Application

Cut transfer to fit area and immerse for approximately one (1) minute in water to thoroughly soak the paper backing of the film. As soon as the backing is soaked, slide it off the transfer and apply it immediately to the body panels with the grained side out.

Apply the film with a wet cloth and using a rubber squeegee and **water as a lubricant,** level off the transfer, working from the center to the edges to remove all air bubbles and wrinkles.

Adjust and smooth out the transfer on the panel, making sure it is centered in the prepared area with approximately ¼ inch of the bond coat showing beyond all edges. Sponge off with clean water to remove all traces of the paper backing and adhesive.

Welding Solvent and Overlay Application

The solvent welding solution should be prepared to contain **one part** of nitro cellulose solvent, for transfer films, to **five parts** of water.

Fold back one half the width of the overlay from the panel and using a small pad of cheesecloth or sponge, apply a uniform coat of the welding solution to the coated body panel. The welding solution is used to soften both the bonding coat and transfer film background color coat to assure a good bond between the two. The solvent solution must also be applied to the back side of all doors, fenders or other edges contacted by the transfer film. Fold over transfer and smooth out the **transfer with a water soaked cloth.** Using a rubber squeegee and **water as a lubricant and working as rapidly as possible with light strokes,** level off the transfer, working from the center to the edges to remove all air bubbles and wrinkles. Inspect the transfer for blisters of trapped air or water and work these out with the squeegee. Install the other half of the transfer film in the same manner.

Inspect the transfer **carefully** for trapped air or water. Blisters of this type should be punctured with a razor blade and squeegeed firmly or pressed down with the thumb to remove excess water or air and to seat the transfer to the bond coat firmly. Minute inspection is necessary to make certain all wrinkles or blisters are removed.

Force dry the transfer for a minimum of ten minutes at 200° to remove all moisture. After the transfer is thoroughly dry, scuff lightly with No. 600 paper which has been soaked in water.

Clear Baking Enamel Application

Apply, by spray, two coats of exterior clear air dry enamel, with a one minute flash between coats. The enamel must be applied over the entire transfer area and ¼ inch beyond all edges of the transfer. Remove all masking paper and tape and bake enamel in accordance with the prescribed schedule for the material used.

Minor Repairs

To repair minor surface defects such as scratches, stone chips and nicks which require more than a simple touch-up brush application, a satisfactory repair may be performed by application of a complete clear topcoat. **Spot repair must be avoided.** Proceed as follows:

Using No. 600 paper which has been soaked in water or mineral spirits, lightly sand the complete panel, feathering out the damaged area, being careful not to damage the wood grain transfer. Wipe with clean cloths.

Color touch-up any minor defects which have appeared during the sanding operation, utilizing a touch-up brush for application of air dry touch-up lacquers. Blend in the light color, prior to the dark color. Air dry for 15 minutes, minimum.

Apply, by spray, 2 single medium wet coats of exterior clean air dry enamel, according to the manufacturer's recommendations.

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BODY AND FRAME ALIGNMENT

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SERVICE PROCEDURES

FRAME ALIGNMENT

The various frame dimensions (Figs. 1, 2 and 3) may be used as a guide in measuring frame alignment. Diagonal measurements (Fig. 4) should be taken when straightening frame.

Measure distance between points connected by line "A," (Fig. 3) (Chrysler models) or any diagonal (Figs. 1 and 2) (Imperial Models). This distance should agree within ¼ inch with distance between points connected by line "B" or comparable diagonal on opposite side.

The diagonals (Fig. 4) represent only one of the few that may be checked. **Care should be taken to make sure that any two diagonals compared represent exactly corresponding points on each side of the frame.**

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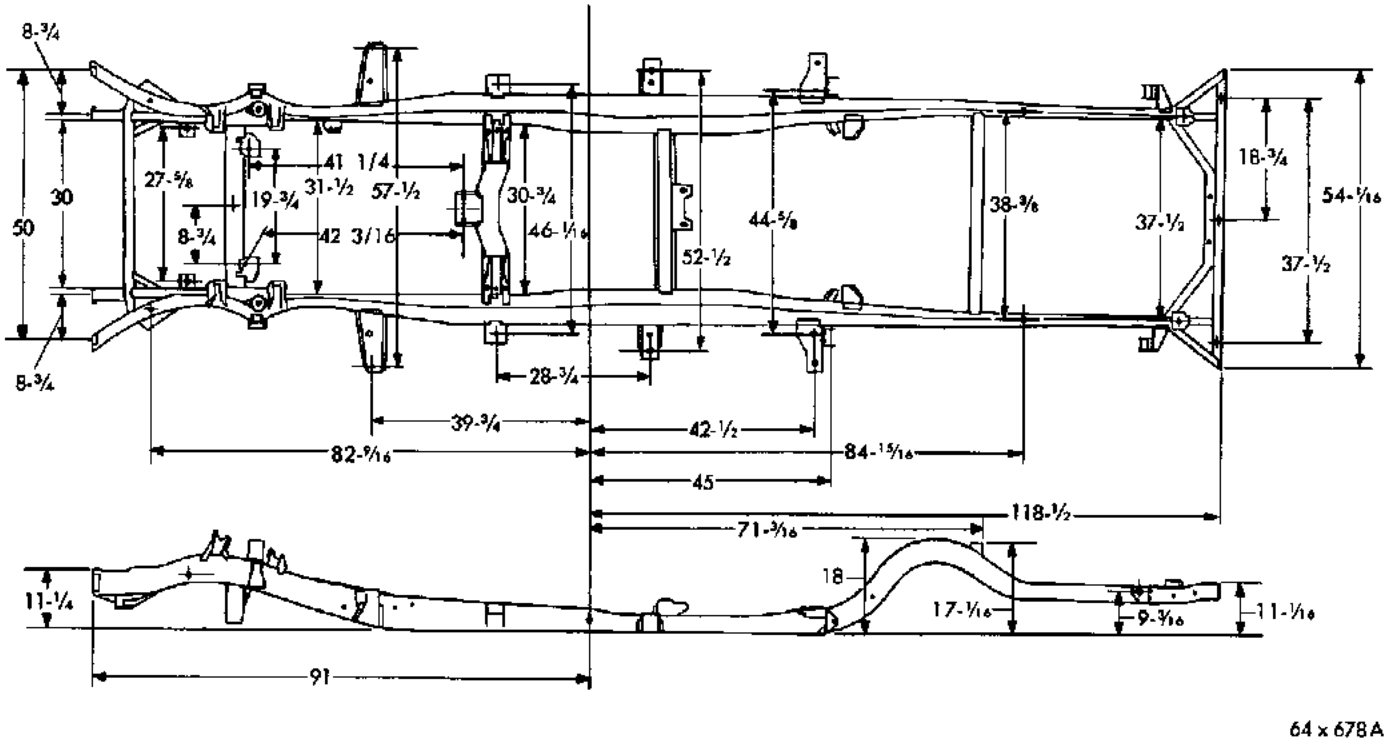


Fig. 1—Frame Dimensions (Imperial)

Minor frame alignment can usually be corrected by straightening bent frame parts. A badly distorted frame can in most cases be replaced more economically than by attempting repairs.

FRAME PLACEMENT

Chrysler Models

The forestructure (stub frame) is attached to the body at ten locations—four at brackets extending

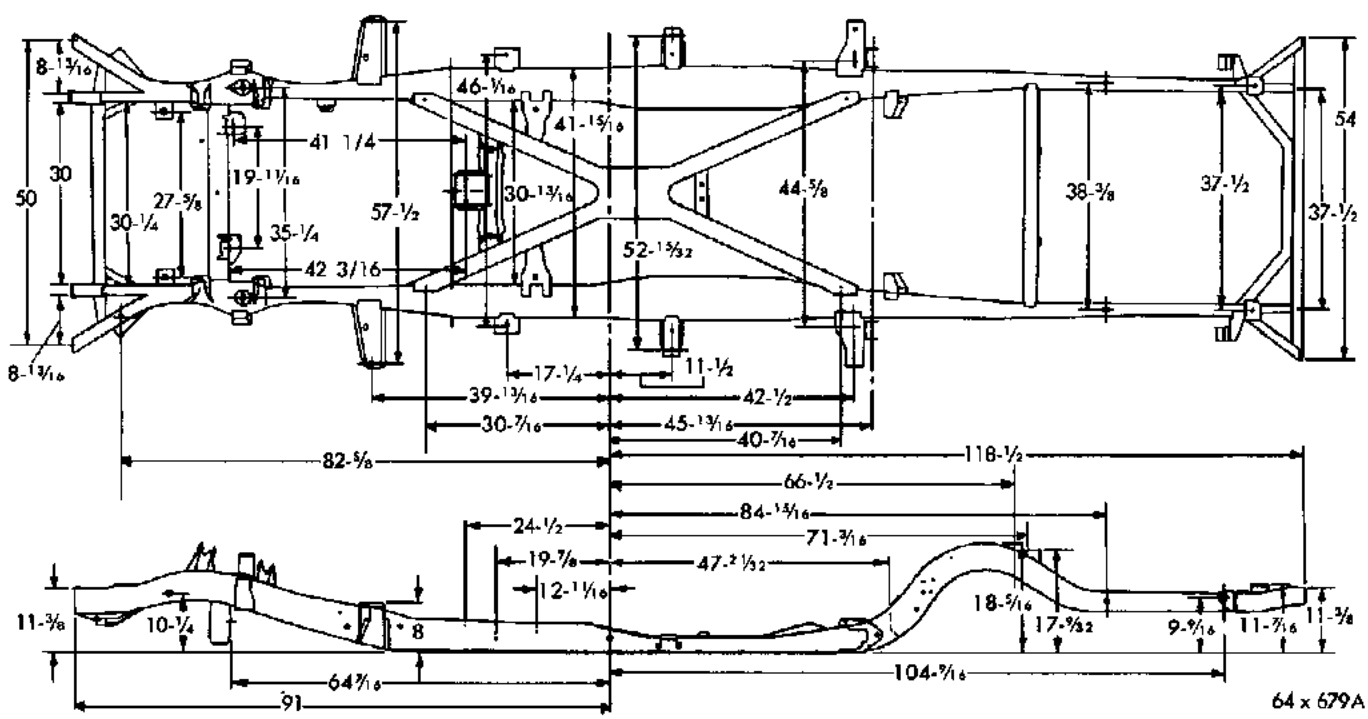


Fig. 2—Frame Dimensions (Imperial Convertible)

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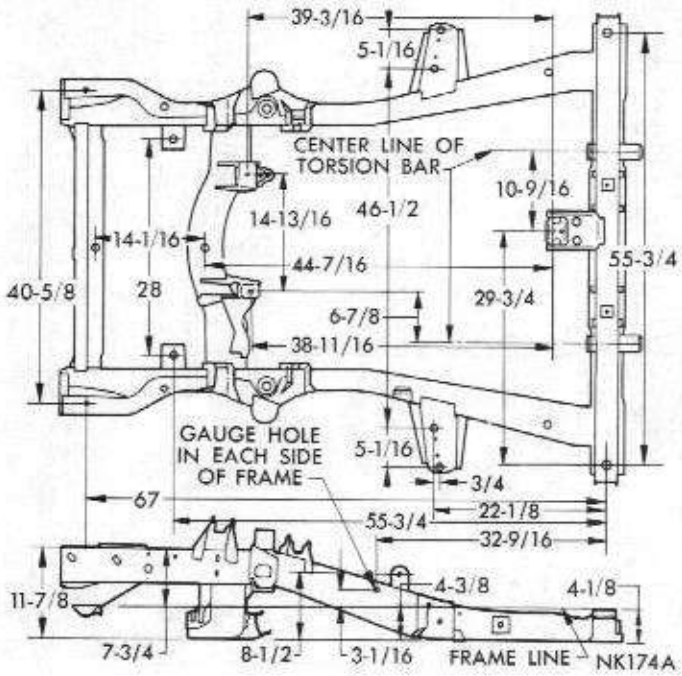


Fig. 3—Frame Dimensions (Newport, 300, New Yorker)

down from the cowl panel and six under the front passenger compartment where the frame is joined to the underbody crossmember.

The body to frame alignment measurement should be performed whenever the stub frame has been removed, replaced, repaired or the front end sheet metal cannot be properly aligned.

Removal

(1) Disconnect battery, drain cooling system and remove heater hoses from engine.

(2) On air conditioned units, use safety goggles when discharging the system and remove hoses from

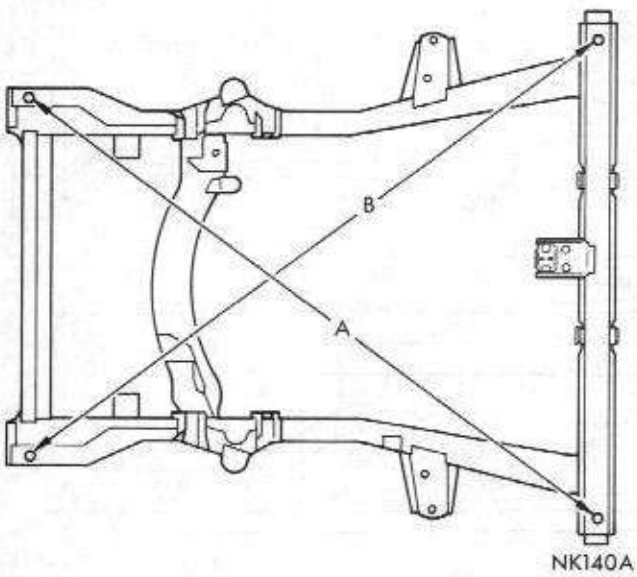


Fig. 4—Frame Diagonal Measurements

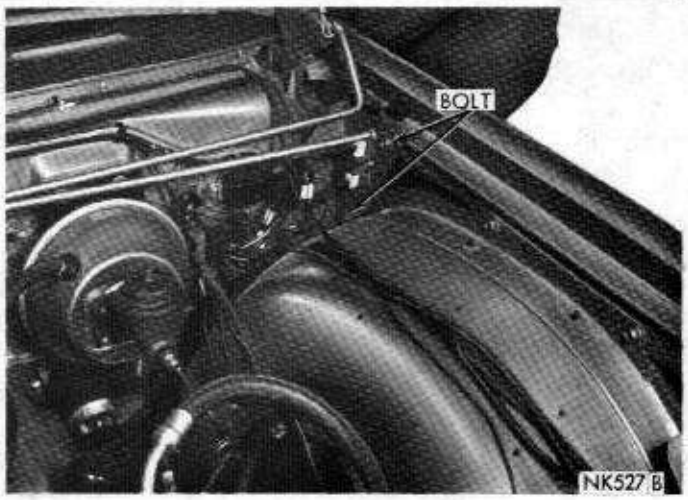


Fig. 5—Hood Torsion Bar Mounting Bracket

air compressor.

(3) Disconnect electrical leads at junction block and all connections between engine and dash panel.

(4) Remove bolts attaching hood torsion bar brackets to cowl and wheelhouse (Fig. 5).

(5) Remove brake line at master cylinder and power brake hose from brake unit.

(6) Disconnect throttle linkage and steering gear at the flexible coupling.

(7) Disconnect windshield washer tube at cowl connection.

(8) Raise vehicle on a hoist, and remove propeller shaft, exhaust pipe at muffler, parking brake cable, transmission shift cable, fuel line at frame and brake line at frame "T."

(9) Lower vehicle and place on floor stands. The floor stands should be placed under rear axle and

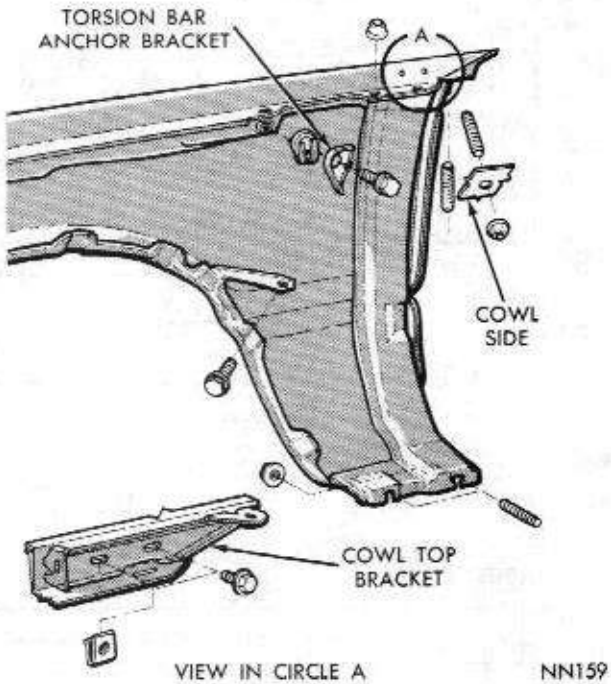


Fig. 6—Fender to Cowl Attachment

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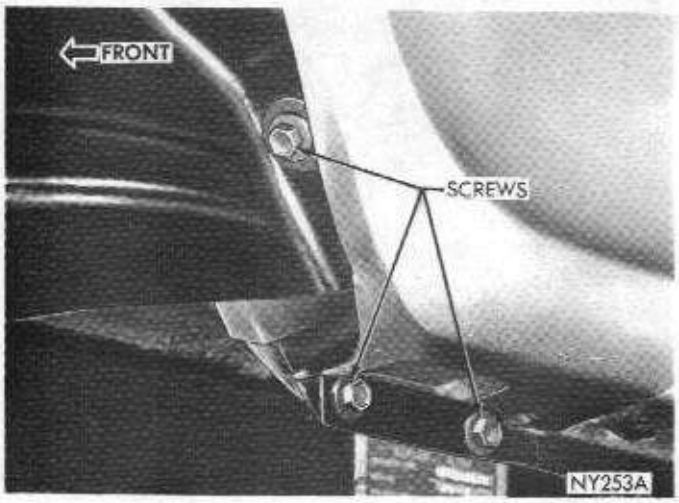


Fig. 7—Fender to Body Frame Mounting

under forward edge of floor sills. **To protect sills, wooden blocks should be placed between floor stands and the sills.**

(10) Disconnect radio antenna from radio.

(11) With both front doors open, remove fender to "A" post bracket attaching nuts (Fig. 6).

(12) Remove filler plate between the "A" post and rear of fender.

(13) Remove fender to cowl stud nuts and fender to floor sill bolts (Fig. 7).

(14) Place a hydraulic jack under forestructure rear cross member to hold it in position when body to frame mounting bolts (Figs. 8 and 9) are removed. **Two bolts are located near top of curved portion of the body to frame cross member.**

(15) Remove frame to body bolts, lower front end assembly and at same time, move front end assembly out and away from the body (make sure antenna lead is free from side cowl).

(16) If frame is to be replaced, transfer serviceable parts to new frame.

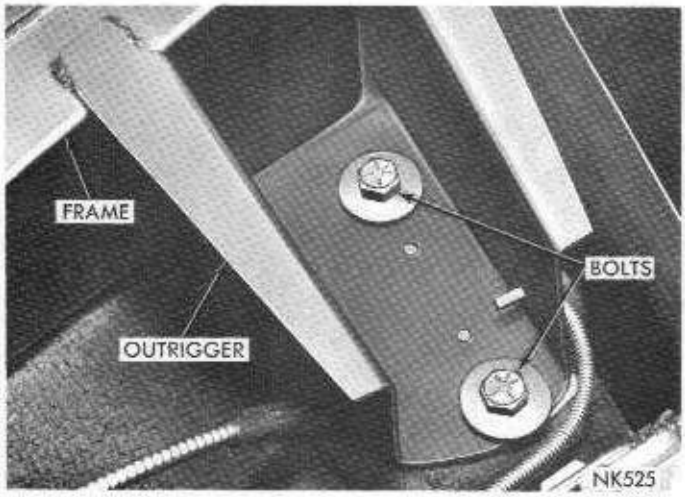


Fig. 8—Body to Frame Outrigger Mounting

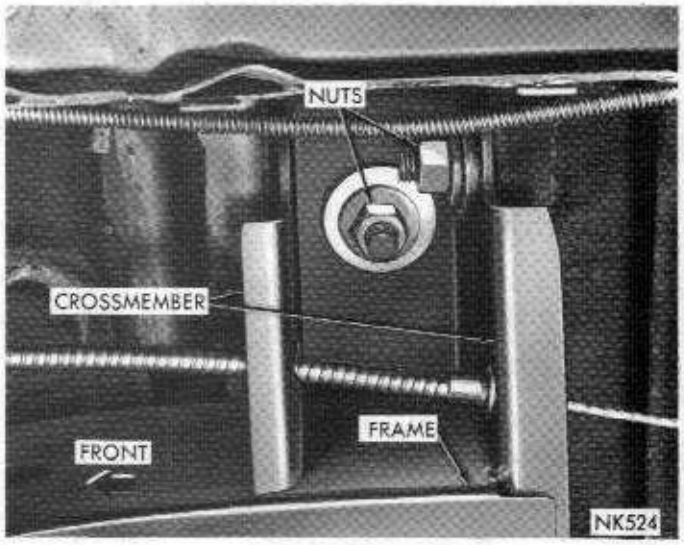


Fig. 9—Body to Frame Crossmember Mounting

Installation

(1) Position forestructure assembly under body, guide tops of fenders past windshield moulding and align frame attaching bolt holes.

(2) Install body to frame bolts and nuts and tighten to 75 foot-pounds.

(3) With both front doors open, install fender to "A" post attaching nuts and tighten securely.

(4) Install "A" post filler plate.

(5) Install floor sill fender to cowl stud nuts and fender to bolts.

(6) Guide antenna cable through cowl and connect radio.

(7) Connect windshield washer tube, steering gear at coupling and throttle linkage at cowl bracket.

(8) Connect master cylinder line and power brake hose.

(9) Install hood torsion bar brackets to cowl and wheel house (Fig. 5).

(10) Connect electrical leads to junction block and all connections between engine and dash panel.

(11) Connect heater and air conditioning hoses and battery.

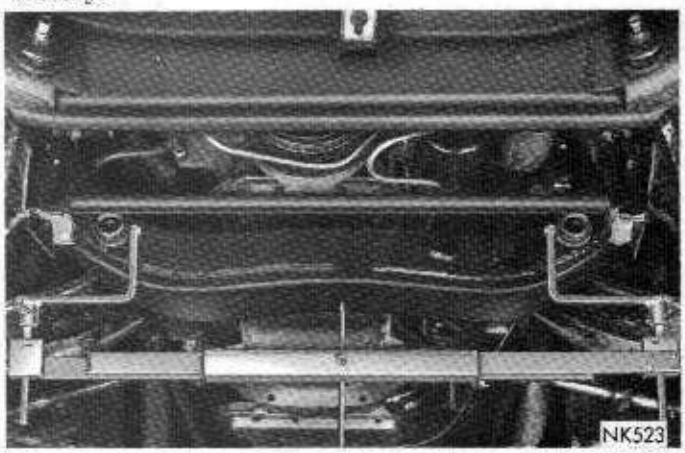


Fig. 10—No. 1 Position

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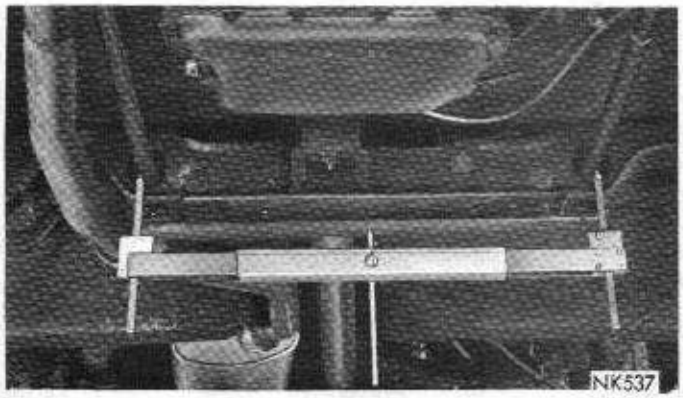


Fig. 11—No. 2 Middle Position

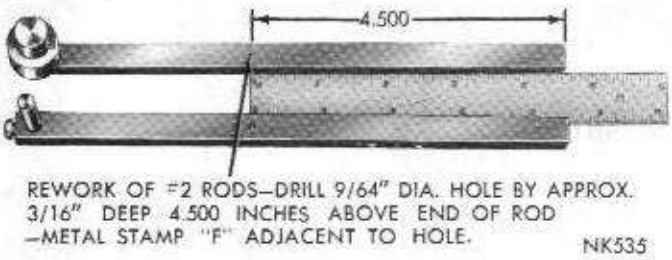


Fig. 12—Rework of No. 2 Gauge Rods

(12) Raise vehicle and install propeller shaft, exhaust pipe muffler, parking brake cable, transmission shift cable, fuel line and brake line.

Bleed brake system, aim headlights, fill cooling system, charge air conditioning system, align front end sheet metal and front suspension system after adjusting body to frame alignment has been completed.

Body to Frame Alignment

To measure the body to frame alignment, using Tool C-3802, refer to the "Gauge Adapter Chart" to determine the correct gauge adapter positions.

All attaching rods must be placed outboard of their respective attaching positions so when closing the self centering gauges and tightening center wing screw, the gauges will not fall off.

(1) The front 45 inch gauge is suspended from centerline of lower control inner pivot shaft. Remove nut cotter pin and select proper sleeve to fit over hex of nut (Fig. 10).

(2) Hang 36 inch middle gauge over top of torsion bars (using a ¼" diameter pin) immediately in front

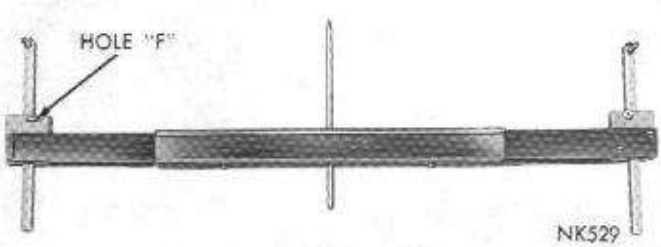


Fig. 13—No. 2 Gauge Assembled into "F" Hole

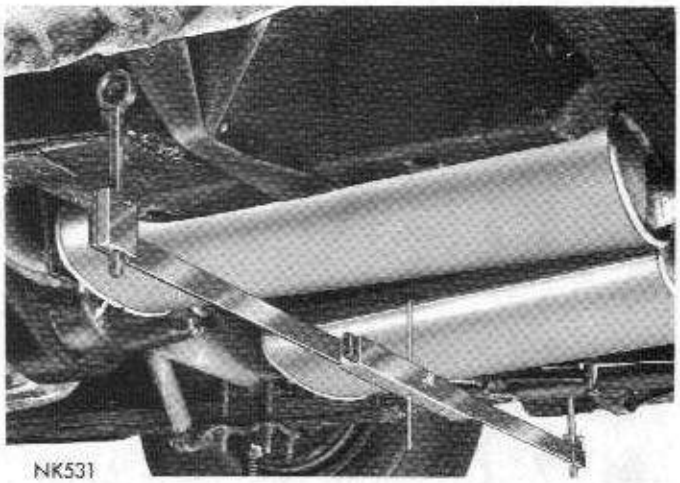


Fig. 14—No. 3 Position

of rear anchor boot. Position 2" in front of forward face of rear crossmember of stub frame (Fig. 11). Rework No. 2 gauge as shown in Fig. 12 and assemble into new hole "F" (Fig. 13).

(3) The rear frame gauge is suspended from centerline of rear spring pivot bolt. (The attached rod eye and/or adapter sleeve fits over outboard hex of bolt or nut) (Fig. 14).

(4) Place the checking bars over No. 2 and No. 3 gauges, and the short bars over No. 1 and No. 2 gauges so they overlap approximately 15 to 20 inches (Fig. 15). The Number 1 body outriggers should be shimmed until check bars are in line (Fig. 16). Both sides should be within 1/16 of each other.

Body Alignment (Chrysler Models)

Body alignment may be accurately measured by the following method. Elevate vehicle to a level position over a clean and smooth floor.

Refer to (Fig. 1) and place the line of a plumb-bob on point "A" with the plumb-bob just contacting the floor. Mark the plumb-bob contact point on floor. Repeat process at points B, C, D, E, F, G and H on both sides of body. Snap a chalk line between points as

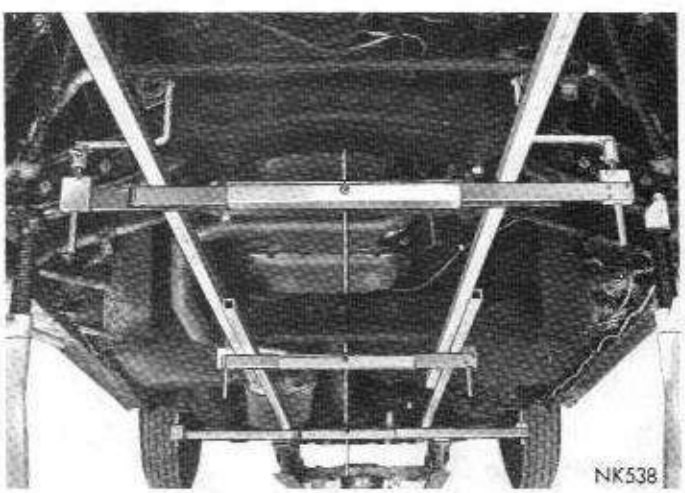


Fig. 15—Frame Alignment Checking Gauge

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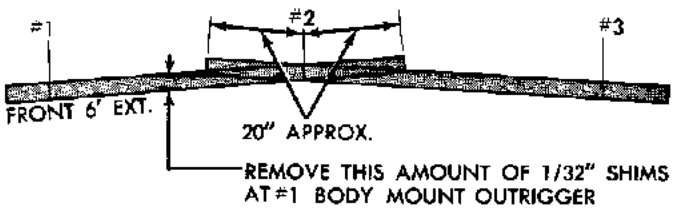
GAUGE ALIGNMENT ADAPTER CHART

Gauge and Position	Wheelbase	Distance Below Body "D" Line
No. 1—Front	121.5, 123.5	3.07"—Letter "D" Hole @ Centerline of Lower Control Arm inner Pivot Shaft (1/4" forward of Nut washer).
No. 2—Middle	121.5, 123.5	6.36"—Letter "F" Hole @ Bottom edge of Torsion Bar Clearance Hole at Front Face Rear X-member.
No. 3—Rear	121.5, 123.5 All Except Town and Country	4.82"—Letter "D" Hole @ Centerline of Front Eye of Rear Spring.
No. 3—Rear	121.5 Town and Country	5.32"—Letter "C" Hole @ Centerline of Front Eye of Rear Spring.

illustrated. **Care should be taken that all diagonals compared represent the corresponding measuring points.**

Compare the dimensions with the specifications. All matching point to point dimensions should agree within ¼ inch.

In making any body opening measurements, always compare the matching measurements of both sides of the vehicle. All dimensions must be measured at the welded joints of the body to insure uniform measurements.



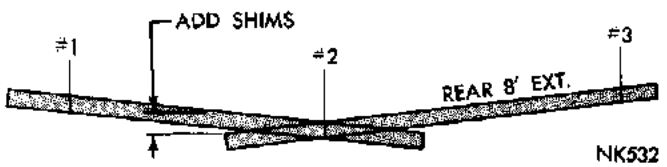


Fig. 16—Extruded Bars in Position

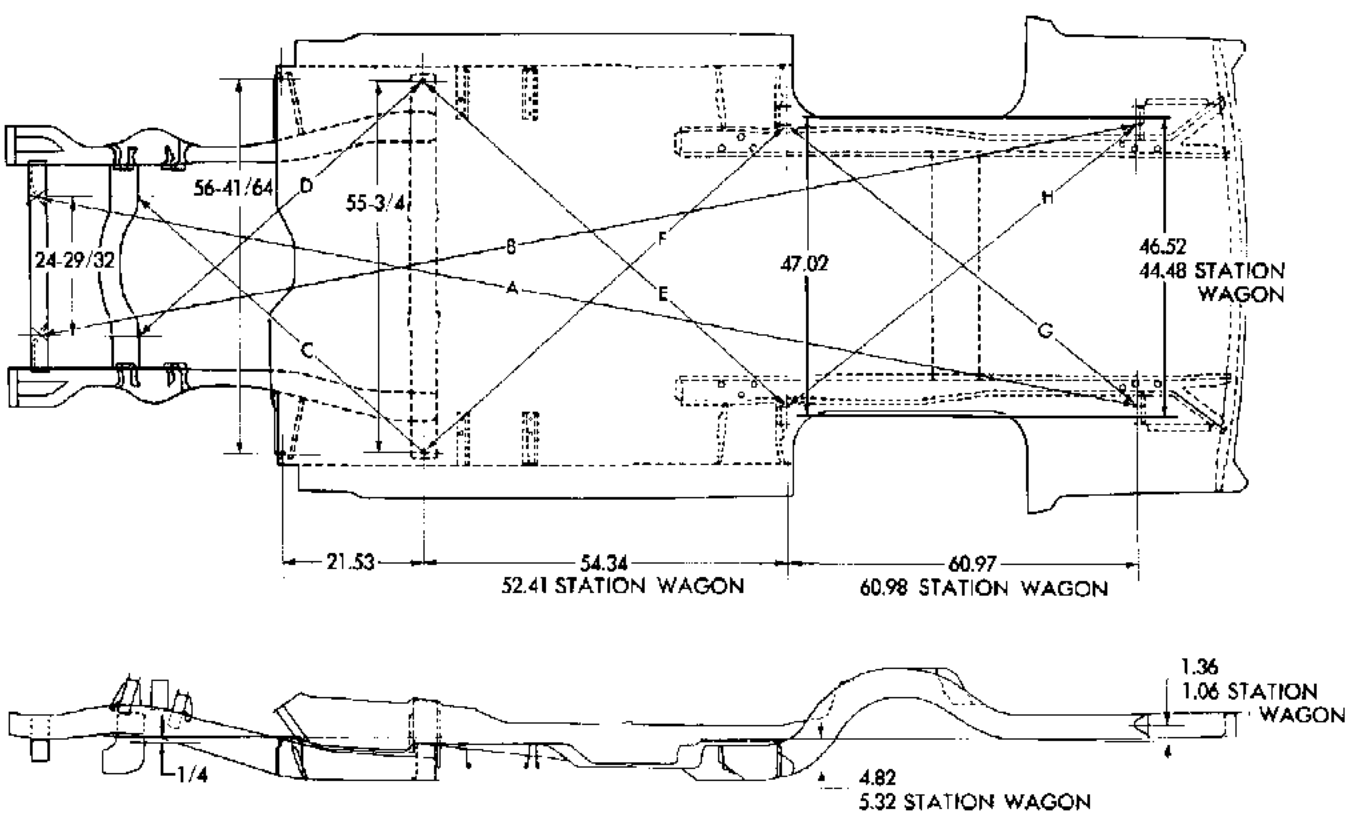


Fig. 1—Body To Frame Alignment (Chrysler)

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REFINISHING PROCEDURES

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ACRYLIC FINISHES

The vehicles are finished in an acrylic enamel. To determine the correct color and part number of the enamel used on the car, refer to the code on the body number plate and then locate the corresponding code on the paint chart.

DEFINITIONS OF TECHINICAL TERMS

COAT—SINGLE

This means one coat overlapping to give complete coverage.

COAT—DOUBLE

A double coat means to first spray a single coat with vertical strokes and then across with horizontal strokes, or vice versa.

DRYING

The drying or hardening of a film goes through several stages. The first is known as "dust-free" and is the time required for a film to reach the condition where, if any dust settles on it, the dust will not become imbedded, but may be wiped off after the film has hardened. The second stage is known as "tack-free" and is the time required for a film to reach the condition where it may be touched with light pressure of the finger. The third is "hard-dry" and is the time required for the film to become thoroughly hard so that it may be rubbed and polished.

FEATHER-EDGING

This is the tapering of the edges of a finish so that when the finger is passed over it no break will be felt. Feather-edging is usually done with water and sandpaper on a sanding block.

FERROUS AND NON-FERROUS METALS

Ferrous metals are those which are made from iron (steel). Non-ferrous metals are those which are not made from iron or do not present an iron (steel) surface, such as aluminum, aluminum alloys, brass, copper and magnesium.

FLASH

This is the term applied to a coat of a product when enough of the solvent has passed off for recoating.

MIST COAT

This is a coat of thinner to which may be added a small amount of retarder and applied as a final coat to increase flow and lustre of lacquer-type finishes.

PRIMING

The function of a primer is to form a bond between the surface and the succeeding product.

PUTTYING

A glazing putty is used for filling in small imperfections which are too deep to be taken care of by surfacer coats. It may be applied either before or after the last coat of surfacer.

REDUCERS

Reducers are mixtures of volatile liquids used to reduce alkyd, synthetic and orthodox materials to the proper consistency for application.

SANDING BLOCK

As a rule a sanding block is a flexible rubber block, so arranged sandpaper may be fastened to it securely. It affords a good grip for the operator.

Wherever possible sanding should be done with a block as it distributes the pressures and gives a more uniform surface.

SURFACING

The function of a surfacer is to prepare a smooth surface for the color coats.

TACK RAG

This is a piece of cheesecloth that has been dipped in thin, non-drying varnish and then wrung out. It is kept in a container so that the varnish will not harden but will remain tacky. The tack rag is used to wipe off a surface or remove dust.

THINNERS

Thinners are mixtures of volatile liquids used to thin lacquer-type finishing materials to the proper consistency for application.

UNDERCOATS

All products used to prepare the surface to receive the color coats are classified as undercoats, such as primers, surfacers, putties, primer-surfacers and sealers.

PAINT REPAIRS ON GALVANIZED METALS

To perform paint repairs on galvanized rocker panels on any other galvanized steel surfaces, care must be exercised when preparing the bare galvanized surface to properly accept the primer-surfacer and finish

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paint. Do not use short cut methods nor inter-mixing of materials.

Metal Preparation

(1) Thoroughly sand the affected area to remove all corrosion products from the exposed metal surface while carefully feathering all paint edges.

(2) Wire brush or steel wool the entire metal surface and remove all grease or oil by wiping with a clean solvent.

(3) Treat the bare metal panel with Galvaprep (Ditzler or DuPont) or R-M (Rinshed-Mason) 802 Galvanize and Zinc Conditioner or equivalent according to label directions.

(4) Rinse with clean water and blow off with compressed air.

Refinishing

(1) Apply one light coat of Ditzco Zinc Dust Primer DPE 659 (Ditzler) and as soon as thinner flashes off and within 30 minutes, apply a coat of Duracryl Sealer (Ditzler) or equivalent.

(2) Apply Ditzler A-L-E Primer Surfacer (DZL-3200 Light Gray, DZL-3400 Dark Gray, DZL-7200 Red Oxide) or Ditzco Speed-Sand Synthetic Primer Surfacer (DPS-70 Red Oxide, or DPS-30 Gray) DuPont Hi-Speed Primer-Surfacer, or Rinshed-Mason APS-403 Primer Surfacer Sealer or equivalent.

(3) Sand when dry and proceed with application of finish coats according to the paint manufacturers recommendations.

RUST PROTECTION

Prior to applying any paint to the sheet metal, clean the entire area to be repainted with a good wax and grease remover. **Eliminate all fingerprints.** Chemically treat all bare metal using a good metal conditioner. This conditions the exposed metal to resist rust.

BUFFING AND POLISHING

Minor imperfections in the paint finish normally can be removed by sanding, buffing and polishing. The following procedure should be used when working on these minor conditions:

(1) Oil sand by hand the affected area using #600 paper which has been soaked in mineral spirits. Caution should be used not to rub too hard over any of the affected areas or on ridges.

(2) Tack off the area with a clean soft cloth.

(3) Buff the entire area using a fine buffing compound.

(4) Polish the area with a good wax polish.

REFINISHING

Preparation Acrylic System—Over Old Acrylic

(1) Remove outside accessories, mouldings and bumper face bars (if necessary).

(2) Remove silicone polish, wax, or any other surface contamination with wax and grease remover. A chemically clean surface allows for effective sanding and assures adhesion of the undercoats and finish color.

(3) Sand the old finish. This operation removes surface deterioration, feathers out scratches, nicks, stone bruises, or any other minor imperfections. Water sand with #360 grit paper or its equivalent.

(4) Blow off entire car, using high pressure air to eliminate dirt or dust from blowing out on to the surface as the paint is applied.

(5) Mask off the areas not to be painted. If a complete color change is being made, mask off interior parts adjacent to door openings to prevent paint spray from soiling interior trim and upholstering.

(6) Reclean entire area to be painted with wax and grease remover, eliminating workman's fingerprints.

(7) Chemically treat bare metal. This conditions exposed metal to inhibit rust. Use a good metal conditioner.

Priming The Surface

This operation is the backbone or foundation for the finish color. It primes the metal to insure adhesion and fills minor surface imperfections. Use one of the recommended lacquer primer surfacers.

(8) Apply Undercoats.

(9) To expedite repairs of the other surface imperfections, use spot putty, glazing putty or all-purpose putty.

(10) Sand undercoats. Water sand with 400 or finer paper (or its equivalent if other sanding methods or systems are employed). This is the key operation in refinishing. The final finish will be as good as the foundation over which it is applied.

(11) Respray with primer surfacer any area that may have been sanded through to bare metal in step 10.

(12) Resand undercoat with 400 or finer paper.

(13) When the color is being changed, wash the door jambs and door opening areas. Spray interior.

(14) Remove overspray from exterior and reclean entire surface with wax and grease remover. This ensures positive adhesion.

(15) Tack rag the entire surface to remove lint and dust.

(16) Apply acrylic color. (Four to six double coats.) Refinishing in the field must be done with acrylic lacquer. The acrylic lacquer can then be polished to match original finish gloss. Care must be exercised when selecting paint for refinishing acrylic metallics, to select the proper paint code.

(17) When the color has dried hard, compound and polish.

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SPOT REPAIRS

The procedures for making spot repairs with acrylic lacquer are the same as for complete panel refinishing with the following exceptions:

Sealer Coats

The use of a sealer is not practical where a spot repair is demanded, as it is difficult to spray sealer without leaving an edge. If care is taken in preparation of the surface, a satisfactory repair is possible by sanding the original finish about 2 or 3 inches beyond the area where the acrylic lacquer will be applied. Apply the lacquer directly on the sanded original finish, being careful not to overlap the color on the unsanded enamel.

APPLICATION OF COLOR COATS

Metallic color can appear to vary in richness. The variation can be described as:

A closed pattern that appears lighter with fine metallic dispersion.

An open pattern that appears richer with the metallic flakes less noticeable.

A closed pattern is best matched by reducing the DDL color 150% with DTL-135 Acrylic Thinner, or equivalent, adjusting the air pressure at the gun to 35 lbs. and applying medium wet coats.

An open pattern is achieved by lowering the air pressure to 20-30 lbs. **at the gun,** reducing the DDL color 100% with a blend of DTL-135 and DTX-1140 Retarder, or equivalent, and applying even wet coats. The blending of thinner and retarder can be varied in percentage as necessary depending on the room temperature.

Compounding Color Coats

Compound the sanded area that extends around the refinish lacquer and then compound the lacquer, blending it into the enamel. **The hard surface of the acrylic enamel will permit compounding without leaving scratches.**

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AIR CONDITIONING

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AIR CONDITIONER DESCRIPTION AND OPERATION

AIR CONDITIONER CONTROLS

Imperial—Installations

Two types of original equipment air conditioner options are available. The first option is a combination air conditioning and heating unit. It is a dash-mounted unit, operated by push buttons located on the instrument panel. The second option is a dual installation consisting of the combination front unit and a rear unit evaporator assembly mounted in the luggage compartment is also available. This deluxe installation insures equal distribution of conditioned air to rear seat as well as front-seat passengers.

The dash-mounted front unit is the basic factory installed option. The rear unit, mounted in the luggage compartment is not available as a single unit without the front unit. Since the rear unit option operates automatically in conjunction with the front unit, only the front unit will be described in detail.

Selection of the degree of air conditioning desired is controlled by the push buttons located on the instrument panel. The larger lever below the push buttons, provides control of the hot water flow through the heater core to regulate the temperature. The small lever controls the switch which regulates the speed of the blower motor fan (Fig. 1).

Operation of the doors and damper which direct air flow through the combination heater and air conditioner unit is by means of vacuum diaphragm units called vacuum actuators. The vacuum source is the



Fig. 1—Air Conditioner Controls ("D" Body)

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engine intake manifold. Vacuum lines connect to each side of the vacuum actuator diaphragm, with the push button serving as a "switch valve" to admit vacuum to one side or the other of the vacuum actuator diaphragm. The diaphragm is connected to the door or damper by a rod and suitable linkage. Movement of the diaphragm, opens or closes the door or damper.

The push buttons also control the electrical circuits to the magnetic clutch and to the blower switch. The switch on the end of the temperature control lever controls the blower speed.

The fresh air door and the recirculating door are connected by a linkage so that they work in conjunction with each other (Fig. 2). They are both operated by one vacuum actuator. When the fresh-air door is fully closed, the recirculating door will be fully open. Conversely, when the fresh-air door is fully open the recirculating door will be fully closed. An adjustment is provided in the linkage connecting these two doors.

The heater bypass door is also controlled by a vacuum actuator. When the bypass door is closed, all air is directed through the heater core. When the bypass door is open, 75% of the air is bypassed around the heater core, and the remaining 25% flows through the heater core. The temperature control valve is mechanically controlled by the temperature control lever adjacent to the push buttons. For heating only, the temperature control valve can be opened to provide full water flow through the heater core. The bypass door will be closed, sending all air through the core. The bypass door linkage can be adjusted.

The distribution duct damper is also operated by a vacuum actuator. Its function is to control the percentage of air directed to the instrument panel outlet grilles and spot-cooler, and the percentage of air delivered through the central floor outlet deflector. In the extreme down position it will direct most of the air upward and to the spot cooler, the balance to the central floor outlet. In the extreme up position, the damper directs most of the air to the floor outlet, the balance to the upper outlets and the spot cooler.

Although the exact division of air flow is determined automatically by the push buttons controlling the distribution duct damper vacuum actuator, the driver can override the automatic control. The air distribution control knob provides the means of manually controlling the distribution duct damper.

The central floor outlet deflectors are controlled by a separate vacuum actuator. Position of these deflectors determines the direction of air flow from the floor outlet. Normal deflector position for cooling is up. This directs air upward and toward the rear-seat passengers. Normal deflector position for heating is down. Directing the warm air downward improves warm air circulation and insures maximum passenger comfort. The deflectors can be moved manually to override the automatic control.

An outlet is installed at each end of the instrument

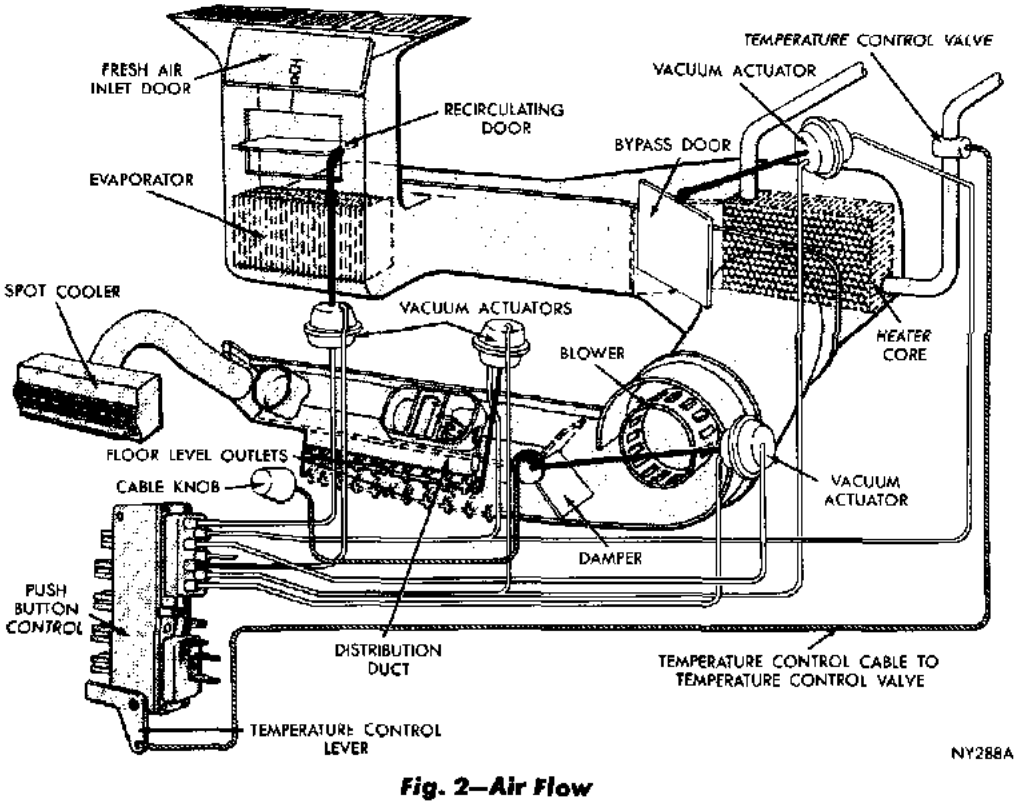


Fig. 2—Air Flow

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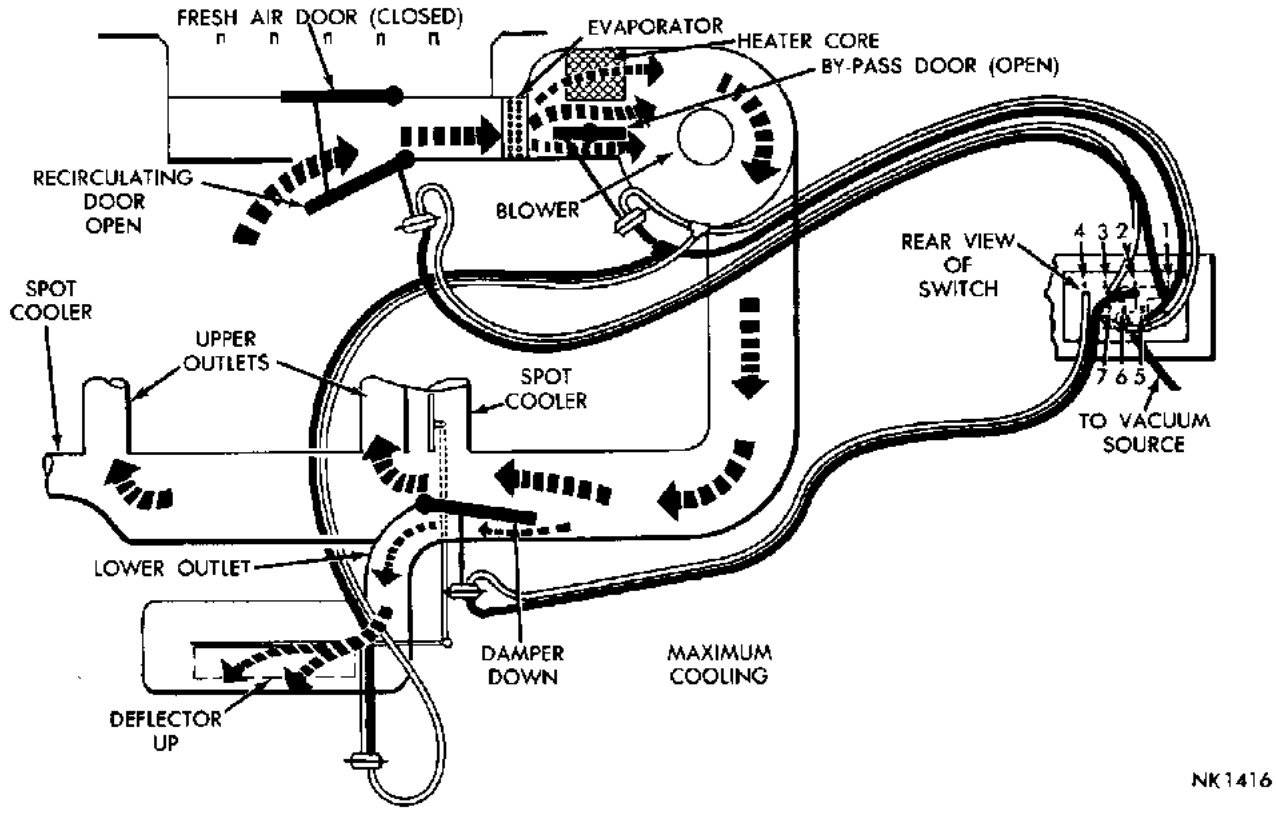


Fig. 3—Air Flow-Maximum Cooling

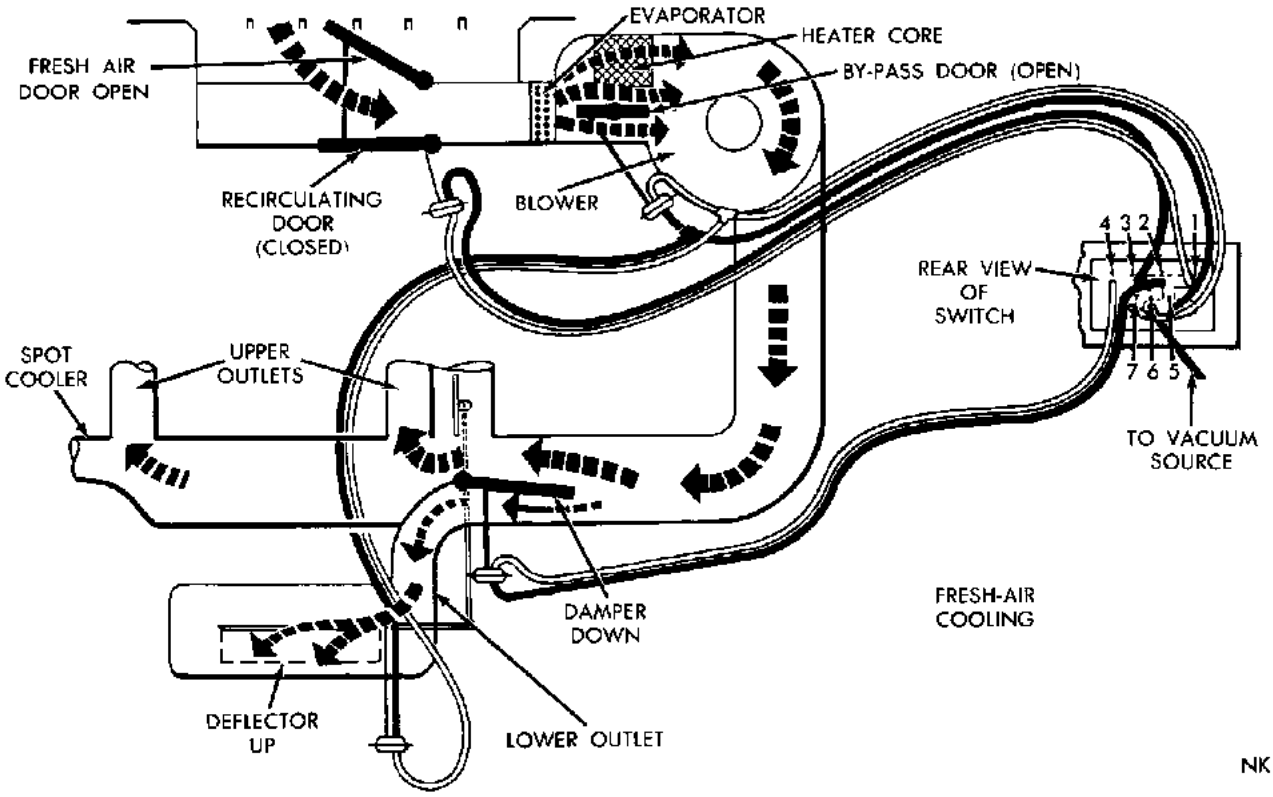


Fig. 4—Air Flow-Fresh Air Cooling

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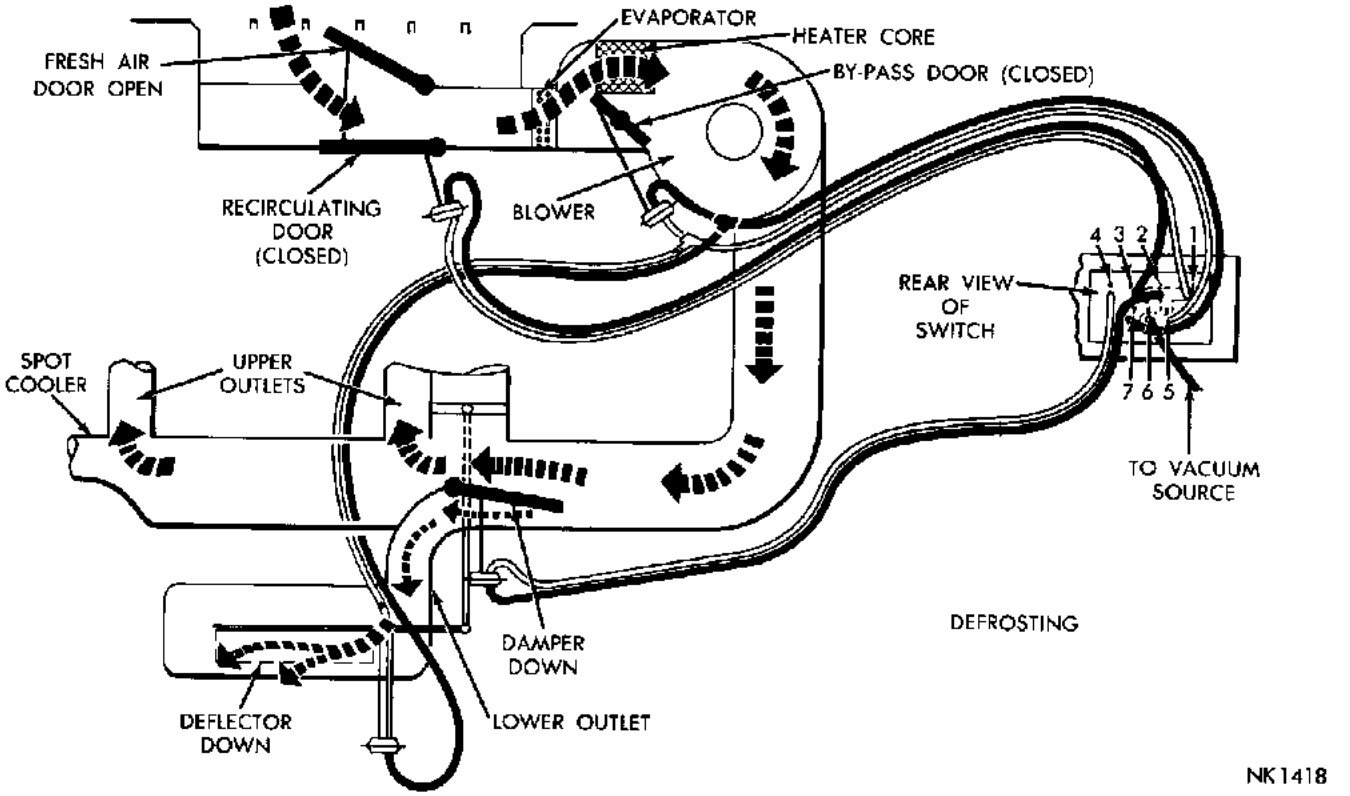


Fig. 5—Air Flow-Defrosting

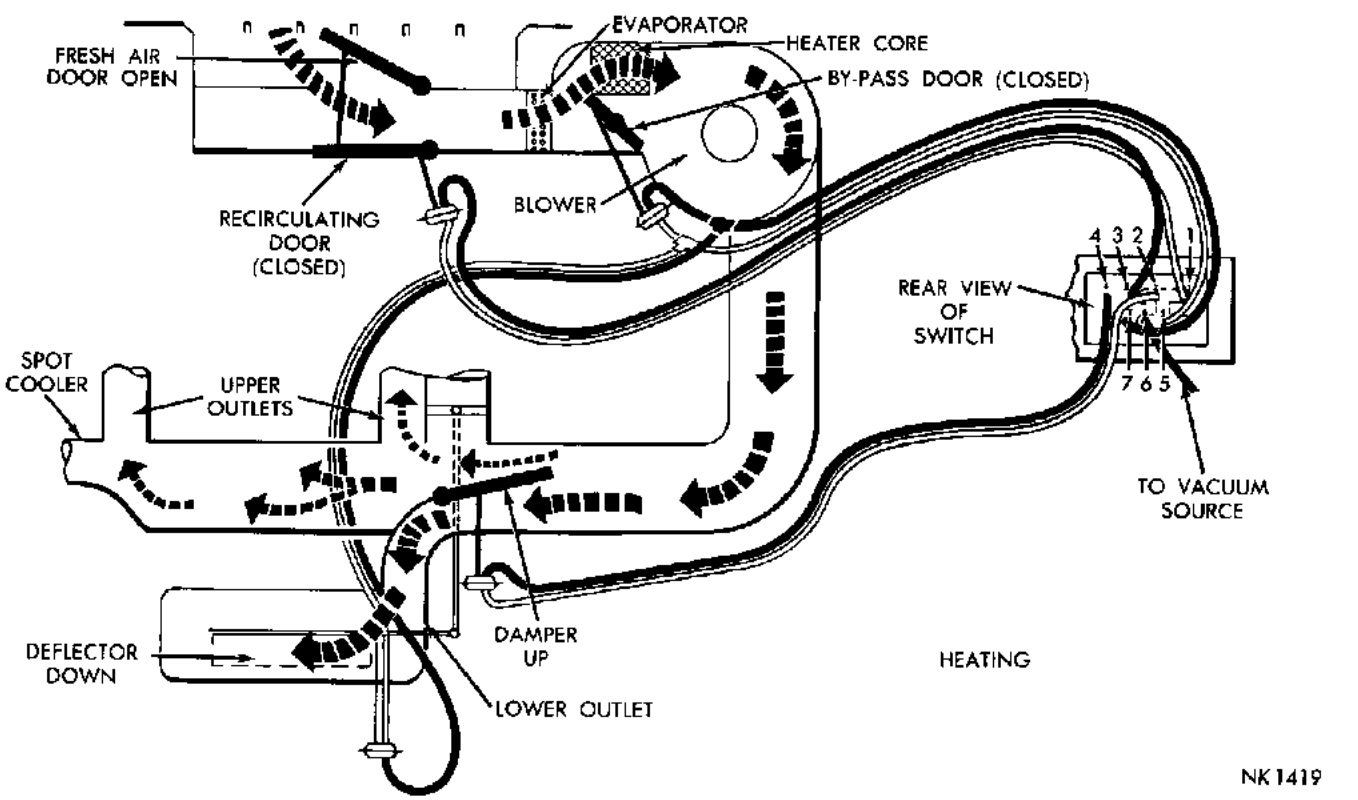


Fig. 6—Air Flow-Heating

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panel (on the lower edge) for the comfort of driver and passenger. The Floor Air feature controls the division of air between the floor and the two upper outlets. The distribution of air desired is regulated by turning the Floor Air Output Control knob, located on the driver's outlet above the parking brake pedal. Turn knob clockwise fully for maximum downward air. Turn the division louver control located on bottom edge of both outlets, to regulate direction of air flow to either left or right. To control amount of air on the chest area, pull the Upward Air control tab up to the desired position. To turn off, turn division louver control to far right.

AIR FLOW FOR EACH PUSH BUTTON POSITION (Figs. 3 thru 6)

Wheel testing or adjusting the doors and dampers in the distribution system, it is important to know the correct position of each door and damper for each push button position. The accompanying illustrations indicate which vacuum actuator hoses are activated for each push button position.

Ventilation

Pushing either the "Defrost" button or the "Heat" button, and moving the temperature control lever to "Off" will set the system for fresh-air ventilation—a desirable setting when temperature conditions are such that neither cooling nor heating is desired. The only difference between the operation of the system with the "Defrost" button or the "Heat button pushed in is the circulation of the discharge air. With the "Defrost" button in, most of the air is discharged through the instrument panel outlet grilles; with the "Heat" button in, most of the air is discharged through the floor level outlet.

The driver can adjust the air distribution control to change the position of the distribution duct damper only when the "Defrost" button is pushed in.

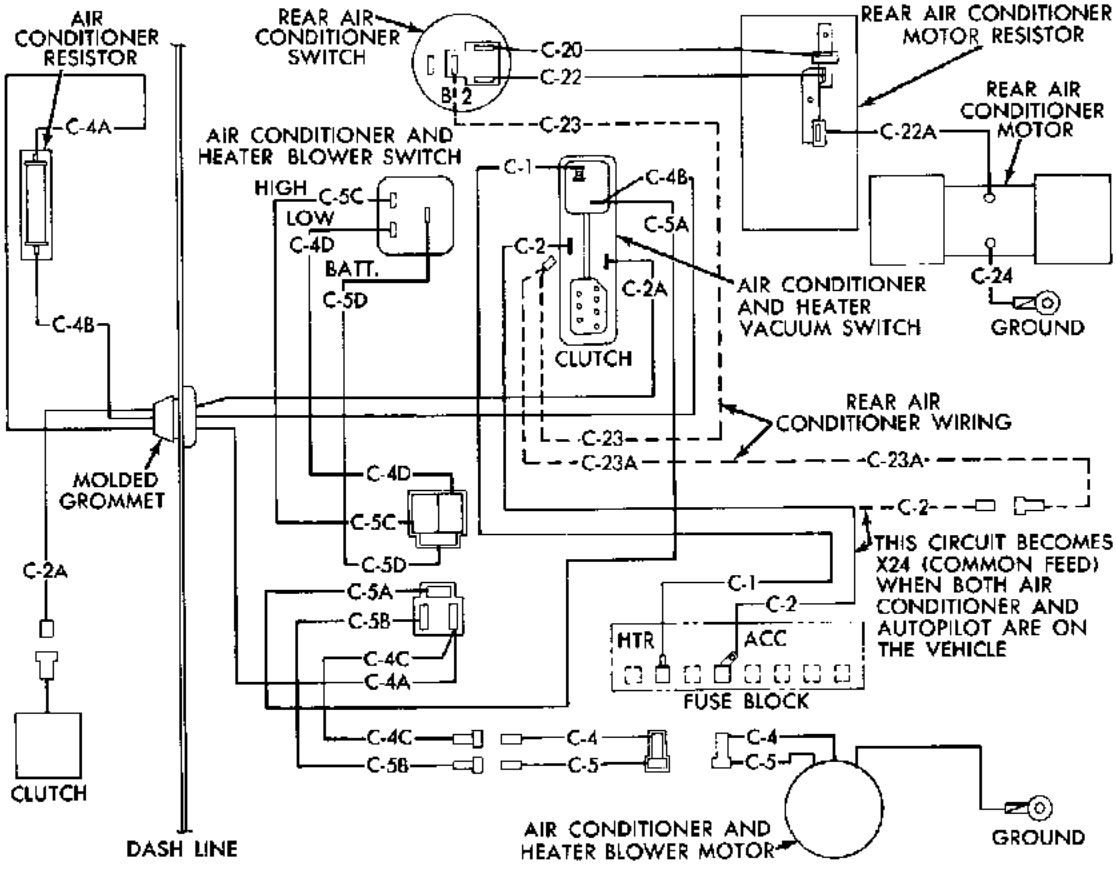
ELECTRICAL CONTROLS AND CIRCUITS

On all air-conditioning systems (front-unit type) there are two switches, one for the clutch control circuit and one for the blower motor speed control circuit. The push-button switch assembly controls the actuators and the clutch circuit. The push-button switch also controls the "feed" circuit to the blower motor speed control switch.

Push-Button Control

The power "Feed" circuit connects directly to the air conditioning terminal of the fuse block (Fig. 7).

The clutch circuit is energized ("hot") **only** when the "Maximum Cool," or the "Fresh Cool" push buttons are depressed. The blower motor circuit and the power "Feed" circuit to the blower motor speed con-



CIRCUIT	GAUGE WIRE	COLOR
C-1	14	BLACK WITH TRACER
C-2	16	LIGHT GREEN
C-2A	18	LIGHT BLUE
C-4	16	BROWN
C-4A	16	BROWN
C-4B	16	BROWN
C-4C	16	BROWN
C-4D	16	BROWN
C-5	16	DARK GREEN
C-5A	16	BLACK
C-5B	16	DARK GREEN
C-5C	16	DARK GREEN
C-5D	16	BLACK
C-20	16	BROWN
C-22	16	DARK GREEN
C-22A	16	DARK GREEN
C-23	14	LIGHT GREEN
C-23A	14	LIGHT GREEN
C-24	16	BLACK

Fig. 7—Electrical Control Circuits

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trol switch are energized ("hot") when any button other than the "Off" button is depressed.

Blower Motor Speed Control Switch

The speed control switch and control circuits are the same for all models, and the switch is controlled by moving the control lever from left (low) to right (high), (Fig. 1).

Trunk Unit Control

The trunk unit evaporator is dependent upon the controls used to operate the front unit. The evaporator of a trunk unit of a dual installation will "cool" only when the "MAXIMUM COOL" or the "FRESH COOL" push button of the front unit control is depressed to energize the magnetic compressor clutch.

The blower circuit of the trunk unit is entirely independent of the front unit.

OPERATING INSTRUCTIONS FOR OWNERS

The purchaser of an air conditioner equipped vehicle should be instructed on proper operation of the controls at the time of new vehicle delivery. It should never be assumed that the new owner will study the Owner's Manual or that his experience with the past models provides a complete understanding of the new controls. Customer satisfaction can be increased and complaints minimized by instructing the owner on the operation of the air conditioning unit as well as his service responsibilities. The following suggestions cover special operating conditions and preventive service suggestions.

Fast Cool-Down

(1) If the vehicle has been sitting in the hot sun, open the windows immediately.

(2) Move the temperature control lever to the extreme opposite position of the "warm" arrow.

(3) Pull out temperature control lever "knob" for high blower speed.

(4) Start engine.

(5) Press the "**Maximum Cooling**" button.

(6) Start driving car. Car motion and air-conditioner blower action will flush the hot air out of the vehicle.

(7) After one or two minutes of driving, close all windows.

Operation In Traffic

(1) If **extremely slow traffic** is encountered, 10 to 15 miles per hour, additional cooling can be obtained by operating the transmission in the lowest range (No. 1 position).

(2) For **moderate traffic** operation 20 to 30 miles per hour, operate the transmission in intermediate range (No. 2 position).

(3) At **stop lights** and other stops of some duration, shift the transmission to ("N") Neutral position and increase engine speed with the foot accelerator.

(4) At **higher speeds,** shift the transmission to ("D") Drive position.

(5) When hauling a trailer and with the air conditioning system in operation, it may be necessary to turn the air conditioner "Off" for awhile when overheating conditions are encountered. Also, driving at reduced highway speeds will help the engine to run cooler.

Highway and Light Traffic Operation

As soon as the vehicle cools down, and especially at highway speeds, change the air-conditioner buttons from **"Maximum Cool"** to **"Fresh Cool."** This will slightly pressurize the vehicle and prevent any unrefrigerated air from seeping into the vehicle. This will remove tobacco odors, etc. When changing air-conditioner buttons from **"Maximum Cool"** to **"Fresh Cool,"** particularly at highway speeds, momentarily release accelerator pedal, and return it to its former speed position. This momentary release of accelerator pedal will increase engine vacuum causing a fast action in the closing of the recirculating door and opening of the fresh air door.

"Fresh Cool" operation will be the most desirable operating position except for extremely hot or humid weather, or starting with a hot vehicle, as previously outlined.

If less cooling is desired, push in blower switch on temperature control lever for medium or low blower speed.

If still too cool, move the temperature control lever in the direction of the "warm" arrow.

Off-Season Operation

During the off-cooling season, suggest to owners that they operate the air-conditioning system for at least a few minutes once a week, with the "Fresh Cool" button in and the temperature control lever in the "warm" position. This will cause the air-conditioner compressor to pump oil to the compressor seal, preventing the seal from drying out and causing loss of refrigerant.

Antifreeze Required for Summer Operation

The air-conditioning system requires the engine's cooling system to be protected to +15°F. with a permanent-type antifreeze for summer operation. This is to prevent freezing of the coolant in the heater core.

However, this protection does not provide sufficient corrosion inhibitors for the engine cooling system. Summer protection to —15°F will provide adequate inhibitors for protection of engine cooling system against corrosion.

In the springtime, after the winter's operation with the cooling system protected with permanent-type antifreeze for the temperatures of the area, it is suggested the system be drained and flushed out with

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water. When draining, flushing and refilling, have the temperature control lever in the extreme hot position so the heater core is drained, flushed and refilled. Install a gallon of permanent-type antifreeze in the system, and add enough water to fill the system.

Do Not Re-use The Old Antifreeze

The permanent antifreeze does not lose its antifreeze qualities during the winter season operation, but the chemical inhibitors for rust and corrosion prevention are weakened and finally exhausted by extended use.

Do not add new inhibitor to used antifreeze in hope of revitalizing the used antifreeze.

The chemical inhibitors come in various chemical compositions, some are compatible, some neutralize each other, and some form violent reactions to each other causing foaming and other undesirable reactions.

Play it safe and use new permanent-type antifreeze.

Bug Screens

Bug screens should not be installed on vehicles equipped with an air conditioner. A bug screen installed in front of the condenser will reduce air flow and affect air-conditioner performance. Under severe heat conditions, a bug screen may cause the engine to over-heat.

AIR CONDITIONER CONTROLS

Chrysler Installations

Two air conditioner options are available. The first option (Front Unit) is a combination air conditioning and heating unit which is installed inside the passenger compartment behind the instrument panel. The controls and cooling air outlets are integral with the instrument panel. This system functions on the reheat principle.

The second option (Station Wagons Only), includes the first option plus a roof mounted evaporator assembly.

The roof mounted unit operates automatically in conjunction with the front unit and is not available as a single unit without the front unit.

Controls for the front system consists of five push buttons, a temperature control slide lever and a three-position toggle-type fan blower switch (Fig. 8).

Control for the roof mounted system consists of a rotary two speed switch.

Push Buttons—Control the source and route of circulating air. "Off" (turns off system); "Max A/C" (maximum air conditioning); "A/C" (fresh air-air conditioning); "Heat" (for heater use only); "Def" (windshield defroster).

Temperature Control Slide Lever—Maintains any desired temperature by sliding the lever right or left when operating either the heater or air conditioner.

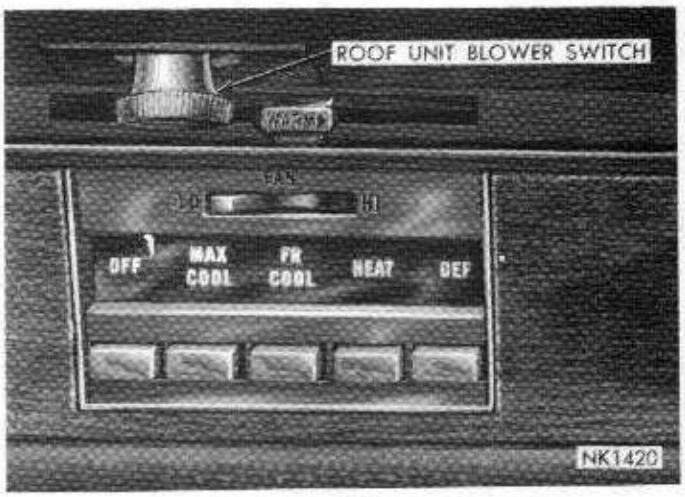


Fig. 8—Air Conditioner Controls

Fan Switch—Permits selection of low, medium or high blower speeds. "Low" (far left); "Medium" (Center) and "High" (far right) used when operating either the heater or air conditioner.

Air Directional Vanes—One at each end, and two in the center of the instrument panel. These are adjusted manually to direct cool air to suit the requirements of the driver and passengers.

The center outlets are cylindrical units that can be rotated to direct air up or down; adjustable vanes direct air to either side.

The outlets at each end of the instrument panel are also adjustable or can be shut-off by a damper operated by a vertical slide lever or a horizontal slide lever depending on car model.

AIR FLOW FOR EACH PUSH BUTTON POSITION

When testing or adjusting the doors in the distribution system, it is necessary to know the correct position of each door for each push-button position. It is also necessary to know which vacuum hoses are activated for each push-button position. In the following illustrations air flow is indicated as the vacuum actuator hoses are activated for each push-button position (Figs. 9 through 13).

Ventilation

While driving, outside air can be brought into the interior through the inlets in the side cowls. These inlets are opened by pulling the control knobs, located on the lower edge of the instrument panel on both sides of the steering column. The knob to the left of the column controls the air inlet on the left side of the car and the right hand knob controls the right side. The amount of air intake is regulated by the distance the knobs are pulled out. Pushing the knobs all the way in closes off the air intake.

Be sure the air intake controls are pushed all the way in before operating the air conditioning system.

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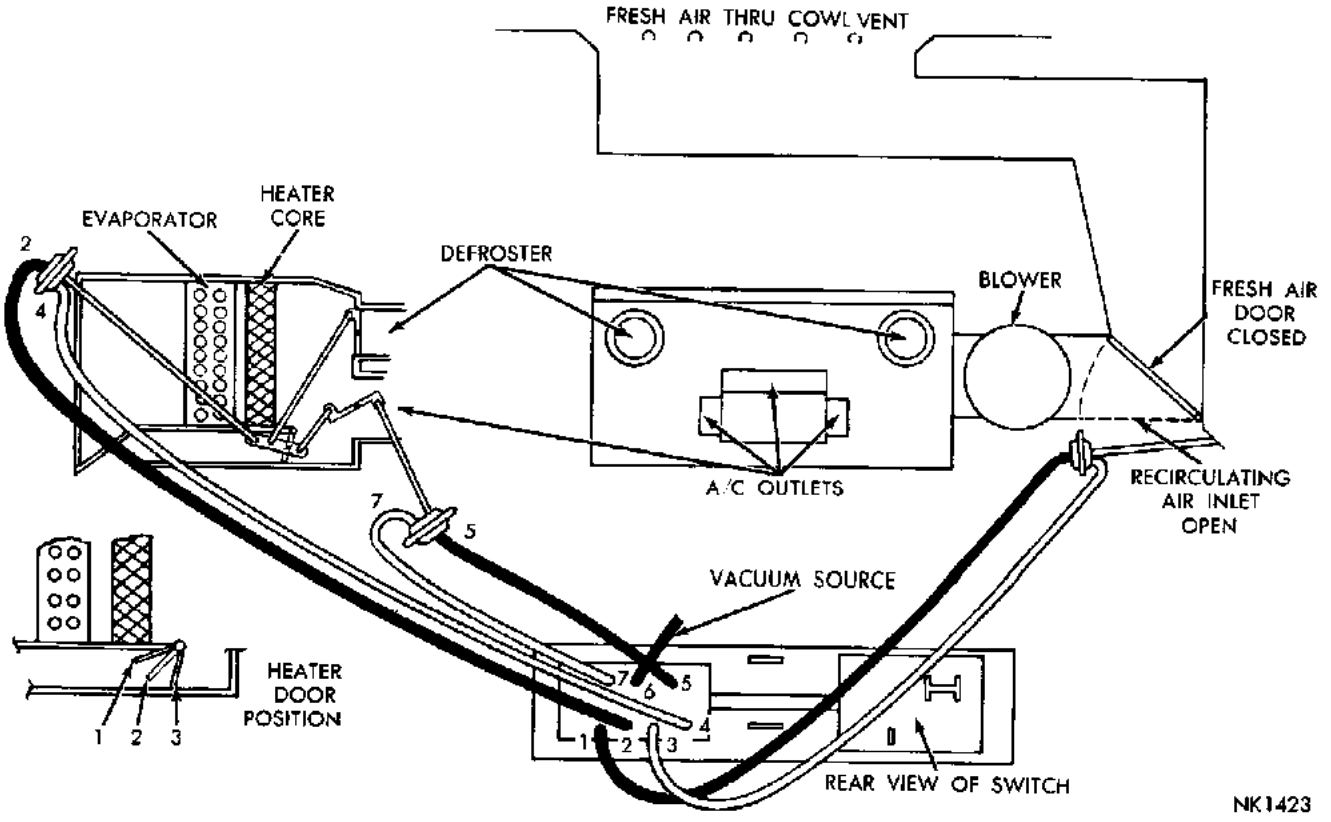
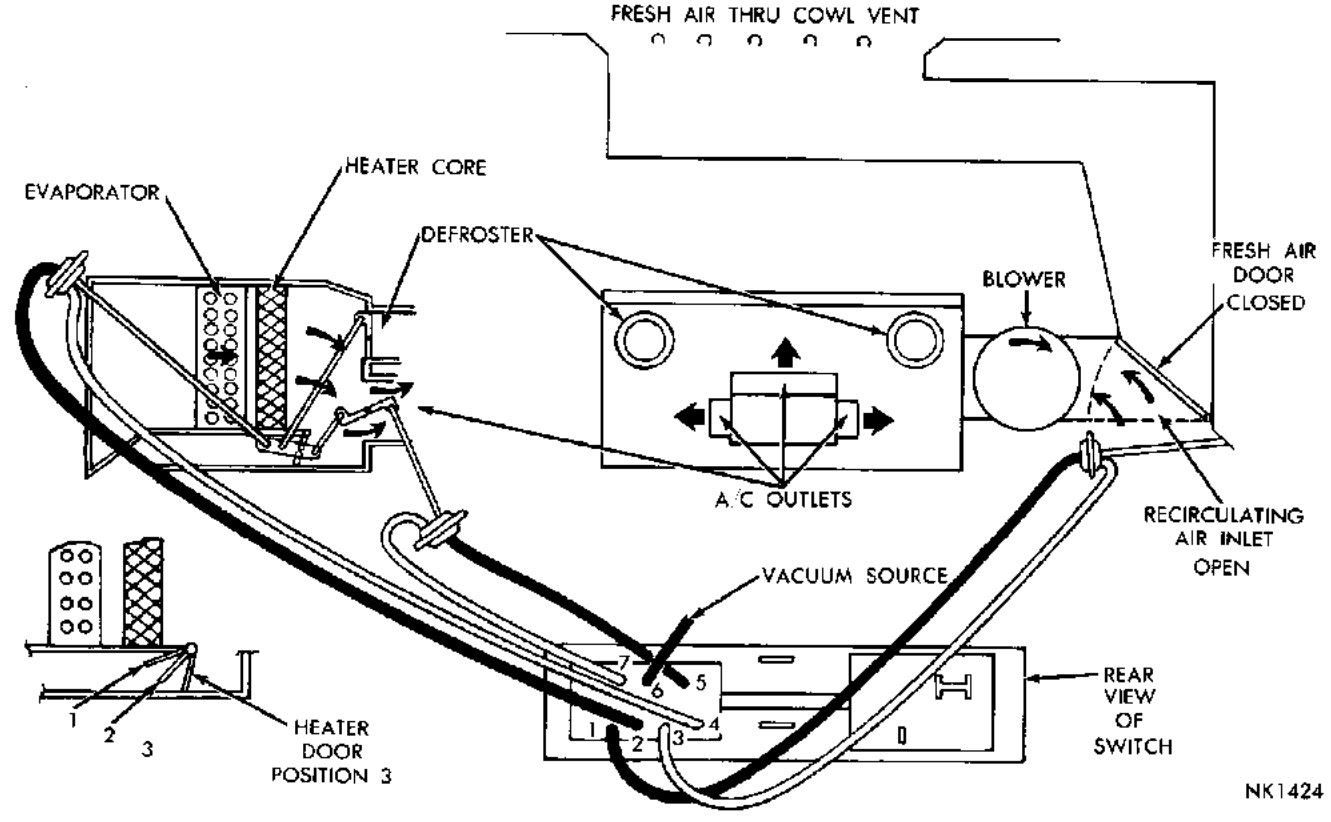


Fig. 9—Air Conditioning Controls Off Position



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Fig. 10—Air Flow-Maximum Cooling

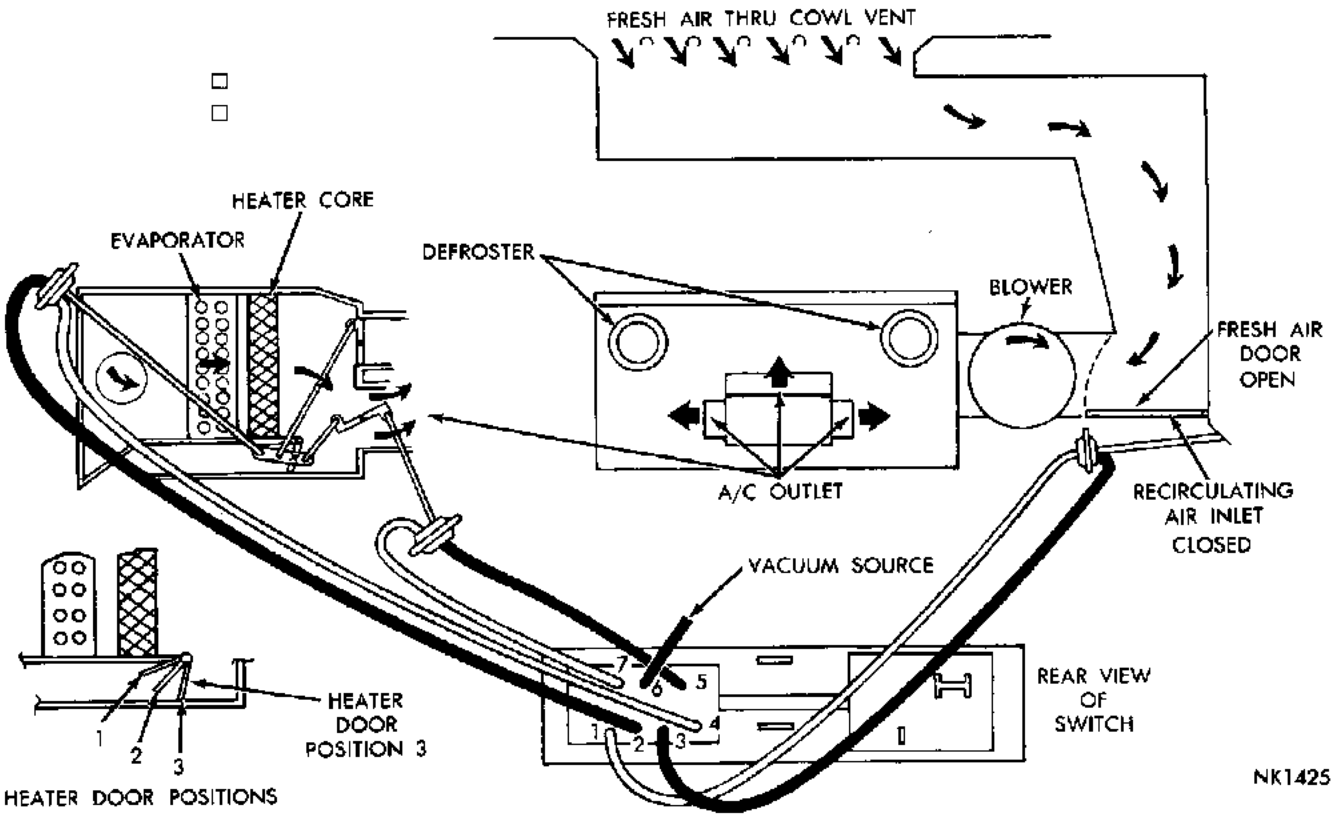


Fig. 11—Air Flow-Fresh Air Cooling

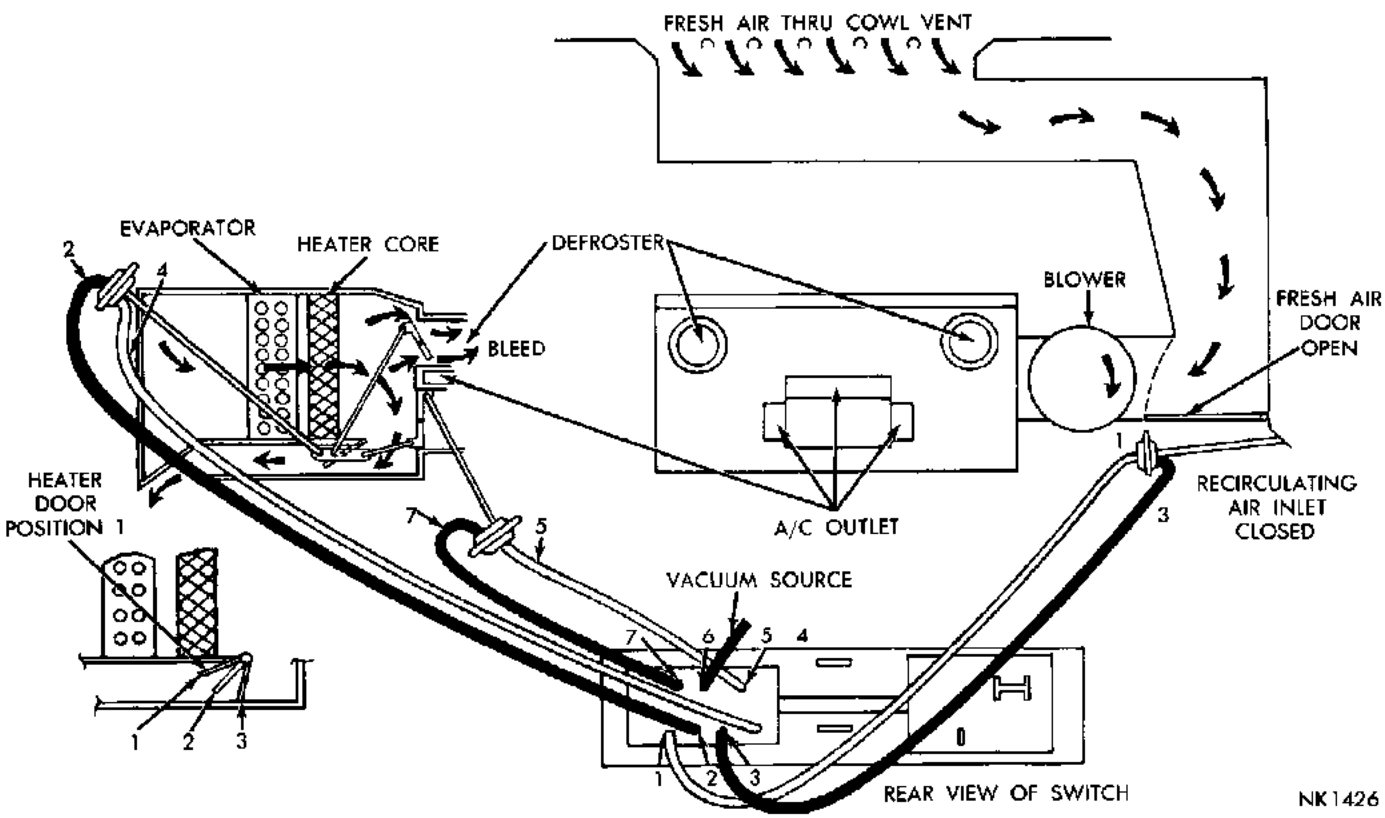


Fig. 12—Air Flow—Heating

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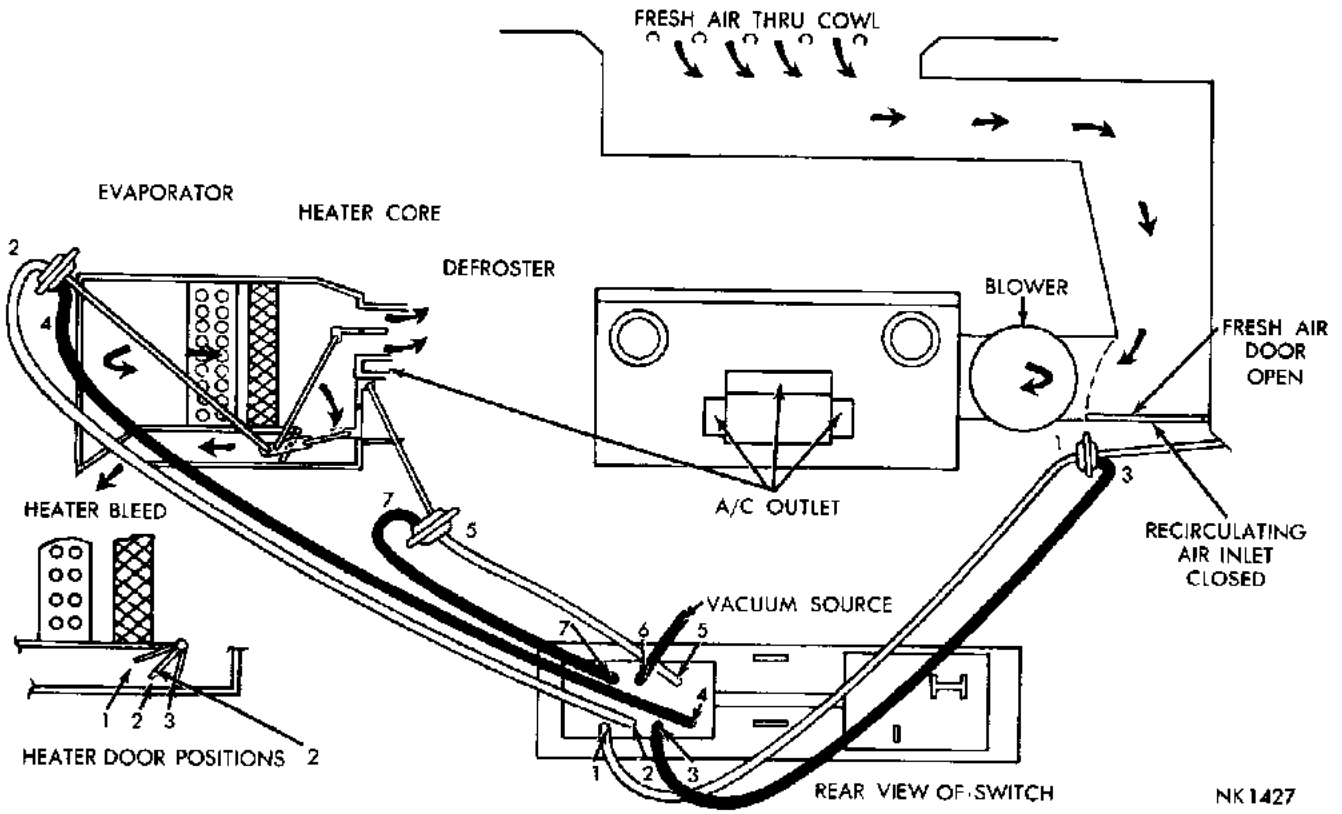


Fig. 13—Air Flow—Defrosting

ELECTRICAL CONTROLS AND CIRCUITS

There are three switches, push button switch (air conditioner and heater vacuum switch), fan switch (air conditioner and heater blower switch), and the air conditioner and heater resistor by-pass switch.

Push Button Control

The power feed circuit is shown in (Fig. 14). A 20 ampere fuse in the fuse block protects the circuit.

The compressor clutch circuit is energized when either the "Max A/C," (maxium air conditioning) or the "A/C" (fresh air—air conditioning) push buttons are depressed. The "Off" button turns off the system.

Blower Motor (Fan Switch)

The power feed line from the push-button switch to the blower switch is energized only when the ignition is on and any push button, other than "Off," is depressed.

The switch is controlled by moving the control lever from left (low) to right (high).

OPERATING INSTRUCTIONS FOR OWNERS

Fast Cool Down

If the car has been parked in the hot sun, open the windows and drive the car for several minutes to expel the warm air, and at the same time:

(1) Slide the temperature control lever to the "Off" position (far left).

(2) Push the "Max Cool" button.

(3) Move the fan switch to "High" (Hi) far right.

(4) Adjust the four cooling outlet vanes to direct cooled air to the desired area to suit occupants wishes.

Normal Cooling (Cooling with Fresh Air)

When the desired amount of cooling is obtained with the "Max Cool," you can continue cooling with fresh outside air for added comfort by pushing the "Fr Cool" button and adjusting the fan switch to change fan blower speed. If less cooling is desired, move the fan switch lever to "Low" speed and readjust the cooling outlets for indirect cooling. For warmer air, move the temperature control lever to the right to the desired temperature.

Cooling For Special Conditions

The air conditioner provides maximum dehumidified air at the most comfortable weather conditions above 50°F.

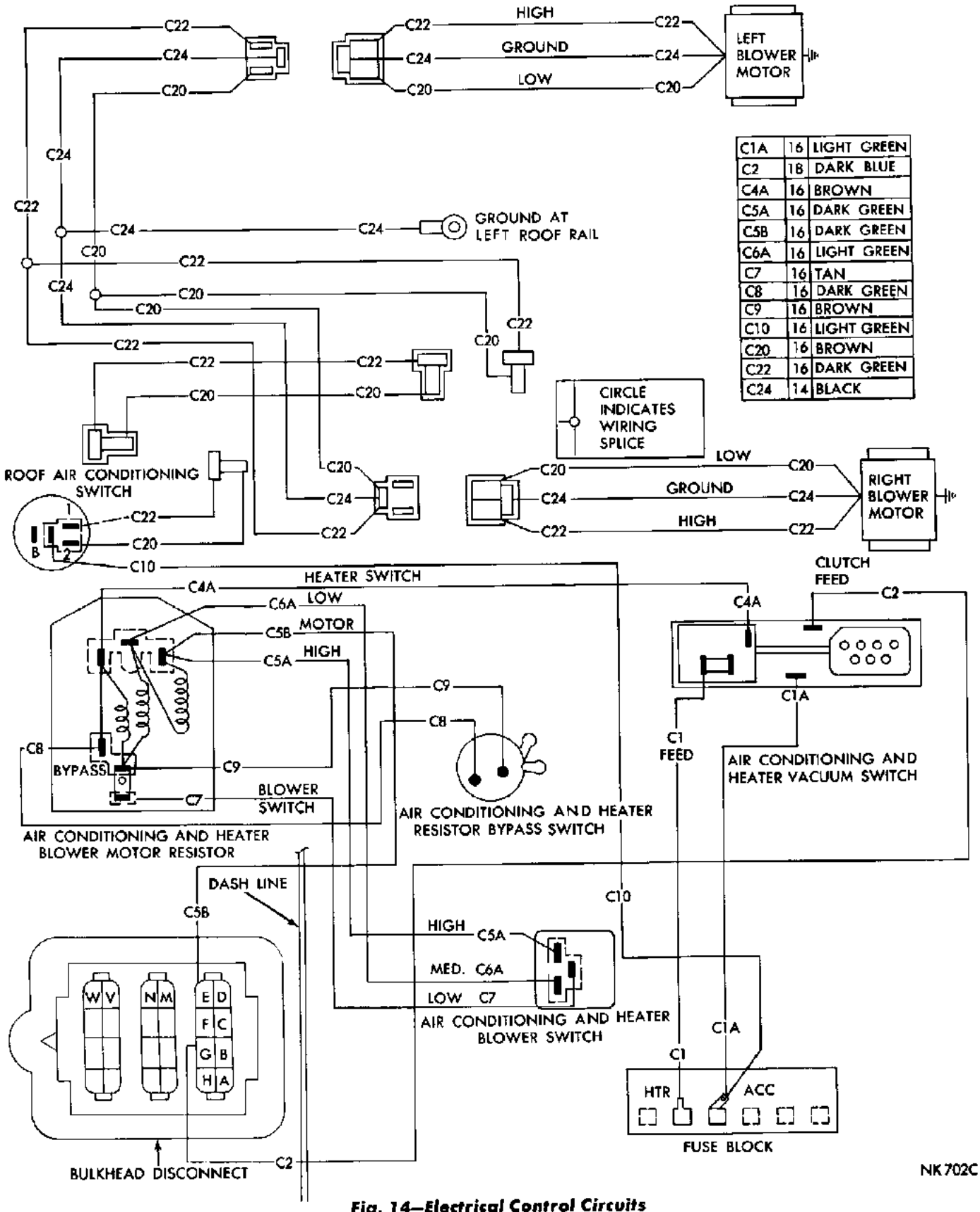
During rainy or muggy weather, operate the system as usual, using the temperature control lever to clear the windows and provide interior comfort.

If the outside air is extremely humid or too warm for cooling with fresh air as previously described, push the "Max Cool" button. This method is also recommended when driving through areas which are extremely dusty or have objectionable odors.

Operation In Traffic

(1) In extremely slow traffic, 10 to 15 miles per

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C1A	16	LIGHT GREEN
C2	18	DARK BLUE
C4A	16	BROWN
C5A	16	DARK GREEN
C5B	16	DARK GREEN
C6A	16	LIGHT GREEN
C7	16	TAN
C8	16	DARK GREEN
C9	16	BROWN
C10	16	LIGHT GREEN
C20	16	BROWN
C22	16	DARK GREEN
C24	14	BLACK

Fig. 14—Electrical Control Circuits

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hour, additional cooling can be obtained by operating the transmission in the lowest range.

(2) For moderate traffic operation 20 to 30 miles per hour, operate the transmission in the intermediate range.

(3) At stop lights and other stops of some duration, place the transmission in neutral and increase the engine speed with the foot accelerator.

(4) At higher speeds, operate the transmission in the "D" (Drive) range.

(5) When hauling a trailer and with the air conditioning system in operation, it may be necessary to turn the air conditioner "Off" for awhile when overheating conditions are encountered. Also, driving at reduced highway speeds will help the engine to run cooler.

Off-Season Operation

During the off-cooling season, suggest to the owners that they operate the air-conditioning system for at least five minutes once a week with the "Max Cool" button depressed and the temperature control lever in the warm position. This will cause the air conditioner compressor to pump oil to the compressor seal, preventing the seal from drying out and causing loss of refrigerant.

Antifreeze Required for Summer Operation

Air conditioned vehicles must be protected with a permanent type antifreeze during summer +15°F. or lower to prevent the heater core from freezing. However, this protection does not provide sufficient corrosion inhibitors for the engine cooling system.

Summer protection to —15°F. will provide adequate inhibitors for protection of engine cooling system against corrosion. **Do not use the same antifreeze for more than one year.**

Bug Screens

Bug screens should not be installed on vehicles equipped with an air conditioner. A bug screen installed in front of the condenser will reduce air flow and effect air conditioner performance. Under severe heat conditions a bug screen may cause the engine to over-heat.

INSPECTION AND TEST PROCEDURES

Satisfactory performance of the combined air-conditioning and heating system is dependent upon proper operation and adjustment of all operating controls, as well as proper functioning of all refrigeration system units. The inspections, tests and adjustments should be used to locate the cause of a malfunction. The inspections and tests in this manual have been arranged in a logical sequence that has proved to be the surest and shortest route to accurate diagnosis. It is recommended that they be followed and performed in the order in which they are presented.

OPERATION OF ALL CONTROLS

Imperial

Operating controls must be tested as described in the following sequence:

(1) Inspect and adjust compressor drive belt tension. Remove radiator cap.

(2) Open the vehicle windows.

(3) Move the temperature control lever to the "Off" position.

(4) Start the engine and adjust engine speed to 800 rpm. Use a reliable tachometer.

(5) Push the "Fresh Cool" button in.

(6) Test blower operation at all three speed positions. If blower does not operate correctly, refer to Paragraph "Electrical Controls and Circuits." Leave the blower in the "Low" position.

(7) The compressor clutch should be engaged, the compressor operating, and the air-conditioning system in operation. If the clutch does not engage, test the circuit. (Refer to "Electrical Controls and Circuits.")

Push Button Operation

Reduce the engine speed to normal idle. With the engine operating at idle speed, the vacuum will be high and the vacuum actuators should operate quickly.

If the actuator operation is slow, check the source hose connection at the engine manifold.

Push each button to test the over-all operation of the electrical and vacuum controls.

The Push Button Control Chart summarizes the actions that should take place when each button is pushed.

If all controls operate in the proper sequence but action of dampers and doors is slow or incomplete, inspect for mechanical misalignment, binding or improper linkage adjustment.

Water Temperature Control Valve Adjustment.

Move the temperature control lever on the instrument panel to the extreme "Warm" position, and then back to the "Off" position. At the same time, inspect the control cable action and the movement of the water temperature control valve lever. The valve should be moved to the wide-open position and back to the fully closed position. Figure 15 shows the valve in the fully **closed** position. The water valve is pushed to open and pulled to close.

If the temperature control valve does not close

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IMPERIAL PUSH BUTTON CONTROL CHART

BUTTON	OFF	MAX. COOL	FRESH COOL	DEFROST	HEAT
FRESH AIR DOOR	Closed	Closed	Open	Open	Open
RECIRCULATING DOOR	Open	Open	Closed	Closed	Closed
BYPASS DOOR	Open	Open	Open	Closed	Closed
DEFLECTOR	Up	Up	Up	Down	Down
DAMPER	Down	Down	Down	Down	Up
BLOWER SPEED	Off	Hi-Med. Low	Hi-Med. Low	Hi-Med. Low	Hi.-Med. Low
COMPRESSOR CLUTCH	Off	On	On	Off	Off
SPOT COOLER RIGHT LEFT	Open Manual	Open Manual	Open Manual	Closed Manual	Closed Manual

completely, reposition the control cable housing in the retaining clip so that the valve does close completely.

Push the "Max Cool" button in, and with the blower in the "Low" speed position, run the air conditioning for five minutes then test the water valve by momentarily disconnecting the heater outlet hose at the upper side of the heater.

Test the water valve by momentarily disconnecting the heater outlet hose at the upper side of the heater housing (Fig. 16). A slight spillage of water when the hose is removed is normal. (The radiator cap was removed at the start of this test to minimize pressure in the vehicle cooling system.) A continuous flow of water indicates that the valve is not closing properly. This may be caused by an improperly adjusted control cable or a faulty valve. Readjust the control cable or replace the valve, as necessary, and retest.

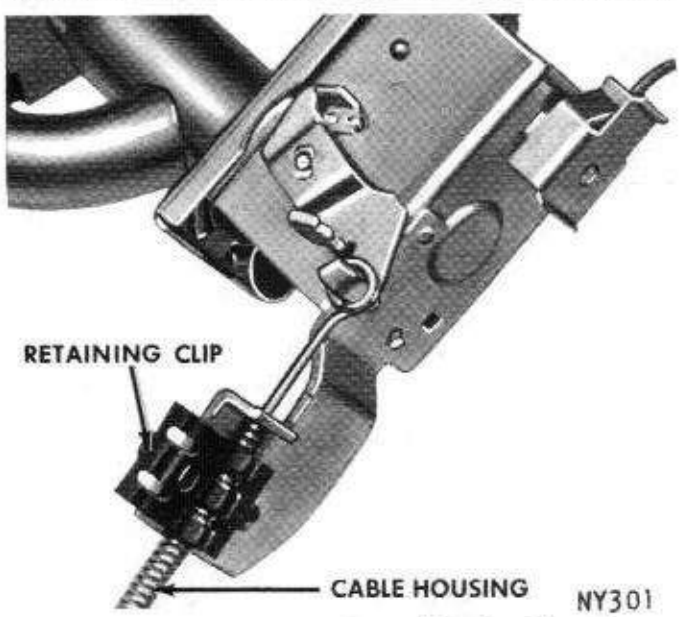


Fig. 15—Temperature Control Valve Closed

RADIATOR CAP

The 1966 air conditioned vehicles must be equipped with a radiator cap having a holding pressure of 15 to 16 psi. Replace the radiator cap that does not test within these specification's with a cap that does.

CONDENSER AND SUB-COOLER

Inspect the condenser and sub-cooler fins for obstructions for foreign matter. Clean if necessary.

Any obstructions to the free flow of air across the condenser and/or sub-cooler will decrease heat dissipation from the condenser, decrease the efficiency of the condenser and, in turn, decrease the vaporator's efficiency. These conditions result in increasing the discharge pressure and horsepower load on the engine. The use of a bug screen is not recommended as it, too, will decrease the flow of air.

Inspect the condenser and sub-cooler for bent or

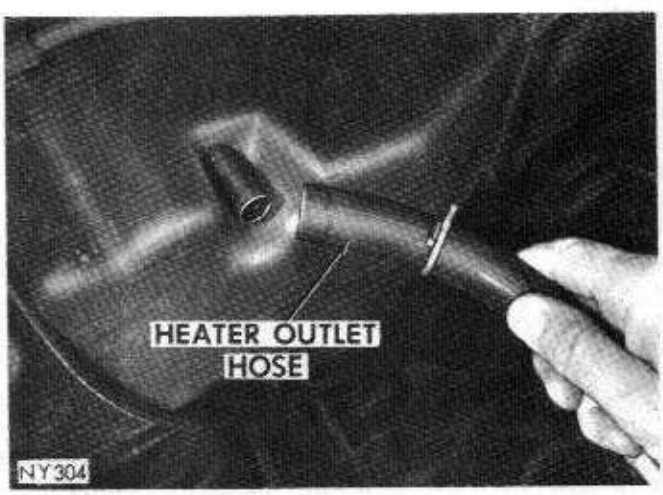


Fig. 16—Water Valve Test

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damaged fins. The bent fins on the condenser and/or sub-cooler deflect air flow across the bent portions, decreasing the condenser area. Be sure the fan shroud is properly positioned.

OPERATION OF ALL CONTROLS

Chrysler

Operating controls must be tested in the following sequence. Remove radiator cap.

(1) Inspect and adjust compressor drive belt tension.

(2) Open the vehicle windows.

(3) Move the temperature control slide lever to the "Off" position.

(4) Start the engine and adjust engine speed to 1300 rpm. Use a reliable tachometer.

(5) Push the "Fresh Cool" button in.

(6) Fresh-recirculating door should be open to fresh air.

(7) Test the blower operation at all three speed positions. If the blower does not operate correctly, refer to "Electrical Controls and Circuits." Leave the blower switch in the "Low" position.

(8) The compressor clutch should be engaged, the compressor operating, and the air conditioning system in operation. If the clutch does not engage, test the circuit as outlined under "Electrical Controls and Circuits."

Push Button Operation

Reduce the engine speed to normal idle. With the engine operating at idle speed, the vacuum will be high and the vacuum actuators should operate quickly.

If the actuator operation is slow, check the source hose connection at the engine manifold.

Push each button to test the over-all operation of the electrical and vacuum controls.

The "Push Button Control Chart" summarizes the actions that should take place when each button is pushed. See "Chart." Also refer to "Air Flow for Each Push Button Position."

If all the controls operate in the proper sequence but the action of the dampers and doors is slow or incomplete, inspect for mechanical misalignment, binding or improper linkage adjustment.

Water Temperature Control Valve Adjustment

Remove the radiator cap to minimize pressure in the car's cooling system.

Move the temperature control slide lever on the instrument panel to the extreme "Warm" position, and then back to the "Off" position.

Push the "Max A/C" button in, and with the blower in the "Low" position, run the air conditioning system for five minutes, then test the water valve by momentarily disconnecting the heater outlet hose at the upper side of the heater.

If the temperature control valve does not close completely, reposition the control cable housing in the retaining clip so that the valve does close completely. If the valve cannot be closed completely by adjustment, replace the water valve and retest the adjustment.

RADIATOR CAP

The 1966 air conidtioned vehicles must be equipped with a radiator cap having a holding pressure of 15 to 16 psi. Replace the radiator cap that does not test within these specification's with a cap that does.

CONDENSER

Inspect the condenser for obstructions for foreign matter. Clean if necessary.

Any obstructions to the free flow of air across the condenser will decrease heat dissipation from the condenser, decrease the efficiency of the condenser and, in turn, decrease the evaporator's efficiency. These conditions result in increasing the discharge pressure and horsepower load on the engine. The use of a bug screen is not recommended as it, too, will decrease the free flow of air.

Inspect the condenser for bent or damaged fins. The bent fins on the condenser deflect air flow across the bent portions, decreasing the condenser area.

TEST PROCEDURES

THE GAUGE SET MANIFOLD AND INSTALLATION

The Gauge Set Manifold is an indispensable test and diagnosis instrument. The gauge set manifold Tool C-3740 has two compound suction gauges and one discharge pressure gauge. Two accurately calibrated suction pressure gauges are required for the evaporator pressure regulator valve test. Refer to (Fig. 17).

The hoses are shown in the test illustrations for quick reference to distinguish the various adaptations.

Evaporator Suction Gauge—at the left side of the manifold set is calibrated to register 0 to 30 inches of vacuum and 0 to 150 psi. This gauge is connected to the suction service port of the compressor. A special service port adapter, supplied with the gauge set, provides the means of connecting the gauge set manifold hose to the service port. When the adapter is installed at the port and tightened, the stem of the valve in the service port is depressed, opening the service port valve.

Discharge Pressure Gauge—at the center of the manifold set is calibrated to register 0 to 300 psi. For all tests this gauge is connected to the discharge service port of the compressor. A service port adapter is

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CHRYSLER PUSH BUTTON CONTROL CHART

BUTTON	OFF	MAX. A/C	A/C	HEAT	DEFROST
FRESH AIR DOOR	Closed	Closed	Open	Open	Open
RECIRCULATING DOOR	Open	Open	Closed	Closed	Closed
AIR CONDITIONING DOOR	Open	Open	Open	Closed	Closed
HEATER DOOR	Closed	Closed	Closed	Open	Closed with Air Bleed
DEFROSTER DOORS	Closed	Closed	Closed	Closed with Air Bleed	Open
BLOWER SPEED	Off	Hi.-Med. Low	Hi.-Med. Low	Hi.-Med. Low	Hi.-Med. Low
COMPRESSOR CLUTCH	Off	On	On	Off	Off

used to make this connection. The needle valve, located below the discharge pressure gauge, is used to damp out gauge needle oscillations so that accurate readings can be obtained.

Compressor Inlet Gauge—is mounted at the right side of the manifold set. This mounting is for convenience only. There are no passages between this gauge and the gauge manifold. The compressor inlet gauge is calibrated to register 0 to 30″ of vacuum and 0 to 150 psi. This gauge and evaporator suction gauge must be accurately calibrated so that needles of both gauges are exactly at 0 before making tests. The compressor inlet gauge is connected to the compressor inlet service port by a special service port adapter. **This gauge is used, when checking EPR Valve.**

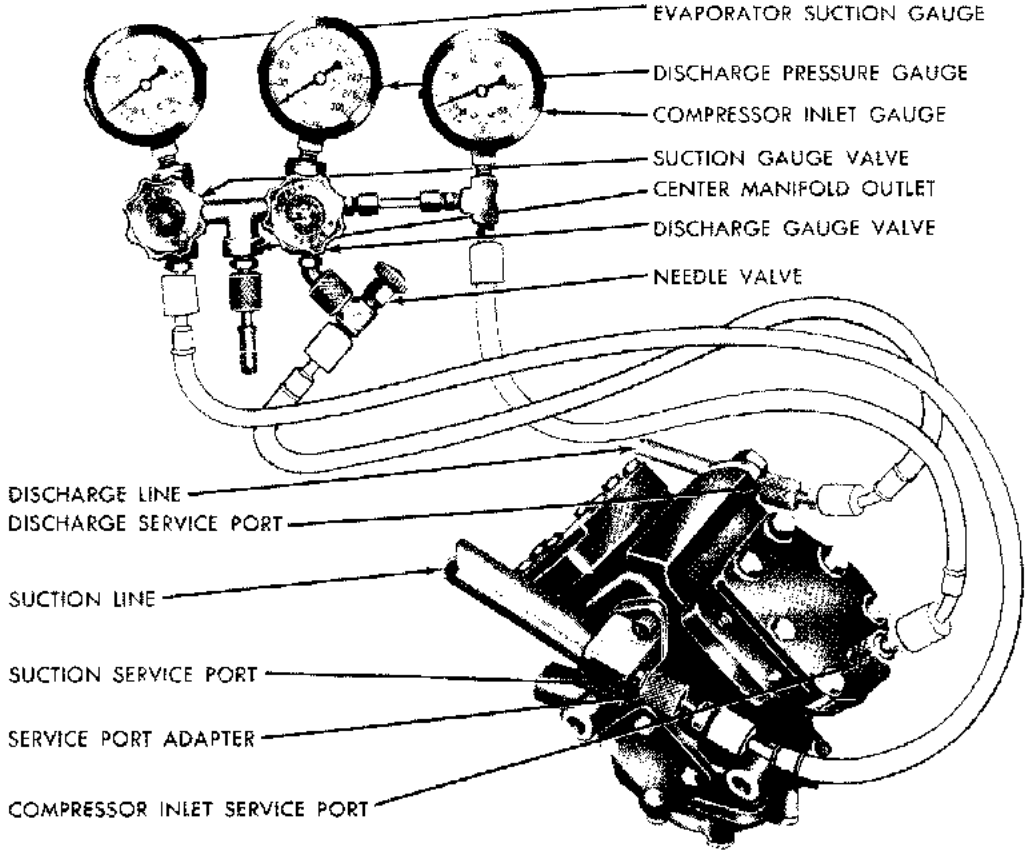


Fig. 17—Gauge Set Manifold Connections

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Center Manifold Outlet—provides the necessary connection for a long service hose used when discharging the system, using a vacuum pump to "pull a vacuum" before charging the system, and for connecting the supply of refrigerant when charging the system. When performing the Compressor Capacity Test, TEST 7, the hose is removed and a special test cap is installed in its place.

Manifold Gauge Valves—should be closed when connecting the gauge set manifold to the service ports of the compressor. The suction gauge valve at the left is opened to provide a passage between the suction gauge and the center manifold outlet. The discharge gauge valve at the right is opened to provide a passage between the discharge pressure gauge and the center manifold outlet.

Detailed instructions for proper use of the gauge set manifold are contained in the text covering each test and service operating employing these gauges.

TEST 1

TEST SYSTEM PRESSURE

(Engine not Running)

Install the gauge set manifold. For identification of test hose connections at service ports see Figure 17.

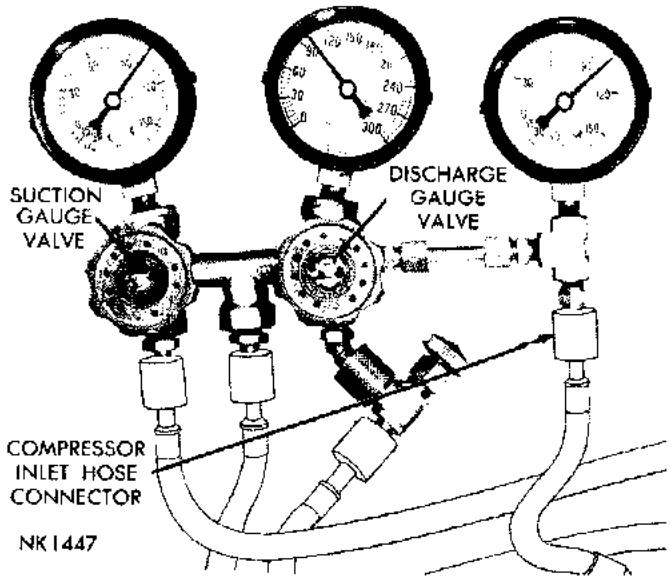


Fig. 18—Purge Gauge Hoses

After tightening service port adapters, make sure that the needle valve located below the discharge pressure gauge is open. Purge air from the gauge hoses (Fig. 18) as follows:

(1) Open the suction gauge valve momentarily,

TEMPERATURE-PRESSURE RELATIONSHIP CHART
(FOR REFRIGERANT 12)

Temp. F.	Press. PSI	Temp. F.	Press. PSI	Temp. F.	Press. PSI	Temp. F.	Press. PSI	Temp. F.	Press. PSI
0	9.1	35	32.5	60	57.7	85	91.7	110	136.0
2	10.1	36	33.4	61	58.9	86	93.2	111	138.0
4	11.2	37	34.3	62	60.0	87	94.8	112	140.1
6	12.3	38	35.1	63	61.3	88	96.4	113	142.1
8	13.4	39	36.0	64	62.5	89	98.0	114	144.2
10	14.6	40	36.9	65	63.7	90	99.6	115	146.3
12	15.8	41	37.9	66	64.9	91	101.3	116	148.4
14	17.1	42	38.8	67	66.2	92	103.0	117	151.2
16	18.3	43	39.7	68	67.5	93	104.6	118	152.7
18	19.7	44	40.7	69	68.8	94	106.3	119	154.9
20	21.0	45	41.7	70	70.1	95	108.1	120	157.1
21	21.7	46	42.6	71	71.4	96	109.8	121	159.3
22	22.4	47	43.6	72	72.8	97	111.5	122	161.5
23	23.1	48	44.6	73	74.2	98	113.3	123	163.8
24	23.8	49	45.6	74	75.5	99	115.1	124	166.1
25	24.6	50	46.6	75	76.9	100	116.9	125	168.4
26	25.3	51	47.8	76	78.3	101	118.8	126	170.7
27	26.1	52	48.7	77	79.2	102	120.6	127	173.1
28	26.8	53	49.8	78	81.1	103	122.4	128	175.4
29	27.6	54	50.9	79	82.5	104	124.3	129	177.8
30	28.4	55	52.0	80	84.0	105	126.2	130	182.2
31	29.2	56	53.1	81	85.5	106	128.1	131	182.6
32	30.0	57	55.4	82	87.0	107	130.0	132	185.1
33	30.9	58	56.6	83	88.5	108	132.1	133	187.6
34	31.7	59	57.1	84	90.1	109	135.1	134	190.1

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then close it.

(2) Open the discharge gauge valve momentarily, then close it.

(3) Loosen the compressor inlet suction hose connection at the manifold momentarily, then tighten it.

If vehicle has been parked and the air conditioning system not operating, gauge pressure should be normal for temperature of the system. Refer to the Temperature-Pressure Relationship Chart.

If no pressure is indicated on the gauges it means that the system is empty, due to a leak. It will be necessary to evacuate, charge with a sweep-test charge, locate and correct the leak, purge the test charge, replace the drier, vacuum the system and charge the system with the proper amount of Refrigerant 12.

If pressures are normal, proceed with the next test and adjustment.

TEST 2

REFRIGERANT LEVEL

The system must be operated at high blower speed, with vehicle doors and windows open, if the system is a dual system, both units must be operated, simultaneously at high blower speed when this test is made, and when adding to the charge.

The sight glass is an integral part of the receiver-strainer-drier. The outlet line (liquid) from the condenser must be attached to the connection marked IN. The word IN is stamped on the top face of the inlet connection (Fig. 19). If the receiver-strainer-drier is reversed and the lines are connected wrong, the system must be purged, the lines reversed and the system recharged.

Block the air flow across the condenser to raise the discharge pressure to 225 to 250 psi, and check the sight glass for foam. There should be no foam. If sight glass is clear, remove the air restriction from the condenser and allow the discharge pressure to return to normal.

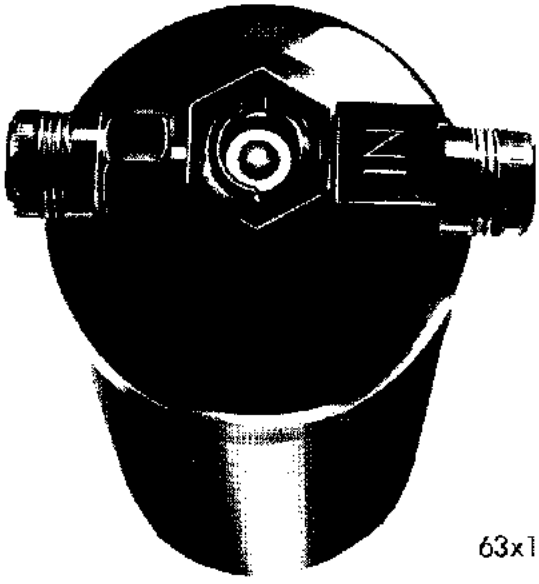


Fig. 19—Sight Glass

If the foam shows in the sight glass when the discharge pressure is 225 to 250 psi, it indicates the system is low on refrigerant. The proper amount of refrigerant required to complete a full charge may be added to the system as follows: Maintaining the discharge pressure at 225 to 250 psi, add refrigerant gas through the suction side of the system until foam is cleared from sight glass, then add exactly one-half (½) pound of refrigerant.

TEST 3

TESTING THE SYSTEM FOR LEAKS

The Leak Detector Torch Tool C-3569 is a propane gas-burning torch used to locate a leak in any part of the refrigeration system. Refrigerant gas drawn into the sampling or "snifter" tube will cause the flame to change color in proportion to the size of the leak. A very small leak will produce a flame varying from yellowish-green to bright green. A large leak will produce a brilliant blue flame.

(1) Open the torch valve until you hear a faint hiss of escaping gas. Light the test torch and adjust the valve until the flame is very small. A small flame will detect large as well as small leaks, whereas a large flame will detect only large leaks. As soon as the reaction plate seen through the window in the burner shield becomes red hot, the tester is ready for use.

(2) Examine all tube connectors and other possible leak points by moving the end of the sampling hose from point to point. Since Refrigerant 12 is heavier than air, it is good practice to place the open end of the sampling hose directly below the point being tested. Be careful not to pinch the sampling tube since this will shut off the air supply to the flame and cause a color change.

(3) Watch for a change in the color of the flame. Small leaks will produce a green color and large leaks a bright blue color. If leaks are observed at tube fittings, tighten the connection, using the proper flare wrenches, and retest.

CAUTION: Do not use the lighted detector in any place where explosive gases, dust or vapors are present.

Do not breathe the fumes that are produced by the burning of refrigerant gas. Large concentrations of refrigerant in the presence of a live flame become dangerously toxic. Observe the flame through the window of the burner shield, not through the top of the shield.

If the flame remains bright yellow when the tester is removed from possible leak point, insufficient air is being drawn in through the sampling tube, or the

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reaction plate is dirty.

Remove Sweep-Test Charge

If the system is free of leaks, or after correcting a leak, if no air conditioning components have been removed, add necessary refrigerant as described under TEST 4 "Correcting Low Refrigerant Level." If any parts of the refrigerant system were disconnected, remove the sweep test charge. Close the refrigerant manifold valve so that any refrigerant remaining in the container is sealed. Remove the long test hose from the refrigerant manifold. Insert the free end of this test hose into an exhaust system outlet. Open the right-hand gauge set manifold valve a fraction of a turn to let the sweep-test charge escape slowly. Allow the system to discharge until the discharge pressure gauge registers zero. Open the left-hand gauge valve to allow any refrigerant trapped in the suction side of the system to escape.

TEST 4

CORRECTING LOW REFRIGERANT LEVEL

Since refrigeration system is completely sealed, refrigerant level will not be low unless there is a leak in system or refrigerant has been allowed to escape by depressing one of service port valves. For detailed instructions on proper procedure for checking refrigerant level, refer to "Refrigerant Level" TEST 2.

Before adding refrigerant where cause of low level is not known, the system should be tested for leaks. Assuming no leaks are present, or that leaks have been corrected without discharging the system, proceed with partial charge.

Install and connect the gauge set manifold valves, as shown in (Fig. 20).

(1) Close both gauge set manifold valves. Open gauge set manifold needle valve.

(2) Connect suction gauge test hose to suction service port of the compressor. Connect discharge gauge test hose to discharge service port of compressor.

(3) Connect one end of long test hose to center manifold outlet, other end to the refrigerant dispensing manifold.

(4) Close two of the dispensing manifold valves and open the remaining dispensing manifold valve. Remove the protective cap from the opened valve.

(5) Screw a can of Refrigerant 12 to the opened manifold valve. Be sure gasket is in place and in good condition. Tighten refrigerant can and manifold locking nut to insure a good seal. Do not over-tighten since 6 to 8 foot pounds is sufficient if gasket is in good condition.

(6) Turn manifold valve (above the refrigerant can) completely clockwise to puncture the can. This closes the valve and seals the refrigerant in the can.

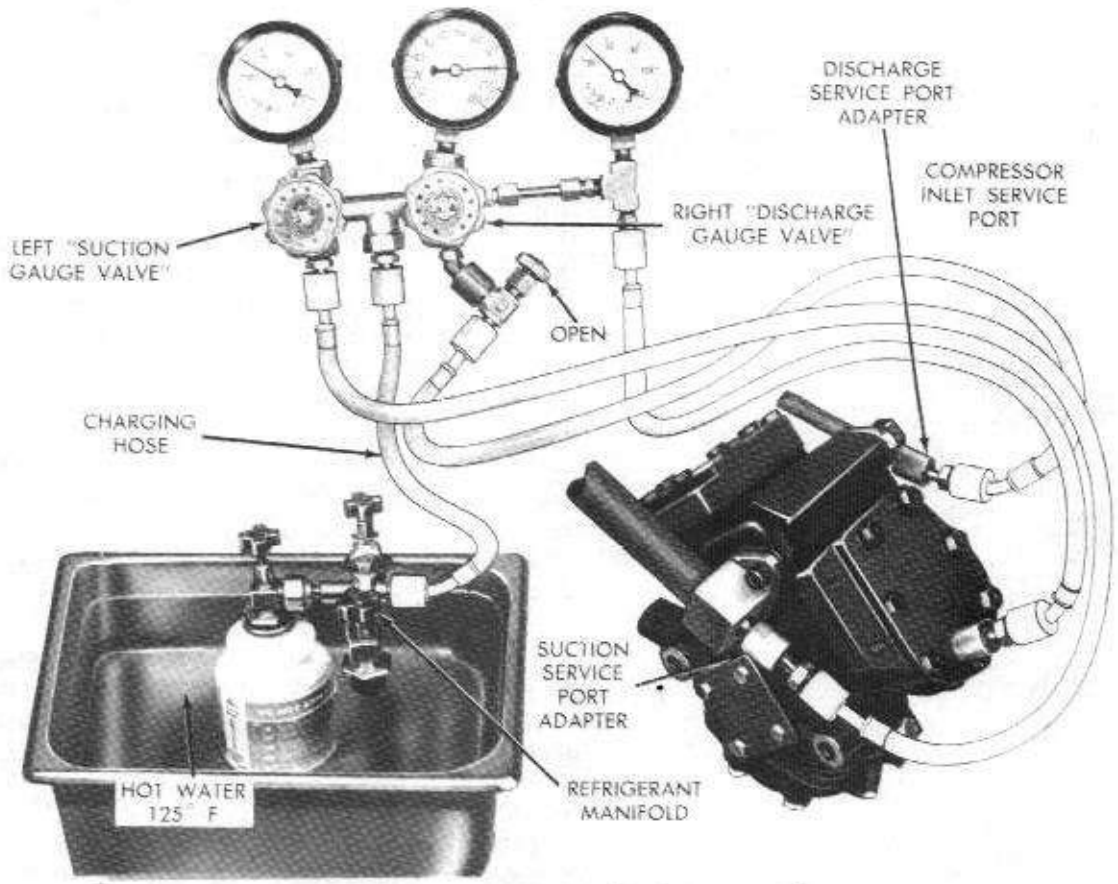


Fig. 20—Adding Partial Refrigerant Charge

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(7) Place refrigerant in a large pan of water heated to 125 F. Place pan of water containing the refrigerant can on an accurate scale Tool C-3429 so the amount of refrigerant added can be weighed. Open refrigerant manifold valve.

(8) Purge all air from test hoses. Air in the system will be trapped in the condenser causing abnormally high discharge pressures and interfering with condensation of the refrigerant.

(a) Loosen both test hoses at the gauge set manifold. Tighten hoses as soon as the air is purged.

(b) Loosen charging hose connection at gauge set manold. This will purge air form the charging hose. Tighten the connection as soon as air is purged.

With vehicle windows open and hood up, operate the engine as shown in the following chart:

Model	Engine	Engine R.P.M.
IMPERIAL	8 Cyl.	800
CHRYSLER	8 Cyl.	1300

Imperial Installations—push in "Fresh Cool" button, blower on high. On dual installation both blowers must be on high speed during the charging operation.

Chrysler Installations—push in "A/C" button, fan switch on high. On dual installation both blowers must be on high speed during the charging operation.

If necessary, block the condenser to maintain a discharge pressure of 225 to 250 psi. The system must be charged through the evaporator suction service port as follows:

(9) Slowly open suction service gauge valve. Meter the flow of refrigerant by adjusting the suction service gauge valve so that pressure registered at the suction service gauge does not exceed 50 psi. **Keep refrigerant container upright.**

(10) Add refrigerant gas until there is no foam visible at the sight glass. As soon as all foam clears, note the weight registered on the refrigerant scale.

(11) Watch the refrigerant weighing scale and add **exactly** ½ pound more refrigerant to the system. Close suction gauge valve.

Too much refrigerant in the system can cause abnormally high discharge pressures. Care must be used so that exactly **½ pound of refrigerant is added after foam clears in the sight glass.**

(12) Close the dispensing manifold valve. Remove test hoses and adapters from the service ports of the compressor, and install protective caps at the service ports.

TEST 5

OVER-ALL PERFORMANCE TEST

Humidity (the amount of moisture in the air) has an important bearing on the temperature of the air delivered to the vehicle's interior. This is true of all air-conditioned systems whether in the home, office or vehicle. It is important to understand the effect humidity has on the performance of the system. When humidity is high, the evaporator has to perform a double duty. It must lower the air temperature and the temperature of the moisture carried in the air. Condensing the moisture in the air transfers a great deal of heat energy into the evaporator fins and tubing. This reduces the amount of heat the evaporator can absorb from the air. In other words, high humidity greatly reduces the evaporator's ability to lower the temperature of the air delivered to the vehicle interior.

Evaporator capacity used to reduce the amount of moisture in the air is not wasted. Wringing some of the moisture out of the air entering the vehicle adds materially to the comfort of the passengers. However, an owner may expect too much from his air-conditioning system on humid days. A performance test is the best way to determine whether or not the system is performing up to standard. This test also provides valuable clues to the possible cause of trouble.

The preliminary inspections in TESTS 1 thru 4, outlined previously, should be made before the "Over-All Performance Test." Install gauge set as shown in Figure 17. **Air temperature in test room must be 75°F. minimum for this test.**

FRONT UNIT PERFORMANCE TEST

Start engine, open the windows, temperature control lever must be in the off position.

Imperial—push in "Fresh Cool" button, operate front blower at high speed and adjust floor air control to give maximum air down to the floor. Open the spot outlet grilles.

Chrysler—push in "A/C" button, fan switch on high. Open all grille outlets. **When testing the front unit of a dual system, leave rear or roof unit blower turned off.**

Adjust engine RPM as outlined in the following chart:

Model	Engine	Engine R.P.M.
IMPERIAL	8 Cyl.	800
CHRYSLER	8 Cyl.	1300

Arrange the gauge set manifold hoses and tachometer leads to allow the hood to be lowered, and close the hood.

Place motor-driven psychrometer Tool C-3704 at cowl inlet opening. Distilled water should be used

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with this meter to prevent drying out and hardening the wet sock.

Place thermometer Tool C-3623 fully into right outlet grille opening. The left outlet should be fully extended and direct towards rear of vehicle.

Operate the air-conditioning system until a stabilized condition on the gauges and thermometers has been established. One of the most important steps in making the over-all performance test that the engine must be operated at the RPM as indicated on the above chart for approximately five minutes to allow all the under-hood components of the system to reach their operating temperature.

Partially close the needle valve, located below the discharge pressure gauge, to minimize oscillation of the pointer. Do not close the needle valve completely since this would prevent the discharge pressure gauge from registering pressure.

This test should be performed with the discharge pressure from 190 to 210 psi. The 190 to 210 pound pressure is for **test purposes only.** To increase pressure restrict the air flow across the condenser using cardboard, paper, etc. to decrease pressure, increase air flow across condenser with external floor fans.

Observe and record both the "Inlet Dry Bulb Temperature" and "Inlet Wet Bulb Temperature" as registered on the psychrometer.

Observe and record the "Discharge Air Temperature" registered by the thermometer at the right hand grille outlet.

From the appropriate "Performance Temperature Chart," for vehicle and type installation being tested (Figs. 22 thru 27), determine the maximum allowable discharge air temperature for the prevailing "Dry" and "Wet" bulb temperature recorded. If the vehicle's discharge air temperature is at or below the temperature given on the Performance Chart, the air-conditioning is delivering its cooling capacity. However, to assure trouble-free operation, continue with the "Evaporator Pressure Regulator Test 6."

If the discharge air temperature at the outlet grilles is above the maximum allowable on the Performance Chart, perform the following operations in the order indicated until proper performance is obtained.

(1) Evaporator Pressure Regulator Test.
(2) Compressor Capacity Test.
(3) Expansion Valve Test.

TRUNK UNIT PERFORMANCE TEST

Imperial

The method used to test the trunk unit of a dual installation is essentially the same as for a front unit. The front unit should be tested before testing the trunk unit. When testing the trunk unit of a dual system, turn the front unit off by pushing the "OFF" button. Next, connect a jumper from the positive terminal of the battery to the compressor so that the refrigeration part of the entire system can be operated without air-flow through the front unit.

Open the windows, adjust engine speed to 800 rpm and close the hood. Turn the trunk unit blower motor switch to "high" speed position.

Place the motor-driven psychrometer Tool C-3704 near the rear unit air inlet grille and a thermometer Tool C-3623 in the right-hand air outlet grille.

Operate air-conditioning system until a stabilized condition on the gauges and thermometers has been established. One of the most important factors in making the over-all performance test is that the engine must be operated at 800 rpm for a sufficient time to build up to operating temperatures and allow all the underhood components of the system to be subjected to the under-hood operating temperatures for a period of time.

Partially close the needle valve, located below the discharge pressure gauge, to minimize oscillation of the discharge gauge pointer. Do not close the needle valve completely since this would prevent the discharge pressure gauge from registering discharge pressure.

Read the discharge pressure on the gauge. This test should be performed with the discharge pressure from 190 to 210 psi. The 190 to 210 pound pressure is for test purposes only. These pressures change according to the ambient temperature, humidity and the efficiency of the entire system.

Take the necessary steps to bring and maintain the discharge pressure within these limits.

To increase the discharge pressure, restrict the air flow across the condenser using cardboard, paper, etc. In high ambient temperatures and high humidity areas it may be necessary to put an electric fan in front of the condenser in order to keep the pressure down to these limits.

Observe the record both the "Inlet Dry Bulb Temperature" and "Inlet Wet Bulb Temperature" as registered on the psychrometer.

Observe and record the "Discharge Air Temperature" registered by the thermometer at the right-hand grille outlet.

From the appropriate Trunk Unit Performance Temperature Chart for the vehicle and type of installation being tested (Figs. 22 thru 27), determine the maximum allowable discharge air temperature for the prevailing "Dry" and "Wet" bulb temperatures. If the vehicles discharge air temperature is at or below the temperature given on the Performance Chart, the trunk unit is delivering its rated cooling capacity.

If the discharge air temperature at the outlet grille is above the maximum allowable on the Performance Chart, test the trunk unit expansion valve.

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ROOF UNIT PERFORMANCE TEST

Chrysler

The method used to test the roof unit of a dual installation is essentially the same as for a front unit. The front unit should be tested before testing the roof unit. When testing the roof unit of a dual system, turn the front unit off by pushing the "OFF" button. Connect a jumper from the positive terminal of the battery to the compressor so that the refrigeration part of the entire system can be operated without air-flow through the front unit.

Open the windows, adjust engine speed to 1300 rpm and close the hood. Turn the roof unit blower motor switch to "high" speed position.

Place the motor-driven psychrometer Tool C-3704 near the roof unit air outlet grille and a thermometer Tool C-3623 in the right-hand air outlet grille, as shown in Figure 21.

Operate the air-conditioning system until a stabilized condition on the gauges and thermometers has been established. One of the most important factors in making the over-all performance test is that the engine must be operated at 1300 rpm a sufficient time to build up to operating temperatures and allow all the under-hood components of the system to be subjected to the under-hood operating temperatures for a period of time.

Partially close the needle valve, located below the discharge pressure gauge, to minimize oscillation of the discharge gauge pointer. Do not close the needle valve completely since this would prevent discharge pressure gauge from registering discharge pressure.

Read the discharge pressure on the gauge. This test should be performed with the discharge pressure from 190 to 210 psi. The 190 to 210 pound-pressure is for test purposes only. These pressures change according to the ambient temperature, humidity and the efficiency of the entire system.

Take the necessary steps to bring and maintain the discharge pressure within these limits.

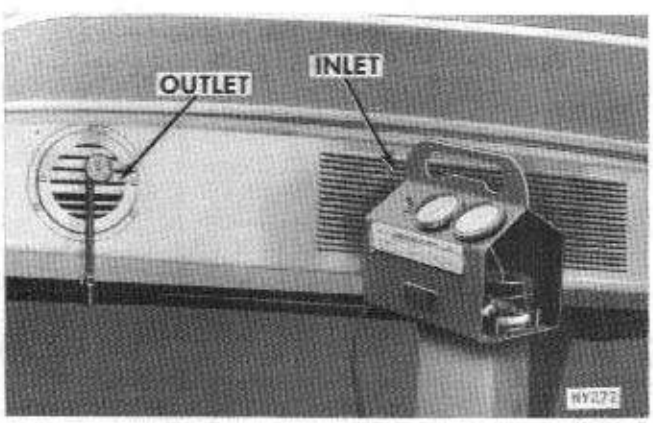


Fig. 21 Roof Unit Performance Test

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To increase the discharge pressure, restrict the air flow across the condenser using cardboard, paper, etc. In high ambient temperatures and high humidity areas, it may be necessary to put an electric fan in front of the condenser in order to keep the pressure down to these limits.

Observe and record both the "Inlet Dry Bulb Temperature" and "Inlet Wet Bulb Temperature" as registered on the psychrometer.

Observe and record the "Discharge Air Temperature" registered by the thermometer at the right-hand grille outlet.

From the approximate Roof Unit Performance Temperature Chart for vehicle and type installation being tests (Figs. 22 thru 27), determine the maximum allowable discharge air temperature for the prevailing "Dry" and "Wet" bulb temperatures. If the discharge air temperature is at or below the temperature given on the Performance Chart, the roof unit is delivering its rated cooling capacity.

If the discharge air temperature at the outlet grilles is above the maximum allowance on the "Performance Chart," perform the following operations in the order indicated until proper performance is obtained.

(1) "Evaporator Pressure Regulator Test."
(2) "Compressor Capacity Test."
(3) "Expansion Valve Test."

TEST 6

EVAPORATOR PRESSURE REGULATOR VALVE TEST

TEST 6 is divided into two parts to simplify the test procedures. As both parts of the test must be made progressively, it is important that both parts be read thoroughly before proceeding with the test.

PART 1

The EPR valve is calibrated to produce maximum "cooling" without causing frost or ice on the evaporator fins and tubing. If for any reason the factory calibration has been disturbed, the EPR valve may restrict the flow of refrigerant at an evaporator pressure which is either too high for maximum performance or too low to prevent coil freeze up.

The evaporator pressure regulator test determines whether or not the valve is functioning properly.

EPR Valve Test Conditions

Normally, this test is performed after completion of the "Performance Test." The gauge set manifold will be connected as illustrated in Figure 17.

Imperial installations—Adjust the engine speed to 800 rpm, and push the "Fresh Cool" button and turn the blower on high.

Chrysler installations—adjust the engine speed to 1300 rpm, push the "A/C" button and turn the blower on high.

On all models open the windows and open the hood

AIR CONDITIONING PERFORMANCE CHART

DRY BULB TEMP.	WET BULB AIR TEMPERATURE																																						
	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
75	48	48	48	48	48	48	48	48	49	49	49	50	50	51	51	52	53	53	54	55	55	56	57																
76	48	48	48	48	48	48	49	49	49	49	49	50	50	51	51	52	53	53	54	55	56	56	57	57															
77	48	48	48	48	49	49	49	49	49	49	50	50	50	51	51	52	53	53	54	55	56	57	57	57	59														
78	48	48	49	49	49	49	49	49	50	50	50	50	51	51	52	52	53	54	54	55	56	57	57	58	59	60													
79	49	49	49	49	49	49	49	50	50	50	50	50	51	51	52	52	53	54	54	55	56	57	58	58	59	60	61												
80	49	49	49	49	49	50	50	50	50	50	50	50	51	51	52	52	53	54	54	55	56	57	58	59	59	60	61	62											
81	49	49	49	50	50	50	50	50	50	50	51	51	51	52	52	53	53	54	55	55	56	57	58	59	60	61	62	63	63										
82	50	50	50	50	50	50	50	50	51	51	51	51	52	52	53	53	54	54	55	56	56	57	58	59	60	61	62	63	64	64									
83	50	50	50	51	51	51	51	51	51	51	52	52	52	53	53	54	54	55	55	56	57	58	58	59	60	61	62	63	64	65	66								
84	51	51	51	51	51	51	52	52	52	52	52	52	53	53	53	54	54	55	56	56	57	58	59	59	60	61	62	63	64	65	66	67							
85	51	51	51	51	52	52	52	52	52	52	52	53	53	53	54	54	55	55	56	57	57	58	59	60	60	61	62	63	64	65	66	67	68						
86	52	52	52	52	52	52	52	52	53	53	53	53	53	53	54	54	55	55	56	57	57	58	59	60	61	61	62	63	64	65	66	67	68	68					
87	52	52	52	52	53	53	53	53	53	53	54	54	54	54	54	55	55	56	56	57	58	58	59	60	61	62	63	63	64	65	66	67	68	68	69				
88	53	53	53	53	53	54	54	54	54	54	54	54	54	54	55	55	55	56	57	57	58	59	59	60	61	62	63	64	64	65	66	67	68	68	69	70			
89	54	54	54	54	54	54	54	54	54	54	55	55	55	55	55	55	56	56	57	57	58	59	60	60	61	62	63	64	64	65	66	67	68	68	69	70	71		
90				54	54	54	54	55	55	55	55	55	55	55	55	56	56	56	57	58	58	59	60	61	61	62	63	64	65	65	66	67	68	69	69	70	71	72	
91					55	55	55	55	55	55	55	55	55	55	56	56	56	57	57	58	58	59	60	61	61	62	63	64	65	66	66	67	68	69	70	70	71	72	73
92					55	55	55	55	56	56	56	56	56	56	56	56	57	57	58	58	59	59	60	61	62	62	63	64	65	66	66	67	68	69	70	70	71	72	73
93						56	56	56	56	56	56	56	56	56	57	57	57	58	58	59	59	60	61	61	62	63	63	64	65	66	66	67	68	69	70	70	71	72	73
94						57	57	57	57	57	57	57	57	57	57	57	57	58	58	59	60	60	61	61	62	63	63	64	65	66	66	67	68	69	70	70	71	72	73
95						57	57	57	57	57	57	57	57	57	57	58	58	58	59	59	60	60	61	62	62	63	63	64	65	66	66	67	68	69	70	70	71	72	73
96						58	58	58	58	58	58	58	58	58	58	58	58	59	59	59	60	61	61	62	62	63	64	64	65	66	67	67	68	69	70	71	71	72	73
97						58	58	58	58	58	58	58	58	59	59	59	59	60	60	60	61	61	62	62	63	63	64	65	65	66	67	68	68	69	70	71	72	72	73
98							59	59	59	59	59	59	59	59	59	59	60	60	61	61	61	62	62	63	63	64	64	65	66	67	67	68	69	69	70	71	72	72	73
99							60	60	60	60	60	60	60	60	60	60	60	61	61	61	62	62	63	63	63	64	65	65	66	67	67	68	69	70	70	71	72	72	73
100							60	60	60	60	60	60	60	60	60	61	61	61	61	62	62	62	63	63	63	64	65	65	66	67	67	68	69	70	70	71	72	72	73
101															61	61	61	61	62	62	62	63	63	63	64	64	65	66	66	67	68	68	69	70	71	71	72	73	74
102															61	61	62	62	62	62	62	63	63	64	64	65	65	66	66	67	68	69	69	70	71	71	72	73	74
103															62	62	62	62	62	63	63	63	64	64	64	65	65	66	67	67	68	69	70	70	71	72	73	74	74
104															62	62	62	62	63	63	63	63	64	64	65	65	66	66	67	67	68	69	70	70	71	72	73	74	75
105															62	62	62	63	63	63	63	64	64	64	65	65	66	66	67	67	68	69	70	70	71	72	73	74	75
106															63	63	63	63	63	63	64	64	64	65	65	65	66	66	67	68	68	69	70	71	71	72	73	74	75
107															63	64	64	64	64	64	64	64	65	65	65	66	66	67	67	68	69	69	70	71	72	72	73	74	75
108															64	64	64	64	64	64	65	65	65	65	66	66	67	67	68	68	69	69	70	71	72	73	74	75	76
109															64	64	64	65	65	65	65	65	65	66	66	66	67	67	68	68	69	70	70	71	72	73	74	75	76
110															65	65	65	65	65	65	65	65	65	66	66	66	67	67	68	68	69	70	70	71	72	73	74	75	76

MAXIMUM DISCHARGE AIR TEMPERATURE

NY282B

Fig. 22—Performance Temperature Chart—Front Unit Only

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AIR CONDITIONING PERFORMANCE CHART

DRY BULB TEMP	WET BULB AIR TEMPERATURE																																								
	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
75	50	50	50	50	50	50	50	50	51	51	51	52	52	53	53	54	55	55	56	57	57	58	59																
76	50	50	50	50	50	50	51	51	51	51	51	52	52	53	53	54	55	55	56	57	58	58	59	59															
77	50	50	50	50	51	51	51	51	51	51	52	52	52	53	53	54	55	55	56	57	58	59	59	59	61														
78	50	50	51	51	51	51	51	51	52	52	52	52	53	53	54	54	55	56	56	57	58	59	59	60	61	62													
79	51	51	51	51	51	51	51	52	52	52	52	52	53	53	54	54	55	56	56	57	58	59	60	60	61	62	63												
80	51	51	51	51	51	52	52	52	52	52	52	52	53	53	54	54	55	56	56	57	58	59	60	61	61	62	63	64											
81	51	51	51	52	52	52	52	52	52	52	53	53	53	54	54	55	55	56	57	57	58	59	60	61	62	63	64	65	65										
82	52	52	52	52	52	52	52	52	53	53	53	53	54	54	55	55	56	56	57	58	58	59	60	61	62	63	64	65	66	66									
83	52	52	52	53	53	53	53	53	53	53	54	54	54	55	55	56	56	57	57	58	59	60	60	61	62	63	64	65	66	67	68								
*84	53	53	53	53	53	53	54	54	54	54	54	54	55	55	55	56	56	57	58	58	59	60	61	61	62	63	64	65	66	67	68	69							
85	53	53	53	53	54	54	54	54	54	54	54	55	55	55	56	56	57	57	58	59	59	60	61	62	62	63	64	65	66	67	68	69	70						
86	54	54	54	54	54	54	54	54	55	55	55	55	55	55	56	56	57	57	58	59	59	60	61	62	63	63	64	65	66	67	68	69	70	70					
87	54	54	54	54	55	55	55	55	55	55	56	56	56	56	56	57	57	58	58	59	60	60	61	62	63	64	65	65	66	67	68	69	70	70	71				
88	55	55	55	55	55	56	56	56	56	56	56	56	56	56	57	57	57	58	59	59	60	61	61	62	63	64	65	66	66	67	68	69	70	70	71	72			
89	56	56	56	56	56	56	56	56	56	56	57	57	57	57	57	57	58	58	59	59	60	61	62	62	63	64	65	66	66	67	68	69	70	70	71	72	73		
90				56	56	56	56	57	57	57	57	57	57	57	57	58	58	58	59	60	60	61	62	63	63	64	65	66	67	67	68	69	70	71	71	72	73	74	
91					57	57	57	57	57	57	57	57	57	57	58	58	58	59	59	60	60	61	62	63	63	64	65	66	67	68	68	69	70	71	72	72	73	74	75
92					57	57	57	57	58	58	58	58	58	58	58	58	59	59	60	60	61	61	62	63	64	64	65	66	67	68	68	69	70	71	72	72	73	74	75
93						58	58	58	58	58	58	58	58	58	59	59	59	60	60	61	61	62	63	63	64	65	65	66	67	68	68	69	70	71	72	72	73	74	75
94						59	59	59	59	59	59	59	59	59	59	59	59	60	60	61	62	62	63	63	64	65	65	66	67	68	68	69	70	71	72	72	73	74	75
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96						60	60	60	60	60	60	60	60	60	60	60	60	61	61	61	62	63	63	64	64	65	66	66	67	68	69	69	70	71	72	73	73	74	75
97						60	60	60	60	60	60	60	60	61	61	61	61	62	62	62	63	63	64	64	65	65	66	67	67	68	69	70	70	71	72	73	74	74	75
98							61	61	61	61	61	61	61	61	61	61	62	62	63	63	63	64	64	65	65	66	66	67	68	69	69	70	71	71	72	73	74	74	75
99							62	62	62	62	62	62	62	62	62	62	62	63	63	63	64	64	65	65	65	66	67	67	68	69	69	70	71	72	72	73	74	74	75
100							62	62	62	62	62	62	62	62	62	63	63	63	63	64	64	64	65	65	65	66	67	67	68	69	69	70	71	72	72	73	74	74	75
101															63	63	63	63	64	64	64	65	65	65	66	66	67	68	68	69	70	70	71	72	73	73	74	75	76
102															63	63	64	64	64	64	64	65	65	66	66	67	67	68	68	69	70	71	71	72	73	73	74	75	76
103															64	64	64	64	64	65	65	65	66	66	66	67	67	68	69	69	70	71	72	72	73	74	75	76	76
104															64	64	64	64	65	65	65	65	66	66	67	67	68	68	69	69	70	71	72	72	73	74	75	76	77
105															64	64	64	65	65	65	65	66	66	66	67	67	68	68	69	69	70	71	72	72	73	74	75	76	77
106															65	65	65	65	65	65	66	66	66	67	67	67	68	68	69	70	70	71	72	73	73	74	75	76	77
107															65	66	66	66	66	66	66	66	67	67	67	68	68	69	69	70	71	71	72	73	74	74	75	76	77
108															66	66	66	66	66	66	67	67	67	67	68	68	69	69	70	70	71	71	72	73	74	75	76	77	78
109															66	66	66	67	67	67	67	67	67	68	68	68	69	69	70	70	71	72	72	73	74	75	76	77	78
110															67	67	67	67	67	67	67	67	67	68	68	68	69	69	70	70	71	72	72	73	74	75	76	77	78

MAXIMUM DISCHARGE AIR TEMPERATURE

NY283B

Fig. 23—Performance Temperature Chart—Front Unit of Dual System

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AIR CONDITIONING PERFORMANCE CHART

MAXIMUM DISCHARGE AIR TEMPERATURE

DRY BULB TEMP.	WET BULB AIR TEMPERATURE																																						
	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
75	45	45	45	45	45	45	45	45	46	46	46	46	47	48	48	49	50	50	51	52	52	53	54																
76	45	45	45	45	45	45	46	46	46	46	46	47	47	48	48	49	50	50	51	52	53	53	54	54															
77	45	45	45	45	46	46	46	46	46	46	47	47	47	48	48	49	50	50	51	52	53	54	54	54	56														
78	45	45	46	46	46	46	46	46	47	47	47	47	48	48	49	49	50	51	51	52	53	54	54	55	56	57													
79	46	46	46	46	46	46	46	47	47	47	47	47	48	48	49	49	50	51	51	52	53	54	55	55	56	57	58												
80	46	46	46	46	46	47	47	47	47	47	47	47	48	48	49	49	50	51	51	52	53	54	55	56	56	57	58	59											
81	46	46	46	47	47	47	47	47	47	47	48	48	48	49	49	50	50	51	52	52	53	54	55	56	57	58	59	60	60										
82	47	47	47	47	47	47	47	47	48	48	48	48	49	49	50	50	51	51	52	53	53	54	55	56	57	58	59	60	61	61									
83	47	47	47	48	48	48	48	48	48	48	49	49	49	50	50	51	51	52	52	53	54	55	55	56	57	58	59	60	61	62	63								
84	48	48	48	48	48	48	49	49	49	49	49	49	50	50	50	51	51	52	53	53	54	55	56	56	57	58	59	60	61	62	63	64							
85	48	48	48	48	49	49	49	49	49	49	49	50	50	50	51	51	52	52	53	54	54	55	56	57	57	58	59	60	61	62	63	64	65						
86	49	49	49	49	49	49	49	49	50	50	50	50	50	50	51	51	52	52	53	54	54	55	56	57	58	58	59	60	61	62	63	64	65	65					
87	49	49	49	49	50	50	50	50	50	50	51	51	51	51	51	52	52	53	53	54	55	55	56	57	58	59	60	60	61	62	63	64	65	65	66				
88	50	50	50	50	50	51	51	51	51	51	51	51	51	51	52	52	52	53	54	54	55	56	56	57	58	59	60	61	61	62	63	64	65	65	66	67			
89	51	51	51	51	51	51	51	51	51	51	52	52	52	52	52	52	53	53	54	54	55	56	57	57	58	59	60	61	61	62	63	64	65	65	66	67	68		
90				51	51	51	51	52	52	52	52	52	52	52	52	53	53	53	54	55	55	56	57	58	58	59	60	61	62	62	63	64	65	66	66	67	68	69	
91					52	52	52	52	52	52	52	52	52	52	53	53	53	54	54	55	55	56	57	58	58	59	60	61	62	63	63	64	65	66	67	67	68	69	70
92					52	52	52	52	53	53	53	53	53	53	53	53	54	54	55	55	56	56	57	58	59	59	60	61	62	63	63	64	65	66	67	67	68	69	70
93						53	53	53	53	53	53	53	53	53	54	54	54	55	55	56	56	57	58	58	59	60	60	61	62	63	63	64	65	66	67	67	68	69	70
94						54	54	54	54	54	54	54	54	54	54	54	54	55	55	56	57	57	58	58	59	60	60	61	62	63	63	64	65	66	67	67	68	69	70
95						54	54	54	54	54	54	54	54	51	[illegible]	55	55	55	56	56	57	57	58	59	59	60	60	61	62	63	63	64	65	66	67	67	68	69	70
96						55	55	55	55	55	55	55	55	55	55	55	55	56	56	56	57	58	58	59	59	60	61	61	62	63	64	64	65	66	67	68	68	69	70
97						55	55	55	55	55	55	55	55	56	56	56	56	57	57	57	58	58	59	59	60	60	61	62	62	63	64	65	65	66	67	68	69	69	70
98							56	56	56	56	56	56	56	56	56	56	57	57	58	58	58	59	59	60	60	61	61	62	63	64	64	65	66	66	67	68	69	69	70
99							57	57	57	57	57	57	57	57	57	57	57	58	58	58	59	59	60	60	60	61	62	62	63	64	64	65	66	67	67	68	69	69	70
100							57	57	57	57	57	57	57	57	57	58	58	58	58	59	59	59	60	60	60	61	62	62	63	64	64	65	66	67	67	68	69	69	70
101															58	58	58	58	59	59	59	60	60	60	61	61	62	63	63	64	65	65	66	67	68	68	69	70	71
102															58	58	59	59	59	59	59	60	60	61	61	62	62	63	63	64	65	66	66	67	68	68	69	70	71
103															59	59	59	59	59	60	60	60	61	61	61	62	62	63	64	64	65	66	67	67	68	69	70	71	71
104															59	59	59	59	60	60	60	60	61	61	62	62	63	63	64	64	65	66	67	67	68	69	70	71	72
105															59	59	59	60	60	60	60	61	61	61	62	62	63	63	64	64	65	66	67	67	68	69	70	71	72
106															60	60	60	60	60	60	61	61	61	62	62	62	63	63	64	65	65	66	67	68	68	69	70	71	72
107															60	61	61	61	61	61	61	61	62	62	62	63	63	64	64	65	66	66	67	68	69	69	70	71	72
108															61	61	61	61	61	61	62	62	62	62	63	63	64	64	65	65	66	66	67	68	69	70	71	72	73
109															61	61	61	62	62	62	62	62	62	63	63	63	64	64	65	65	66	67	67	68	69	70	71	72	73
110															62	62	62	62	62	62	62	62	62	63	63	63	64	64	65	65	66	67	67	68	69	70	71	72	73

NY285B

Fig. 24—Performance Temperature Chart—Trunk Unit of Dual System

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SINGLE UNIT

INLET AIR WET BULB TEMPERATURE

55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
41	42	43	44	45	46	47	48	49	50	50	50	51	51	52	52	53	53	53	54	54	55	56	57	58	59	59	60	62	64	66	67	68	69	70	71

DISCHARGE AIR DRY BULB TEMPERATURE

INLET AIR DRY BULB TEMPERATURE MUST BE BETWEEN 75° AND 110°F NK1342A

Fig. 25—Performance Temperature Chart—Front Unit Only

FRONT UNIT OF DUAL

INLET AIR WET BULB TEMPERATURE

55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
43	44	45	46	47	48	49	50	51	52	52	52	53	53	54	54	55	55	55	56	56	57	58	59	60	61	61	62	64	66	68	69	70	71	72	73

DISCHARGE AIR DRY BULB TEMPERATURE

INLET AIR DRY BULB TEMPERATURE MUST BE BETWEEN 75° AND 110°F NK1343A

Fig. 26—Performance Temperature Chart—Front Unit of Dual System

ROOF UNIT OF DUAL

INLET AIR WET BULB TEMPERATURE

55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
52	53	54	55	56	57	58	59	60	61	61	61	62	62	63	63	64	64	64	65	66	67	68	69	70	71	71	72	74	76	78	79	79	80	80	81

DISCHARGE AIR DRY BULB TEMPERATURE

INLET AIR DRY BULB TEMPERATURE MUST BE BETWEEN 75° AND 110°F NK1344A

Fig. 27—Performance Temperature Chart—Roof Unit of Dual System

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for this test.

The heat load on the evaporator will soon call for continuous operation of the refrigeration system. The EPR valve will open and the pressure at both the suction port and the compressor inlet service port will be approximately the same. It is normal for the compressor inlet pressure to be slightly lower than the evaporator suction pressure.

Observe the evaporator suction gauge and the compressor inlet gauge. Both should register 26 psi (Fig. 28), or slightly higher. This indicates that the EPR valve is open. The next step is to determine the minimum evaporator suction pressure maintained in the suction line by the EPR valve.

EPR valve action can be accelerated by reducing the heat load on the evaporator as follows:

Imperial installations—by pushing the blower switch to the "Low-Speed" position, push the "Maximum Cool" button.

Chrysler installations—by pushing the blower to the "Low-Speed" position, push the "Max. A/C" button.

This will reduce the volume of air passing through the evaporator, immediately the evaporator will start to get colder. It is necessary to watch both suction gauges for the following reactions:

(1) Pressure registered at the evaporator suction gauges will become progressively lower.

(2) At the same time, the compressor inlet gauge will start to fluctuate. This fluctation is caused by the alternate opening and closing of the EPR valve. It indicates that suction pressure is reduced to the point where it just about balances the internal gas pressure in the bellows. The EPR valve is actually operating as a modulating valve.

(3) When fluctuation at the compressor inlet gauge stops and the pressure registered drops steadily, the EPR valve is maintaining minimum suction line pressure. Allow pressure registered at the compressor inlet gauge to drop to 17 psi or lower, then read the evaporator suction gauge (refer to Figure 29).

If and only if the compressor inlet pressure will not pull down to 17 psi, increase engine speed to approximate rpm on the following chart:

Model	Engine	Engine R.P.M.
Imperial	8 Cyl.	1700
Chrysler	8 Cyl.	2000

(4) The suction guage pressure should be 22 to 26 psi. This indicates that the suction pressure maintained by the EPR valve is correct. However, if engine speed is increased to approximate rpm shown in the above chart in order to pull the inlet pressure down to 15 psi, this also increases the suction pressure to 24 to 28 psi. Again, determine the pressure at which the valve is fully open.

(5) **Imperial installations**—push the "Fresh Cool" button and turn the blower on high.

Chrysler installations—push the "A/C" button and turn the blower on high.

This will increase the heat load on the evaporator and increase the suction pressure, causing the EPR valve to open fully.

(6) Watch both the evaporator suction and the compressor inlet pressure gauge. The pressure registered at the compressor inlet gauge will increase quite rapidly. Both suction gauges should again stabilize at a pressure of 26 psi or slightly higher within a

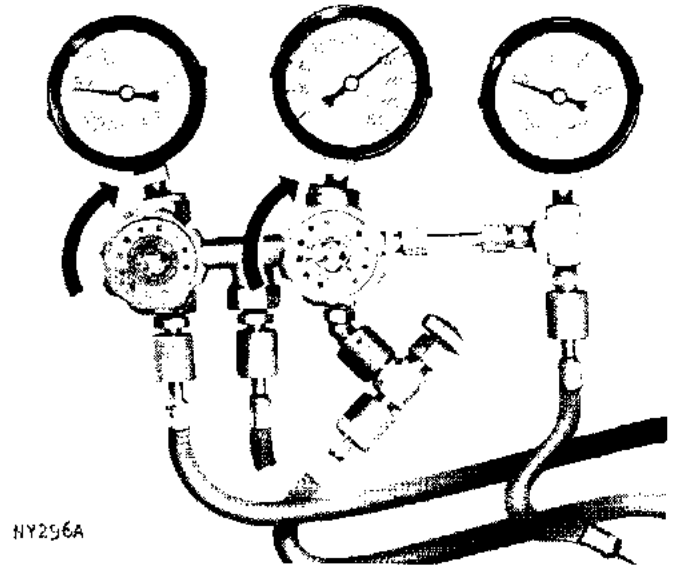


Fig. 28—Pressure, EPR Valve Open

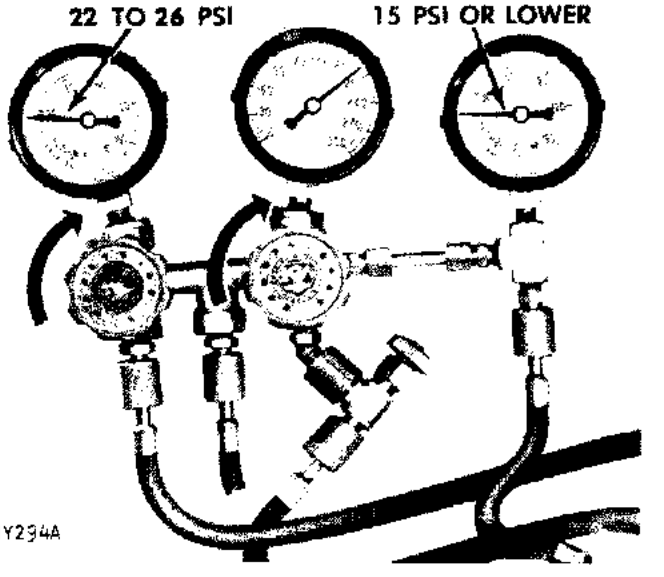


Fig. 29—EPR Valve Test Pressures

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few minutes.

If the minimum suction pressure registered (Step 4, Page 26) is 22 to 26 psi and the suction pressure registered with the valve fully open (Step 6, Page 26) is 31 psi or slightly higher, the EPR valve is functioning normally. A system which passes both the Over-All Performance Test and the EPR Valve Test requires nor further tests.

Suction Pressure Above 26 psi

If the minimum suction pressure is higher than 26 psi (Step 4, Page 26), the evaporator will not get as cold as it should for maximum performance. It will be necessary to replace the EPR valve, repeat the EPR Valve Test and the Performance Test.

Suction Pressure Below 22 psi.

If suction pressure goes below 22 psi (Step 4, Page 26), the evaporator is too cold. The correction is to replace EPR valve and repeat the EPR Valve Test.

If the system failed to pass the Performance Test but passed the EPR Valve Test, proceed with the Compressor Capacity Test.

PART 2

This part of the test will save time as the expansion valve and compressor are being tested during the EPR valve test. There is always a definite relationship between the temperature and pressure of refrigerant vapor in a system that's working right; however, this temperature-pressure relationship will be upset if the compressor capacity is not up to specifications, or if the expansion valve is not doing its job properly.

If the expansion valve opens too much, the evaporator will be flooded and there will be liquid refrigerant leaving the evaporator outlet. If there is liquid refrigerant along with the vapor, the vapor can't become superheated and the gas temperature will be low in relation to pressure.

If the expansion valve doesn't open enough, the evaporator will be starved and the liquid refrigerant will be vaporized before it gets to the outlet. As the temperature of the vapor is somewhere around 30 degrees, it will be cooler than the outside air so that the vapor will still absorb some heat before it leaves the evaporator. This will create a over-superheated condition where the temperature will be very high in relation to pressure.

If the compressor capacity is low, it is because the refrigerant vapor is leaking internally, usually past the reed valves or a blown gasket. This will be indicated by low discharge pressure. With the refrigerant being recirculated in the compressor due to the internal leakage, heat will be generated and the refrigerant will absorb some of this heat; superheating the refrigerant. This will result in a discharge temperature which will be above the maximum.

When you hook up the gauges, install the thermometer clip on the discharge line, getting the clip as close to the compressor as possible and making sure you have a tight contact between the clip and the discharge line. The thermometer bulb must fit tightly (Fig. 30) in the loop and none of the bulb should overhang the clip otherwise you will measure air temperature instead of refrigerant temperature.

It is recommended to wrap the bulb and clip to insulate them from the engine compartment heat (Fig. 31).

You must have a high heat load to get head pressure within the range of the chart.

When the head pressure is in the chart range, wait a few minutes. This will allow the pressure to stabilize and the thermometer to register the exact temperature. Then read the discharge pressure and temperature. Consult the chart to see if the temperature is correct for the discharge pressure reading.

COMPRESSOR DISCHARGE TEMPERATURE-PRESSURE CHART

DISCHARGE PRESSURE GAUGE READING (PSI)	TEMPERATURE °FAHRENHEIT	
	MINIMUM	MAXIMUM
190-195	168	214
195-200	170	216
200-205	172	218
205-210	174	220
210-215	176	222
215-220	178	224
220-225	180	226
225-230	182	228

For example, suppose the pressure is 203 PSI. In the chart, you will see that the minimum temperature should be 172 degrees and the maximum temperature is 218 degrees. **If temperature is in range, compressor and expansion valve are okay. No further testing is necessary.**

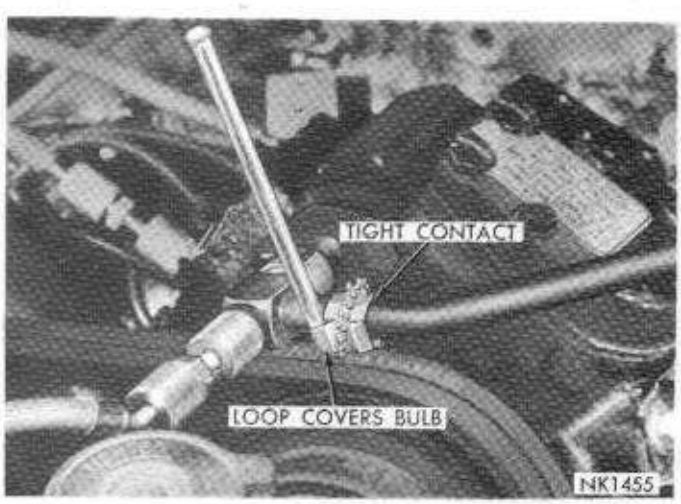


Fig. 30—Thermometer Clip and Thermometer Installed

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If the temperature is below the minimum, the expansion valve is flooding the evaporator and the expansion valve should be replaced.

If the temperature is above the maximum, either the compressor or the expansion valve is faulty in which case the system will have to be discharged.

Test the compressor and expansion valve separately using Tests 7 and 8 which follow.

A conclusive result from this test eliminates the need for a separate compressor and expansion valve test.

TEST 7

COMPRESSOR CAPACITY TEST

The Performance Test and the Evaporator Pressure Regulator Valve Test should be performed before testing compressor capacity. These tests are made with the system fully charged with refrigerant. It is necessary to discharge the system before making the Compressor Capacity Test. It is also necessary to discharge the system in order to perform the Expansion Valve Test. It is recommended that tests be made in the order in which they are presented in this service manual. Experience has proven this to be the surest and quickest way to locate and correct the cause of unsatisfactory performance.

The Compressor Capacity Test must be performed immediately after completing the Evaporator Pressure Regulator Valve Test as the compressor will be up to operating temperature and most of the refrigerant oil will have returned to the compressor crankcase.

If the system has been standing any length of time, it will be necessary to operate the air-conditioning system at full capacity for at least 15 minutes at the engine RPM shown in the following chart.

Model	Engine	Engine R.P.M.
Imperial	8 Cyl.	800
Chrysler	8 Cyl.	1300

This will cause most of the compressor oil in the system to be returned to the compressor crankcase.

It will also insure that the compressor is up to operating temperature, which is very important when making this test.

Discharge the System

When making the "Compressor Capacity Test" the compressor must be disconnected from the rest of the system. That means the system must be discharged.

(1) Lead the manifold discharge hose into an exhaust ventilation system or to the outside of the building so the [illegible] area will not be filled with refrigerant vapor.

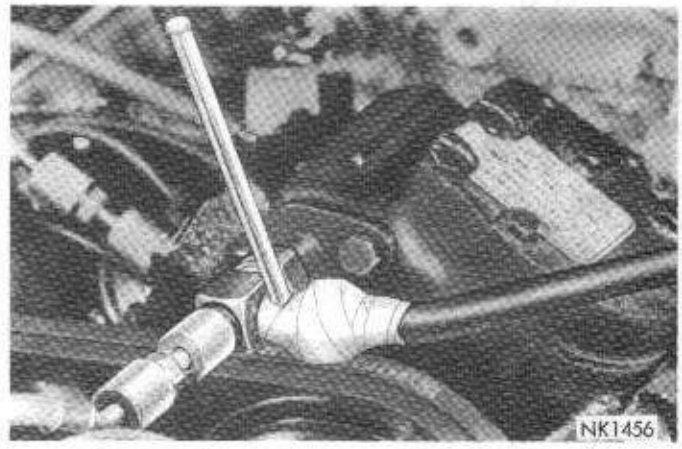


Fig. 31—Thermometer and Clip Insulated

(2) Fully open the manifold needle valve.

(3) Open the discharge (right-hand) gauge valve a small amount. This will allow the refrigerant vapor to discharge **slowly.**

CAUTION: Do not open the valve fully and allow the system to discharge rapidly, since this would sweep some of the refrigerant oil out with the refrigerant.

(4) Allow the system to discharge until the discharge pressure gauge registers zero.

(5) Open the suction (left-hand) gauge valve to release any vapor trapped at the suction side.

TEST PREPARATIONS AND CONNECTIONS

After the system is completely discharged, isolate the compressor and connect the gauge set manifold as follows:

(1) Disconnect the discharge line from the muffler. Cap the muffler outlet with a ½ inch cap. Seal the discharge line with a ½ inch plug.

(2) Disconnect the evaporator suction line (hose) from the suction muffler. Seal the suction line and muffler as follows: Use a ¾ inch fitting or plug for the RV2 Compressor.

The compressor is now isolated from the system and sealed at both the suction and the discharge sides. Refer to Figure 32, and make the following gauge set manifold connections:

(a) Disconnect the test hose and adapter from the compressor inlet port.

(b) Remove the valve body from the compressor inlet port. The tire valve stem Tool C-3788 can be used for this purpose.

(c) Disconnect the test hose from the suction service port of the fitting.

(d) Install the test cap (SP-2922) at the center manifold outlet.

Be sure the test cap is perfectly clean. Particles adhering to the cap or the metering orifice can restrict the flow and cause false readings. Never use a

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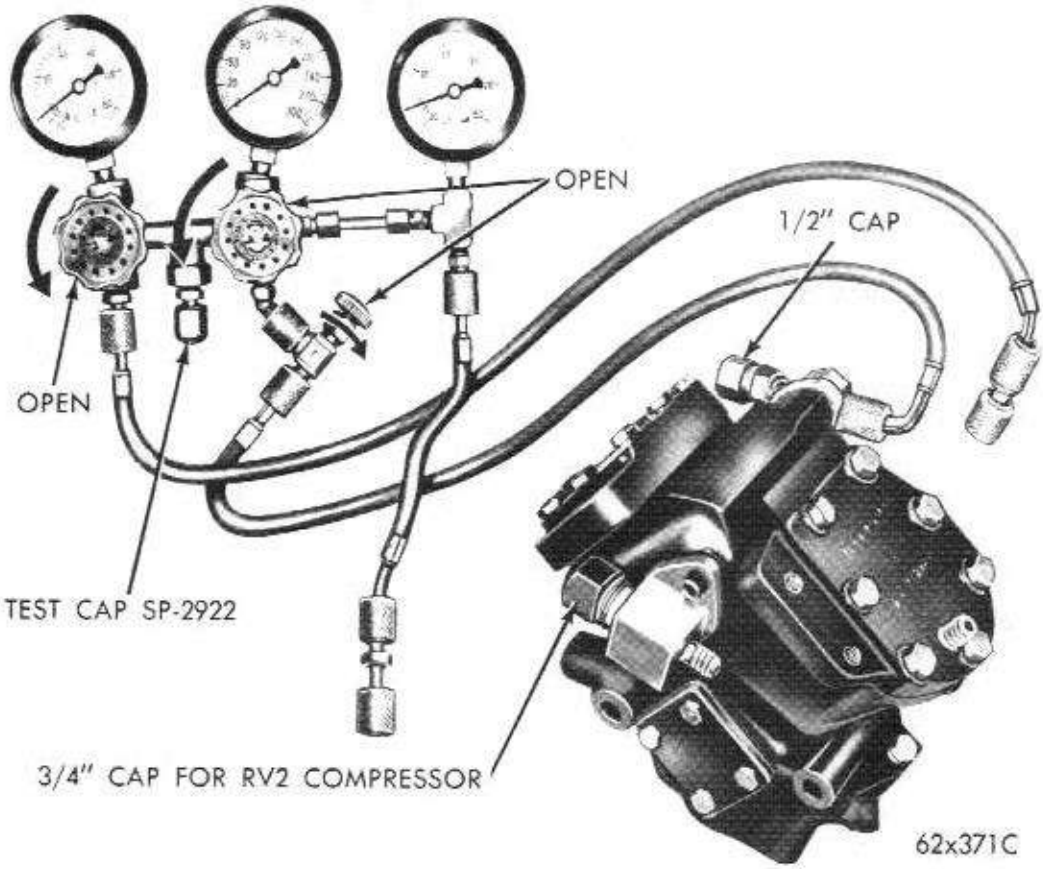


Fig. 32—Compressor Test Connections (Typical)

wire or probe of any kind to clean the cap. Wash it with clean solvent and blow dry with compressed air.

(3) Make sure both the left and right gauge valves are open. The compressor can now be operated as an air pump. Air will be drawn in through the compressor inlet port, compressed and delivered (through the test hose attached to the discharge port) to the gauge set manifold. The compressor capacity is determined by noting the pressure registered at the discharge gauge when the compressor is driven at the exact engine R.P.M. shown in the chart that follows.

The tachometer used must be accurate. The compressor capacity test results are dependent upon controlling the engine speed at the exact engine R.P.M. shown in the chart.

Test Pressures and Results

(1) Start the engine and adjust to the exact engine R.P.M. shown in the chart.

(2) Slowly close the left-hand gauge valve. Refer to Figure 33. All air delivered by the compressor will now be discharged through the metering orifice in the test cap. The pressure registered at the discharge gauge should build up to at least the minimum PSI shown in the chart.

(3) The load on the compressor may affect engine speed to **exact** R.P.M. shown in the chart. The discharge pressure should build up to the minimum PSI shown in the chart.

COMPRESSOR CAPACITY CHART

Model	Engine Cu. In. Displacement	Compressor Type	Engine RPM	Minimum PSI
Chrysler	383 440	RV-2	500	230 230
Imperial	440	RV-2	450	230

(4) Open the left-hand gauge valve momentarily to allow the pressure to drop. Then close the valve to make sure the pressure again builds up to the minimum PSI and engine R.P.M. shown in the chart.

CAUTION: To prevent possible compressor damage from excessive heat, do not operate the compressor more than a total of five minutes.

If the compressor does not develop the minimum PSI at the proper engine speed shown in the chart, both the compressor valve plate assemblies and gaskets must be replaced. (See "Compressor Service Instructions"). After repair, the compressor capacity must be tested before charging the system and repeating the "Over-All Performance Test."

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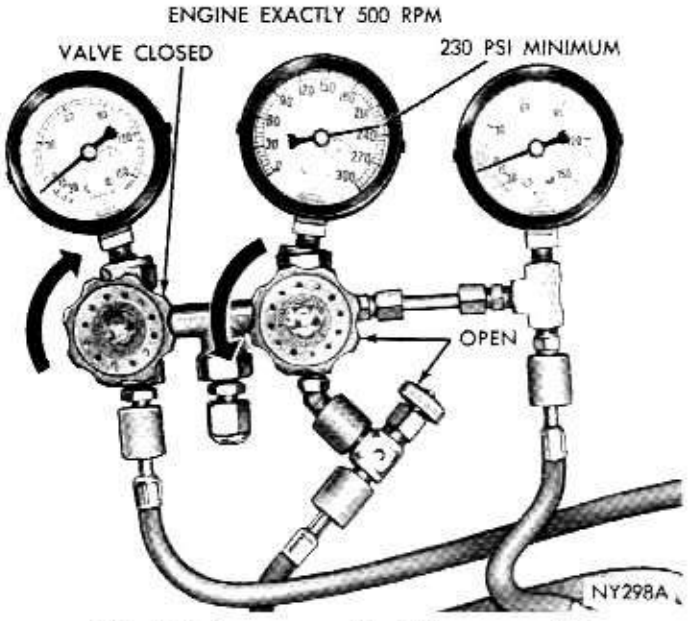


Fig. 33—Compressor Test Pressures—V2 Compressor Shown

A compressor that consistently builds up to the minimum PSI, at the proper engine speed shown in the chart is delivering rated capacity. Reconnect the evaporator suction line to suction muffler and the discharge line to muffler discharge fitting. When connecting these lines use a new gasket or "O" ring, and lubricate both male and female threads and the turning surface of the female nut with refrigerant oil. Proceed with the "Expansion Valve Test."

TEST 8

EXPANSION VALVE TEST

The following procedure permits testing the expansion valve without removing it from the system. This test is made with the system completely discharged.

When testing the expansion valves on dual installations (front and rear units) **each expansion valve must be tested separately.** To test the expansion valve of the front unit, disconnect and cap the liquid and suction lines leading to the rear unit evaporator and expansion unit. To test the expansion valve of the rear unit, disconnect and cap the liquid and suction lines leading to the front unit evaporator and expansion valve.

IMPORTANT: It is absolutely necessary for the compressor to pass the "compressor capacity" test before **testing the expansion valve in its installed position.**

A compressor which does not pass the compressor capacity test may have leaking reed valves or a fractured head gasket. Such a leak would allow refrigerant gas, used in the expansion valve test, to leak from the discharge side of the compressor. An internal leak between the discharge and suction side of the compressor will upset the expansion valve test results.

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TEST PREPARATIONS AND CONNECTIONS

(1) Close both the left and right gauge set manifold valves. Open the manifold needle valve.

(2) Install a ¼" connector and a ¼" tee fitting at the side of the gauge manifold. Install the test cap (Tool SP-2922) on the tee fitting and connect the test hose to the lower end of the tee fitting.

(3) Connect the other end of the suction test hose to the suction service port, using the special adapter to keep the suction service valve open.

(4) Connect the discharge test hose to the discharge service port, using a special adapter to hold this service valve open.

(5) Connect one end of the long test hose to the center of the gauge manifold, the other end to the refrigerant dispensing manifold.

(6) Close two of the dispensing manifold valves (turn clockwise). Open the remaining dispensing manifold valve (fully counterclockwise). Remove the protective cap from the opened valve.

(7) Screw a refrigerant can to the opened manifold valve, and tighten 6 to 8 foot-pounds maximum. Tighten the manifold locking nut against the shoulder of the can, again using 6 to 8 foot-pounds maximum to insure a good seal.

(8) Turn the manifold valve (above the refrigerant can) **completely clockwise** to puncture the can. This also closes the valve and seals the refrigerant in the can.

This completes all the test connections necessary for the expansion valve test. Compare the test set-up against those illustrated in Figure 34.

Then, proceed with the following preparation steps:

(a) **On Imperial installations,** remove the grommet retainer and grommet, located behind the expansion valve, from the evaporator housing and remove the expansion valve thermal bulb from its well inside the evaporator housing.

(b) **On Chrysler installations,** remove the expansion valve thermal line from its well, located in the suction line.

(c) Prepare a large pan of water heated to 125 degrees F. and place the refrigerant can upright in the water. Use enough water to provide the heat necessary to insure ample refrigerant pressure throughout this test.

(d) Prepare a container of ice and water to provide a known temperature of 32 degrees F. This will be used to test the expansion valve in its "Minimum flow" position.

Under extreme conditions of high heat and humidity the temperature of the ice and water may not reduce to 32 degrees F. Use a thermometer to test the actual temperature. If it is necessary to lower the temperature of the ice and water, add small quantities of salt while stirring until the desired tempera-

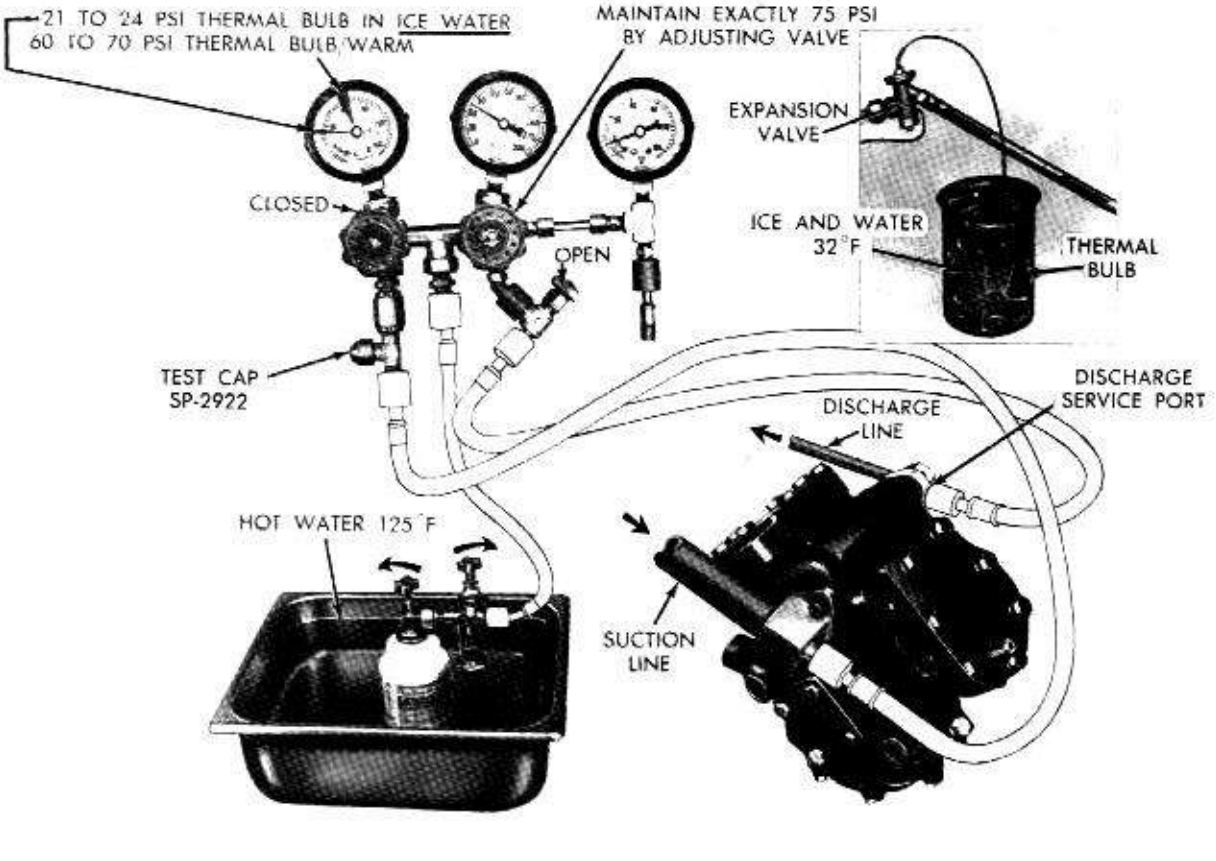


Fig. 34—Expansion Valve Test

ture of 32 degrees F. is obtained.

Maximum Flow Test—Thermal Bulb Warm

(1) Warm the thermal bulb by holding it in your hand. This will produce the same effect as a warm evaporator . . . it will open the expansion valve for maximum flow.

(2) Open the **refrigerant manifold valve** (fully counterclockwise) to allow refrigerant vapor to flow to the gauge set manifold.

(3) Adjust the right-hand gauge set manifold valve to maintain **exactly** 75 psi on the discharge gauge.

(4) On all units, the suction gauge should register 60 to 70 psi for the front and rear units, however, the roof units should be 65 to 75 psi when pressure registered at the discharge gauge is maintained at exactly 75 psi.

Minimum Flow Test—Thermal Bulb At 32°F

(1) Close the right gauge valve to reduce pressure on the expansion valve. This will accelerate movement of the valve toward the "minimum flow" position.

(2) Insert the thermal bulb in the container of ice and water. Use sufficient ice to insure a water temperature of 32°F. This will cause the expansion valve to move to the "minimum flow" position.

(3) Adjust the right gauge valve to maintain **exactly** 75 psi as registered at the discharge pressure gauge.

(4) On all units the suction gauge should register 21 to 24 psi when discharge pressure is maintained at

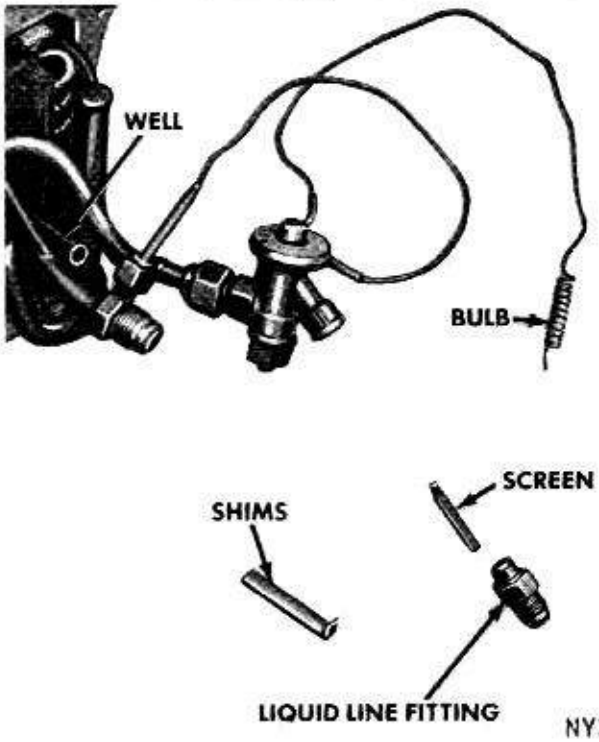


Fig. 35—Expansion Valve Details

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exactly 75 psi.

Test Results and Corrections

If the expansion valve does not pass these tests, it must be replaced.

An expansion valve which passes the above tests has the proper super heat setting, the proper pressure limit calibration, the correct rated capacity and has not lost its thermal bulb charge, therefore, it will give satisfactory performance.

Since the system is without refrigerant, it is good practice to remove the expansion valve inlet screen, clean it if necessary and reinstall it before charging the system (Fig. 35). Clean the thermal bulb, the thermal bulb well and the brass thermal bulb wedging strips. Wedge the bulb into its well so that the brass strips force the bulb toward the suction line. The fit must be mechanically tight and all surfaces clean to insure good thermal contact.

On **Imperial models** only, install the rubber grommet and the grommet retainer at the evaporator housing. To put the system into operation it will be necessary to sweep, test for leaks, vacuum and recharge the system.

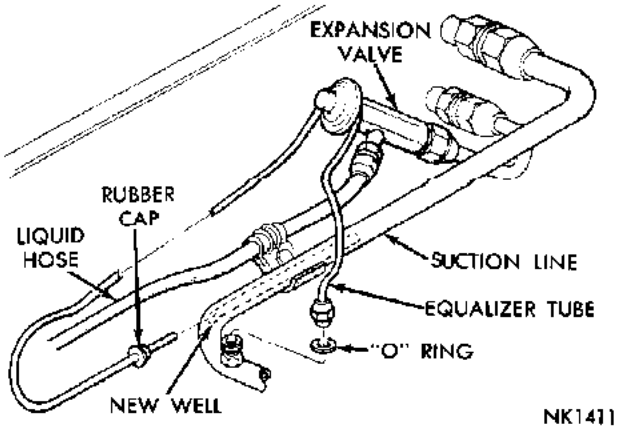


Fig. 36—Expansion Valve Details

On **Chrysler Models** with a rubber seal on the capillary sensing tube, carefully insert the tube in the suction line well as far as it will go. (Approximately five inches (Fig. 36).

SERVICE PROCEDURES

SAFETY PRECAUTIONS

The refrigerant used in all 1966 air-conditioning installations is Refrigerant 12. It is transparent and colorless in both the liquid and vapor state. Since it has a boiling point of **21.7 degrees F. below zero,** it will be a vapor at all normal temperatures and pressures. The vapor is heavier than air, non-flammable and nonexplosive. It is nonpoisonous except when it is in direct contact with open flame. It is noncorrosive except when combined with water. It is a safe refrigerant. The following precautions, however must be observed when handling Refrigerant 12.

CAUTION: Wear safety goggles when servicing the refrigeration system.

Refrigerant 12 evaporates so rapidly at normal atmospheric pressures and temperatures that it tends to freeze anything it contacts. For this reason, extreme care must be taken to prevent any liquid refrigerant from contacting the skin and especially the eyes.

Always wear safety goggles Tool C-3355 when servicing the refrigeration part of the air-conditioning system. Keep a bottle of sterile mineral oil and a weak solution of boric acid handy when working on the refrigeration system. Should any liquid refrigerant get into the eyes, use a few drops of mineral oil to wash them out. Refrigerant 12 is rapidly absorbed by the oil. Next, wash the eyes with the weak solution of boric acid. Call your doctor immediately even though irritation has ceased after first aid treatment.

CAUTION: Do not heat refrigerant 12 above 125 degrees F.

In most instances, moderate heat is required to bring the pressure of the refrigerant in its container above the pressure of the system when charging or adding refrigerant. A bucket or large pan of hot water not over 125 degrees F. is all the heat required for this purpose. Do not heat the refrigerant container with a blow torch or any other means that would raise temperature and pressure above this temperature. Do not weld or steam clean on or near the system components or refrigerant lines.

CAUTION: Keep Refrigerant 12 containers upright when charging the system.

When metering Refrigerant 12 into the refrigeration system, keep the supply tank or cans in an upright position. If the refrigerant container is on its side or upside down, liquid refrigerant will enter the system and damage the compressor.

CAUTION: Always work in a well-ventilated room.

Always maintain good ventilation in the working area. Always discharge the refrigerant into the service bay exhaust system or outside the building. Large quantities of refrigerant vapor in a small, poorly ventilated room can displace the air and cause suffocation.

Although Refrigerant 12 vapor is normally nonpoisonous, it can be changed into a very poisonous gas if allowed to come in contact with an open flame. Do not discharge large quantities of refrigerant in an area having an open flame. A poisonous gas is pro-

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duced when using the flame-type leak detector. Avoid inhaling the fumes from the leak detector.

CAUTION: Do not allow liquid refrigerant to touch bright metal.

Refrigerant will tarnish bright metal and chrome surfaces. Avoid splashing refrigerant on any surface. Refrigerant in combination with moisture is very corrosive and can cause great damage to all metal surfaces.

HANDLING TUBING AND FITTINGS

Kinks in the refrigerant tubing or sharp bends in the refrigerant hose lines will greatly reduce the capacity of the entire system. High pressures are produced in the system when it is operating. Extreme care must be exercised to make sure that all connections are pressure tight. Dirt and moisture can enter the system when it is opened for repair or replacement of lines or components. The following precautions must be observed.

The system must be completely discharged before opening any fitting or connection in the refrigeration system. Open fittings with caution even after the system has been discharged. If any pressure is noticed as a fitting is loosened, allow trapped pressure to bleed off very slowly. Use a suitable tube bender Tool C-3362 when bending the refrigerant lines to avoid kinking. **Never attempt to rebend formed lines to fit. Use the correct line for the installation you are servicing.**

A good rule for the flexible hose lines is keep the radius of all bends at least 10 times the diameter of the hose. Sharper bends will reduce the flow of refrigerant. The flexible hose lines should be routed so that they are at least 3 inches from the exhaust manifold. It is good practice to inspect all flexible hose lines at least once a year to make sure they are in good condition and properly routed.

"O" rings and fittings must be in good condition. The slightest burr or foreign material may cause a leak. "O" rings and fittings must be coated with refrigerant oil to allow the connections to seat squarely and to be tightened evenly to the proper torque. Fittings which are not oiled with refrigerant oil are almost sure to leak (Fig. 37).

The use of proper wrenches when making connections is very important. Improper wrenches or improper use of wrenches can damage the fittings. Always use two wrenches when loosening or tightening tube fittings to prevent distorting of lines and components.

The internal parts of the refrigeration system will remain in a state of chemical stability as long as pure moisture-free Refrigerant 12 and refrigerant oil is used. Abnormal amounts of dirt, moisture or air can upset the chemical stability and cause operational troubles or even serious damage if present in more than minute quantities.

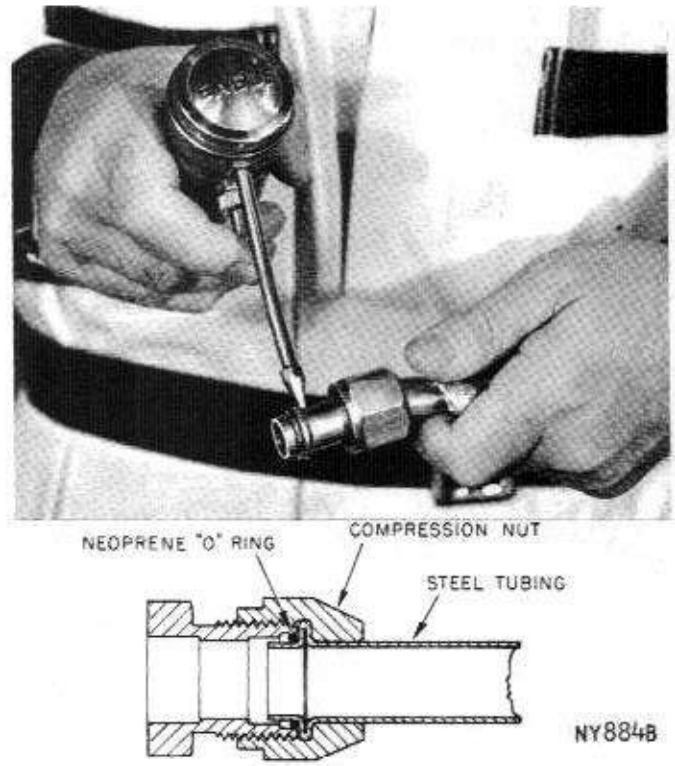


Fig. 37—Lubricate with Refrigerant Oil (Typical)

When it is necessary to open the refrigeration system, have everything you will need to service the system ready so that the system will not be left open any longer than necessary. Cap or plug all lines and fittings as soon as they are opened to prevent the entrance of dirt and moisture. All lines and components in parts stock should be capped or sealed until they are ready to be used.

All tools, including the refrigerant dispensing manifold, the gauge set manifold and test hoses should be kept clean and dry.

The special refrigeration oil supplied for the system is as clean and dry as it is possible to make it. **Only refrigeration oil** should be used in the system or on the fittings and lines. The oil container should be kept tightly capped until it is ready for use, and then tightly capped after use to prevent entrance of dirt and moisture. Refrigerant oil will quickly absorb any moisture with which it comes in contact.

COMPRESSOR DRIVE BELT ADJUSTMENT

Satisfactory performance of the air-conditioning system is dependent upon drive belt condition and tension. If the proper tensions are not maintained, belt slippage will greatly reduce air-conditioning performance and drive belt life. To avoid such adverse effects, the following service procedure should be followed:

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(1) Any belt that has operated for a minimum of a half-hour is considered to be a "used" belt. Adjust air-conditioning drive belts at the time of new-car preparation. See Chart, "Accessory Belt Drives."

(2) Measure the drive belt tension at regular service intervals, using the torque method, and readjust as needed.

(3) On all new-belt installations, new-belt tension specifications should be used when the belt is first installed to obtain proper tension. Thereafter, these replacement belts should be serviced according to the above procedure. Always replace belts in pairs if so equipped, otherwise the old belt will have insufficient tension and the load will be primarily on the new belt. See Chart, "Accessory Belt Drives."

ANTIFREEZE RECOMMENDATIONS

The Air-Conditioning System requires the engine's cooling system to be protected to +15°F. with a permanent type antifreeze for summer operation. This is to prevent freezing of the coolant in the heater core. However, this protection does not provide sufficient corrosion inhibitors for the engine cooling system. Summer protection to —15°F will provide adequate inhibitors for protection of engine cooling system against corrosion.

In the springtime, after the winter's operation with the cooling system protected with permanent-type antifreeze for the temperatures of the area, it is suggested the system be drained and flushed out with water. When draining, flushing and refilling, have the temperature control lever in the extreme hot position so the heater core is drained, flushed and refilled. Install a gallon of permanent type antifreeze in the

ACCESSORY BELT DRIVES

TORQUE METHOD

TORQUE (FT.-LBS.) TO BE APPLIED TO COMPONENTS

ACCESSORY MODEL APPLICATION	USED BELT* 383 440 Cu. In.	NEW BELT 383 440 Cu. In.
POWER STEERING BRACKET		
Solid Bracket	55	90
Self Tightening	45	45
ALTERNATOR		
With Air Conditioning	40	60
Without Air Conditioning	40	60
	30**	40**
FAN IDLER	35	50

*Any belt that has operated for a minimum of a half-hour is considered to be used.
**"RB" Engine only.

BELT DEFLECTION METHOD

DEFLECTION (INCHES) TO BE APPLIED AT MIDPOINT OF BELT SEGMENT UNDER A 5 LB. LOAD

ACCESSORY	USED BELT 383 440 Cu. In.	New Belt 383 440 Cu. In.
POWER STEERING	3/16	1/8
FAN BELT IDLER	1/8	1/16
ALTERNATOR		
Without A/C	1/4	1/8
With A/C	3/8	1/4
	—	—

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system, and add enough water to fill the system.

Do not re-use the old antifreeze. The permanent type antifreeze does not lose its antifreeze qualities during the winter season operation, but the chemical inhibitors for rust and corrosion prevention are weakened and finally exhausted by extended use. Do not add new inhibitor to used antifreeze in hope of revitalizing the used antifreeze.

The chemical inhibitors come in various chemical compositions, some are compatible, some neutralize each other, and some form violent reactions to each other causing foaming and other undesirable reactions. Play it safe and use new permanent-type antifreeze.

RADIATOR PRESSURE CAP

It is absolutely necessary for the 1966 air-conditioned vehicle to be equipped with a 15 to 16 psi radiator cap.

A radiator pressure cap testing below these specifications will permit loss of coolant during a hard pull on a hot day, or in slow moving traffic, or when the engine is stopped on a hot day.

Test the radiator pressure cap, using Tool C-3499 (Fig. 38). Before assembling the adapter and radiator pressure cap to the pump, dip the radiator cap and both ends of the adapter into clean water to assure a tight seal.

Hold the assembled tester in a vertical position with the radiator cap downward, as shown in Figure 38. Stroke the tester pump plunger until the gauge indicates the pressure cap is relieving pressure. It must relieve at a pressure between 15 to 16 psi. If within these specifications, reinstall on the radiator.

These test specifications are for caps tested at average altitudes. In high altitudes, the test specifications are lowered about one (1) psi for each 2,000 feet above sea level.

If the radiator cap does not test within these specifications, replace it with a cap which does.

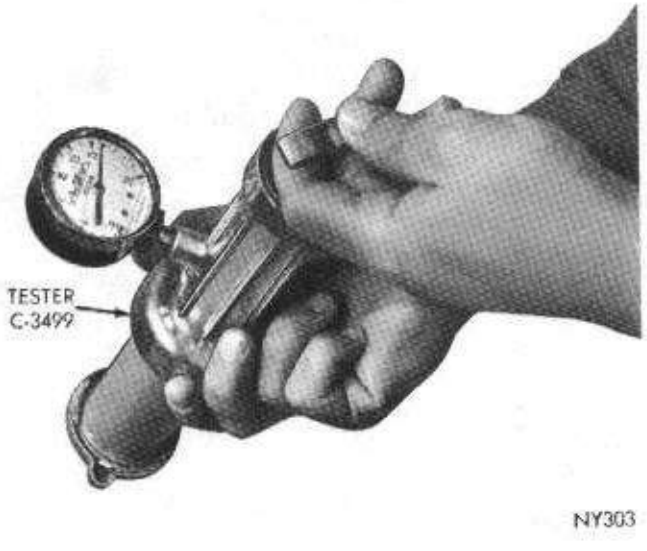


Fig. 38—Radiator Cap Tester

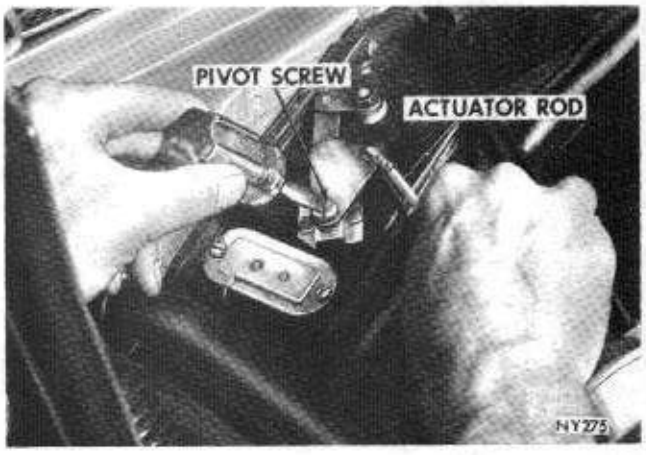


Fig. 39—Heater By-Pass Adjustment

VACUUM CONTROL SYSTEM ADJUSTMENTS AND TESTS

(IMPERIAL)

Heater Bypass Door Adjustment

Press the "Defrost" or "Heat" button. The bypass door should be fully closed and the vacuum actuator should move the over-center lever into a straight line with the pivot screw. To adjust the over-center linkage, loosen the pivot lever screw (Fig. 39). Slide the pivot and screw in its slot as you push the actuator rod rearward to close the bypass door completely. Hold the actuator rod and tighten the pivot screw to maintain this adjustment.

Recirculating Door and Fresh Air Door Linkages

Inspect and correct any binding of the recirculating door over-center lever, hinges and fresh air door con-

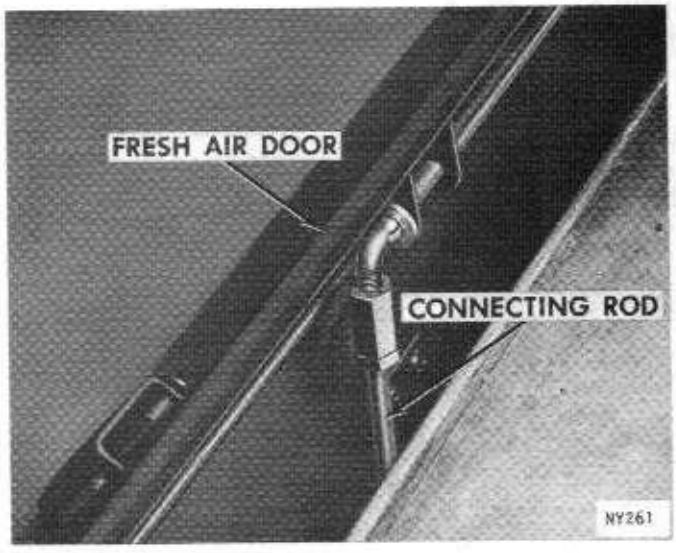


Fig. 40—Fresh Air Door Connecting Rod

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necting rod. To adjust the fresh air door connecting rod, remove the dowl inlet grille and push the "FRESH COOL" button in. The fresh air door will open, and the connecting rod (Fig. 40) is then readily accessible.

The connecting rod is provided with a turnbuckle nut and lock nut. The length of the rod can be adjusted by using two 7/16 inch open-end wrenches. The fresh air door should be adjusted to give the **minimum** possible opening when the recirculating door is completely closed. Push in the "MAXIMUM COOL" button and inspect to see that the fresh air door moves to its fully closed position.

Vacuum Control System Test

The test of the push-button operation determines whether or not the vacuum and electrical circuits are properly connected and the controls are functioning properly. However, it is possible that a vacuum control system that operates perfectly at the high vacuum provided at engine idle speed may not function properly at high engine speeds. Before starting this test, stop the engine and make certain that the vacuum source hose at the engine intake manifold is tight on its connector.

Start the vacuum pump (Tool C-3652) and connect the vacuum test set (Tool C-3707). Adjust the bleed valve on the test set to obtain exactly 8 inches of vacuum, with a finger blocking the prod on the end of the test hose (Fig. 41).

It is absolutely essential that the bleed valve be adjusted so the vacuum gauge pointer will return to exactly 8 inches when the prod is covered by a finger, otherwise a false reading will be obtained when the control circuit is tested.

CAUTION: Alternately release and reblock the hose prod several times. Make sure the bleed valve is adjusted so the vacuum gauge pointer returns to exactly 8 inches of vacuum when the prod is covered with a finger.

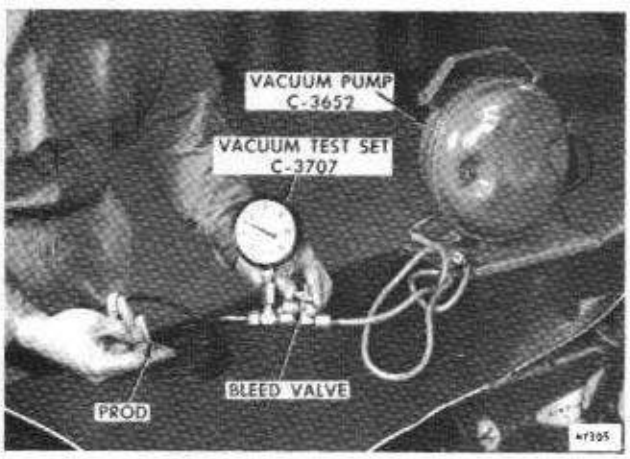


Fig. 41—Adjusting Vacuum Test Bleed Valve

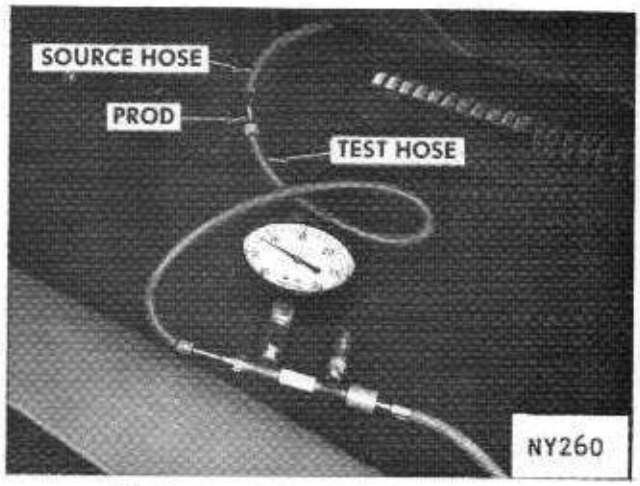


Fig. 42—Push Button Vacuum Test

Disconnect the engine vacuum source hose (Fig. 42) at the plastic junction connector under the instrument panel, and insert the vacuum tester hose prod into the source hose leading to the control switch.

Start the test by pushing the "H" or heat button. The vacuum tester gauge needle will drop until the actuator has operated, and then will return to 8 inches. Note how much the vacuum drops below 8 inches. Continue to push buttons; "OFF," "MAX. COOL," "FRESH COOL," "DEFROST" and "HEAT" allowing time for actuators to operate after each button is pushed, and note the vacuum drop below 8 inches after each operation. The maximum allowable vacuum drop below 8 inches after each operation is ¾ inch.

If the vacuum drop is more than ¾ inch, first recheck the tester for reading exactly 8 inches. If cor-

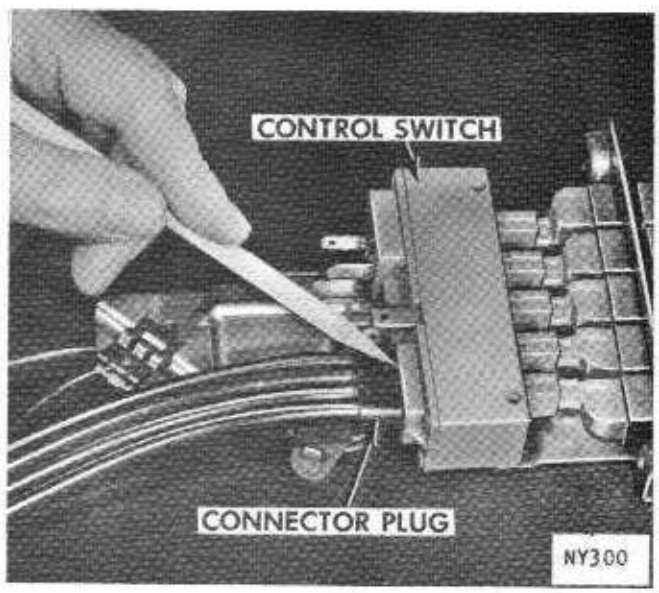


Fig. 43—Connector Plug Installed

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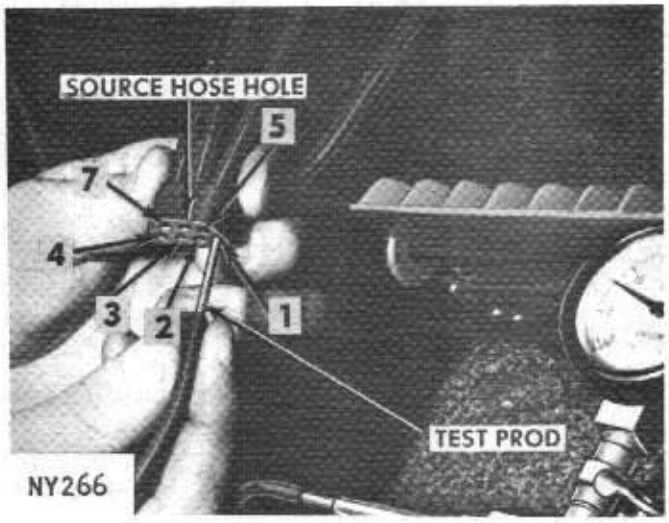


Fig. 44—Vacuum Tube Assembly Test

rect, inspect the fit of the 7-hole hose connector plug on the control switch (Fig. 43). This plug must be positioned all the way on the 7 prods on the control switch.

CAUTION: Do not use lubricant on the switch prods or in the holes in the plug, as lubricant will ruin the vacuum valve in the switch. If it is impossible to properly position the connector plug all the way on the switch prods, put a drop or two of clean water in the holes of the connector plug. This will allow the plug to slide completely on the switch prods.

If vacuum drop is now within limits, proceed with the over-all performance test. If the vacuum drop is still in excess of ¾ inch, remove the connector plug from the switch. Insert the vacuum test prod alternately in each of the connector holes except the source hose connector hole (Fig. 44). Note the amount of vacuum drop **below** 8 inches after each actuator has operated. If the vacuum test gauge comes back to 8 inches at each of the 6 holes, the hoses and actuators are not leaking. The control switch is faulty and must be replaced. If excessive vacuum drop shows up at one or more holes in the connector block, isolate the faulty hose or actuator.

If the vacuum drop occurs at numbers 5 or 7 holes, first check the tee connectors under the instrument panel that tie numbers 5 and 7 hoses to the bypass door and deflector hoses. If the tee connections are all right, inspect the hose connections to the actuator involved. Then test whether the actuator or hose is at fault; use the test hose on the actuator involved (Fig. 45).

A leak in a hose may be detected with the leak tester by running fingers along the hose and watching the vacuum gauge reading. A faulty spot may be cut out and the hose spliced, using ⅛ inch 00 copper tubing.

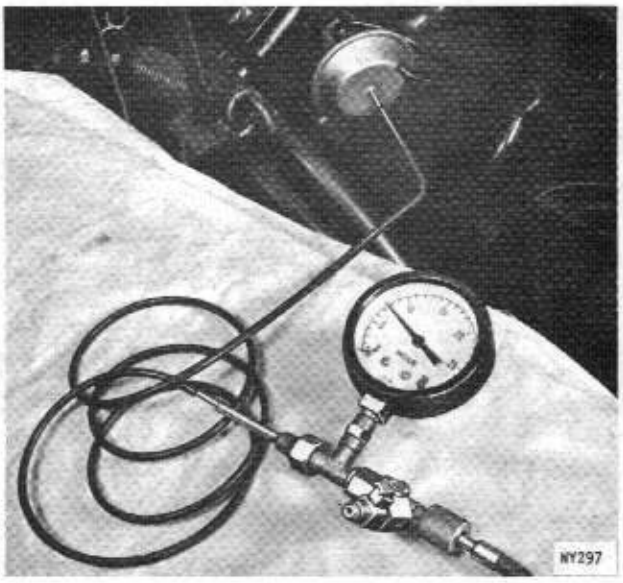


Fig. 45—Vacuum Actuator Test

A vacuum drop in excess of ¾ inch below the 8 inches needed in this test would not interfere with the engine operation, other than perhaps to cause a rough idle. It could, however, interfere with the proper operation of the air-conditioning and heating controls at high speeds and during acceleration.

VACUUM CONTROL SYSTEM ADJUSTMENTS AND TESTS

(Chrysler)

Linkage Adjustment

With the air conditioner door in the full open position and vacuum applied to the top of the air conditioner and heater door vacuum actuators, raise the heater door vacuum actuator mounting bracket until the levers **A, B,** and **C** touch; then, tighten the bracket mounting nuts. (Fig. 46).

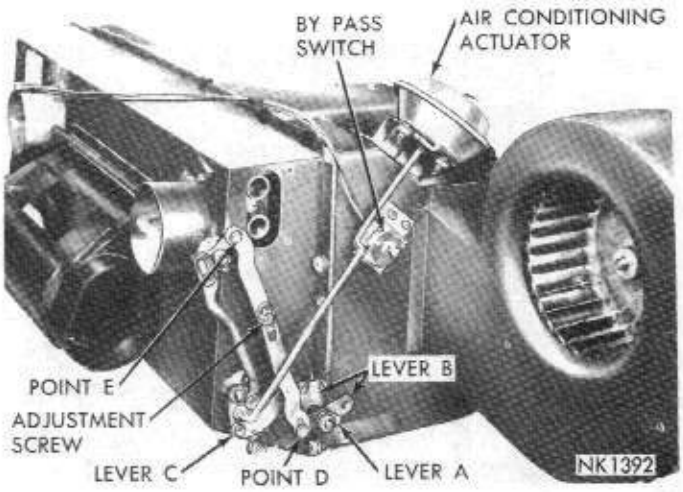


Fig. 46—Linkage Nomenclature

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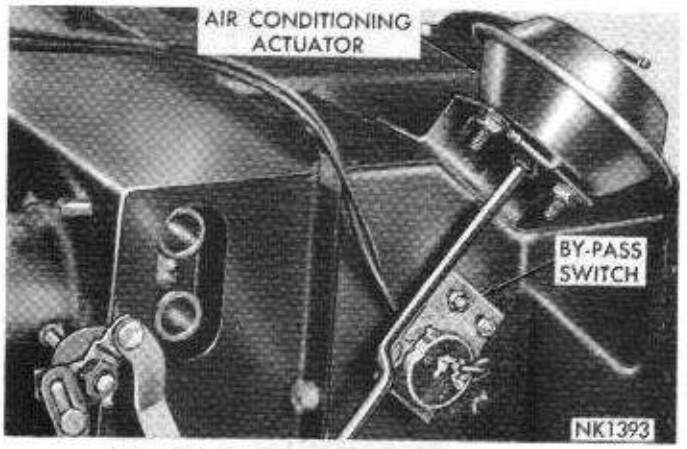


Fig. 47—By-Pass Switch Adjustment

Apply vacuum to the shaft side of the air conditioner door vacuum actuator and with vacuum applied to the top side of the heater door vacuum actuator, apply pressure at points **D** and **E** and tighten the adjustment screw.

By-Pass Switch Adjustment

With vacuum applied to the top of the actuator to open the air conditioner door. The blower motor resistor by-pass switch must be adjusted so that the vacuum actuator shaft will engage the switch lever, moving it to the open position with vacuum applied to the rod side. (Fig. 47) switch shown in the closed (on) position.)

Vacuum Control System Test

The test of the push-button operation determines whether or not the vacuum and electrical circuits are properly connected and the controls are functioning properly. However, it is possible that a vacuum control system that operates perfectly at the high vacuum provided at engine idle speed may not function properly at high engine speeds. Before starting this test, stop the engine and make certain that the vacuum source hose at the engine intake manifold is tight on its connector.

Start the vacuum pump (Tool C-3652) and connect to the vacuum test set (Tool C-3707). Adjust the bleed valve on the test set to obtain exactly 8 inches of vacuum with a finger blocking the prod on the end of the test hose (Fig. 48).

It is absolutely essential that the bleed valve be adjusted so the vacuum gauge pointer will return to exactly 8 inches when the prod is covered by a finger. Otherwise a false reading will be obtained when the control circuit is tested.

CAUTION: Alternately release and reblock the hose prod several times. Make sure the bleed valve is adjusted so the vacuum gauge pointer returns to exactly 8 inches of vacuum when the prod is covered with a finger.

Disconnect the engine vacuum source hose at the engine intake manifold and insert the vacuum tester hose prod into the source hose leading to the control switch. Place the vacuum gauge on the cowl so it can be observed from the driver's position as the push buttons are operated.

Start the test by pushing the "H" or heat button. The vacuum tester gauge needle will drop until the actuator has operated, and then will return to 8 inches. Note how much the vacuum drops below 8 inches. Continue to push buttons; "Off," "Max," "Cool," "Fresh Cool," "Defrost" and "Heat" allowing time for actuators to operate after each button is pushed, and note the vacuum drop below 8 inches after each operation. The maximum allowable vacuum drop below 8 inches after each operation is ¾ inch.

If the vacuum drop is more than ¾ inch, first re-

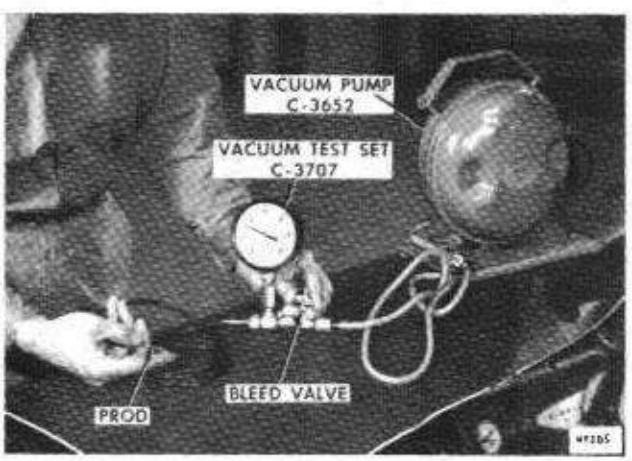


Fig. 48—Vacuum Test Bleed Valve

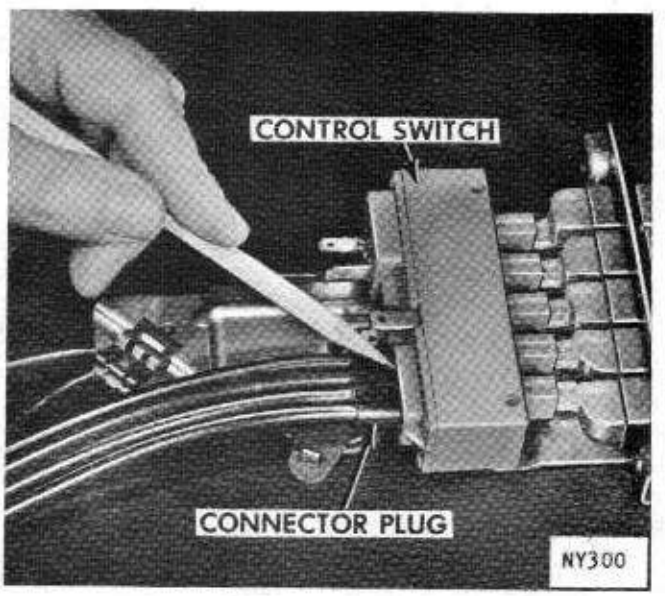


Fig. 49—Push Button Vacuum Test

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check the tester for reading exactly 8 inches. If correct, inspect the fit of the 7-hole hose connector plug on the control switch (Fig. 49). This plug must be positioned all the way on the 7 prods on the control switch.

CAUTION: Do not use lubricant on the switch prods or in the holes in the plug, as lubricant will ruin the vacuum valve in the switch. If it is impossible to properly position the connector plug all the way on the switch prods, put a drop or two of clean water in the holes of the connector plug. This will allow the plug to slide completely on the switch prods.

If vacuum drop is now within limits, proceed with the over-all performance test. If the vacuum drop is still in excess of ¾ inch, remove the connector plug from the switch. Insert the vacuum test prod alternately in each of the connector holes except the source hose connector hole (Fig. 50). Note the amount of vacuum drop **below** 8 inches after each actuator has operated. If the vacuum test gauge comes back to 8 inches at each of the 6 holes, the hoses and actuators are not leaking. The control switch is faulty and must be replaced. If excessive vacuum drop shows up at one or more holes in the connector block, isolate the faulty hose or actuator.

Inspect the hose connections to the actuator involved. Then test whether the actuator or hose is at fault; use the test hose on the actuator involved (Fig. 51).

A leak in a hose may be detected with the leak tester by running the fingers along the hose and watching the vacuum gauge reading. A faulty spot may be cut out and the hose spliced, using ⅛ inch 00 copper tubing.

A vacuum drop in excess of ¾ inch below the 8 inches needed in this test would not interfere with the engine operation, other than perhaps to cause a rough idle. It could, however, interfere with the proper operation of the air-conditioning and heating controls at high speeds and during acceleration.

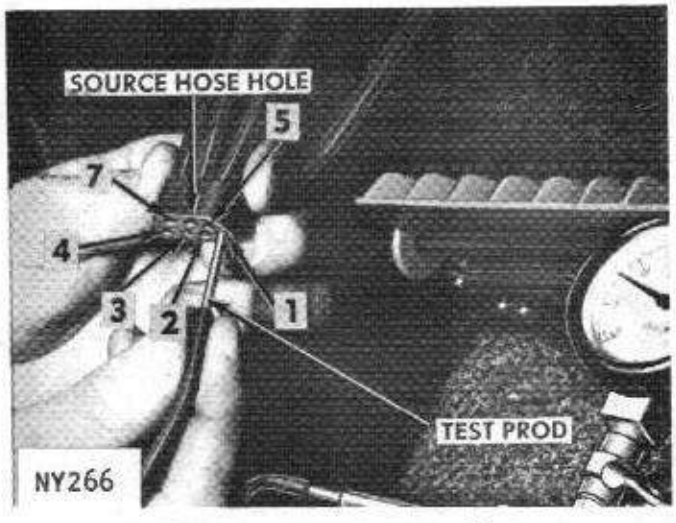


Fig. 50—Vacuum Tube Assembly Test

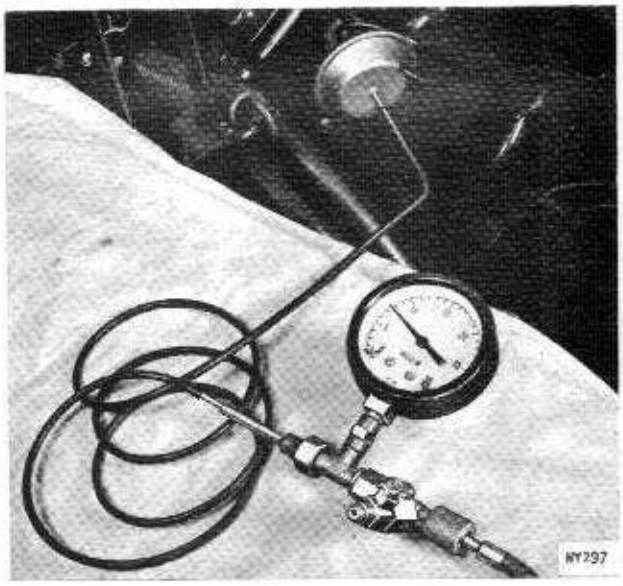


Fig. 51—Vacuum Actuator Test

MAGNETIC CLUTCH

Two types of magnetic clutches (Figs. 52 and 53) are used for 1966 models. All use a stationary electromagnet attached to the compressor. Since the electromagnet does not rotate, collector rings and brushes are eliminated.

Testing Electromagnet Current Draw

To test the coil for a short or open circuit, connect an ammeter (0-10 ampere scale) in series with a fully charged 12 volt battery and the field coil lead. The current draw at 12 volts and 68° temperature should be as follows:

2.7 to 3.3 amperes for Warner Plate Type
2.9 to 3.3 amperes for Pitts (Electro-Loc)

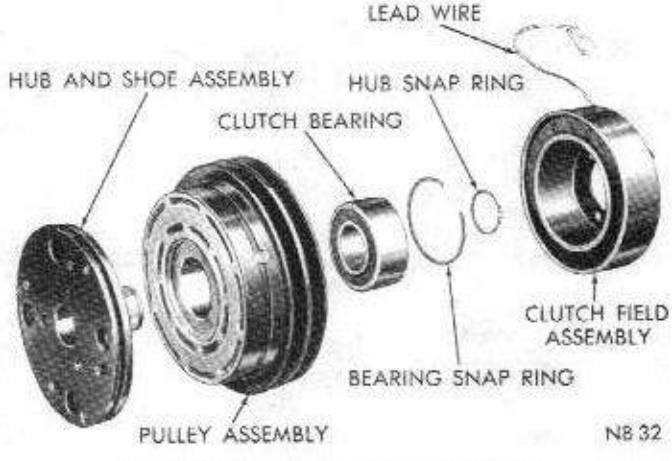


Fig. 52—Warner Clutch Plate Type

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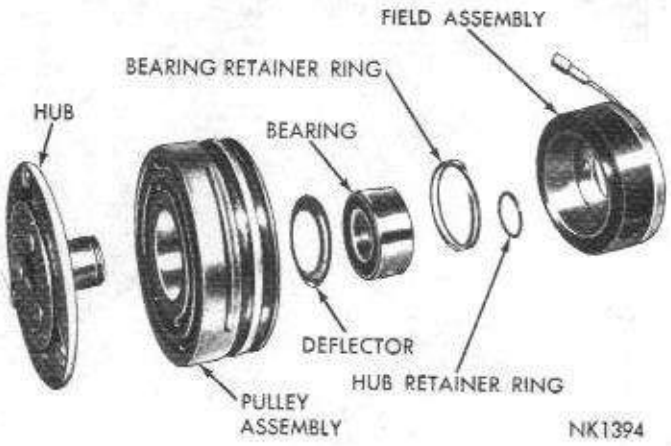


Fig. 53—Pitts Electro-Loc Clutch

Removal (All)

(1) Loosen and remove belts. Disconnect clutch field lead wire at the connector.

(2) Remove special locking bolt and washer from compressor crankshaft at the front center of clutch.

(3) Insert a 5/8"—11 x2½" cap screw into threaded portion of hub assembly.

(4) Support clutch with one hand, then tighten cap screw until clutch is removed.

(5) Remove the three hexagon head screws attaching clutch field assembly to the compressor and lift off the assembly.

Installation (All)

(1) Install clutch field coil assembly on base of compressor bearing housing. Make sure coil assembly is positioned so lead wire points to left of the compressor as viewed from the front. Install the three mounting screws and tighten to 17 inch pounds.

(2) Insert woodruff key in crankshaft.

(3) Insert clutch assembly on the crankshaft.

(4) Install washer and a new self-locking bolt, and tighten to 20 foot-pounds.

(5) Connect field lead wire.

(6) Install belts and tighten to specified tension shown on page 34 in this manual.

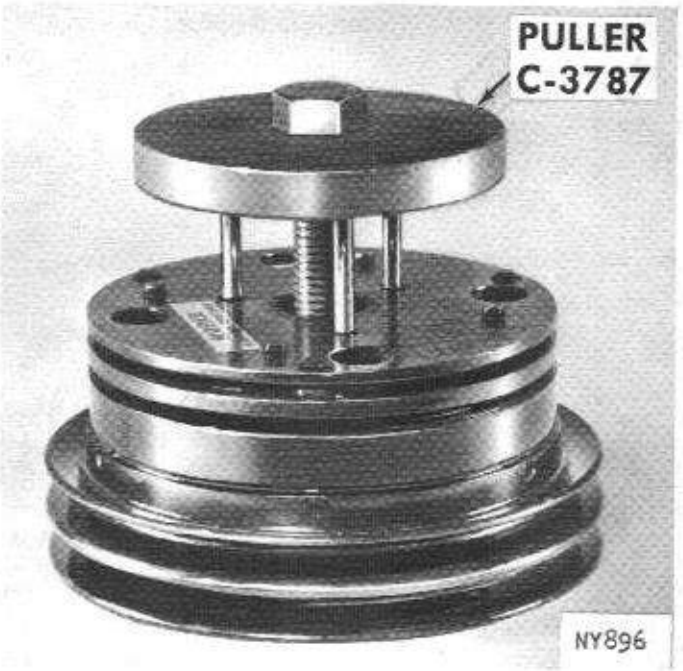


Fig. 54—Removing the Hub and Shoe Assembly

WARNER PLATE TYPE AND PITTS ELECTRO-LOCK

Disassembly

(1) Remove small snap ring from drive hub with Tool C-3128 or equivalent.

(2) On Warner Plate Type, install the drive hub puller Tool C-3787 aligning the three pins of the Tool in the three holes in the hub and shoe assembly. Tighten the hex head bolt down until drive hub is removed from the bearing (Fig. 54).

(b) On Pitts Electro-Loc, install a bold ⅝-11 x 2½ 4 inch into rear of hub and while holding pulley in the hand use a soft hammer and drive hub from pulley.

(3) Remove bearing snap ring from pulley assembly.

(4) Place pulley assembly on an arbor press, with pulley side down, and bearing hub centered on Tool C-3835. Install the Tool SP-3496 on the inner race of the bearing and press the bearing from the pulley assembly (Fig. 55).

A new bearing must be installed every time magnetic clutch is disassembled.

Assembly

(1) Install pulley assembly with pulley side up on an arbor press and insert a **new** bearing into the bore. Install Tool C-3807 against the bearing and press into position (Fig. 56).

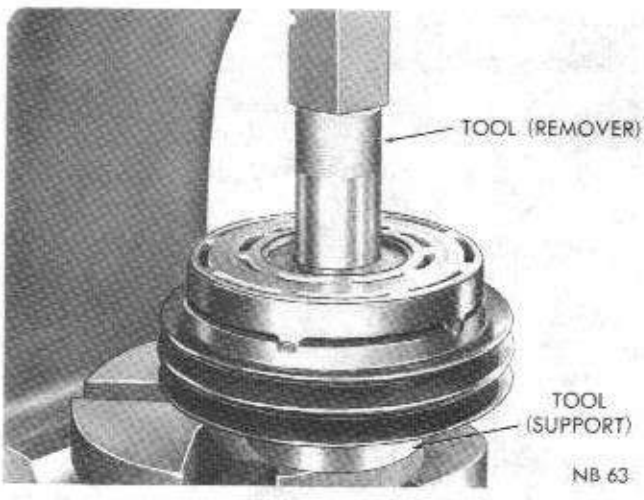


Fig. 55—Removing the Bearing from the Pulley Assembly

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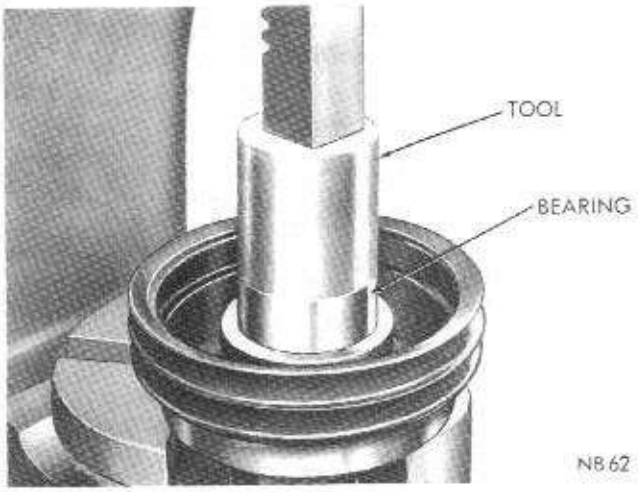


Fig. 56—Installing a New Bearing in the Pulley Assembly

(2) Install pulley assembly with pulley side facing down on Tool C-3807.

(3) Start drive hub into the inner bearing race, and press the hub into position with an arbor press.

(4) Install bearing snap ring and hub snap ring.

CAUTION: The pulley assembly and hub assembly are mated parts. They are burnished at the factory before shipment. No attempt should be made to replace either unit separately as this may reduce the initial torque of the clutch.

SERVICING THE COMPRESSOR

The compressor is a two-cylinder, reciprocating-type designed specifically for the Chrysler Air-Conditioning System. Service parts are available so that the compressor can be repaired in the field.

Figure 57 is a disassembled view of the compressor with the nomenclature of the parts. Some parts are serviced individually and some are serviced in packages which include two or more service parts. Refer to the parts book for this information.

CAUTION: The refrigerant oil used in the compressor is carried through the entire system by the refrigerant. Some of this oil will be trapped and retained in the system when the refrigerant is discharged for testing or unit replacement. If the compressor is to be removed for repair or replacement, measure the refrigerant oil level in the compressor before the compressor is removed from the vehicle so that the same oil level can be established when the new or

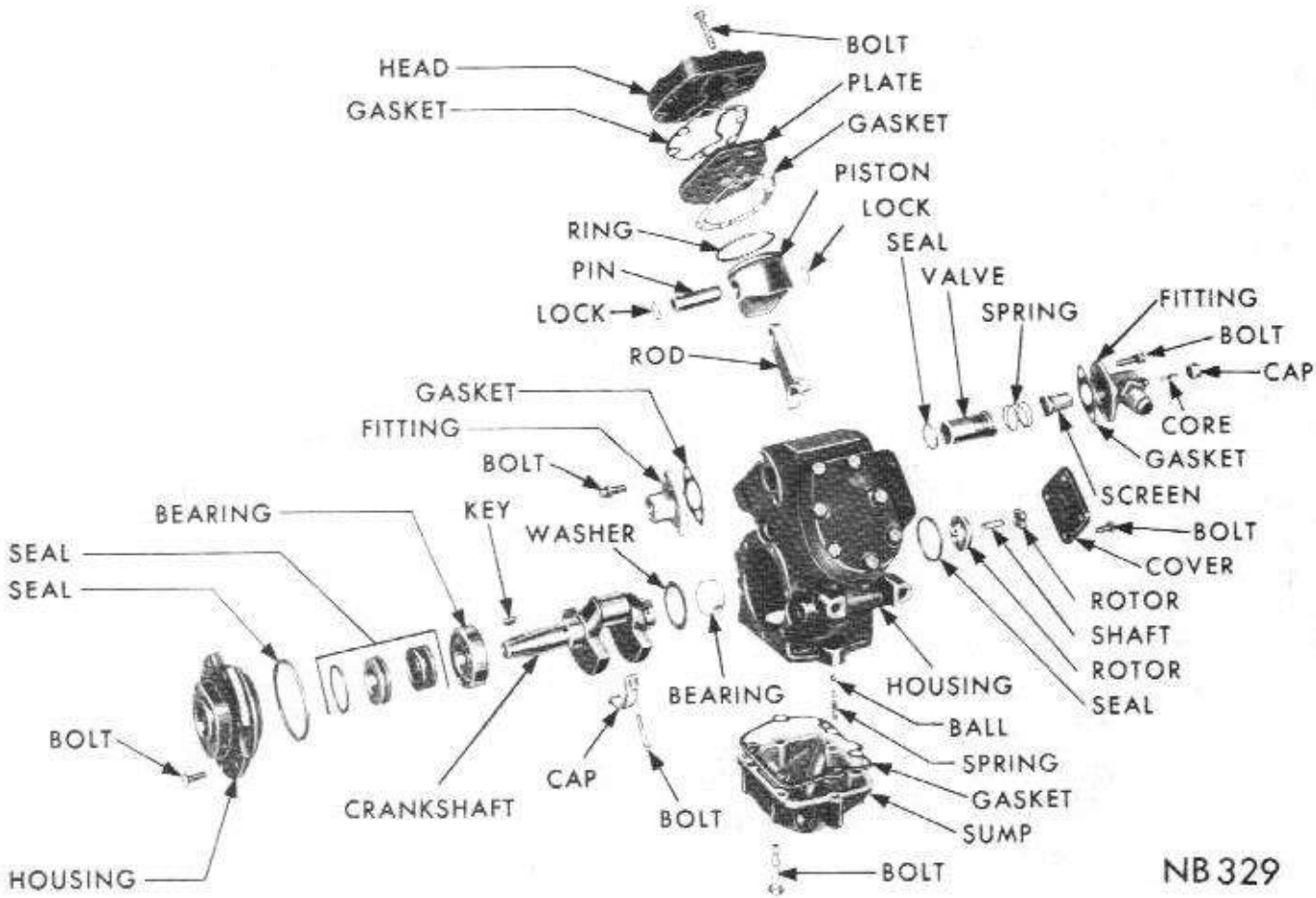


Fig. 57—Compressor Disassembled

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repaired compressor is installed on the vehicle. Too much refrigerant oil in the system can cause abnormal operating pressures and reduce the performance of the entire system.

Complete disassembly and assembly of the compressor must be performed with the compressor removed from the vehicle. On some models however, the valve plate and crankshaft gas seal assemblies can be repaired with the compressor installed on the vehicle.

CAUTION: The system must be completely discharged before attempting to perform any disassembly or repair service to the compressor.

Before disassembling the compressor, clean exterior surfaces thoroughly.

Cleanliness is extremely important. The work area must be clean and free of air-borne dust and dirt. All parts must be thoroughly cleaned and blown dry before reassembly.

Do not use air to dry the crankshaft front main bearing. Wash the bearing in **clean** mineral spirits and shake out all excess cleaning fluid. Saturate the bearing with **clean refrigerant oil** and assemble immediately. Any dirt in the front main bearing assembly will cause noisy operation and possible damage to the bearing.

CAUTION:Before reassembly of any unit, all contact surfaces must be liberally coated with clean refrigerant oil. Refrigerant oil must be kept in a sealed container until ready for use to prevent entrance of moisture and dirt. Never use engine oil as a substitute for refrigerant oil.

EPR VALVE

Removal

(1) Remove the two "EPR" Valve suction line fitting bolts, the fitting which also contains the compressor suction screen, spring, and the gasket.

(2) Remove the "EPR" Valve and "O" ring from the compressor using Tool C-3822, by rotating the valve counterclockwise slightly (Fig. 58).

CAUTION: Do not handle the "EPR" Valve more than necessary. The valve should be inspected externally and wiped clean with a lint-free cloth. Place the valve in a plastic bag until ready to be installed.

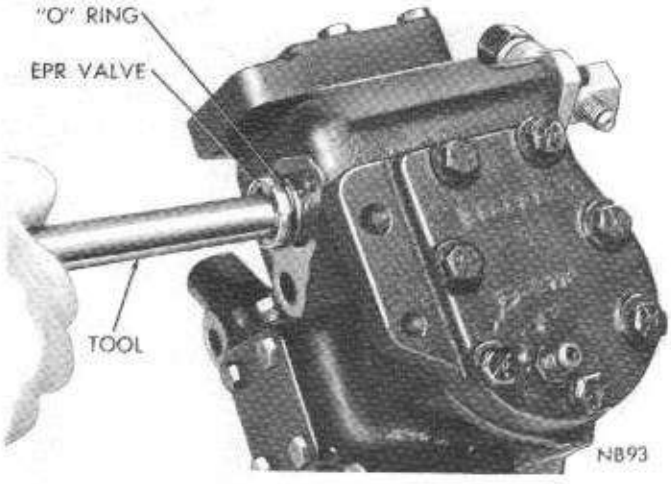


Fig. 58–Removing the EPR Valve

Installation

(1) Install new "O" ring on the "EPR" Valve.

(2) Lubricate "O" ring with refrigerant oil and install "EPR" Valve in the compressor with Tool C-3822 and rotating the valve counterclockwise.

(3) Install compressor suction screen in "EPR" Valve suction line fitting.

(4) Install suction line fitting gasket, spring, fitting, and attaching bolts.

COMPRESSOR

Removal

(1) Discharge the system. (Refer to "Discharging the System.")

(2) Measure and record the refrigerant oil level so that the oil level of a replacement or repaired compressor can be adjusted to the **exact level in the compressor removed from the vehicle.**

(3) Disconnect suction line from suction muffler and the discharge line from the muffler fitting.

CAUTION: Plug or cap all the lines as soon as they are disconnected to keep the moisture out of the system.

(4) Disconnect the magnetic clutch-to-control-unit wire.

(5) Loosen and remove compressor pulley belts.

(6) Remove compressor-to-bracket attaching bolts, and remove the compressor.

Installation

(1) Install the compressor to the bracket, and tighten attaching bolts.

(2) Install the compressor pulley belts.

(3) Connect the magnetic clutch-to-control-unit wire.

(4) Remove the caps or plugs and connect the suction line to the suction muffler and connect discharge line to the muffler fitting.

CAUTION: When replacing the compressor assembly, the crankshaft should be rotated by hand at least two complete revolutions to clear oil accumulation from the compressor head before the clutch is energized to avoid damaging the compressor reed valves.

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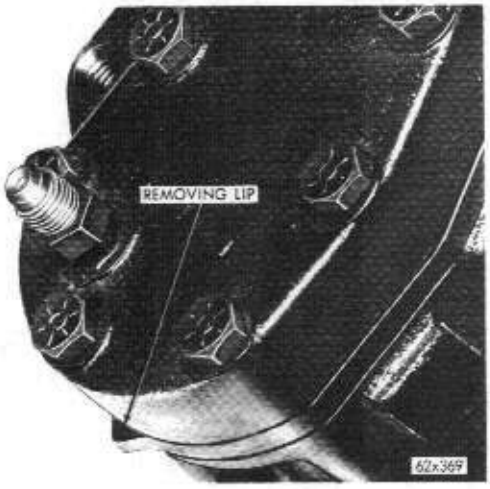


Fig. 59—Valve Plate and Head Removing Lip

IMPORTANT: After the compressor is installed on the engine, the oil level must be adjusted to the level recorded before removing the compressor. If the original oil level is not known, adjust 2¾ inches for 383-440 cubic inch engines measured through crankcase oil filler opening.

CYLINDER HEAD AND VALVE PLATE ASSEMBLY

Removal

(1) Remove cylinder head bolts, head and valve plate assembly. If the plate does not separate from the head, tap the removing lip on valve plate lightly with a plastic hammer (see Figure 59). Do not pry apart.

Inspection

After removal of head, plate and gaskets, examine the valves. If the valves are broken and damage extends to the cylinder bores, examine the bores to see if they can be repaired by removing light scoring, scuffing or scratches with a crocus cloth. After conditioning the cylinder bores, clean the surfaces of the cylinder block, valve plate and head thoroughly with mineral spirits.

Use care to remove all shreads of old gasket from plate, block and head surfaces. Clean attaching stud holes in the block. If the valve plate or cylinder head is damaged, replace, using a complete compressor valve plate replacement package.

CAUTION: Do not touch or pry the reed valves.

Installation

(1) The valve plate and the cylinder head must be assembled with the reed assembly, as shown in Figure 60.

(2) Dip gaskets in clean refrigerant oil. **Do Not Soak.** Using the pilot studs as a guide, install the valve plate gasket, valve plate, cylinder head gasket and cylinder head, as shown in Figure 61.

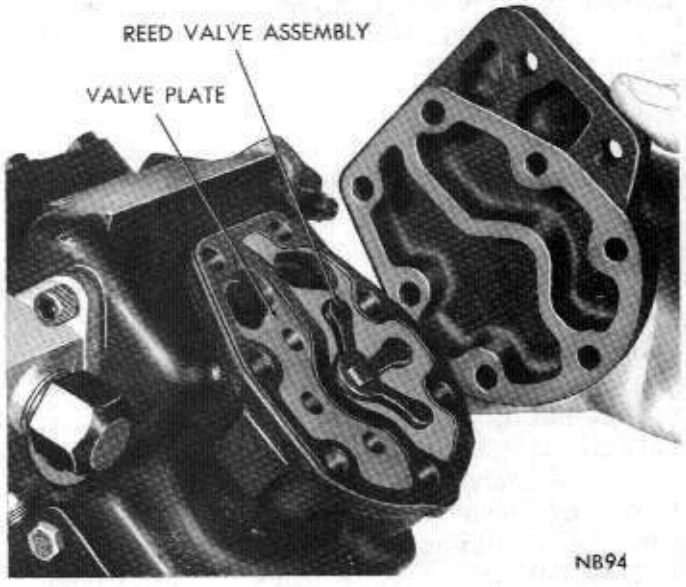


Fig. 60—Valve Plate-Installed Position

(3) Install attaching bolts. Tighten each bolt alternately and evenly 23 to 27 foot-pounds.

PISTON AND CONNECTING ROD

Removal

(1) Drain oil from compressor.

(2) Remove sump attaching bolts.

(3) Separate the sump from the case by tapping with a plastic hammer being careful not to distort the oil pressure relief spring.

(4) Remove oil relief spring and (rubber) ball from crankcase.

(5) Remove cylinder heads and valve plates.

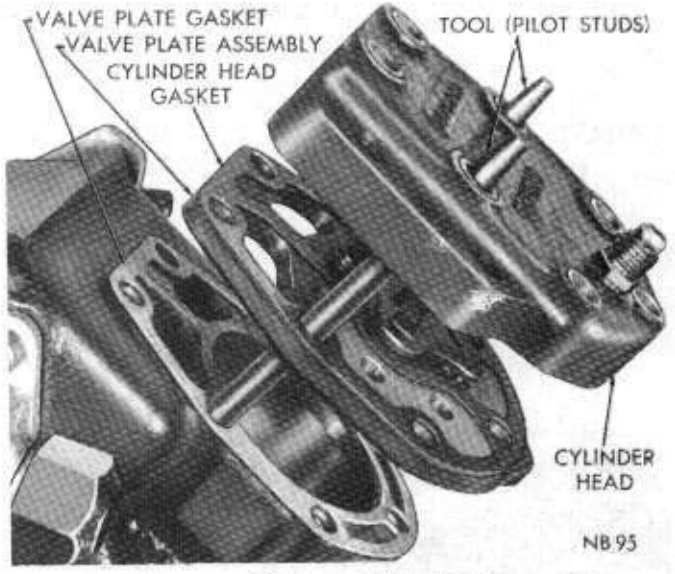


Fig. 61—Installing the Valve Plate and the Cylinder Head

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Before removing the pistons, rods or rod caps, mark all parts to insure reassembly in the original position.

(6) Remove rod caps; remove piston and rod assembly from cylinder.

Inspection

Inspect piston and rings for score marks. Inspect the rod bearing for pits and for chipping. Replace parts if damaged.

Installation

(1) Remove bearing cap and install piston in the bore. Use piston ring compressor to prevent ring damage.

(2) Install bearing caps, and tighten screws 52 to 56 inch-pounds. Be sure each cap is installed in its original position.

(3) Install valve plates and cylinder heads.

(4) Turn compressor upside down. Install pilot studs, gasket, oil pressure relief ball and spring.

(5) Install sump over the pilot studs (Fig. 62), making sure that the oil pressure relief spring depresses uniformly as the sump is lowered on the case.

(6) Tighten sump bolts finger tight to prevent spring misalignment, then tighten 15 to 19 foot-pounds.

(7) Refill with new refrigerant oil after the compressor is installed on vehicle. Do not re-use the oil that was previously drained.

CRANKSHAFT BEARING HOUSING AND GAS SEAL

Removal

(1) Remove crankshaft bearing housing seal bolts.

(2) Remove bearing housing from the crankcase, using two screwdrivers inserted in the slots provided to pry the housing from the case (Fig. 63).

(3) Remove crankshaft bearing housing gas seal seat plate from the bearing housing. This is part of the gas seal replacement package and must be replaced when the gas seal assembly is replaced.

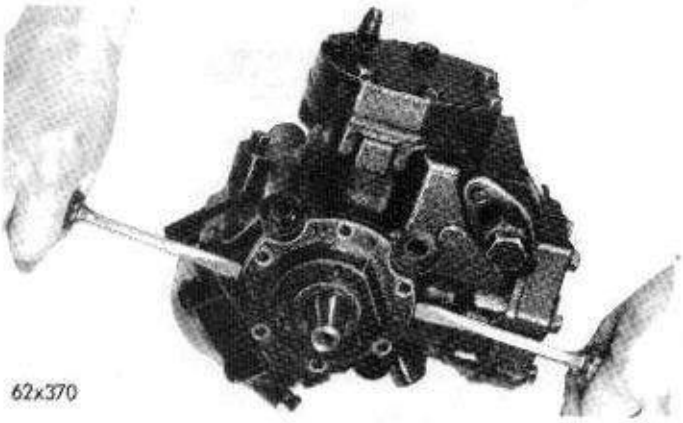


Fig. 63—Removing the Crankshaft Bearing Housing

(4) Remove gas seal from the crankshaft.

Installation

The crankshaft gas seal replacement package consists of the crankshaft gas seal assembly and the crankshaft bearing housing seal seat plate. Two types of crankshaft seals are supplied for service, as shown in Figure 64. If the replacement package contains the cartridge-type seal, follow the entire installation procedure given below. If the replacement package contains the unitized-type seals, steps 1, 2 and 4 will not apply.

(1) Before installing cartridge-type gas seal assembly, inspect the assembly to make sure that tangs index in slots of mating part. This will insure proper spring action. The carbon seal must be assembled as shown in Figure 64.

(2) Hold seal firmly on the outside edge to prevent it from rotating out of the index slots. **Do not touch**

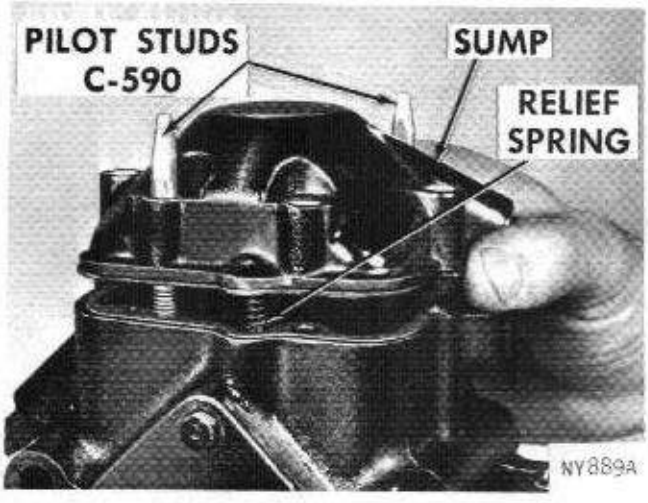


Fig. 62—Installing the Sump

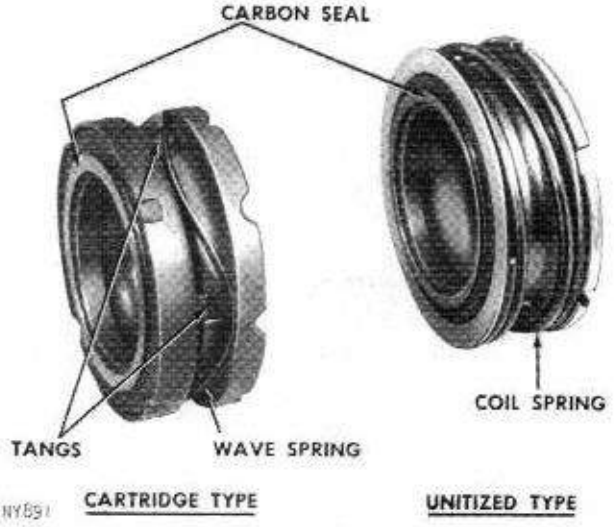


Fig. 64—Gas Seal Identification

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sealing face of carbon seal.

(3) Lubricate on crankshaft with refrigerant oil. Slide the seal on the crankshaft with the smooth (carbon seal) surface up, or toward the front of the compressor.

(4) When the seal bottoms against crankshaft bearing, inspect indexing of tangs again by pressing down with thumbs to see if it has the proper spring action. (Refer to Figure 65).

(5) Lubricate and install the crankshaft bearing housing seal seat plate with the smooth (micro-finish) side up. Use a sleeve with the minimum inside diameter of 1-3/8 inches to avoid damaging the micro-finish sealing surface of the face plate. Tap sleeve lightly until the seal seat is fully seated in the housing.

Cleanliness is important. Wipe seat clean with a lint-free cloth and re-oil with refrigerant oil.

(6) Install bearing housing oil seal, using plenty of refrigerant oil.

(7) Install the housing, making sure that it is in proper alignment with the screw holes. The gas seal assembly may be damaged if the bearing housing is rotated after the housing seal contacts the carbon seal.

(8) Install the bolts and tighten 10 to 13 foot-pounds.

CRANKSHAFT AND BALL BEARING

Removal

(1) Remove cylinder heads and valve plates.

(2) Remove pistons and connecting rods.

(3) Remove crankshaft bearing housing and gas seal.

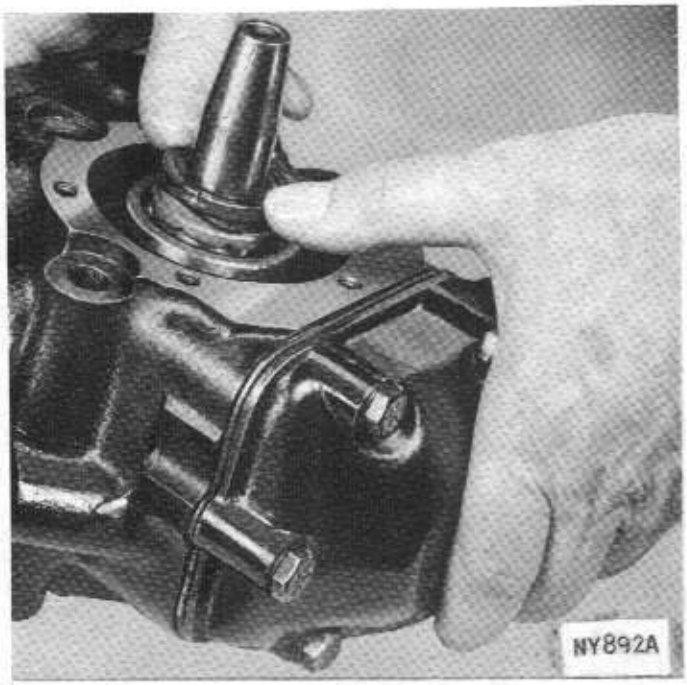


Fig. 65—Inspect the Indexing of Tangs

The pistons and rods must be completely removed before the crankshaft removal.

(4) Remove crankshaft and thrust washer from crankcase.

(5) Use a small arbor press to remove the crankshaft ball bearing. Make sure the bearing is properly supported before pressing the bearing from the shaft.

Inspection

Clean and inspect all the parts. Replace the questionable parts as required. If the crankshaft ball bearing is in good condition and clean, protect it against entry of dirt and re-use it. If the bearing is serviceable but dirty, or there is evidence of dirt, clean it carefully with mineral spirits and shake dry. Saturate the bearing with clean refrigerant oil and assemble immediately. If a new bearing is to be installed, leave it wrapped in its protective package until ready for installing.

Do not wash a new bearing assembly before installation.

Installation

(1) Press the crankshaft ball bearing on the crankshaft using a sleeve which bears on the inner race **only.**

(2) Install the crankshaft, making sure that the thrust washer is on the rear bearing journal before placing the crankshaft in the crankcase.

(3) Rotate crankshaft to engage the oil pump shaft in the crankshaft slot.

(4) Install the new gas seal and crankshaft bearing housing. Use a suitable tool, as shown in Figure 66 to assure the free axial movement.

(5) Install the pistons and connecting rods.

(6) After pistons and connecting rods are installed, turn the crankshaft to check freeness. Shaft should turn without binding.

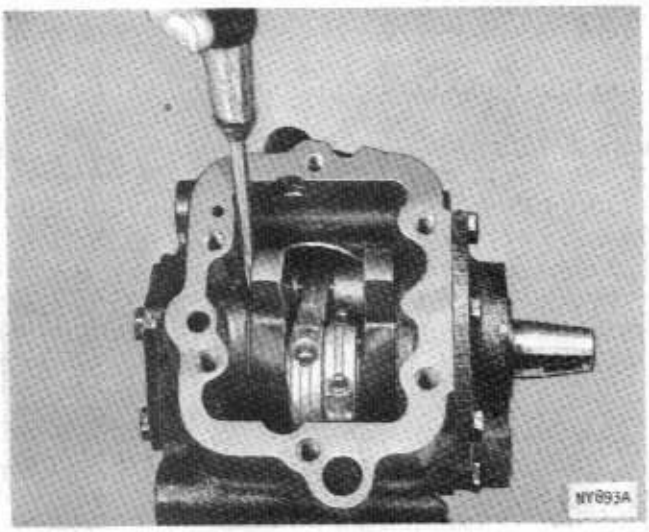


Fig. 66—Measuring the Crankshaft Axial Movement

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(7) Install oil sump, valve plates and cylinder heads, using new gaskets.

OIL PUMP

Removal

To remove oil pump, it is not necessary to drain refrigerant oil from the crankcase.

(1) Remove oil pump cover plate and the oil seal.
(2) Remove drive shaft and rotors.

Installation

(1) Install oil pump drive shaft by rotating the shaft until tang end engages in the crankshaft slot.
(2) Install inner rotor on the drive shaft, engaging the drive.
(3) Install outer rotor, and rotate it until it will slide forward over the inner rotor cams. Turn compressor crankshaft with the oil pump in this position to determine that rotors do not bind.
(4) Install oil pump cover plate and oil seal.
(5) Tighten the bolts 10 to 13 foot-pounds.

EXPANSION VALVE

(Imperial)

The expansion valve is a factory-calibrated trouble free unit. It should not be removed or replaced unless a complete test has proven it to be faulty. It is recommended that Test 8, "Expansion Valve Test," be performed before replacing the expansion valve.

Removal

The system must be completely discharged before opening any of the refrigerant lines.

(1) Remove the equalizer line from the evaporator suction line fitting.
(2) Disconnect the valve from the 3/8 inch inlet line and from the ½ inch outlet line. Use two wrenches to loosen each of these connections.
(3) Remove the grommet retainer and the rubber grommet from the evaporator engine-side housing. Carefully pull the thermal bulb (Fig. 67) and the thermal bulb wedging shims from the well located inside the evaporator housing.

Installation

Clean the thermal bulb well, wedging shims and thermal bulb before installing the expansion valve. The valve will not function properly unless there is a good thermal contact between the bulb and its well.

Clean parts and a tight fit of the bulb in the well will insure a good thermal contact.

(1) Install the thermal bulb in its well, using brass wedging strips to insure a tight mechanical fit.
(2) Lubricate the expansion valve, line fittings, and new "O" rings with clean refrigerant oil. Install the expansion valve, using **two** wrenches to prevent rotation and twisting of the lines.
(3) Install the rubber grommet in the housing, and install the grommet retainer.
(4) Connect the equalizer tube to the fitting on the evaporator suction line.
(5) Using two wrenches, test all connections for tightness.

After the expansion valve is installed, it must be completely tested. Then the system must be tested for leaks and recharged.

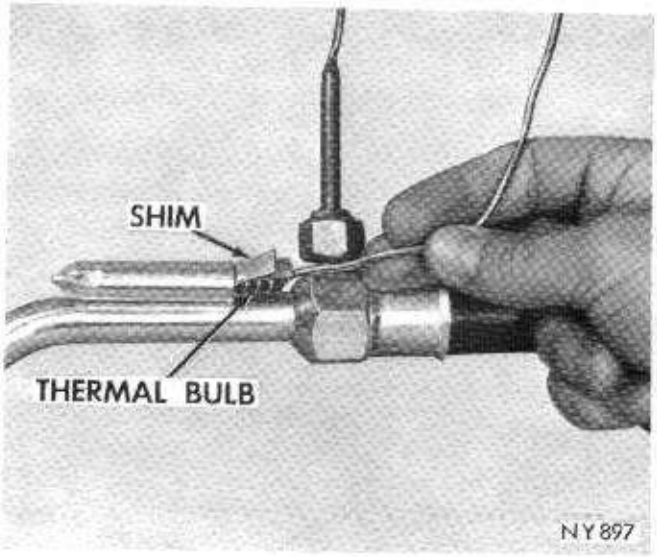


Fig. 67—Thermal Bulb Installed Typical

HEATER CORE

(Imperial)

The heater core is located behind a **separator cover** attached to the evaporator engine-side housing. The core is held in position in its cover by two plastic rivets. The heater core and cover are removed and installed as an assembly. (Refer to Figure 68.)

Removal

(1) Drain the cooling system and remove the heater

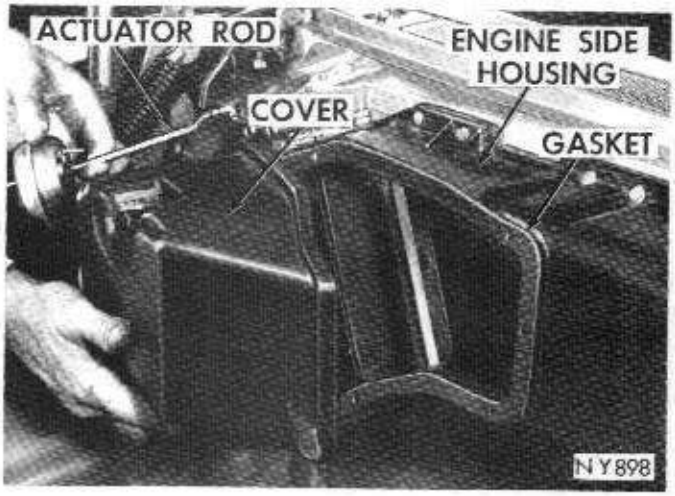


Fig. 68—Removing the Heater Core

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hoses from the core.

(2) Disconnect the by-pass door vacuum actuator rod from the actuator linkage on the engine side housing. Disconnect the vacuum lines from the actuator.

(3) Remove the heater core and cover attaching screws, and lift the entire assembly from the evaporator engine-side housing.

(4) Remove the cover-to-evaporator-housing gasket to expose the two plastic rivets. These are expansion type rivets. Pull the expanding pin from each of the rivets so the core can be separated from the cover without damaging the rivets.

Installation

(1) Position the heater core in its cover and install the two plastic rivets to maintain alignment of these two parts.

(2) Install the rivet expanding pins in the rivets to hold the core and cover assembly together.

(3) Carefully position the gasket between the cover and the engine-side evaporator housing so it will seal both the core-to-cover flange and the cover-to-evaporator-housing joint. Cement the gasket in place to facilitate installation.

(4) Install and tighten the heater core and cover attaching screws. Be careful to maintain the gasket alignment to insure an air-tight seal at this point.

(5) Connect the by-pass door actuator rod and vacuum lines.

(6) Connect the heater hoses, and refill the cooling system. For summer operation as well as winter operation, be sure the system is protected with the proper type and amount of antifreeze.

EVAPORATOR ASSEMBLY

(Imperial)

The evaporator assembly includes the evaporator core, the cast evaporator housing with fresh-air and recirculating doors, and the evaporator engine-side housing with the heater by-pass door. These sub-assemblies are built up before installation on the car to form a complete unitized evaporator assembly. The unitized evaporator assembly must be removed and installed as a complete assembly. (Refer to Figure 69.)

Removal

(1) Remove the heater core and cover assembly from the evaporator engine-side housing. Remove the temperature control valve capillary from its well in the engine-side housing.

(2) Discharge the refrigerant from the system, and disconnect the expansion valve and the suction line. Cap all refrigerant lines to prevent entrance of dirt and moisture.

(3) Disconnect the recirculating door actuator rod from the recirculating door linkage. This actuator is located on the distribution duct in the passenger compartment. Position the recirculating door linkage so the **fresh-air door** is fully closed.

(4) Remove all 15 evaporator assembly attaching screws. These screws, particularly the ones located along the lower edge of the housing, are difficult to reach. They must all be removed before attempting to pull the evaporator assembly out of the dash panel. A 3/8″ drive flexible extension (Tool C-3622) and palm grip ratchet (Tool C-3616) will facilitate removal of the evaporator housing attaching screws. The evaporator assembly can now be pulled from the dash panel. Make sure that the fresh-air door remains closed as the assembly is removed.

It will not be necessary to separate the evaporator housing from the evaporator engine-side housing unless the evaporator core is to be repaired. To separate these two housings, drill out the tubular rivets. After installation of a new or repaired core, install new gaskets and cement them in place to insure an air-tight seal between the two housings. Reassemble the core in the evaporator housing and then assemble the evaporator housing to the engine-side housing, using tubular rivets.

Installation

Before installing the evaporator assembly, inspect the evaporator drains. Make sure they are secure and functioning properly. There is one tubular-type drain valve in the engine-side housing. If this valve sticks in the closed position, condensed moisture will collect in the evaporator. If the valve sticks in the open position,



Fig. 69—Evaporator Installation

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it will allow hot air to leak into the air distribution system. There are four flapper-type valves in the cast evaporator housing. It is recommended that a small piece of tape be used at the rear edge of each of these valves to hold it in place during installation of the evaporator assembly. Also, make sure there is an air-tight seal between the engine-side housing and the cast evaporator housing.

(1) Close the fresh-air door and install the evaporator assembly as shown in Figure 69. Make sure the rear edge of the rain shield is folded upward.

(2) Install all evaporator assembly attaching screws, and tighten lightly. After all screws are installed, tighten alternately until all are tight. Alternate tightening of the screws will prevent distortion or damage to the assembly.

(3) Install the heater core and cover. Install the temperature control valve sensing bulb in the engine side housing. Connect the heater hoses.

(4) Reconnect the by-pass door and recirculating door vacuum actuators.

After the evaporator assembly is installed in the vehicle, it will be necessary to connect the expansion valve, sweep the system, test for leaks, and charge the system with the proper amount of refrigerant. It is recommended that the operation of all controls be tested and an over-all performance test be made after repair or replacement of the evaporator assembly.

TRUNK UNIT

(Imperial)

Removal (Fig. 70)

(1) Discharge the refrigerant from the system.

(2) Remove the rear seat, back rest and insulation blanket to assist in removal of the trunk unit components.

(3) Release the four clamps on the flexible ducts (Fig. 71) and remove the ducts from the evaporator.

(4) Disconnect electrical connections and drains.

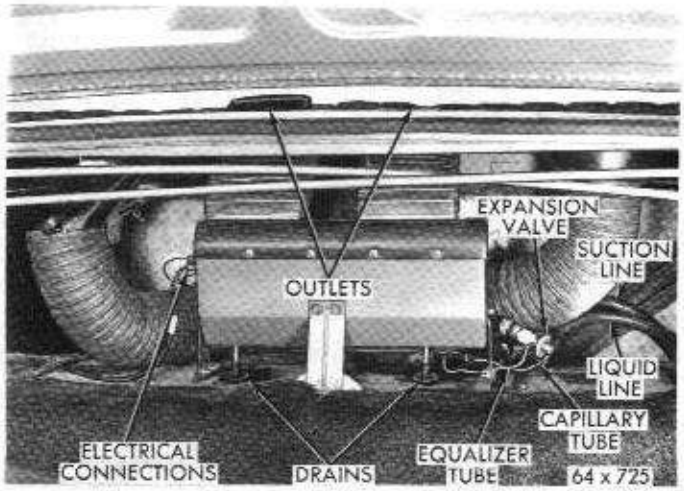


Fig. 70—Evaporator Installed in the Trunk

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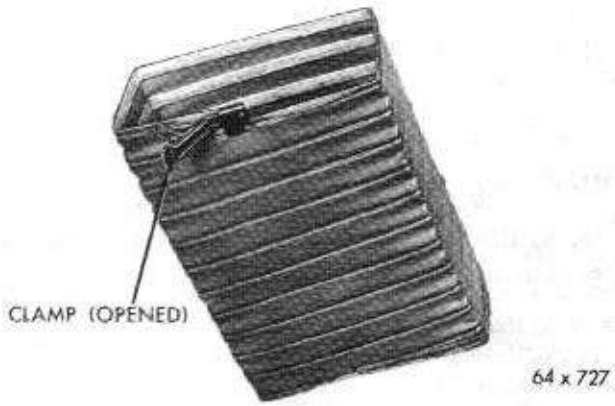


Fig. 71—Outlet Tube and Clamp

(5) Disconnect the suction and discharge lines. Cap all refrigerant lines to prevent dirt and moisture from entering the system.

(6) Remove the mounting bracket to flange bolts (six) and remove the evaporator assembly from the luggage compartment.

Installation

(1) Position the evaporator assembly in the luggage compartment and install the mounting bracket to flange bolts. The blower motor ground is connected to the left front bolt.

(2) Install the electrical connection and drains.

(3) Use new "O" rings with clean refrigerant oil on connections. Install the suction and discharge lines using two wrenches to prevent rotation and twisting of the lines.

(4) Install the flexible ducts and secure the clamps.

(5) After the evaporator assembly is installed in the vehicle, it will be necessary to sweep the system. Test for leaks, and charge with the proper amount of refrigerant.

An over-all Performance Test should be made after repair or replacement of the evaporator assembly.

(6) Install the insulation blanket, back rest and back seat.

BLOWER MOTOR AND DISTRIBUTOR DUCT

(Imperial)

Removal

(1) Disconnect the battery ground cable.

(2) Disconnect the heater ground wire at the windshield wiper motor mounting bracket and disconnect the blower and clutch circuit wires from the harness connectors.

(3) Disconnect the vacuum hoses and the actuator rods from each vacuum unit. Remove the hoses from their attaching clips.

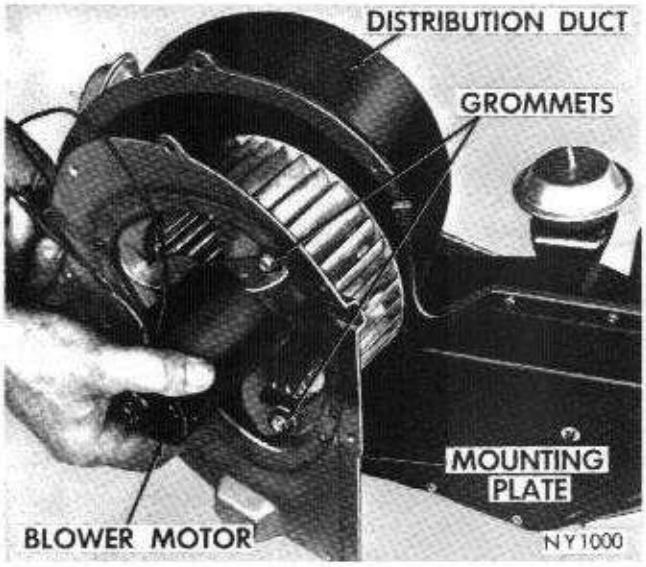


Fig. 72—Removing the Blower Motor

(4) Disconnect the distribution duct damper control cable.

(5) Remove the temperature control valve capillary from the engine-side housing.

(6) Remove the three screws attaching the distribution duct to the dash panel (one is located to the left of the recirculating door and to the right of brake pedal bracket; one below the floor outlet at passenger side, and one screw is located at the windshield wiper motor ring link pivot).

To facilitate the removal, disconnect the windshield wiper right link at the pivot to expose the housing screw.

(7) Remove the housing and the blower by pulling down and out of driver's compartment. Remove the blower, mounting plate and motor (See Figure 72).

Installation

If the blower is removed from the mounting plate, be sure the mounting grommets are installed at the attaching bolts.

(1) Install the blower motor and mounting plate to the distribution duct. Be sure the blower wheel is free and does not rub.

(2) Test the operation of right spot cooler outlet by applying vacuum to actuator away from the rod side. If the linkage is correct, the outlet door will be fully closed, adjust the linkage as necessary (Fig. 73).

(3) Position the housing on the dash panel, making sure the large mounting-plate-to-dash-panel gasket is properly positioned to insure a good seal. Install the three attaching screws.

CAUTION: There is a spacer at each attaching screw. Be sure these spacers are installed between the distribution duct and the dash panel when installing the housing; otherwise, the housing could be damaged when tightening the screws.

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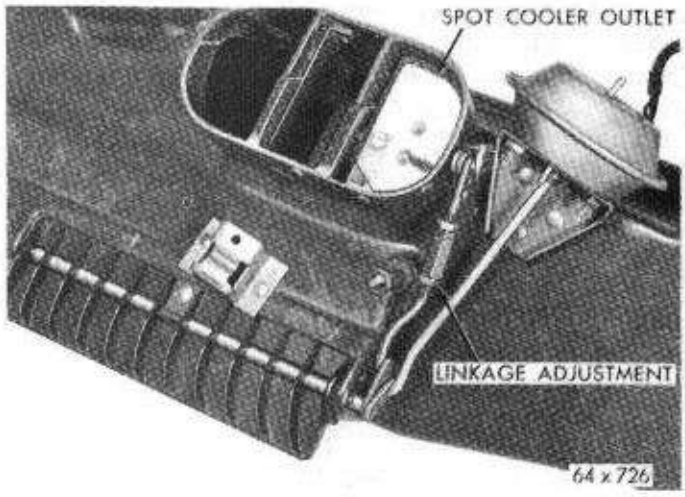


Fig. 73—Right Spot Cooler Outlet

(4) Reposition the temperature control valve capillary in the engine-side housing.

(5) Connect the vacuum actuator hoses and rods, and install all attaching clips.

(6) Connect and adjust the distribution duct damper control cable.

(7) Connect the blower and clutch circuit wires. Install the ground wire at the windshield wiper motor bracket.

(8) Attach the windshield wiper motor pivot link (if disconnected). Connect the battery ground cable.

(9) Test the operation of all controls and actuators.

EXPANSION VALVE

(Chrysler)

Removal

The system must be completely discharged before opening any of the refrigerant lines.

(1) Disconnect the equalizer line from the suction

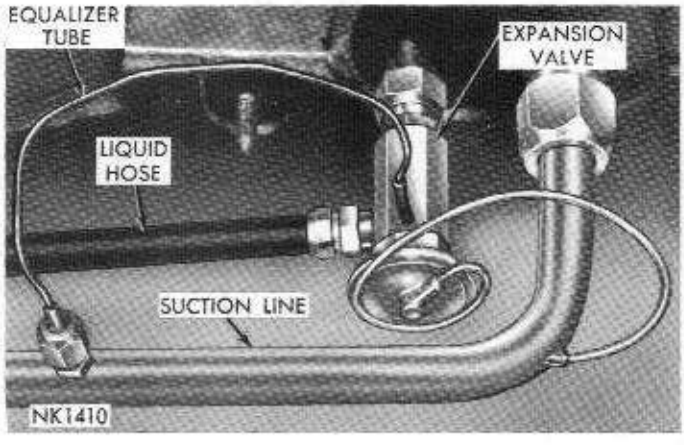


Fig. 74—Expansion Valve Installed

line fitting (Fig. 74).

(2) Disconnect the expansion valve from the liquid line and the evaporator. Use two wrenches to loosen each of these connections.

(3) Carefully pull out the capillary sensing tube from the suction line well.

(4) Remove the rubber seal from the capillary sensing tube. Inspect condition of inlet screen.

Installation

(1) With new "O" rings and clean refrigerant oil on all fittings, connect the expansion valve to the liquid line and the evaporator assembly using two wrenches to prevent rotation and twisting of the lines.

(2) Connect the equalizer tube to the fitting on the suction line.

(3) With a rubber seal on the capillary sensing tube, carefully insert the tube in the suction line well as far as it will go (approximately five inches).

(4) After the expansion valve is installed, it must be completely tested and the system must be tested for leaks and recharged.

HEATER CORE

(Chrysler)

Removal

The heater core is located behind a separate cover attached to the evaporator case forward of the instrument panel (Figs. 75 and 76).

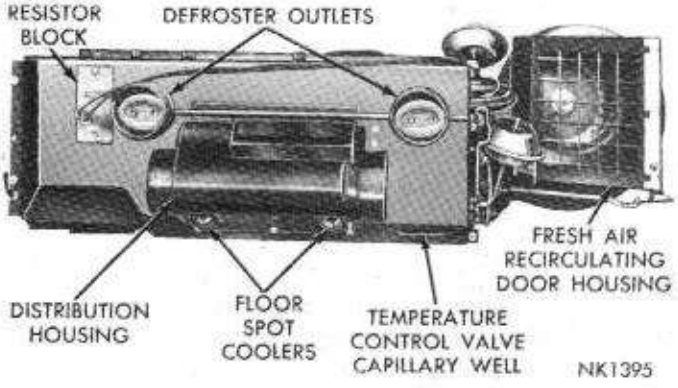


Fig. 75—Heater and Evaporator Assembly —Front View

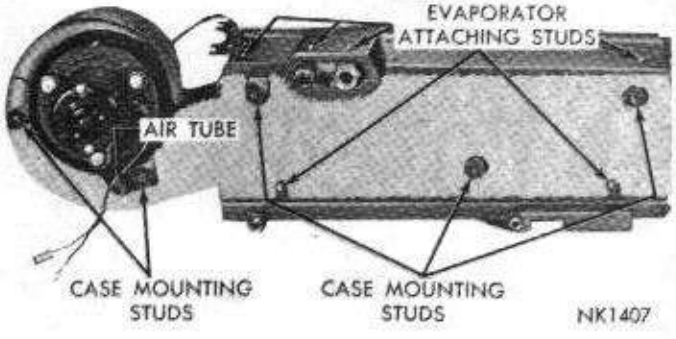


Fig. 76—Heater and Evaporator Assembly—Rear View

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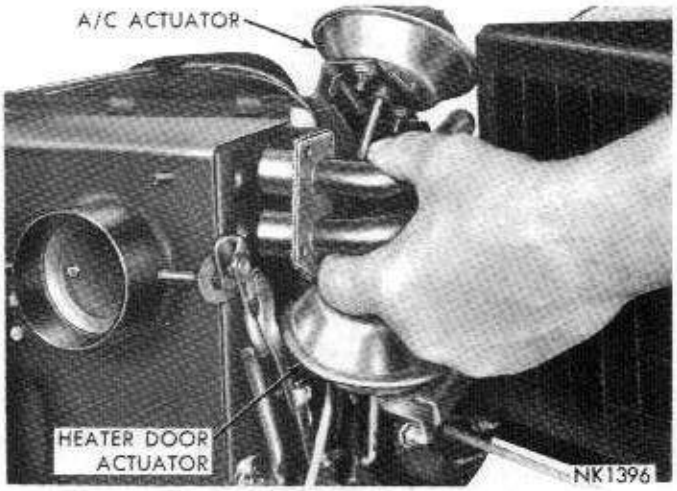


Fig. 77—Heater Core Water Tube Assembly— Removal or Installation

(1) Disconnect the cable at the battery, drain the cooling system, remove the air cleaner, and disconnect the heater hoses.

(2) Remove the distribution housing (Fig. 75) glove box and the heater core inlet-outlet tube assembly. (Fig. 77).

(3) Remove the fresh air-recirculating air inlet hose.

(4) Disconnect the floor air actuator rod from linkage.

(5) Disconnect the actuator vacuum hoses and remove the fresh air-recirculating door housing assembly. (Fig. 78).

(6) Remove the defroster hoses, disconnect the electrical connections from the resistor block and by-pass switch.

(7) Remove the two screws attaching the water by-pass valve to the heater cover and the operating link attaching screw (Fig. 79).

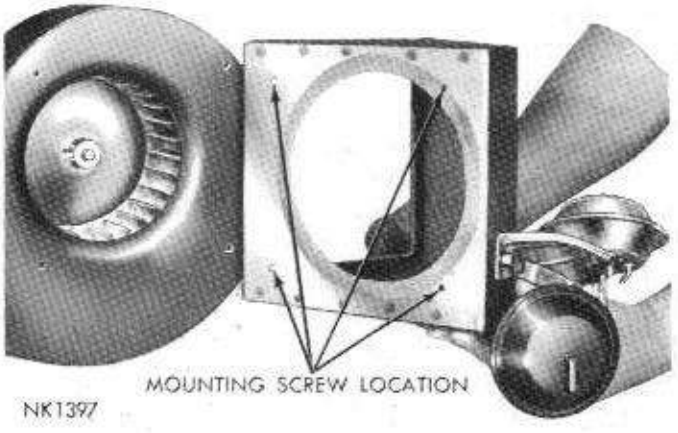


Fig. 78—Fresh Air-Recirculating Door Housing Removal or Installation

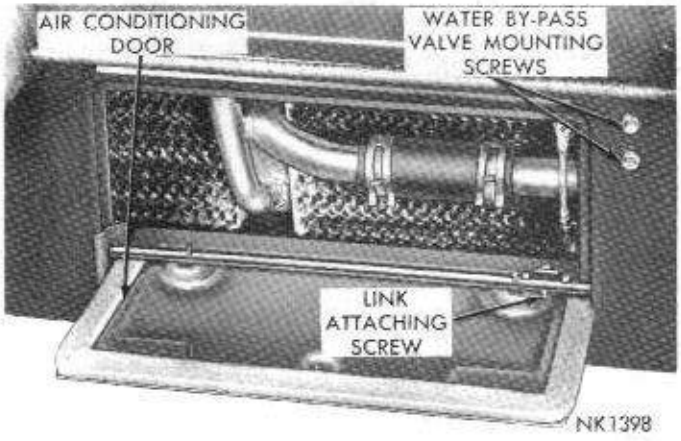


Fig. 79—Water By-Pass Valve Link Attaching Screw

(8) Disconnect the air conditioning door actuator from the mounting bracket and remove the two support braces.

(9) Remove the five retainer spring clips and the ten screws attaching the cover to the case.

(10) To remove the cover and heater core it will be necessary to pull the lower edge rearward, then lift assembly ⅜ inch to unhook the cover lip from the case. Carefully lower the assembly and out to the right side.

Installation

Install the water by-pass valve with linkage to the heater core (if removed). Use new "O" rings on the inlet and outlet tubes (Fig. 80).

(1) Position the heater core on the evaporator case.

(2) To install the cover it is necessary to hook the cover lip on the evaporator case and roll it down into position. Secure the cover with the five retainer spring clips on top and the ten screws on the two sides and bottom.

(3) Attach the water by-pass valve to the heater cover and the operating link to the air conditioning door.

(4) Install the air conditioning door actuator with the vacuum hoses (hose with red stripe to the rod side), and the two support braces.

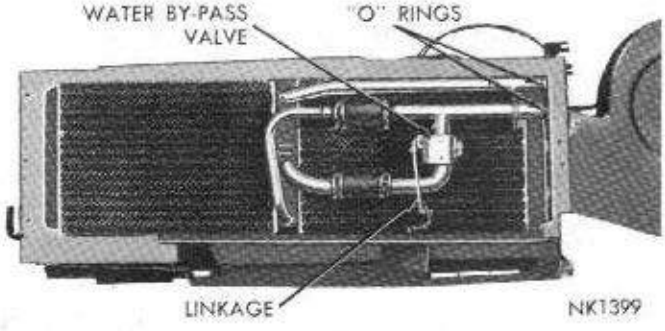


Fig. 80—Heater Core and By-Pass Valve Assembly

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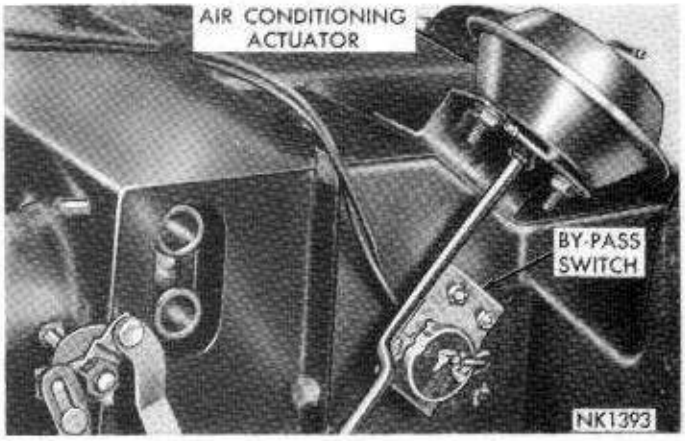


Fig. 81—By-Pass Switch Adjustment

(5) Install the electrical connections to the resistor block.

(6) Adjust the electrical by-pass switch operating arm to have .020 to .060 inch operating clearance between the operating arm and the actuator rod. (Fig. 81).

(7) Install the vacuum hoses to the floor air actuator and the fresh air-recirculating actuator (hose with red stripe to the rod side) and install the fresh air-recirculating door housing. Connect the floor air actuator rod to the linkage with the retainer clip.

(8) Install the fresh air-recirculating air inlet hose

(9) Install the heater core inlet-outlet tube assembly, a drop or two of clean water on the "O" rings will facilitate the installation.

(10) Install the temperature control valve capillary tube in the heater core cover.

(11) With the air conditioning door open approximately one inch, install the distribution housing.

(12) Install the flexible hoses to the instrument panel outlets.

(13) Install the glove box assembly.

(14) Connect the heater hoses and fill the cooling system. For summer operation as well as winter operation, be sure the system is protected with the proper type and amount of antifreeze.

(15) Install the air cleaner and connect the battery cable.

(16) Start the engine, operate until the normal engine operating temperature is obtained and test the operation of the heater assembly.

EVAPORATOR

(Chrysler)

Removal

The system must be completely discharged before opening any of the refrigerant lines.

To remove the evaporator and case assembly it is necessary to remove the heater core and cover assembly first.

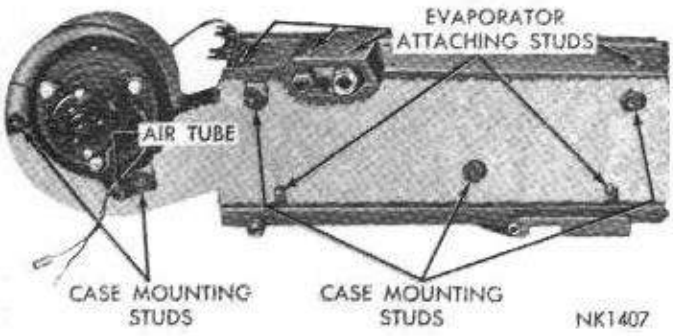


Fig. 82—Heater and Evaporator Assembly—Rear View

(1) Disconnect the suction line and the expansion valve from the evaporator. Use two wrenches to loosen each of these connections.

Cap all refrigerant openings to prevent the entrance of dirt and moisture.

(2) Disconnect the blower motor wires and air tube.

(3) Remove the five mounting stud nuts and remove the evaporator assembly with the blower motor as a single unit (Fig. 82).

(4) Remove the six evaporator attaching screws and carefully remove the evaporator from the case. (Fig. 83).

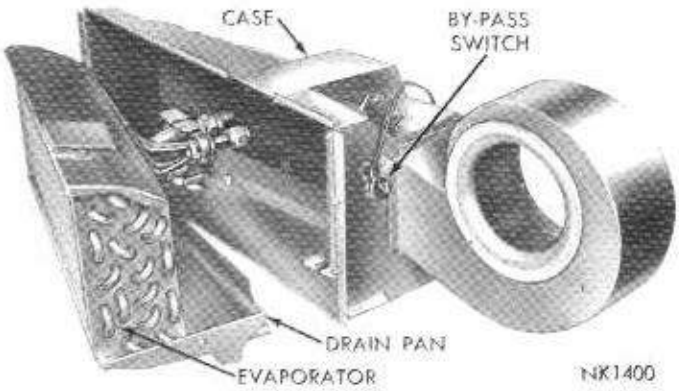


Fig. 83—Evaporator Removed from Case

Installation

(1) Install the evaporator and drain pan being careful not to damage the case insulation, secure the six attaching screws.

(2) Install the collars and insulators on the two drain tubes. (Fig. 84).

(3) Position the evaporator with the blower motor on the dash panel and install the stud nuts that attach the assembly to the dash panel.

(4) Install the blower motor wires and air tube.

(5) Use new "O" rings with clean refrigerant oil on all connections. Install the suction line and the expansion valve to the evaporator fittings. Use two wrenches to prevent rotation and twisting of the lines.

(6) Install heater as described in Paragraph

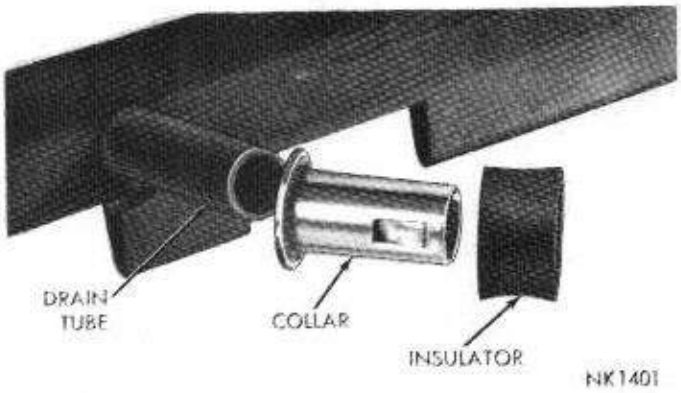


Fig. 84—Evaporator Drain Tube Collar and Insulator

"Heater."

After the evaporator and heater assemblies are installed in the vehicle, it will be necessary to sweep the system, test for leaks and charge the system with the proper amount of refrigerant. It is recommended that the operation of all controls be tested and an overall performance test be made after the repair or replacement of the evaporator assembly.

BLOWER MOTOR

(Chrysler)

All service to the blower motor is made from the engine compartment side.

Removal

(1) Disconnect the feed wire at the connector and the ground wire. Remove the air tube.

(2) Remove the three sheet metal screws located on the outer surface of the mounting plate. (Fig. 85).

(3) Remove the mounting plate, blower motor and fan as an assembly.

Installation

If the blower was removed from the mounting plate, be sure the mounting grommets are installed at

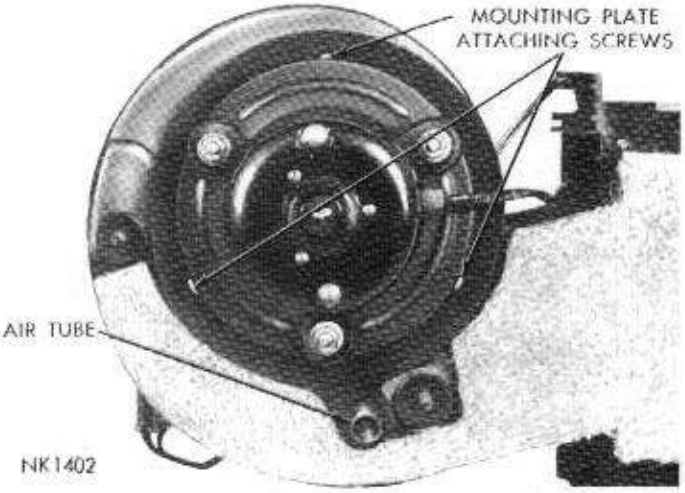


Fig. 85—Blower Motor Installed

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the attaching bolts. Be sure the blower wheel is free and does not rub.

(1) Install the blower motor assembly to the evaporator case with the air tube opening to the bottom. Secure with the three sheet metal screws.

(2) Install the air tube, motor ground wire and connect the feed wire.

(3) Test operation of blower.

1966 REFRIGERANT CHARGE

MODEL	Single	Dual
Imperial	3 lbs. 14 oz. to 4 lbs. 2 oz.	4 lbs. 14 oz. to 5 lbs. 2 oz.
Chrysler	2 lbs. 14 oz. to 3 lbs. 2 oz.	3 lbs. 14 oz. to 4 lbs. 2 oz.

An accurate scale must be used to insure charging with the proper amount of refrigerant.

Since the use of canned refrigerant is preferred universally, only that method is described.

COMPLETE SYSTEM DISCHARGE AND RECHARGE

REFRIGERANT SERVICE

Use only Refrigerant 12 in the 1966 air-conditioning system. Refrigerant 12 is available in bulk tanks or in sealed 15 ounce cans. The use of canned refrigerant is preferred by most technicians because it provides a very quick and simple means of adding refrigerant or charging the system completely. Refer to the 1966 Refrigerant Charge Chart.

Before the system can be opened for replacement of lines or components, the system must be completely discharged. It is also necessary to discharge the system before performing the Compressor Capacity Test and the Expansion Valve Test. Whenever the system has been opened, it must be swept with a partial charge, and the entire system tested for leaks. The drier should be replaced and the system evacuated using a vacuum pump to remove all air and moisture. The system should be charged with the proper amount of refrigerant. Detailed instruction for performing these operations follow.

DISCHARGE THE SYSTEM

(1) Be sure the valves of the gauge manifold set are closed before attaching the gauge set manifold (suction test hose to the suction service port and discharge test hose to the discharge service port). Attach the long test hose to the center connection of the gauge set manifold. Lead the other end of this hose into an exhaust ventilation system outlet or to the outside of the building.

(2) Open the gauge set manifold needle valve and close both of the gauge set manifold gauge valves.

(3) With the vehicle windows open and hood up, operate the engine as shown in the following chart:

Model	Engine	Engine R.P.M.
Imperial	8 Cyl.	800
Chrysler	8 Cyl.	1300

(4) **Imperial installation**—push in "Fresh Cool" button, blower on high. On dual installation both blowers must be on high speed during the charging operation.

Chrysler installation—push in "A/C" button, fan switch on high. On dual installation both blowers must be on high speed during the charging operation.

(5) Allow the system to operate at full capacity for at least 15 minutes at the rpm shown in the chart step 3. This will cause most of the compressor oil in the system to return to the compressor crankcase.

(6) Open the discharge right-hand gauge valve a small amount. This will allow the refrigerant vapor to discharge **slowly.**

CAUTION: Do not allow the system to discharge rapidly since this would sweep some of the refrigerant oil out of the compressor.

(7) Allow the system to discharge until the discharge pressure gauge registers zero. Open the left-hand valve to release any vapor trapped at the suction side of the system.

SWEEP-TEST CHARGE

The purpose of the sweep-test charge is to pressurize the system so that a leak test can be made. The sweep-test charge also serves the purpose of drying the system or sweeping out trapped moisture. Repairs and component replacement must be completed before charging with the sweep-test charge.

(1) Close both gauge set manifold valves and open the gauge set manifold needle valve.

(2) Attach the free end of the long hose used for discharging to the refrigerant dispensing manifold.

(3) Attach a single can of Refrigerant 12 to the dispensing manifold. Place the refrigerant in 125 degree water. For detailed instructions on attaching refrigerant can for charging, see "Charging the System" in this section.

(4) With the vehicle windows open and hood up, operate the engine as shown in the following chart:

Model	Engine	Engine R.P.M.
Imperial	8 Cyl.	800
Chrysler	8 Cyl.	1300

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(5) **Imperial installation**—push in "Fresh Cool" button, blower on high. On dual installation both blowers must be on high speed during the charging operation.

Chrysler installation—push in "A/C" button, fan switch on high. On dual installation both blowers must be on high speed during the charging operation.

(6) Slowly open the left-hand gauge set manifold valve to meter the refrigerant into the system. When the full can of refrigerant has been metered into the system, close the gauge set manifold valves and the refrigerant manifold valve.

If the system has been opened for repair or replacement, a complete leak test must be made to make sure the system is sealed. Also, if the system has accidentally lost its charge it will be necessary to perform a leak test while the sweep-test charge is in the system. Stop the engine and disconnect the test hoses and adapters from the compressor service ports.

TESTING THE SYSTEM FOR LEAKS

The leak detector torch Tool C-3569 is a propane gas-burning torch used to locate a leak in any part of the refrigeration system. Refrigerant gas drawn into the sampling or "snifter" tube will cause the flame to change color in proportion to the size of the leak. A very small leak will produce a flame color varying from yellowish-green to bright green. A large leak will produce a brilliant blue flame.

CAUTION: Do not use the lighted detector in any place where explosive gases, dust, or vapor are present. Do not breathe the fumes that are produced by the burning of refrigerant gas. Large concentrations of refrigerant in the presence of a live flame become dangerously toxic. Observe the flame through the window of the burner shield, not through the top of the shield.

(1) Open the torch valve until you hear a faint hiss of escaping gas. Light the test torch and adjust the valve until the flame is very small. A small flame will detect large as well as small leaks, whereas, a large flame will detect only large leaks. As soon as the reaction plate seen through the window in the burner shield becomes red hot, the tester is ready for use.

(2) Examine all the tube connectors and other possible leak points by moving the end of the sampling hose from point to point. Since Refrigerant 12 is heavier than air, it is good practice to place the open end of the sampling hose directly below the point being tested. Be careful not to pinch the sampling tube since this will shut off the air supply to the flame and cause a color change.

(3) Watch for a change in the color of the flame. Small leaks will produce a green color and large leaks a bright blue color. If leaks are observed at the tube fittings, tighten the connection, using the proper flare wrenches, and retest.

If the flame remains bright yellow when the tester is removed from a possible leak point, insufficient air is being drawn in through the sampling tube, or the reaction plate is dirty.

REMOVE SWEEP-TEST CHARGE

If the system if free of leaks, or after correcting a leak, if no air-conditioning components have been removed, add the necessary refrigerant as described under "Correcting the Low Refrigerant Level." If any parts of the refrigerant system were disconnected remove the sweep-test charge. Close the refrigerant manifold valve so that any refrigerant remaining in the container is sealed. Remove the long test hose from the refrigerant manifold. Insert the free end of this test hose into an exhaust system outlet. Open the right-hand gauge set manifold valve a fraction of a turn to let the sweep-test charge escape slowly. Allow the system to discharge until the discharge pressure gauge registers zero. Open the left-hand gauge valve to allow any refrigerant trapped in the suction side of the system to escape.

REPLACE THE RECEIVER-DRIER-STRAINER

The system must be discharged and swept with a test charge before replacing the receiver-drier-strainer. To remove the receiver-drier-strainer, simply unscrew it from the combination dry-eye sight glass. When installing a new receiver-drier-strainer, use a new gasket. Tighten the new unit to 12 foot-pounds. Do not overtighten since this might damage the gasket.

CAUTION: Replacement receiver-drier-strainer units must be sealed while in storage. The drier used in these units is so hungry for moisture that it can saturate quickly upon exposure to the atmosphere. When installing a drier, have all tools and supplies ready for quick reassembly to avoid keeping the system open any longer than necessary.

EVACUATE THE SYSTEM

Whenever the system has been opened to atmosphere, it is absolutely essential that the system be swept with refrigerant and evacuated or "vacuumed" to remove all the air and the moisture. If any appreciable amount of air remains in the system when it is charged, the trapped air will concentrate near the top of the condenser and cause abnormally high discharge pressures. Air in the system will reduce the condenser's ability to condense the refrigerant gas and supply adequate liquid refrigerant to the evaporator. To evacuate the system, proceed as follows:

(1) Connect the gauge set manifold to the compressor and the long test hose from the gauge set manifold center connection to the vacuum pump, Tool C-3652, as shown in Figure 86.

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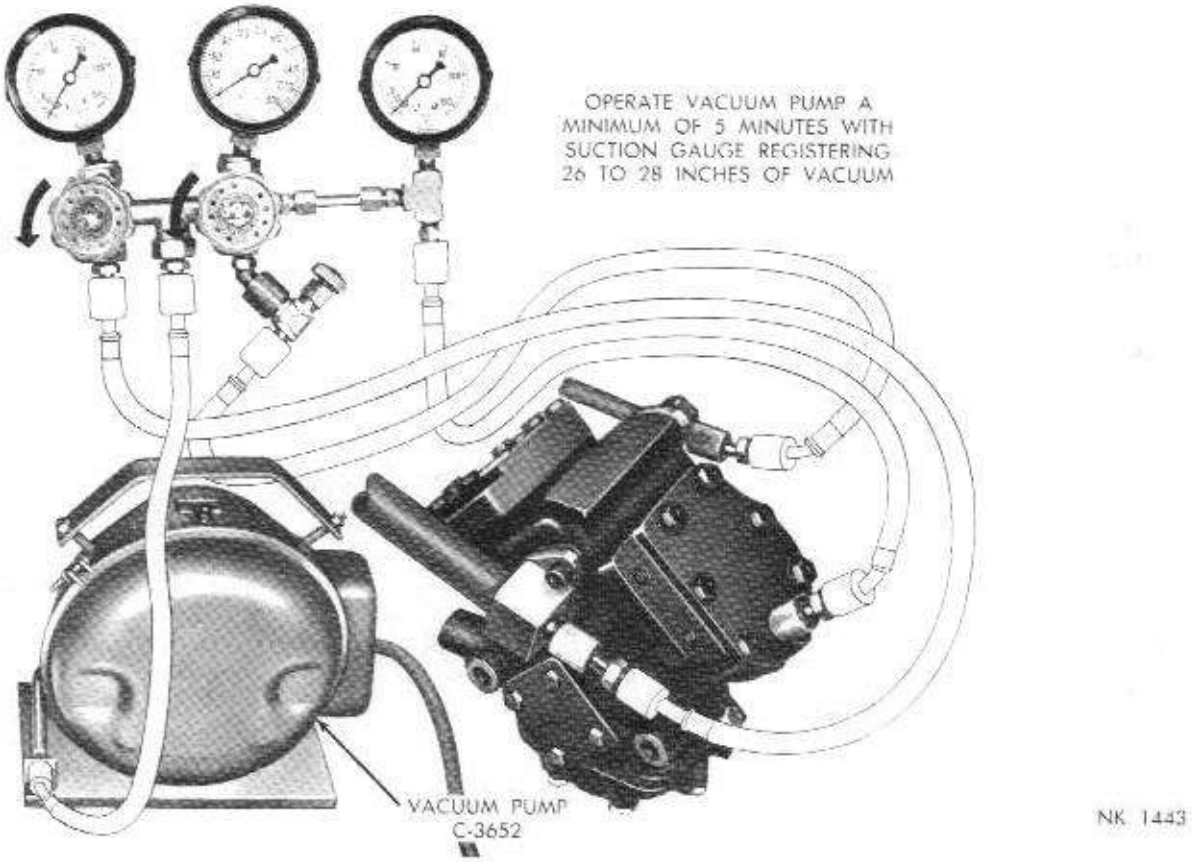


Fig. 86—Evacuating the System

(2) Open both gauge set manifold valves and the needle valve.

(3) Start the vacuum pump and operate until the evaporator suction gauge registers at least 26 inches of vacuum. If the system is tight and the pump in good condition, the vacuum will go as low as 28 inches.

(4) Allow the vacuum pump to operate with the suction gauge registering 26 to 28 inches of vacuum for a minimum of five minutes.

(5) Close both gauge set manifold valves, turn off the vacuum pump and remove the test hose from the vacuum pump. Leave the gauge set manifold connected to the compressor. Charge the system with the proper amount of Refrigerant 12.

Failure to pull at least 26 inches of vacuum indicates a leak in the refrigeration system or a defective vacuum pump. Locate and correct the trouble before recharging the system.

CHARGING THE SYSTEM (Fig. 87)

An accurate scale must be used to insure charging with the proper amount of refrigerant.

The special refrigerant dispensing manifold permits charging three full cans of refrigerant at one time.

1966 REFRIGERANT CHARGE

MODEL	Single	Dual
Imperial	3 lbs. 14 oz. to 4 lbs. 2 oz.	4 lbs. 14 oz. to 5 lbs. 2 oz.
Chrysler	2 lbs. 14 oz. to 3 lbs. 2 oz.	3 lbs. 14 oz. to 4 lbs. 2 oz.

Keep the refrigerant mainfold valves capped when not in use. Keep a supply of extra refrigerant-can-to-refrigerant-manifold gaskets on hand so that gaskets can be replaced periodically. This will insure a good seal without excessive tightening of the can or the manifold nuts.

(1) Attach the center hose from the gauge set manifold to the refrigerant dispensing manifold. Turn the refrigerant manifold valves completely counterclockwise so that they are fully open. Remove the protective caps from the refrigerant manifold.

(2) Screw the refrigerant cans into the manifold. Be sure the manifold-to-can gasket is in place and in good condition. Tighten the can and the manifold nuts to 6 to 8 foot-pounds.

(3) Turn the three refrigerant manifold valves completely clockwise to puncture the cans and close

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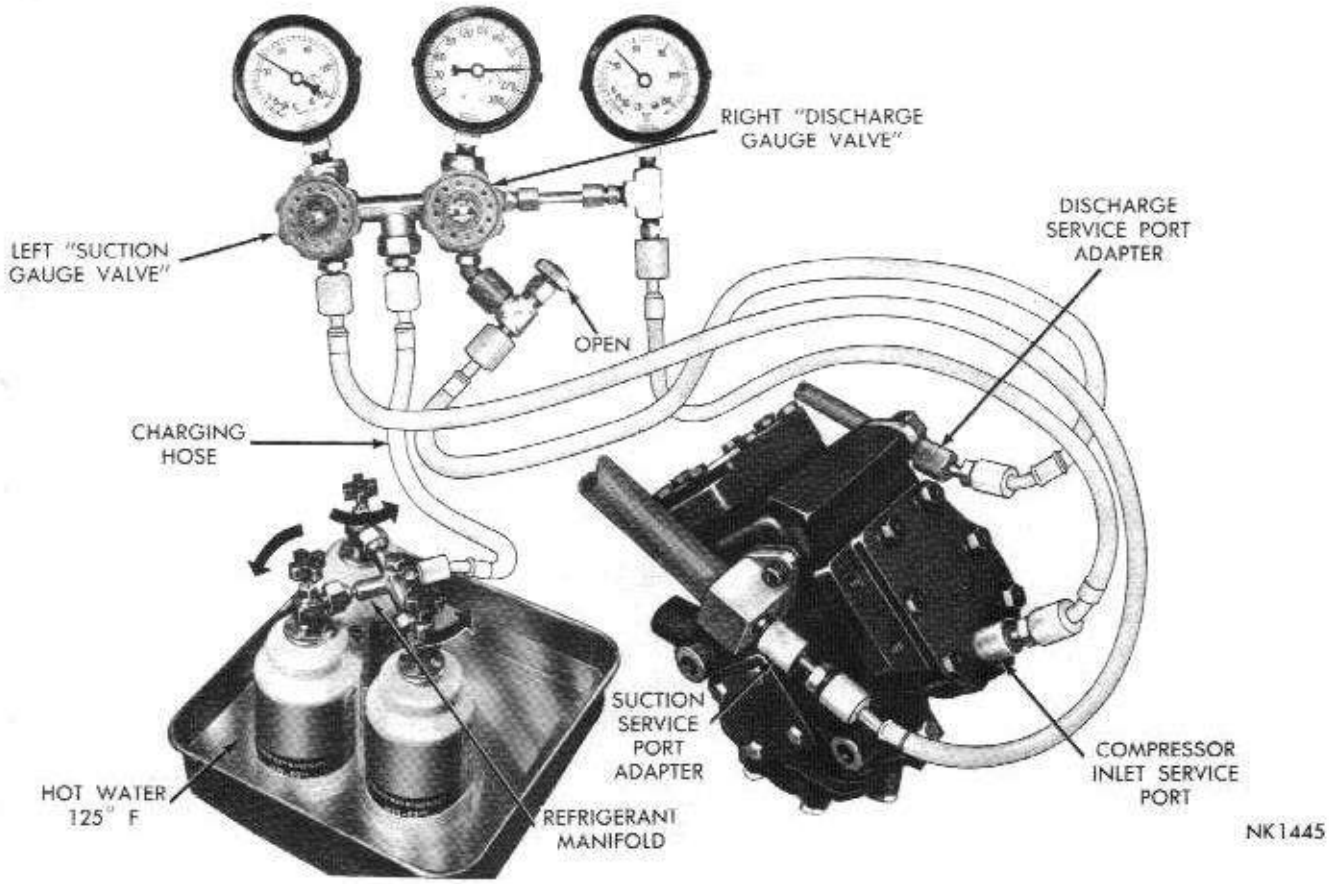


Fig. 87—Complete System Charging

the manifold valves.

(4) Turn the refrigerant manifold valves counterclockwise to open them.

(5) Momentarily loosen the charging hose at the gauge set manifold to allow the refrigerant gas to purge air out of the charging hose.

(6) Place the three cans of refrigerant into a pan containing hot water at a temperature of 125 degrees F.

Model	Engine	Engine R.P.M.
Imperial	8 Cyl.	800
Chrysler	8 Cyl.	1300

(7) Start the engine and adjust the speed as follows:

(a) Charge the system through the suction side of the system by slowly opening the left-hand gauge set manifold valve. Adjust the valve as necessary so the charging pressure does not exceed 50 psi. Maintain the temperature of the water in the pan by adding warm water as necessary.

(b) When all three cans of refrigerant are completely empty, close the gauge set manifold valves and the refrigerant manifold valves.

(c) If more than three cans of refrigerant are necessary to complete the charge repeat steps two through six.

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