TOYOTA

REPAIR MANUAL SUPPLEMENT FOR CHASSIS & BODY

CELICA 4WD

ST205 series Feb., 1994

Pub.No. RM399E

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FOREWORD

This supplement has been prepared to provide information covering general service repairs for the chassis and body of the TOYOTA CELICA 4WD.

Applicable model: ST205 series

For the service specifications and repair procedure of the above model other than those listed in this supplement, refer to the following manuals.

Manual Name	Pub. No.
• Celica Chassis and Body Repair Manual	RM380E
• 3S-GE Engine Repair Manual	RM396E
• 3S-GTE Engine Repair Manual Supplement	RM398E
• Celica Electrical Wiring Diagram	EWD198Y
• Celica 4WD Electrical Wiring Diagram Supplement	EWD204F

All information in this manual is based on the latest product information at the time of publication. However, specifications and procedures are subject to change without notice.

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NOTE: The following screen toning letters sections refer to the Celica Repair Manual for Chassis and Body (Pub. No. RM380E).

INTRODUCTION	IN
CLUTCH	CL
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PROPELLER SHAFT	PR
SUSPENSION AND AXLE	SA
BRAKE SYSTEM	BR
STEERING	SR
SUPPLEMENTAL RESTRAINT SYSTEM	RS
BODY ELECTRICAL SYSTEM	BE
BODY	BO
AIR CONDITIONING SYSTEM	AC
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INTRODUCTION

HOW TO USE THIS MANUAL ..... IN– 2
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HOW TO USE THIS MANUAL

IN02E-01

INDEX

An INDEX is provided on the first page of each section to guide you to the item to be repaired. To assist you in finding your way through the manual, the Section Title and major heading are given at the top of every page.

IN

IN02G-01

GENERAL DESCRIPTION

At the beginning of each section, a General Description is given that pertains to all repair operations contained in that section.
Read these precautions before starting any repair task.

IN02H-09

TROUBLESHOOTING

TROUBLESHOOTING tables are included for each system to help you diagnose the problem and find the cause. Be sure to read this before performing troubleshooting.

IN02J-01

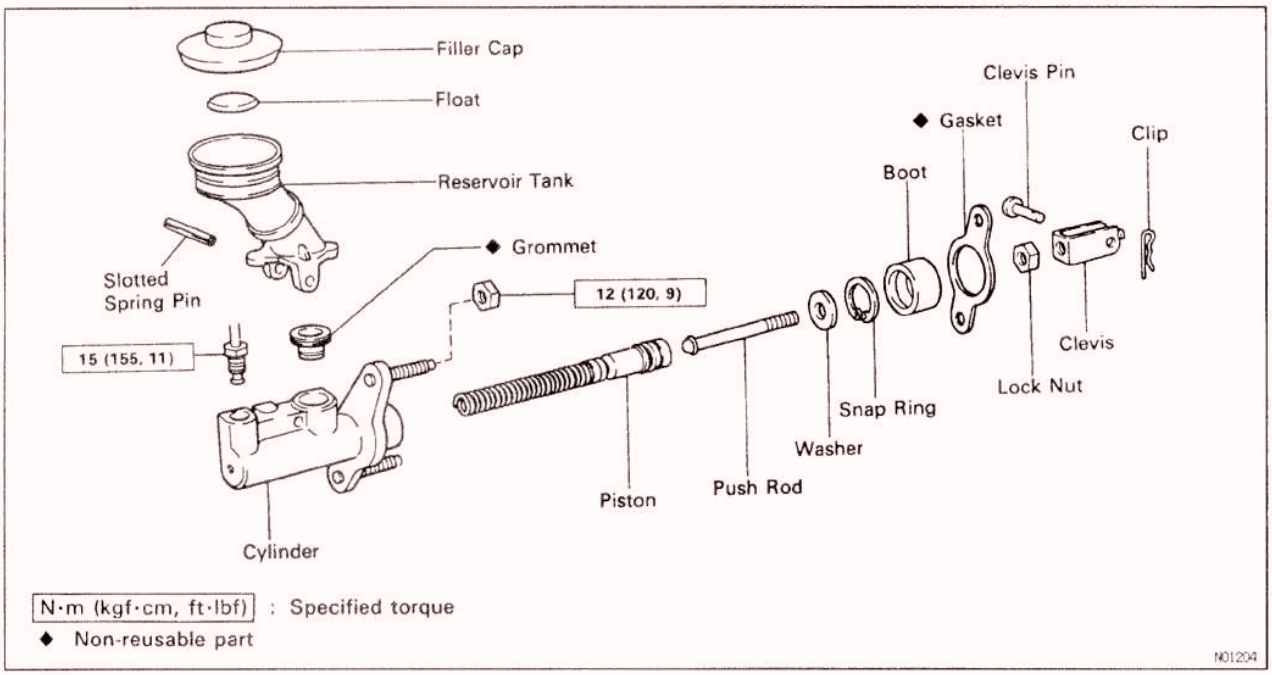
PREPARATION

Preparation lists the SST (Special Service Tools), recommended tools, equipment, lubricant and SSM (Special Service Materials) which should be prepared before beginning the operation and explains the purpose of each one.

IN02K-01

REPAIR PROCEDURES

Most repair operations begin with an overview illustration. It identifies the components and shows how the parts fit together.
Example:



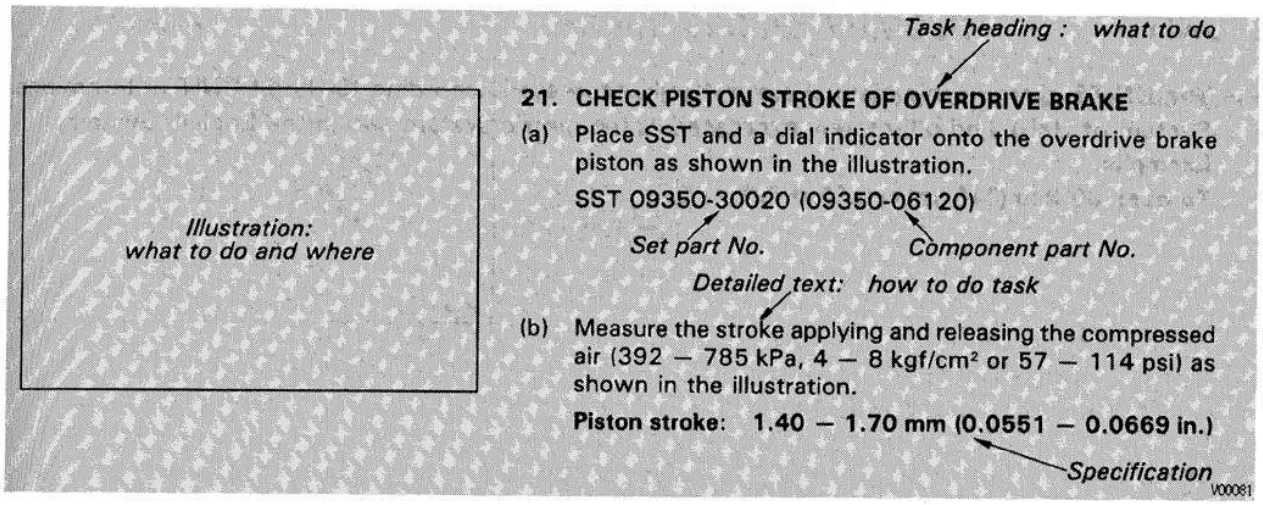
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The procedures are presented in a step–by–step format:

- The illustration shows what to do and where to do it.
- The task heading tells what to do.
- The detailed text tells how to perform the task and gives other information such as specifications and warnings.

Example:

IN



This format provides the experienced technician with a FAST TRACK to the information needed. The upper case task heading can be read at a glance when necessary, and the text below it provides detailed information. Important specifications and warnings always stand out in bold type.

REFERENCES

IN02L–01

References have been kept to a minimum. However, when they are required you are given the page to refer to.

SPECIFICATIONS

IN02M–01

Specifications are presented in bold type throughout the text where needed. You never have to leave the procedure to look up your specifications. They are also found at the end of each section, for quick reference.

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CAUTIONS, NOTICES, HINTS:

IN02N-01

- CAUTIONS are presented in bold type, and indicate there is a possibility of injury to you or other people.
- NOTICES are also presented in bold type, and indicate the possibility of damage to the components being repaired.
- HINTS are separated from the text but do not appear in bold. They provide additional information to help you perform the repair efficiently.

SI UNIT

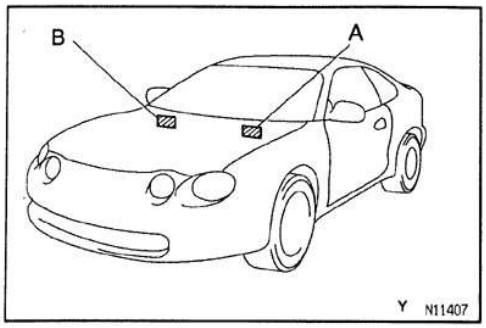
IN02P-02

The UNITS given in this manual are primarily expressed according to the SI UNIT (International System of Unit), and alternately expressed in the metric system and in the English System.

Example:

Torque: 30 N·m (310 kgf·cm, 22 ft·lbf)

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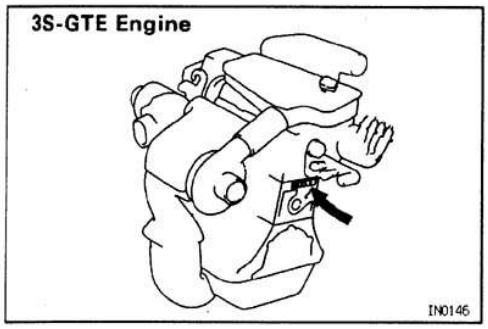
IDENTIFICATION INFORMATION

VEHICLE IDENTIFICATION NUMBER

IN003-01

The vehicle identification number is stamped on the vehicle identification number plate and manufacture's plate.

A. Vehicle Identification Number Plate
B. Manufacture's Plate

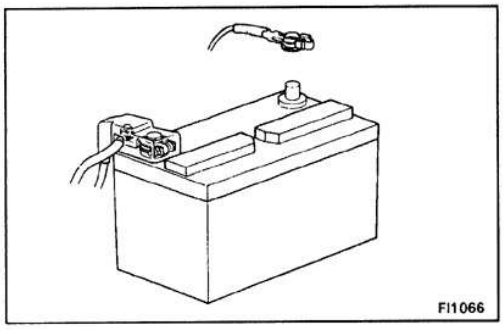


ENGINE SERIAL NUMBER

IN04E-01

The engine serial number is stamped on the engine block as shown.

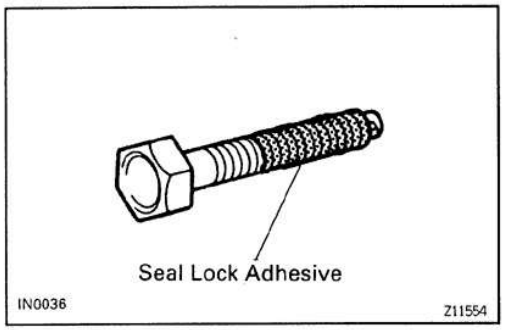
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GENERAL REPAIR INSTRUCTIONS

IN045-02

1. Use fender, seat and floor covers to keep the vehicle clean and prevent damage.
2. During disassembly, keep parts in the appropriate order to facilitate reassembly.
3. Observe the following:
   (a) Before performing electrical work, disconnect the negative terminal cable from the battery.
   (b) If it is necessary to disconnect the battery for inspection or repair, always disconnect the cable from the negative (−) terminal which is grounded to the vehicle body.
   (c) To prevent damage to the battery terminal post, loosen the terminal nut and raise the cable straight up without twisting or prying it.
   (d) Clean the battery terminal posts and cable terminals with a clean shop rag. Do not scrape them with a file or other abrasive objects.
   (e) Install the cable terminal to the battery post with the nut loose, and tighten the nut after installation. Do not use a hammer to tap the terminal onto the post.
   (f) Be sure the cover for the positive (+) terminal is properly in place.
4. Check hose and wiring connectors to make sure that they are secure and correct.
5. Non−reusable parts
   (a) Always replace cotter pins, gaskets, O−rings and oil seals etc. with new ones.
   (b) Non−reusable parts are indicated in the component illustrations by the "◆" symbol.



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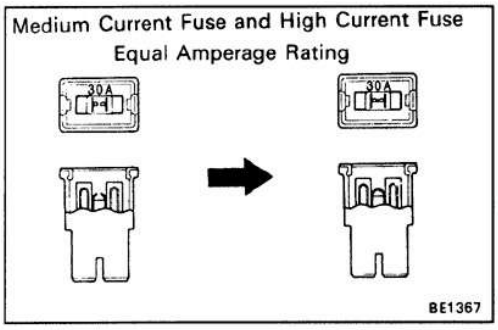
6. Precoated parts
   Precoated parts are bolts and nuts, etc. that are coated with a seal lock adhesive at the factory.
   (a) If a precoated part is retightened, loosened or caused to move in any way, it must be recoated with the specified adhesive.

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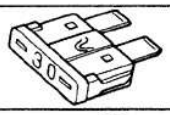
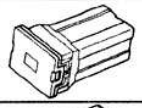
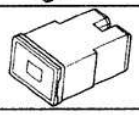
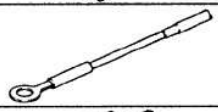
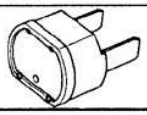
(b) When reusing precoated parts, clean off the old adhesive and dry with compressed air. Then apply the specified seal lock adhesive to the bolt, nut or threads.

(c) Precoated parts are indicated in the component illustrations by the "★" symbol.

7. When necessary, use a sealer on gaskets to prevent leaks.
8. Carefully observe all specifications for bolt tightening torques. Always use a torque wrench.
9. Use of special service tools (SST) and special service materials (SSM) may be required, depending on the nature of the repair. Be sure to use SST and SSM where specified and follow the proper work procedure. A list of SST and SSM can be found in the preparation part at the front of each section in this manual.



10. When replacing fuses, be sure the new fuse has the correct amperage rating. DO NOT exceed the rating or use one with a lower rating.

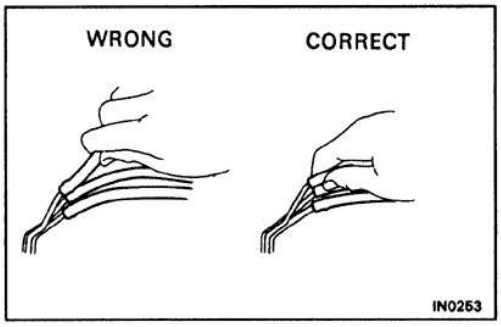
Illustration	Symbol	Part Name	Abbreviation
 BE5594	 IN0365	FUSE	FUSE
 BE5595	 IN0366	MEDIUM CURRENT FUSE	M-FUSE
 BE5596	 IN0367	HIGH CURRENT FUSE	H-FUSE
 BE5597	 IN0367	FUSIBLE LINK	FL
 BE5598	 IN0368	CIRCUIT BREAKER	CB

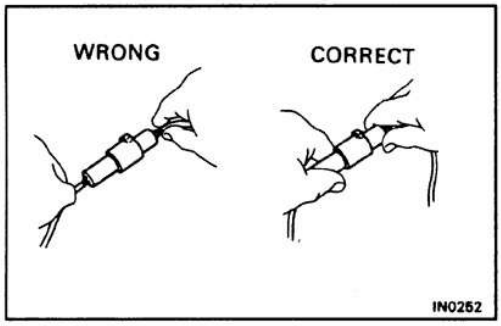
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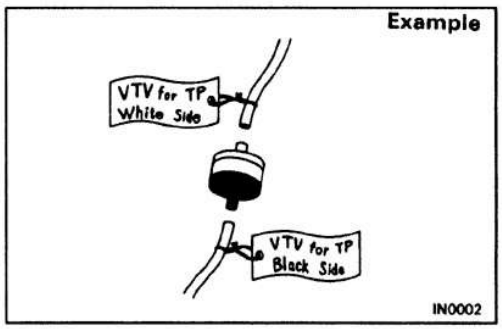
IN

11. Care must be taken when jacking up and supporting the vehicle. Be sure to lift and support the vehicle at the proper locations (See page IN−18).
    (a) If the vehicle is to be jacked up only at the front or rear end, be sure to block the wheels at the opposite end in order to ensure safety.
    (b) After the vehicle is jacked up, be sure to support it on stands. It is extremely dangerous to do any work on a vehicle raised on a jack alone, even for a small job that can be finished quickly.
12. Observe the following precautions to avoid damage to the following parts:
    (a) Do not open the cover or case of the ECU unless absolutely necessary. (If the IC terminals are touched, the IC may be destroyed by static electricity.)





    (b) To disconnect vacuum hoses, pull on the end, not the middle of the hose.
    (c) To pull apart electrical connectors, pull on the connector itself, not the wires.
    (d) Be careful not to drop electrical components, such as sensors or relays. If they are dropped on a hard floor, they should be replaced and not reused.
    (e) When steam cleaning an engine, protect the distributor, air filter, and VCV from water.
    (f) Never use an impact wrench to remove or install temperature switches or temperature sensors.
    (g) When checking continuity at the wire connector, insert the tester probe carefully to prevent terminals from bending.
    (h) When using a vacuum gauge, never force the hose onto a connector that is too large. Use a step−down adapter instead. Once the hose has been stretched, it may leak.



13. Tag hoses before disconnecting them:
    (a) When disconnecting vacuum hoses, use tags to identify how they should be reconnected.
    (b) After completing a job, double check that the vacuum hoses are properly connected. A label under the hood shows the proper layout.

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14. Unless otherwise stated, all resistance is measured at an ambient temperature of 20°C (68°F). Because the resistance may be outside specifications if measured at high temperatures immediately after the vehicle has been running, measurements should be made when the engine has cooled down.

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PRECAUTION

FOR VEHICLES EQUIPPED WITH SRS AIRBAG

IN00D-08

The TOYOTA CELICA is equipped with an SRS (Supplemental Restraint System) airbag as an option.

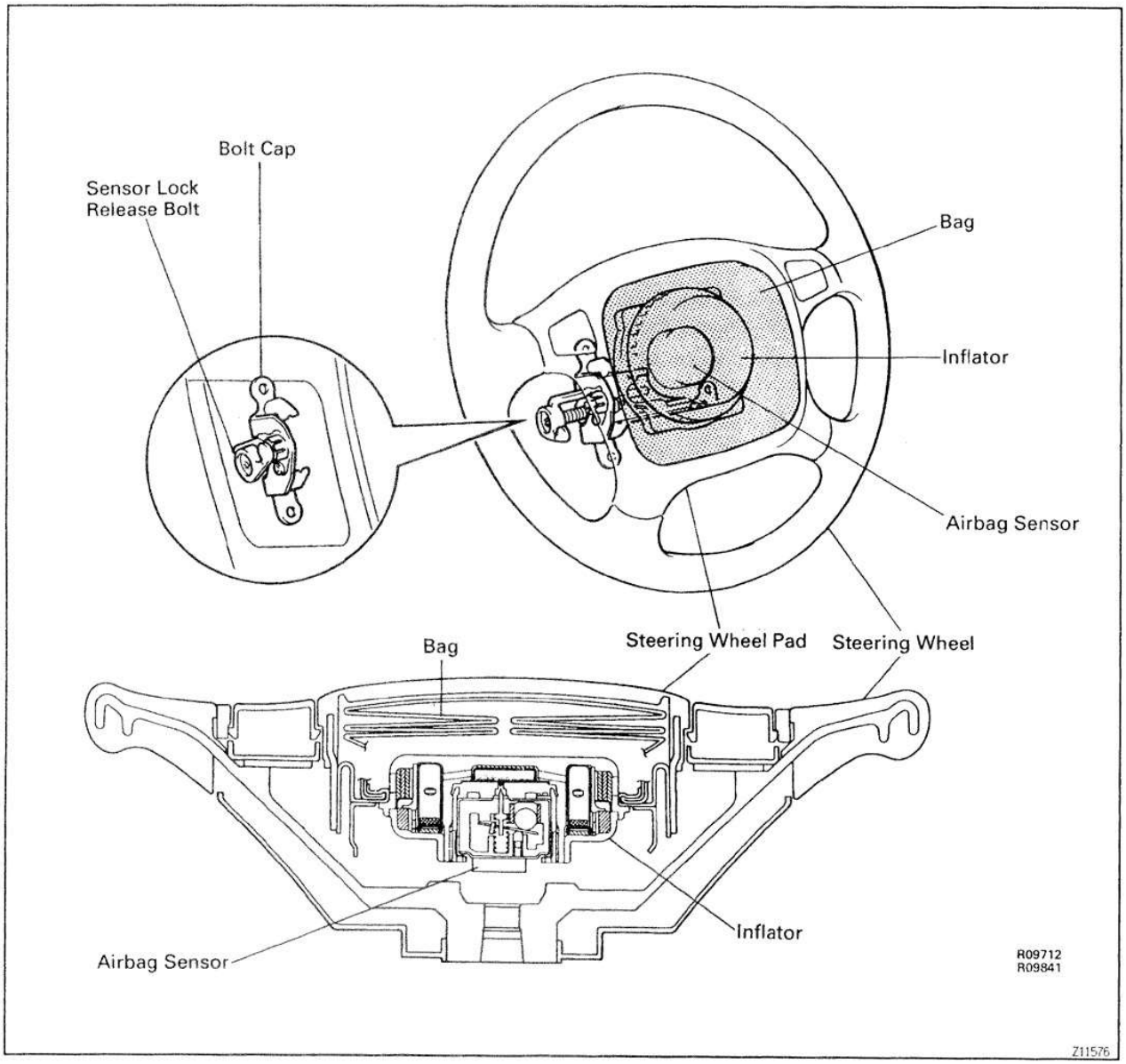
IN

Failure to carry out service operations in the correct sequence could cause the SRS to unexpectedly deploy during servicing, possibly leading to a serious accident.

Further, if a mistake is made in servicing the SRS, it is possible the SRS may fail to operate when required.

Before performing servicing (including removal or installation of parts, inspection or replacement), be sure to read the following items carefully, then follow the correct procedure described in this manual.

Location of Components



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1. Never disassemble the steering wheel pad assembly.
2. Do not subject the steering wheel pad to shocks or bring magnets close to it.
3. Do not expose the steering wheel pad to high temperatures or fire.
4. If grease, cleaner, oil or water gets on the steering wheel pad, promptly wipe it off with a dry cloth.
5. Do not drop the steering wheel pad. Never use a steering wheel pad which has been dropped.
6. Never install the steering wheel and pad in another vehicle.
7. When the steering wheel pad is removed, store it on a stable, flat place with the pad surface facing upwards. Never place anything on top of the pad.
8. When work on the vehicle will produce too strong a shock, first loosen the sensor lock release bolt until it turns freely and perform the work after sensor lock occurs.
9. Even in cases where the vehicle is in a low–impact accident where the airbag is not activated, always check the pad surface and airbag sensor part. If dents, cracks or deformation is visible, replace the SRS with a new assembly.
10. When disposing of the vehicle or steering wheel, always deploy the SRS first.
11. The deployed inflator inside the steering wheel pad is hot, so dispose of it after it has naturally cooled down to ambient temperature. Never apply water to cool it down.

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IN

WHEN SERVICING ALL–TRAC/4WD VEHICLES

IN03E–03

The center differential of the All–Trac/4WD Celica is equipped with the viscous coupling type LSD.
If incorrect preparations or test procedures are used, the test will not only unsuccessfull, but may be dangerous as well.
Therefore, before beginning any such servicing or test, be sure to check the following items:

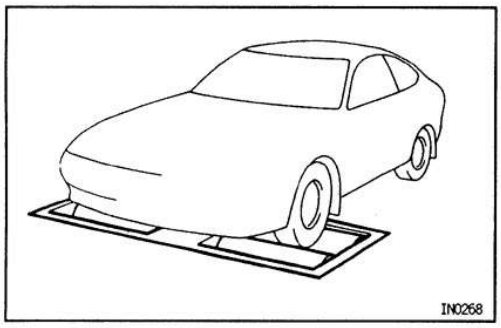
(1) Whether wheels should be touching ground or jacked up
(2) Transaxle gear position
(3) Maximum testing vehicle speed
(4) Maximum testing time

Also be sure to observe the following cautions:

(1) Never accelerate or decelerate the vehicle suddenly
(2) Observe the other cautions given for each individual test

Before Beginning Test

This vehicle does not have a Center Diff. Lock Mode or 4WD (Normal) Mode to allow only the front or rear wheel to be rotated.
The test method for this vehicle is different to that for vehicles equipped with the Center Diff. Lock Mode or 4WD (Normal) Mode, so make sure you use the correct test method.



Braking Force Test

Vehicle Speed:

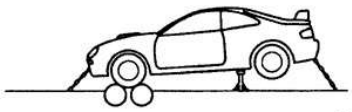
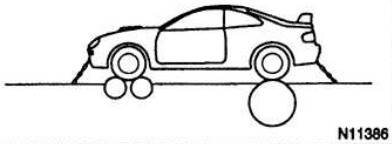
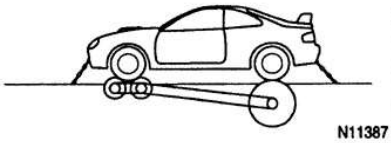
Below 0.5 km/h or 0.3 mph

When performing low–speed type brake tester measurements, observe the following instructions.

(1) Position the wheels to be tested (front or rear) on the tester.
(2) Shift the transaxle shift lever to Neutral.
(3) Idle the engine, operate the brake booster and perform the test.

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Speedometer Test or Other Tests (Using Speedometer Tester or Chassis Dynamometer)

No.	Chassis Dynamometer Type	Vehicle Condition	Vehicle Speed and Test Time
1	2-Wheel Chassis Dynamometer	 N11385	* Low speed (50km/h or less) and 1minute or less
2	4-Wheel Free Chassis Dynamometer	 N11386	* Low speed (50km/h or less) and 1minute or less
3	4-Wheel Driven Chassis Dynamometer	 N11387	No restriction on vehicle speed or duration of test

* This is to avoid damaging the center viscous coupling.

Y

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NOTICE:

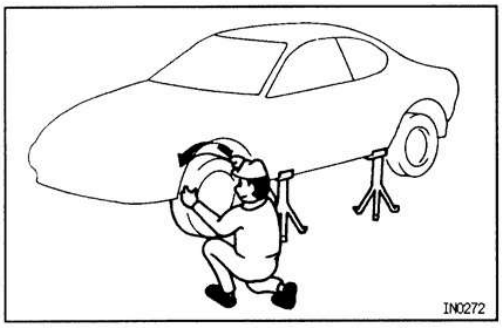
1. **Confirm that the vehicle is securely immobilised.**
2. **Never operate the clutch or brakes suddenly, suddenly drive the wheels, or suddenly decelerate.**

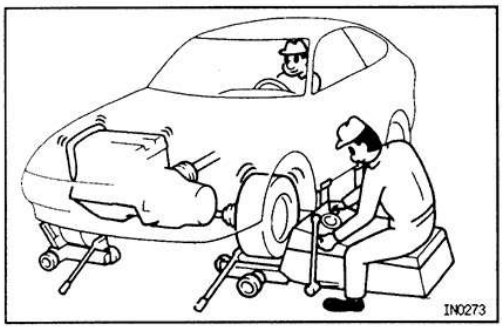
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On–Vehicle Wheel Balancing

IN

When doing on–vehicle wheel balancing on a full–time 4WD vehicle, to prevent the wheels from rotating at different speeds in different directions from each other (which could damage the center differential), always be sure to observe the following precautions:





(1) All 4 wheels should be jacked up, clearing the ground completely.
(2) The parking brake lever should be fully released.
(3) None of the brakes should be allowed to drag.
(4) The wheels should be driven with both the engine and the wheel balancer.

HINT: When doing this, be careful of the other wheels, which will rotate at the same time.

(5) Avoid sudden acceleration, deceleration and braking.
(6) Carry out the wheel balancing with the transaxle in 3rd or 4th gear.

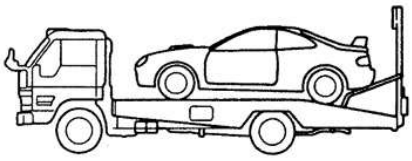
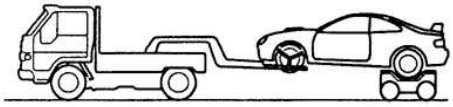
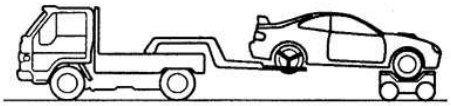
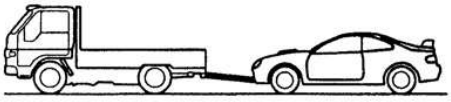
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IN04F-01

WHEN TOWING ALL–TRAC/4WD VEHICLES

1. Use one of the methods shown below to tow the vehicle.
2. When there is trouble with the chassis and drive train, use method ① (flat bed truck)
3. Recommended Method: No. ①, ②
   Emergency Method: No. ③

IN

Towing Method \ Conditions	Parking Brake	Transaxle Shift Lever Position
① **Flat Bed Truck**  N11381	Applied	Any Position
② **Wheel Lift Type Truck** From Front  From Rear  N11382 N11383	Applied	Any Position
③ **Towing with a Rope**  N11384	Released	Neutral

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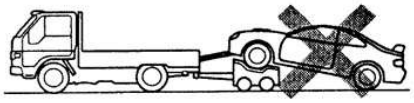
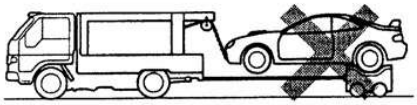
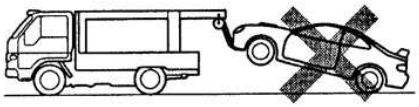
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NOTICE: Do not use any towing method other than those shown above.

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For example, the twoing methods shown below are dangerous or will damage the vehicle, so do not use them.

IN

NO  N11378	• During towing with this towing method, either from the front or rear, there is a danger of the drivetrain heating up and causing breakdown, or of the front wheels flying off the dolly. • Never perform towing using a method where the lifted-up wheel cannot rotate.
NO  N11379	• Do not perform sling type towing, either from the front or rear, as this method causes damage to the bumper, engine undercover, suspension lower arm bushing and the air conditioning condensor buring towing.
NO  N11380	

Y V05530

IN006-01

FOR VEHICLES EQUIPPED WITH A CATALYTIC CONVERTER

CAUTION: If large amounts of unburned gasoline flow into the converter, it may overheat and create a fire hazard. To prevent this, observe the following precautions and explain them to your customer.

1. **Use only unleaded gasoline.**
2. **Avoid prolonged idling.**
   Avoid running the engine at idle speed for more than 20 minutes.
3. **Avoid spark jump test.**

(a) Perform spark jump test only when absolutely necessary. Perform this test as rapidly as possible.
(b) While testing, never race the engine.

4. **Avoid prolonged engine compression measurement.**
   Engine compression tests must be done as rapidly as possible.
5. **Do not run engine when fuel tank is nearly empty.**
   This may cause the engine to misfire and create an extra load on the converter.
6. **Avoid coasting with ignition turned off and prolonged braking.**
7. **Do not dispose of used catalyst along with parts contaminated with gasoline or oil.**

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IF VEHICLE IS EQUIPPED WITH MOBILE COMMUNICATION SYSTEM

INQ2R–04

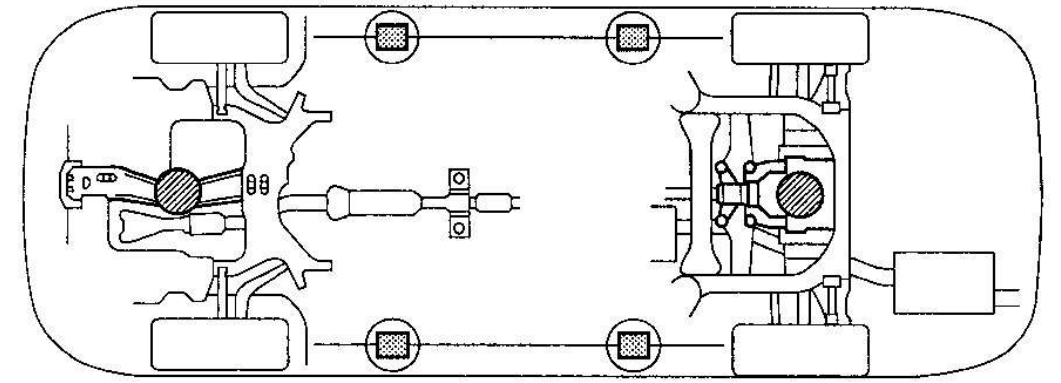
For vehicles with mobile communication systems such as two–way radios and cellular telephones, observe the following precautions.

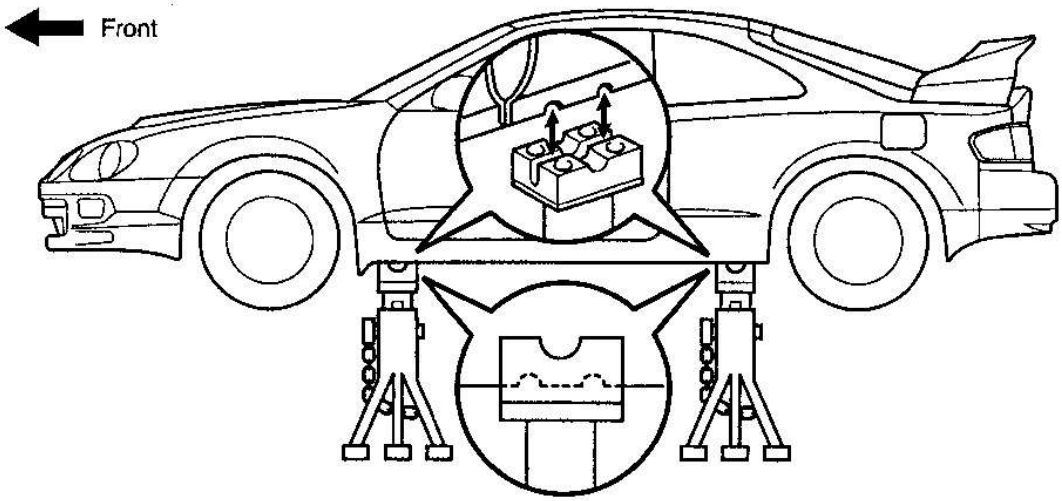
(1) Install the antenna as far as possible away from the ECU and sensors of the vehicle's electronic system.
(2) Install the antenna feeder at least 20 cm (7.87 in.) away from the ECU and sensors of the vehicle's electronics systems. For details about ECU and sensors locations, refer to the section on the applicable component.
(3) Do not wind the antenna feeder together with the other wiring. As much as possible, also avoid running the antenna feeder parallel with other wire harnesses.
(4) Confirm that the antenna and feeder are correctly adjusted.
(5) Do not install powerful mobile communications system.

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VEHICLE LIFT AND SUPPORT LOCATIONS

IN





JACK POSITION ——————————

Front ····· Front crossmember
Rear ····· Rear axle beam

CAUTION: Before jacking-up the rear and front, make sure the car is not carrying any extra weight.

PANTOGRAPH JACK POSITION ——————————

SUPPORT POSITION

Safety stand and swing arm type lift ·····

N11390
N11391

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ABBREVIATIONS USED IN THIS MANUAL

IN01D–02

ABS	Anti–Lock Brake System
ALR	Automatic Locking Retractor
APPROX.	Approximately
A/T	Automatic Transaxle
ATF	Automatic Transaxle Fluid
CB	Circuit Breaker
CD	Compact Disc
CRS	Child Restraint System
ECU	Electronic Control Unit
ELR	Emergency Locking Retractor
ETR	Electronic Turning Radio
EX	Exhaust
Ex.	Except
FIPG	Formed in Place Gasket
FL	Fusible Link
Fr	Front
H–Fuse	High Current Fuse
IG	Ignition
JB	Junction Block
LED	Light Emitting Diode
LH	Left–Hand
LSD	Limited Slip Differential
Max.	Maximum
MP	Multipurpose
M/T	Manual Transaxle
O/D	Overdrive
P & BV	Proportioning and By–pass Valve
PS	Power Steering
RH	Right–Hand
SRS	Supplemental Restraint System
SSM	Special Service Materials
SST	Special Service Tools
STD	Standard
SW	Switch
TEMP.	Temperature
w/	With
w/o	Without

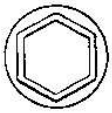
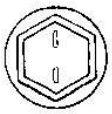
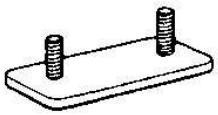
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STANDARD BOLT TORQUE SPECIFICATIONS

IN006-01

IN

HOW TO DETERMINE BOLT STRENGTH

	Mark	Class		Mark	Class
Hexagon head bolt	 Bolt head No. 4 — 4 5 — 5 6 — 6 7 — 7 8 — 8 9 — 9 10 — 10 11 — 11	4T 5T 6T 7T 8T 9T 10T 11T	Stud bolt	 No mark	4T
	 No mark	4T		 Grooved	6T
Hexagon flange bolt w/ washer hexagon bolt	 No mark	4T			
Hexagon head bolt	 2 protruding lines	5T			
Hexagon flange bolt w/ washer hexagon bolt	 2 protruding lines	6T	Welded bolt		4T
Hexagon head bolt	 3 protruding lines	7T			
Hexagon head bolt	 4 protruding lines	8T			

V00078

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SPECIFIED TORQUE FOR STANDARD BOLTS

Class	Diameter mm	Pitch mm	Specified torque					
			Hexagon head bolt			Hexagon flange bolt		
			N·m	kgf·cm	ft·lbf	N·m	kgf·cm	ft·lbf
4T	6	1	5	55	48 in.·lbf	6	60	52 in.·lbf
	8	1.25	12.5	130	9	14	145	10
	10	1.25	26	260	19	29	290	21
	12	1.25	47	480	35	53	540	39
	14	1.5	74	760	55	84	850	61
	16	1.5	115	1,150	83	–	–	–
5T	6	1	6.5	65	56 in.·lbf	7.5	75	65 in.·lbf
	8	1.25	15.5	160	12	17.5	175	13
	10	1.25	32	330	24	36	360	26
	12	1.25	59	600	43	65	670	48
	14	1.5	91	930	67	100	1,050	76
	16	1.5	140	1,400	101	–	–	–
6T	6	1	8	80	69 in.·lbf	9	90	78 in.·lbf
	8	1.25	19	195	14	21	210	15
	10	1.25	39	400	29	44	440	32
	12	1.25	71	730	53	80	810	59
	14	1.5	110	1,100	80	125	1,250	90
	16	1.5	170	1,750	127	–	–	–
7T	6	1	10.5	110	8	12	120	9
	8	1.25	25	260	19	28	290	21
	10	1.25	52	530	38	58	590	43
	12	1.25	95	970	70	105	1,050	76
	14	1.5	145	1,500	108	165	1,700	123
	16	1.5	230	2,300	166	–	–	–
8T	8	1.25	29	300	22	33	330	24
	10	1.25	61	620	45	68	690	50
	12	1.25	110	1,100	80	120	1,250	90
9T	8	1.25	34	340	25	37	380	27
	10	1.25	70	710	51	78	790	57
	12	1.25	125	1,300	94	140	1,450	105
10T	8	1.25	38	390	28	42	430	31
	10	1.25	78	800	58	88	890	64
	12	1.25	140	1,450	105	155	1,600	116
11T	8	1.25	42	430	31	47	480	35
	10	1.25	87	890	64	97	990	72
	12	1.25	155	1,600	116	175	1,800	130

V00079

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CLUTCH

DESCRIPTION ..... CL – 2
PREPARATION ..... CL – 3
TROUBLESHOOTING ..... CL – 4
CLUTCH PEDAL ..... CL – 5
CLUTCH UNIT ..... CL – 7
SERVICE SPECIFICATIONS ..... CL – 11

REFER TO CELICA REPAIR MANUAL FOR CHASSIS AND BODY (Pub. No. RM380E)

NOTE: The above pages contain only the points which differ from the above listed manual.

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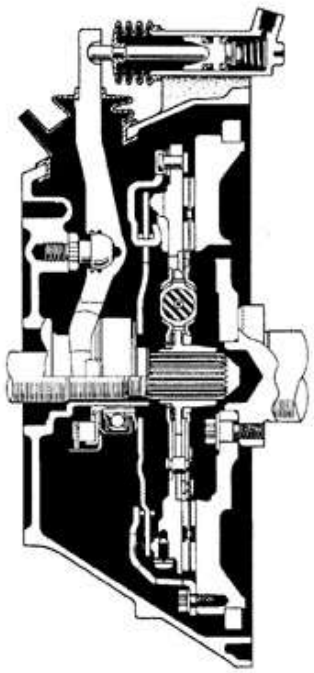
DESCRIPTION

CL099-01

The diaphragm spring turnover type clutch providing lighter release performance.

CL

CLUTCH ASSEMBLY



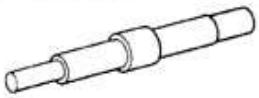
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PREPARATION

SST(SPECIAL SERVICE TOOLS)

CL003-01

	09301–00220 Clutch Guide Tool	
	09333–00013 Clutch Diaphragm Spring Aligner	

CL

EQUIPMENT

CL004-01

Calipers	
Dial indicator	
Torque wrench	

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TROUBLESHOOTING

CL05M-04
Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in order. If necessary, replace these parts.

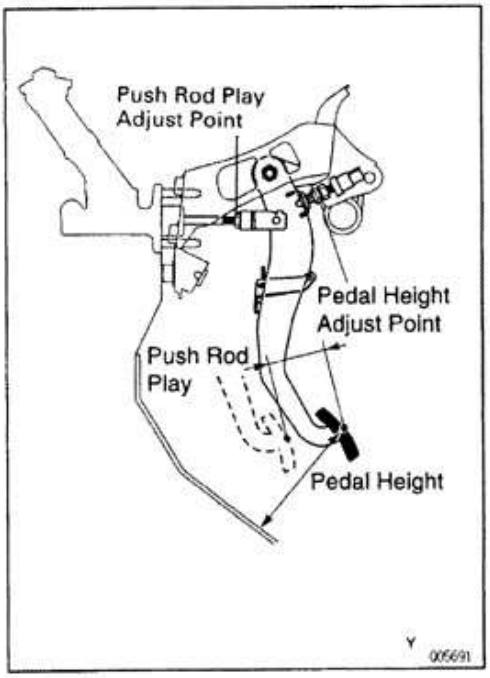
CL

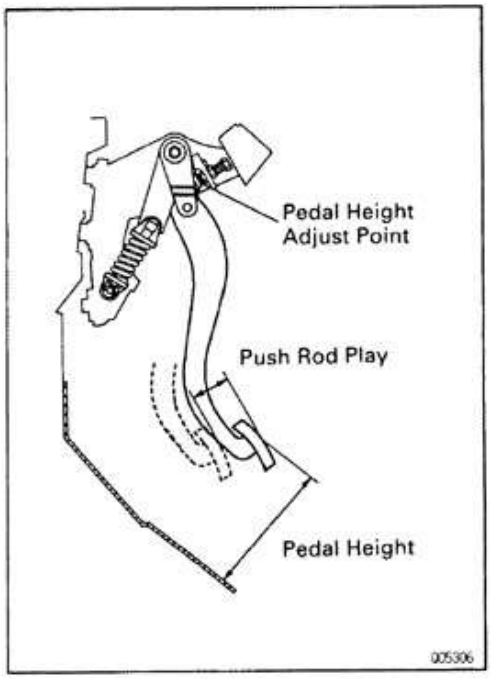
See Page / Parts Name / Trouble	CL-5	*CL-6	*CL-9	*CL-13	–	CL-7	–	CL-7	CL-7	CL-7	CL-7	CL-7	CL-7	CL-7	CL-7	CL-7	CL-10	CL-7	CL-9	CL-7	–
	Clutch pedal (Freeplay out of adjustment)	Clutch line (Air in line)	Master cylinder cup (Damaged)	Release cylinder cup (Damaged)	Engine mounting (Loosen)	Release bearing (Worn, dirty or damaged)	Input shaft bearing (Worn or damaged)	Clutch disc (Out of true)	Clutch disc (Runout is excessive)	Clutch disc (Lining broken)	Clutch disc (Dirty or burred)	Clutch disc (Oily)	Clutch disc (Worn out)	Clutch disc torsion rubber (Damaged)	Clutch disc (Glazed)	Clutch disc (Lack of spline grease)	Diaphragm spring (Damaged)	Diaphragm spring (Out of tip alignment)	Pressure plate (Distortion)	Flywheel (Distortion)
Clutch grabs/chatters					1				2			2	2	2	2			2			
Clutch pedal spongy		1	2	2																	
Clutch noisy						1	2							3							
Clutch slips	1											2	2				3		4	5	
Clutch does not disengage	1	2	3	4			5	6	6	6	6	6				6	7	7	8		

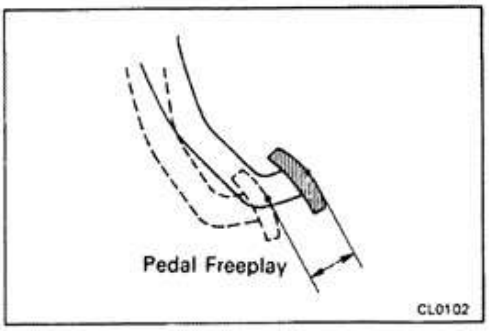
V05513

* See Pub. No. RM380E

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CLUTCH PEDAL

CLUTCH PEDAL CHECK AND ADJUSTMENT

1. **CHECK THAT PEDAL HEIGHT IS CORRECT**

Pedal height from asphalt sheet:

LHD 144.9 – 154.9 mm (5.705 – 6.098 in.)

RHD 141.0 – 151.0 mm (5.551 – 5.945 in.)

2. **IF NECESSARY, ADJUST PEDAL HEIGHT**

Loosen the lock nut and turn the stopper bolt until the height is correct. Tighten the lock nut.

3. **CHECK THAT PEDAL FREEPLAY AND PUSH ROD PLAY ARE CORRECT**

Pedal freeplay:

Push in on the pedal until the beginning of clutch resistance is felt.

Pedal freeplay:

5.0 – 15.0 mm (0.197 – 0.591 in.)

Push rod play:

Gently push on the pedal until the resistance begins to increase a little.

Push rod play at pedal top:

1.0 – 5.0 mm (0.039 – 0.197 in.)

4. **IF NECESSARY, ADJUST PEDAL FREEPLAY AND PUSH ROD PLAY**

(a) Loosen the lock nut and turn the push rod until the freeplay and push rod play are correct.

(b) Tighten the lock nut.

(c) After adjusting the pedal freeplay, check the pedal height.

(d) Connect the air duct and install the lower finish panel.

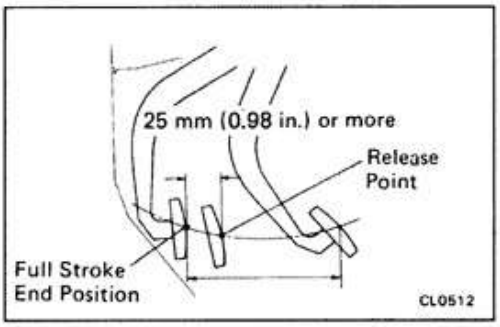
5. **CHECK CLUTCH RELEASE POINT**

(a) Pull the parking brake lever and install wheel stopper.

(b) Start the engine and idle the engine.

(c) Without depressing the clutch pedal, slowly shift the shift lever into reverse position until the gears contact.

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(d) Gradually depress the clutch pedal and measure the stroke distance from the point the gear noise stops (release point) up to the full stroke end position.

Standard distance:

25 mm (0.98 in.) or more

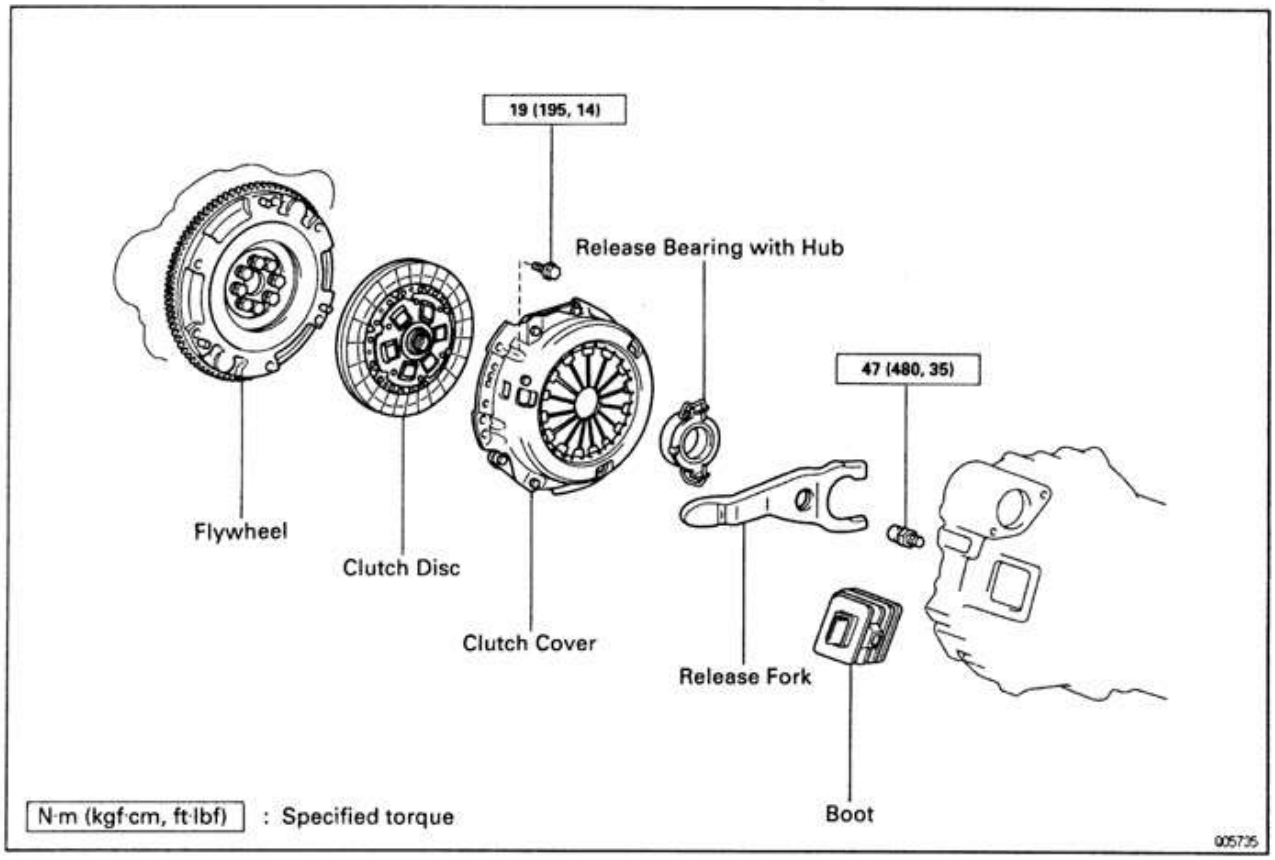
If the distance not as specified, perform the following operation.

- Check pedal height.
- Check push rod play and pedal freeplay.
- Bleed the clutch line.
- Check the clutch cover and disc.

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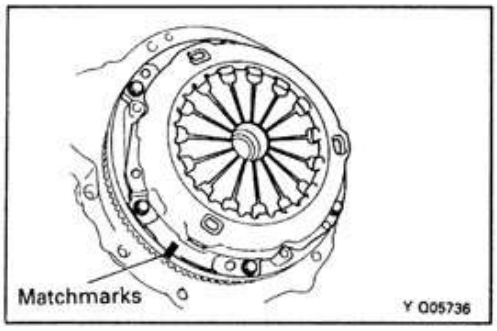
CLUTCH UNIT
COMPONENTS

CL



CLUTCH UNIT REMOVAL

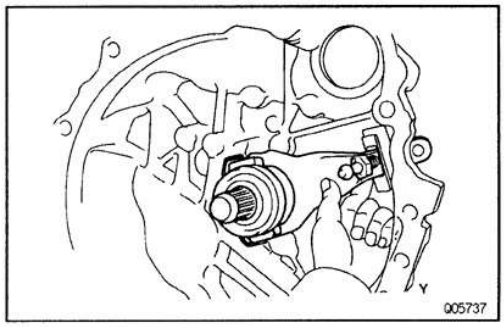
1. **REMOVE TRANSAXLE FROM ENGINE**
   (See page MX–12)



2. **REMOVE CLUTCH COVER AND DISC**
   (a) Place matchmarks on the flywheel and clutch cover.
   (b) Loosen each set bolt one turn at a time until spring tension is released.
   (c) Remove the set bolts, and pull off the clutch cover with the clutch disc.
   NOTICE: Do not drop the clutch disc.

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CL

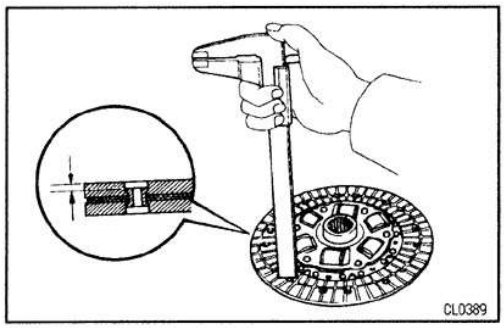


3. REMOVE RELEASE BEARING AND FORK FROM TRANSAXLE

Remove the release bearing together with the fork and then separate them.

CLUTCH PARTS INSPECTION

CL00M–07



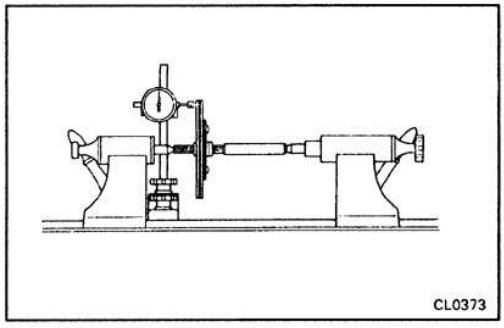
1. INSPECT CLUTCH DISC FOR WEAR OR DAMAGE

Using calipers, measure the rivet head depth.

Minimum rivet depth:

0.3 mm (0.012 in.)

If necessary, replace the clutch disc.



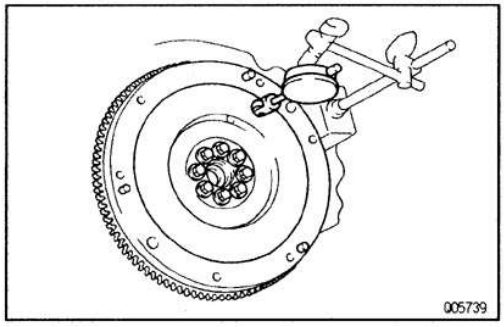
2. INSPECT CLUTCH DISC RUNOUT

Using a dial indicator, check the disc runout.

Maximum runout:

0.8 mm (0.031 in.)

If necessary, replace the clutch disc.



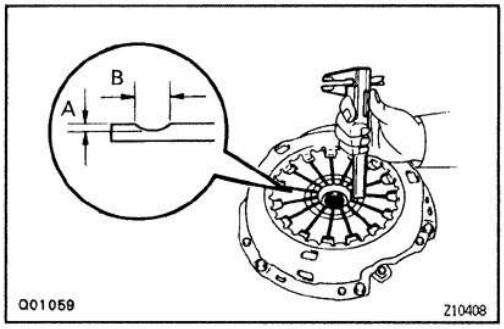
3. INSPECT FLYWHEEL RUNOUT

Using a dial indicator, check the flywheel runout.

Maximum runout:

0.1 mm (0.004 in.)

If necessary, replace the flywheel.



4. INSPECT DIAPHRAGM SPRING FOR WEAR

Using calipers, measure the diaphragm spring for depth and width of wear.

Maximum:

A: Depth

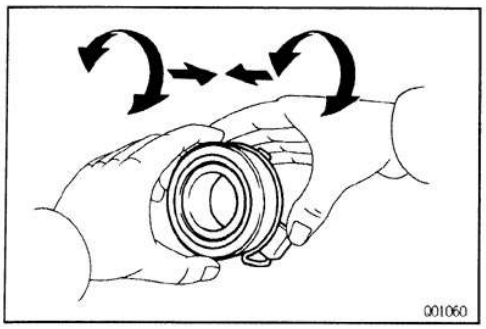
0.6 mm (0.024 in.)

B: Width

5.0 mm (0.197 in.)

If necessary, replace the clutch cover.

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5. INSPECT RELEASE BEARING

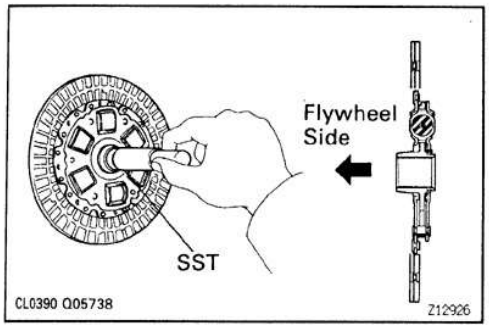
Turn the bearing by hand while applying force in the axial direction.

HINT: The bearing is permanently lubricated and requires no cleaning or lubrication.

If necessary, replace the release bearing.

CLUTCH UNIT INSTALLATION

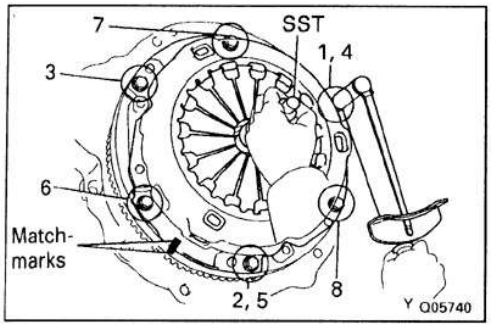
CL00N-08



1. INSTALL CLUTCH DISC AND CLUTCH COVER ON FLYWHEEL

(a) Insert the SST in the clutch disc, and then set them and the clutch cover in position.

SST 09301–00220

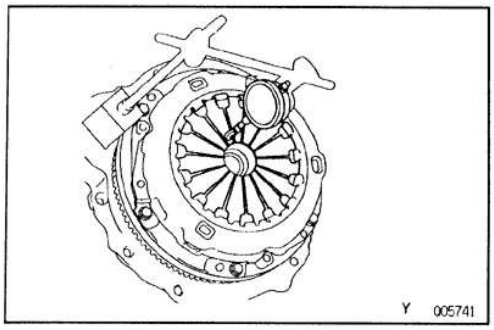


(b) Align the matchmarks on the clutch cover and flywheel.

(c) Torque the bolts on the clutch cover in the order shown.

Torque: 19 N·m (195 kgf·cm, 14 ft·lbf)

HINT: Temporarily tighten the No.1 and No.2 bolts.

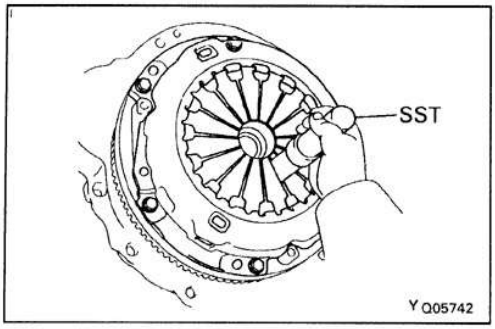


2. CHECK DIAPHRAGM SPRING TIP ALIGNMENT

Using a dial indicator with roller instrument, check the diaphragm spring tip alignment.

Maximum non–alignment:

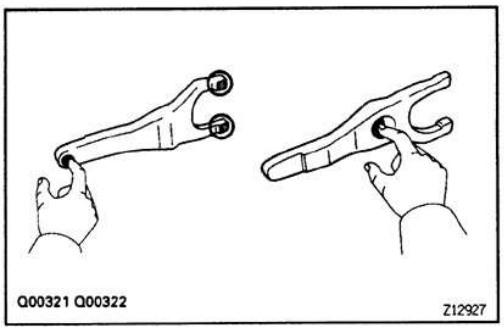
0.5 mm (0.020 in.)



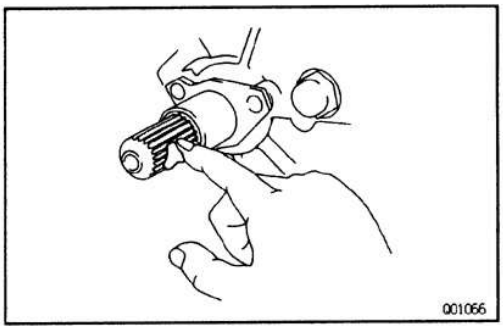
If alignment is not as specified, using SST, adjust the diaphragm spring tip alignment.

SST 09333–00013

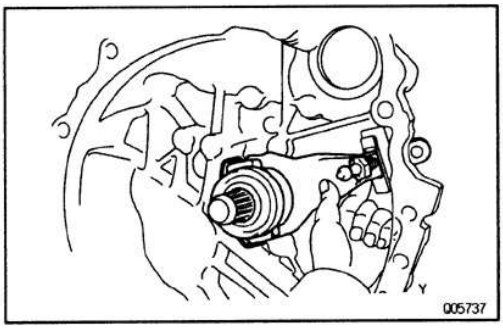
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3. **APPLY MOLYBDENUM DISULPHIDE LITHIUM BASE GREASE (NLGI NO.2) TO FOLLOWING PARTS**
   - Release fork and hub contact point
   - Release fork and push rod contact point
   - Release fork pivot point



- Clutch disc spline



4. **INSTALL RELEASE BEARING AND FORK TO TRANSAXLE**
   Install the bearing to the release fork, and then install them to the transaxle.

5. **INSTALL TRANSAXLE TO ENGINE**
   (See page MX–13)

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SERVICE SPECIFICATIONS

SERVICE DATA

CL02U-04

Pedal height from asphalt sheet	LHD	144.9–154.9 mm (5.705–6.098 in.)
Pedal height from asphalt sheet	RHD	141.0–151.0 mm (5.551–5.945 in.)
Push rod play at pedal top		1.0–5.0 mm (0.039–0.197 in.)
Pedal freeplay		5.0–15.0 mm (0.197–0.591 in.)
Clutch release point from pedal full stroke end position		25 mm (0.98 in.) or more
Disc rivet head depth	Minimum	0.3 mm (0.012 in.)
Disc runout	Maximum	0.8 mm (0.031 in.)
Diaphragm spring tip non–alignment	Maximum	0.5 mm (0.020 in.)
Diaphragm spring finger wear	Maximum depth	0.6 mm (0.024 in.)
Diaphragm spring finger wear	Maximum width	5.0 mm (0.197 in.)
Flywheel runout	Maximum	0.1 mm (0.004 in.)

TORQUE SPECIFICATIONS

CL000-0M

Part tightened	N·m	kgf·cm	ft·lbf
Clutch cover x Flywheel	19	195	14
Release fork support	47	480	35

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MANUAL TRANSAXLE

DESCRIPTION ..... MX– 2
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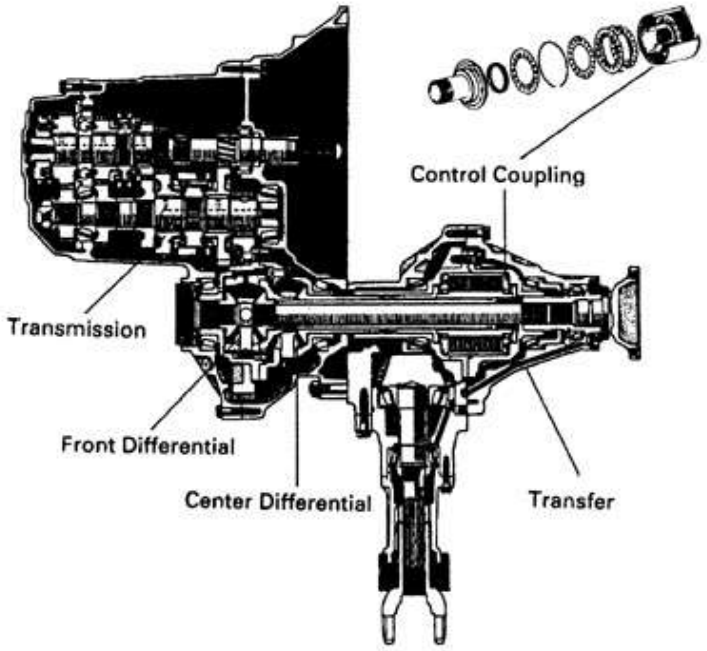
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DESCRIPTION

GENERAL

MX01R-00

- A triple–cone type synchromesh mechanism is used in the 2nd gear and a double–cone type synchromesh mechanism is used in the 3rd gear to improve the shift feeling characteristics. This helps to reduce the shifting effort. A reverse synchromesh mechanism is used to suppress gear engagement noise during reverse gear shifting.
- The E154F transaxle has been compactly designed by arranging the transmission, the center differential, the front differential and the transfer on the same quadruple case axle.
- The center differential, which compenstates the difference in rotation speed between the front and rear wheels, utilizes bevel gear to provide durability and reliability by distributing the engine power from the transmission 50/50 to both front and rear propeller shafts. This center differential has been equipped with a control coupling which functions as a LSD.



MT0340
D06028

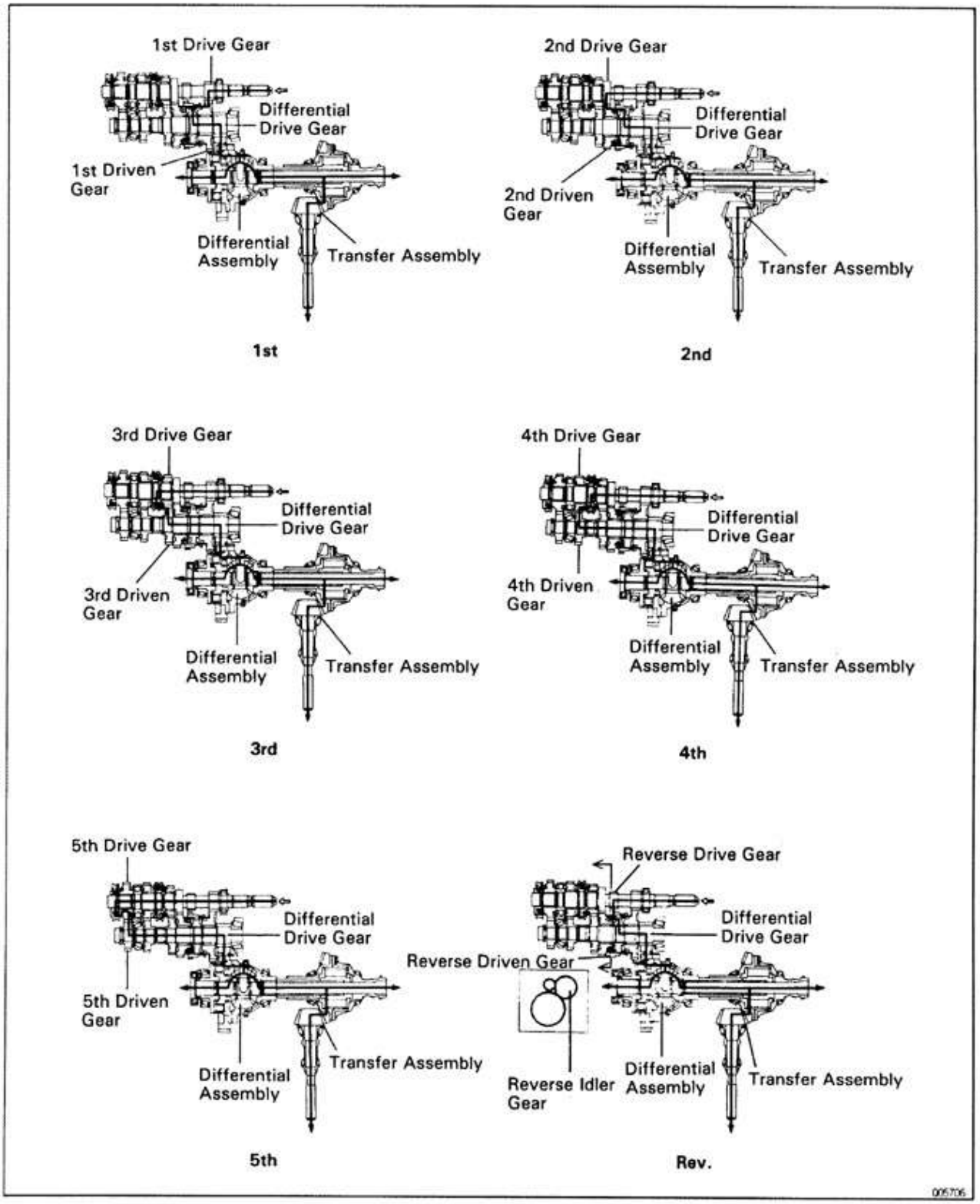
Y V05503

Type of Transaxle		E154F
Type of Engine		3S–GTE
Gear Ratio	1st Gear	3.384
	2nd Gear	1.913
	3rd Gear	1.258
	4th Gear	0.918
	5th Gear	0.731
	Reverse Gear	3.545
Differntial Gear Ratio		4.285
Oil Capacity		5.2 liters (5.5 US qts, 4.6 Imp. qts)
Oil Viscosity		SAE 75W–90 or 80W–90
Oil Grade		API GL–5

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OPERATION

- **The illustrations below show the engagements of the transaxle gears.**



MX

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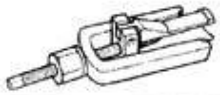
PREPARATION

SST (SPECIAL SERVICE TOOLS)

MX018-00

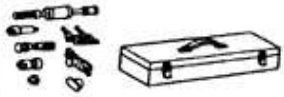
	09223–15010	Crankshaft Rear Oil Seal Replacer	Differential case oil seal
	09308–00010	Oil Seal Puller	
	09309–36010	Transmission Rear Bearing Replacer	
	09316–20011	Transfer Bearing Replacer	Input shaft bearing Differential side bearing
	09316–60010	Transmission & Transfer Bearing Replacer	No.1 hub sleeve Differential case taper roller bearing outer race Transaxle case cover oil seal
	(09316–00010)	Replacer Pipe	Side gear shaft holder bearing
	(09316–00020)	Replacer "A"	Input shaft front bearing inner race
	(09316–00040)	Replacer "C"	1st gear No.1 hub sleeve
	(09316–00050)	Replacer "D"	Driven pinion front bearing
	(09316–00060)	Replacer "E"	Transfer left case outer race
	(09316–00070)	Replacer "F"	Output shaft front bearing
	09316–20011	Transfer Bearing Replacer	
	09318–20010	Transfer Side Bearing Adjusting Nut Wrench	Ring gear mounting case side bearing outer race

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	09319–60020	Output Shaft Needle Roller Bearing Remover	Control shaft cover bearing
	09325–20010	Transmission Oil Plug	Extension housing oil seal
	09326–20011	Output Shaft Bearing Lock Nut Wrench	Driven pinion preload
	09506–30012	Differential Drive Pinion Rear Bearing Cone Replacer	Output shaft rear bearing
	09506–35010	Differential Drive Pinion Rear Bearing Replacer	No.2 hub sleeve Side bearing Input shaft bearing
	09550–10012	Replacer Set "B"	Drive pinion bearing cage rear bearing outer race
	(09252–10010)	No. 1 Replacer Handle	
	(09555–10010)	Differential Drive Pinion Rear Bearing Replacer	
	09608–12010	Front Hub & Drive Pinion Bearing Replacer Set	Input shaft oil seal
	(09608–00020)	Remover & Replacer Handle	
	(09608–00060)	Drive Pinion Front Bearing Cup Replacer	
	(09608–00080)	Replacer	
	09608–35014	Axle Hub & Drive Pinion Bearing Tool Set	
	(09608–06020)	Handle	

MX

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	(09608–06120) Front Hub Outer Bearing Cup Replacer	
	(09608–06180) Drive Pinion Rear Bearing Cup Replacer	Transfer right case outer race
	09612–65014 Steering Worm Bearing Puller	Input shaft bearing Differential taper roller bearing outer race
	09620–30010 Steering Gear Box Replacer Set	Control shaft cover bearing
	(09627–30010) Steering Sector Shaft Bushing Replacer	Control shaft cover oil seal
	(09631–00020) Handle	
	09910–00015 Puller Set	Differential side gear intermediate shaft
	(09911–00011) Puller Clamp	
	(09912–00010) Puller Slide Hammer	
	09950–00020 Bearing Remover	
	09950–00030 Bearing Remover Attachment	
	09950–30010 Puller A Set	5th diven gear No.3 clutch hub
	09950–40010 Puller B Set	Differential case side bearing Transfer case side bearing

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RECOMMENDED TOOLS

MX01T-08

	09025–00010	Small Torque Wrench	Differential preload
	09031–00030	Pin Punch	
	09042–00040	Torx Socket T50	
	09042–00050	Torx Socket T45	
	09905–00012	Snap Ring No. 1 Expander	

MX

EQUIPMENT

MX01U-08

Dial indicator with magnetic base	
Feeler gauge	
Micrometer	
Calipers	
Cylinder gauge	
Torque wrench	

LUBRICANT

MX01S-06

Item	Capacity	Classification
Manual transaxle oil (w/Differential and Transfer oil)	5.2 liters (5.5 US qts, 4.6 Imp. qts)	API GL–5 SAE 75W–90 or 80W–90

SSM (SPECIAL SERVICE MATERIALS)

MX01V-08

08826–00090	Seal Packing 1281, THREE BOND 1281 or equivalent (FIPG)	Transaxle case x Case cover Transmission case x Transaxle case Transmission case x Case cover
08833–00080	Adhesive 1344, THREE BOND 1344, LOCTITE 242 or equivalent	Transaxle case cover bolt Straight screw plug Control shaft cover bolt

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TROUBLESHOOTING

MX02A-0E

Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in order. If necessary, replace these parts.

See Page / Parts Name / Trouble	Oil (Level Low)	Oil (Wrong)	Oil (Level too high)	Gasket (Damaged)	Oil seal (Worn or damaged)	O-Ring (Worn or damaged)	Control cable (Faulty)	Locking ball spring (Damaged)	Shift fork (Worn)	Gear (Worn or damaged)	Bearing (Worn or damaged)	Synchronizer ring (Worn or damaged)	Shifting key spring (Damaged)	Differential, Center differential (Faulty)		
	I	MX-2	—	MX-15, 86*	MX-15, 86*	MX-15, 85, 86*	MX-84	MX-15	MX-15	MX-15, 86*	MX-15, 86*	MX-15, 31, 37	MX-15, 31, 37	MX-53		
Noise	1	2								3	3					
Oil leakage			1	2	2	3										
Hard to shift or will not shift							1					2	3			
Jumps out of gear								1	2	3	3					
Tight corner braking														1		

* TRANSFER

W05499

PRECAUTION

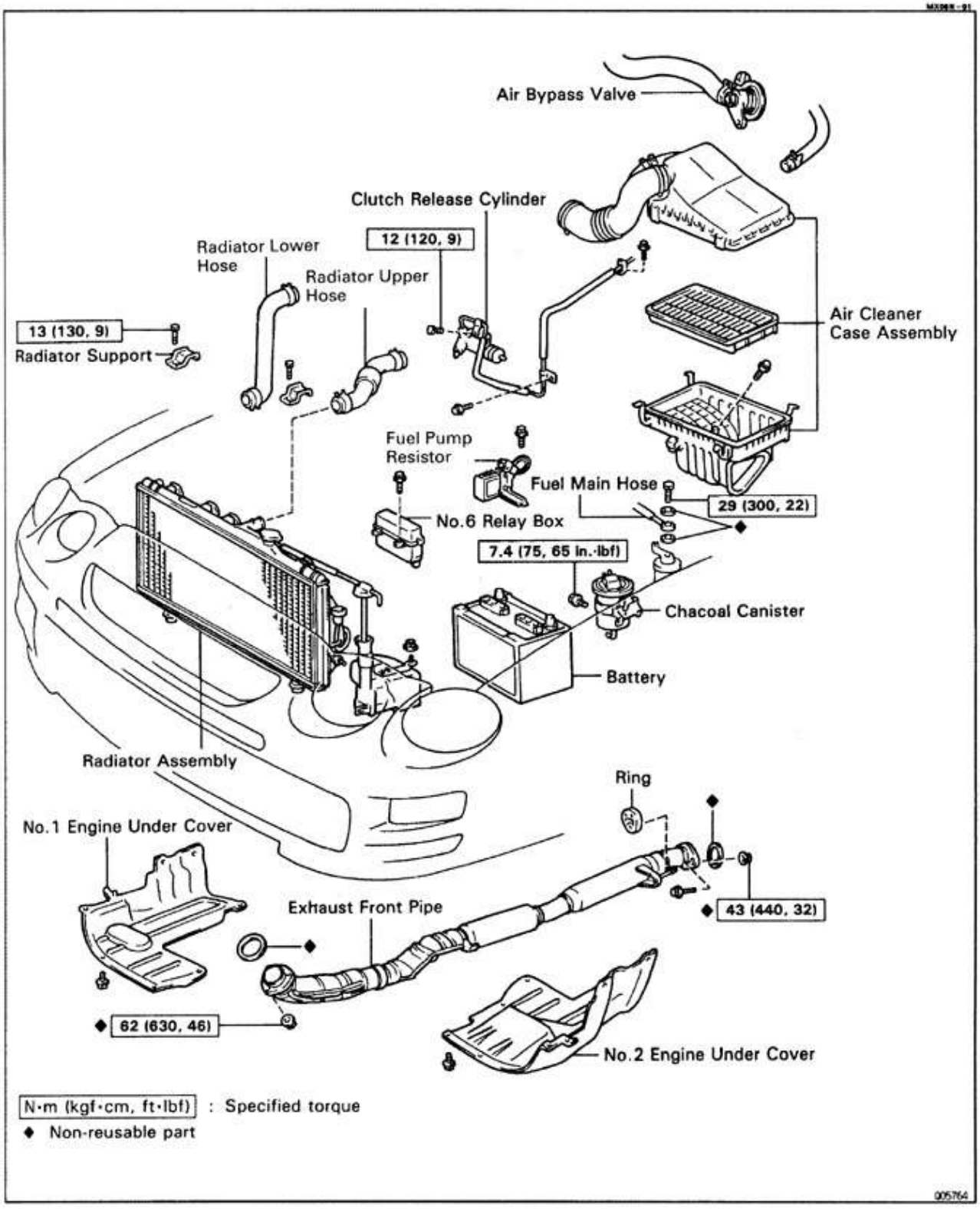
MX022-0E

When working with FIPG material, you must observe the following.

- Using a razor blade and gasket scraper, remove all the old FIPG material from the gasket surfaces.
- Thoroughly clean all components to remove all the loose material.
- Clean both sealing surfaces with a non—residue solvent.
- Apply the FIPG in an approx. 1 mm (0.04 in.) wide bead along the sealing surface.
- Parts must be assembled within 10 minutes of application. Otherwise, the FIPG material must be removed and reapplied.

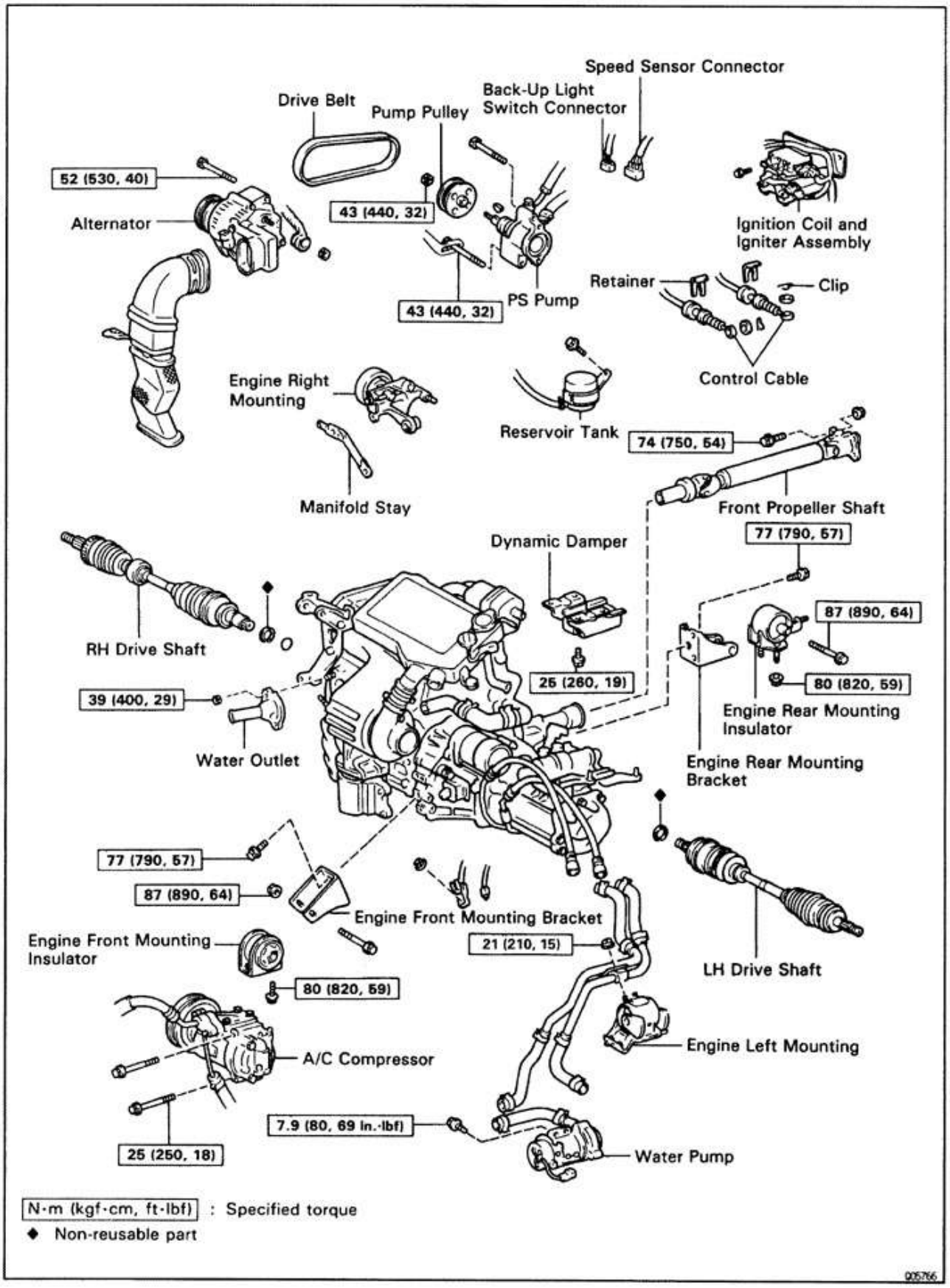
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ASSEMBLY REMOVAL AND INSTALLATION

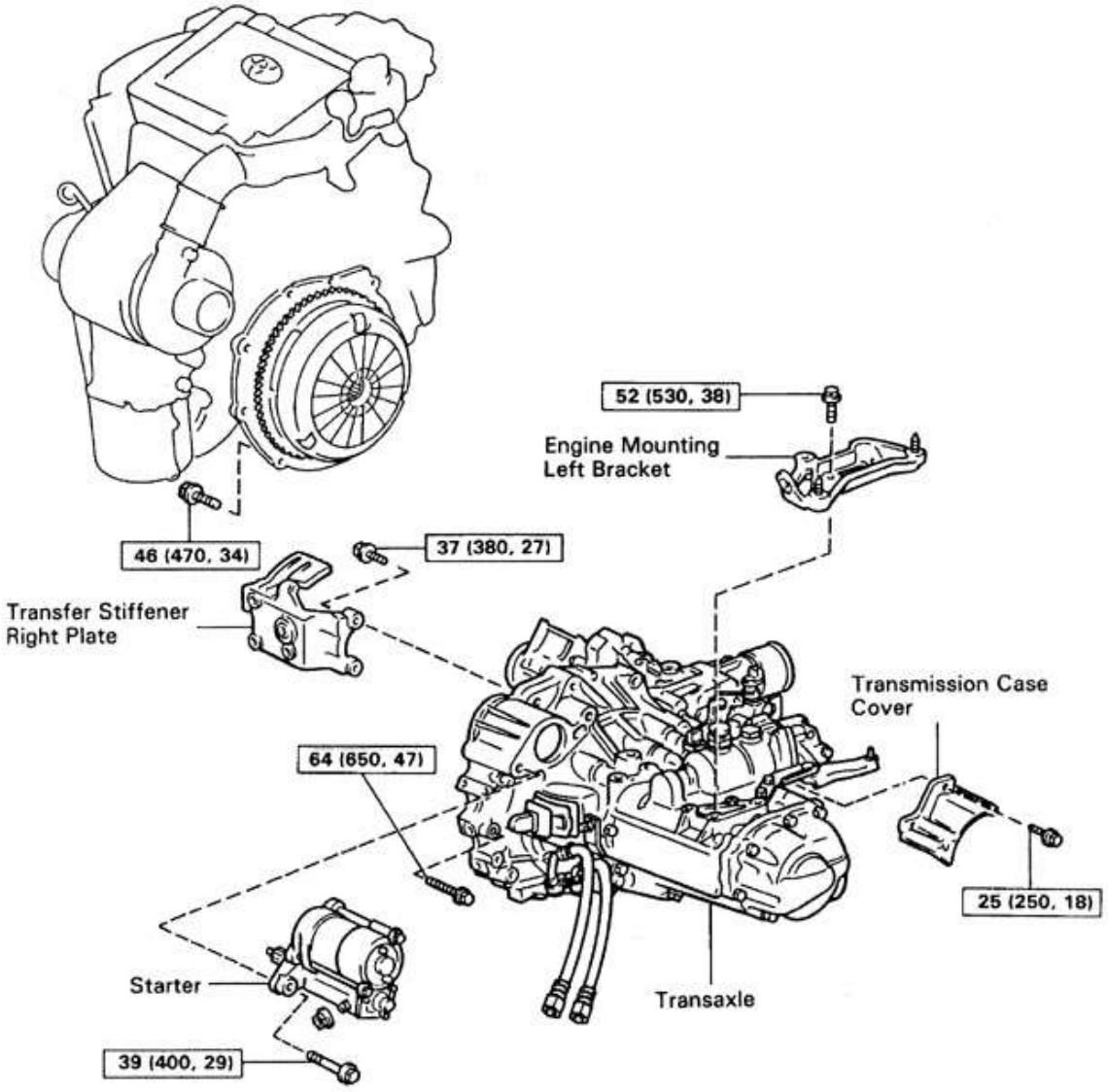


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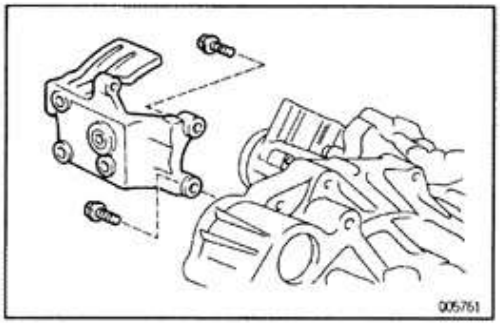


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N·m (kgf·cm, ft·lbf) : Specified torque

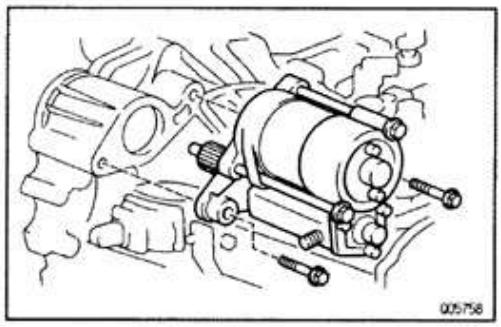
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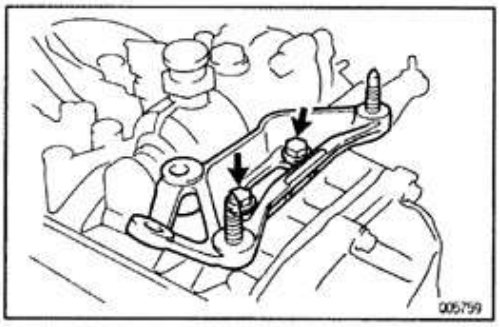
TRANSAXLE REMOVAL

1. **REMOVE TRANSAXLE WITH ENGINE**
   (See pages MX–9 and MX–10)
2. **REMOVE TRANSFER STIFFENER RIGHT PLATE**
   Remove the 2 bolts and transfer stiffener right plate.

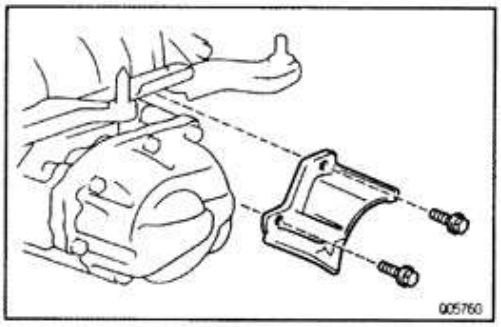
MX



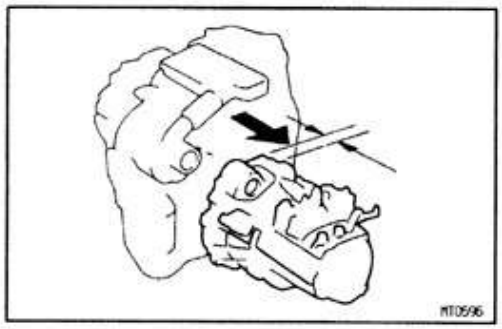
3. **REMOVE STARTER**
   Remove the 2 bolts and starter.



4. **REMOVE ENGINE MOUNTING LEFT BRACKET**
   Remove the 2 bolts and engine mounting left bracket.



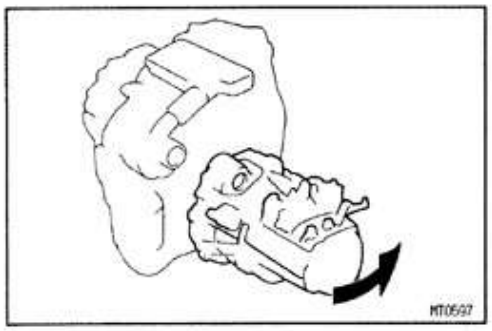
5. **REMOVE TRASAXLE CASE COVER**
   Remove the 2 bolts and transaxle case cover.



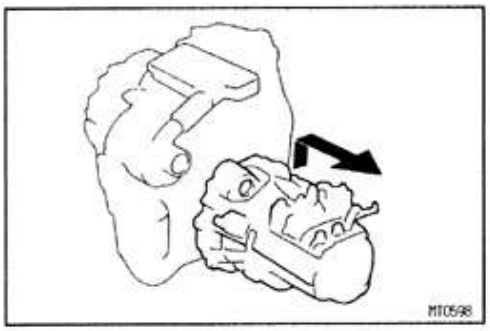
6. **REMOVE TRANSAXLE FROM ENGINE**
   (See page MX–11)

(a) Remove the transaxle mounting bolts from the engine.
(b) Pull straight until there is a gap of about 60–80 mm (2.0–3.0 in.) between the engine and transaxle case.

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(c) Move the transmission case cover in the direction illustration.



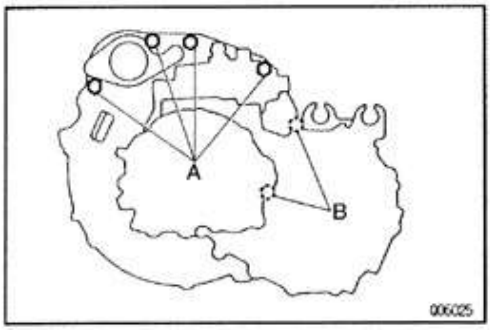
(d) While holding, transfer output slightly, pull out whole transaxle.

TRANSAXLE INSTALLATION

MX0BG-01

1. INSTALL TRANSAXLE TO ENGINE

(a) Install the transaxle following removal sequence in reverse.

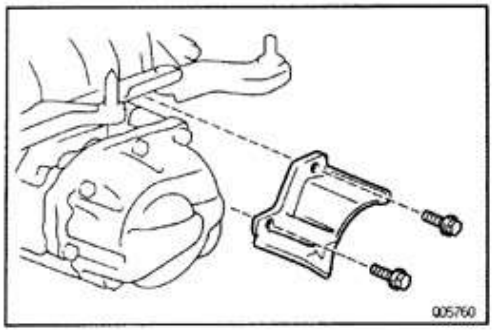


(b) Install and torque the transaxle mounting bolts to the engine.

Torque:

Bolt A 64 N·m (650 kgf·cm, 47 ft·lbf)

Bolt B 46 N·m (470 kgf·cm, 34 ft·lbf)

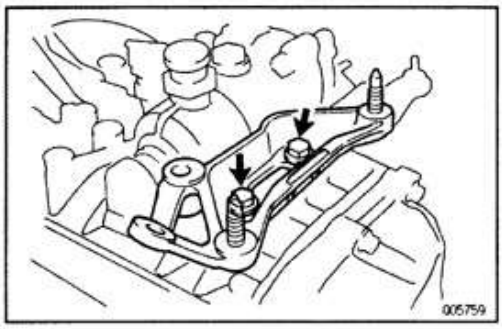


2. INSTALL TRANSAXLE CASE COVER

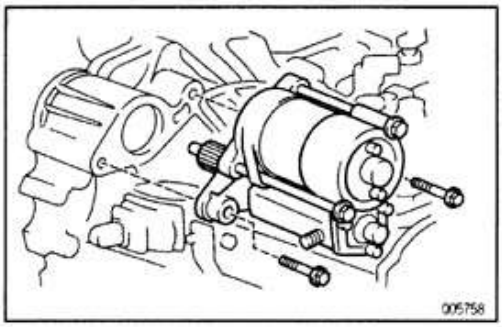
Install the transaxle case cover and torque the 2 bolts.

Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

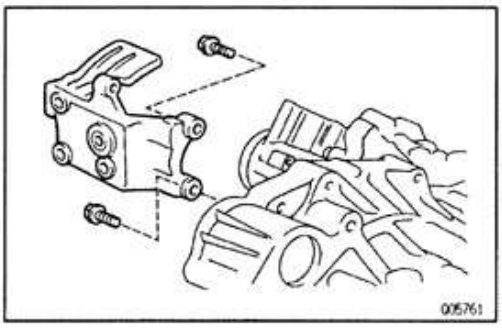
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3. **INSTALL ENGINE MOUNTING LEFT BRACKET**
Install the engine mounting left bracket and torque the 2 bolts.
Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)



4. **INTALL STARTER**
Install the starter and torque the 2 bolts.
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)



5. **INSTALL TRANSFER STIFFENER RIGHT PLATE**
Install the transfer stiffener right plate and torque the 2 bolts.
Torque: 37 N·m (380 kgf·cm, 27 ft·lbf)

6. **INSTALL TRANSAXLE WITH ENGINE**
(See pages MX–9 and MX–10)

7. **FILL TRANSAXLE WITH GEAR OIL**

Recommended oil

Oil grade:

API GL–5

Viscosity:

Above –18°C (0°F)

SAE 75W–90, 80W–90 or 90

Below –18°C (0°F)

SAE 75W–90, 80W–90 or 80W

Capacity:

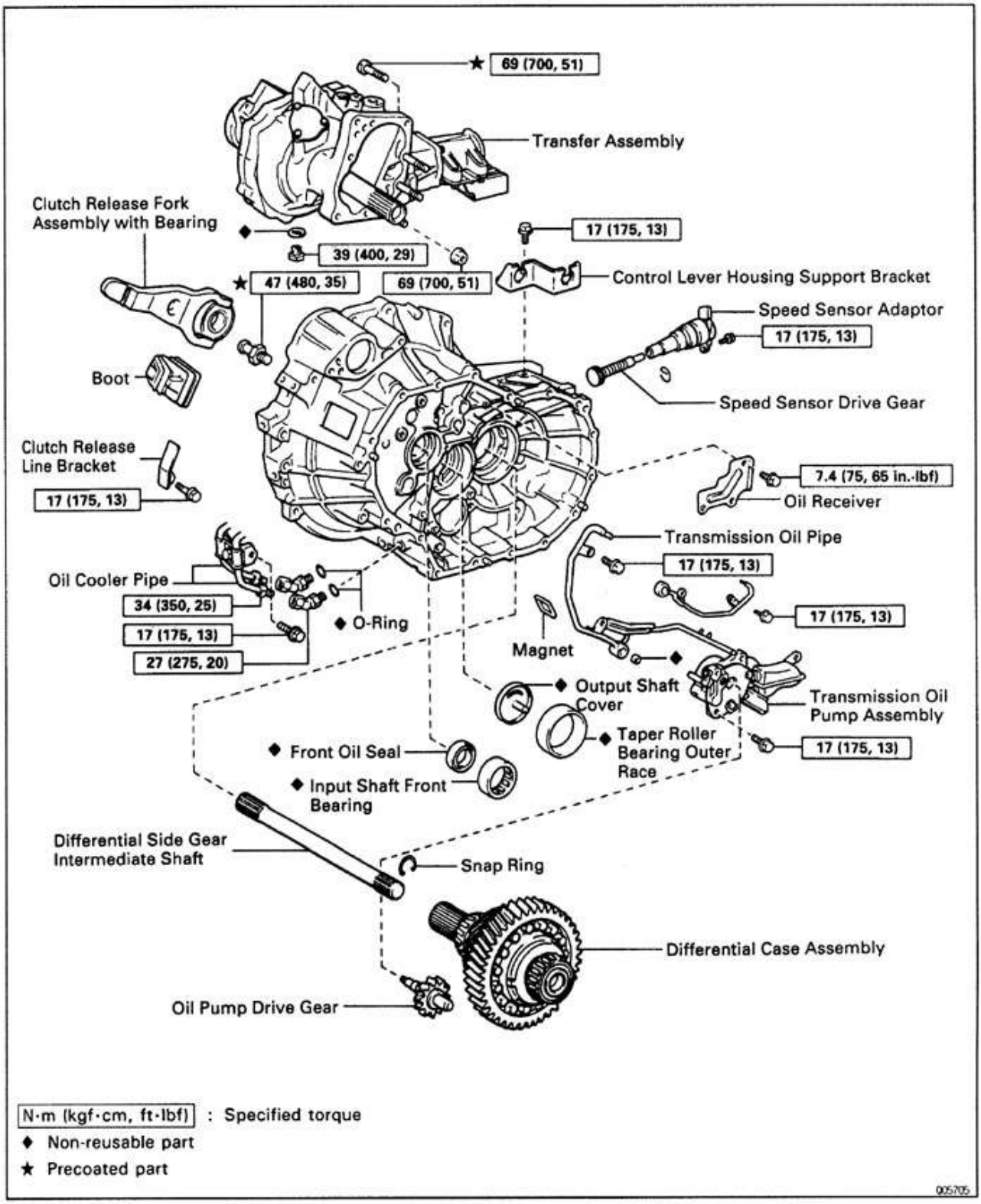
5.2 liters (5.5 US qts, 4.6 Imp. qts)

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COMPONENT PARTS REMOVAL

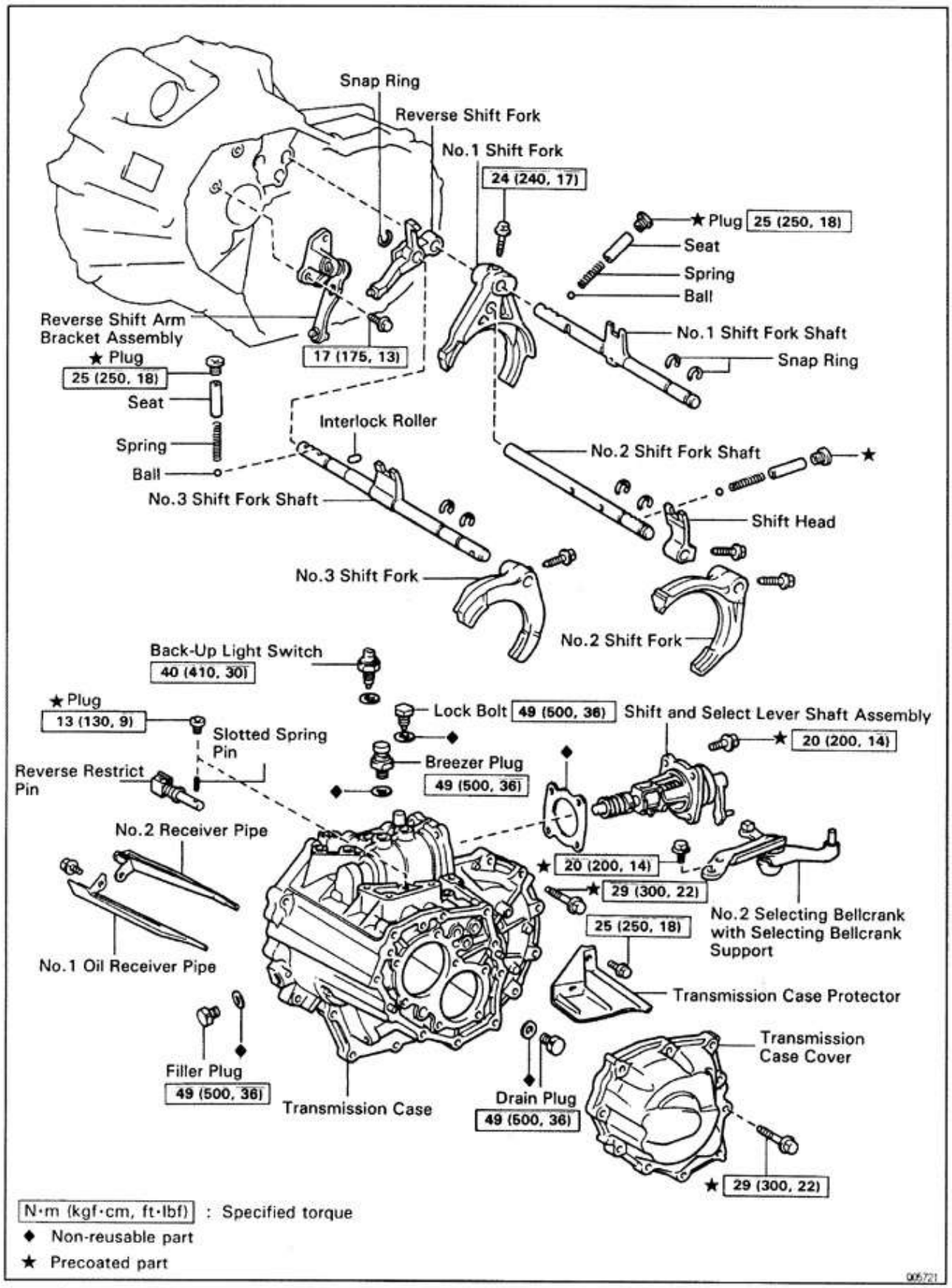
MX014-07

COMPONENTS

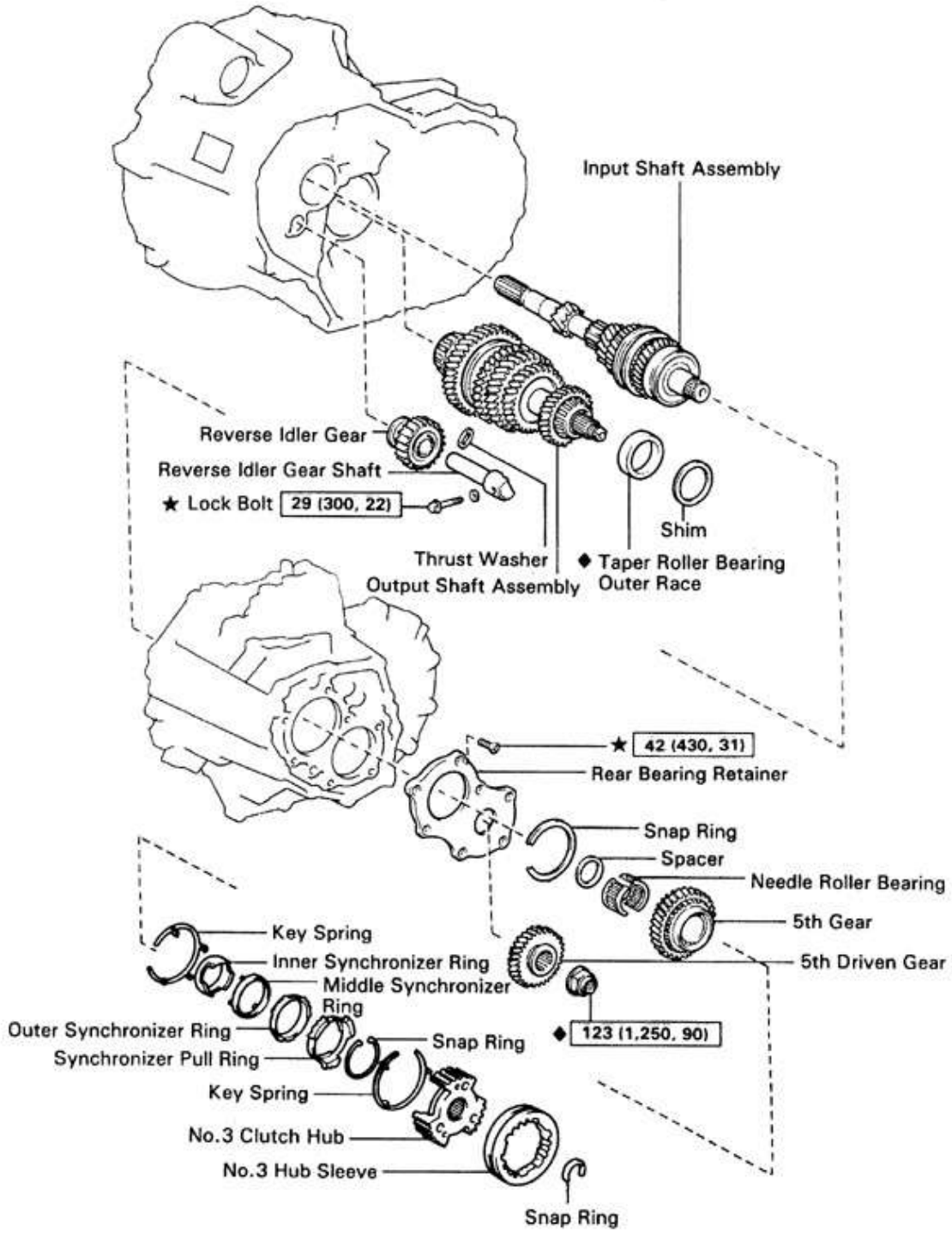


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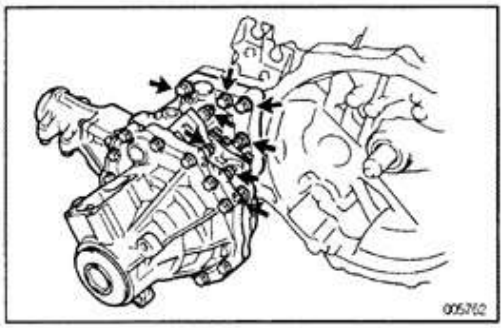
N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non-reusable part
★ Precoated part

000694

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BASIC SUBASSEMBLY SEPARATION

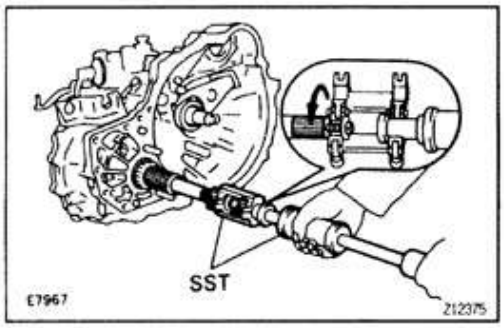
(See pages MX–15 to MX–17)



1. REMOVE TRANSFER ASSEMBLY

(a) Remove the 3 bolts and 5 nuts.

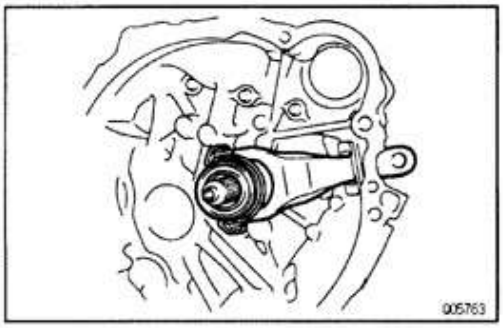
(b) Using a plastic hammer, remove the transfer assembly from the transaxle.



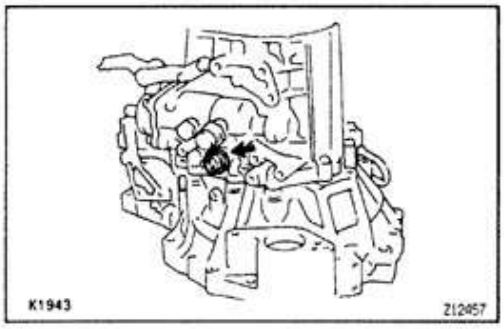
2. REMOVE DIFFERENTIAL SIDE GEAR INTERMEDIATE SHAFT

(a) Screw in a suitable bolt with washer into the side gear intermediate shaft.

(b) Using SST, remove the side gear intermediate shaft.
SST 09910–00015 (09911–00011, 09912–00010)

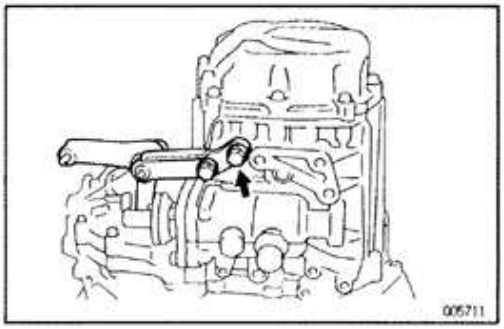


3. REMOVE RELEASE FORK AND BEARING



4. REMOVE BACK–UP LIGHT SWITCH

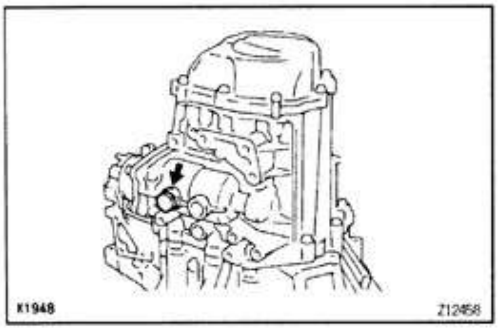
5. REMOVE SPEED SENSOR



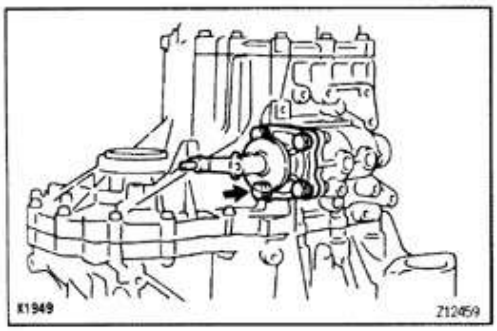
6. REMOVE NO.2 SELECTING BELLCRANK WITH SELECTING BELLCRANK SUPPORT

Remove the 2 bolts and No.2 selecting bellcrank with selecting bellcrank support.

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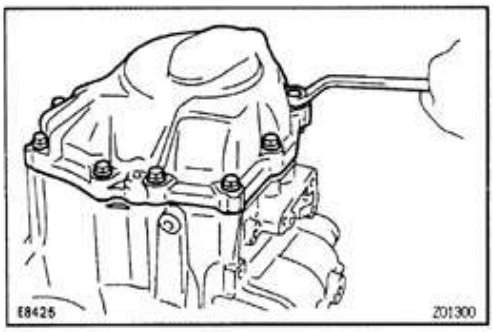


7. REMOVE SHIFT AND SELECT LEVER SHAFT LOCK BOLT WITH GASKET



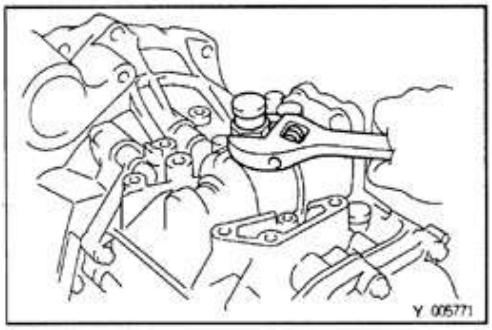
8. REMOVE SHIFT AND SELECT LEVER SHAFT ASSEMBLY

Remove the 4 bolts and shift and select lever shaft assembly.

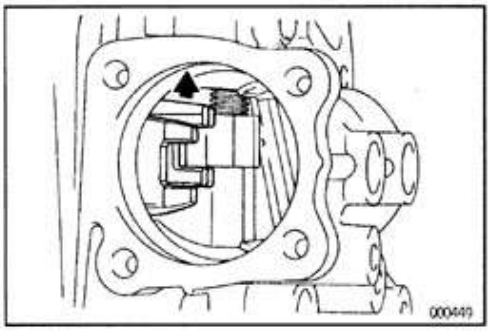


9. REMOVE TRANSMISSION CASE COVER

Remove the 10 bolts and transmission case cover.



10. REMOVE BREATHER PLUG WITH GASKET

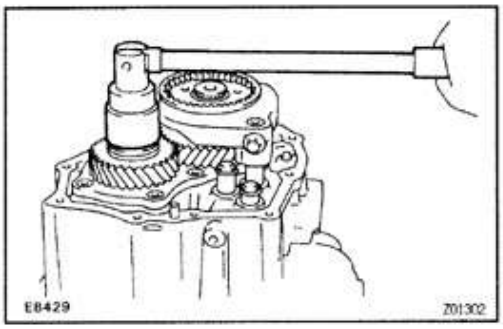


11. REMOVE OUTPUT SHAFT LOCK NUT

(a) Unstake the lock nut.

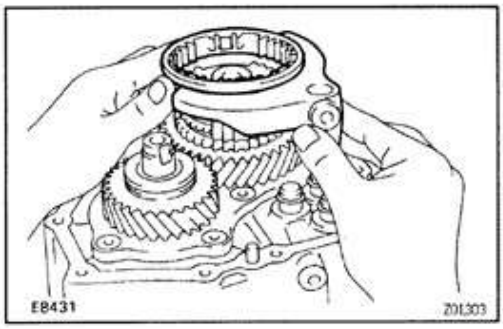
(b) Engage the gear double meshing.

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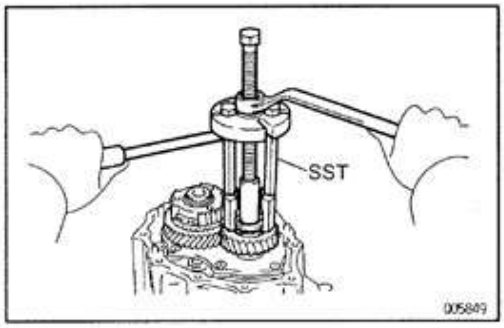
(c) Remove the lock nut.
(d) Disengage the gear double meshing.

MX



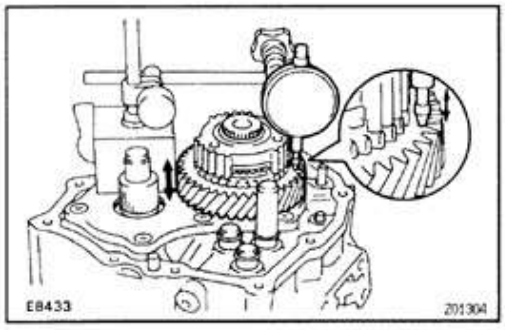
12. REMOVE NO. 3 HUB SLEEVE AND NO. 3 SHIFT FORK

(a) Remove the No.3 shift fork set bolt.
(b) Remove the No.3 hub sleeve and No.3 shift fork.



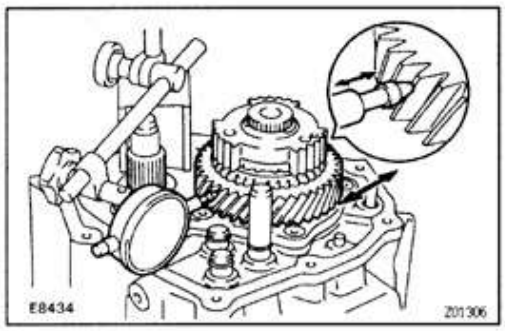
13. REMOVE 5TH DRIVEN GEAR

Using SST, remove the 5th driven gear.
SST 09950–30010



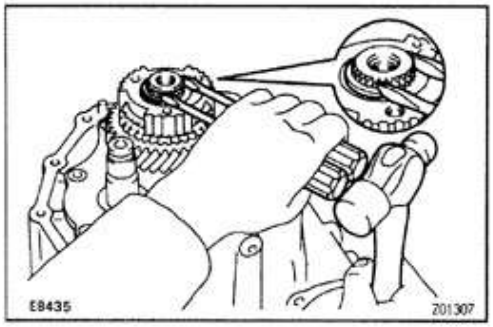
14. MEASURE 5TH GEAR THRUST CLEARANCE AND RADIAL CLEARANCE

(a) Using a dial indicator, measure the thrust clearance.
Standard clearance:
0.10–0.57 mm (0.0039–0.0224 in.)
Maximum clearance:
0.65 mm (0.0256 in.)



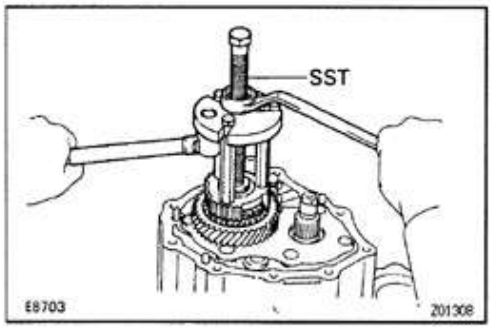
(b) Using a dial indicator, measure the radial clearance.
Standard clearance:
0.009–0.050 mm (0.0004–0.0020 in.)
Maximum clearance:
0.070 mm (0.0028 in.)

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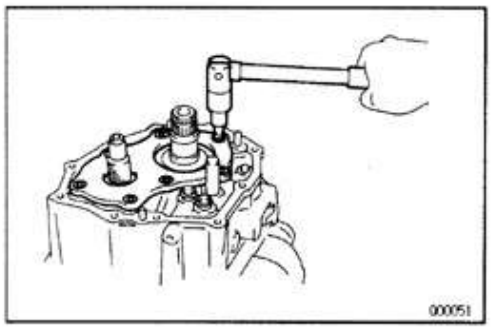
15. REMOVE NO.3 CLUTCH HUB AND 5TH GEAR

(a) Using 2 screwdrivers and a hammer, tap out the snap ring.



(b) Using SST, remove the No.3 clutch hub with the synchronizer ring and 5th gear.
SST 09950–30010

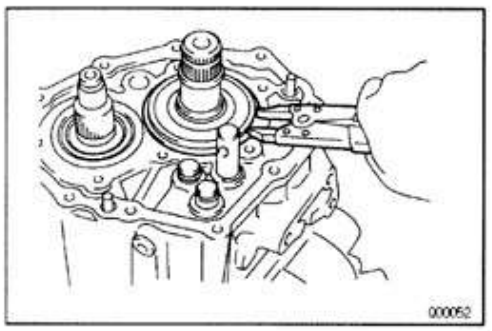
16. REMOVE NEEDLE ROLLER BEARING AND SPACER



17. REMOVE REAR BEARING RETAINER

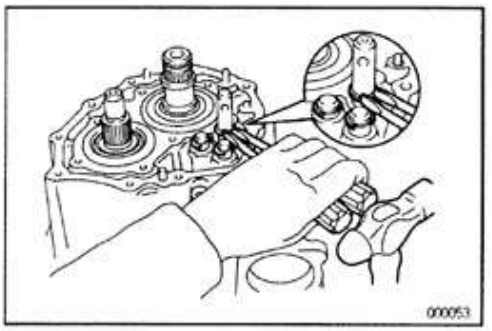
(a) Using a torx socket wrench, remove the 7 torx screws and rear bearing retainer.
(Torx wrench T45 09042–00050)

(b) Remove the adjust shim.



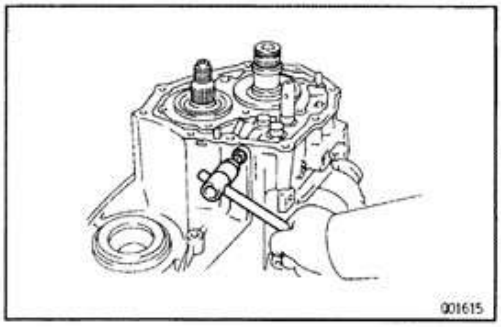
18. REMOVE SNAP RING

(a) Using a snap ring expander, remove the snap ring.



(b) Using 2 screwdrivers and a hammer, remove the 3 snap rings.

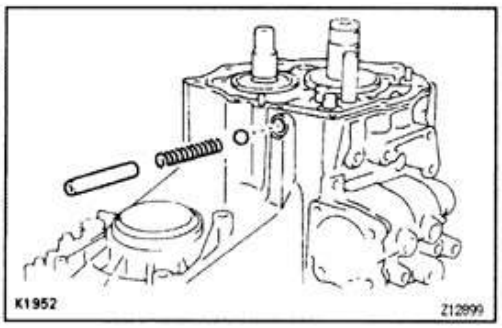
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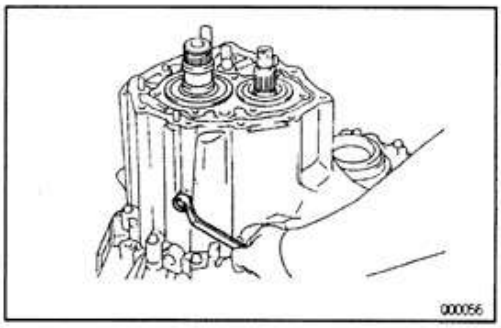
19. REMOVE STRAIGHT SCREW PLUG, SEAT, SPRING AND LOCKING BALL

(a) Using a hexagon wrench (6 mm), remove the plug.

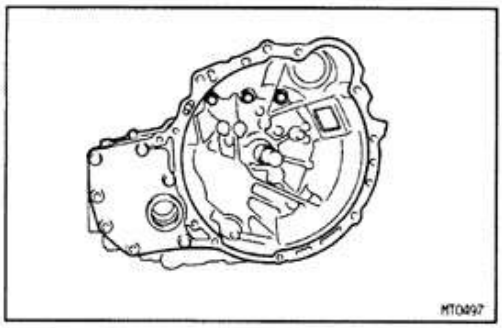
MX



(b) Using a magnetic finger, remove the seat, spring and locking ball.

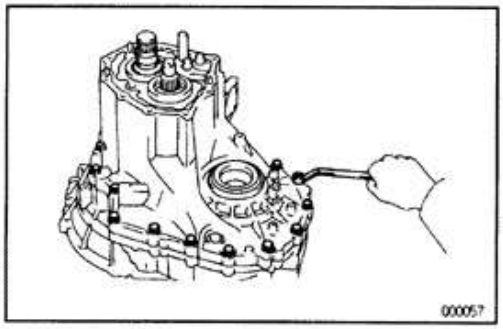


20. REMOVE REVERSE IDLER GEAR SHAFT RETAINING BOLT



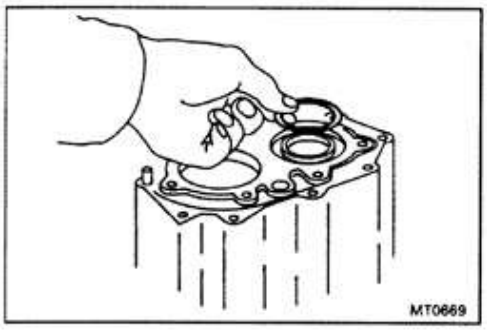
21. REMOVE TRANSMISSION CASE

(a) Remove the 3 bolts from the transaxle case side.



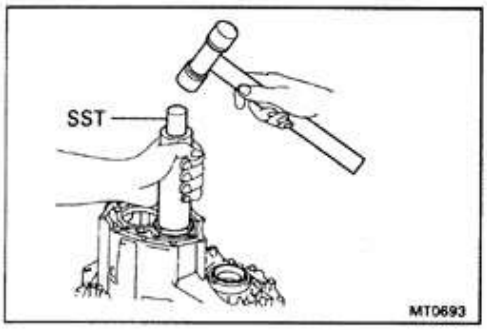
(b) Remove the 14 bolts from the transmission side and tap the case with a plastic hammer.

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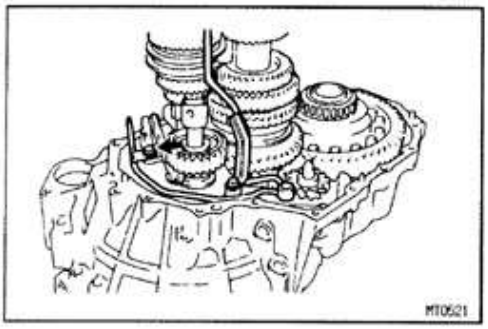


22. REMOVE OUTPUT SHAFT REAR TAPER ROLLER BEARING OUTER RACE

(a) Remove the shim.



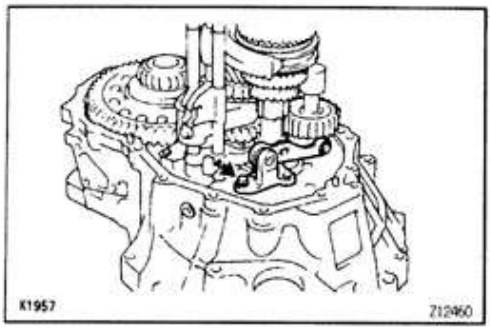
(b) Using SST and a hammer, remove the output shaft rear taper roller bearing outer race.
SST 09316–60010 (09316–00010)



23. REMOVE NO.2 TRANSMISSION OIL PIPE

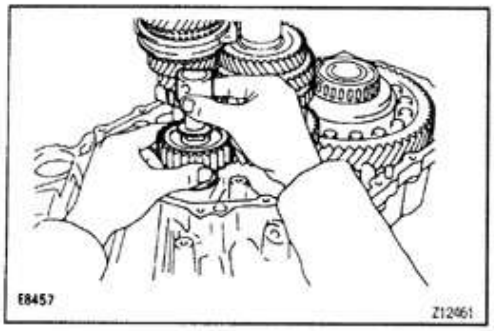
(a) Remove the gasket.

(b) Remove the 2 bolts and oil pipe.



24. REMOVE REVERSE SHIFT ARM BRACKET ASSEMBLY

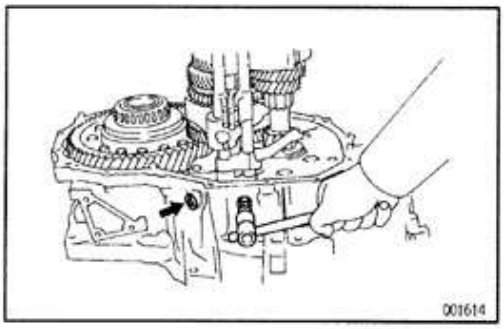
Remove the bolt and pull off the reverse shift arm and bracket.



25. REMOVE REVERSE IDLER GEAR AND SHAFT

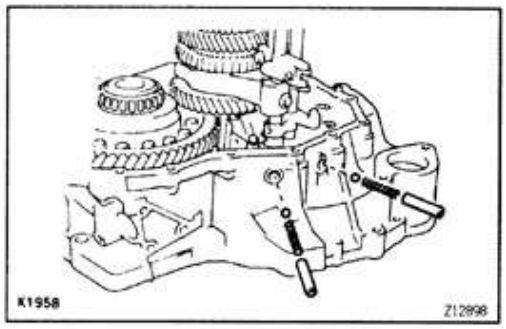
Pull out the shaft, remove the reverse idler gear and thrust washer.

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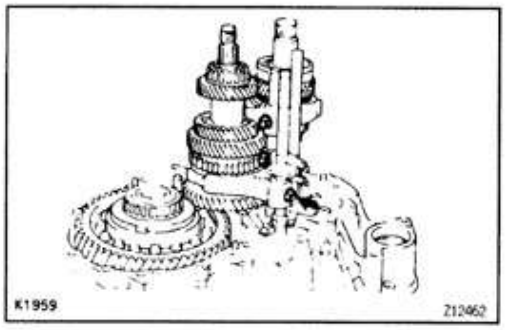


26. REMOVE STRAIGHT SCREW PLUGS, LOCKING BALLS AND SPRINGS

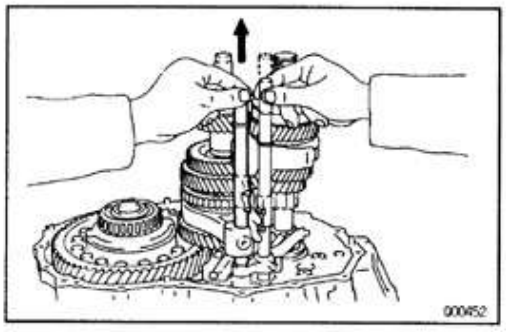
(a) Using a hexagon wrench (6 mm), remove the 2 plugs.



(b) Using a magnetic finger, remove the 2 seats, springs and balls.

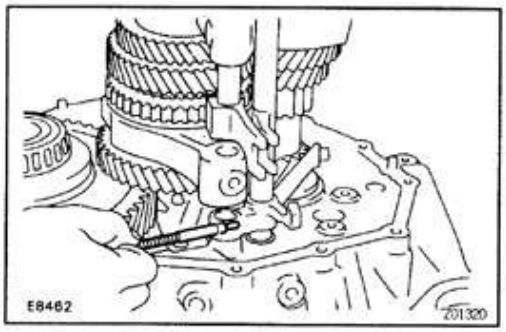


27. REMOVE SHIFT FORK 3 SET BOLTS



28. REMOVE NO.1 SHIFT FORK SHAFT

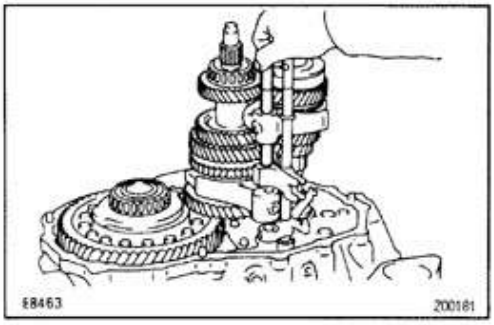
Pull up the No.3 shift fork shaft, remove the No.1 shift fork shaft.



29. REMOVE INTERLOCK ROLLER

Using a magnetic finger, remove the interlock roller from the reverse shift fork.

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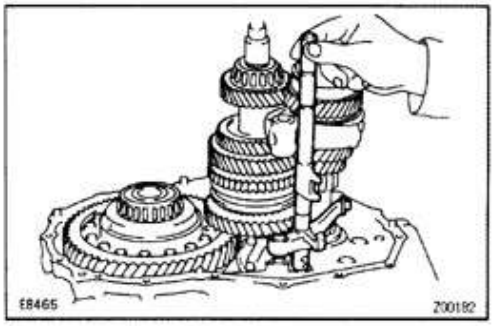


30. REMOVE NO.2 SHIFT FORK SHAFT, SHIFT HEAD AND NO.1 SHIFT FORK

(a) Pull out the No.2 shift fork shaft.

(b) Remove the shift head and No.1 shift fork.

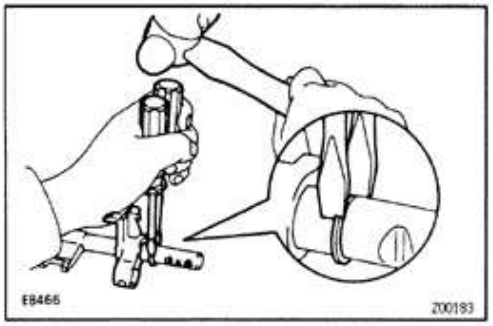
MX



31. REMOVE NO.3 SHIFT FORK SHAFT WITH REVERSE SHIFT FORK AND NO.2 SHIFT FORK

(a) Pull out the No.3 shift fork shaft with the reverse shift fork.

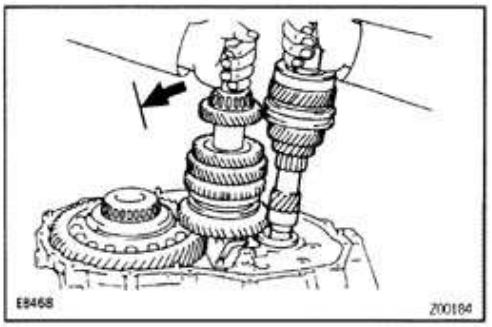
(b) Remove the No.2 shift fork.



32. REMOVE SNAP RINGS

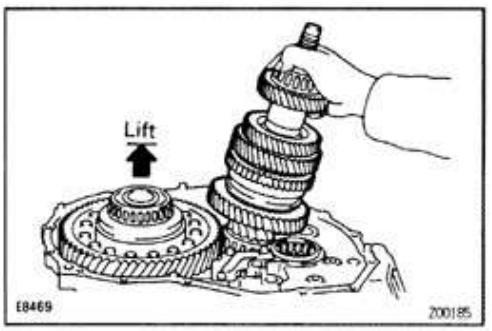
(a) Using 2 screwdrivers and a hammer, remove the snap ring and reverse shift fork from the No.3 shift fork shaft.

(b) Using 2 screwdrivers and a hammer, remove the snap rings from the No.1, No.2 and No.3 shift fork shafts.



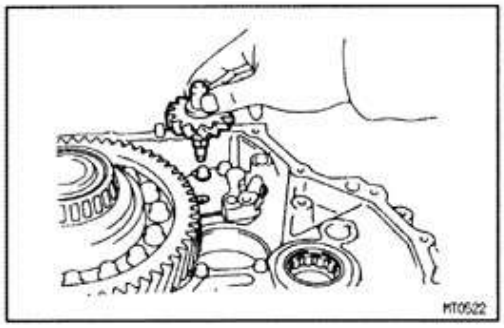
33. REMOVE INPUT AND OUTPUT SHAFT ASSEMBLY

(a) Leaning the output shaft to the differential side, remove the input shaft assembly.



(b) Lift up the differential case assembly, remove the output shaft assembly.

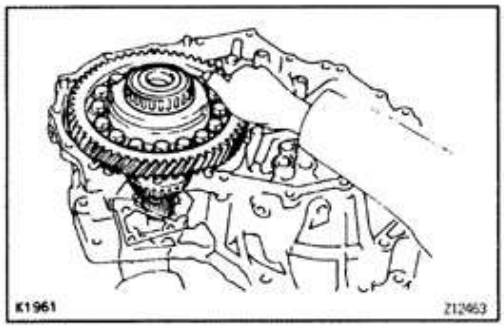
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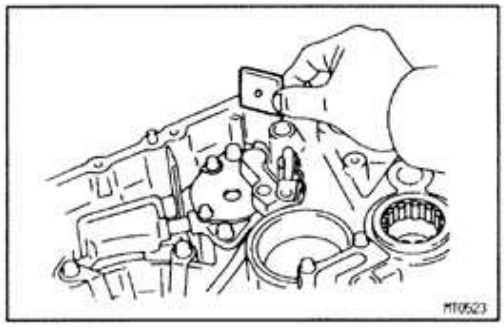
34. REMOVE DIFFERENTIAL ASSEMBLY

(a) Remove the oil pump drive gear.

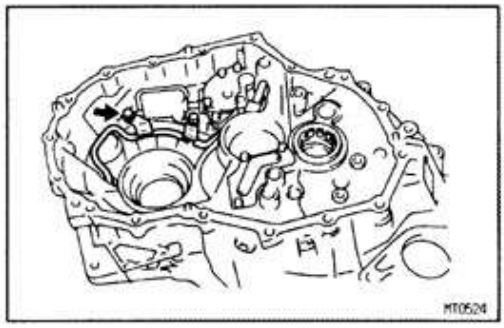
MX



(b) Remove the differential case assembly.

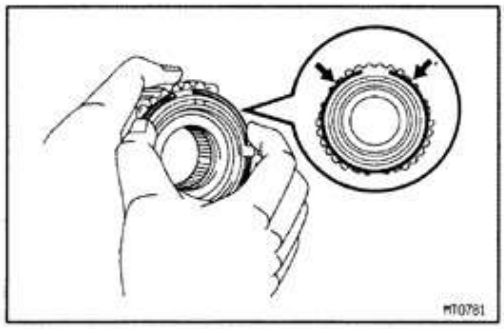


35. REMOVE MAGNET FROM TRANSAXLE CASE



36. REMOVE OIL PUMP ASSEMBLY

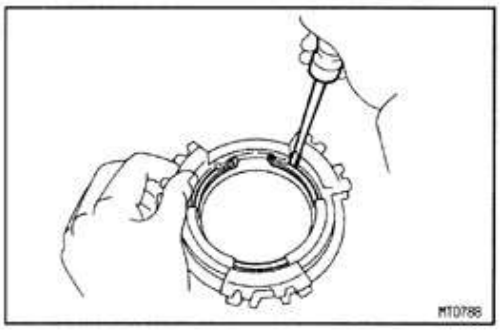
Remove the 4 bolts, oil pipe and oil pump.



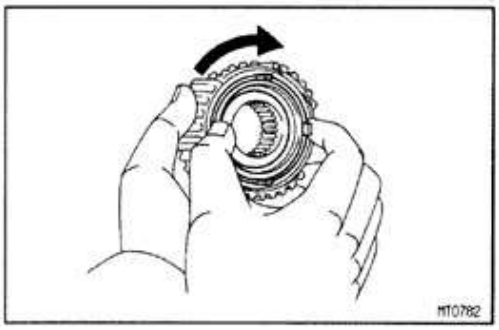
37. REMOVE NO.5 SYNCHRONIZER RING WITH KEY SPRING FROM NO.3 CLUTCH HUB

(a) Remove the No. 5 synchronizer ring with the key spring from the No.3 clutch hub.

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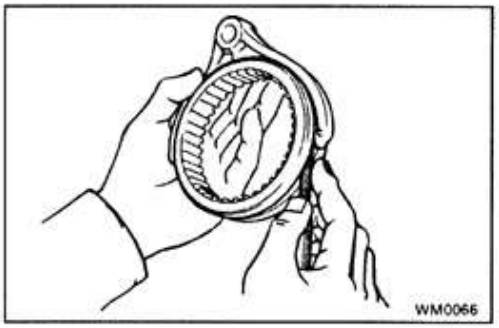
(b) Using a screwdriver, remove the snap ring.
HINT: Wrap vinyl tape on the screwdriver to prevent damaging the synchronizer ring.
(c) Remove the synchronizer rings.



COMPONENT PARTS INSPECTION

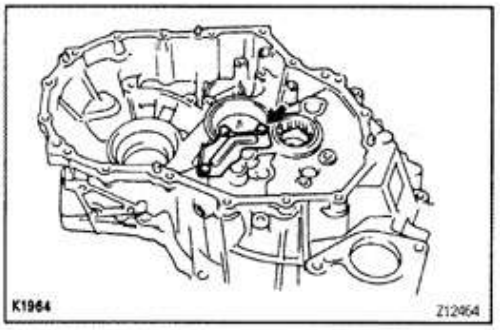
1. INSPECT NO.5 SYNCHRONIZER RINGS

(a) Check for wear or damage.
(b) Check the braking effect of the synchronizer ring. Turn the middle No.5 synchronizer ring in one direction while pushing it to the outer No.5 synchronizer ring. Check that the ring locks.
If it does not lock, replace the synchronizer ring.



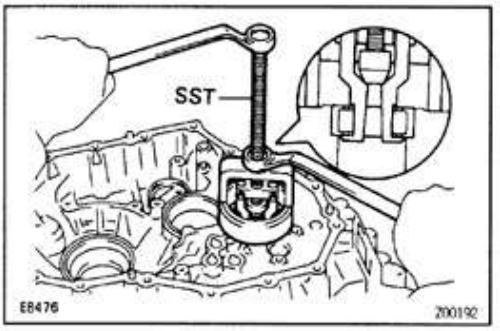
2. MEASURE SHIFT FORKS AND HUB SLEEVES CLEARANCE

Using a feeler gauge, measure the clearance between the hub sleeve and shift fork.
Maximum clearance:
1.0 mm (0.039 in.)
If the clearance exceeds the limit, replace the shift fork or hub sleeve.



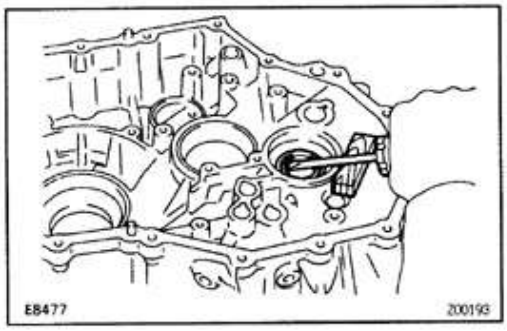
3. IF NECESSARY, REPLACE INPUT SHAFT BEARING AND OIL SEAL

(a) Remove the 3 bolts and transaxle case receiver.



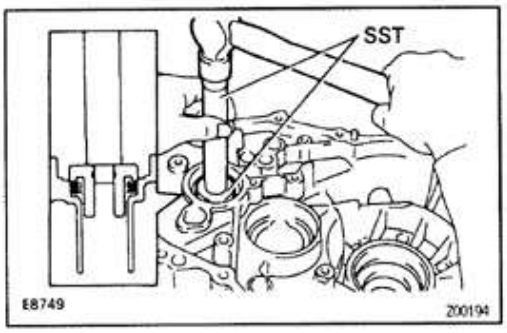
(b) Using SST, pull out the bearing.
SST 09612–65014

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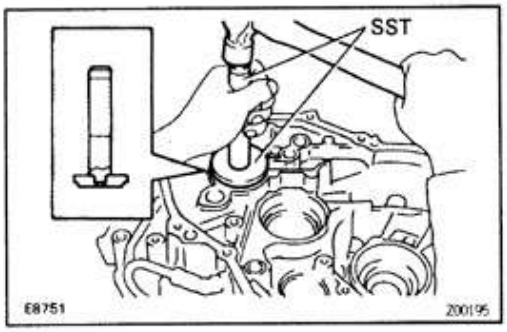
(c) Using a screwdriver, remove the oil seal.

MX

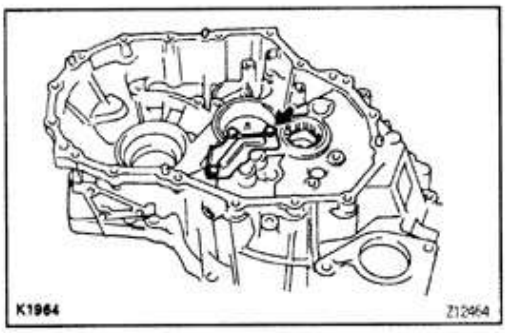


(d) Using SST, drive in a new oil seal.
SST 09608–12010 (09608–00020, 09608–00080)

(e) Coat the lip of seal with MP grease.

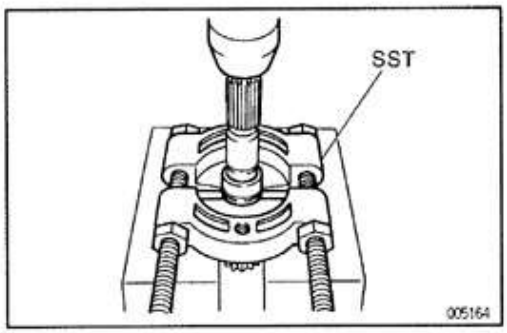


(f) Using SST, drive in a new bearing.
SST 09608–12010 (09608–00020, 09608–00060)



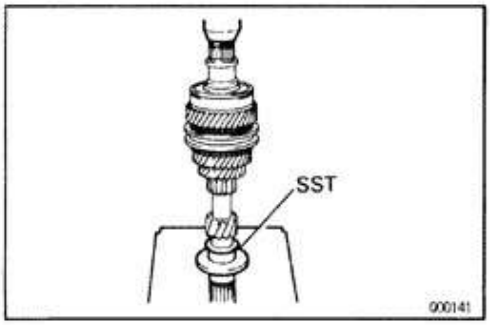
(g) Install the transaxle case receiver.

(h) Install and torque the 3 bolts.
Torque: 7.4 N·m (75 kgf·cm, 65 in.·lbf)

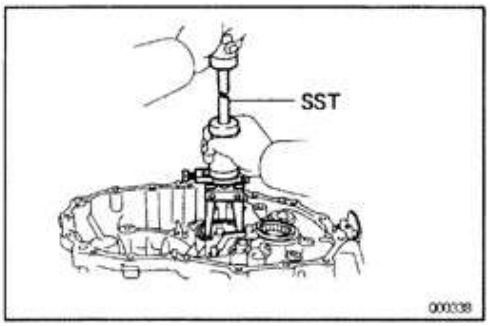


(i) Using SST and a press, remove the inner race.
SST 09950–00020

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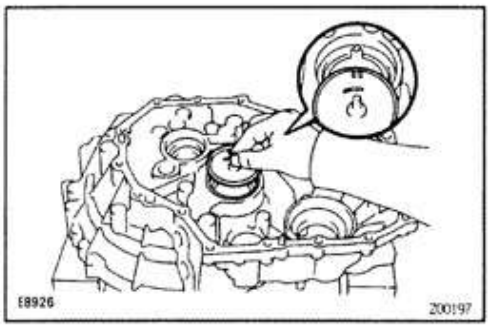
(j) Using SST and a press, install a new input shaft front bearing inner race.
SST 09316–60010 (09316–00020)



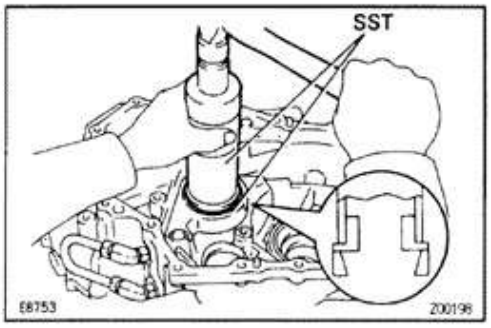
4. IF NECESSARY, REPLACE OUTPUT SHAFT FRONT BEARING OUTER RACE AND OUTPUT SHAFT FRONT COVER

(a) Using SST, pull out the output shaft front bearing outer race.
SST 09308–00010

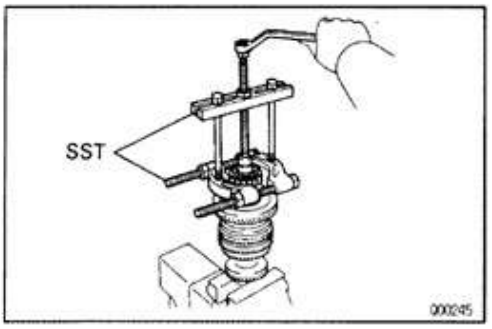
(b) Remove the output shaft cover.



(c) Install a new output shaft cover.
HINT: Install the output shaft cover projection into the case side groove.

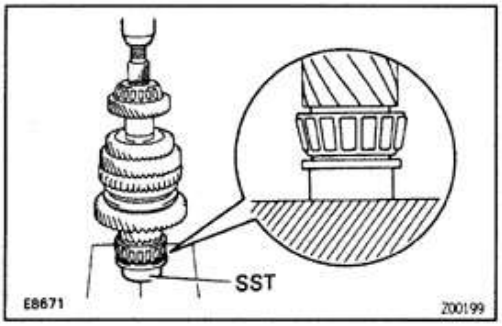


(d) Using SST and a hammer, drive in a new output shaft front bearing outer race.
SST 09316–60010 (09316–00010, 09316–00020)



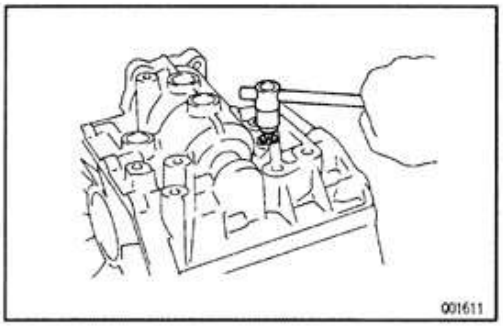
(e) Using SST and a socket wrench, remove the output shaft front bearing.
SST 09950–00020, 09950–00030

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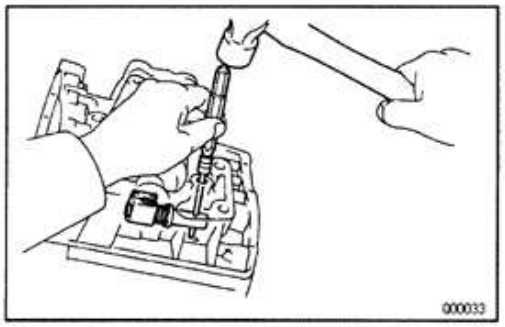
(f) Using SST and a press, install a new output shaft front bearing.
SST 09316–60010 (09316–00070)

MX

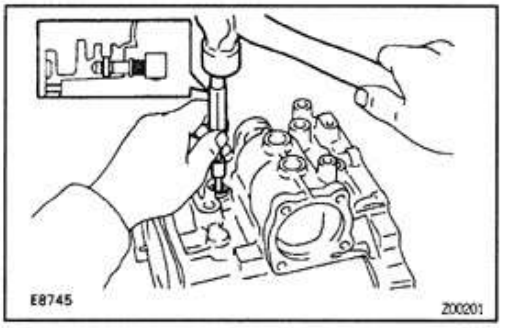


5. IF NECESSARY, REPLACE REVERSE RESTRICT PIN

(a) Using a hexagon wrench (6 mm), remove the screw plug.

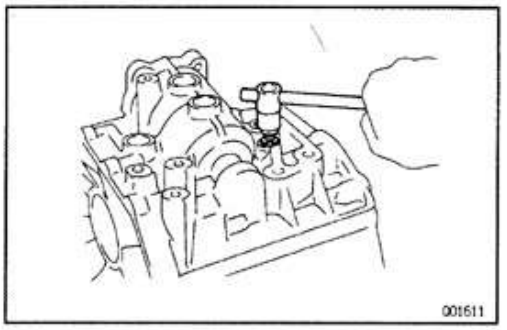


(b) Using a pin punch and hammer, drive out the slotted spring pin.



(c) Replace the reverse restrict pin.

(d) Using a pin punch and hammer, drive in the slotted spring pin.



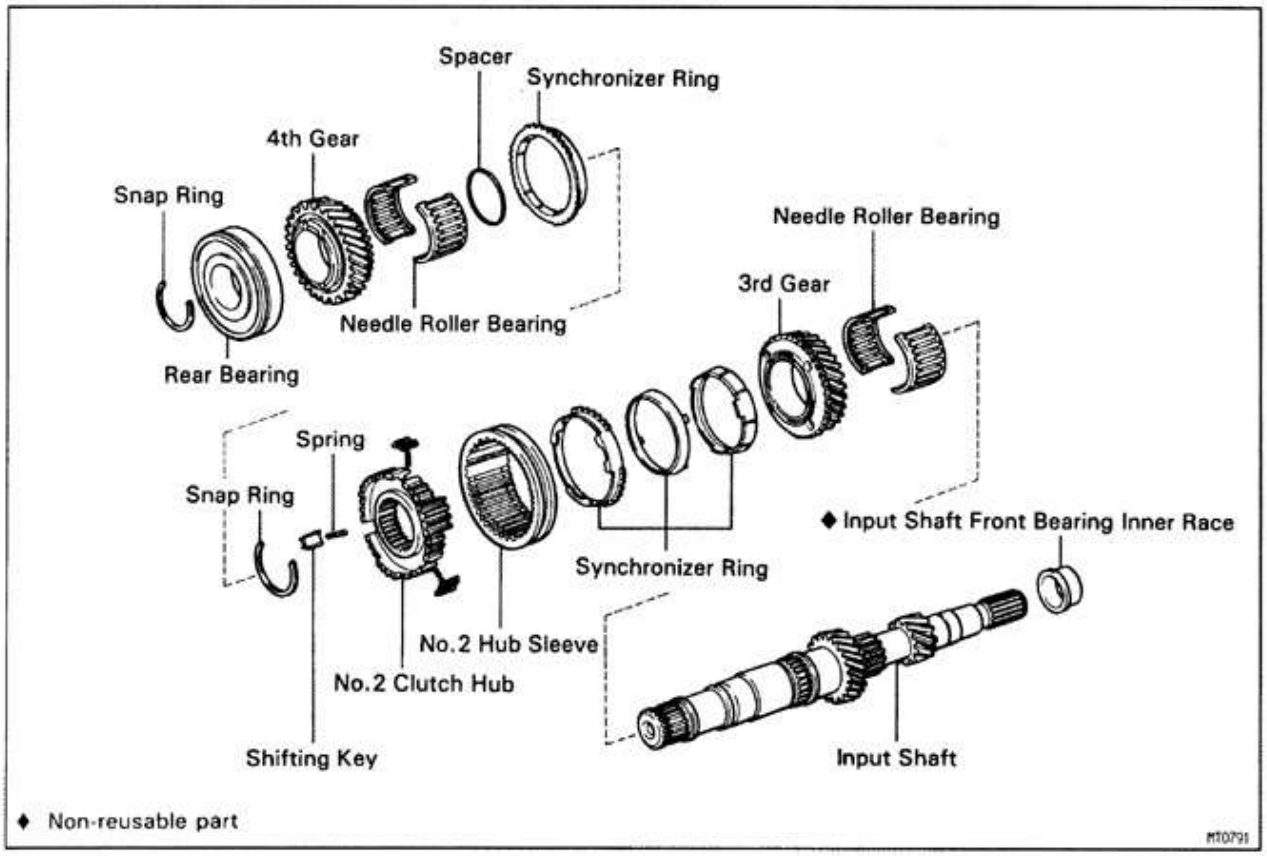
(e) Apply sealant to the screw plug threads.
Sealant:
Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent

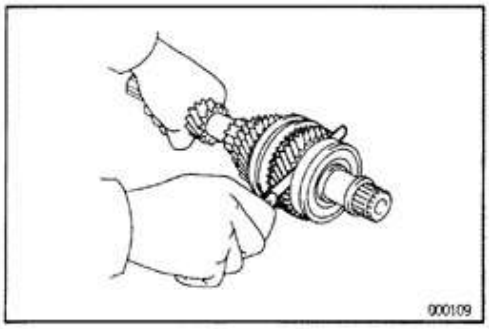
(f) Using a hexagon wrench (6 mm), install the screw plug.

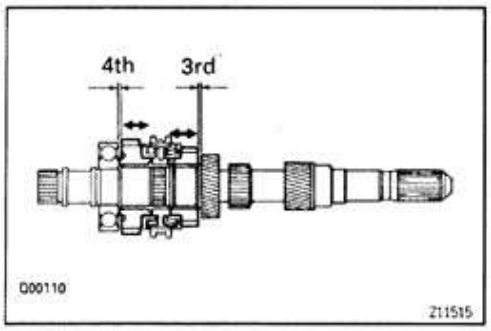
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INPUT SHAFT
COMPONENTS

MX016-01







MX017-06

INPUT SHAFT DISASSEMBLY

1. **MEASURE 3RD AND 4TH GEAR THRUST CLEARANCE**

Using a feeler gauge, measure the thrust clearance.

Standard clearance:

3rd gear

0.10 – 0.35 mm (0.0039 – 0.0138 in.)

4th gear

0.10 – 0.55 mm (0.0039 – 0.0217 in.)

Maximum clearance:

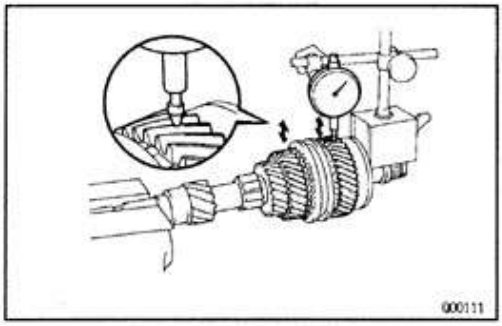
3rd gear

0.40 mm (0.0157 in.)

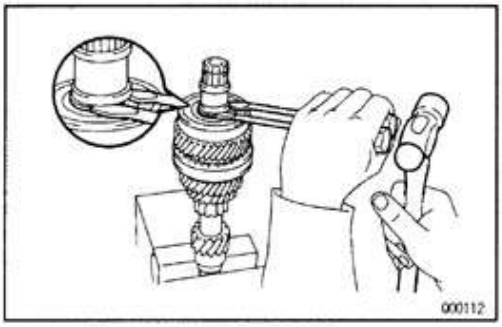
4th gear

0.60 mm (0.0236 in.)

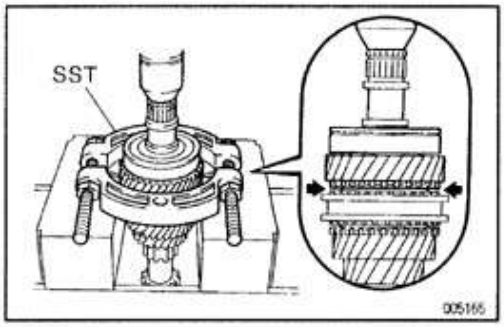
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2. **CHECK 3RD AND 4TH GEAR RADIAL CLEARANCE**
Using a dial indicator, measure the radial clearance between the gear and shaft.
Standard clearance:
3rd gear
0.009 – 0.053 mm (0.0004 – 0.0021 in.)
4th gear
0.009 – 0.051 mm (0.0004 – 0.0020 in.)
Maximum clearance:
3rd and 4th gear
0.070 mm (0.0028 in.)
If the clearance exceeds the limit, replace the gear, needle roller bearing or shaft.

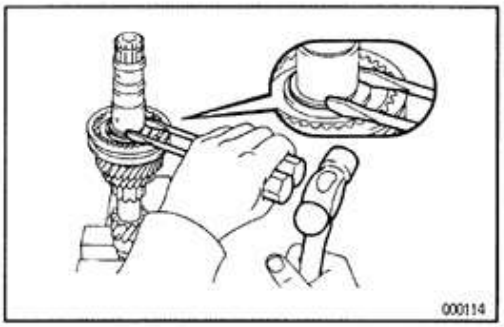


3. **REMOVE SNAP RING**
Using 2 screwdrivers and a hammer, tap out the snap ring.

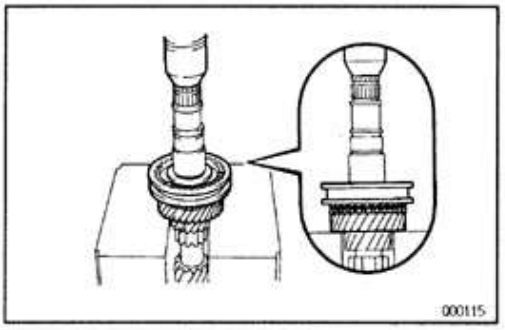


4. **REMOVE RADIAL BALL BEARING AND 4TH GEAR**
Using SST and a press, remove the radial bearing.
SST 09950–00020

5. **REMOVE NEEDLE ROLLER BEARINGS, SPACER AND SYNCHRONIZER RING**



6. **REMOVE SNAP RING**
Using 2 screwdrivers and a hammer, tap out the snap ring.

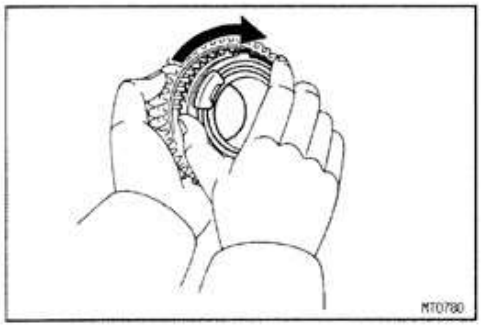


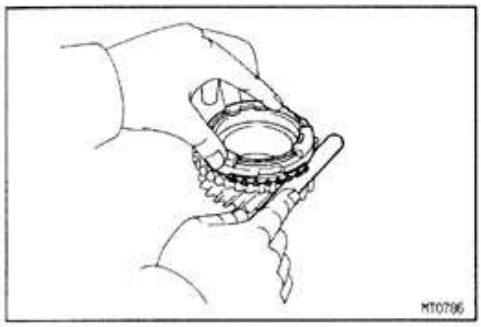
7. **REMOVE NO.2 CLUTCH HUB ASSEMBLY, SYNCHRONIZER RINGS AND 3RD GEAR**
Using a press, remove the No.2 hub sleeve, 3rd gear, synchronizer rings.

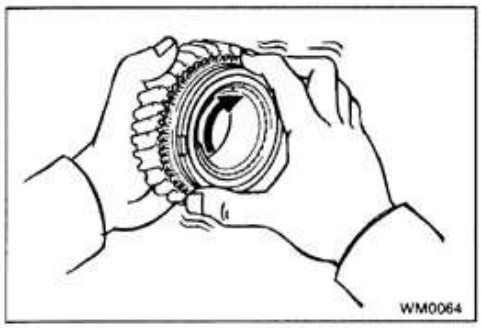
8. **REMOVE NEEDLE ROLLER BEARINGS**

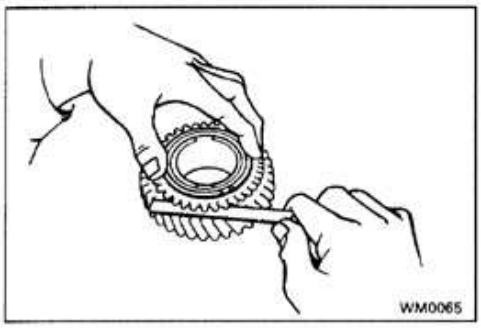
MX

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INPUT SHAFT COMPONENT PARTS INSPECTION

1. INSPECT 3RD GEAR SYNCHRONIZER RING

(a) Check for wear or damage.

(b) Check the braking effect of the synchronizer ring. Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.
If it does not lock, replace the synchronizer ring.

(c) Measure the clearance between the synchronizer ring back and gear spline end.
Minimum clearance:
0.7 mm (0.028 in.)
If the clearance is less than the limit, replace the synchronizer ring.

2. INSPECT 4TH GEAR SYNCHRONIZER RING

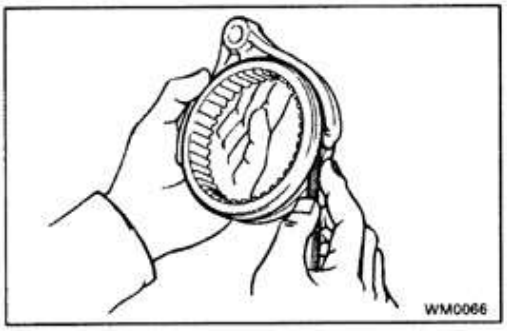
(a) Check for wear or damage.

(b) Check the braking effect of the synchronizer ring. Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.
If the braking effect is insufficient, apply a small amount of fine lapping compound between the synchronizer ring and gear cone.
Lightly rub the synchronizer ring and gear cone together.
NOTICE: Ensure the fine lapping compound is completely washed off after rubbing.

(c) Check again the braking effect of the synchronizer ring.

(d) Measure the clearance between the synchronizer ring back and spline end.
Minimum clearance:
0.8 mm (0.031 in.)
If the clearance is less than the limit, replace the synchronizer ring and gear cone by applying a small amount of fine lapping compound.
NOTICE: Ensure the fine lapping compound is completely washed off after rubbing.

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3. MEASURE NO.2 SHIFT FORK AND HUB SLEEVE CLEARANCE

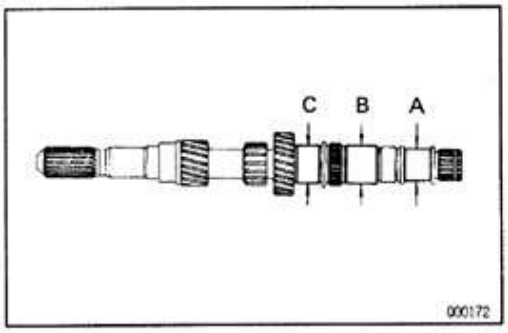
Using a feeler gauge, measure the clearance between the hub sleeve and shift fork.

Maximum clearance:

1.0 mm (0.039 in.)

If the clearance exceeds the limit, replace the shift fork or hub sleeve.

MX



4. INSPECT INPUT SHAFT

(a) Check the input shaft for wear or damage.

(b) Using a micrometer, measure the outer diameter of the input shaft journal surface.

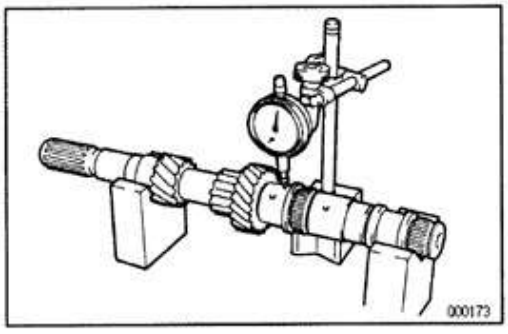
Minimum outer diameter:

Part A

27.950 mm (1.1004 in.)

Part B and C

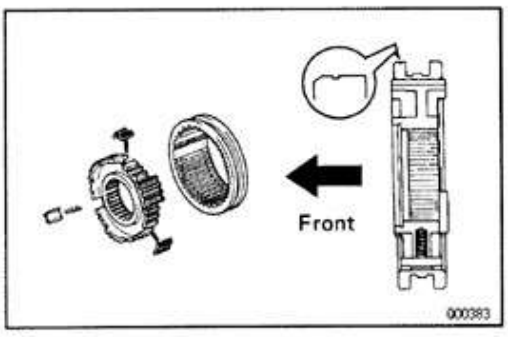
35.950 mm (1.4154 in.)



(c) Using a dial indicator, check the shaft runout.

Maximum runout:

0.05 mm (0.0020 in.)



INPUT SHAFT ASSEMBLY

(See page MX–31)

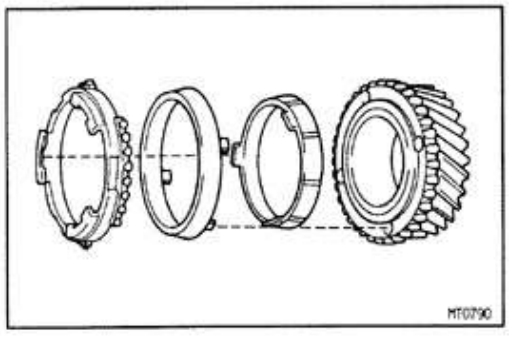
HINT: Coat all of the sliding and rotating surfaces with gear oil before assembly.

1. INSTALL NO.2 CLUTCH HUB INTO HUB SLEEVE

(a) Install the 3 springs and shifting keys to the clutch hub.

(b) Install the hub sleeve to the clutch hub.

HINT: Direct identification groove of the hub sleeve to front of the transmission.



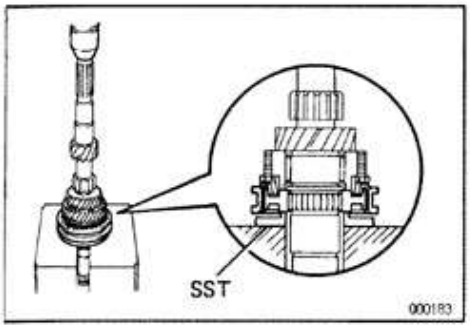
2. INSTALL NEEDLE ROLLER BEARINGS, 3RD GEAR, SYNCHRONIZER RINGS AND NO.2 HUB SLEEVE ASSEMBLY TO INPUT SHAFT

(a) Apply MP grease to the needle roller bearing.

(b) Assemble the needle roller bearings into the 3rd gear.

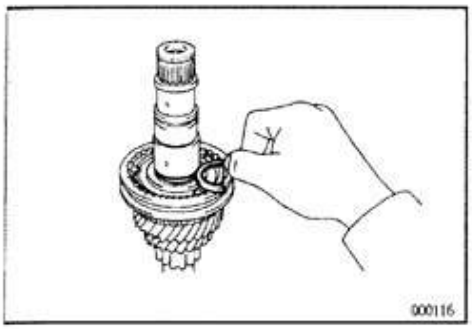
(c) Place the synchronizer rings on the gear and align the ring slots with the shifting keys.

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(d) Using SST and a press, install the 3rd gear and No.2 hub sleeve.
SST 09506–35010

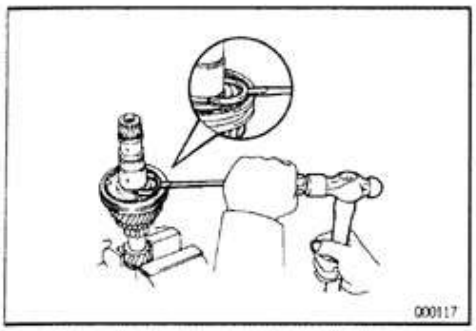
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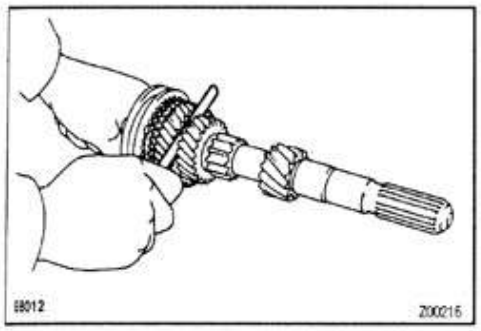
3. INSTALL SNAP RING

(a) Select a snap ring that will allow minimum axial play.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
H	2.30 (0.0906)	M	2.50 (0.0984)
J	2.35 (0.0925)	N	2.55 (0.1004)
K	2.40 (0.0945)	P	2.60 (0.1024)
L	2.45 (0.0965)	–	–



(b) Using a screwdriver and hammer, tap in the snap ring.



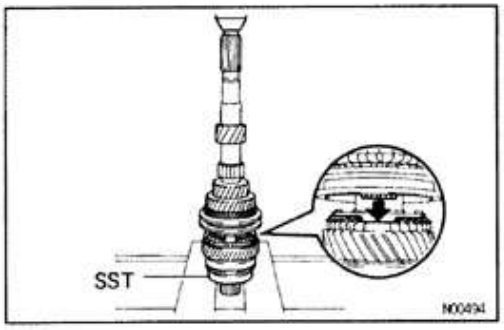
4. MEASURE 3RD GEAR THRUST CLEARANCE

Using a feeler gauge, measure the 3rd gear thrust clearance.

Standard clearance:
0.10 – 0.35 mm (0.0039 – 0.0138 in.)

Maximum clearance:
0.40 mm (0.0157 in.)

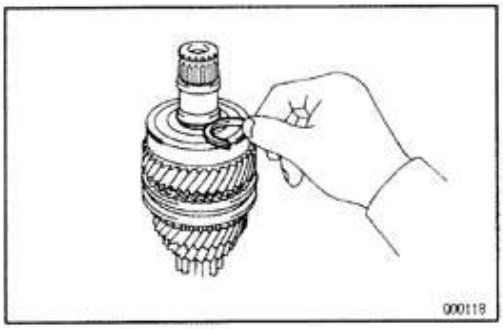
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MX

5. INSTALL SPACER, SYNCHRONIZER RING, NEEDLE ROLLER BEARINGS, 4TH GEAR AND RADIAL BALL BEARING

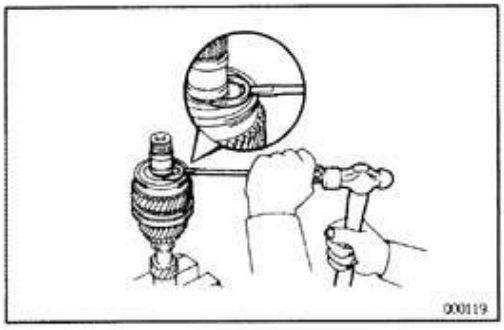
(a) Install the spacer.
(b) Apply MP grease to the needle roller bearings.
(c) Place the synchronizer ring on the gear and align the ring slots with the shifting keys.
(d) Install the 4th gear.
(e) Using SST and a press, install the radial ball bearing.
SST 09506–35010



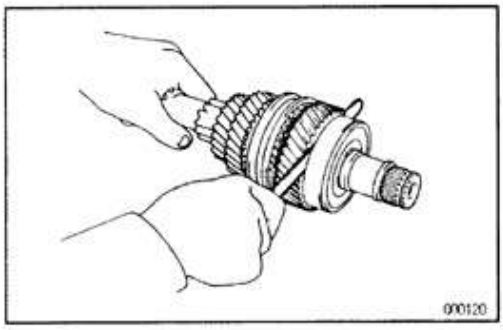
6. INSTALL SNAP RING

(a) Select a snap ring that will allow minimum axial play.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
1	2.35 (0.0925)	5	2.55 (0.1004)
2	2.40 (0.0945)	6	2.60 (0.1024)
3	2.45 (0.0965)	7	2.65 (0.1043)
4	2.50 (0.0984)	8	2.70 (0.1063)



(b) Using a screwdriver and hammer, tap in the snap ring.



7. MEASURE 4TH GEAR THRUST CLEARANCE

Using a feeler gauge, measure the 4th gear thrust clearance.

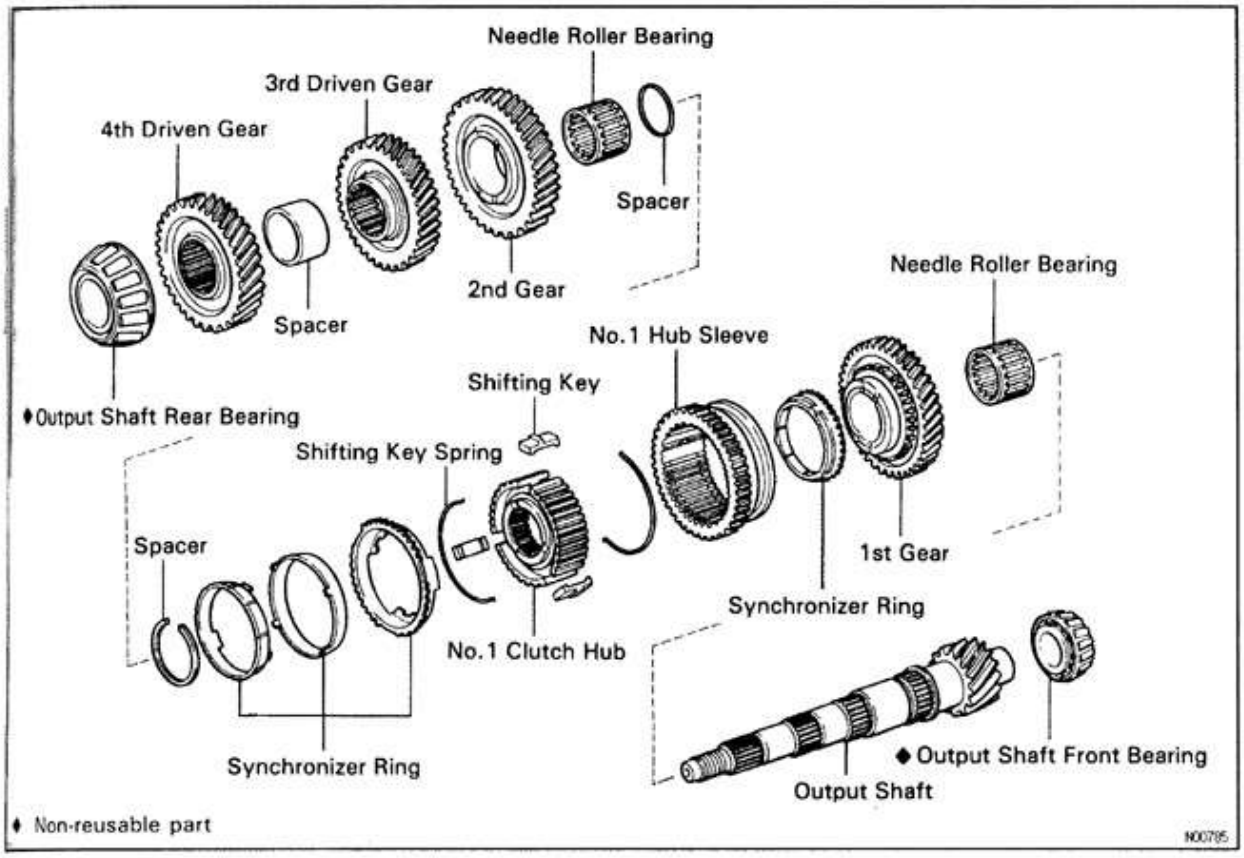
Standard clearance:
0.10 — 0.55 mm (0.0039 — 0.0217 in.)

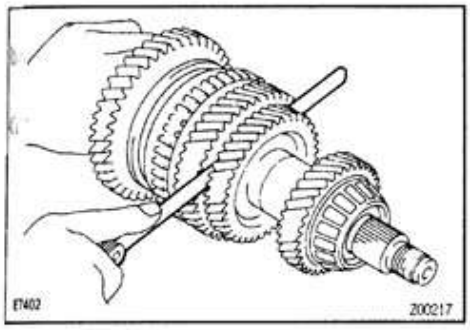
Maximum clearance:
0.60 mm (0.0236 in.)

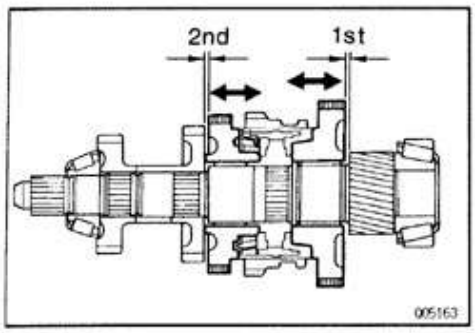
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OUTPUT SHAFT
COMPONENTS

MX001A–01







MX001B–02

OUTPUT SHAFT DISASSEMBLY

1. MEASURE 1ST AND 2ND GEAR THRUST CLEARANCE

Using a feeler gauge, measure the thrust clearance.

Standard clearance:

1st gear

0.10 – 0.35 mm (0.0039 – 0.0138 in.)

2nd gear

0.10 – 0.45 mm (0.0039 – 0.0177 in.)

Maximum clearance:

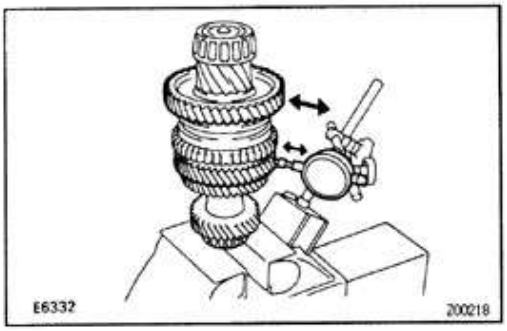
1st gear

0.40 mm (0.0157 in.)

2nd gear

0.50 mm (0.0197 in.)

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2. **CHECK 1ST AND 2ND GEAR RADIAL CLEARANCE**

Using a dial indicator, measure the radial clearance between the gear and shaft.

Standard clearance:

1st gear

0.009 – 0.051 mm (0.0004 – 0.0020 in.)

2nd gear

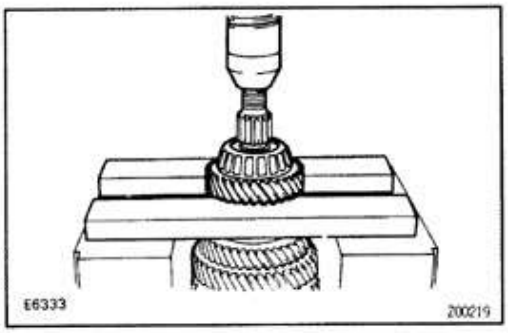
0.009 – 0.053 mm (0.0004 – 0.0021 in.)

Maximum clearance:

1st and 2nd gear

0.070 mm (0.0028 in.)

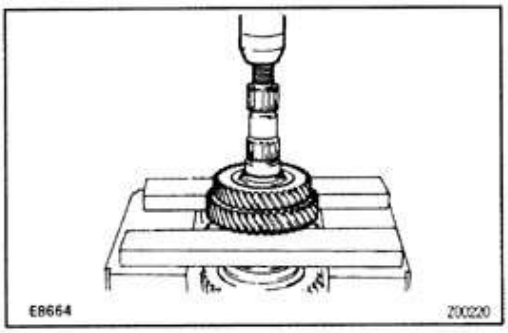
If the clearance exceeds the limit, replace the gear, needle roller bearing or shaft.



3. **REMOVE OUTPUT SHAFT REAR BEARING, 4 TH DRIVEN GEAR AND SPACER**

(a) Using a press, remove the bearing and 4th driven gear.

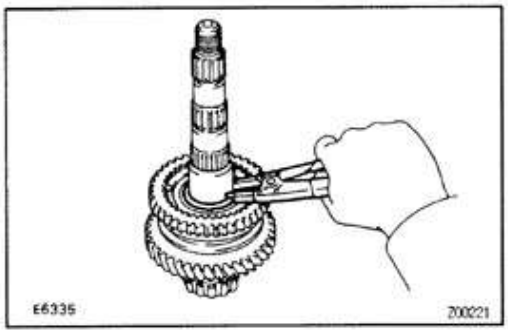
(b) Remove the spacer.



4. **REMOVE 3RD DRIVEN GEAR AND 2ND GEAR**

Using a press, remove the 3rd driven gear and 2nd gear.

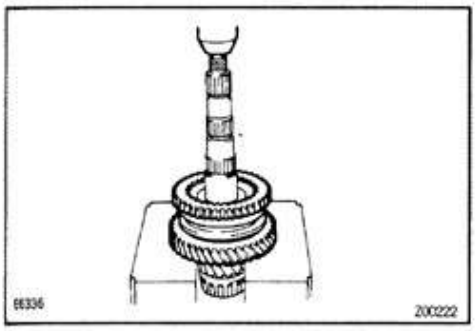
5. **REMOVE NEEDLE ROLLER BEARING, SPACER AND SYNCHRONIZER RINGS**



6. **REMOVE SNAP RING**

Using a snap ring expander, remove the snap ring.

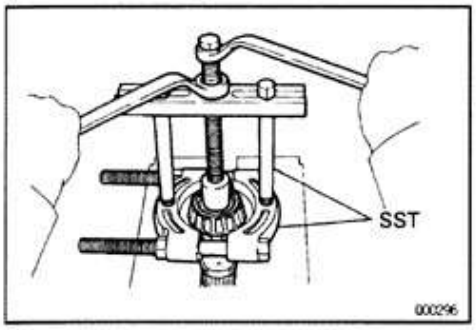
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7. REMOVE NO.1 HUB SLEEVE ASSEMBLY AND 1ST GEAR

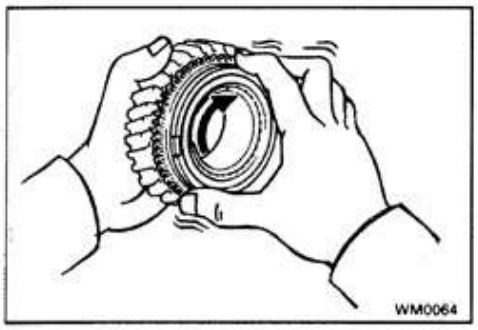
Using a press, remove the No.1 hub sleeve and 1st gear.

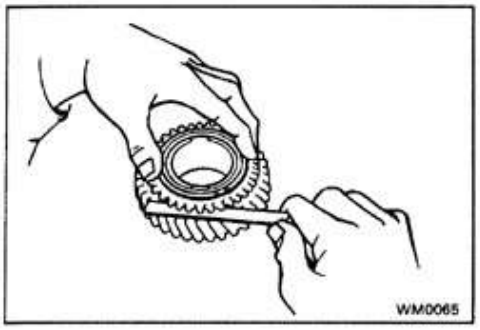
8. REMOVE SYNCHRONIZER RING AND NEEDLE ROLLER BEARING



9. REMOVE OUTPUT SHAFT FRONT BEARING

Using SST, remove the output shaft front bearing.
SST 09950–00020, 09950–00030





OUTPUT SHAFT COMPONENT PARTS INSPECTION

MX01C-04

1. INSPECT 1ST GEAR SYNCHRONIZER RING

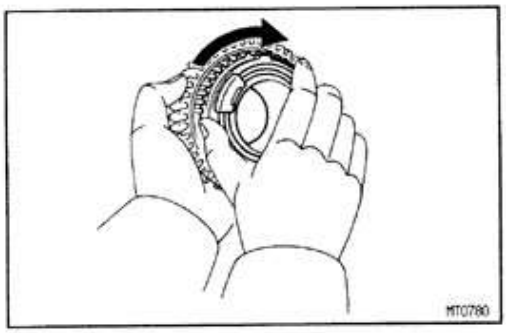
(a) Check for wear or damage.

(b) Check the braking effect of the synchronizer ring. Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.
If the braking effect is insufficient, apply a small amount of fine lapping compound between the synchronizer ring and gear cone.
Lightly rub the synchronizer ring and gear cone together.
NOTICE: Ensure the fine lapping compound is completely washed off after rubbing.

(c) Check again the braking effect of the synchronizer ring.

(d) Measure the clearance between the synchronizer ring back and gear spline end.
Minimum clearance:
0.8 mm (0.031 in.)
If the clearance is less than the limit, replace the synchronizer ring and gear cone by applying a small amount of fine lapping compound.
NOTICE: Ensure the fine lapping compound is completely washed off after rubbing.

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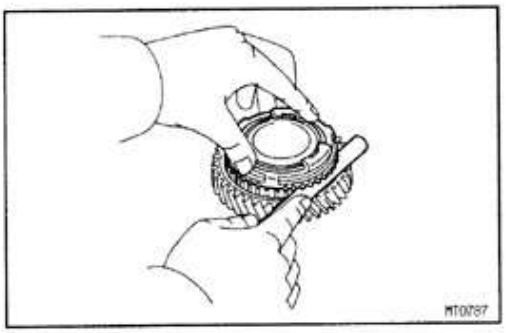


2. INSPECT 2ND GEAR SYNCHRONIZER RING

(a) Check for wear or damage.

(b) Check the braking effect of the synchronizer direction while pushing it to the gear cone. Check that the ring locks.

If it does not lock, replace the synchronizer ring.

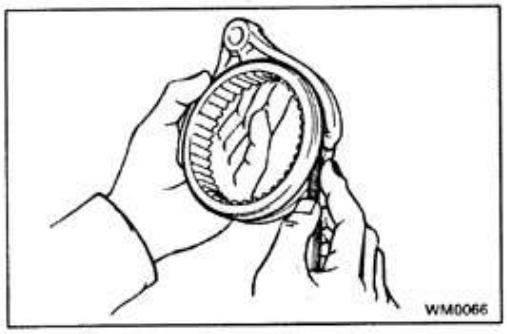


(c) Measure the clearance between the synchronizer ring back and gear spline end.

Minimum clearance:

0.7 mm (0.028 in.)

If the clearance is less than the limit, replace the synchronizer ring.



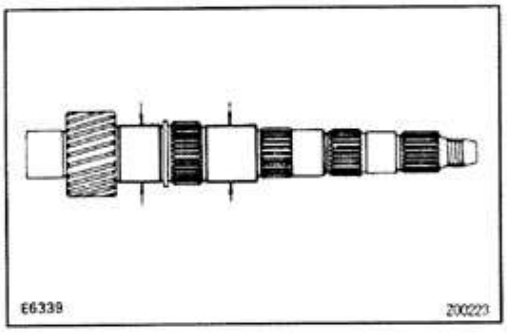
3. MEASURE NO.1 SHIFT FORK AND HUB SLEEVE CLEARANCE

Using a feeler gauge, measure the clearance between the hub sleeve and shift fork.

Maximum clearance:

1.0 mm (0.039 in.)

If the clearance exceeds the limit, replace the shift fork or hub sleeve.



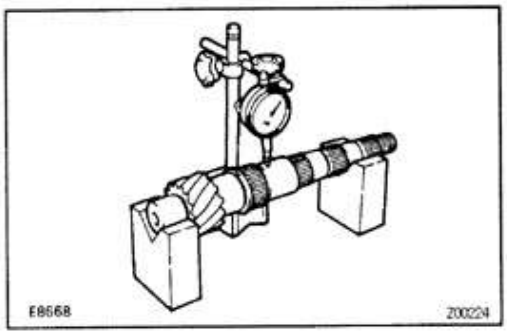
4. INSPECT OUTPUT SHAFT

(a) Check the output shaft for wear or damage.

(b) Using a micrometer, measure the outer diameter of the output shaft journal surface.

Minimum outer diameter:

38.950 mm (1.5335 in.)

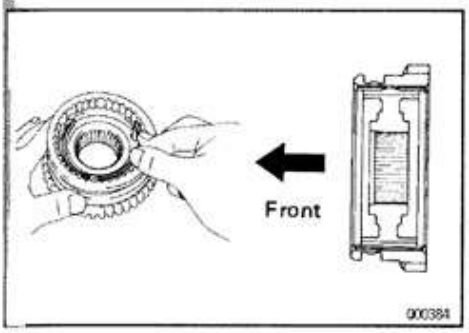


(c) Using a dial indicator, check the shaft runout.

Maximum runout:

0.06 mm (0.0024 in.)

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OUTPUT SHAFT ASSEMBLY

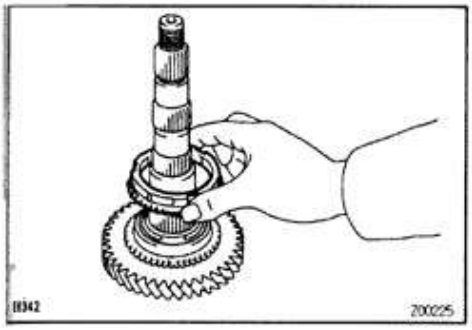
(See page MX–37)

HINT: Coat all of the sliding and rotating surfaces with gear oil before assembly.

1. INSTALL NO.1 CLUTCH HUB INTO HUB SLEEVE

(a) Install the clutch hub and shifting keys to the hub sleeve.

(b) Install the shifting key springs under the shifting keys.
NOTICE: Install the key springs positioned so that their ends are not in line.

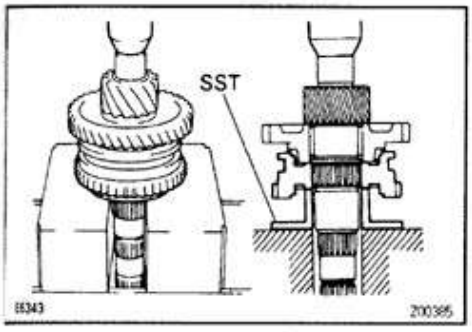


2. INSTALL NEEDLE ROLLER BEARING, 1ST GEAR, SYNCHRONIZER RING AND NO.1 HUB SLEEVE TO OUTPUT SHAFT

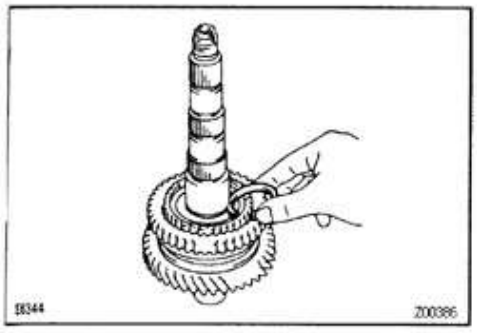
(a) Apply MP grease to the needle roller bearing.

(b) Install the 1st gear.

(c) Place the synchronizer ring (for 1st gear) on the gear and align the ring slots with the shifting keys.



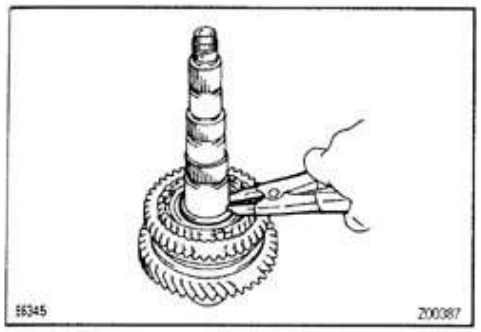
(d) Using SST and a press, install the 1st gear and No.1 hub sleeve.
SST 09316–60010 (09316–00040)



3. INSTALL SNAP RING

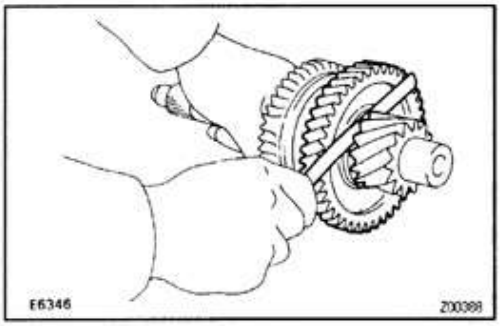
(a) Select a snap ring that will allow minimum axial play.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
A	2.80 (0.1102)	E	3.00 (0.1181)
B	2.85 (0.1122)	F	3.05 (0.1201)
C	2.90 (0.1142)	G	3.10 (0.1220)
D	2.95 (0.1161)	–	–



(b) Using a snap ring expander, install the snap ring.

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4. MEASURE 1ST GEAR THRUST CLEARANCE

Using a feeler gauge, measure the 1st gear thrust clearance.

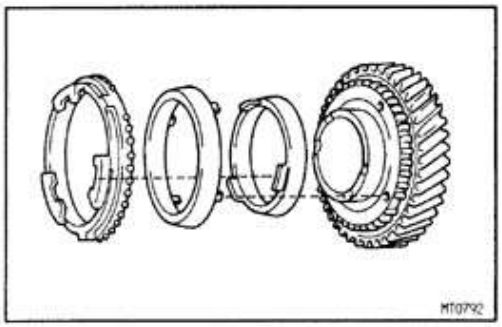
Standard clearance:

0.10 – 0.35 mm (0.0039 – 0.0138 in.)

Maximum clearance:

0.40 mm (0.0157 in.)

MX



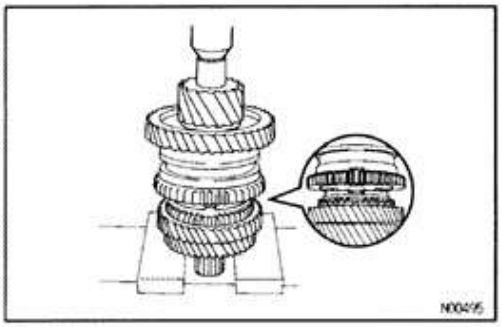
5. INSTALL SPACER, NEEDLE ROLLER BEARING, SYNCHRONIZER RINGS, 2 ND GEAR AND 3 RD DRIVEN GEAR

(a) Install the spacer.

(b) Apply MP grease to the needle roller bearing.

(c) Place the synchronizer rings (for 2nd gear) on the gear.

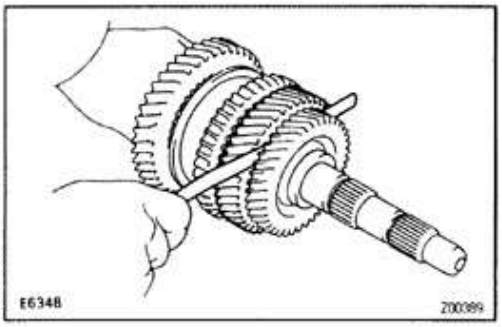
NOTICE: Do not install the synchronizer ring for the 1st gear.



(d) Install the 2nd gear.

(e) Using a press, install the 3rd driven gear.

NOTICE: Align the clutch hub grooves with the projections on the synchronizer ring.



6. MEASURE 2ND GEAR THRUST CLEARANCE

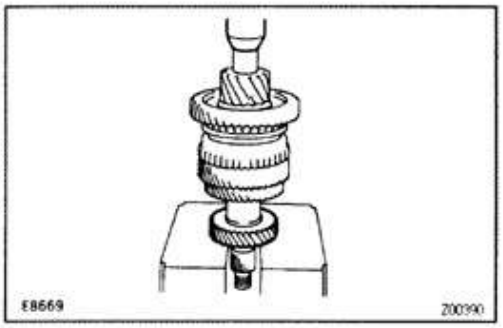
Using a feeler gauge, measure the 2nd gear thrust clearance.

Standard clearance:

0.10 – 0.45 mm (0.0039 – 0.0177 in.)

Maximum clearance:

0.50 mm (0.0197 in.)

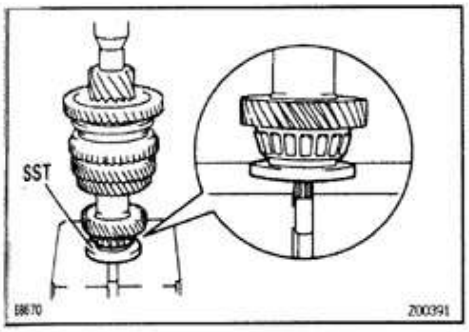


7. INSTALL SPACER AND 4TH DRIVEN GEAR

(a) Install the spacer.

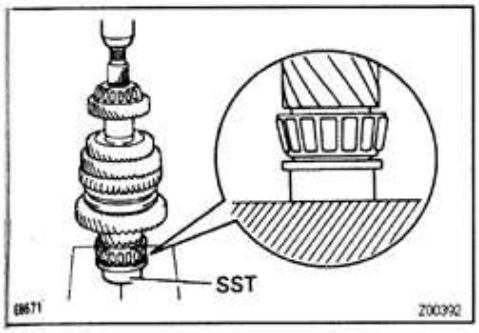
(b) Using a press, install the 4th driven gear.

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8. INSTALL OUTPUT SHAFT REAR BEARING

Using SST and a press, install the bearing.
SST 09506–30012



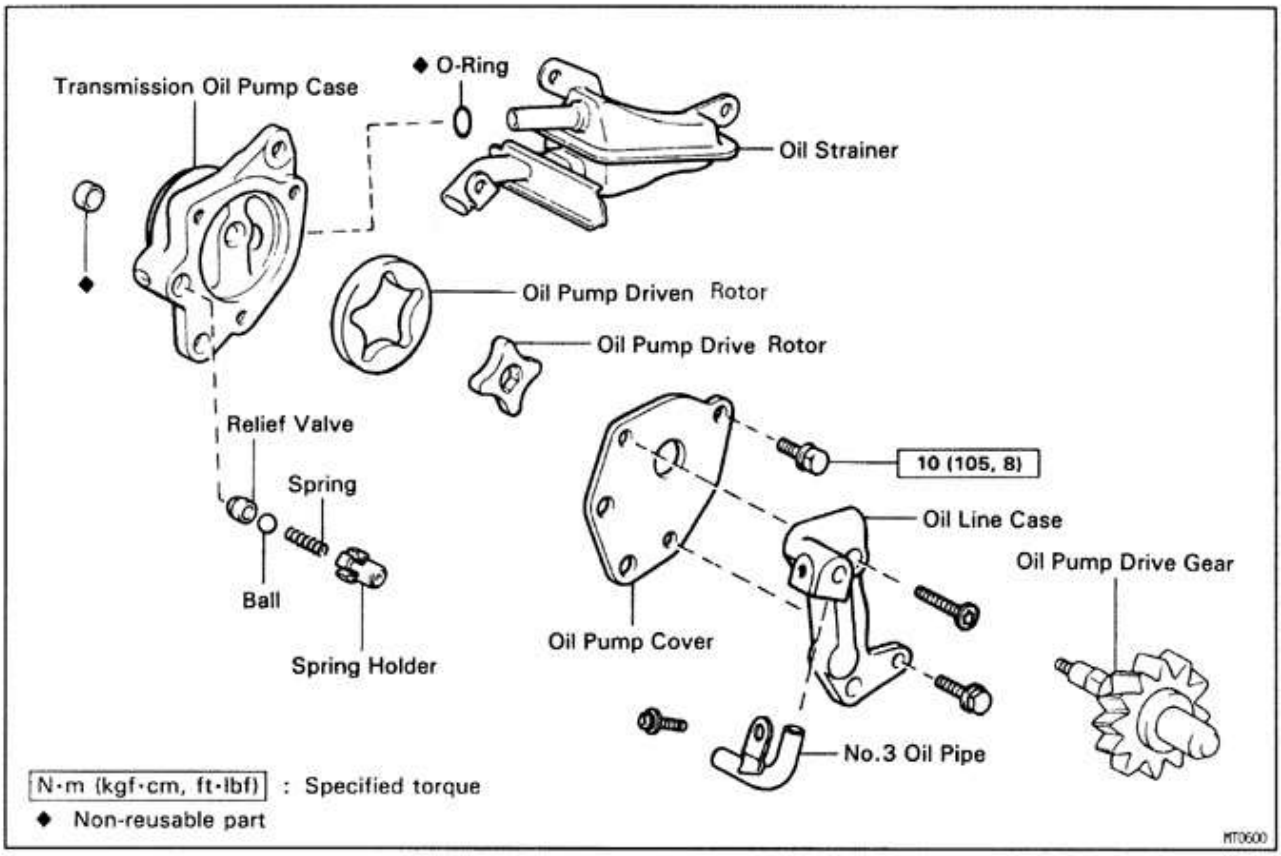
9. INSTALL OUTPUT SHAFT FRONT BEARING

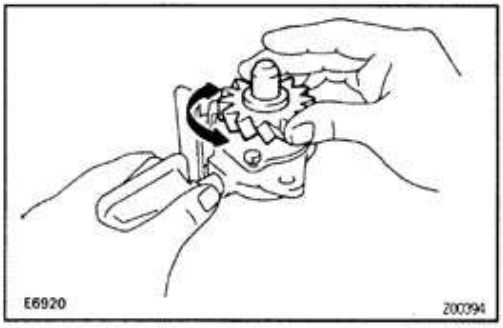
Using SST and a press, install a new output shaft front bearing.
SST 09316–60010 (09316–00070)

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OIL PUMP
COMPONENTS

MX001E–08

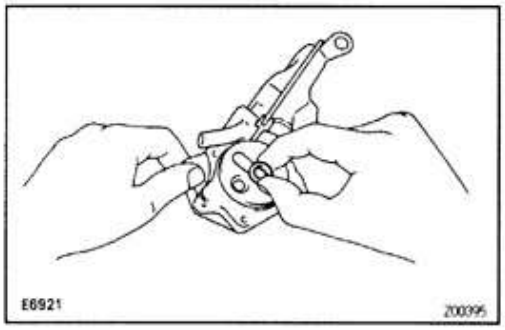




MX068–01

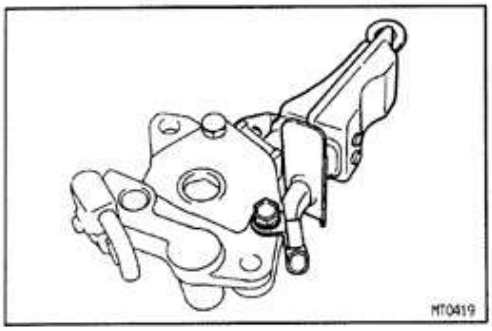
OIL PUMP DISASSEMBLY

1. **CHECK OPERATION OF OIL PUMP**
   Install the oil pump drive gear to the drive rotor, check that the drive rotor turns smoothly.



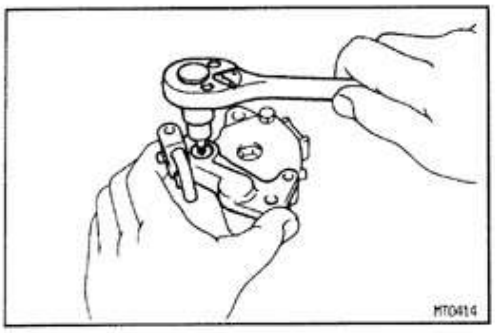
2. **REMOVE GASKET FROM OIL PUMP CASE**

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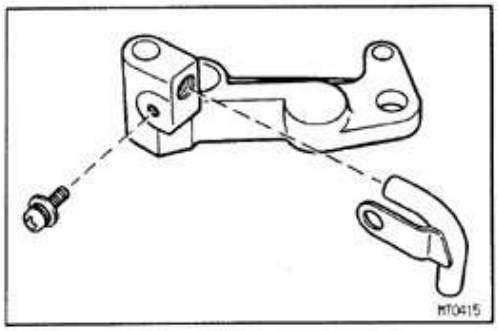
3. REMOVE OIL STRAINER

Remove the bolt and pull out the oil strainer.

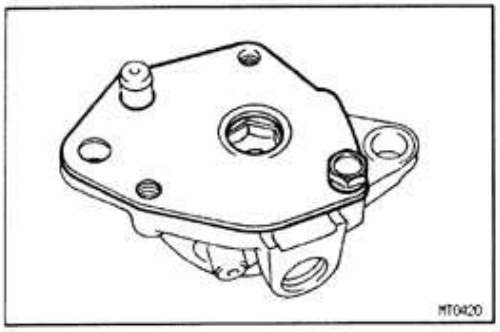


4. REMOVE OIL LINE CASE AND OIL PIPE

(a) Using a torx wrench, remove the torx screw and oil line case.
(Torx wrench T45 09042–00050)

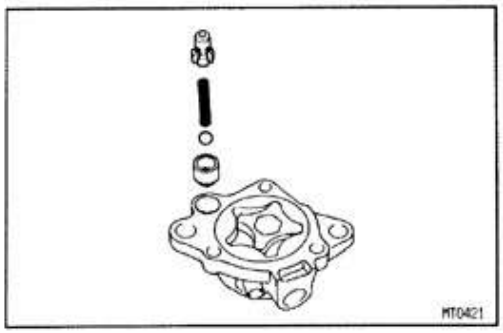


(b) Remove the No.3 oil pipe from the oil line case.



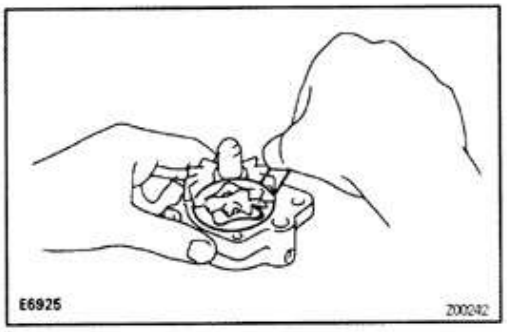
5. REMOVE OIL PUMP COVER, SPRING HOLDER, SPRING, BALL AND RELIEF VALVE

(a) Remove the bolt and oil pump cover.



(b) Remove the spring holder, spring, ball and relief valve.

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6. CHECK ROTOR BODY CLEARANCE

(a) Install the oil pump drive gear to the drive rotor.

(b) Using a feeler gauge, measure the body clearance between the drive rotor and oil pump case.

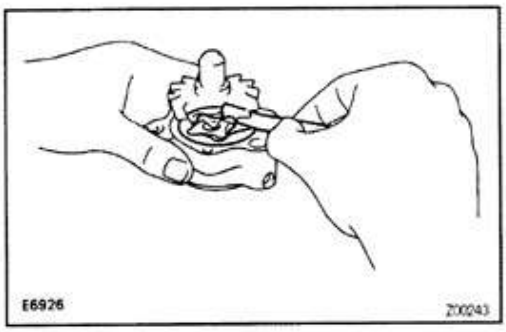
Standard clearance:

0.10 – 0.16 mm (0.0039 – 0.0063 in.)

Maximum clearance:

0.30 mm (0.0118 in.)

MX



7. CHECK ROTOR TIP CLEARANCE

(a) Install the oil pump drive gear to the drive rotor.

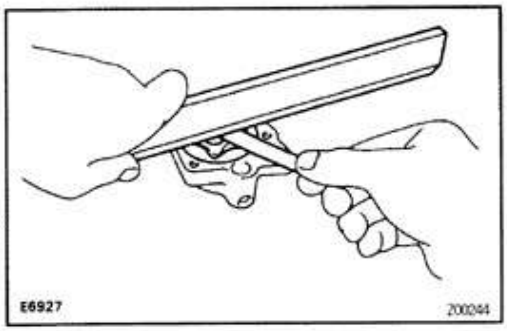
(b) Using a feeler gauge, measure the tip clearance between the drive and driven rotors.

Standard clearance:

0.08 – 0.15 mm (0.0031 – 0.0059 in.)

Maximum clearance:

0.30 mm (0.0118 in.)



8. CHECK SIDE CLEARANCE

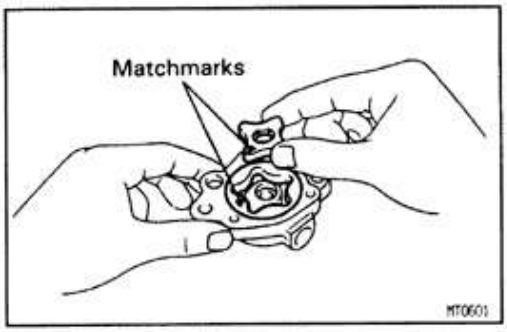
Using a precision straight edge and feeler gauge, measure the side clearance of both rotors.

Standard clearance:

0.03 – 0.08 mm (0.0012 – 0.0031 in.)

Maximum clearance:

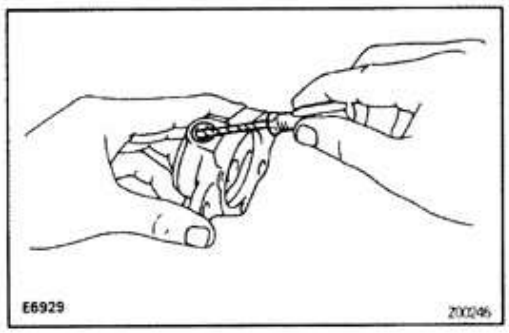
0.15 mm (0.0059 in.)



9. REMOVE OIL PUMP DRIVE ROTOR AND DRIVEN ROTOR

(a) Place matchmarks on the oil pump drive rotor and driven rotor.

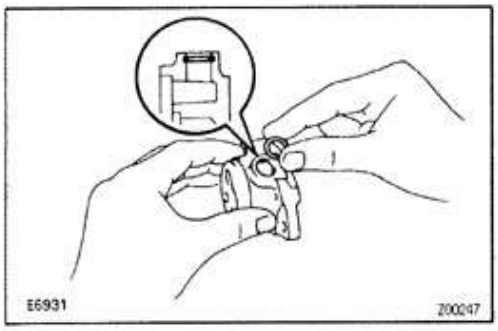
(b) Remove the oil pump drive rotor and driven rotor from the oil pump case.



10. IF NECESSARY, REPLACE O–RING

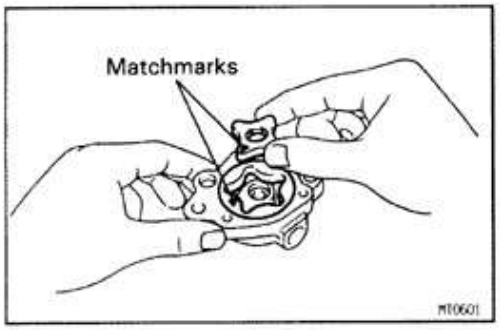
(a) Using a screwdriver, remove the O–ring from the oil pump case.

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(b) Apply gear oil to a new O–ring.
(c) Install the O–ring to the oil pump case.

MX

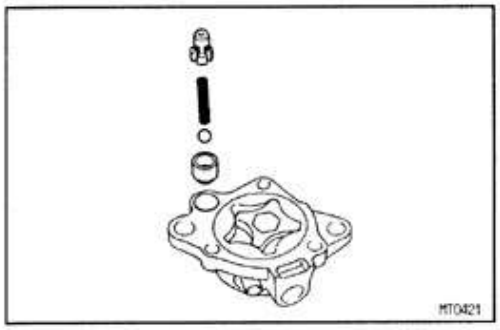


OIL PUMP ASSEMBLY

(See page MX–44)

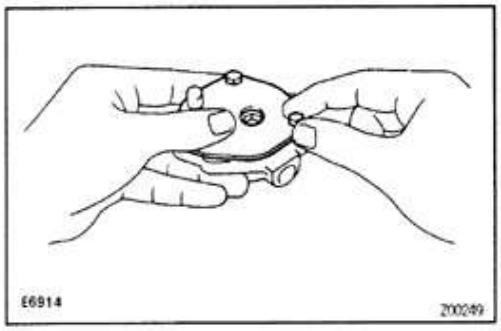
1. INSTALL DRIVEN OIL PUMP ROTOR AND DRIVE ROTOR

Align the matchmarks and install oil pump driven rotor and drive rotor to the oil pump case.

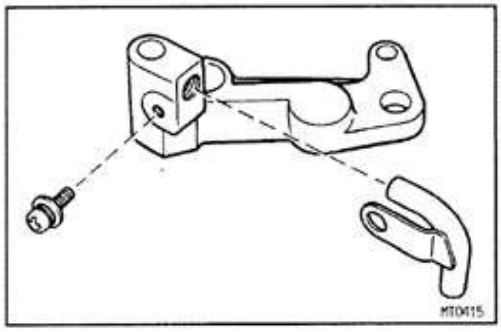


2. INSTALL OIL PUMP COVER, SPRING HOLDER, SPRING, BALL AND RELIEF VALVE

(a) Install the relief valve, ball, spring and spring holder to the oil pump case.



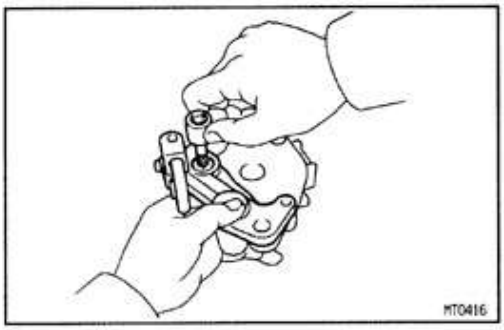
(b) Temporarily install the bolt.



3. INSTALL OIL LINE CASE AND OIL PIPE

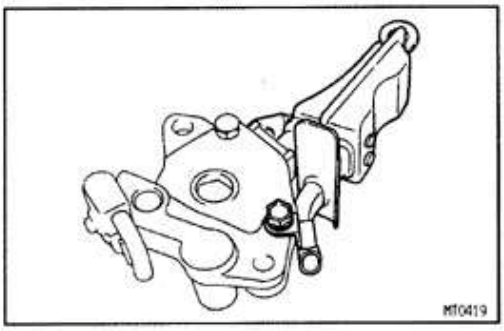
(a) Insall the No.3 oil pipe to the oil line case.

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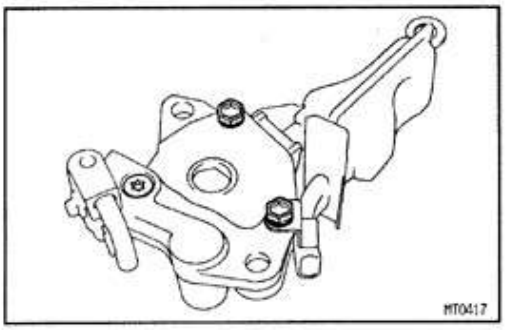


(b) Using a torx wrench, temporarily install the torx screw and oil line case.

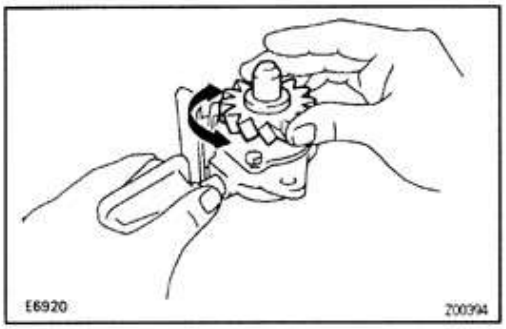
MX



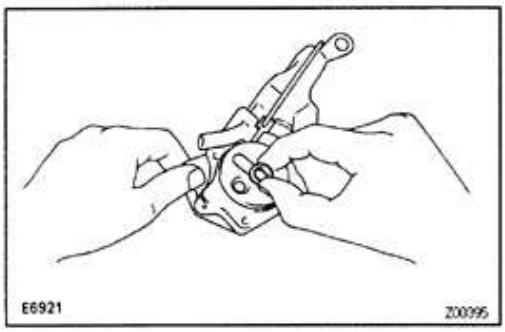
4. INSTALL OIL STRAINER
Install the oil strainer to the oil pump case, temporarily install the bolt.



5. TORQUE 2 OIL PUMP COVER BOLTS AND OIL LINE CASE TORX SCREW
Torque: 10 N·m (105 kgf·cm, 8 ft·lbf)



6. CHECK OPERATION OF OIL PUMP
Install the oil pump drive gear to the drive rotor, check that the drive rotor turns smoothly.

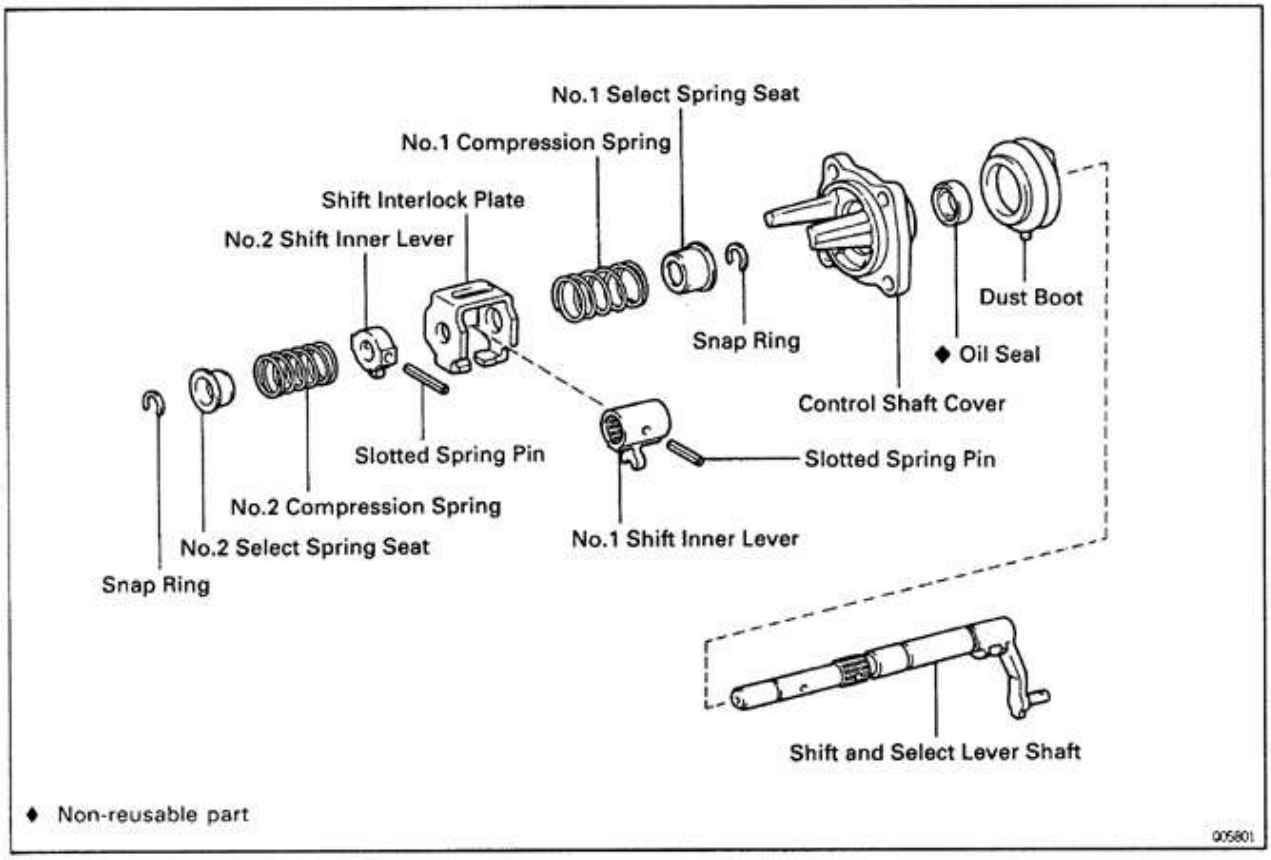


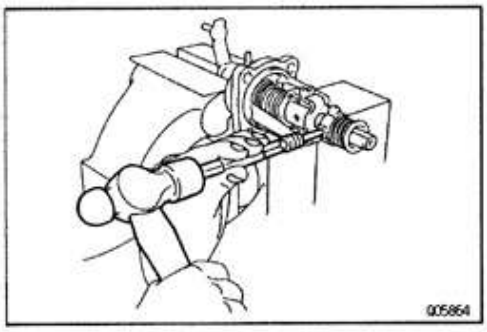
7. INSTALL GASKET
Install a new gasket to the oil pump case.

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SHIFT AND SELECT LEVER SHAFT

COMPONENTS

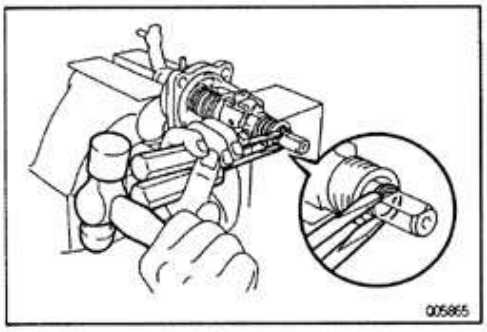




SHIFT AND SELECT LEVER SHAFT DISASSEMBLY

1. **REMOVE NO.2 SHIFT INNER LEVER**

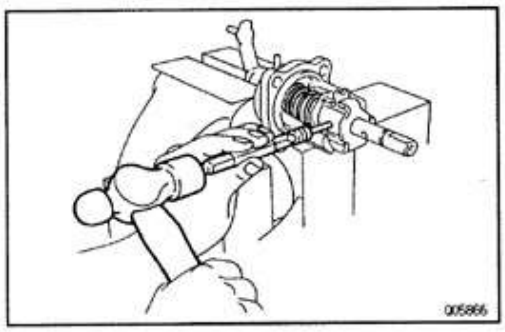
(a) Using a pin punch and hammer, drive out the slotted spring pin from the No.2 shift inner lever.



(b) Using 2 screwdrivers and a hammer, remove the snap ring.

(c) Remove the No.2 select spring seat, No.2 compression spring and No.2 shift inner lever.

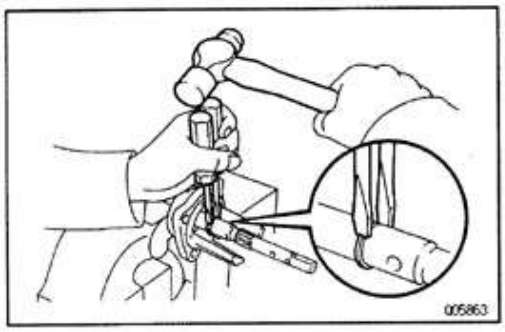
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2. REMOVE SHIFT INTERLOCK PLATE, NO.1 SHIFT INNER LEVER, SPRING AND SEAT

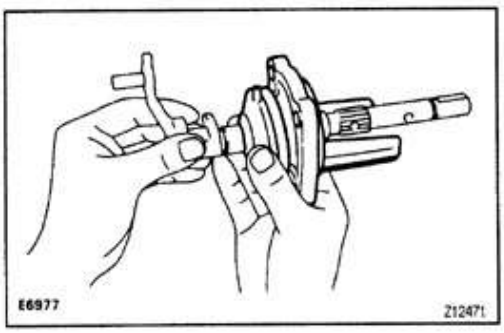
(a) Using a pin punch and hammer, drive out the slotted spring pin.

(b) Remove the shift interlock plate, No.1 shift inner lever, No.1 compression spring and No.1 select spring seat.

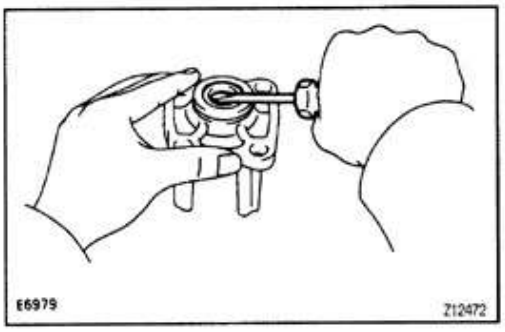


3. REMOVE SNAP RING

Using 2 screwdrivers and a hammer, remove the snap ring.

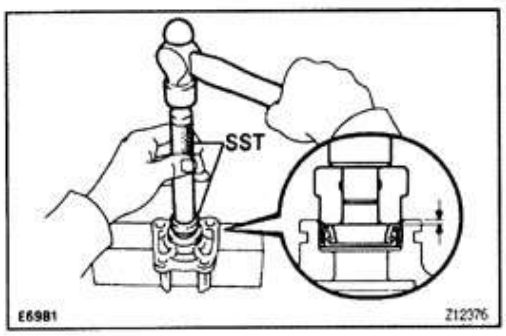


4. REMOVE CONTROL SHAFT COVER AND DUST BOOT



5. IF NECESSARY, REPLACE CONTROL SHAFT COVER OIL SEAL

(a) Using a screwdriver, remove the oil seal.



(b) Using SST and a hammer, drive in a new oil seal.
SST 09620–30010 (09627–30010, 09631–00020)
Oil seal depth:
0–1.0 mm (0–0.039 in.)

(c) Apply MP grease to the oil seal.

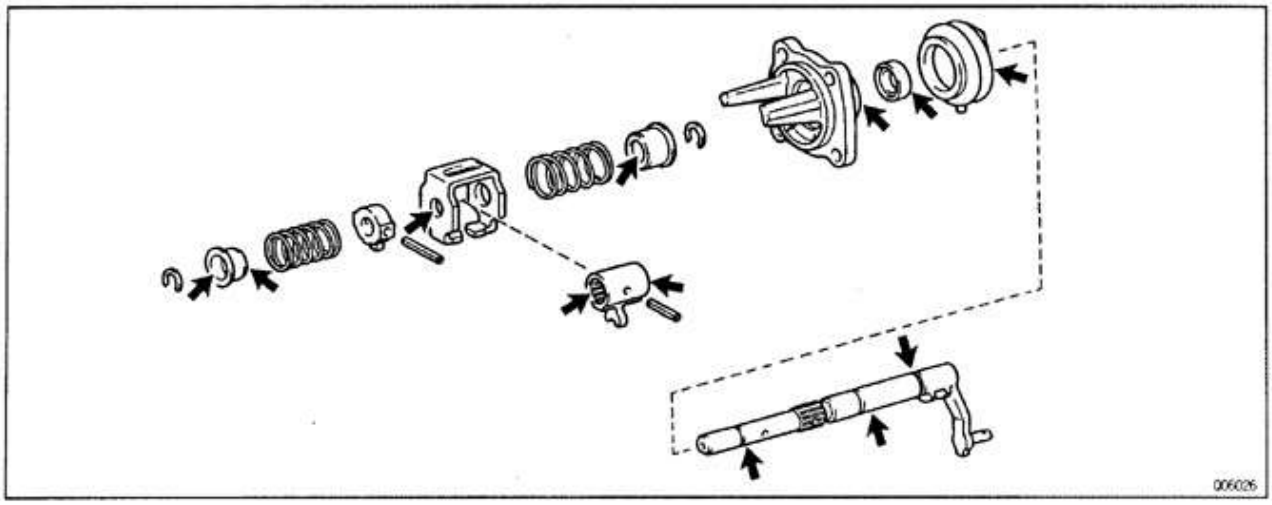
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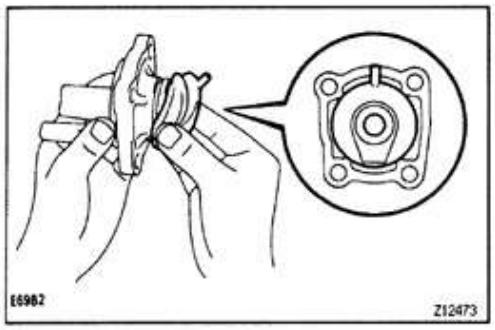
MX042 - 03

SHIFT AND SELECT LEVER SHAFT ASSEMBLY

(See page MX–49)

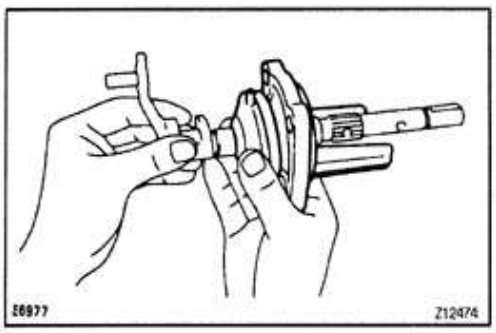
1. APPLY MP GREASE TO PARTS, AS SHOWN



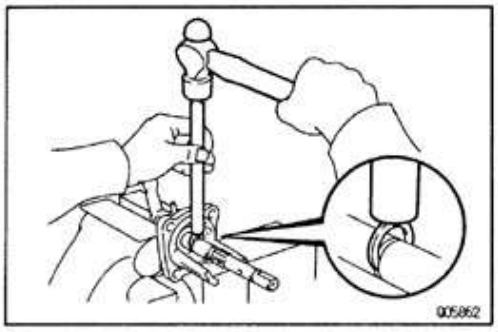


2. INSTALL SHIFT AND SELECT LEVER SHAFT

(a) Install the boot to the control shaft cover.



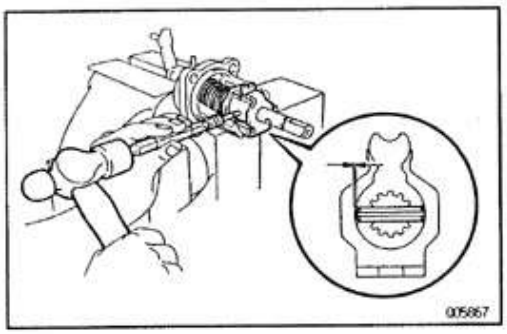
(b) Install the shift and select lever shaft to the control shaft cover.



3. INSTALL SNAP RING

Using a brass bar and hammer, install the snap ring and spring seat.

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4. INSTALL SPRING, SEAT, SHIFT INTERLOCK PLATE AND NO.1 SHIFT INNER LEVER

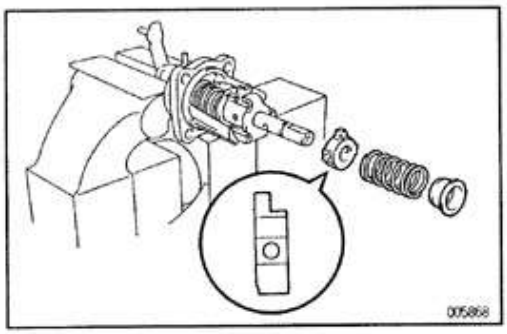
(a) Install the No.1 select spring seat, No.1 compression spring, shift interlock plate and No.1 shift inner lever.

(b) Using a pin punch and hammer, drive in the slotted spring pin.

Drive in depth:

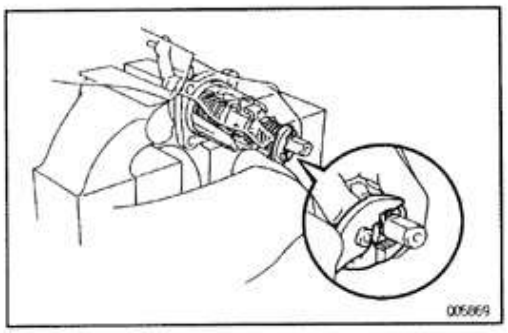
0±0.5 mm (0±0.020 in.)

(c) Check that the shift interlock plate turns smoothly.

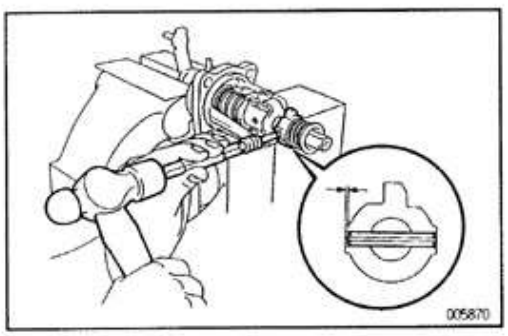


5. INSTALL NO.2 SHIFT INNER LEVER

(a) Install the No.2 shift inner lever, No.2 compression spring and No.2 select spring seat.



(b) Install the snap ring.



(c) Using a pin punch and hammer, drive in the slotted spring pin.

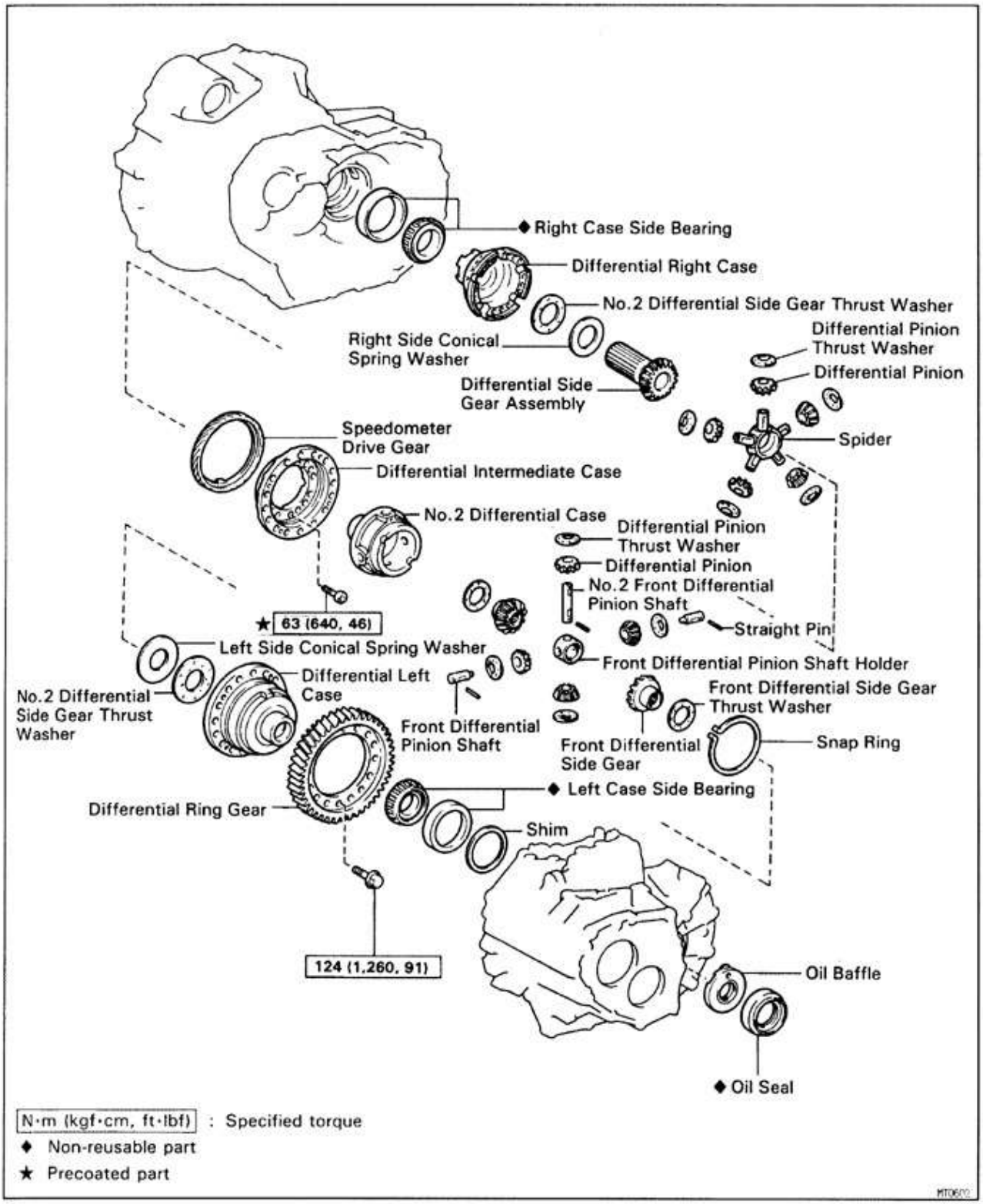
Drive in depth:

0±0.5 mm (0±0.020 in.)

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DIFFERENTIAL CASE
COMPONENTS

MX04V-01



N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non-reusable part
★ Precoated part

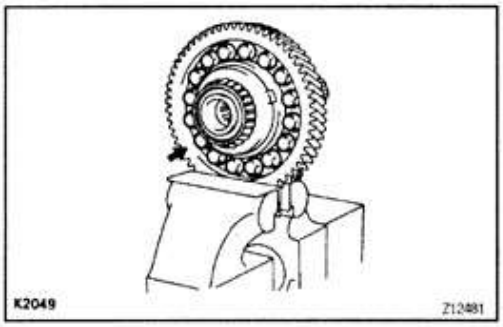
MT0600

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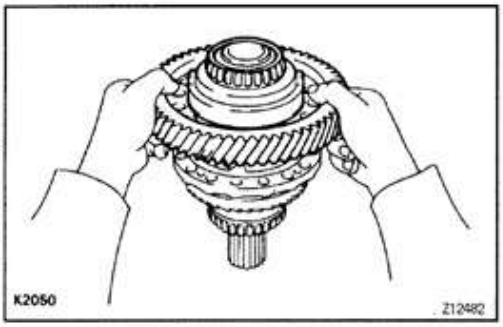
DIFFERENTIAL CASE DISASSEMBLY

MX0WW-01

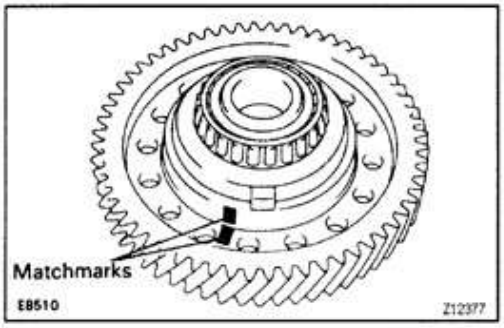


1. REMOVE DIFFERENTIAL LEFT CASE

(a) Remove the 16 bolts.

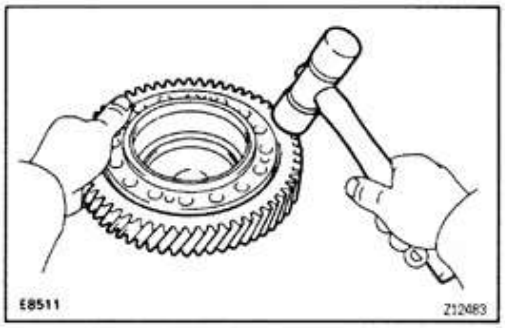


(b) Remove the differential left case upward.

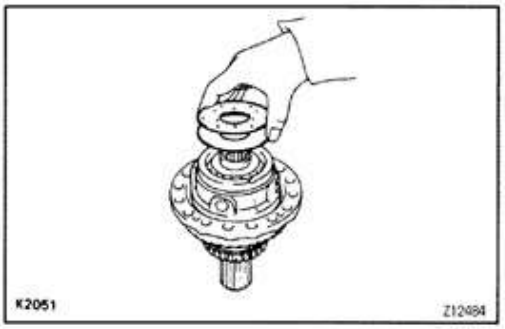


2. REMOVE DIFFERENTIAL RING GEAR

(a) Place matchmarks on both the differential case and ring gear.

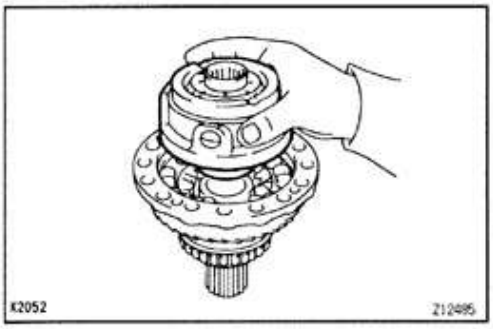


(b) Using a plastic hammer, tap out the ring gear.

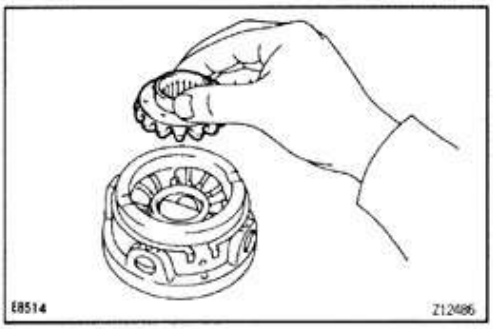


3. REMOVE NO.2 DIFFERENTIAL SIDE GEAR THRUST WASHER AND LEFT SIDE CONICAL SPRING WASHER

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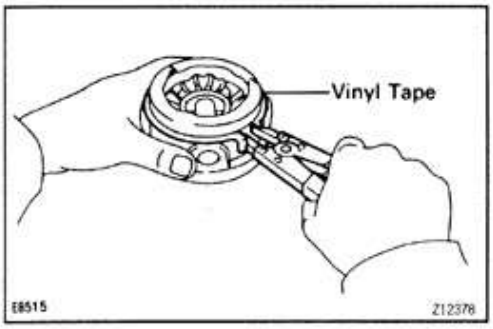
4. REMOVE NO.2 DIFFERENTIAL CASE ASSEMBLY



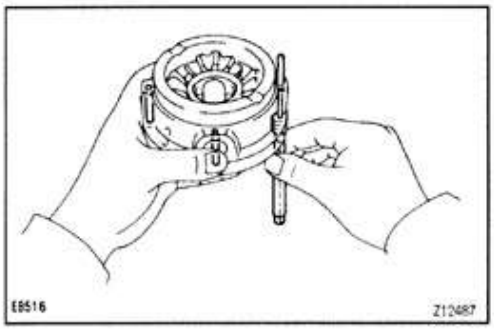
5. DISASSEMBLE NO.2 DIFFERENTIAL CASE

(a) Remove the front differential side gear together with thrust washer.

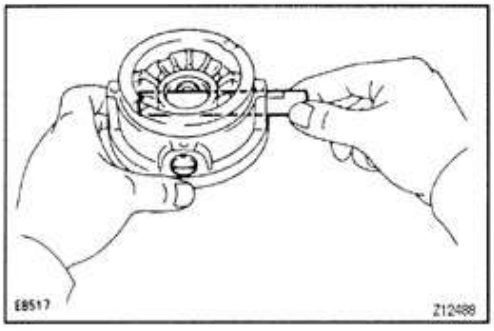
(b) Remove the front differential side gear thrust washer from the side gear.



(c) Using a snap ring expander, remove the snap ring.
HINT: Before removing the shaft snap ring, wrap vinyl tape around the case prevent from damage.

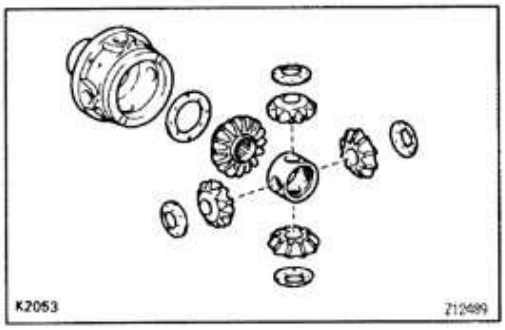


(d) Using a pin punch, push out the 3 straight pins.



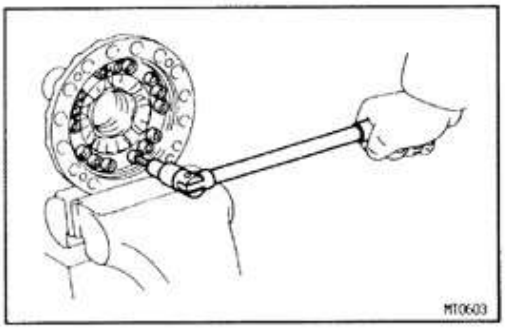
(e) Remove the 2 front differential pinion shafts and No.2 front differential pinion shaft.

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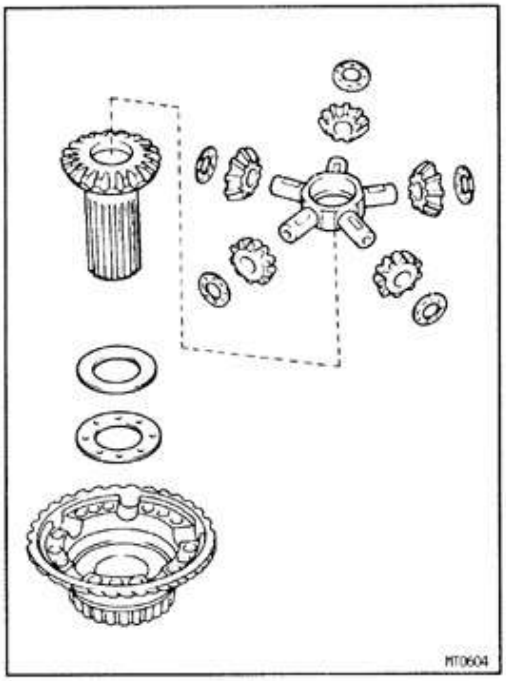
(f) Remove the front differential pinion shaft holder, 4 differential pinions, differential pinion thrust washers, front differential side gear and thrust washer from the No.2 differential case.

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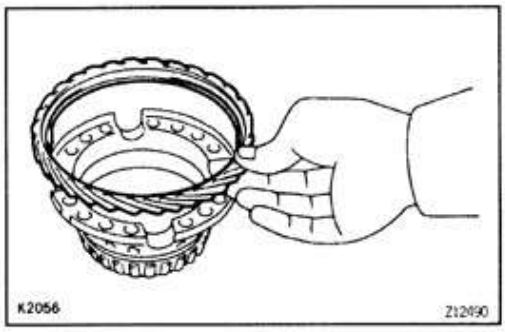
6. REMOVE DIFFERENTIAL INTERMEDIATE CASE

Using a torx wrench, remove the 15 torx screws and differential intermediate case.
(Torx wrench T50 09042–00040)



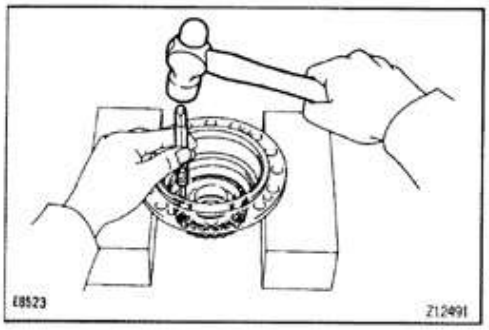
7. DISASSEMBLE DIFFERENTIAL RIGHT CASE

(a) Remove the differential spider, 5 pinions, pinion thrust washers, side gear subassembly, right side conical spring washer and No.2 side gear thrust washer.



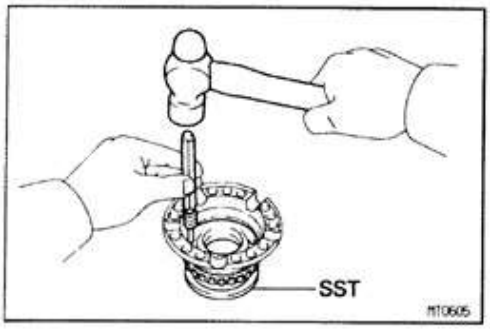
8. REMOVE SPEED SENSOR DRIVE GEAR

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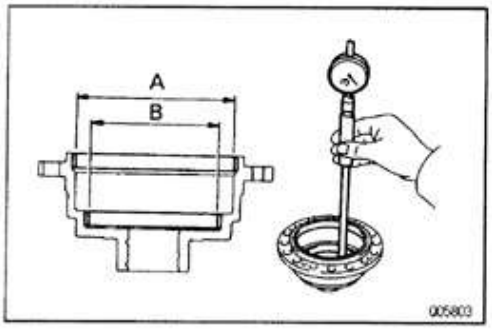


9. REMOVE LEFT AND RIGHT CASE SIDE BEARING

(a) Using a pin punch and hammer, drive out the side bearing evenly through 2 holes in the differential left case.



(b) Using a pin punch, hammer and SST, drive out the side bearing evenly through 4 holes in the differential right case.
SST 09316–60010 (09316–00020)



DIFFERENTIAL CASE INSPECTION

MX04X-01

1. MEASURE DIFFERENTIAL LEFT CASE

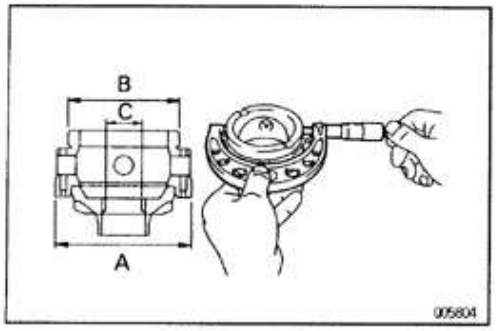
Using a cylinder gauge, measure the inner diameter of the differential left case bushing.

Standard clearance:

A 111.000–111.035 mm (3.9764–3.9778 in.)
B 90.500–90.535 mm (3.5630–3.5644 in.)

Maximum diameter:

A 111.060 mm (3.9788 in.)
B 90.560 mm (3.5653 in.)



2. MEASURE NO.2 DIFFERENTIAL CASE

Using a micrometer, measure the outer diameter of No.2 differential case.

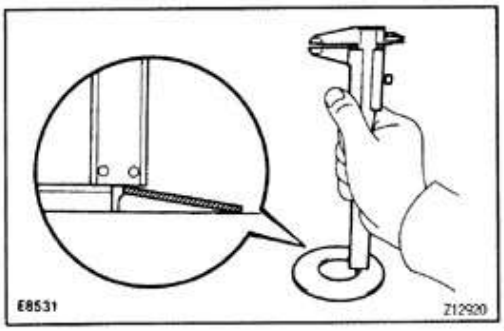
Standard clearance:

A 110.929–110.964 mm (4.3673–4.3686 in.)
B 90.429–90.464 mm (3.5602–3.5616 in.)
C 35.000–35.025 mm (1.3780–1.3876 in.)

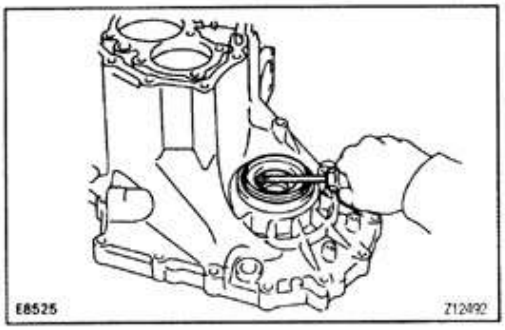
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Minimum diameter:
A 110.850 mm (4.3642 in.)
B 90.350 mm (3.5571 in.)
Maximum diameter:
C 35.030 mm (1.3791 in.)

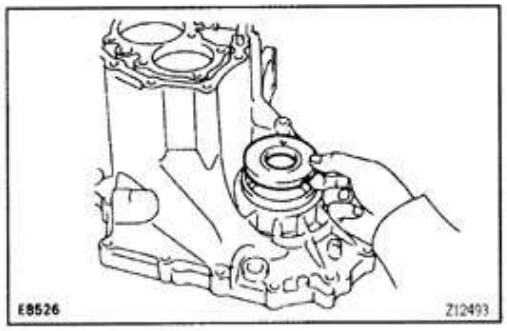
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3. MEASURE CONICAL SPRING WASHER
Using calipers, measure the height of the conical spring washer.
Standard height:
Left side conical spring washer
2.60–2.80 mm (0.102–0.110 in.)
Right side conical spring washer
1.70–1.90 mm (0.067–0.075 in.)
Minimum height:
Left side conical spring washer
2.50 mm (0.098 in.)
Right side conical spring washer
1.60 mm (0.063 in.)

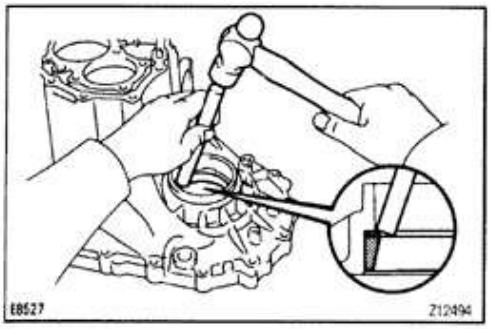


4. Transmission Case Side:
IF NECESSARY, REPLACE OIL SEAL AND TAPERED ROLLER BEARING OUTER RACE
(a) Using a screwdriver, remove the oil seal.



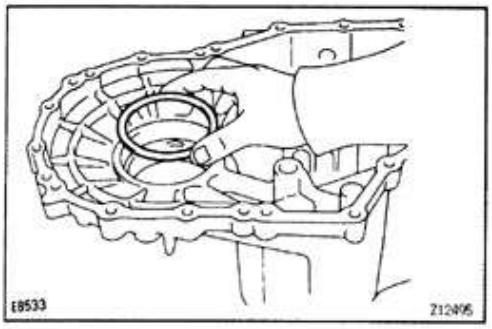
(b) Remove the transmission oil baffle.

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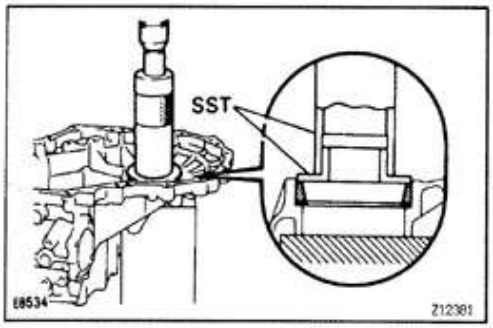


(c) Using a brass bar and hammer, drive out the bearing outer race lightly and evenly.

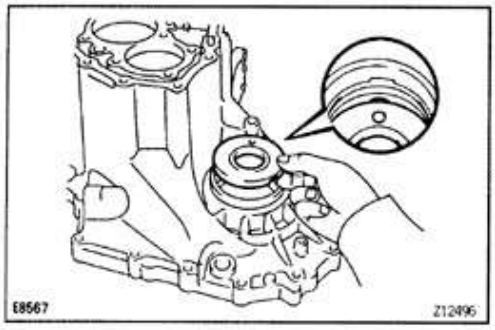
(d) Remove the adjust shim.



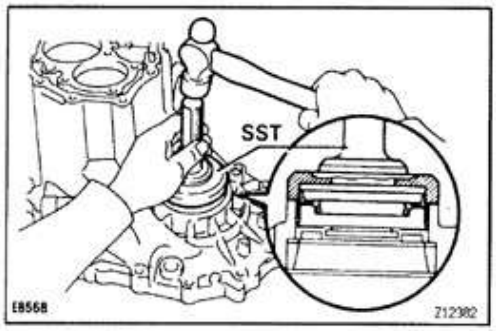
(e) Install the adjust shim.
(See page MX–69)
HINT: First select and install a shim of lesser thickness than before.



(f) Using SST and a press, install the tapered roller bearing outer race.
SST 09316–60010 (09316–00010, 09316–00040)



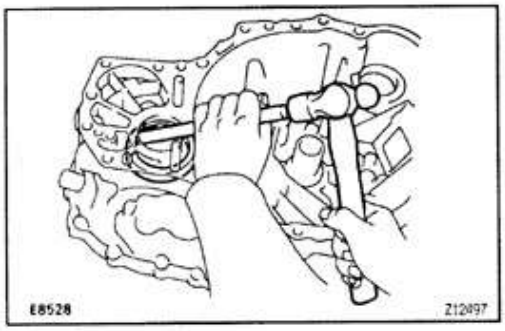
(g) Install the transmission oil baffle.
HINT: Install the transmission oil baffle projection into the case side cutout.



(h) Using SST, drive in a new oil seal.
SST 09223–15010

(i) Coat the lip of the oil seal with MP grease.

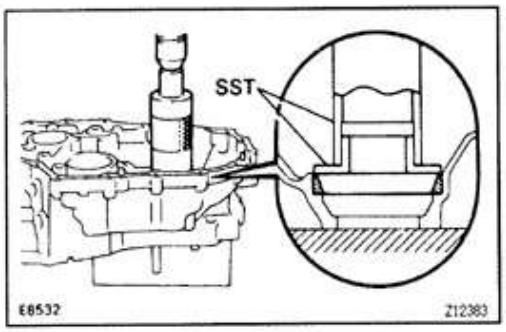
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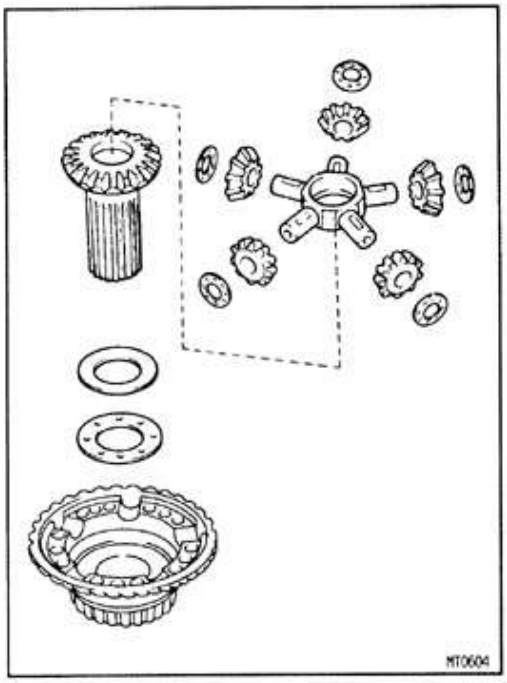
5. **Transfer Case Side:**
IF NECESSARY, REPLACE TAPERED ROLLER BEARING OUTER RACE

(a) Using a brass bar and hammer, drive out the bearing outer race lightly and evenly through the cutout portion on the transaxle case.

MX



(b) Using SST and a press, install the tapered roller bearing outer race.
SST 09316–60010 (09316–00010, 09316–00040)

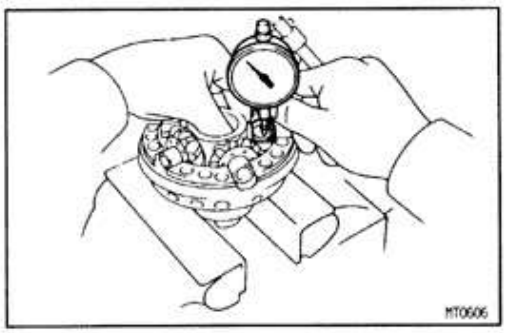


DIFFERENTIAL CASE ASSEMBLY

HINT: Coat all of the sliding and rotating surfaces with gear oil before assembly.

1. **CHECK AND ADJUST CENTER DIFFERENTIAL SIDE GEAR BACKLASH**
Differential Side Gear Subassembly Side:

(a) Install the No.2 side gear thrust washer, temporarily install a 1.0 mm (0.039 in.) thick thrust washer, differential side gear subassembly, spider, 5 pinions and pinion thrust washers to the differential right case.
HINT: The temporarily installed 1.0 mm (0.039 in.) thick thrust washer is used for reference when checking the backlash.



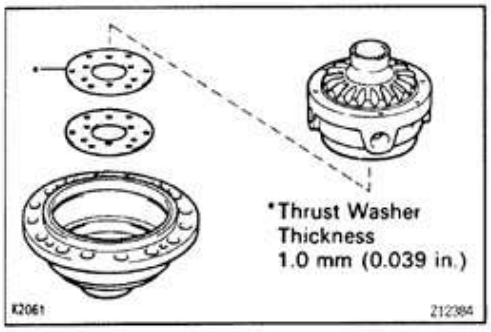
(b) Using a dial indicator, measure the backlash of one pinion gear while holding the differential side gear sub assembly toward the case.
Standard backlash:
0.05–0.20 mm (0.0020–0.0079 in.)
HINT: Push the pinion gear of the right side of the differential case.

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If the backlash is out of specification, refer to the table below and select a thrust washer which will ensure that the backlash is within specification.

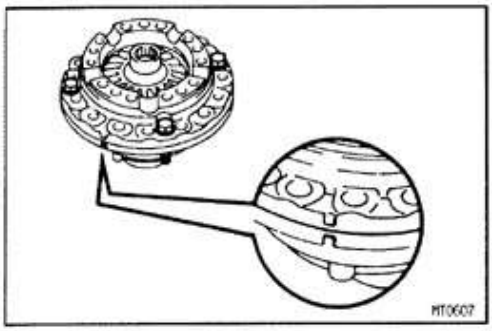
Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
–	0.80 (0.0315)	–	1.15 (0.0453)
–	0.85 (0.0335)	–	1.20 (0.0472)
–	0.90 (0.0354)	–	1.25 (0.0492)
–	0.95 (0.0374)	–	1.30 (0.0512)
–	1.00 (0.0394)	–	1.35 (0.0531)
–	1.05 (0.0413)	–	1.40 (0.0551)
–	1.10 (0.0433)	–	–

(c) Remove the differential right case.

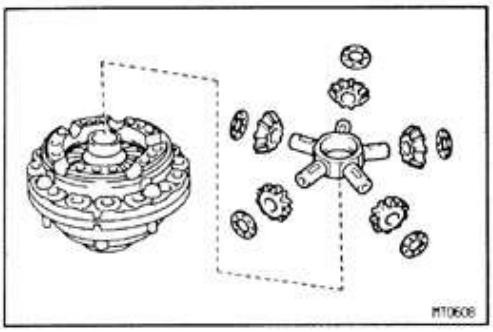


No.2 Differential Case Side:

(a) Install the No.2 side gear thrust washer, temporarily install a 1.0 mm (0.039 in.) thick thrust washer and differential No.2 case to the differential left case.
HINT: The temporarily installed 1.0 mm (0.039 in.) thick thrust washer is used for reference when checking the backlash.

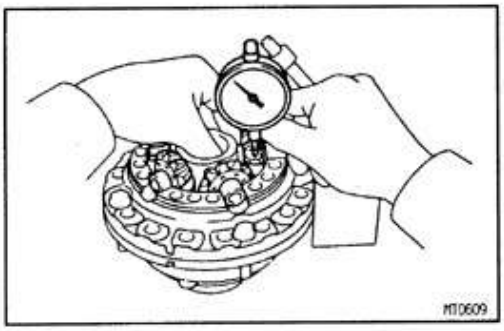


(b) Using the 4 transmission case cover bolts, install the differential intermediate case to the left case.
HINT: Align the matchmarks on the differential left case and connect the intermediate case.



(c) Install the differential spider, 5 pinions and pinion thrust washers to the differential intermediate case.

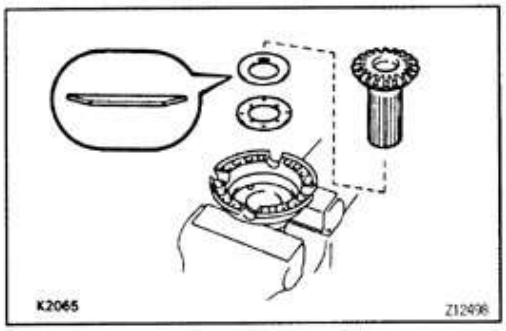
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(d) Using a dial indicator, measure the backlash of one pinion gear while holding the No.2 differential case.
Standard backlash:
0.05–0.20 mm (0.0020–0.0079 in.)
HINT: Push the pinion gear of the differential intermediate case.
If the backlash is out of specification, refer to the table below and select a thrust washer which will ensure that the backlash is within specification.

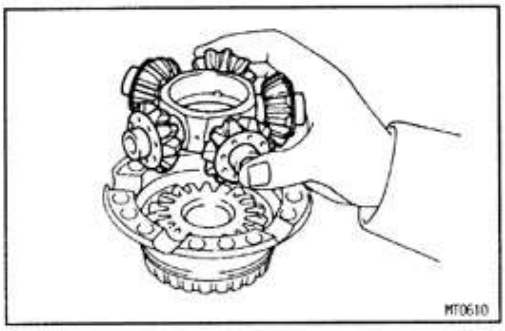
Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
–	0.80 (0.0315)	–	1.15 (0.0453)
–	0.85 (0.0335)	–	1.20 (0.0472)
–	0.90 (0.0354)	–	1.25 (0.0492)
–	0.95 (0.0374)	–	1.30 (0.0512)
–	1.00 (0.0394)	–	1.35 (0.0531)
–	1.05 (0.0413)	–	1.40 (0.0551)
–	1.10 (0.0433)	–	–

(e) Remove the differential case.

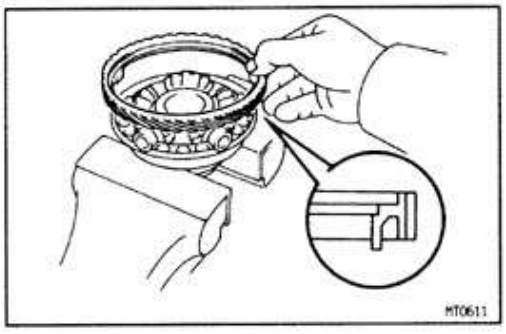


2. ASSEMBLE DIFFERENTIAL RIGHT CASE

(a) Install the No.2 side gear thrust washer (previously selected), conical spring washer and differential side gear subassembly to the right case.
HINT: Ensure that the conical spring washer is installed correctly.



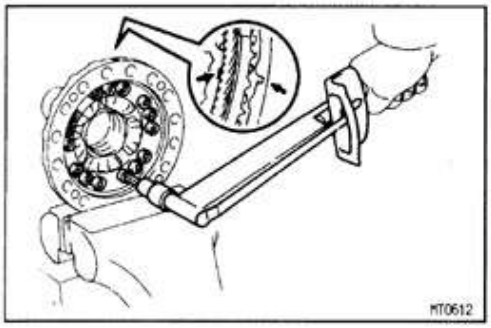
(b) Install the differential spider, 5 pinions and pinion thrust washers to the differential right case.



3. INSTALL SPEED SENSOR DRIVE GEAR

Install the speed sensor drive gear to the differential right case.

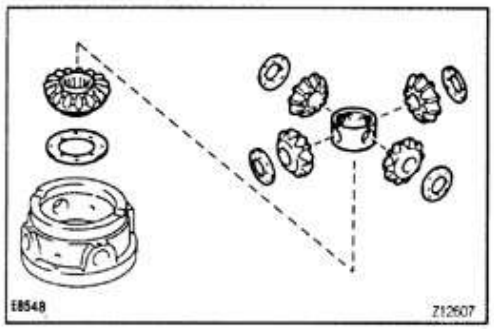
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4. INSTALL DIFFERENTIAL INTERMEDIATE CASE

(a) Align the matchmarks on the right case and connect the intermediate case.

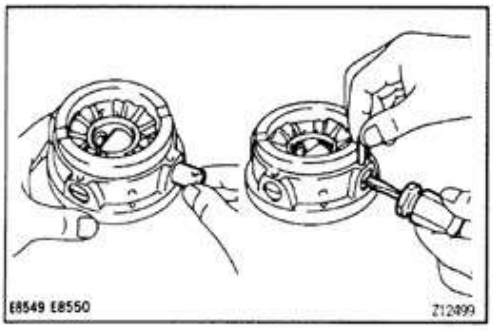
(b) Install the 15 torx screws. Using a torx wrench, tighten the screws uniformly a little at a time in succession. Torque the screws.
(Torx wrench T50 09042–00040)
Torque: 63 N·m (640 kgf·cm, 46 ft·lbf)



5. CHECK AND ADJUST FRONT SIDE GEAR BACKLASH

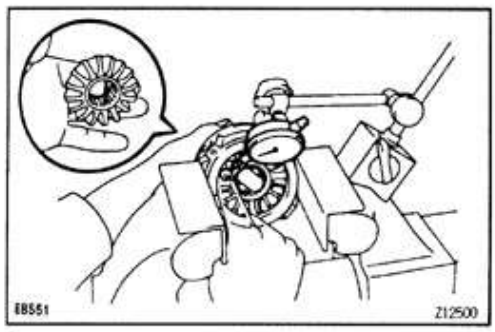
No.2 Differential Case Side:

(a) Install the front differential side gear thrust washer, side gear, pinion shaft holder, 4 pinions and thrust washers.



(b) Install the No.2 front differential pinion shaft and 2 pinion shafts into the No.2 differential case hole with the pinion shaft pin hole facing upwards.

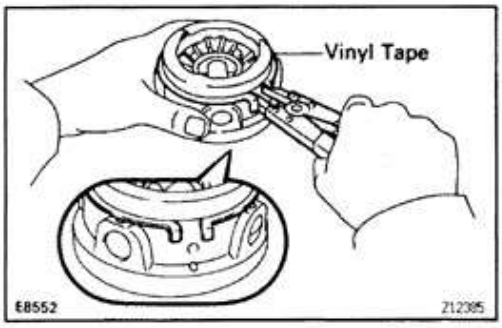
(c) Insert the 3 straight pins through the differential case and into the pinion shafts.



(d) Using a dial indicator, measure the backlash of one pinion gear while holding the front differential side gear toward the case.
Standard backlash:
0.05–0.20 mm (0.0020–0.0079 in.)
HINT: Do not mount the surface of No.2 differential case which contacts with bushing in a vise.
If the backlash is out of specification, refer to the table below and select a thrust washer which will ensure that the backlash is within specification.

Mark	Thickness mm (in.)
B	1.00 (0.0394)
C	1.05 (0.0413)
D	1.10 (0.0433)
E	1.15 (0.0453)
F	1.20 (0.0472)
G	1.25 (0.0492)

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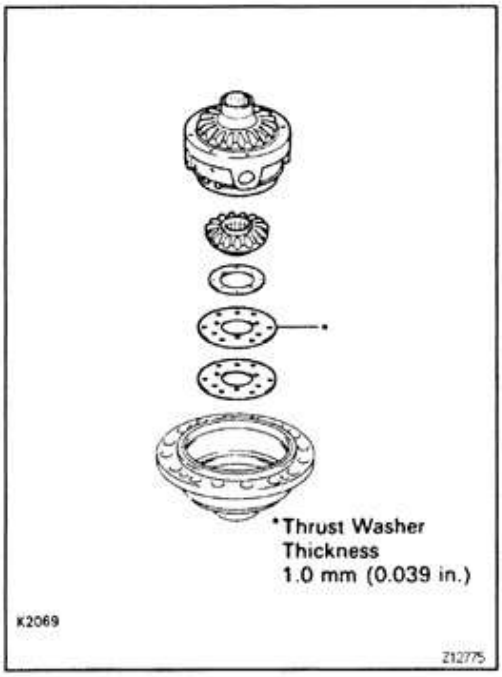


6. INSTALL SNAP RING

Using a snap ring expander, install the shaft snap ring, as shown.

HINT: Before installing the shaft snap ring, wrap vinyl tape around the case to avoid damaging the case.

MX



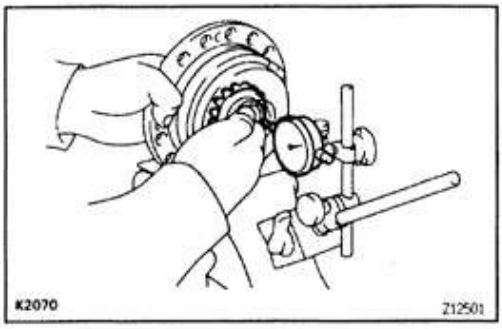
7. CHECK AND ADJUST FRONT DIFFERENTIAL SIDE GEAR THRUST CLEARANCE

Differential Left Case Side:

(a) Install the No.2 side gear thrust washer, temporarily install a 1.0 mm (0.039 in.) thick No.2 side gear thrust washer, front differrential side gear thrust washer, side gear and No.2 differential case assembly.

HINT:

- Engage the front differential side gear and pinion gear of the No.2 differential case.
- The temporarily installed 1.0 mm (0.039 in.) thick No.2 side gear thrust washer is used for reference when checking backlash.



(b) Using a dial indicator, measure the thrust clearance of front differential side gear while holding the No.2 differential case on the left side.

Standard clearance:

0.14–0.21 mm (0.006–0.008 in.)

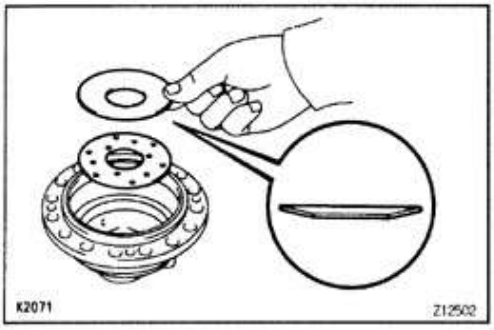
HINT: Turning the side gear a bit, check the maximum value of thrust clearance.

If the backlash is out of specification, refer to the table below and select a thrust washer which will ensure that the backlash is within specification.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
A	0.95 (0.0374)	F	1.20 (0.0472)
B	1.00 (0.0394)	G	1.25 (0.0492)
C	1.05 (0.0413)	H	1.30 (0.0512)
D	1.10 (0.0433)	J	1.35 (0.0531)
E	1.15 (0.0453)	K	1.40 (0.0551)

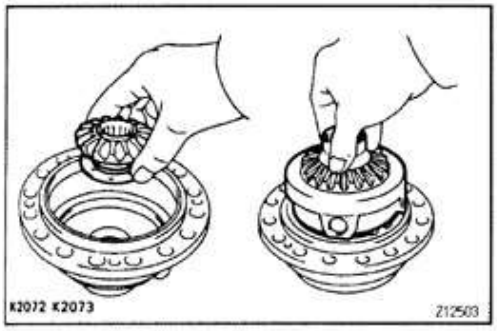
(c) Remove the differential left case.

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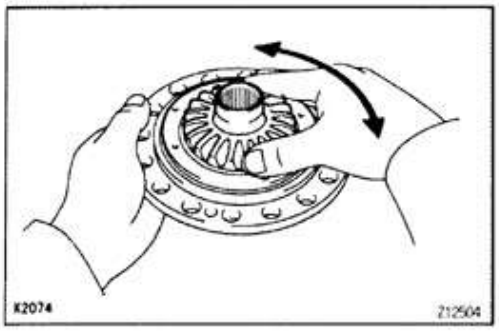


8. ASSEMBLE DIFFERENTIAL LEFT CASE

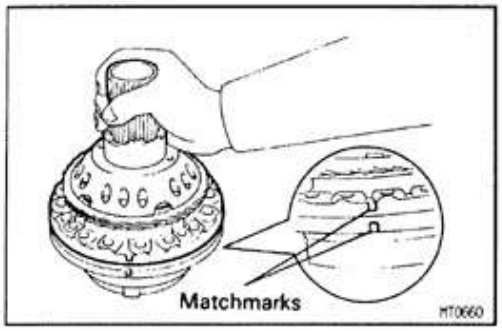
(a) Install the No.2 side gear thrust washer (previously selected) and conical spring washer to the left case.
HINT: Ensure that the conical spring washer is installed correctly.



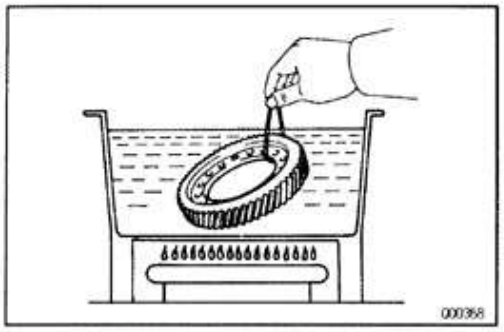
(b) Install the front differential side gear thrust washer and side gear to the left case.
(c) Install the No.2 differential case assembly.
HINT: Engage the front differential side gear and pinion gear of the No.2 differential case.



(d) Ensure that the pinion gears turns smoothly inside the No.2 differential case.



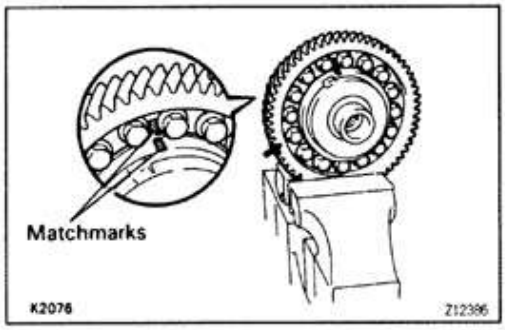
(e) Install the differential intermediate case to the differential left case.
HINT: Align the matchmarks on the differential left case and connect the differential intermediate case.



9. INSTALL RING GEAR

(a) Clean the contact surface of the differential left case.
(b) Heat the ring gear to about 100°C (212°F) in boiling water.
(c) Carefully remove the ring gear from the water.
(d) Clean the contact surface of the ring gear with cleaning solvent.

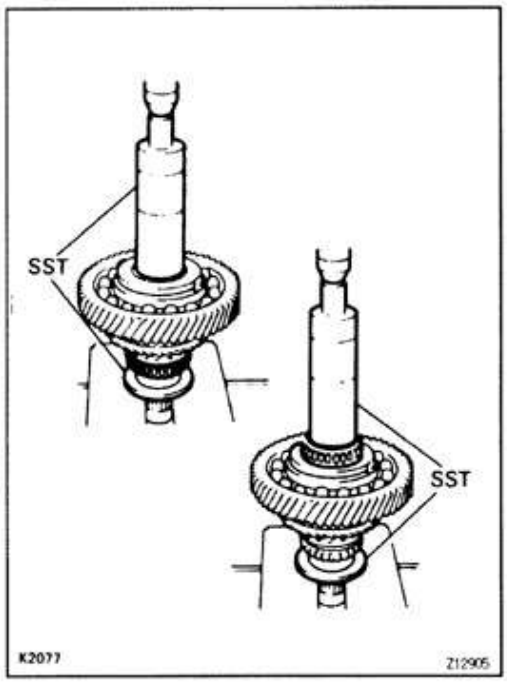
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(e) Quickly install the ring gear on the differential case.
HINT: Align the matchmarks on the differential left case and connect the ring gear.

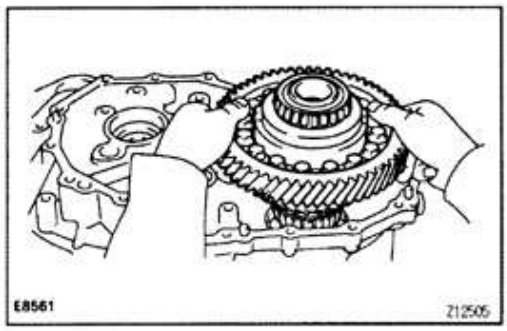
(f) Install the 16 set bolts. Tighten the set bolts uniformly a little at a time in succession. Torque the bolts.
Torque: 124 N·m (1,260 kgf·cm, 91 ft·lbf)

MX

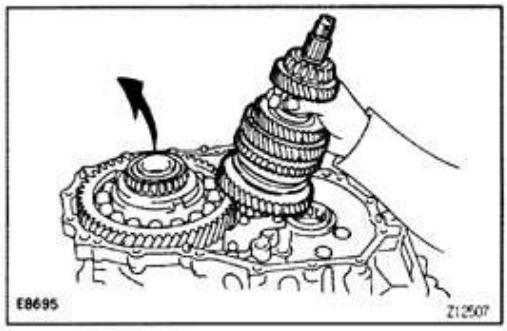


10. INSTALL LEFT AND RIGHT SIDE BEARING
Using SST and a press, install the left and right side bearing to the differential case.
SST 09316–20011, 09316–60010 (09316–00010)

11. ADJUST OUTPUT SHAFT PRELOAD
(See page MX–70)

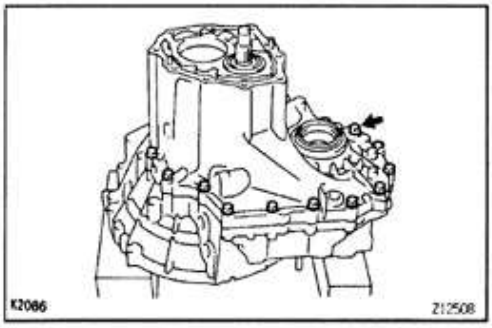


12. INSTALL DIFFERENTIAL CASE ASSEMBLY
Install the differential case assembly to the transaxle case.



13. INSTALL OUTPUT SHAFT ASSEMBLY
Lift up the differential case, install the output shaft assembly.

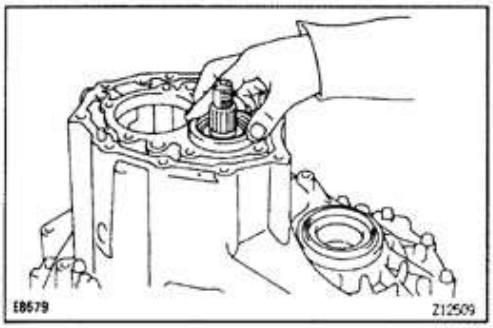
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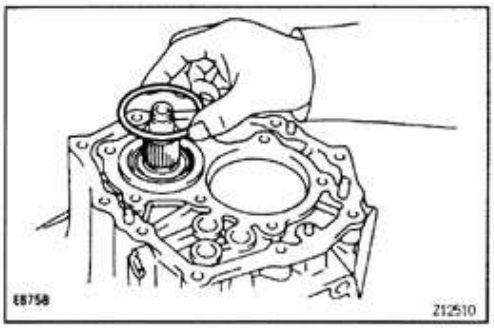
14. INSTALL TRANSMISSION CASE

(a) Install the transmission case.
HINT: If necessary, tap on the transmission case with a plastic hammer.

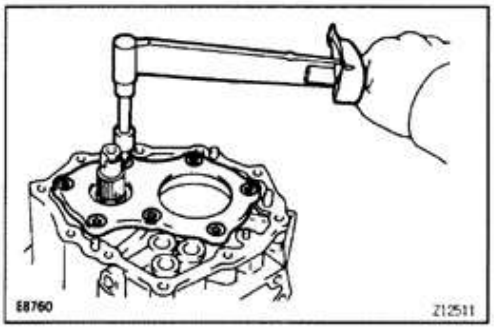
(b) Install and torque the 17 blots.
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)



15. INSTALL OUTPUT SHAFT REAR TAPERED ROLLER BEARING OUTER RACE

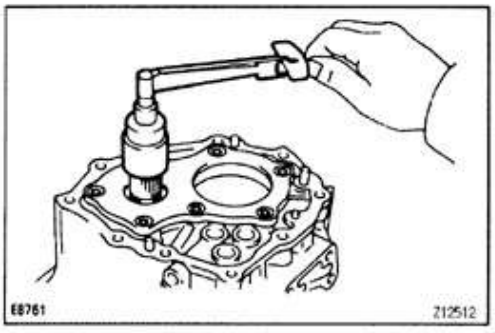


16. INSTALL ADJUST SHIM
(See page MX–69)
HINT: Install the previously selected shim.



17. INSTALL REAR BEARING RETAINER

Using a torx wrench, install and torque the 7 torx screws.
(Torx wrench T45 09042–00050)
Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)



18. ADJUST DIFFERENTIAL CASE SIDE BEARING PRELOAD

(a) Install a new lock nut to the output shaft.

(b) Turn the output shaft right and left 2 or 3 times to allow the bearings to settle.

(c) Using a torque wrench, measure the preload.
Preload (at starting):
New bearing (Add output shaft preload)
0.2–0.4 N·m (1.9–3.7 kgf·cm, 1.6–3.2 in.·lbf)

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Reused bearing (Add output shaft preload)

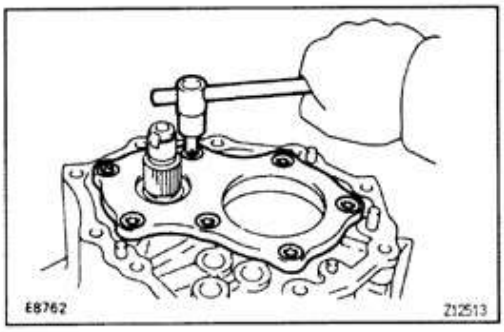
0.1 – 0.2 N·m (1.2 – 2.3 kgf·cm, 1.0 – 2.0 in.·lbf)

If the preload is not within specification, select an appropriate adjusting shim.

HINT: The total preload will change about 0.13 N·m (1.3 kgf·cm, 1.13 in.·lbf) for every 0.05 mm change in adjusting shim thickness.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
0	2.00 (0.0787)	9	2.45 (0.0965)
1	2.05 (0.0807)	A	2.50 (0.0984)
2	2.10 (0.0827)	B	2.55 (0.1004)
3	2.15 (0.0846)	C	2.60 (0.1024)
4	2.20 (0.0866)	D	2.65 (0.1043)
5	2.25 (0.0886)	E	2.70 (0.1063)
6	2.30 (0.0906)	F	2.75 (0.1083)
7	2.35 (0.0925)	G	2.80 (0.1102)
8	2.40 (0.0945)	H	2.85 (0.1122)

MX

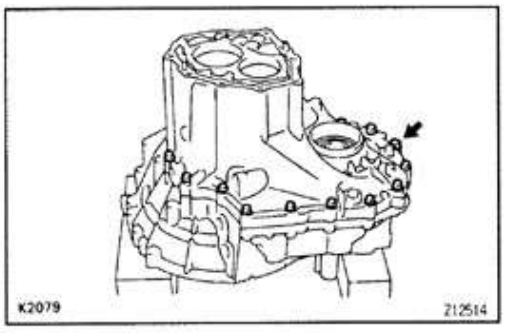


19. REMOVE REAR BEARING RETAINER

Using a torx wrench, remove the 7 torx screws and rear bearing retainer.

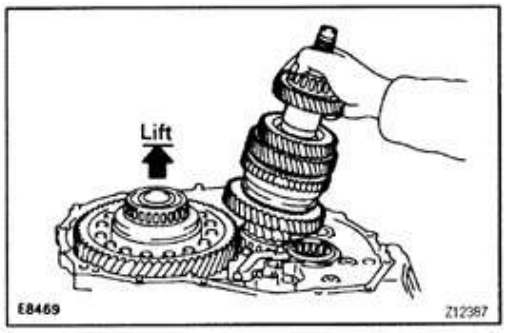
(Torx wrench T45 09042 – 00050)

20. REMOVE ADJUST SHIM



21. REMOVE TRANSMISSION CASE

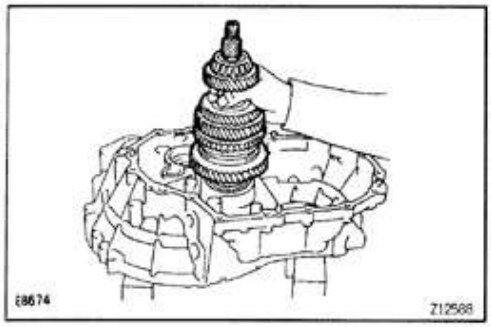
Remove the 17 bolts and tap the transmission case with a plastic hammer.



22. REMOVE OUTPUT SHAFT ASSEMBLY

23. REMOVE DIFFERENTIAL CASE ASSEMBLY

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COMPONENT PARTS INSTALLATION

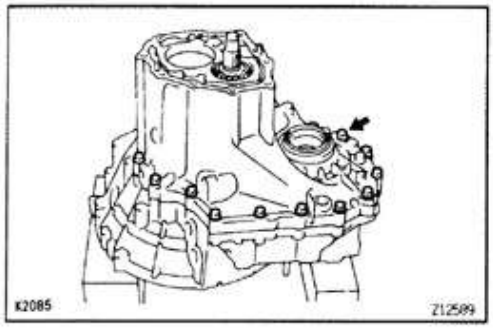
BASIC SUBASSEMBLY REASSEMBLY

(See pages MX–15 to MX–17)

HINT: Coat all of the sliding and rotating surfaces with gear oil before assembly.

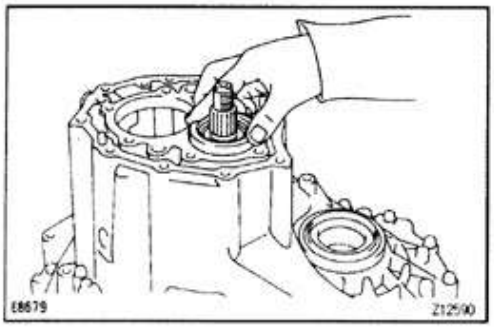
1. **ADJUST OUTPUT SHAFT PRELOAD**

(a) Install the output shaft assembly to the transaxle case.

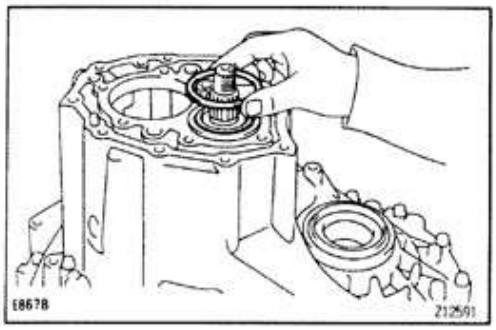


(b) Install the transmission case to the transaxle case.
HINT: If necessary, tap on the case with a plastic hammer.

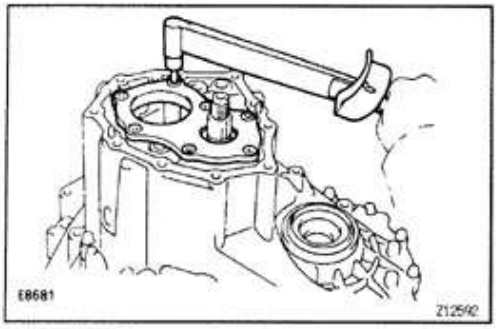
(c) Install and torque the 17 bolts.
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)



(d) Install the output shaft rear taper roller bearing outer race.



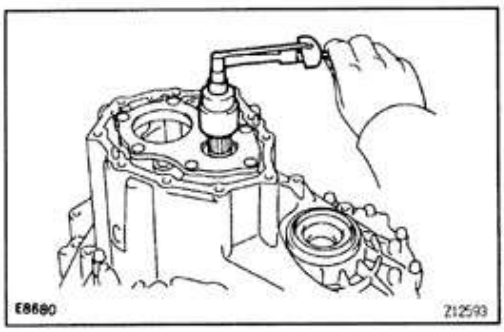
(e) Install the adjusting shim.
HINT: When reusing the output shaft bearing, first install a shim of the same thickness as before. If installing a new taper roller bearing, first select and install a shim of lesser thickness than before.



(f) Install the rear bearing retainer.

(g) Using a torx wrench, install and torque the 7 torx screws.
(Torx wrench T45 09042–00050)
Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)

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MX

(h) Install a new lock nut to the output shaft.

(i) Turn the output shaft right and left 2 or 3 times to allow the bearings to settle.

(j) Using a small torque wrench, measure the preload.

Preload (at starting):

New bearing

0.8 – 1.6 N·m (8 – 16 kgf·cm, 6.9 – 13.9 in.·lbf)

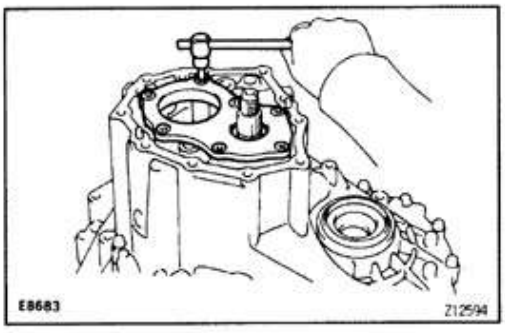
Reused bearing

0.5 – 1.0 N·m (5 – 10 kgf·cm, 4.3 – 8.7 in.·lbf)

If the preload is not within specification, select an appropriate adjusting shim.

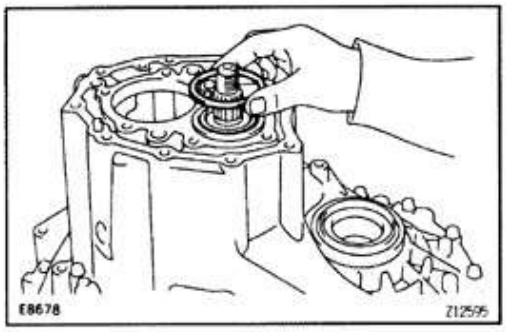
HINT: The preload will change about 0.4 – 0.5 N·m (4 – 5 kgf·cm, 3.5 – 4.3 in.·lbf) for every 0.05 mm change in adjusting shim thickness.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
0	1.30 (0.0512)	D	1.95 (0.0768)
1	1.35 (0.0531)	E	2.00 (0.0787)
2	1.40 (0.0551)	F	2.05 (0.0807)
3	1.45 (0.0571)	G	2.10 (0.0827)
4	1.50 (0.0591)	H	2.15 (0.0846)
5	1.55 (0.0610)	J	2.20 (0.0866)
6	1.60 (0.0630)	K	2.25 (0.0886)
7	1.65 (0.0650)	L	2.30 (0.0906)
8	1.70 (0.0669)	M	2.35 (0.0925)
9	1.75 (0.0689)	N	2.40 (0.0945)
A	1.80 (0.0709)	P	2.45 (0.0965)
B	1.85 (0.0728)	Q	2.50 (0.0984)
C	1.90 (0.0748)	–	–



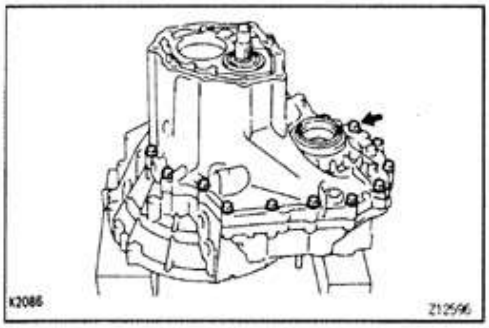
(k) Remove the lock nut.

(l) Using a torx wrench, remove the 7 torx screws and rear bearing retainer.
(Torx wrench T45 09042–00050)

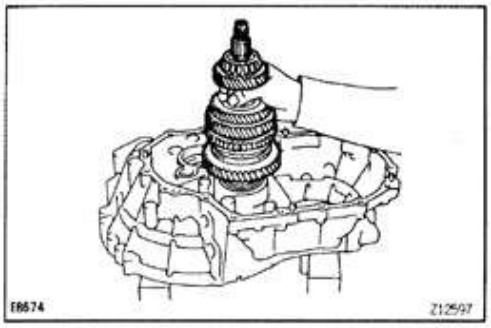


(m) Remove the shim.

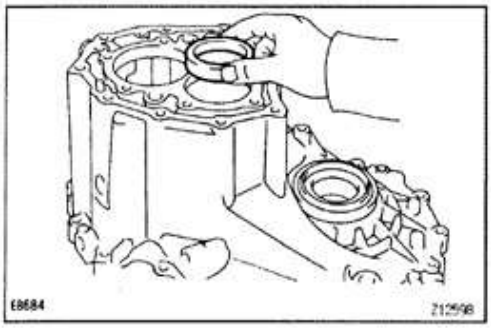
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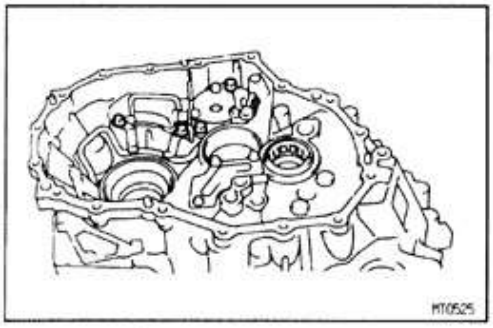
(n) Remove the 17 bolts and transmission case.



(o) Remove the output shaft assembly.



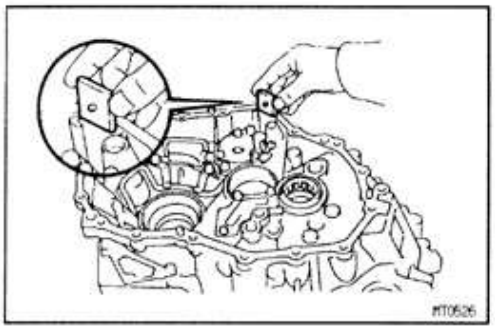
(p) Remove the output shaft rear bearing outer race.



2. INSTALL OIL PUMP ASSEMBLY AND OIL PIPE

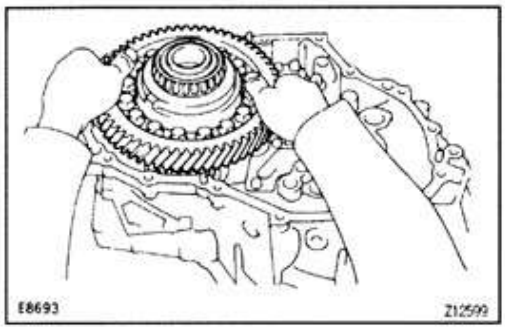
(a) Install the oil pump assembly with the oil pipe.
HINT: Be careful not to drop the oil pump gasket.

(b) Install and torque the 4 bolts.
Torque: 17 N·m (175 kgf·cm, 13 ft·lbf)



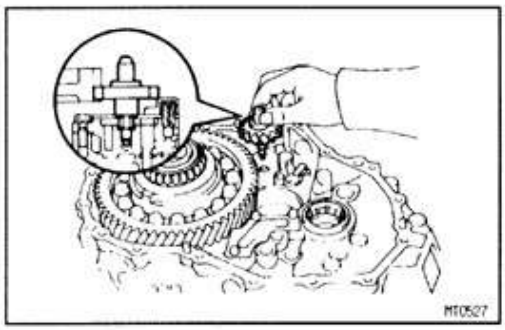
3. INSTALL MAGNET TO TRANSAXLE CASE

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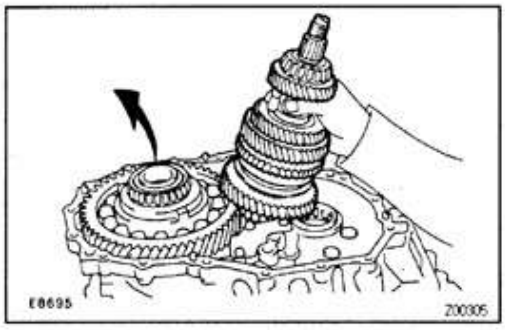


4. INSTALL DIFFERENTIAL CASE ASSEMBLY

MX

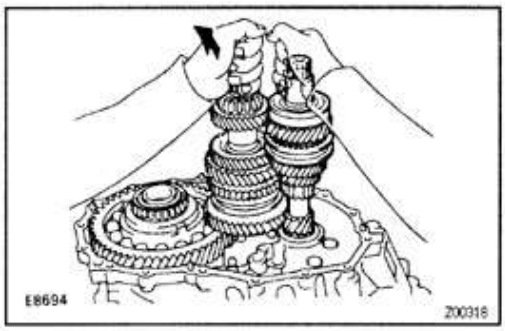


5. INSTALL OIL PUMP DRIVE GEAR

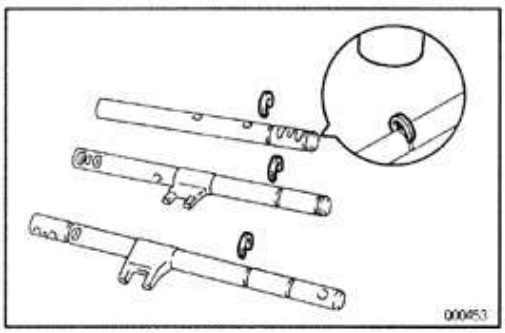


6. INSTALL OUTPUT SHAFT AND INPUT SHAFT ASSEMBLY

(a) Lift up the differential case assembly, install the output shaft assembly.



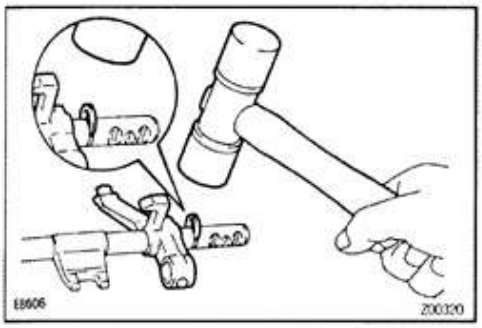
(b) Leaning the output shaft to the differential side, install the input shaft assembly.



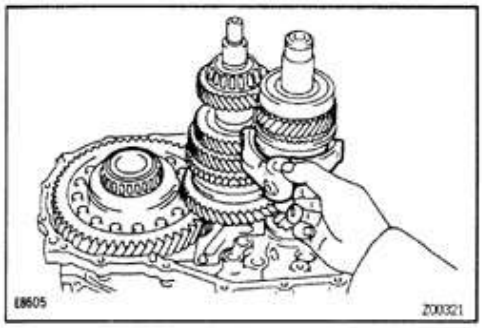
7. INSTALL SNAP RINGS

(a) Using a plastic hammer, install the snap rings to the No.1, No.2 and No.3 shift fork shafts.

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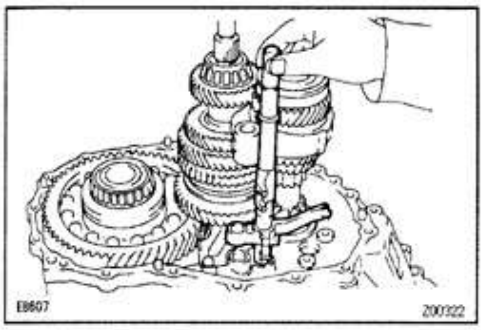


(b) Using a plastic hammer, the reverse shift fork and snap ring to the No.3 shift fork shaft.

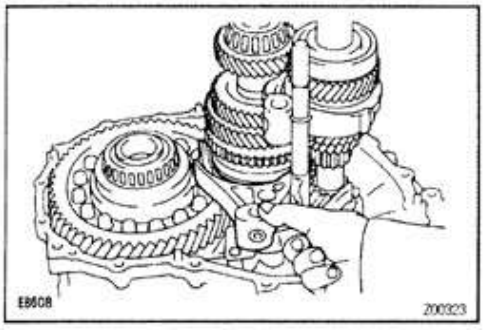


8. INSTALL NO.2 SHIFT FORK AND NO.3 SHIFT FORK SHAFT WITH REVERSE SHIFT FORK

(a) Install the No.2 shift fork to the groove of the No.2 hub sleeve.

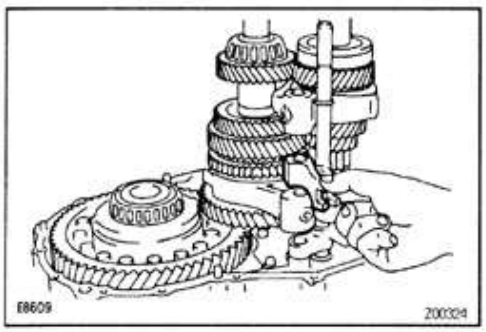


(b) Install the No.3 shift fork shaft with the reverse shift fork.



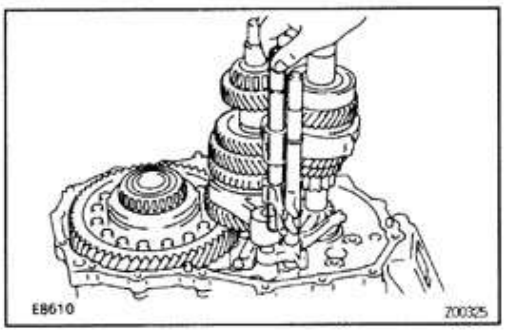
9. INSTALL NO.1 SHIFT FORK, SHIFT HEAD AND NO.2 SHIFT FORK SHAFT

(a) Install the No.1 shift fork to the groove of the No.1 hub sleeve.



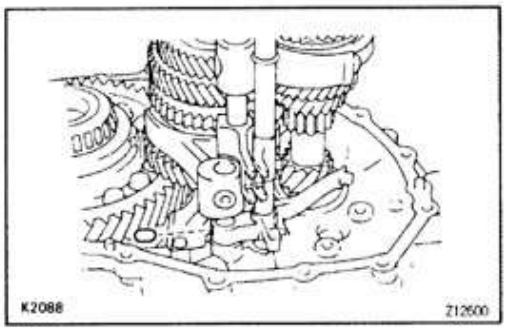
(b) Put the shift head onto the No.1 shift fork.

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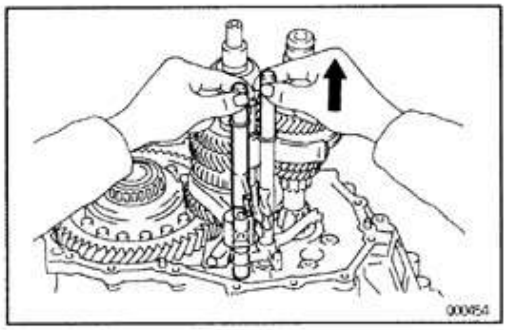
(c) Install the No.2 shift fork shaft to the transaxle case, through the No.2 shift fork, shift head and No.1 shift fork.

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10. INSTALL INTERLOCK ROLLER

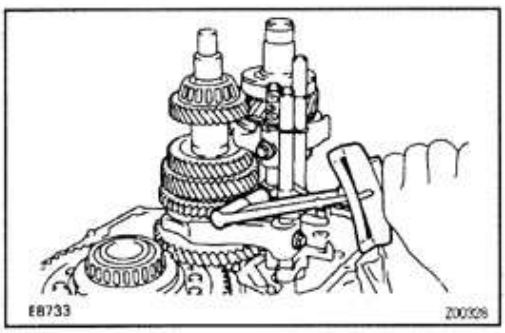
Using a magnetic finger, install the interlock roller into the reverse shift fork.



11. INSTALL NO.1 SHIFT FORK SHAFT

Install the No.1 shift fork shaft to the case, through the No.1 shift fork and reverse shift fork.

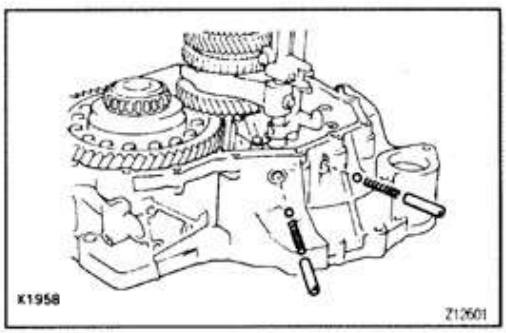
HINT: When it is difficult to push the fork shaft through the reverse shift fork, pull up the No.3 shift fork shaft.



12. INSTALL SHIFT FORK SET BOLTS

Install and torque the 3 set bolts.

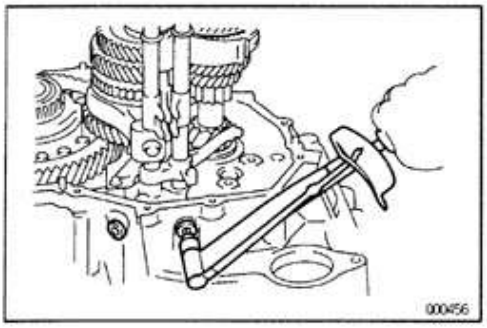
Torque: 24 N·m (240 kgf·cm, 17 ft·lbf)



13. INSTALL LOCKING BALLS, SPRINGS, SEATS AND STRAIGHT SCREW PLUGS

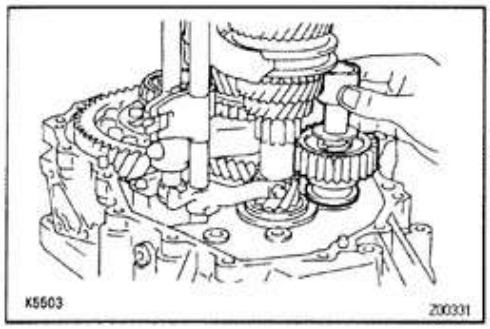
(a) Install the 2 locking balls, springs and seats.

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(b) Apply sealant to the 2 plugs.
Sealant:
Part No.08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent

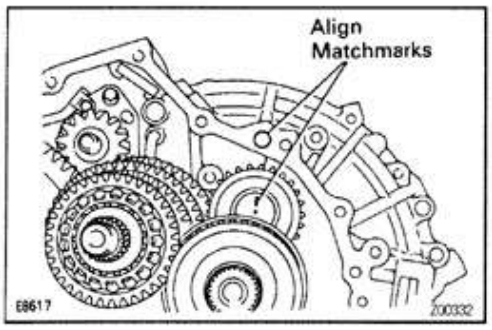
(c) Using a hexagon wrench (6 mm), install and torque 2 plugs.
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)



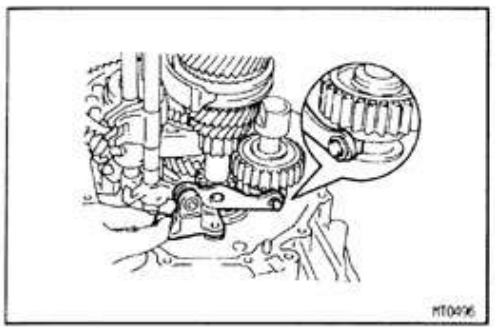
14. INSTALL REVERSE IDLER GEAR AND SHAFT

(a) Install the reverse idler gear shaft and thrust washer to the shaft.

(b) Install the reverse idler gear shaft into the case hole.



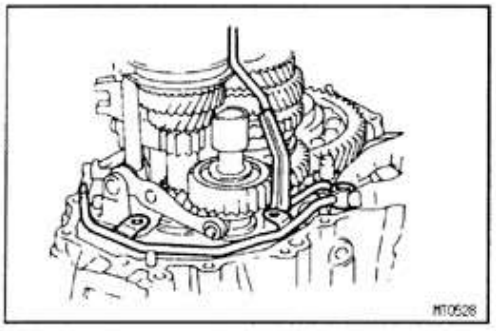
(c) Align the matchmarks, as shown.



15. INSTALL REVERSE SHIFT ARM BRACKET ASSEMBLY AND NO.2 OIL PIPE

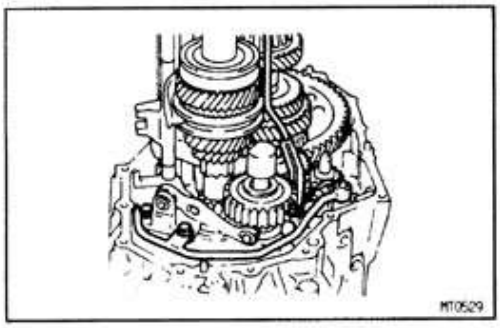
(a) Put the reverse shift fork pivot into the reverse shift arm and install the reverse shift arm bracket assembly to the transaxle case.

(b) Install the bolt.



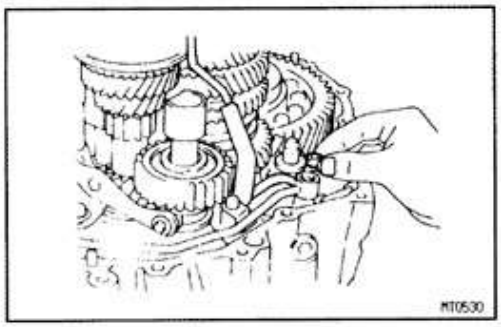
(c) Install the No.2 oil pipe and 2 bolts.

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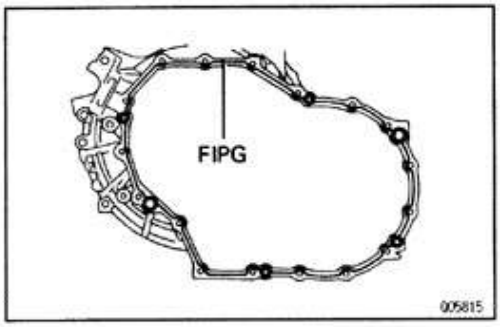


(d) Torque the reverse shift arm bracket and oil pump bolts.
Torque: 17 N·m (175 kgf·cm, 13 ft·lbf)

MX



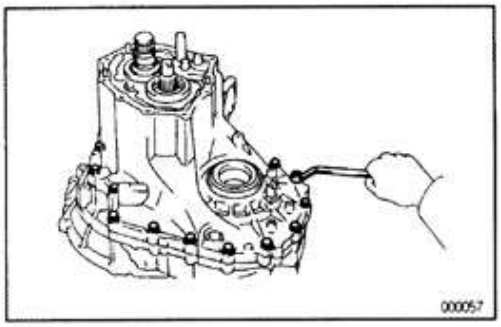
(e) Install a new gasket to the No.2 oil pipe.



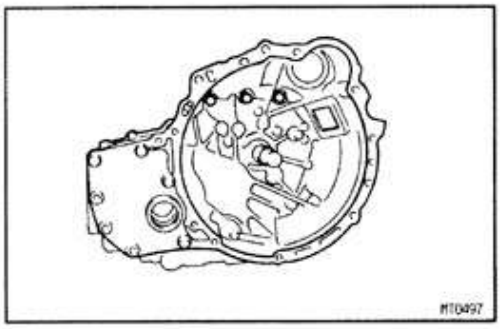
16. INSTALL TRANSMISSION CASE

(a) Remove the FIPG material and be careful not to drop oil on the contacting surfaces of the transmission case or transaxle case.

(b) Apply FIPG to the transmission case, as shown in the illustration.
FIPG:
Part No.08826–00090, THREE BOND 1281 or equivalent
HINT: Install the transmission case, as soon as the FIPG is applied.

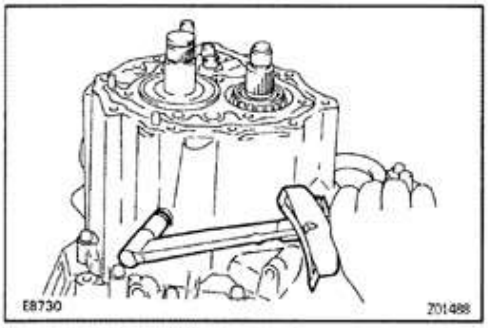


(c) Install and torque the 14 bolts to the transmission case side.
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)



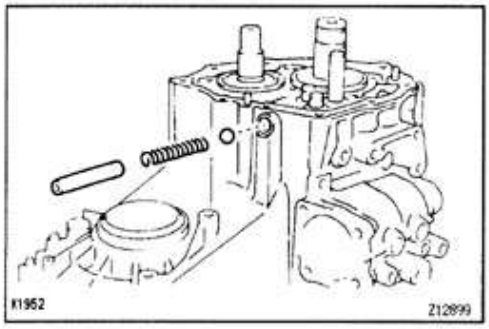
(d) Install and torque the 3 bolts to the transaxle case side.
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)

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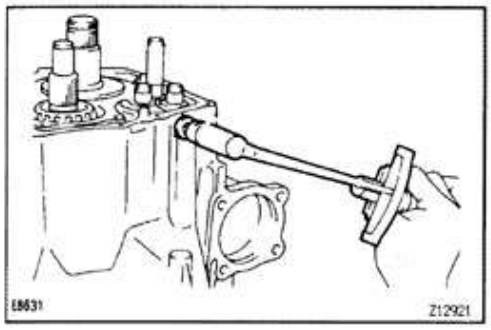
17. INSTALL AND TORQUE REVERSE IDLER GEAR SHAFT RETAINING BOLT

Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)



18. INSTALL LOCKING BALL, SPRING, SEAT AND STRAIGHT SCREW PLUG

(a) Install the locking ball, spring and seat.



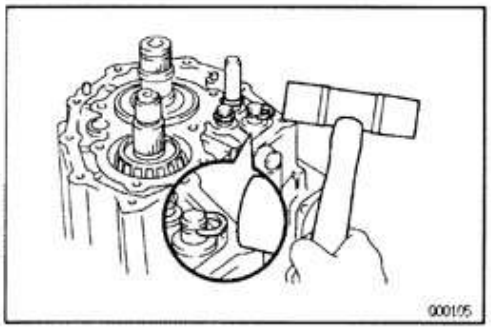
(b) Apply sealant to the plug.

Sealant:

Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent

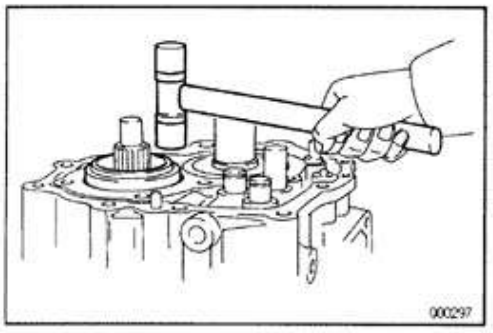
(c) Using a hexagon wrench (6 mm), install and torque the plug.

Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)



19. INSTALL SNAP RINGS

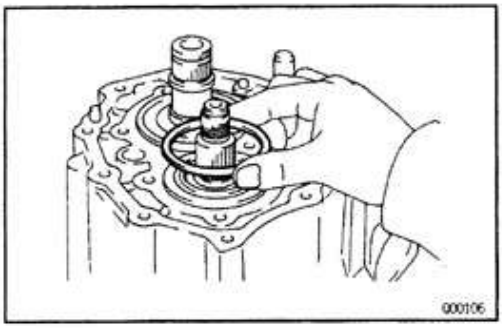
Using a plastic hammer, install the 3 snap rings.



20. INSTALL OUTPUT SHAFT REAR TAPER ROLLER BEARING OUTER RACE

Using a plastic hammer, tap in the outer race.

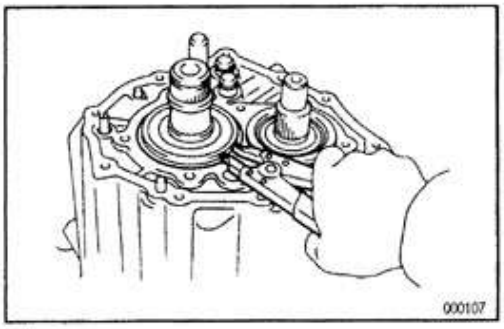
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21. INSTALL SHIM

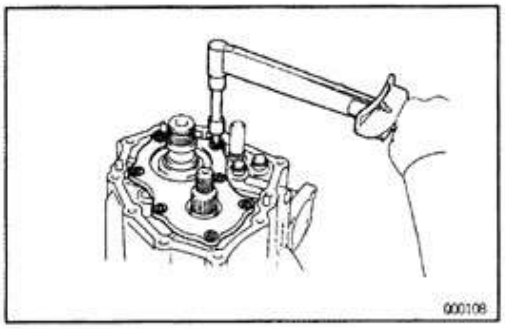
HINT: Install the previously selected shim.

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22. INSTALL SNAP RING

Using a snap ring expander, install the snap ring to the input shaft rear bearing.



23. INSTALL REAR BEARING RETAINER

(a) Apply sealant to the screw.

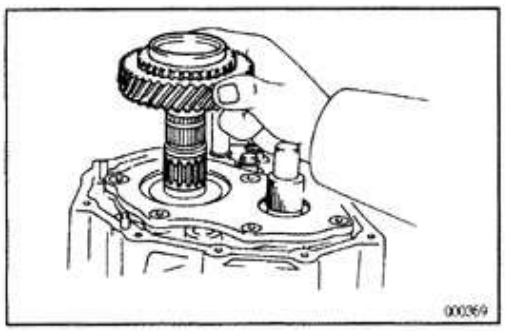
Sealant:

Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent

(b) Using a torx wrench, install and torque the 7 torx screws.

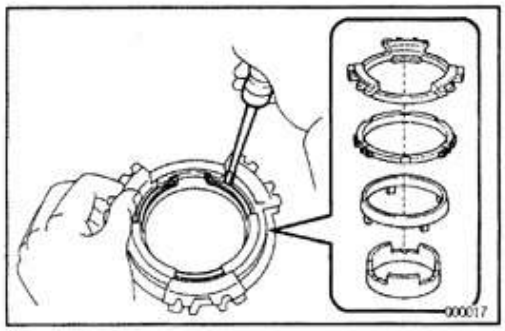
(Torx wrench T45 09042–00050)

Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)



24. INSTALL 5TH GEAR

Install the spacer, needle roller bearing and 5th gear.



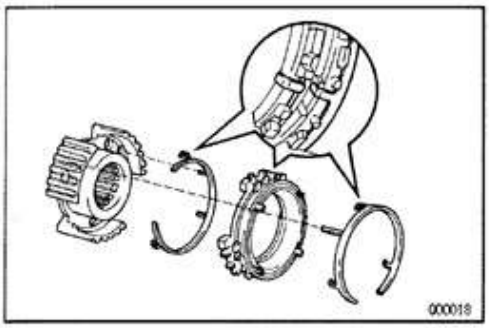
25. INSTALL NO.5 SYNCHRONIZER RINGS WITH KEY SPRING TO NO.3 CLUTCH HUB

(a) Assemble the No.5 synchronizer rings.

(b) Using a screwdriver, install the snap ring.

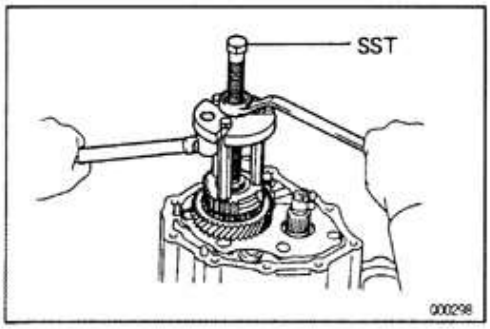
HINT: Wrap vinyl tape on the screwdriver to prevent damaging the synchronizer ring.

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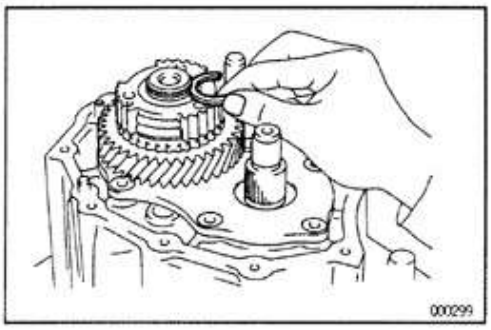


(c) Install the No.5 synchronizer rings with the key springs to the No.3 clutch hub.
HINT: Align the holes of the clutch hub with the key spring.

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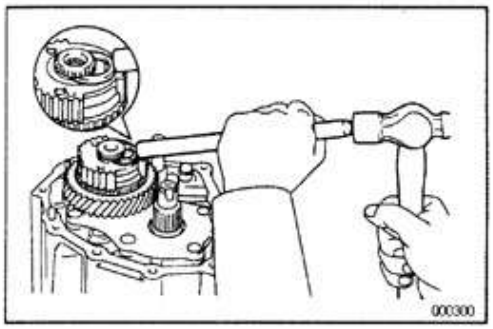


26. INSTALL NO.3 CLUTCH HUB
Using SST, install the No.3 clutch hub with the synchronizer ring and key spring.
SST 09950–30010

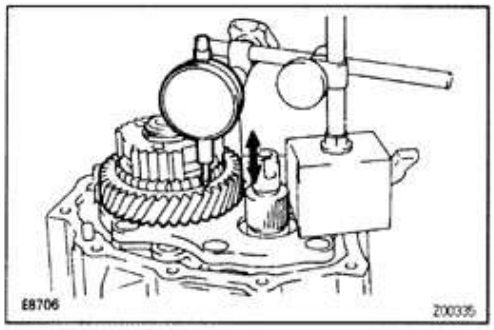


27. INSTALL SNAP RING
(a) Select a snap ring that will allow minimum axial play.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
Q	2.25 (0.0886)	V	2.50 (0.0984)
R	2.30 (0.0906)	W	2.55 (0.1004)
S	2.35 (0.0925)	X	2.60 (0.1024)
T	2.40 (0.0945)	Y	2.65 (0.1043)
U	2.45 (0.0965)	–	–

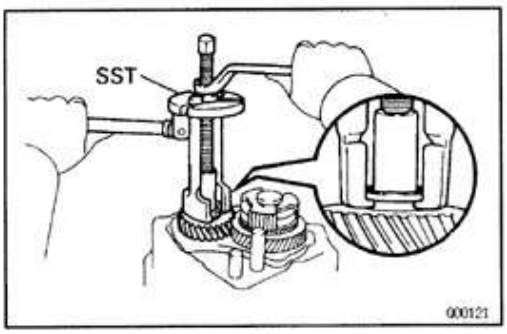


(b) Using a brass bar and hammer, install the snap ring.



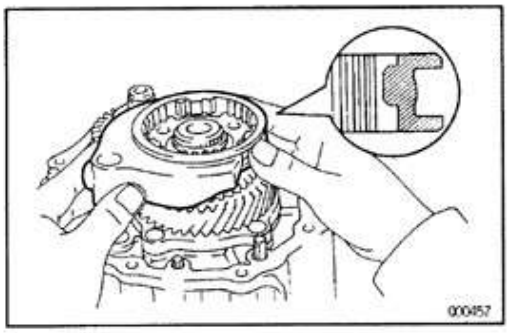
28. INSPECT 5TH GEAR THRUST CLEARANCE
Using a dial indicator, measure the 5th gear thrust clearance.
Standard clearance:
0.10 – 0.57 mm (0.0039 –0.0224 in.)
Maximum clearance:
0.65 mm (0.0256 in.)

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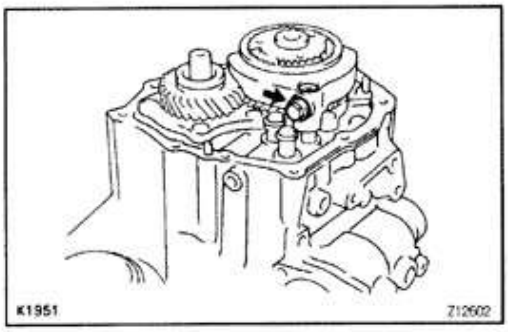


29. INSTALL 5TH DRIVEN GEAR
Using SST, install the 5th driven gear.
SST 09950–30010

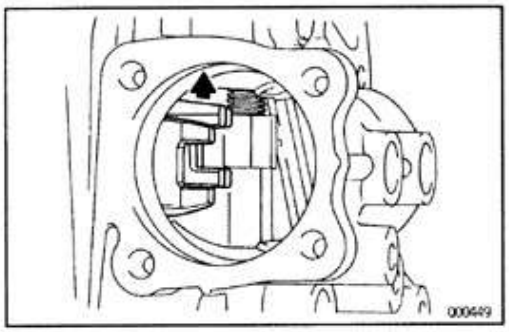
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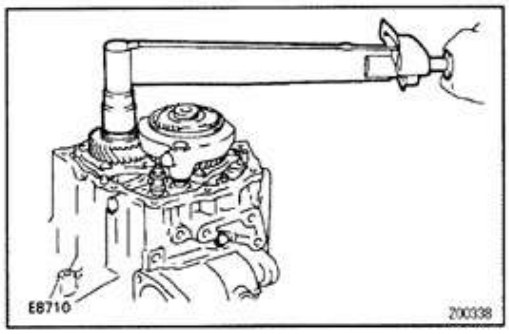
30. INSTALL NO. 3 HUB SLEEVE WITH NO. 3 SHIFT FORK



31. INSTALL NO.3 HUB SLEEVE SET BOLT
Install and torque the set bolt.
Torque: 24 N·m (240 kgf·cm, 17 ft·lbf)

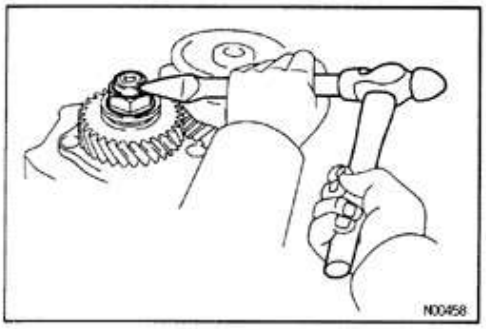


32. INSTALL OUTPUT SHAFT LOCK NUT
(a) Engage the gear double meshing.

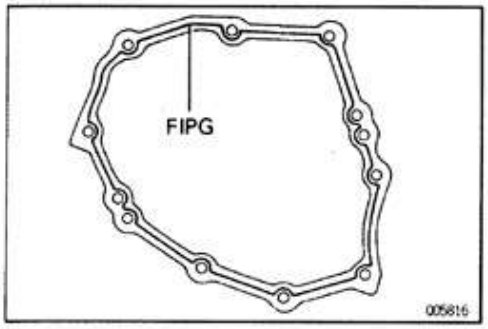


(b) Install and torque a new lock nut.
Torque: 123 N·m (1,250 kgf·cm, 90 ft·lbf)
(c) Disengage the gear double meshing.

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(d) Stake the lock nut.



33. INSTALL TRANSMISSION CASE COVER

(a) Remove the FIPG material and be careful not to drop oil on the contacting surfaces of the transmission case cover.

(b) Apply FIPG to the transmission case, as shown in the illustration.

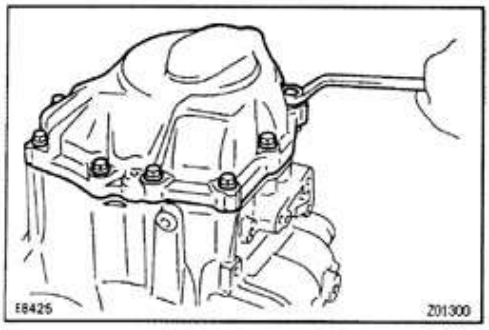
FIPG:

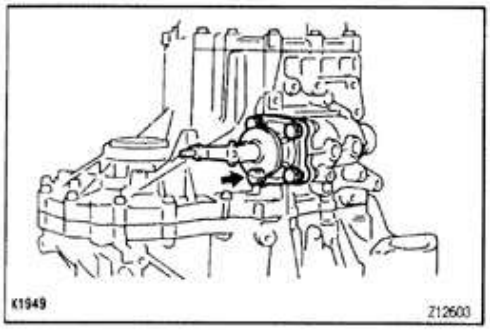
Part No. 08826–00090, THREE BOND 1281 or equivalent

HINT: Install the transmission case cover as soon as the FIPG is applied.

(c) Install and torque the 10 bolts.

Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)





34. INSTALL SHIFT AND SELECT LEVER SHAFT ASSEMBLY

(a) Place a new gasket in position on the control shaft cover.

(b) Install the control shaft cover.

(c) Apply sealant to the bolt threads.

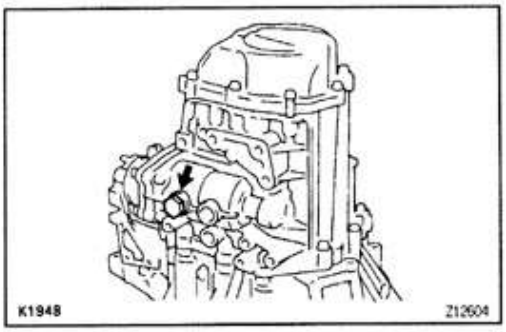
Sealant:

Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent

(d) Install and torque the 4 bolts.

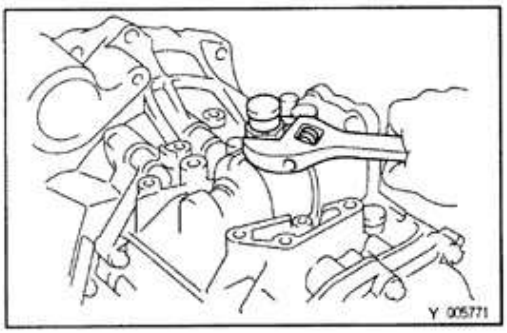
Torque: 20 N·m (200 kgf·cm, 14 ft·lbf)

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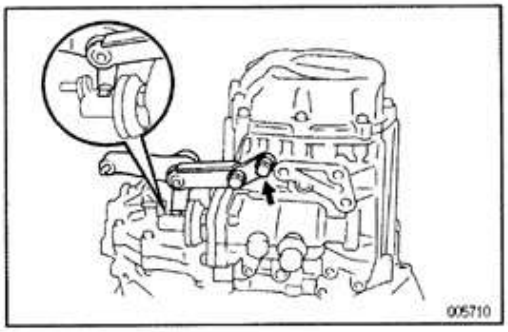


35. INSTALL AND TORQUE LOCK BOLT WITH NEW GASKET
Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

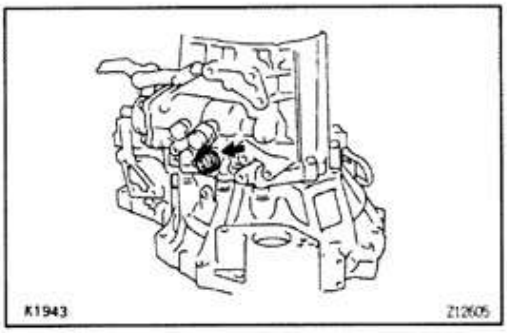
MX



36. INSTALL AND TORQUE BREATHER PLUG WITH NEW GASKET
Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

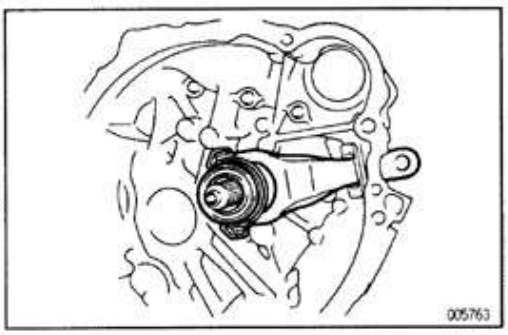


37. INSTALL NO.2 SELECTING BELLCRANK ASSEMBLY WITH SELECTING BELLCRANK SUPPORT
(a) Apply sealant to the bolt threads.
Sealant:
Part No. 08833—00080, THREE BOND 1344, LOCTITE 242 or equivalent
(b) Install the selecting bellcrank assembly with selecting bellcrank support.
(c) Install and torque the 2 bolts.
Torque: 20 N·m (200 kgf·cm, 14 ft·lbf)



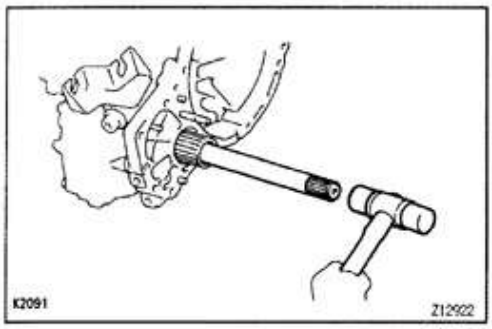
38. INSTALL BACK—UP LIGHT SWITCH
Install and torque the back—up light switch.
Torque: 40 N·m (410 kgf·cm, 30 ft·lbf)

39. INSTALL SPEED SENSOR
Torque: 17 N·m (175 kgf·cm, 13 ft·lbf)



40. INSTALL RELEASE FORK AND BEARING
Apply molybdenum disulphide lithium base grease to the following parts:
- Input shaft spline
- Release fork contact surface

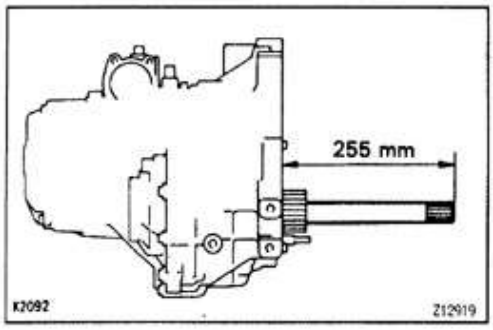
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41. INSTALL DIFFERENTIAL SIDE GEAR INTERMEDIATE SHAFT

(a) Coat the MP grease to the intermediate shaft.

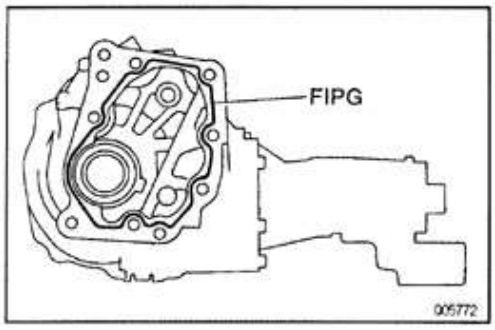
(b) Using a plastic hammer, drive the intermediate shaft straight in until the top of it touches the differential pinion shaft.



HINT: Keeping the intermediate shaft on the differential pinion shaft, measure the dimension in the illustration.

Protrusion length:

255 mm (10.04 in.)



42. INSTALL TRANSFER ASSEMBLY

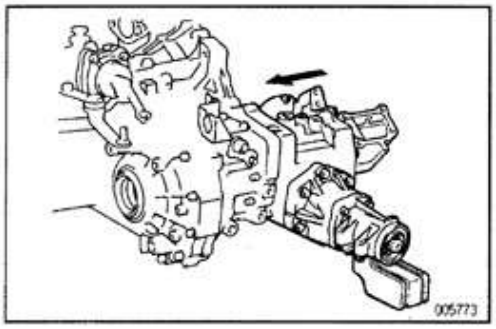
(a) Remove any FIPG material and be careful not to drop oil on the contacting surfaces of the transfer or transaxle.

(b) Apply FIPG to the transfer.

FIPG:

Part No. 08826—00090, THREE BOND 1281 or equivalent

HINT: Install the transfer as soon as FIPG is applied.



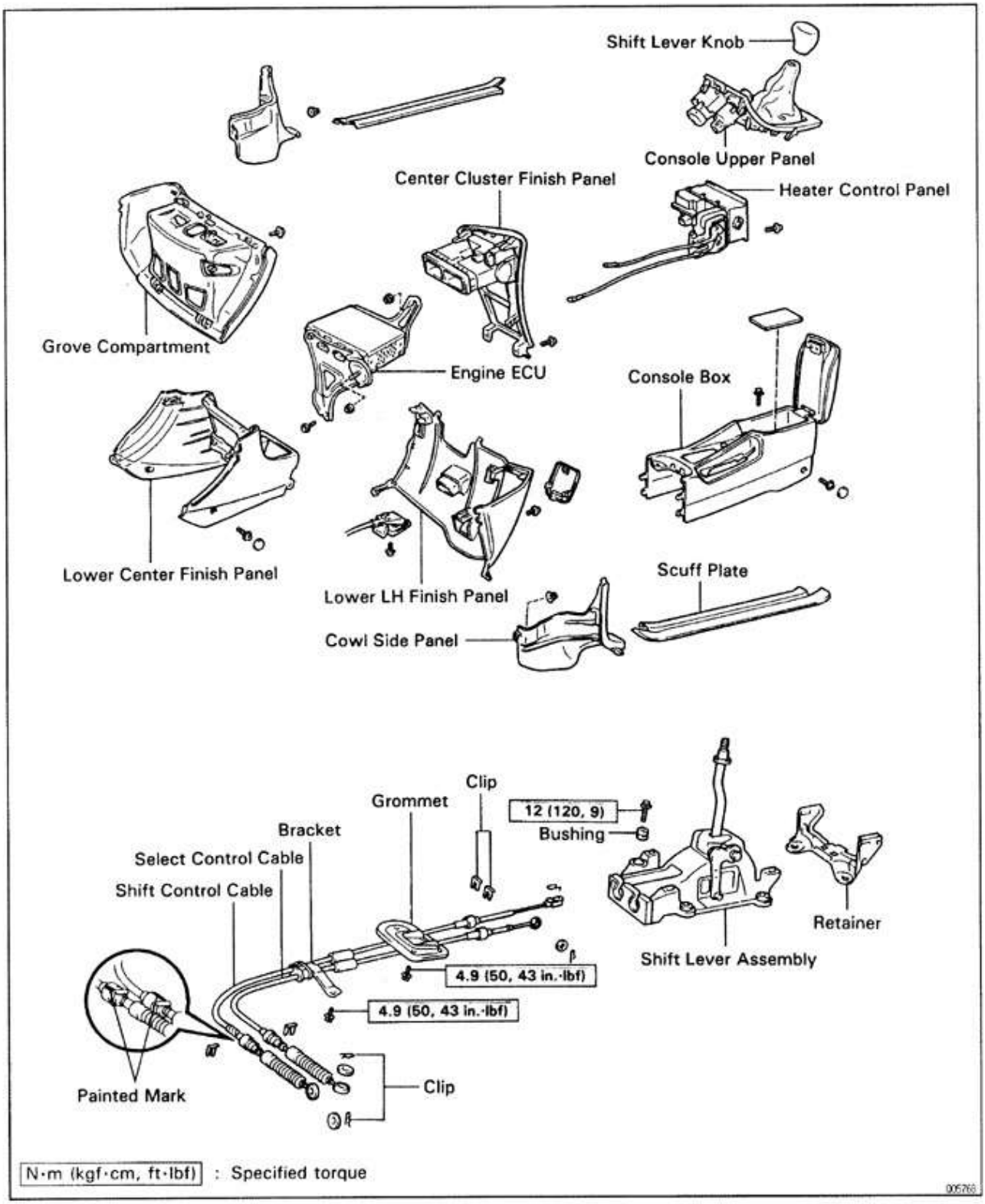
(c) Install the transfer assembly to the transaxle assembly.

HINT: Shift into 4th gear, install the transfer assembly while turning the input shaft of the transaxle.

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SHIFT LEVER AND CONTROL CABLE

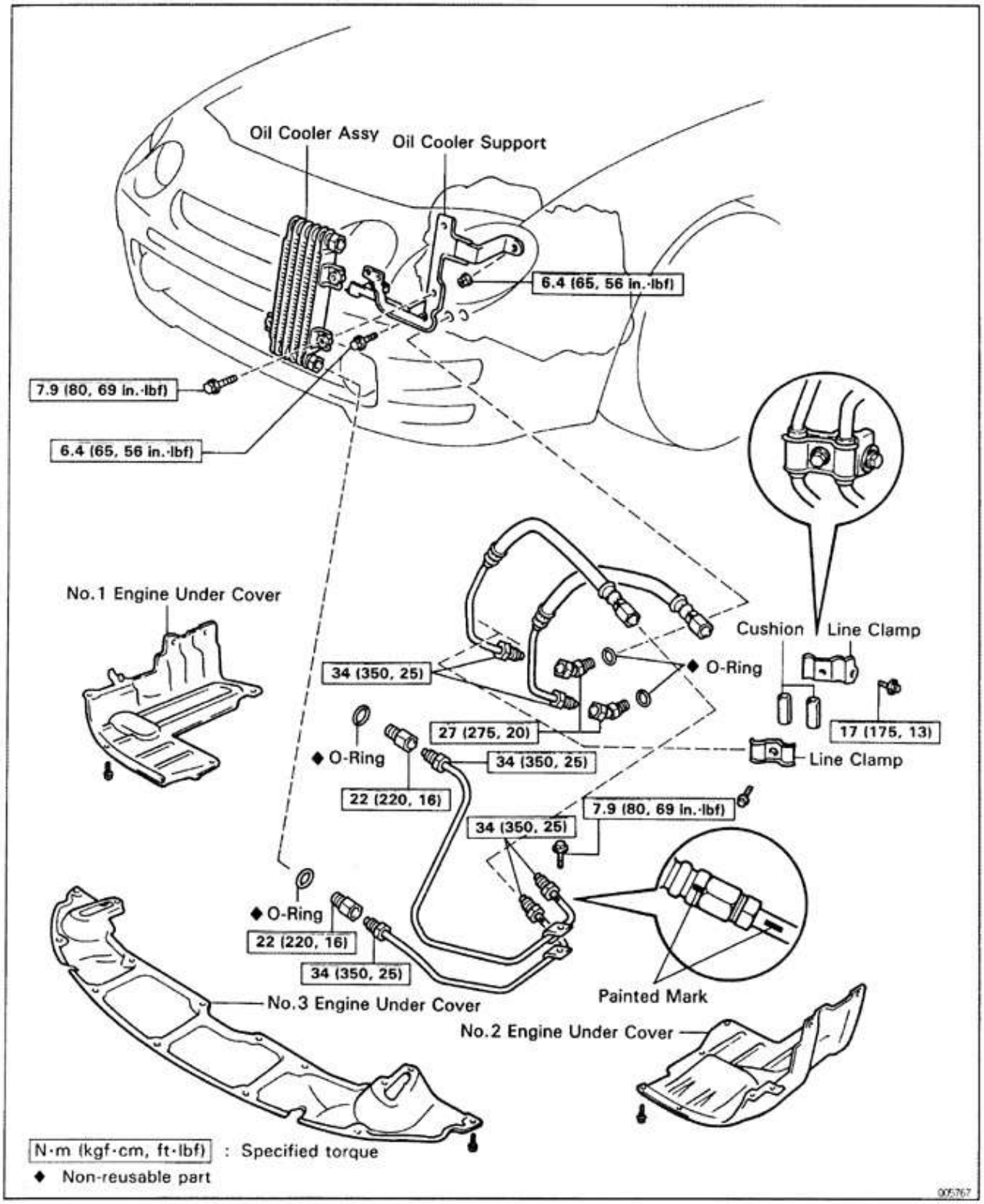
COMPONENTS



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OIL COOLER
COMPONENTS

MX090-01



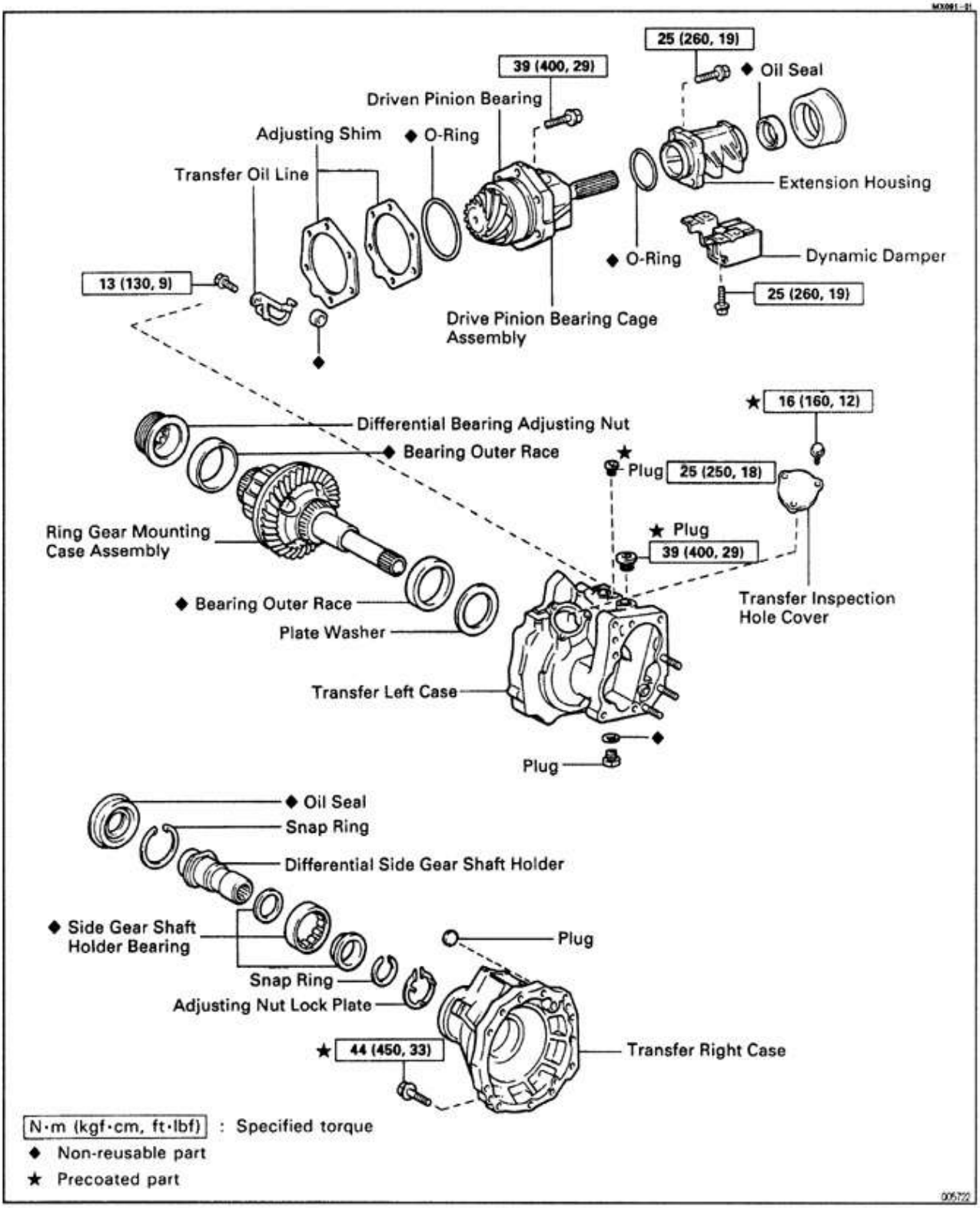
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TRANSFER

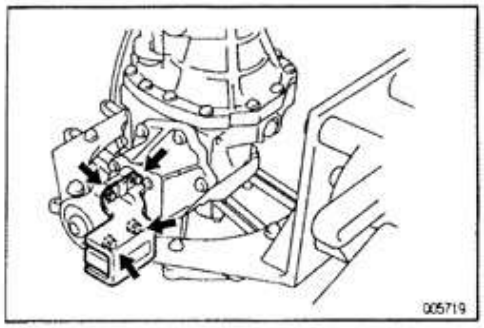
COMPONENT PARTS REMOVAL

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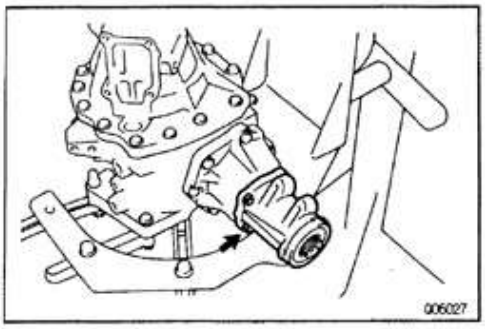
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BASIC SUBASSEMBLY SEPARATION



1. REMOVE DYNAMIC DAMPER

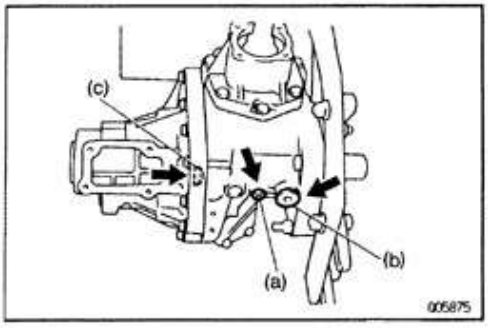
Remove the 4 bolts and dynamic damper.



2. REMOVE EXTENSION HOUSING

(a) Remove the 4 bolts and tap the extension housing with a plastic hammer.

(b) Remove the O–ring from the extension housing.

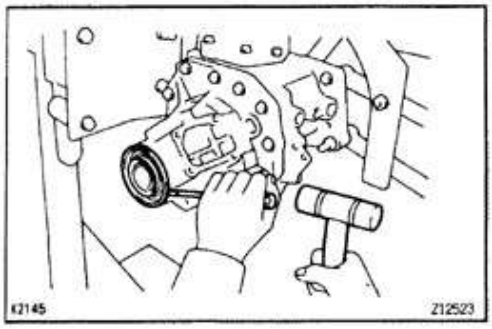


3. REMOVE PLUGS

(a) Using a hexagon wrench (6 mm), remove the plug.

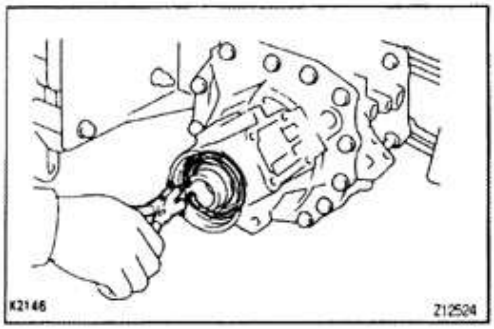
(b) Using a hexagon wrench (10 mm), remove the plug.

(c) Using a screwdriver and hammer, remove the plug.



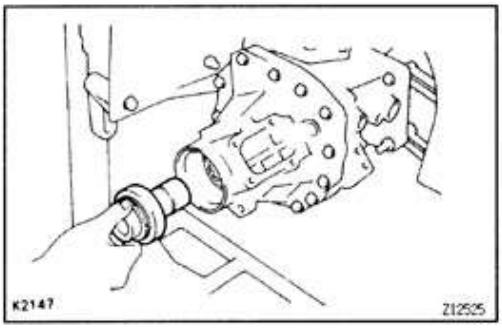
4. REMOVE DIFFERENTIAL SIDE GEAR SHAFT HOLDER

(a) Using a screwdriver and hammer, remove the oil seal.



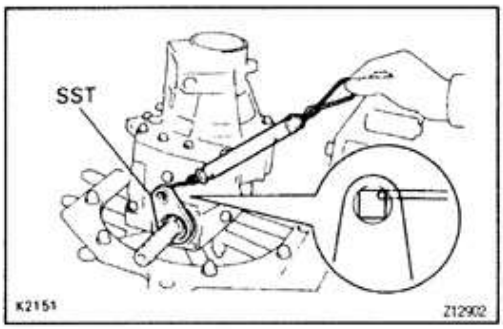
(b) Using snap ring pliers, remove the snap ring.

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(c) Remove the differential side gear shaft holder.

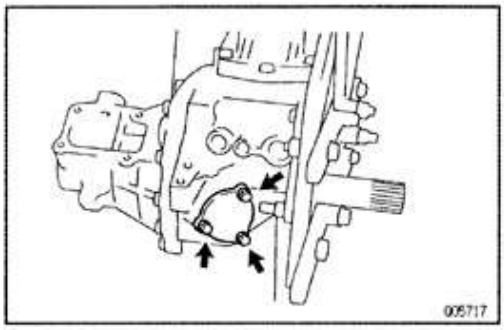
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5. CHECK PRELOAD

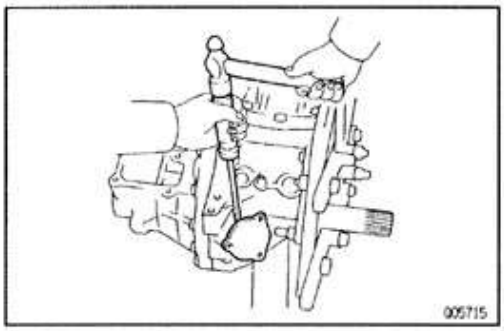
(a) Using SST and a spring tension gauge, measure the driven pinion preload of the backlash between the driven pinion and ring gear.
SST 09326–20011
Preload (at starting):
9–14 N (0.9–1.4 kg, 2–3 lb)

(b) Using SST and a spring tension gauge, measure the total preload.
SST 09326–20011
Total preload (at starting):
Add driven pinion preload
5–9 N (0.5–0.9 kg, 1–2 lb)



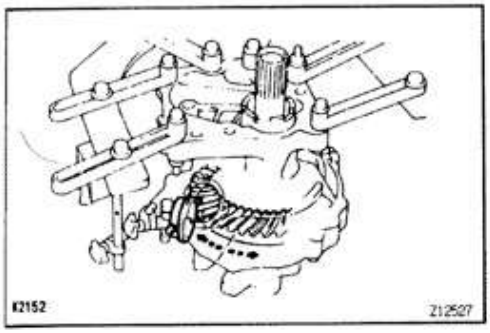
6. REMOVE TRANSFER INSPECTION HOLE COVER

(a) Remove the 3 bolts.



(b) Using a screwdriver and hammer, remove the transfer inspection hole cover.

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7. CHECK RING GEAR BACKLASH

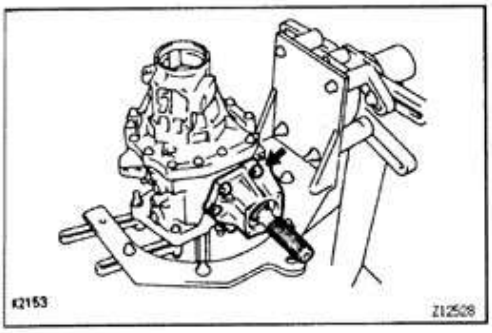
Using a dial indicator, measure the ring gear backlash.

Backlash:

0.13–0.18 mm (0.0051–0.0071 in.)

8. CHECK TOOTH CONTACT

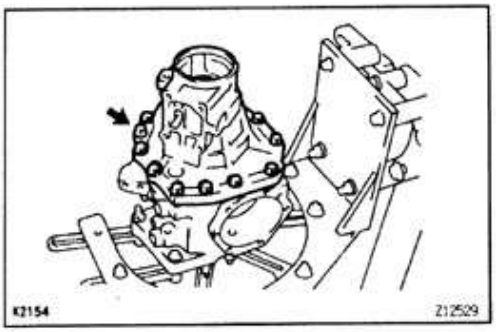
(See page MX–104)



9. REMOVE DRIVE PINION BEARING CAGE ASSEMBLY

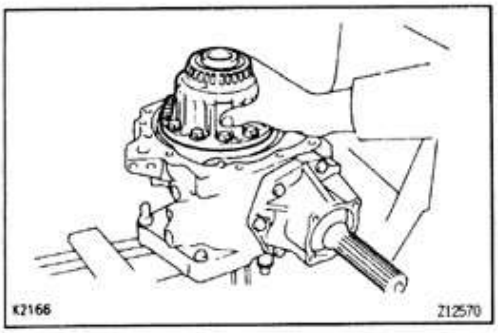
(a) Remove the 6 bolts and tap the drive pinion bearing cage assembly with a plastic hammer.

(b) Remove the O–ring from the drive pinion bearing cage.

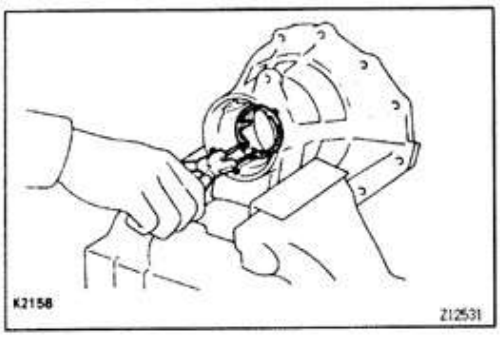


10. REMOVE TRANSFER RIGHT CASE

Remove the 12 bolts and tap the transfer right case with a plastic hammer.



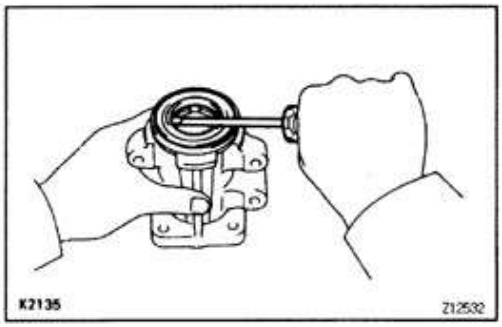
11. REMOVE RING GEAR MOUNTING CASE ASSEMBLY



12. REMOVE ADJUSTING NUT LOCK PLATE

Using snap ring pliers, remove the adjusting nut lock plate from the transfer right case.

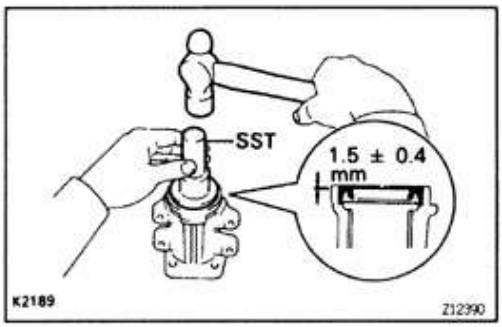
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13. IF NECESSARY, REPLACE EXTENSION HOUSING OIL SEAL

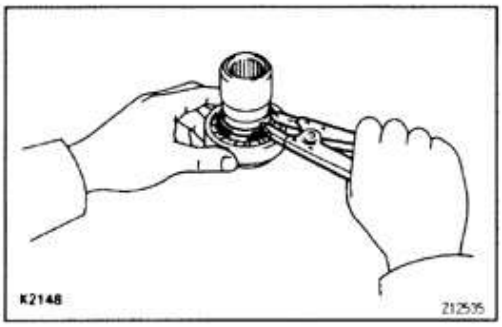
(a) Using a screwdriver, remove the oil seal.

MX



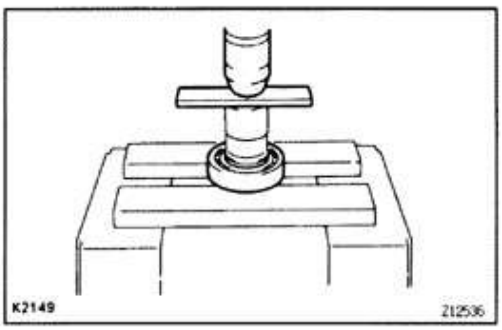
(b) Using SST and a hammer, drive in a new oil seal.
SST 09325–20010
Oil seal depth:
1.5±0.4 mm (0.059±0.016 in.)

(c) Coat the lip of oil seal with MP grease.

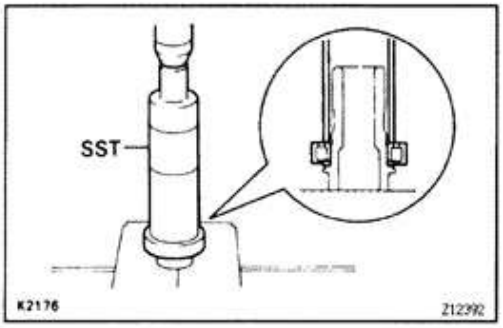


14. IF NECESSARY, REPLACE SIDE GEAR SHAFT HOLDER BEARING

(a) Using a snap ring expander, remove the snap ring.

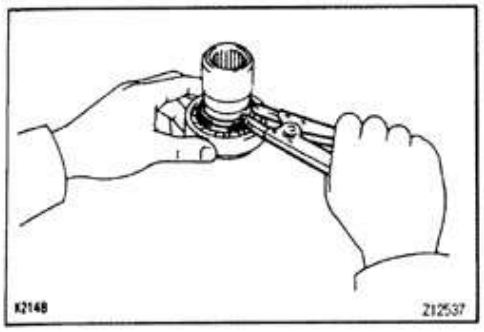


(b) Using a press, remove the bearing from the side gear shaft holder.



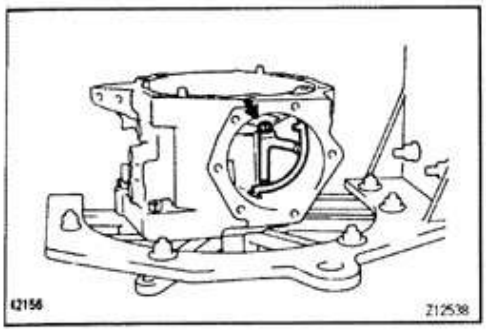
(c) Using SST and a press, install a new bearing.
SST 09316–60010 (09316–00010)

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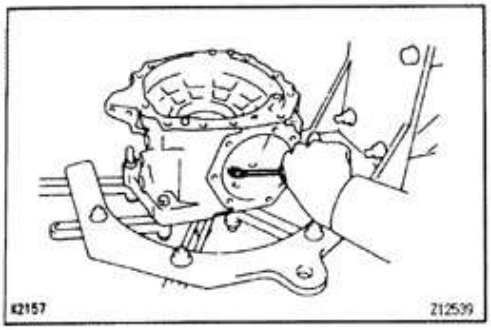
(d) Using a snap ring expander, install the snap ring.

MX

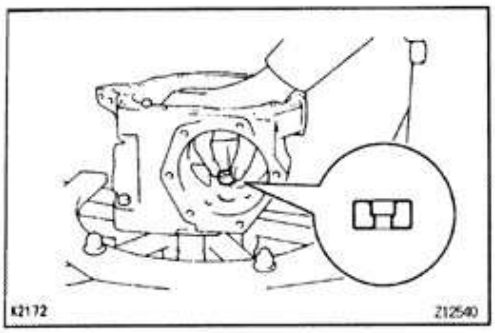


15. IF NECESSARY, REPLACE TRANSFER OIL LINE

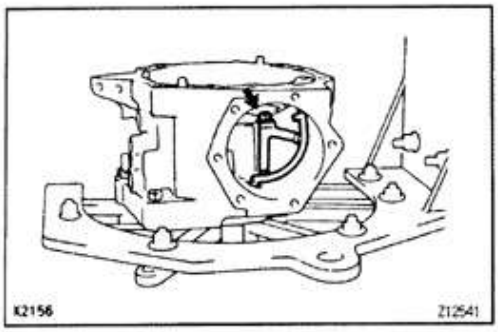
(a) Remove the bolt and oil line.



(b) Using a screwdriver, remove the cushion.



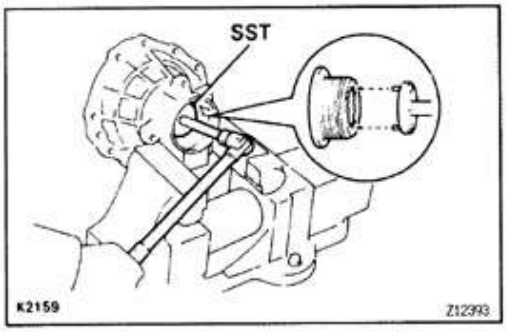
(c) Install a new cushion.



(d) Install the oil line.

(e) Install and torque the bolt.
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

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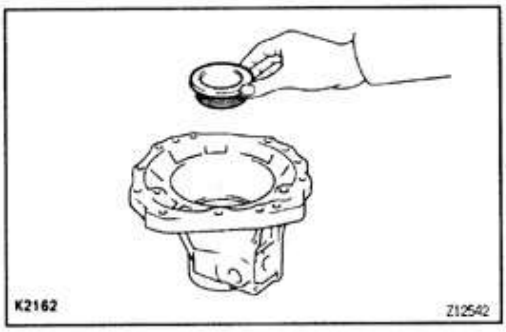


16. IF NECESSARY, REPLACE RING GEAR MOUNTING CASE SIDE BEARING OUTER RACE

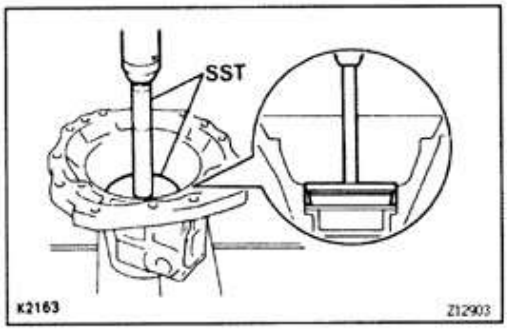
Transfer Right Case Side:

(a) Using SST, turn the bearing adjusting nut, remove the outer race and bearing adjusting nut.
SST 09318–20010

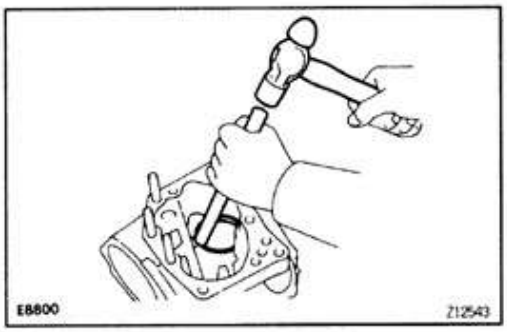
MX



(b) Install the bearing adjusting nut until it touches the lip of the case.
HINT: If the nut is difficult to turn, use SST.
SST 09318–20010



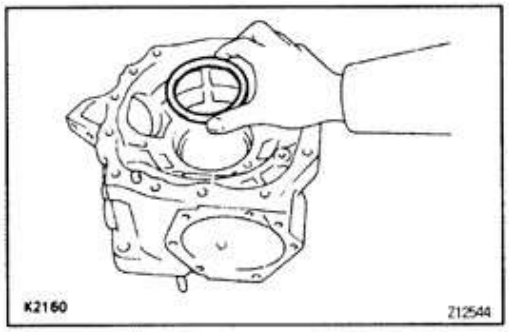
(c) Using SST and a press, install a new bearing outer race until it is almost touching the bearing adjusting nut.
SST 09608–35014 (09608–06020, 09608–06180)



Transfer Left Case Side:

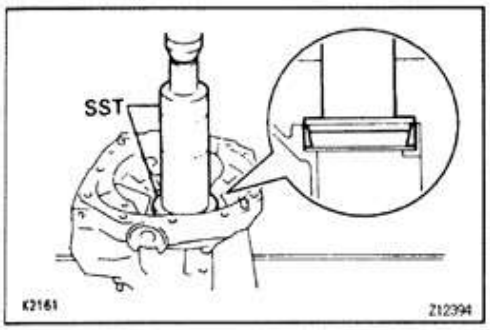
(a) Using a brass bar and hammer, drive out the bearing outer race lightly and evenly.

(b) Remove the plate washer.



(c) Install the plate washer.
HINT: First install a washer of the same thickness as before.

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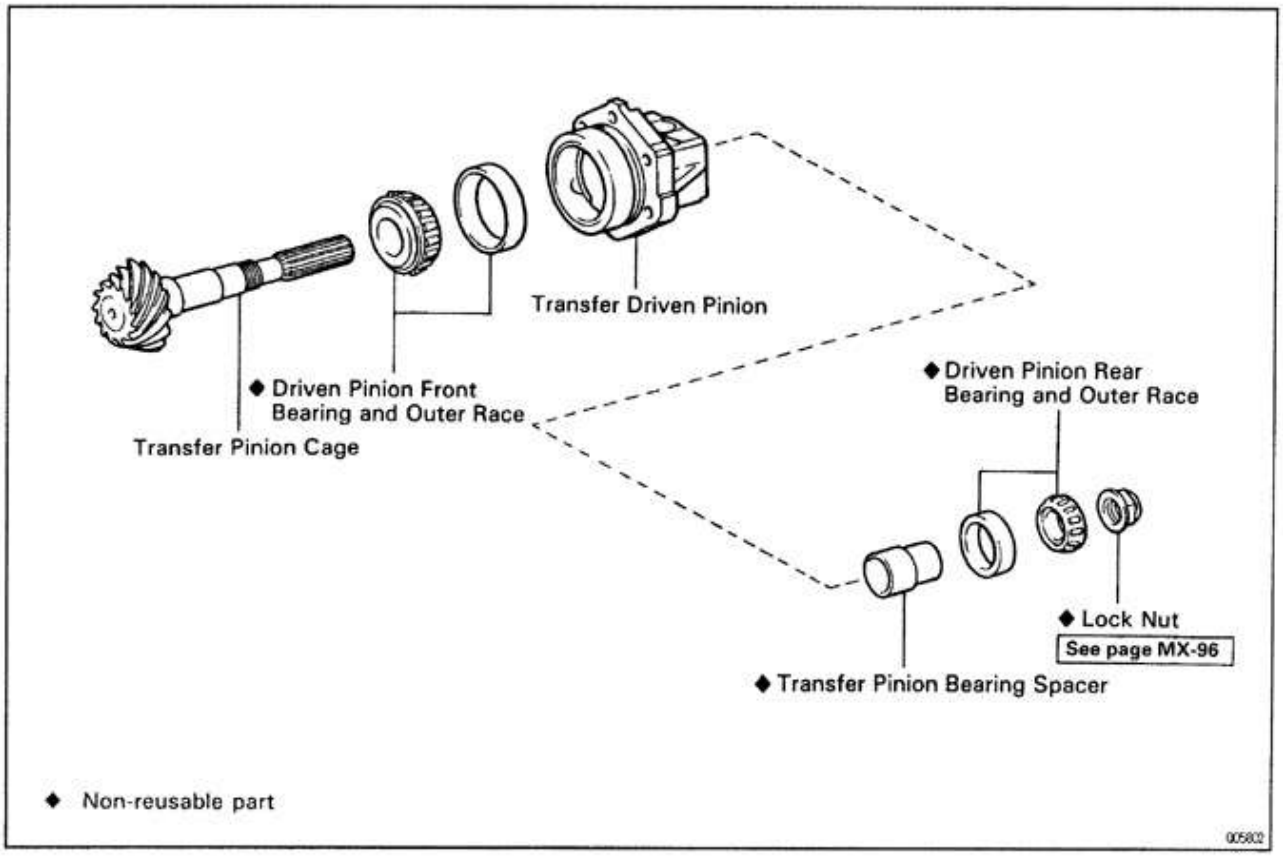


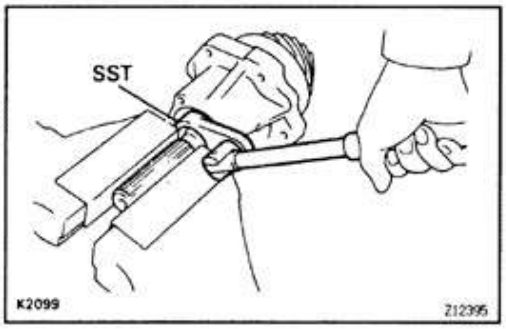
(d) Using SST and a press, install a new bearing outer race.
SST 09316–60010 (09316–00010, 09316–00060)

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DRIVE PINION BEARING CAGE
COMPONENTS

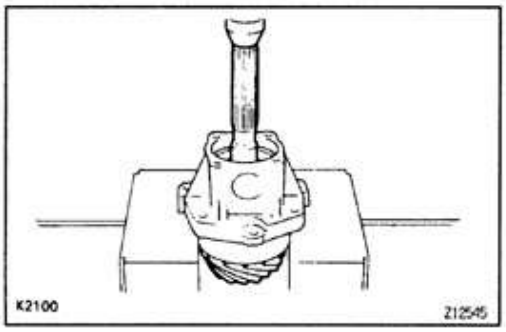
MX





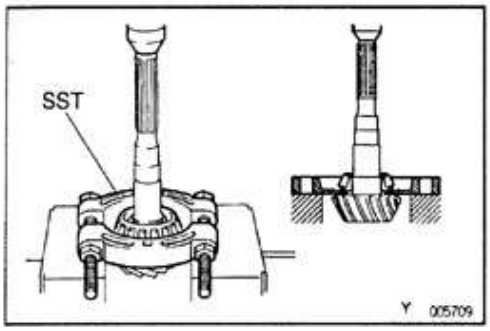
DRIVE PINION BEARING CAGE DISASSEMBLY

1. **REMOVE LOCK NUT**
(a) Unstake the lock nut.
(b) Using SST, remove the lock nut.
SST 09326–20011



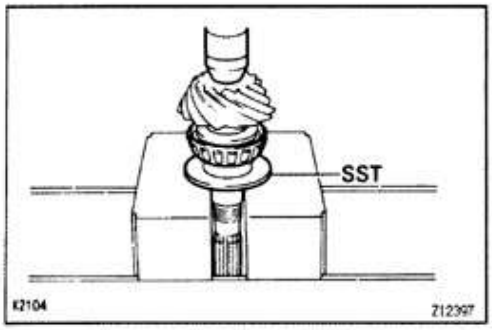
2. **REMOVE TRANSFER DRIVEN PINION**
Using a press, remove the transfer driven pinion, rear bearing and spacer.

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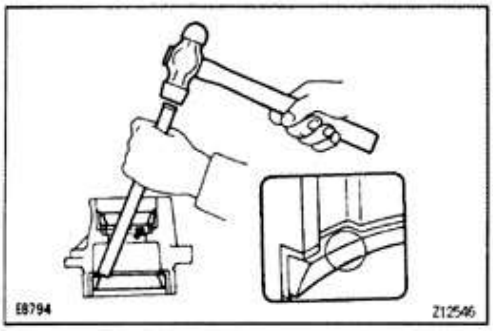


3. IF NECESSARY, REPLACE DRIVEN PINION FRONT BEARING

(a) Using SST and a press, remove the front bearing.
SST 09950–00020

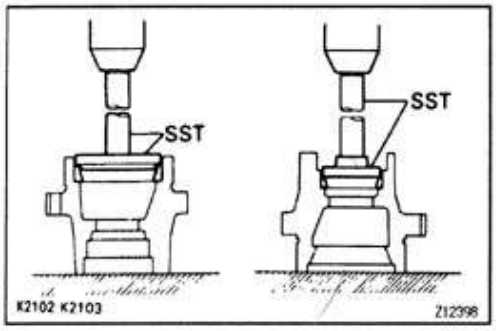


(b) Using SST and a press, install a new front bearing.
SST 09316–60010 (09316–00050)



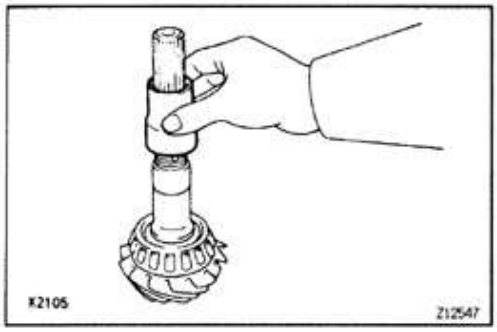
4. IF NECESSARY, REPLACE FRONT AND REAR BEARING OUTER RACE

(a) Using a brass bar and hammer, drive out the front and rear bearing outer race lightly and evenly.



(b) Using SST and a press, install a new front bearing outer race.
SST 09608–35014 (09608–06020, 09608–06120)

(c) Using SST and a press, install a new rear bearing outer race.
SST 09550–10012 (09252–10010, 09555–10010)



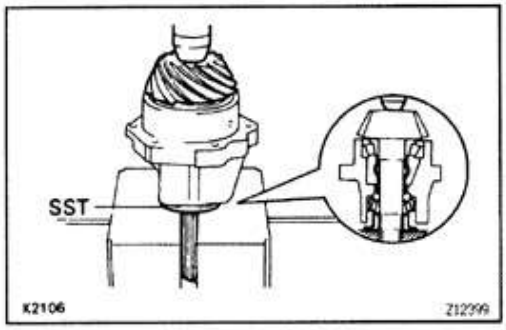
DRIVE PINION BEARING CAGE ASSEMBLY

HINT: Coat all of the sliding and rotating surfaces with gear oil before assembly.

1. INSTALL DRIVE PINION BEARING CAGE

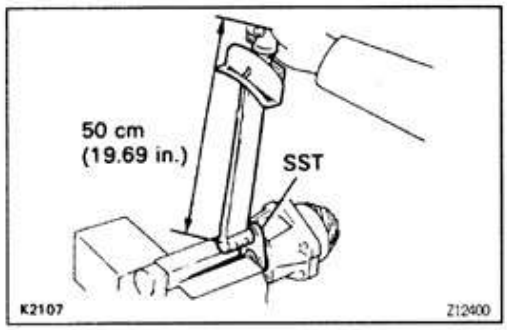
(a) Install a new bearing spacer.
HINT: Insert the spacer with the smaller facing upwards.

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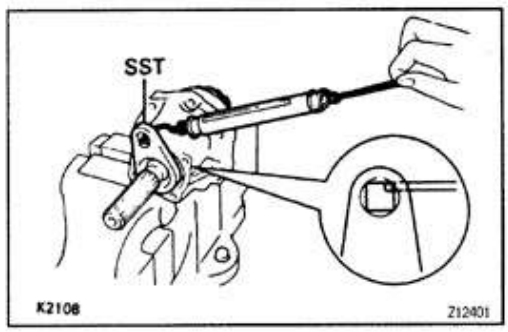
(b) Using SST and a press, install the rear bearing.
HINT: Press down until the pinion can just move slightly up and down.

MX



2. ADJUST DRIVEN PINION PRELOAD

(a) Using SST, install and torque a new lock nut.
SST 09326–20011
Torque: 98 N·m (1,000 kgf·cm, 72 ft·lbf)
HINT: Use a torque wrench with a fulcrum length of 50 cm (19.69 in.).



(b) Using SST and a spring tension gauge, measure the driven pinion preload.
HINT: Turn the driven pinion right and left 2 or 3 times to allow the bearing to settle.
Preload (at starting):
New bearing
17.7–28.4 N (1.8–2.9 kg, 4.0–6.4 lb)
Reused bearing
4.9–8.8 N (0.9–1.4 kg, 1.1–2.0 lb)

- If preload is greater than specification, replace the bearing spacer.
- If preload is less than specification, retighten the nut 5–10° at a time until the specified preload is reached.

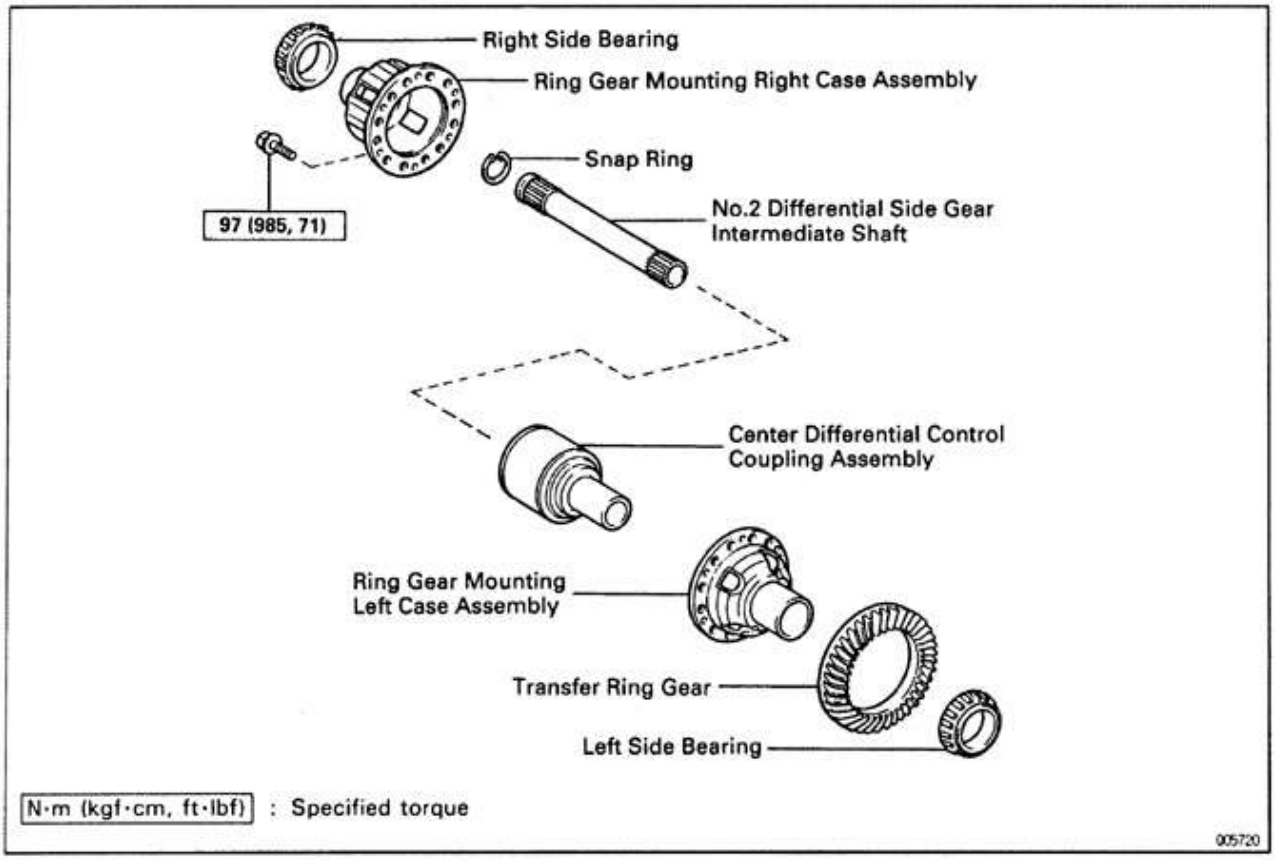
If the maximum torque is exceeded while retighten the nut, replace the bearing spacer and repeat the preload procedure. Do not back off the pinion nut to reduce the preload.
Maximum torque:
216 N·m (2,200 kgf·cm, 159 ft·lbf)

3. STAKE LOCK NUT

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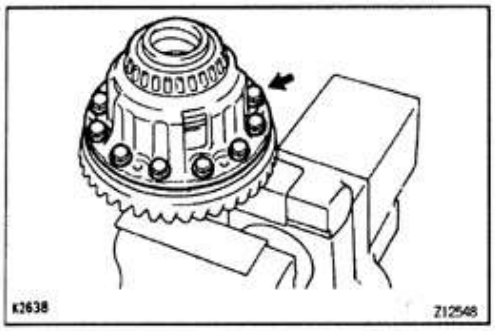
RING GEAR MOUNTING CASE
COMPONENTS

MX096-01



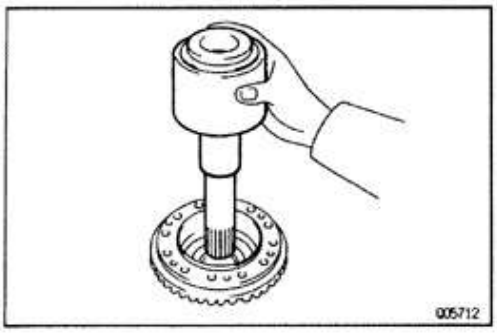
MX

MX097-01



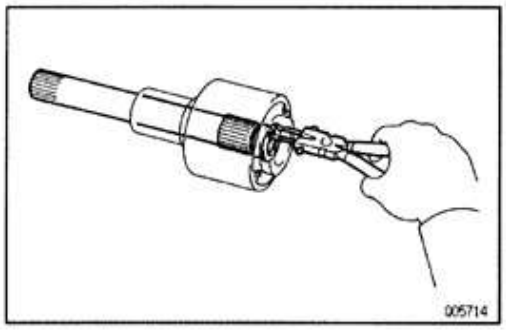
RING GEAR MOUNTING CASE DISASSEMBLY

1. **REMOVE RING GEAR MOUNTING RIGHT CASE**
   Remove the 12 bolts and right case.



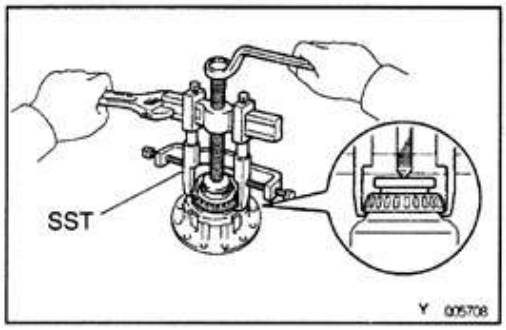
2. **REMOVE CENTER DIFFERENTIAL CONTROL COUPLING**
   Remove the center differential control coupling from the ring gear mounting left case.

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(c) Using snap ring pliers, remove the snap ring and No.2 intermediate differential side gear shaft.

MX

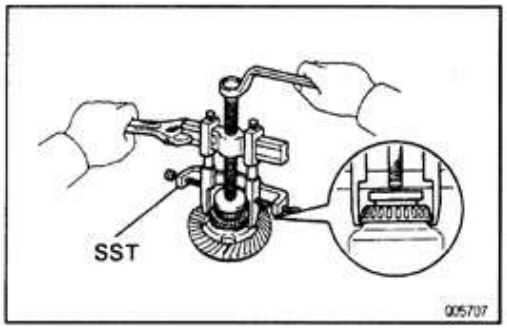


3. REMOVE MOUNTING CASE SIDE BEARING

Right Case Side:

Using SST, remove the side bearing.

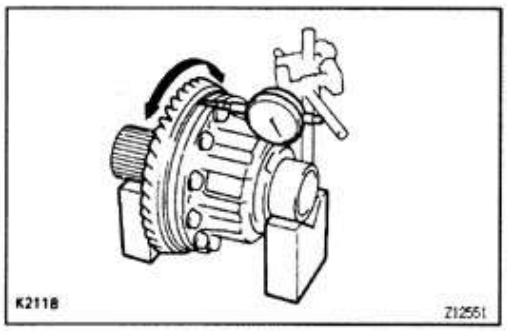
SST 09950–40010



Left Case Side:

Using SST, remove the side bearing.

SST 09950–40010



4. CHECK RING GEAR RUNOUT

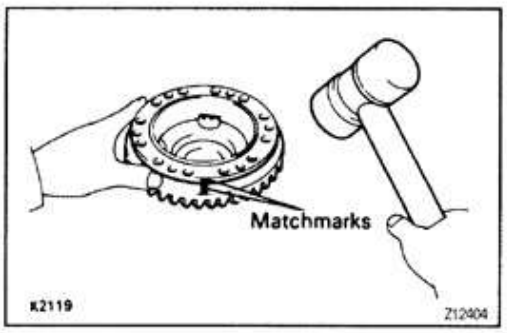
(a) Install the ring gear mounting right case to the ring gear mounting left case.

(b) Using a dial indicator, check the ring gear runout.

Maximum runout:

0.1 mm (0.004 in.)

(c) Remove the ring gear mounting right case from the ring gear mounting left case.

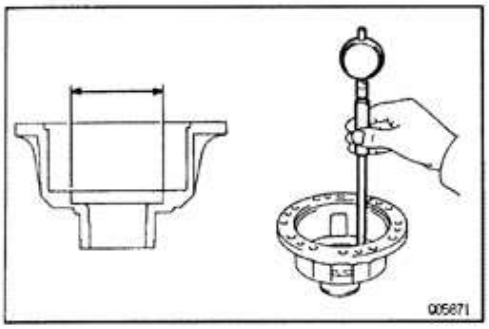


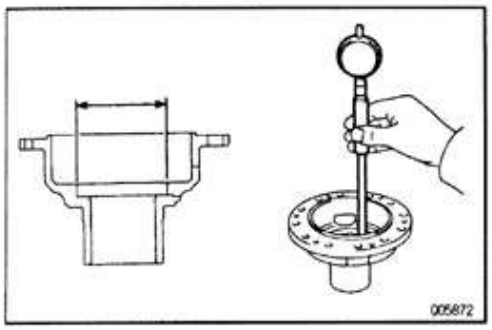
5. REMOVE TRANSFER RING GEAR

(a) Place matchmarks on both the ring gear mounting left case and transfer ring gear.

(b) Using a plastic hammer, tap out the transfer ring gear.

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RING GEAR MOUNTING CASE INSPECTION

1. MEASURE RING GEAR MOUNTING CASE

(a) Using a cylinder gauge, measure the inner diameter of the mounting right case bush.

Standard diameter:

69.000–69.035 mm (2.7165–2.7179 in.)

Maximum diameter:

69.060 mm (2.7189 in.)

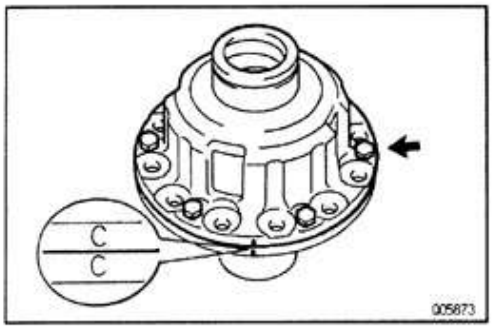
(b) Using a cylinder gauge, measure the inner diameter of the mounting left case bush.

Standard diameter:

69.000–69.035 mm (2.7165–2.7179 in.)

Maximum diameter:

69.060 mm (2.7189 in.)

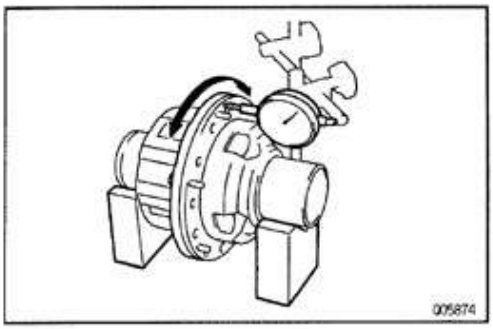


2. CHECK RING GEAR MOUNTING RIGHT AND LEFT CASE RUNOUT

HINT: Perform only when the limit is exceeded in the ring gear runout inspection.

(a) Using the 6 bolts (Diameter 8 mm, Pitch 1.25 mm), install the mounting right case to the left case.

HINT: Align the matchmarks on the right case and connect the left case.



(b) Using a dial indicator, check the mounting case runout.

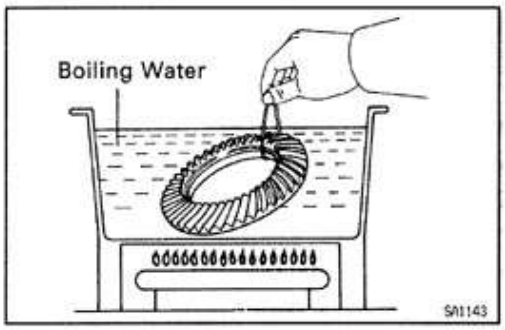
Maximum runout:

0.1 mm (0.004 in.)

(c) Remove the 6 bolts.

(d) Remove the mounting right case from the left case.

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RING GEAR MOUNTING CASE ASSEMBLY

1. INSTALL RING GEAR

(a) Clean the contact surface of the mounting left case.

(b) Heat the ring gear to about 100°C (212 °F) in boiling water.

(c) Carefully remove the ring gear from the water.

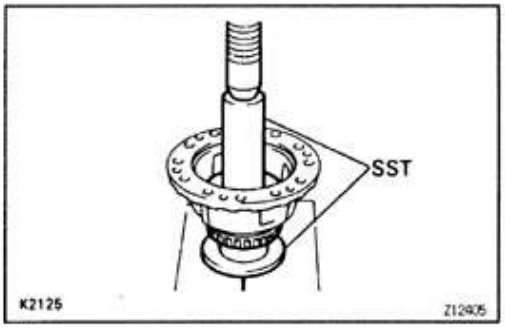
(d) Clean the contact surface of the ring gear with cleaning solvent.

(e) Turn quickly, install the ring gear on the mounting left case.

HINT: Align the matchmarks on the mounting left case and connect the ring gear.

2. CHECK RING GEAR RUNOUT

(See page MX–98)

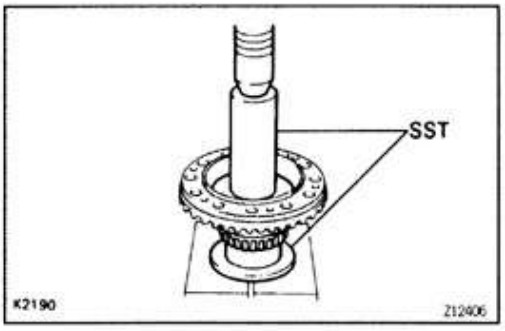


3. INSTALL MOUNTING CASE SIDE BEARING

Right Case Side:

Using SST and a press, install a new side bearing.

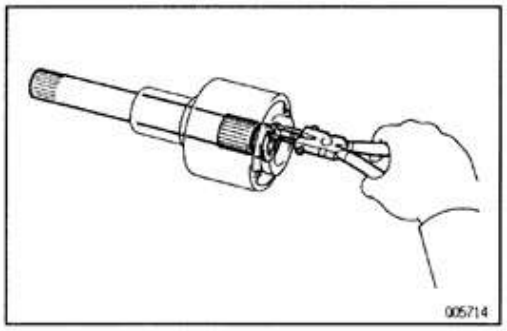
SST 09309–36010, 09316–20011



Left Case Side:

Using SST and a press, install a new side bearing.

SST 09309–36010, 09316–20011

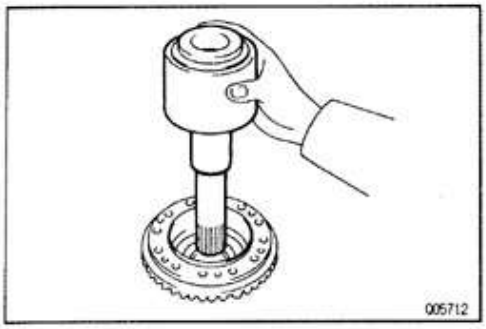


4. INSTALL CENTER DIFFERENTIAL CONTROL COUPLING

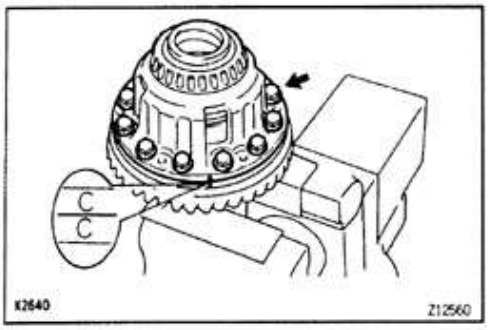
(a) Insert the No. 2 differential side gear intermediate shaft to the center differential control coupling.

(b) Using snap ring pliers, install the snap ring.

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(c) Install the center differential control coupling to the ring gear mounting left case.
HINT: Do not drop the washer.



4. INSTALL RING GEAR MOUNTING RIGHT CASE

(a) Install the ring gear mounting right case to the ring gear mounting left case.

(b) Install and torque the 12 bolts.
Torque: 97 N·m (985 kgf·cm, 71 ft·lbf)
HINT: Align the matchmarks on the ring gear mounting left case and connect the right case.

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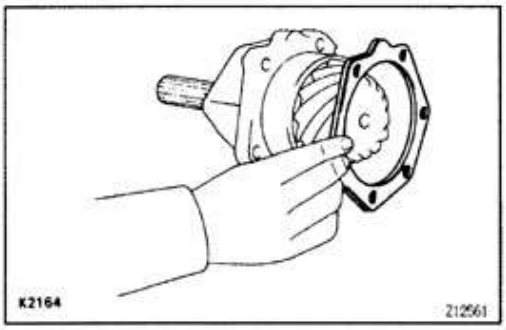
COMPONENT PARTS INSTALLATION

BASIC SUBASSEMBLY REASSEMBLY

(See page MX–86)

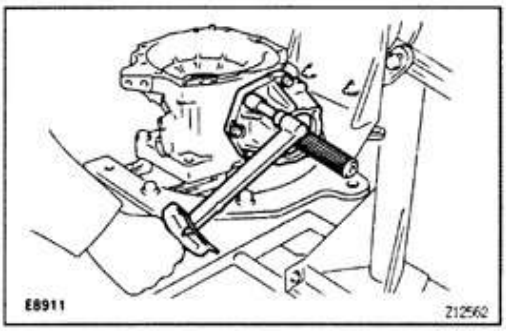
HINT: Coat all of the sliding and rotating surfaces with gear oil before assembly.

MX



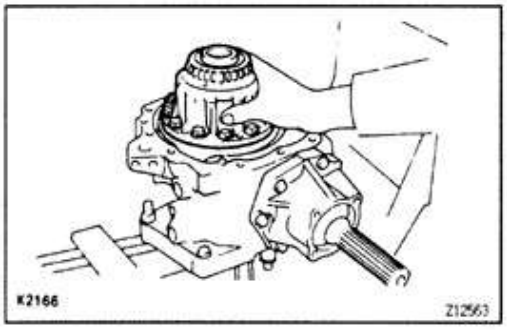
1. ADJUST RING GEAR BACKLASH

(a) Install the adjusting shim to the drive pinion bearing cage assembly.
HINT: First install a shim of the same thickness as before.

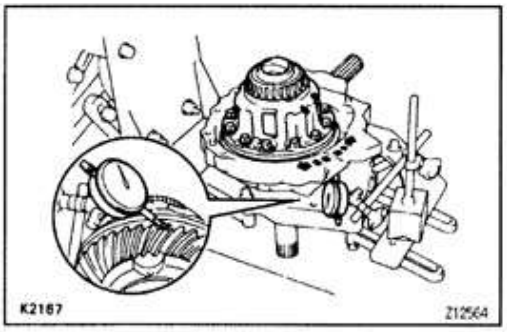


(b) Install the drive pinion bearing cage assembly to the transfer left case.

(c) Install and torque the 6 bolts.
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)
HINT: Do not install the O–ring.



(d) Install the ring gear mounting case assembly to the transfer left case.

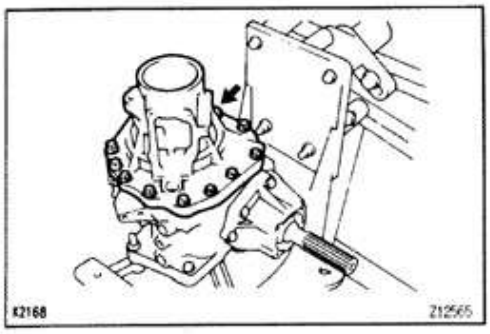


(e) Using a dial indicator, measure the ring gear backlash.
Backlash:
0.13–0.18 mm (0.0051–0.0071 in.)

(f) Referring to the table below, select the plate washer which will ensure that the backlash is within specification. Try to select a washer of the same size.
HINT: The backlash will change about 0.02 mm (0.0008 in.) with each shim thickness.

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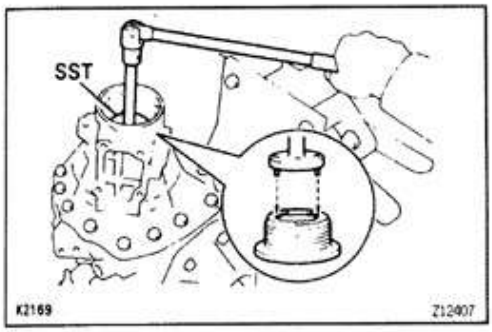
Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
1	2.13 (0.0839)	13	2.49 (0.0980)
2	2.16 (0.0850)	14	2.52 (0.0992)
3	2.19 (0.0862)	15	2.55 (0.1004)
4	2.22 (0.0874)	16	2.58 (0.1016)
5	2.25 (0.0886)	17	2.61 (0.1028)
6	2.28 (0.0898)	18	2.64 (0.1039)
7	2.31 (0.0909)	19	2.67 (0.1051)
8	2.34 (0.0921)	20	2.70 (0.1063)
9	2.37 (0.0933)	21	2.73 (0.1075)
10	2.40 (0.0945)	22	2.76 (0.1087)
11	2.43 (0.0957)	23	2.79 (0.1098)
12	2.46 (0.0968)	24	2.82 (0.1110)



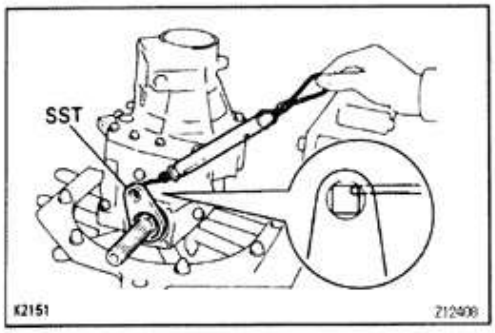
2. ADJUST TOTAL PRELOAD

(a) Install the transfer right case.

(b) Install and torque the 12 bolts.
Torque: 44 N·m (450 kgf·cm, 33 ft·lbf)



(c) Adjust the total preload by tightening the differential bearing adjusting nut.
Using SST, tightening the differential bearing adjusting nut.
SST 09318–20010
HINT: Measure the preload while tightening the adjusting nut a little at a time.



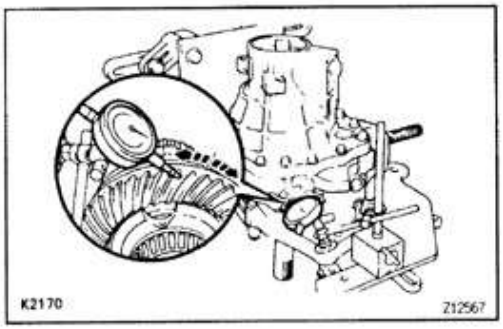
(d) Using SST and a spring tension gauge, measure the total preload.
SST 09326–20011
Preload (at starting):
New bearing (Add driven pinion preload)
13–14 N (1.3–1.4 kg, 2.9–3.1 lb)
Reused bearing (Add driven pinion preload)
5–9 N (0.5–0.9 kg, 1–2 lb)

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HINT: Turn the output shaft counterclockwise and clockwise several times.

(e) When the standard value for tatal preload is exceeded, remove the transfer right case, push in the adjusting nut and outer race. Again adjust the total preload.

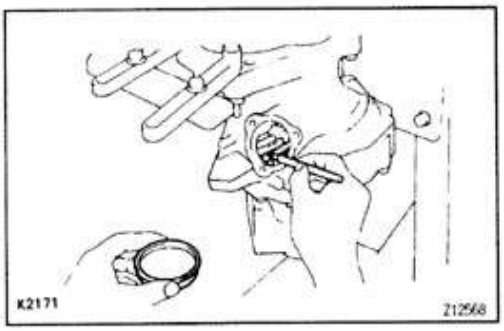
MX



3. CHECK RING GEAR BACKLASH

(a) Using a dial indicator, measure the ring gear backlash.
Backlash:
0.13–0.18 mm (0.0051–0.0071 in.)

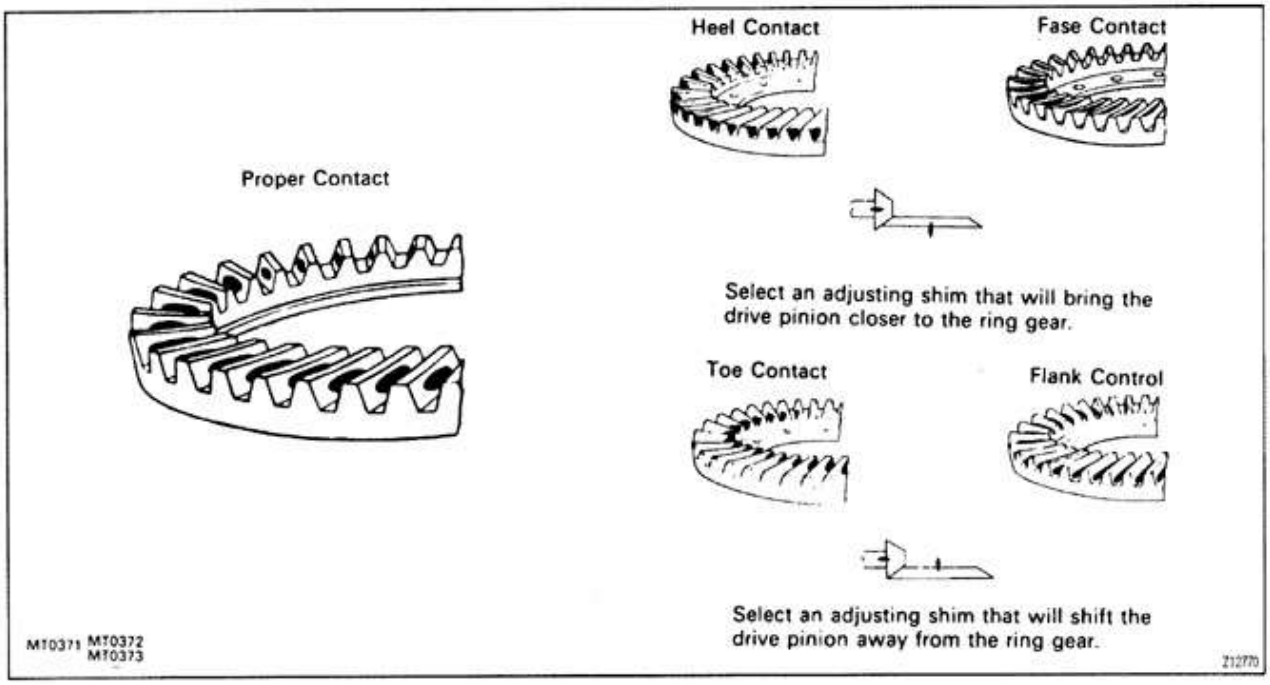
(b) When the backlash is outside the standard value, select a different plate washer to the one selected step 2. Again adjust the backlash and total preload.



4. CHECK TOOTH CONTACT

(a) Coat 3 or 4 teeth at 4 different position on the ring gear with red lead.

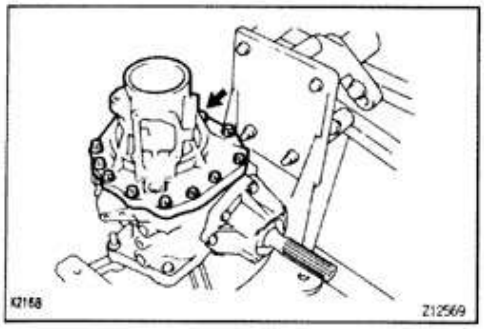
(b) Rotate the ring gear, inspect the teeth pattern.



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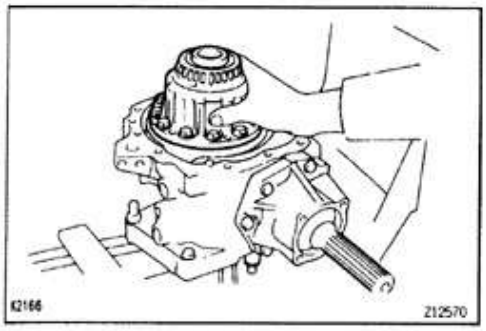
(c) If the teeth are not contacting properly, again select the proper shim and plate.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
A	0.30 (0.0118)	F	0.45 (0.0177)
B	0.33 (0.0130)	G	0.48 (0.0189)
C	0.36 (0.0142)	H	0.51 (0.0201)
D	0.39 (0.0154)	J	0.54 (0.0213)
E	0.42 (0.0165)	K	0.57 (0.0224)

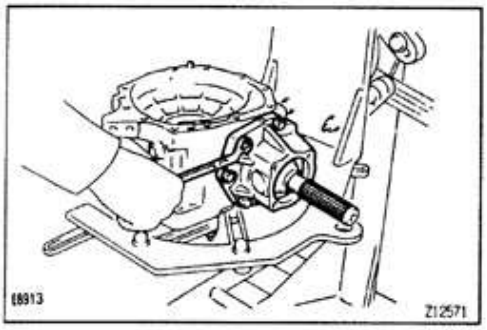


5. REMOVE RING GEAR MOUNTING CASE ASSEMBLY

(a) Remove the 12 bolts and transfer right case.

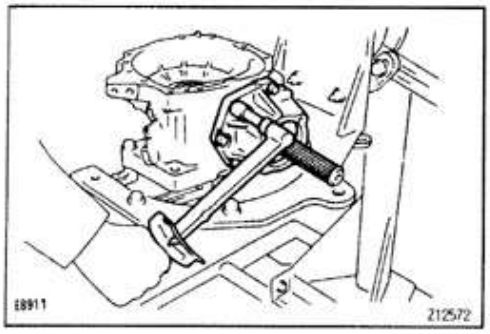


(b) Remove the ring gear mounting case assembly.



6. REMOVE DRIVE PINION BEARING CAGE ASSEMBLY

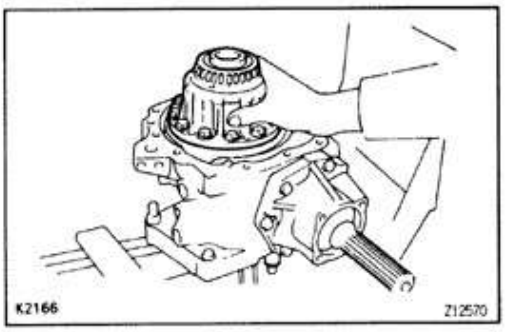
Remove the 6 bolts and drive pinion bearing cage assembly.



7. INSTALL DRIVE PINION BEARING CAGE ASSEMBLY

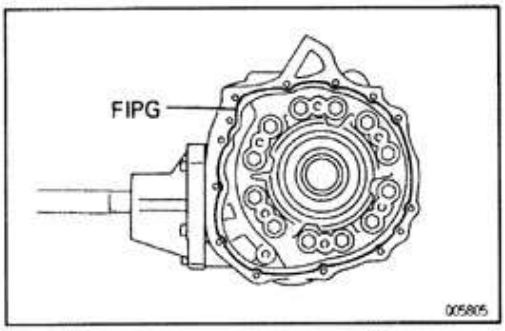
(a) Coat the O–ring with gear oil.
(b) Install the O–ring to the drive pinion bearing cage.
(c) Install the drive pinion bearing cage with the adjusting shim (previously selected) to the transfer left case.
(d) Install and torque the 6 bolts.
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

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8. INSTALL RING GEAR MOUNTING CASE ASSEMBLY

MX



9. INSTALL TRANSFER RIGHT CASE

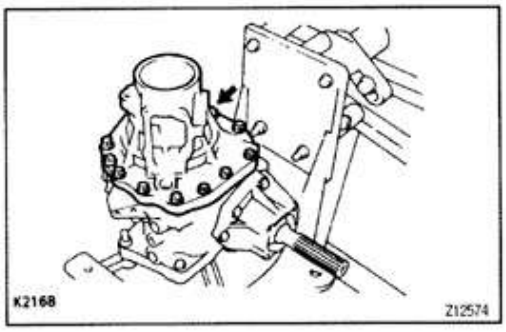
(a) Remove any FIPG material and be careful not to drop oil on the contacting surfaces of the transfer left case or right case.

(b) Apply FIPG to the transfer left case.

FIPG:

Part No. 08826–00090, THREE BOND 1281 or equivalent

HINT: Install the transfer right case as soon as the FIPG is applied.



(c) Apply sealant to the bolt threads.

Sealant:

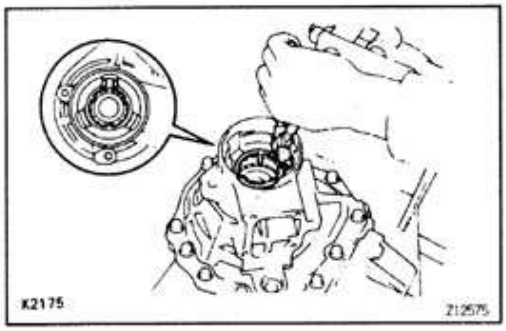
Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent

(d) Install and torque the 12 bolts.

Torque: 44 N·m (450 kgf·cm, 33 ft·lbf)

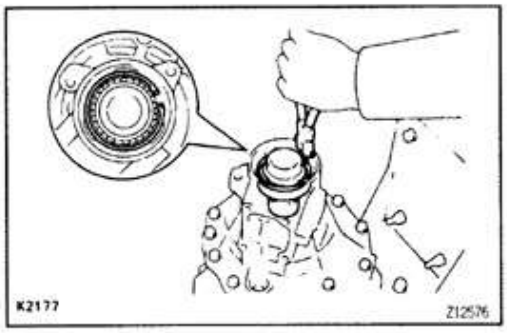
10. CHECK TOTAL PRELOAD

(See page MX–103)



11. INSTALL ADJUSTING NUT LOCK PLATE

Using snap ring pliers, install the lock plate so that the projection from the lock plate fits properly into the groove of the adjusting nut.

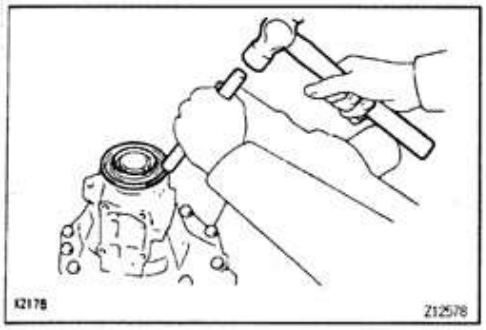


12. INSTALL DIFFERENTIAL SIDE GEAR SHAFT HOLDER

(a) Install the differential side gear shaft holder to the transfer right case.

(b) Using snap ring pliers, install the snap ring.

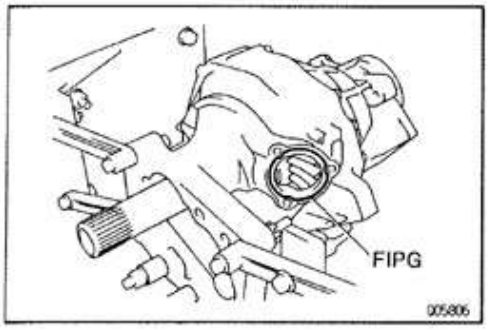
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13. INSTALL OIL SEAL

(a) Coat the lip of the oil seal with MP grease.

(b) Using a brass bar and hammer, drive in a new oil seal.



14. INSTALL TRANSFER INSPECTION HOLE COVER

(a) Remove any FIPG material and be careful not to drop oil on the contacting surfaces of transfer left case or transfer inspection hole cover.

(b) Apply FIPG to the transfer left case.

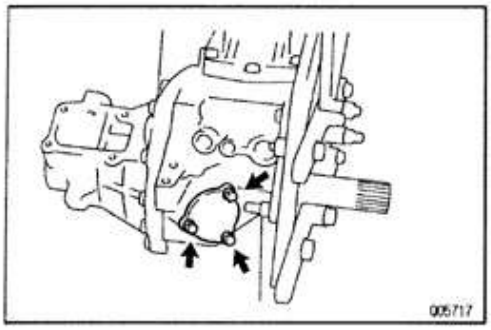
FIPG:

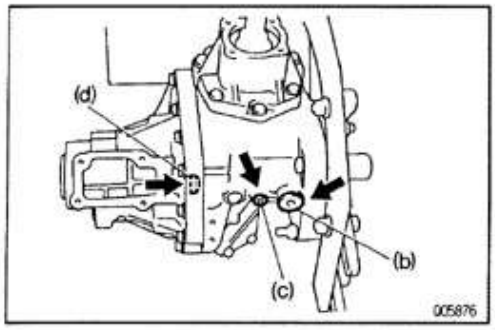
Part NO. 08826–00090, THREE BOND 1281 or equivalent

HINT: Install the transfer inspection hole cover as soon as FIPG is applied.

(c) Install and torque the 3 bolts.

Torque: 16 N·m (160 kgf·cm, 12 ft·lbf)





15. INSTALL PLUGS

(a) Apply sealant to the plug threads.

Sealant:

Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent

(b) Using a hexagon wrench (10 mm), install and torque the plug.

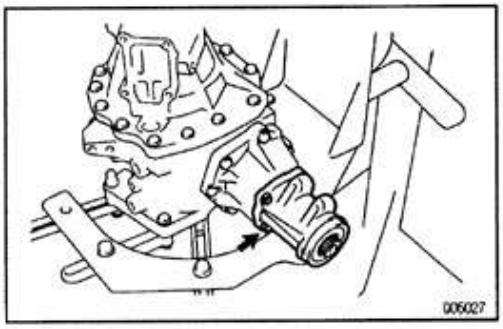
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

(c) Using a hexagon wrench (6 mm), install and torque the plug.

Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

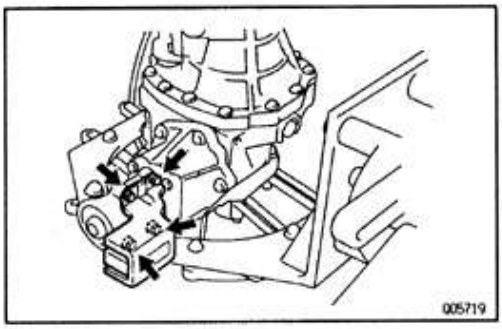
(d) Using a screwdriver and hammer, install the plug.

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16. INSTALL EXTENSION HOUSING

(a) Coat the O–ring with gear oil.
(b) Install a new O–ring to the extension housing.
(c) Install the extension housing to the drive pinion bearing cage.
(d) Install and torque the 4 bolts.
Torque: 25 N·m (260 kgf·cm, 19 ft·lbf)



17. INSTALL DYNAMIC DAMPER

Install and torque the 4 bolts.
Torque: 25 N·m (260 kgf·cm, 19 ft·lbf)

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SERVICE SPECIFICATIONS

SERVICE DATA

MX002-08

Input shaft		
3rd & 4th gear journal diameter	Limit	35.950 mm (1.4154 in.)
5th gear journal diameter	Limit	27.950 mm (1.1004 in.)
Runout	Limit	0.05 mm (0.0020 in.)
Output shaft		
1st & 2nd gear journal diameter	Limit	38.950 mm (1.5335 in.)
Runout	Limit	0.06 mm (0.0024 in.)
Oil pump clearance		
Rotor body	STD	0.10 – 0.16 mm (0.0039 – 0.0063 in.)
	Limit	0.30 mm (0.0118 in.)
Rotor tip	STD	0.08 – 0.15 mm (0.0031 – 0.0059 in.)
	Limit	0.30 mm (0.0118 in.)
Rotor side	STD	0.03 – 0.08 mm (0.0012 – 0.0031 in.)
	Limit	0.15 mm (0.0059 in.)
Gear thrust clearance		
1st & 3rd	STD	0.10 – 0.35 mm (0.0039 – 0.0138 in.)
	Limit	0.40 mm (0.0157 in.)
2nd	STD	0.10 – 0.45 mm (0.0039 – 0.0177 in.)
	Limit	0.50 mm (0.0197 in.)
4th	STD	0.10 – 0.55 mm (0.0039 – 0.0217 in.)
	Limit	0.60 mm (0.0236 in.)
5th	STD	0.10 – 0.57 mm (0.0039 – 0.0224 in.)
	Limit	0.65 mm (0.0256 in.)
Gear radial clearance		
1st & 4th	STD	0.009 – 0.051 mm (0.0004 – 0.0020 in.)
2nd & 3rd	STD	0.009 – 0.053 mm (0.0004 – 0.0021 in.)
5th	STD	0.009 – 0.050 mm (0.0004 – 0.0020 in.)
1st, 2nd, 3rd, 4th & 5th	Limit	0.070 mm (0.0028 in.)
Shift fork to hub sleeve clearance	Limit	1.0 mm (0.039 in.)
Synchronizer ring to gear clearance		
1st, 4th & 5th	Limit	0.8 mm (0.031 in.)
2nd & 3rd	Limit	0.7 mm (0.028 in.)
Drive in depth		
Control shaft cover oil seal		0 – 1.0 mm (0 – 0.039 in.)
No.1 shift inner lever slotted spring pin		0 ± 0.5 mm (0 ± 0.020 in.)
No.2 shift inner lever slotted spring pin		0 ± 0.5 mm (0 ± 0.020 in.)

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Input shaft snap ring thickness	Mark	
No.2 clutch hub	H	2.30 mm (0.0906 in.)
	J	2.35 mm (0.0925 in.)
	K	2.40 mm (0.0945 in.)
	L	2.45 mm (0.0965 in.)
	M	2.50 mm (0.0984 in.)
	N	2.55 mm (0.1004 in.)
	P	2.60 mm (0.1024 in.)
No.3 cluthch hub	Q	2.25 mm (0.0886 in.)
	R	2.30 mm (0.0906 in.)
	S	2.35 mm (0.0925 in.)
	T	2.40 mm (0.0945 in.)
	U	2.45 mm (0.0965 in.)
	V	2.50 mm (0.0984 in.)
	W	2.55 mm (0.1004 in.)
	X	2.60 mm (0.1024 in.)
	Y	2.65 mm (0.1043 in.)
Ball bearing	1	2.35 mm (0.0925 in.)
	2	2.40 mm (0.0945 in.)
	3	2.45 mm (0.0965 in.)
	4	2.50 mm (0.0984 in.)
	5	2.55 mm (0.1004 in.)
	6	2.60 mm (0.1024 in.)
	7	2.65 mm (0.1043 in.)
	8	2.70 mm (0.1063 in.)
Output shaft snap ring thickness	Mark	
No.1 clutch hub	A	2.80 mm (0.1102 in.)
	B	2.85 mm (0.1122 in.)
	C	2.90 mm (0.1142 in.)
	D	2.95 mm (0.1161 in.)
	E	3.00 mm (0.1181 in.)
	F	3.05 mm (0.1201 in.)
	G	3.10 mm (0.1220 in.)
Differential left case		
Inner diameter (Part A)	STD	111.000–111.035 mm (3.9764–3.9778 in.)
	Limit	111.060 mm (3.9788 in.)
Inner diameter (Part B)	STD	90.500–90.535 mm (3.5630–3.5644 in.)
	Limit	90.560 mm (3.5653 in.)
No.2 differential case		
Outer diameter (Part A)	STD	110.929–110.964 mm (4.3673–4.3686 in.)
	Limit	110.850 mm (4.3642 in.)
Outer diameter (Part B)	STD	90.429–90.464 mm (3.5602–3.5616 in.)
	Limit	90.350 mm (3.5571 in.)
Inner diameter (Part C)	STD	35.000–35.025 mm (1.3780–1.3876 in.)
	Limit	35.030 mm (1.3791 in.)

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Conical spring washer height		
Left side	STD	2.60–2.80 mm (0.102–0.110 in.)
	Limit	2.50 mm (0.098 in.)
Right side	STD	1.70–1.90 mm (0.067–0.075 in.)
	Limit	1.60 mm (0.063 in.)
Differential pinion to side gear backlash	STD	0.05–0.20 mm (0.0020–0.0079 in.)
Center differential side gear thrust washer thickness	Mark	
Differential side gear subassembly side	None	0.80 mm (0.0315 in.)
	None	0.85 mm (0.0335 in.)
	None	0.90 mm (0.0354 in.)
	None	0.95 mm (0.0374 in.)
	None	1.00 mm (0.0394 in.)
	None	1.05 mm (0.0413 in.)
	None	1.10 mm (0.0433 in.)
	None	1.15 mm (0.0453 in.)
	None	1.20 mm (0.0472 in.)
	None	1.25 mm (0.0492 in.)
	None	1.30 mm (0.0512 in.)
	None	1.35 mm (0.0531 in.)
	None	1.40 mm (0.0551 in.)
Center differential side gear thrust washer thickness	Mark	
No.2 differential case side	None	0.80 mm (0.0315 in.)
	None	0.85 mm (0.0335 in.)
	None	0.90 mm (0.0354 in.)
	None	0.95 mm (0.0374 in.)
	None	1.00 mm (0.0394 in.)
	None	1.05 mm (0.0413 in.)
	None	1.10 mm (0.0433 in.)
	None	1.15 mm (0.0453 in.)
	None	1.20 mm (0.0472 in.)
	None	1.25 mm (0.0492 in.)
	None	1.30 mm (0.0512 in.)
	None	1.35 mm (0.0531 in.)
	None	1.40 mm (0.0551 in.)
Front differential side gear thrust washer thickness	Mark	
No.2 differential case side	B	1.00 mm (0.0394 in.)
	C	1.05 mm (0.0413 in.)
	D	1.10 mm (0.0433 in.)
	E	1.15 mm (0.0453 in.)
	F	1.20 mm (0.0472 in.)
	G	1.25 mm (0.0492 in.)

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Front differential side gear thrust washer thickness	Mark	
Differential left case side	A	0.95 mm (0.0374 in.)
	B	1.00 mm (0.0394 in.)
	C	1.05 mm (0.0413 in.)
	D	1.10 mm (0.0433 in.)
	E	1.15 mm (0.0453 in.)
	F	1.20 mm (0.0472 in.)
	G	1.25 mm (0.0492 in.)
	H	1.30 mm (0.0512 in.)
	J	1.35 mm (0.0531 in.)
	K	1.40 mm (0.0551 in.)
Front differential side gear thrust clearance		0.14–0.21 mm (0.006–0.008 in.)
Differential case side bearing preload (at starting)		
New bearing (add output shaft preload)		0.2–0.4 N·m (2.0–4.1 kgf·cm, 1.7–3.6 in.·lbf)
Reused bearing (add output shaft preload)		0.1–0.2 N·m (1.3–2.5 kgf·cm, 1.1–2.2 in.·lbf)
Differential side bearing adjusting shim thickness	Mark	
	0	2.00 mm (0.0787 in.)
	1	2.05 mm (0.0807 in.)
	2	2.10 mm (0.0827 in.)
	3	2.15 mm (0.0846 in.)
	4	2.20 mm (0.0866 in.)
	5	2.25 mm (0.0886 in.)
	6	2.30 mm (0.0906 in.)
	7	2.35 mm (0.0925 in.)
	8	2.40 mm (0.0945 in.)
	9	2.45 mm (0.0965 in.)
	A	2.50 mm (0.0984 in.)
	B	2.55 mm (0.1004 in.)
	C	2.60 mm (0.1024 in.)
	D	2.65 mm (0.1043 in.)
	E	2.70 mm (0.1063 in.)
	F	2.75 mm (0.1083 in.)
	G	2.80 mm (0.1102 in.)
	H	2.85 mm (0.1122 in.)
Output shaft bearing preload (at starting)		
New bearing		0.8–1.6 N·m (8–16 kgf·cm, 6.9–13.9 in.·lbf)
Reused bearing		0.5–1.0 N·m (5–10 kgf·cm, 4.3–8.7 in.·lbf)

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Output shaft rear bearing adjusting shim thickness	Mark	
	0	1.30 mm (0.0512 in.)
	1	1.35 mm (0.0531 in.)
	2	1.40 mm (0.0551 in.)
	3	1.45 mm (0.0571 in.)
	4	1.50 mm (0.0591 in.)
	5	1.55 mm (0.0610 in.)
	6	1.60 mm (0.0630 in.)
	7	1.65 mm (0.0650 in.)
	8	1.70 mm (0.0669 in.)
	9	1.75 mm (0.0689 in.)
	A	1.80 mm (0.0709 in.)
	B	1.85 mm (0.0728 in.)
	C	1.90 mm (0.0748 in.)
	D	1.95 mm (0.0768 in.)
	E	2.00 mm (0.0787 in.)
	F	2.05 mm (0.0807 in.)
	G	2.10 mm (0.0827 in.)
	H	2.15 mm (0.0846 in.)
	J	2.20 mm (0.0866 in.)
	K	2.25 mm (0.0886 in.)
	L	2.30 mm (0.0906 in.)
	M	2.35 mm (0.0925 in.)
	N	2.40 mm (0.0945 in.)
	P	2.45 mm (0.0965 in.)
	Q	2.50 mm (0.0984 in.)
Differential side gear intermediate shaft protrusion length		225 mm (10.04 in.)

MX

(TRANSFER)

Driven pinion preload (at starting)		9–14 N (0.9–1.4 kg, 2–3 lb)
Driven pinion total preload (at starting) (Add driven pinion preload)		5–9 N (0.5–0.9 kg, 1–2 lb)
Extension housing oil seal drive in depth		1.5±0.4 mm (0.059±0.16 in.)
Driven pinion preload (at starting)		
New bearing		17.7–28.4 N (1.8–2.9 kg, 4.0–6.4 lb)
Reused bearing		4.9–8.8 N (0.9–1.4 kg, 1.1–2.0 lb)
Ring gear mounting right case bush		
Inner diameter	STD	69.000–69.035 mm (2.7165–2.7179 in.)
	Limit	69.060 mm (2.7189 in.)
Ring gear mounting left case bush		
Inner diameter	STD	69.000–69.035 mm (2.7165–2.7179 in.)
	Limit	69.060 mm (2.7189 in.)
Ring gear mounting case runout	Limit	0.1 mm (0.004 in.)
Ring gear		
Backlash		0.13–0.18 mm (0.0051–0.0071 in.)
Runout	Limit	0.1 mm (0.004 in.)

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Ring gear plate washer thickness	Mark	
	1	2.13 mm (0.0839 in.)
	2	2.16 mm (0.0850 in.)
	3	2.19 mm (0.0862 in.)
	4	2.22 mm (0.0874 in.)
	5	2.25 mm (0.0886 in.)
	6	2.28 mm (0.0898 in.)
	7	2.31 mm (0.0909 in.)
	8	2.34 mm (0.0921 in.)
	9	2.37 mm (0.0933 in.)
	10	2.40 mm (0.0945 in.)
	11	2.43 mm (0.0957 in.)
	12	2.46 mm (0.0968 in.)
	13	2.49 mm (0.0980 in.)
	14	2.52 mm (0.0992 in.)
	15	2.55 mm (0.1004 in.)
	16	2.58 mm (0.1016 in.)
	17	2.61 mm (0.1028 in.)
	18	2.64 mm (0.1039 in.)
	19	2.67 mm (0.1051 in.)
	20	2.70 mm (0.1063 in.)
	21	2.73 mm (0.1075 in.)
	22	2.76 mm (0.1087 in.)
	23	2.79 mm (0.1098 in.)
	24	2.82 mm (0.1110 in.)
Driven pinion preload (at starting)		
New bearing (Add driven pinion preload)		13 – 14 N (1.3 – 1.4 kg, 2.9 – 3.1 lb)
Reused bearing (Add driven pinion preload)		5 – 9 N (0.5 – 0.9 kg, 1 – 2 lb)
Ring gear adjusting shim thickness	Mark	
	A	0.30 mm (0.0118 in.)
	B	0.33 mm (0.0130 in.)
	C	0.36 mm (0.0142 in.)
	D	0.39 mm (0.0154 in.)
	E	0.42 mm (0.0165 in.)
	F	0.45 mm (0.0177 in.)
	G	0.48 mm (0.0189 in.)
	H	0.51 mm (0.0201 in.)
	J	0.54 mm (0.0213 in.)
	K	0.57 mm (0.0224 in.)

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TORQUE SPECIFICATIONS

MX010-09

Part tightened		N·m	kgf·cm	ft·lbf
Transaxle x Engine	17 mm head	64	650	47
	14 mm head	46	470	34
Engine front mounting bracket x Engine		77	790	57
Engine front mounting insulator x Bracket		87	890	64
Engine front mounting insulator x Center crossmember		80	820	59
Engine rear mounting bracket x Engine		77	790	57
Engine rear mounting insulator x Bracket		87	890	64
Engine rear mounting insulator x Center crossmember		80	820	59
Engine left mounting insulator x Bracket		52	530	38
Engine left mounting bracket x Transaxle		21	210	15
Alternator x Alternator bracket		52	530	38
Water outlet x Cylinder head		39	400	29
Water pump x Cylinder block		7.8	80	69 in.·lbf
A/C compressor x Cylinder block		25	250	18
PS pump set bolt		43	440	32
Pump pulley set nut		43	440	32
Chacoal canister x Body		7.4	75	65 in.·lbf
Fuel main hose		29	300	22
Radiator support x Body		13	130	9
Clutch release cylinder x Transaxle		12	120	9
Exhaust front pipe x Exhaust manifold		62	630	46
Exhaust front pipe x Exhaust center pipe		43	440	32
Starter x Transaxle		39	400	29
Transfer stiffener right plate x Transaxle		37	380	27
Front propeller shaft x Front intermediate shaft		74	750	54
Transmission case cover x Transaxle		25	250	18
Shift lever assembly x Body		12	120	9
Grommet x Body		4.9	50	43 in.·lbf
Transmission control cable bracket x Body		4.9	50	43 in.·lbf
Oil cooler assembly x Oil cooler support		7.9	80	69 in.·lbf
Oil cooler support x Body		6.4	65	56 in.·lbf
Line clamp x Transaxle		17	175	13
Elbow x Transaxle		27	275	20
Oil cooler hose x Elbow		34	350	25
Transmission oil cooler line x Oil cooler hose		34	350	25
Transmission oil cooler line x Body		7.9	80	69 in.·lbf
Transmission oil cooler line x Union		34	350	25
Union x Oil cooler assembly		22	220	16
Transaxle assembly x Transfer assembly		69	700	51
Clutch release fork support		47	480	35
Control lever housing support bracket x Transaxle case		17	175	13
Clutch release line bracket x Transaxle case		17	175	13
Shift and select lever shaft assembly x Transmission case		20	200	14
No.2 selecting bellcrank with selecting bellcrank support		20	200	14
Transmission case x Transaxle case		29	300	22
Transmission case cover x Transmission case		29	300	22
Filler and drain plugs		49	500	36

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Shift lever lock bolt	49	500	36
Breezer plug	49	500	36
Back–up light switch	40	410	30
Speed sensor	17	175	13
Straight screw plug (Reverse restrict pin)	13	130	9
Straight screw plug	25	250	18
Transmission oil pump assembly x Transaxle case	17	175	13
Transaxle oil receiver x Transaxle case	7.4	75	65 in.·lbf
No.2 oil pipe x Transaxle case	17	175	13
Reverse shift arm bracket assembly x Transaxle case	17	175	13
Reverse idler gear shaft retaining bolt	29	300	22
Rear bearing retainer x Transmission case	42	430	31
5th driven gear lock nut	123	1,250	90
Shift forks set bolt	24	240	17
Oil pump case set bolt and torx screw	10	105	8
Differential ring gear x Differential left case	124	1,260	91
Differential intermediate case x Differential right case	63	640	46

MX

(TRANSFER)

Transfer right case x Transfer left case	44	450	33
Drive pinion bearing cage assembly x Transfer left case	39	400	29
Extension housing x Drive pinion bearing cage assembly	25	260	29
Dynamic damper x Extension housing	25	260	19
Transfer inspection hole cover x Transfer left case	16	160	12
Transfer oil line x Tansfer left case	13	130	9
Ring gear mounting right case x left case	97	985	71
Plug (10 mm)	39	400	29
Plug (6 mm)	25	250	18

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PROPELLER SHAFT

DESCRIPTION ..... PR– 2
PREPARATION ..... PR– 3
PRECAUTION ..... PR– 4
TROUBLESHOOTING ..... PR– 4
PROPELLER SHAFT ..... PR– 5
SERVICE SPECIFICATIONS ..... PR– 17

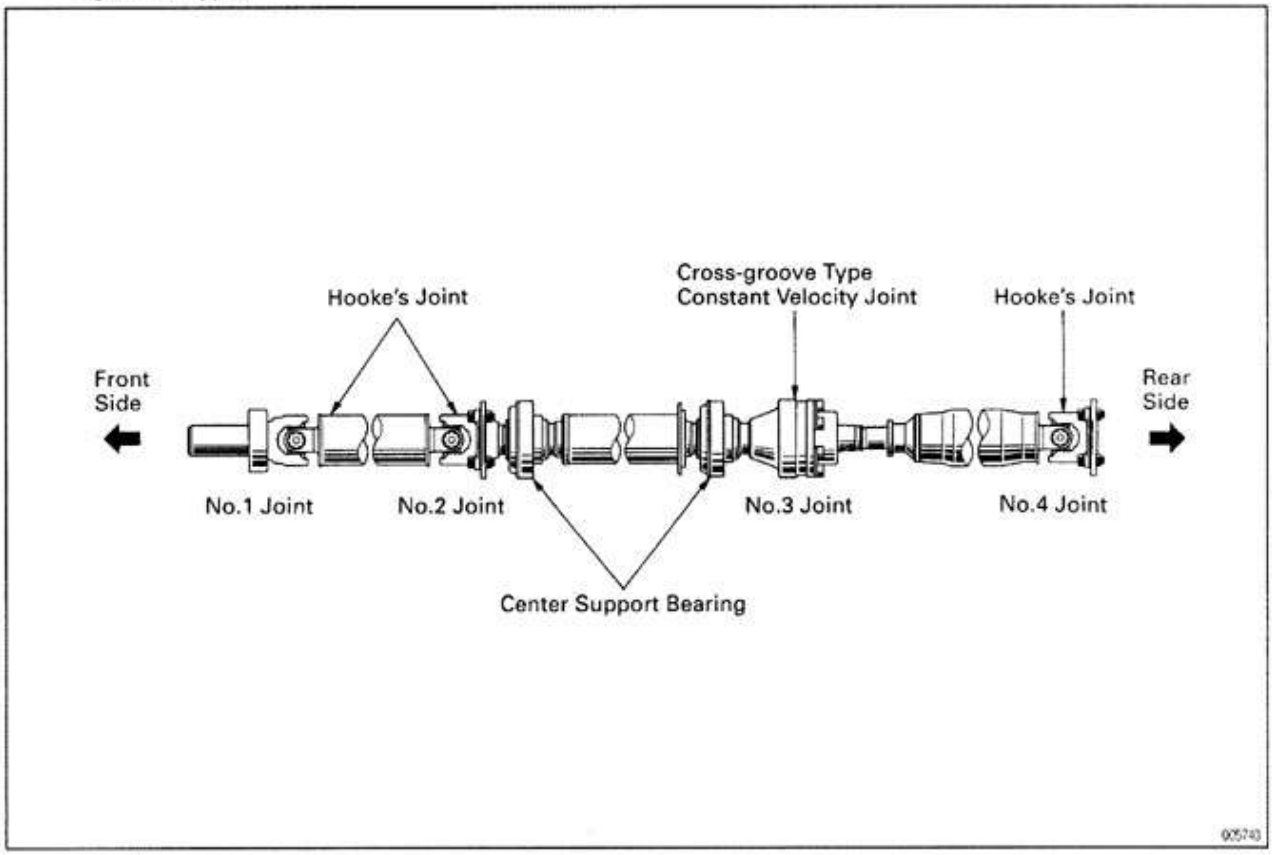
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DESCRIPTION

DESCRIPTION

PR057-01

The propeller shaft is a 4–joint type. No.1, 2 and 4 joints are Hooke's joint. No.3 joint is a cross–groove type.

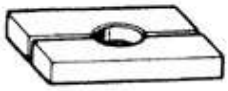


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PREPARATION

SST (SPECIAL SERVICE TOOLS)

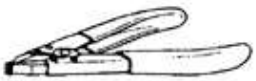
PR01A-07

	09527–21011	Rear Axle Shaft Bearing Remover	
	09330–00021	Companion Flange Holding Tool	
	09325–20010	Transmission Oil Plug	
	09950–30010	Puller A Set	
	09950–40010	Puller B Set	

PR

RECOMMENDED TOOLS

PR01B-03

	09040–00010	Hexagon Wrench Set	
	09904–00010	Expander Set	
	(09904–00060)	No. 5 Claw	
	09905–00012	Snap Ring No. 1 Expander	

EQUIPMENT

PR01C-03

Torque wrench	
Dial indicator	

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PRECAUTION

Be careful not to grip the propeller shaft tube too tightly in the vise as this will cause deformation.

TROUBLESHOOTING

Use the table to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in order. If necessary, replace these parts.

PR

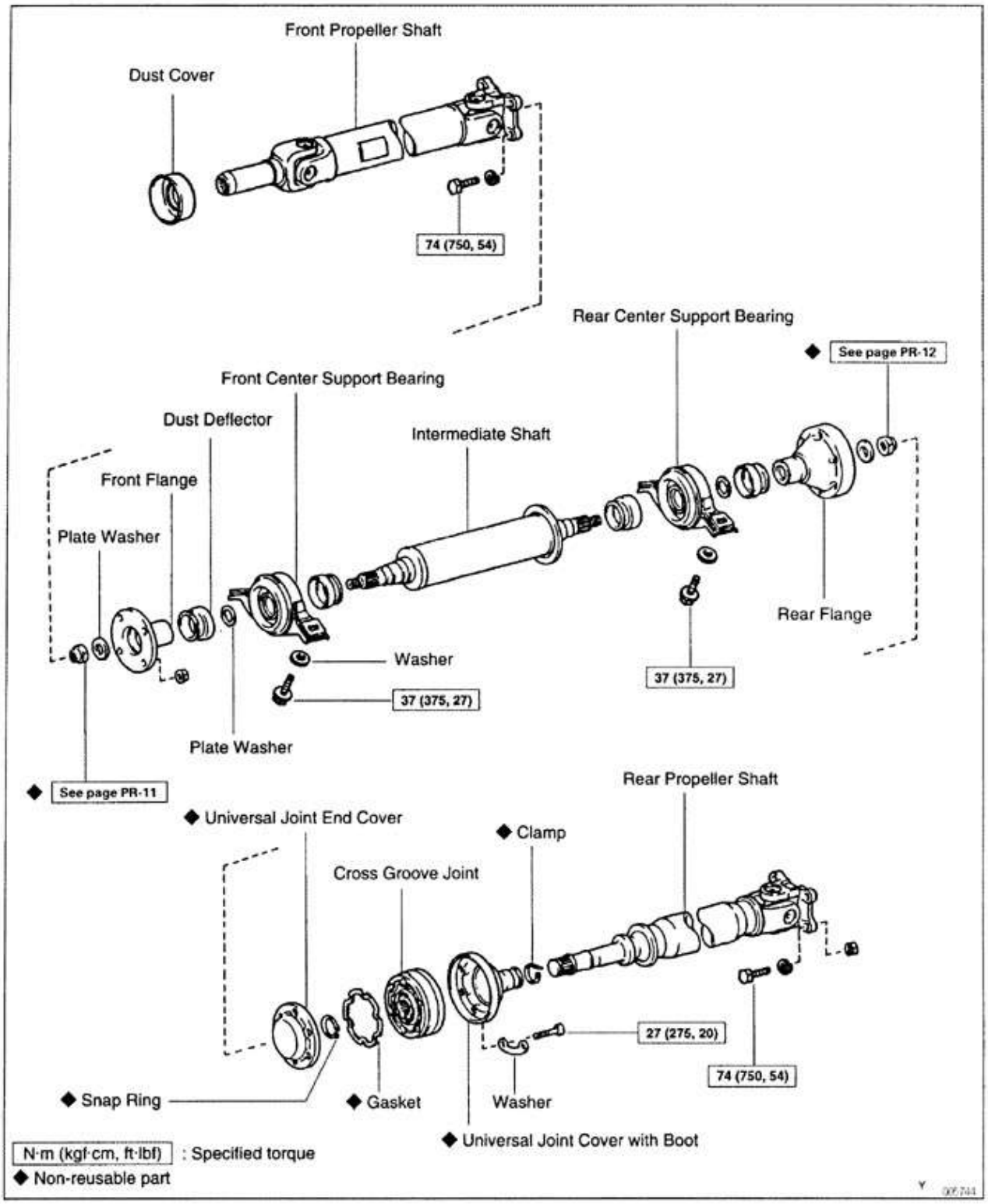
See page / Parts Name / Trouble	PR-8	PR-10	PR-8	PR-7	-	PR-7	PR-7	PR-8	PR-8	-
	Sleeve yoke spline worn	Center support bearing worn	Spider bearing worn or stuck	Propeller and intermediate shafts runout	Propeller shafts imbalance	Front flange runout	Rear flange runout	Sleeve yoke spline stuck	Cross groove joint stuck or damaged	Transfer extension housing rear bushing worn
Noise	1	2	3							
Vibration				1	2	3	4	7	5	6

V05520

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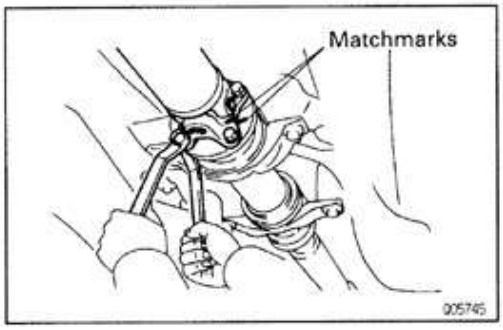
PROPELLER SHAFT
COMPONENTS

PR050-01



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PROPELLER SHAFT REMOVAL

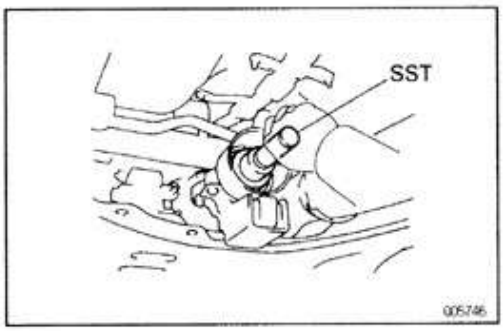


1. DISCONNECT FROMT PROPELLER SHAFT

(a) Place matchmarks on the both flanges.

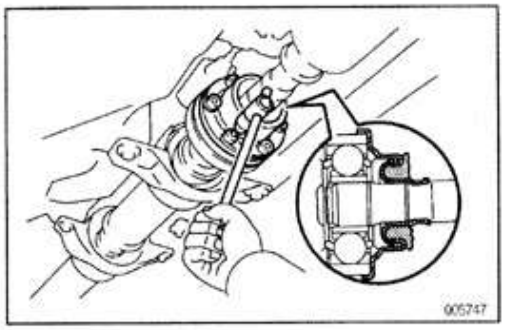
(b) Remove the 4 nuts, bolts and washer.

PR



(c) Pull the yoke from the transfer.

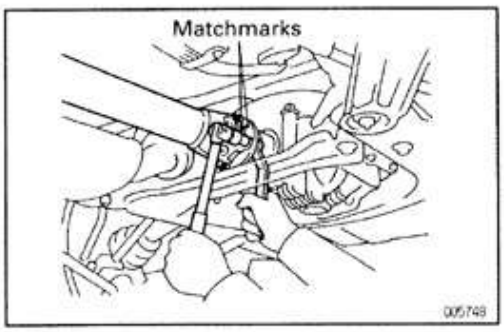
(d) Insert SST in the transfer to prevent oil leakage.
SST 09325–20010



2. LOOSEN CROSS GROOVE JOINT SET BOLT

(a) Depress the brake pedal and hold it.

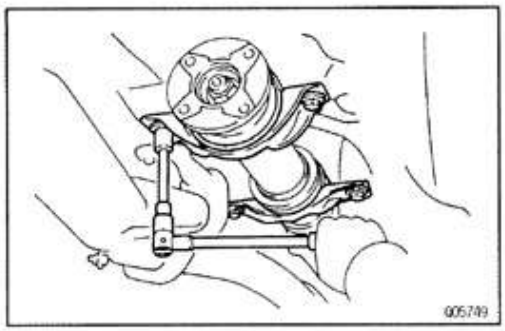
(b) Using a hexagon wrench, loosen the cross groove joint set blots 1/2 turn.
HINT: Put a piece of cloth, or equivalent, into the inside of the universal joint cover so that the boot dose not touch the inside of the universal joint cover.



3. REMOVE INTERMEDIATE SHAFT AND REAR PROPELLER SHAFT

(a) Place matchmarks on both the flanges.

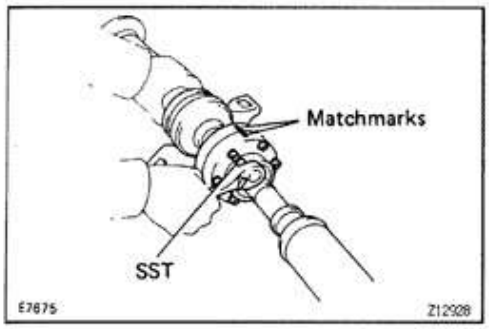
(b) Remove the 4 nuts, bolts and washers.



(c) Remove the 2 bolts and washers, front center support bearing and washers.

(d) Remove the 2 bolts and washers, rear center support bearing.

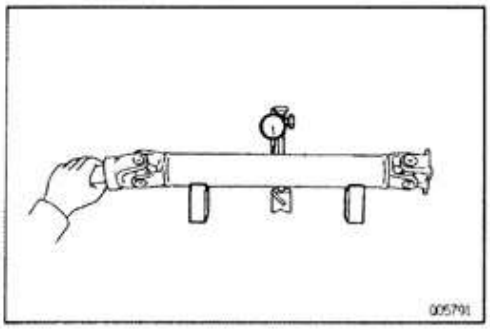
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4. **SEPARATE INTERMEDIATE SHAFT AND REAR PROPELLER SHAFT**

(a) Place matchmarks on the joint and flange.
HINT: Do not make matchmarks with a punch.

(b) Using a hexagon wrench, remove the 6 bolts and 3 washers and separate the intermediate shaft from the rear propeller shaft.



PROPELLER SHAFT INSPECTION

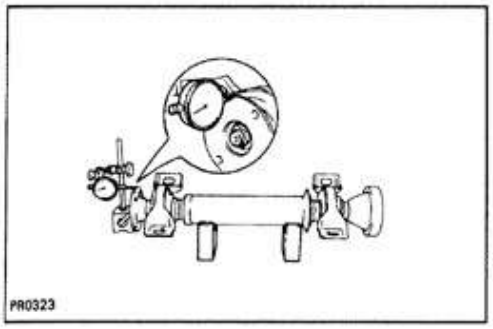
PR

1. **INSPECT PROPELLER AND INTERMEDIATE SHAFTS RUNOUT**

If shaft runout is greater than maximum, replace the shaft.

Maximum runout:

0.8 mm (0.031 in.)

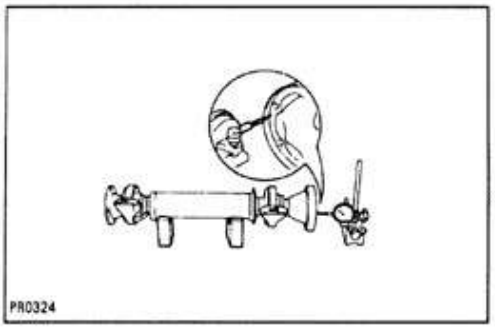


2. **INSPECT INTERMEDIATE SHAFT FLANGE RUNOUT**

- Inspect the front side of intermediate shaft flange runout.

Maximum runout:

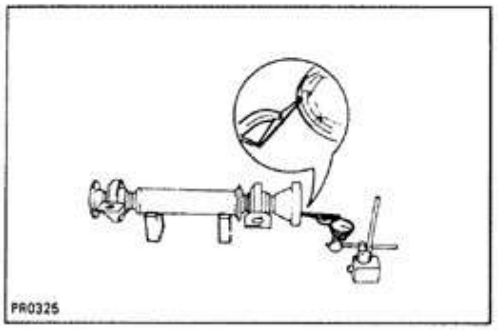
0.1 mm (0.004 in.)



- Inspect the rear side of intermediate shaft flange runout in horizontal direction.

Maximum runout:

0.1 mm (0.004 in.)

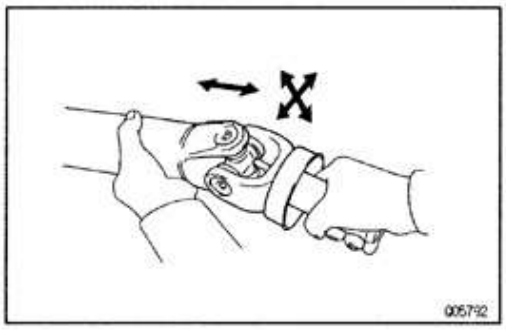


- Inspect the rear side of intermediate shaft flange runout in vertical direction.

Maximum runout:

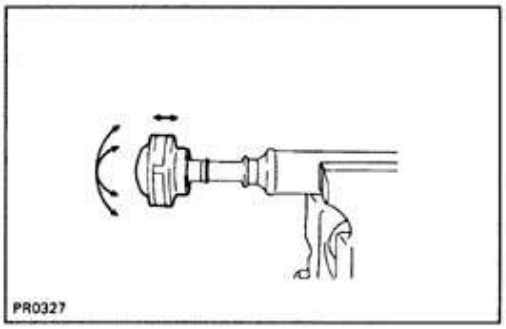
0.1 mm (0.004 in.)

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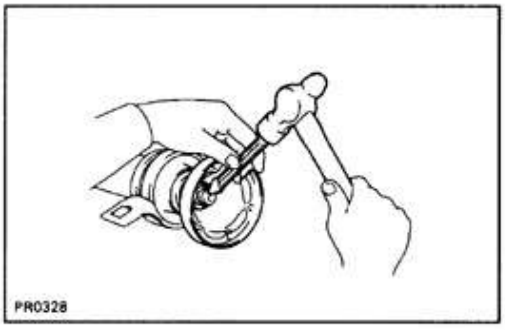
3. **INSPECT SPIDER BEARINGS**
   - Check the spider bearing axial play by turning the flange while holding the shaft tightly.

PR



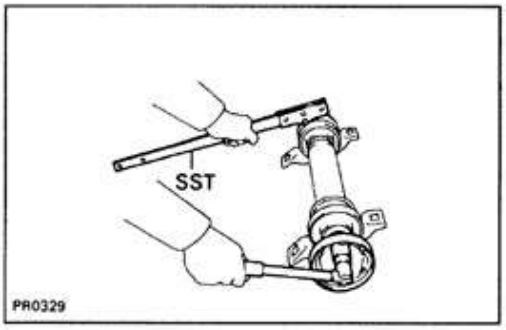
4. **INSPECT CROSS GROOVE JOINT**
   - Check that the joint turns smoothly in all directions, as shown.
   - Check for cracks damage and grease leaking from the boot. If a problem is found, replace the joint.

PROPELLER SHAFT DISASSEMBLY

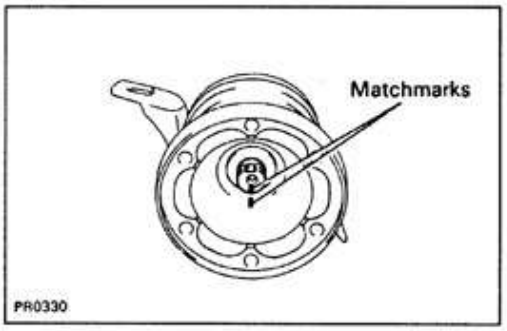


1. **REMOVE REAR CENTER SUPPORT BEARING**

(a) Using a hammer and chisel, loosen the staked part of the nut.

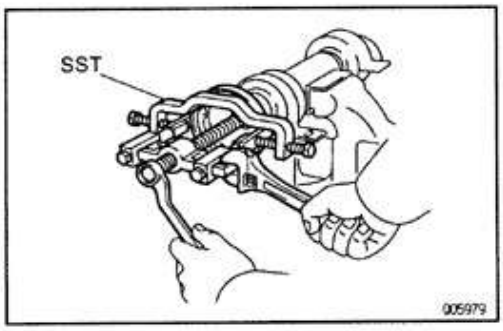


(b) Using SST to hold the front flange, remove the nut and plate washer.
SST 09330–00021



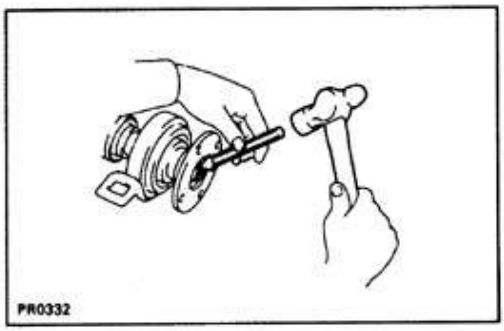
(c) Place matchmarks on the rear flange and shaft.

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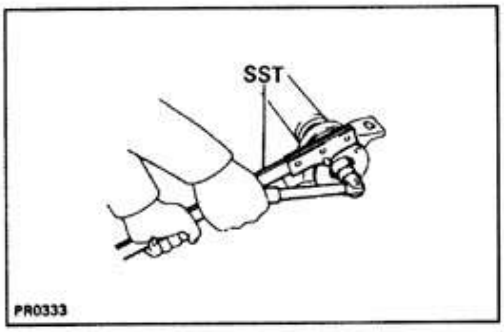
(d) Using SST, remove the rear flange.
SST 09950–40010

(e) Remove the rear center support bearing and plate washer.

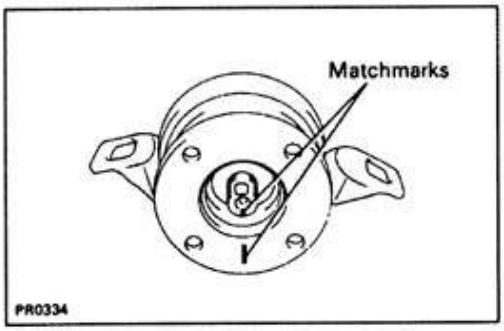


2. **REMOVE FRONT CENTER SUPPORT BEARING**

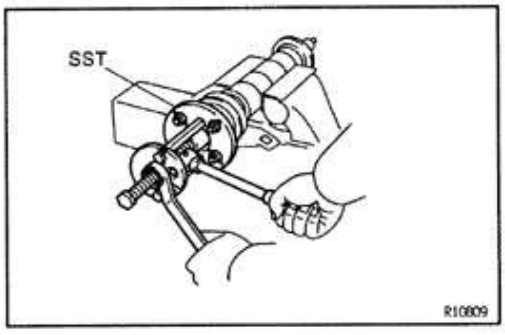
(a) Using a hammer and chisel, loosen the staked part of the nut.



(b) Using SST to hold the flange, remove the nut and plate washer.
SST 09330–00021



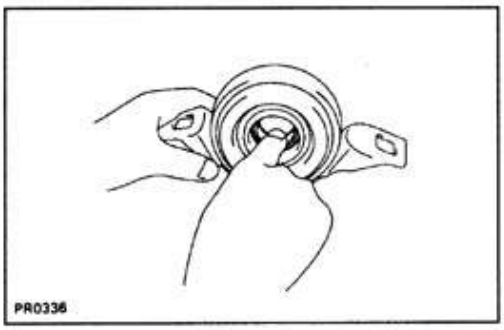
(c) Place matchmarks on the flange and the shaft.



(d) Using SST, remove the flange.
SST 09950–30010

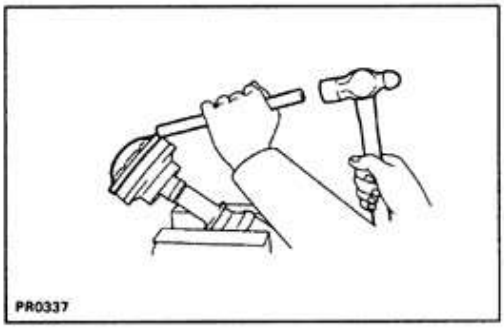
(e) Remove the front center support bearing and plate washer.

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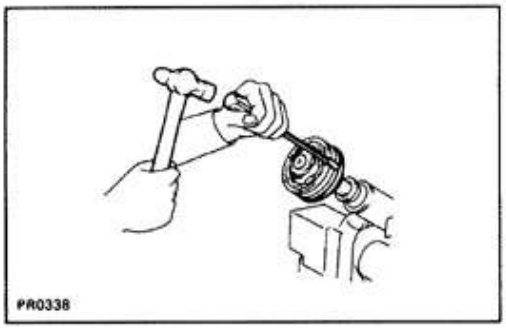
3. INSPECT CENTER SUPPORT BEARING

- Turn the bearing by hand. Check that it turns smoothly.
- Check that there are no cracks and no damage to the seals.

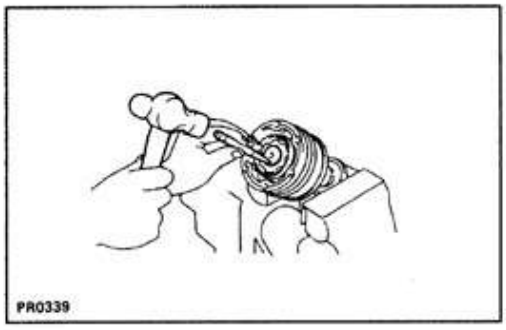


4. REMOVE CROSS GROOVE JOINT

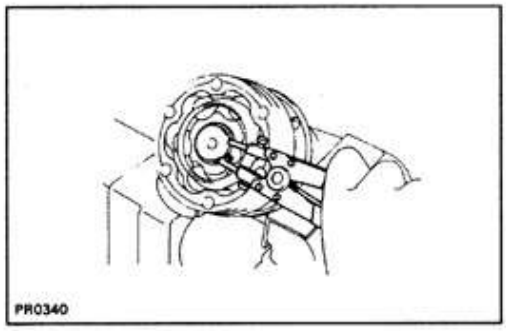
(a) Using a hammer and brass bar, remove the joint end cover.



(b) Using a hammer and screwdriver, remove the cover.

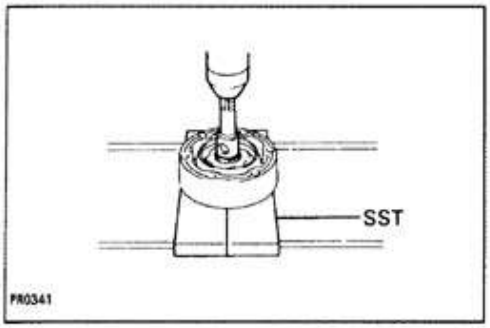


(c) Place matchmarks on the inner race and shaft.

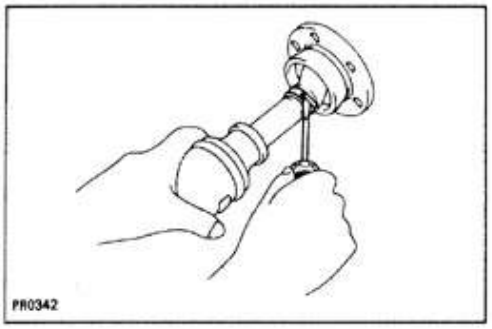


(d) Using snap ring pliers, remove the snap ring.

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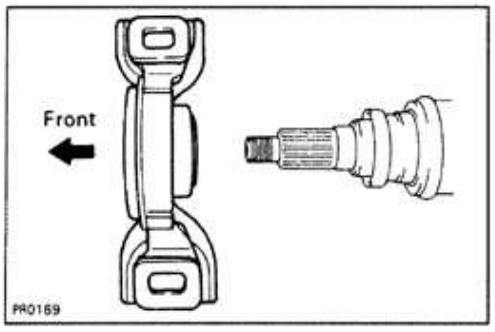
(e) Using SST, extension bar and press, remove the cross groove joint.
SST 09527–21011
(f) Remove the joint end cover gasket.



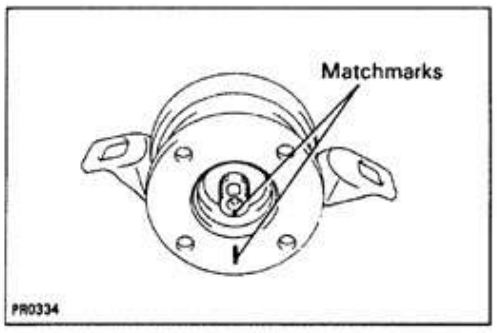
5. REMOVE UNIVERSAL JOINT COVER WITH BOOT
Remove the clamp and the universal joint cover with boot.

PR

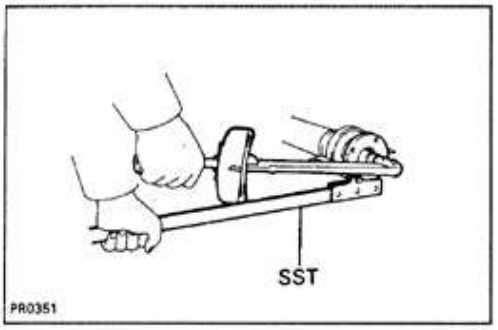
PROPELLER SHAFT ASSEMBLY



1. INSTALL FRONT CENTER SUPPORT BEARING
(a) Set the front center support bearing on the intermediate shaft, as shown.

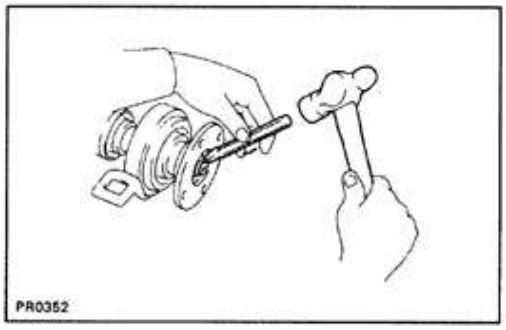


(b) Install the plate washer to the intermediate shaft.
(c) Align the matchmarks on the flange and shaft and place the flange on the shaft.



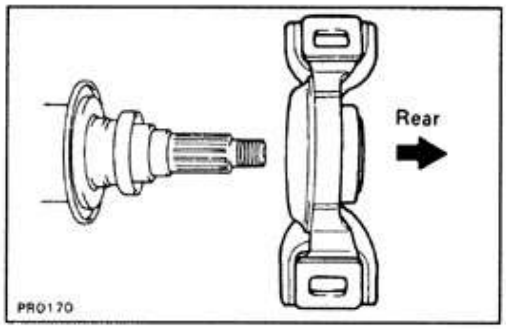
(d) Using SST to hold the flange, press the bearing into position by tightening down a new nut and washer.
SST 09330–00021
Torque: 181 N·m (1,850 kgf·cm, 134 ft·lbf)
(e) Loosen the nut.
(f) Torque the nut again.
Torque: 69 N·m (700 kgf·cm, 51 ft·lbf)

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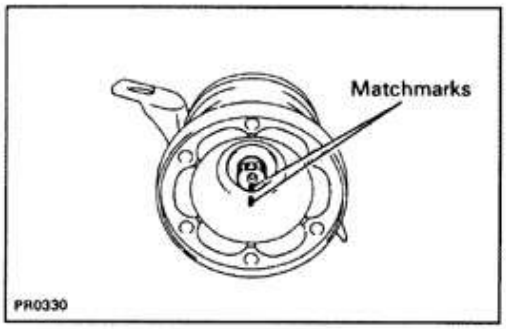
(g) Using a hammer and chisel, stake the nut.

PR



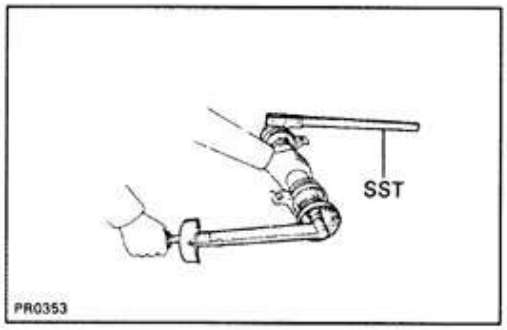
2. INSTALL REAR CENTER SUPPORT BEARING

(a) Set the rear center support bearing on the intermediate shaft, as shown.



(b) Install the plate washer to the intermediate shaft.

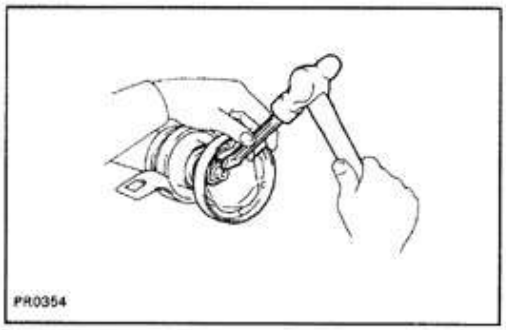
(c) Align the matchmarks on the flange and shaft and place the flange on the shaft.



(d) Using SST to hold the flange, press the bearing into position by tightening down a new nut and washer.
SST 09330–00021
Torque: 181 N·m (1,850 kgf·cm, 134 ft·lbf)

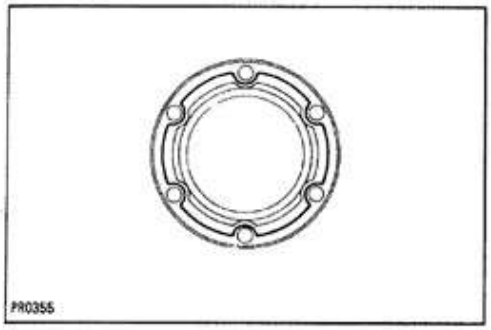
(e) Loosen the nut.

(f) Torque the nut again.
Torque: 69 N·m (700 kgf·cm, 51 ft·lbf)



(g) Using a hammer and chisel, stake the nut.

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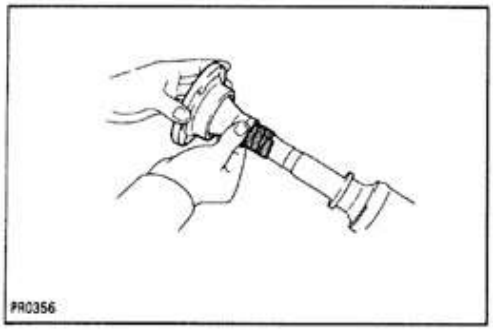
3. INSTALL UNIVERSAL JOINT COVER WITH BOOT

(a) Apply sealant to the new joint cover with boot, as shown in the illustration.

Sealant:

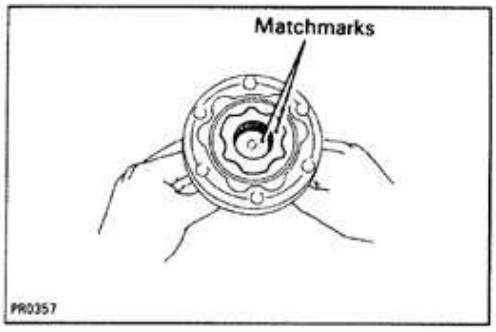
Part No.08828–00801

HINT: The sealant stould be applied in a 1.0–1.8 mm (0.0394–0.0709 in.) wide bead, as shown.



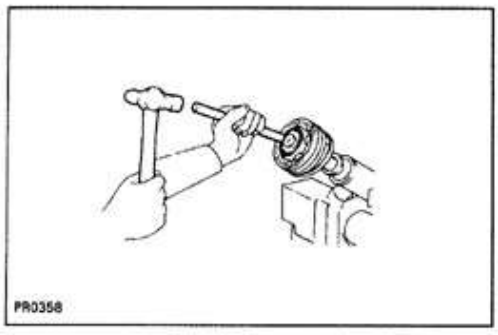
(b) Apply adhesive tape from the top of shaft to the spline to prevent damaging the boot.

(c) Install the universal joint cover with boot to the shaft.



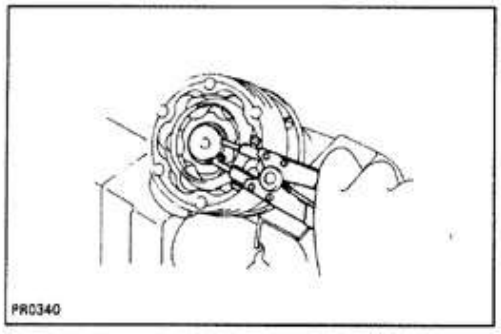
4. INSTALL CROSS GROOVE JOINT

(a) Align the matchmarks on the shaft and the inner race.



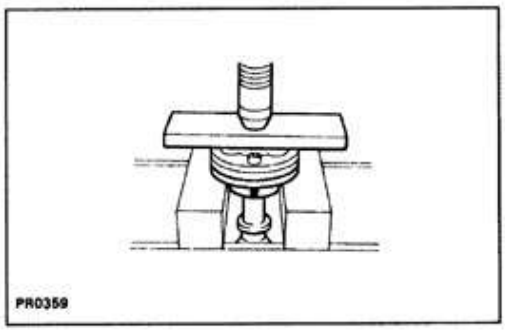
(b) Using a hammer and brass bar, tap the cross groove joint.

HINT: Be sure to put the brass bar on the inner race.



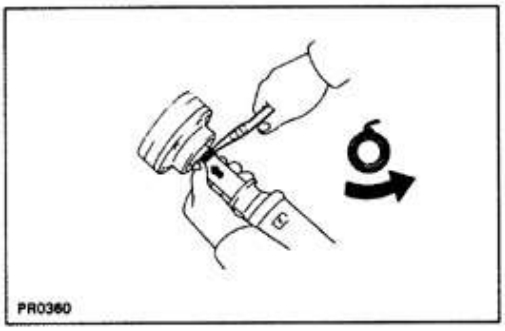
(c) Using snap ring pliers, install the new snap ring.

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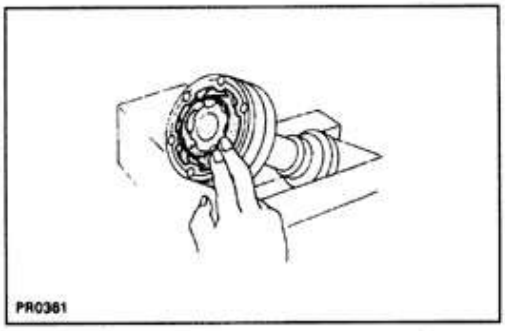


(d) Pass the bolt through to align both the bolt holes, then using a press and steel plate, press the universal joint cover with boot.

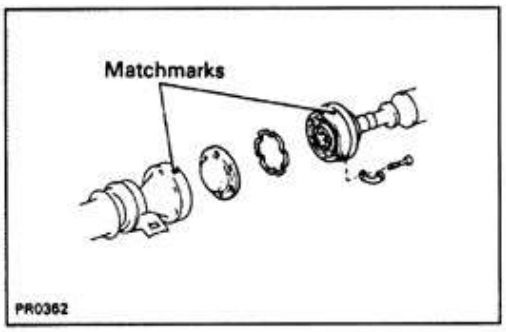
PR



(e) Install the new boot clamp.
HINT: Bend the clamp in the opposite direction to the shaft rotation.



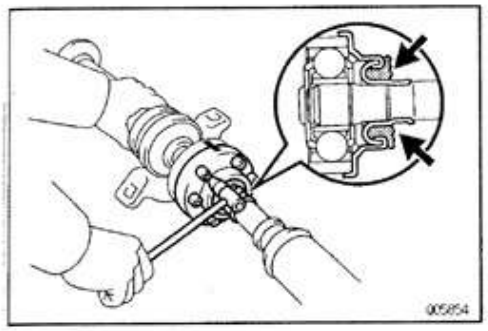
(f) Pack grease into the joint.
Grease capacity:
110 g (0.24 lb)



5. INSTALL JOINT END COVER

(a) Remove the backing paper from the new gasket, then attach the gasket.
(b) Install the joint end cover.
(c) Align the matchmarks and install the universal joint flange to the cross groove joint.
(d) Tighten the 6 bolts and 3 washers to press the joint end cover.
HINT: Tighten the bolts gradually and equally to prevent damaging the end cover.
(e) Remove the 6 bolts and 3 washers and separate the universal joint flange from the cross groove joint.

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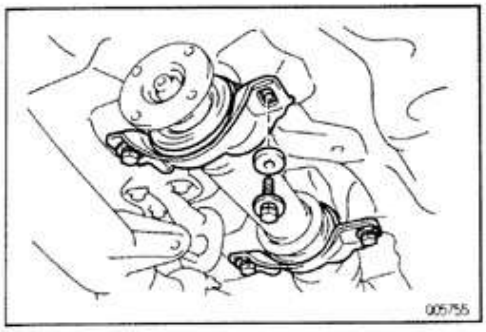


6. **INSPECT CROSS GROOVE JOINT**
(See step 4 on page PR–8)

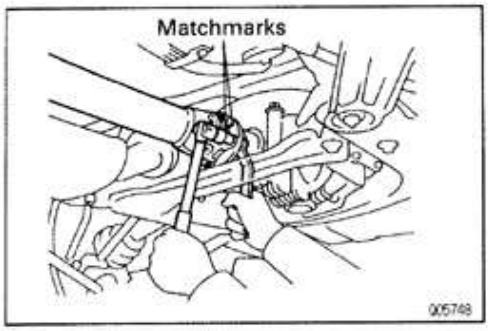
7. **CONNECT INTERMEDIATE SHAFT WITH REAR PROPELLER SHAFT**
Using a hexagon wrench, tighten the 6 bolts and 3 washers temporaily.
HINT: Put a piece of cloth, or equivalent, inside the universal joint cover.

PROPELLER SHAFT INSTALLATION

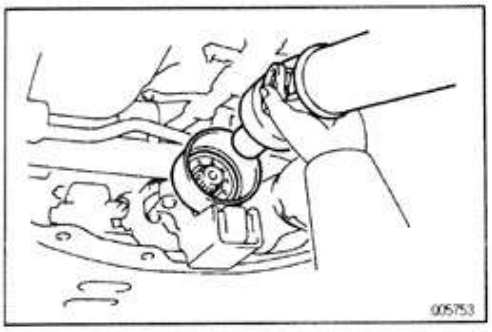
PR



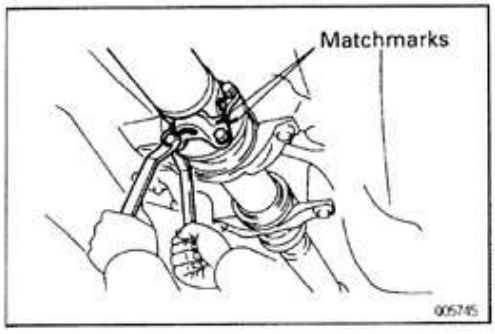
1. **INSTALL CENTER SUPPORT BEARING TEMPORARILY**



2. **INSTALL REAR PROPELLER SHAFT**
(a) Align the matchmarks on the flanges and connect the shaft with the 4 bolts, washers and nuts.
(b) Torque the bolts and nuts.
Torque: 74 N·m (750 kgf·cm, 54 ft·lbf)

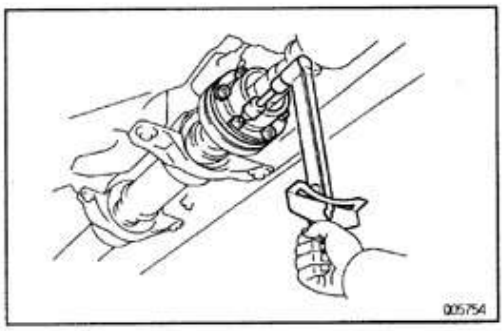


3. **INSTALL FRONT PROPELLER SHAFT**
(a) Remove SST from the transfer.
(b) Insert the yoke into the transfer.



(c) Align the matchmarks on the both flanges, then install the bolts, washers and nuts.
Torque: 74 N·m (750 kgf·cm, 54 ft·lbf)

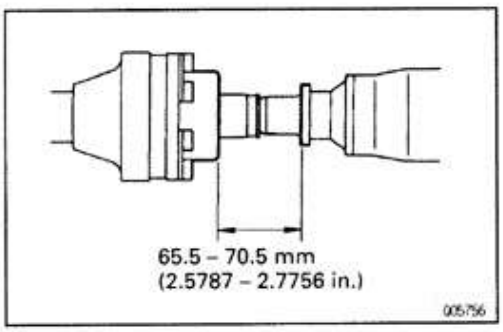
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4. TIGHTEN CROSS GROOVE JOINT SET BOLT

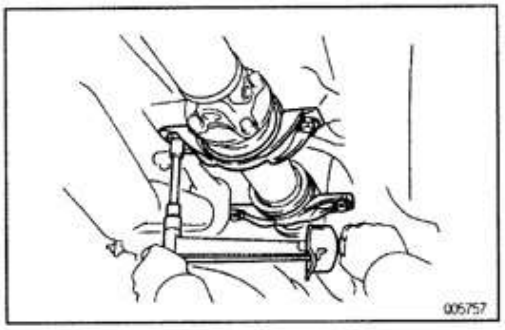
(a) Depress the brake pedal and hold it.

(b) Using a hexagon wrench, tighten the cross groove joint set bolts.
SST 09923–00020
Torque: 27 N·m (275 kgf·cm, 20 ft·lbf)

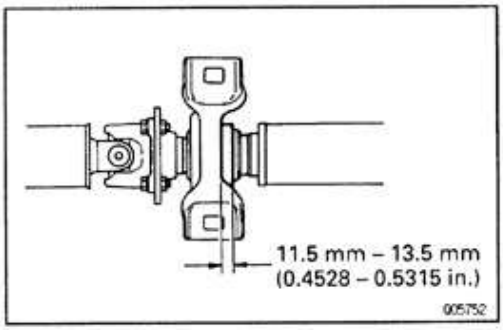


5. INSTALL CENTER SUPPORT BEARING

(a) With the vehicle unladen, adjust the dimension between the rear side of cover and the shaft, as shown.



(b) Under the same condition, adjust the dimension between the rear side the center bearing housing and the rear side the of cushion to 11.5 – 13.5 mm (0.4528 in. – 0.5315 in.), as shown in the illustration below, then torque the bolts.
Torque: 37 N·m (375 kgf·cm, 27 ft·lbf)



(c) Check that the center line of the bracket is at right angles at the shaft axial direction.

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SERVICE SPECIFICATIONS

SERVICE DATA

PR013-04

Propeller shaft runout	Maximum runout	0.8 mm (0.031 in.)
Intermediate shaft runout	Maximum runout	0.8 mm (0.031 in.)
Intermediate shaft flange runout	Maximum runout	0.1 mm (0.004 in.)

TORQUE SPECIFICATIONS

PR014-07

Part tightened	N·m	kgf·cm	ft·lbf
Intermediate shaft x Front center support bearing			
1st	181	1,850	134
Loosen nut			
2nd	69	700	51
Intermediate shaft x Rear center support bearing			
1st	181	1,850	134
Loosen nut			
2nd	69	700	51
Front propeller shaft x Front flange	74	750	54
Rear propeller shaft x Rear differential	74	750	54
Universal joint end cover x Universal joint cover with boot	27	275	20
Front center support bearing x Body	37	375	27
Rear center support bearing x Body	37	375	27

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SUSPENSION AND AXLE

GENERAL INSPECTION ..... SA– 2
WHEEL ALIGNMENT ..... SA– 4
FRONT WHEEL ALIGNMENT ..... SA– 4
REAR WHEEL ALIGNMENT ..... SA– 6
FRONT DRIVE SHAFT ..... SA– 8
DESCRIPTION ..... SA– 8
PREPARATION ..... SA– 9
FRONT DRIVE SHAFT ..... SA– 10
REAR AXLE HUB AND CARRIER ..... SA– 20
DESCRIPTION ..... SA– 20
PREPARATION ..... SA– 21
REAR AXLE HUB AND CARRIER ..... SA– 23
REAR DRIVE SHAFT ..... SA– 32
DESCRIPTION ..... SA– 32
PREPARATION ..... SA– 33
REAR DRIVE SHAFT ..... SA– 34
REAR DIFFERENTIAL ..... SA– 40
DESCRIPTION ..... SA– 40
PREPARATION ..... SA– 41
ON–VEHICLE REPAIR ..... SA– 43
ASSEMBLY REMOVAL AND INSTALLATION ..... SA– 47
DIFFERENTIAL CARRIER ..... SA– 50
REAR SUSPENSION ..... SA– 67
DESCRIPTION ..... SA– 67
PREPARATION ..... SA– 68
LOWER SUSPENSION ARM AND STRUT ROD ..... SA– 69
STABILIZER BAR ..... SA– 72
SERVICE SPECIFICATIONS ..... SA– 74

SA

REFER TO CELICA REPAIR MANUAL FOR CHASSIS AND BODY (Pub. No. RM380E)

NOTE: The above pages contain only the points which differ from the above listed manual.

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GENERAL INSPECTION

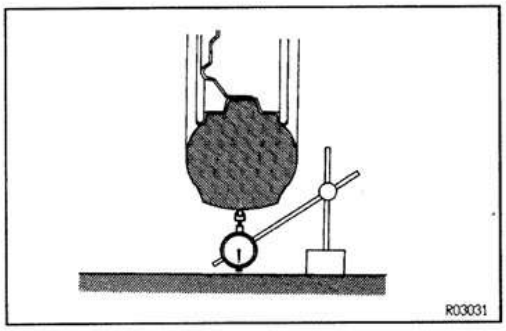
8A1GH-01

1. INSPECT TIRE

(a) Check the tires for wear and for the proper inflation pressure.

Cold tire inflation pressure

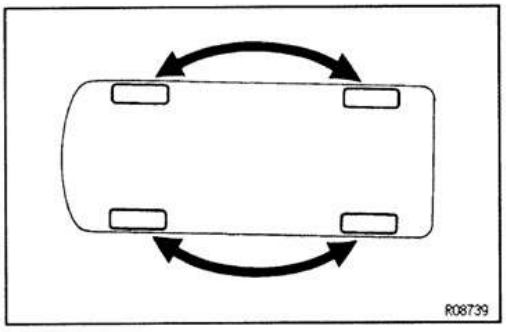
Tire size	Front kPa (kgf/cm², psi)	Rear kPa (kgf/cm², psi)
215/50R16 90W	240 (2.4, 35)	240 (2.4, 35)



(b) Check the tire runout.

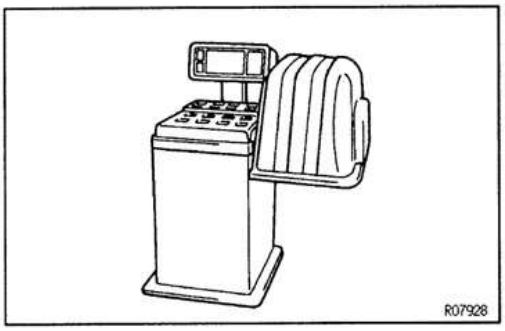
Tire runout:

Less than 1.0 mm (0.039 in.)



2. ROTATING TIRES

Rotate the front and rear tires.



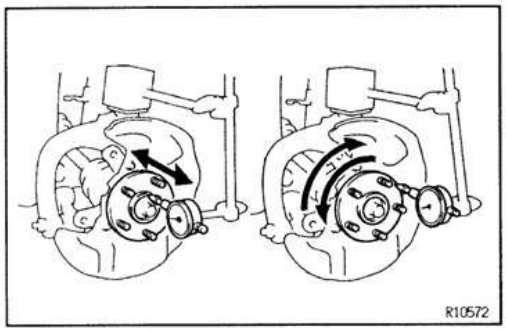
3. INSPECT WHEEL BALANCE

(a) Check and adjust the Off–the–car balance.

(b) If necessary, check and adjust the On–the–car balance.

Unbalance after adjustment:

8.0 g (0.018 lb) or less



4. CHECK WHEEL BEARING LOOSENESS

(a) Check the backlash in bearing shaft direction.

Maximum:

0.05 mm (0.0020 in.)

(b) Check the axle hub deviation.

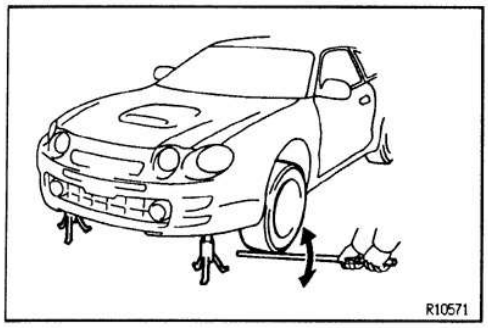
Maximum:

0.07 mm (0.0028 in.)

5. CHECK FRONT SUSPENSION FOR LOOSENESS

6. CHECK STEERING LINKAGE FOR LOOSENESS

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7. CHECK BALL JOINT FOR LOOSENESS

(a) Jack up the front of the vehicle.

(b) Move the wheel up and down, and check the ball joint has no play.

8. CHECK SHOCK ABSORBERS WORK PROPERLY

- Check for oil leak
- Check mounting bushings for wear
- Bounce front and rear of the vehicle

SA

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WHEEL ALIGNMENT

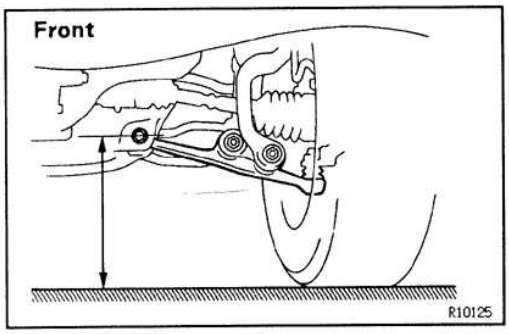
FRONT WHEEL ALIGNMENT

SA1D6-02

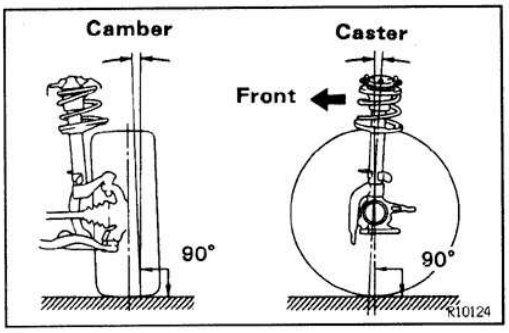
1. MEASURE VEHICLE HEIGHT

Vehicle height

Tire size	Height
215/50R16	183.2 mm (7.21 in.)



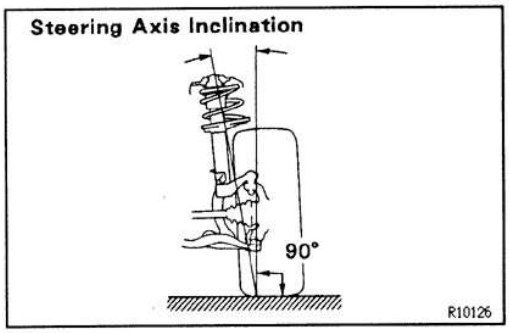
Measuring point:
Measure from the ground to the center of the suspension lower No.1 arm mounting bolt.
NOTICE: Before inspection the wheel alignment, adjust the vehicle height to specification.
If the vehicle height is not standard, try to adjust it by pushing down on or lifting the body.



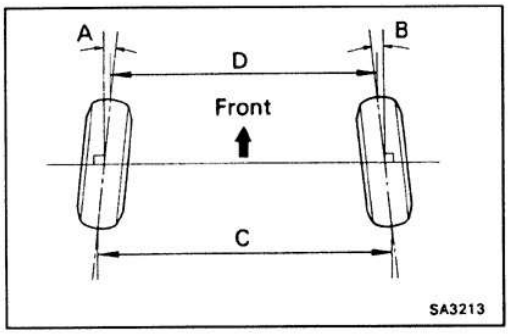
2. INSPECT CAMBER, CASTER AND STEERING AXIS INCLINATION

Specifications

Camber	−0°21′ ± 45′
Left−right error	45′ or less
Caster	2°44′ ± 45′
Left−right error	45′ or less
Steering axis inclination	3°01′ ± 45′



HINT: Camber, caster and steering axis inclination are not adjustable. If measurements are not within specification, inspect the suspension parts for damaged and/or worn out parts and replace them as necessary.



3. INSPECT TOE−IN

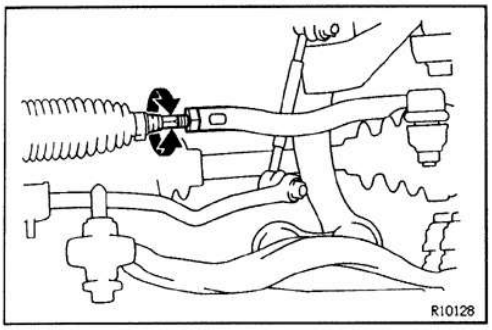
Toe−in (total):

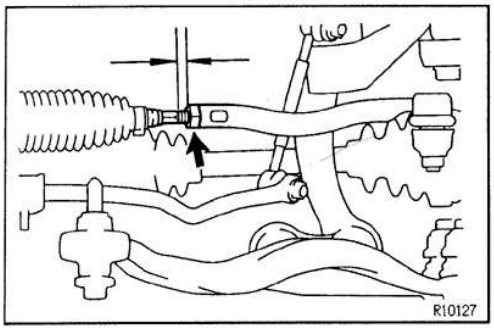
A+B = 0°12′ ± 12′

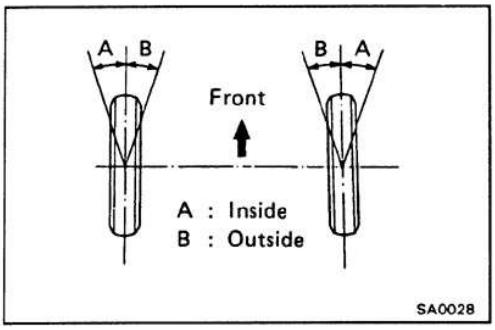
C−D = 2 ± 2 mm (0.08 ± 0.08 in.)

If the toe−in is not within the specification, adjust it at the tie rod end.

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4. ADJUST TOE–IN

(a) Remove the boot clamps.

(b) Loosen the tie rod end lock nuts.

(c) Turn the left and right tie rod ends an equal amount to adjust the toe–in.

Toe–in (total):

A+B = 0°12′ ± 6′

C–D = 2 ± 1 mm (0.08 ± 0.04 in.)

HINT: Measure that the lengths of the left and right tie rod end length are the same.

Tie rod end length difference:

1.5 mm (0.059 in.) or less

(d) Torque the tie rod end lock nuts.

Torque: 56 N·m (570 kgf·cm, 42 ft·lbf)

(e) Place the boot on the seat and install the clamp.

HINT: Make sure that the boots are not twisted.

SA

5. INSPECT WHEEL ANGLE

Wheel angle

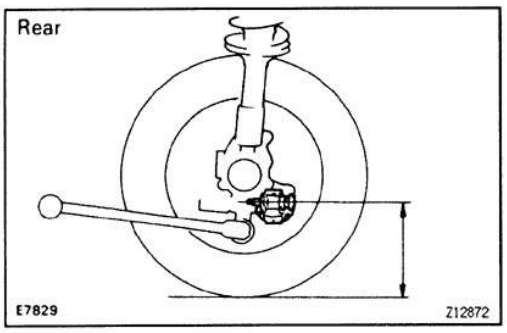
Inside wheel	Outside wheel (reference)
34°32′ ± 2°	28°18′

If the wheel angles differ from the specification, check the difference of the left and right tie rod end length.

Tie rod end length difference:

1.5 mm (0.059 in.) or less

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REAR WHEEL ALIGNMENT

SA1D8-02

1. MEASURE VEHICLE HEIGHT

Vehicle height

Tire size	Height
215/50R16	231.8 mm (9.13 in.)

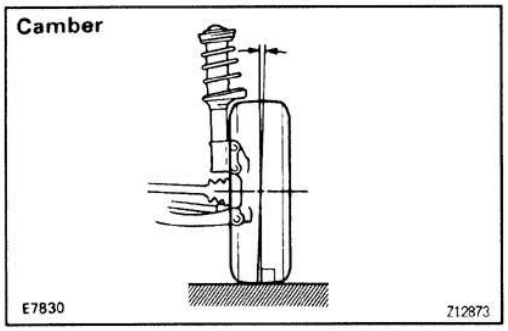
Measuring point:

Measure from the ground to the center of the body side No.2 suspension arm mounting bolt.

NOTICE: Before inspecting the wheel alignment, adjust the vehicle height to specification.

If the vehicle height is not standard, try to adjust it by pushing down on or lifting the body.

SA

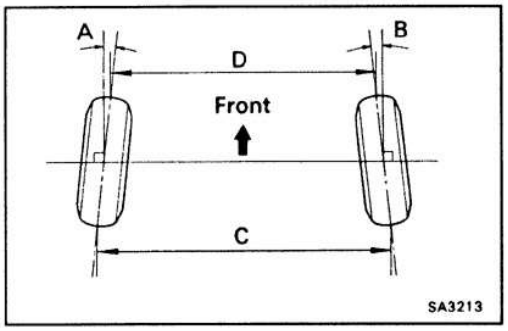


2. INSPECT CAMBER

Camber

Camber	−1°21′ ± 45′
Left−right error	45′ or less

HINT: Camber is not adjustable, if measurement is not within specification, inspect and replace the suspension parts as necessary.



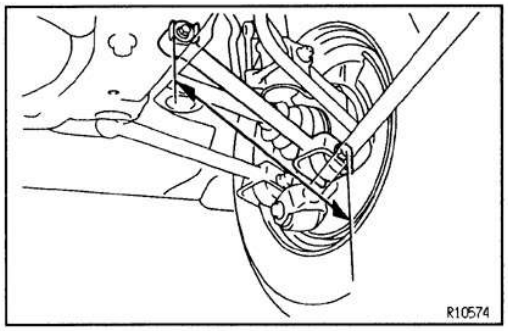
3. INSPECT TOE−IN

Toe−in (total):

A+B = 0°27′ ± 12′

C−D = 4.5 ± 2 mm (0.18 ± 0.08 in.)

If the toe−in is not within the specification, adjust by the cam.



4. ADJUST TOE−IN

Toe−in (total):

A+B = 0°27′ ± 6′

C−D = 4.5 ± 1 mm (0.18 ± 0.04 in.)

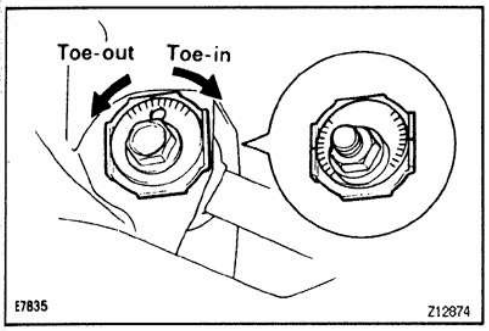
(a) Measure the distance between each wheel disc and corner of the cam bracket, then confirm that both are the same.

Left−right difference:

3 mm (0.12 in.) or less

If the left−right error is greater than 3 mm (0.12 in.), adjust following the procedures below.

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(b) Loosen the lock bolts.

(c) If the toe–in is out of the standard toward toe–out side, lengthen the longer arm by the cam.

(d) If the toe–in is out of the standard toward toe–in side, lengthen the shorter arm by the cam.
If the left–right error is within specifications but the over all toe–in is not, lengthen or shorten both arms an equal amount by turning the 2 cams in the opposite direction, until the adjustment standard is obtained.
HINT: The toe–in will change about 4.5 mm (0.177 in.) with each graduation of the cam (one side).

(e) Torque the lock bolts.
Torque: 98 N·m (1,000 kgf·cm, 72 ft·lbf)

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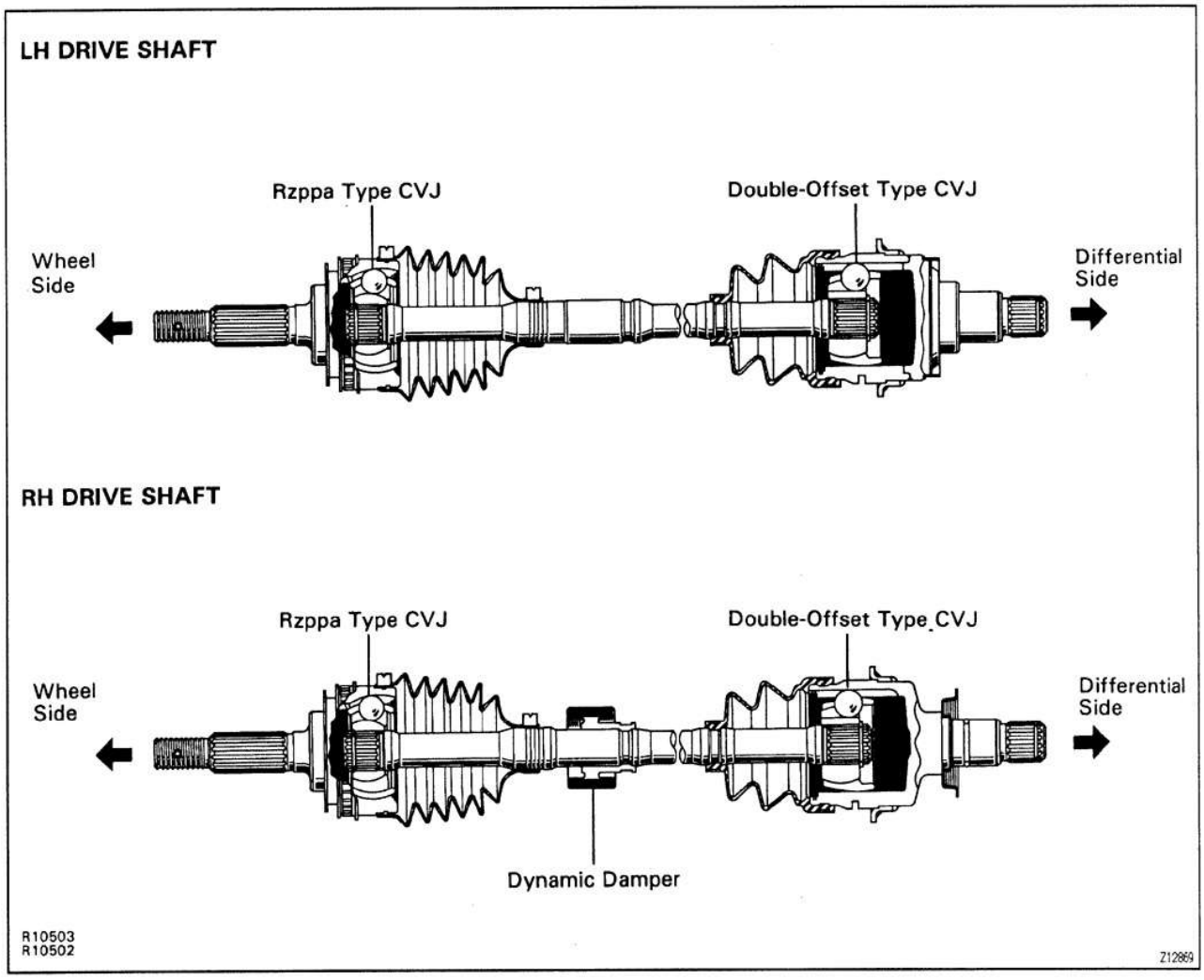
FRONT DRIVE SHAFT

DESCRIPTION

SA020-07

The front drive shaft has a double–offset CVJ (Constant Velocity Joint) on the differential side and Rzeppa type CVJ on the wheel side.

SA

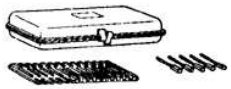
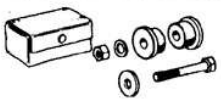
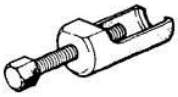


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PREPARATION

SST (SPECIAL SERVICE TOOLS)

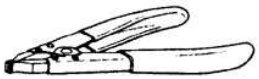
8A02E-09

	09240–00020	Wire Gauge Set	
	09521–24010	Drive Shaft Boot Clamping Tool	
	09608–16041	Front Hub Bearing Adjusting Tool	
	(09608–02020)	Bolt & Nut	
	(09608–02040)	Retainer	
	09610–20012	Pitman Arm Puller	
	09628–62011	Ball Joint Puller	

SA

RECOMMENDED TOOLS

8A02F-02

	09905–00012	Snap Ring No. 1 Expander	For removing and installing snap ring

EQUIPMENT

8A02G-02

Torque wrench	

LUBRICANT

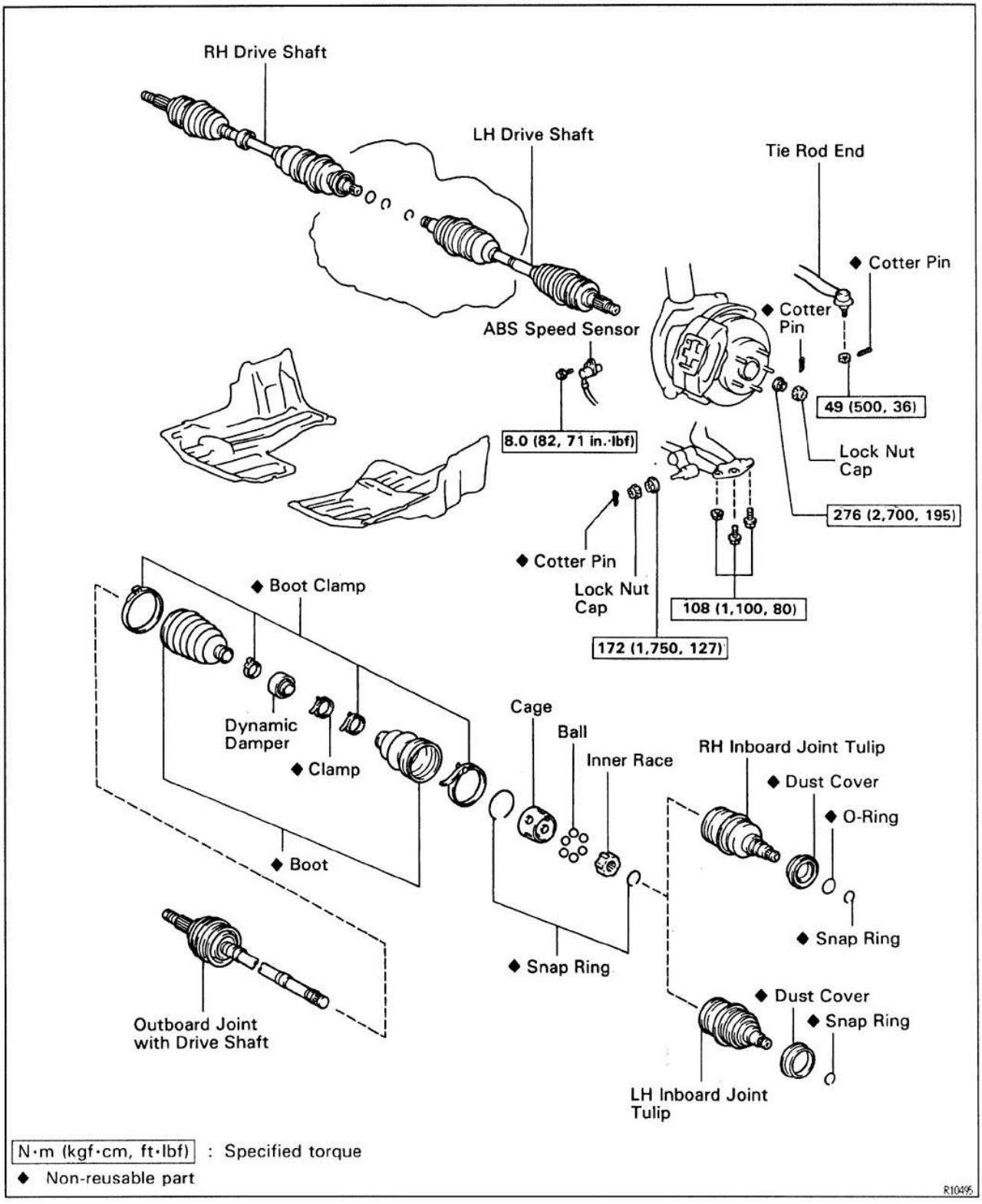
8A02H-04

Item	Capacity	Classification
Outboard joint grease	120–140 g (4.2–4.9 oz.)	
Inboard joint grease	100–120 g (3.5–4.2 oz.)	

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FRONT DRIVE SHAFT
COMPONENTS

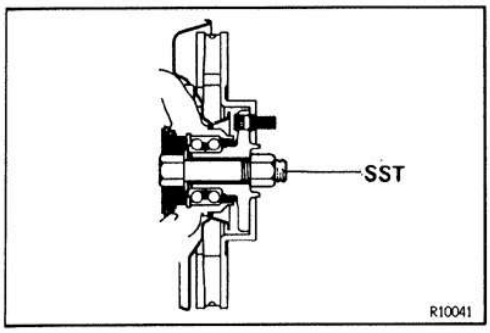
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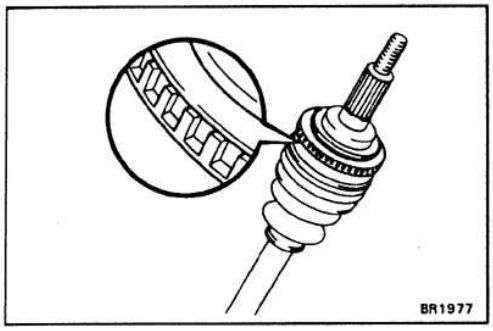
SA10J-01

FRONT DRIVE SHAFT REMOVAL



NOTICE: The hub bearing could be damaged if it is subjected to the vehicle weight, such as when moving the vehicle with the drive shaft removed. Therefore, if it is absolutely necessary to place the vehicle weight on the hub bearing, first support it with SST.

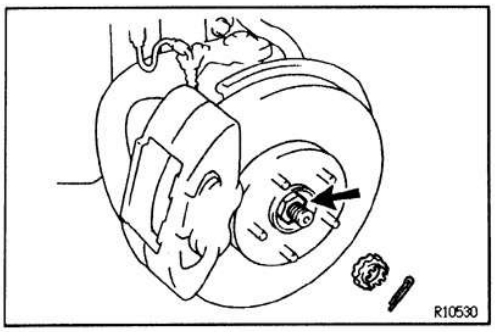
SST 09608–16041 (09608–02020,09608–02040)



After disconnecting the drive shaft from the axle hub, work carefully so as not to damage the sensor rotor serrations on the drive shaft.

SA

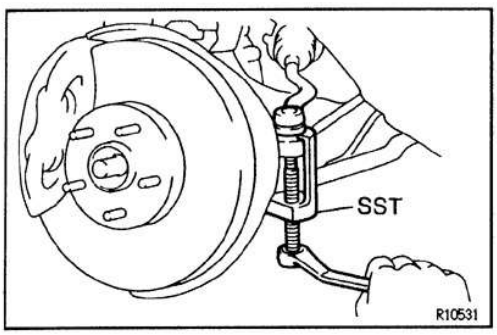
1. **JACK UP VEHICLE AND REMOVE FRONT WHEEL**
2. **REMOVE ENGINE UNDER COVERS**
3. **DRAIN TRANSAXLE OIL**



4. **REMOVE COTTER PIN, LOCK NUT CAP AND LOCK NUT**

(a) Remove the cotter pin and lock nut cap.

(b) Loosen the drive shaft lock nut while depressing the brake pedal.

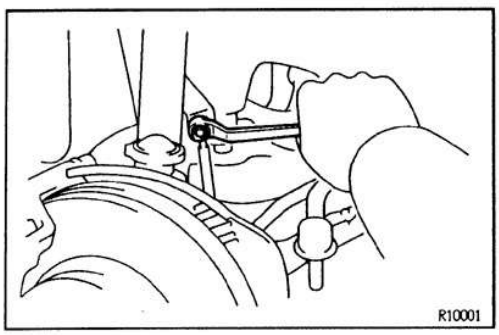


5. **DISCONNECT TIE ROD END**

(a) Remove the cotter pin and nut from the steering knuckle.

(b) Using SST, disconnect the tie rod end from the steering knuckle.

SST 09610–20012

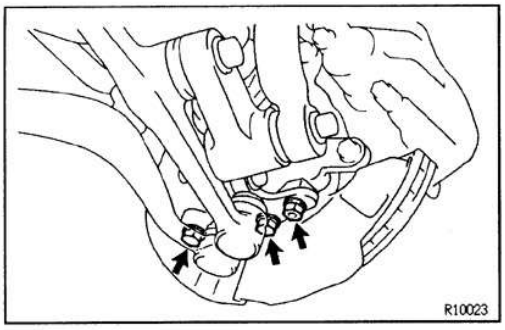


6. **DISCONNECT STABILIZER BAR LINK**

Remove the nut and disconnect the stabilizer bar link from shock absorber.

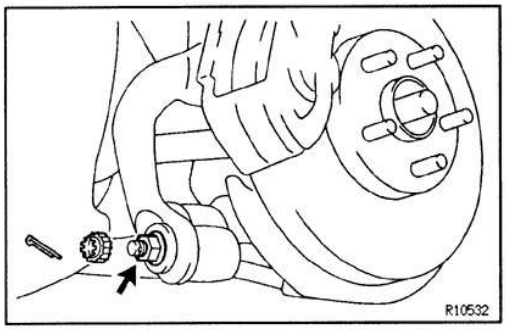
HINT: If the ball joint stud turns together with the nut, use a hexagon wrench to hold the stud.

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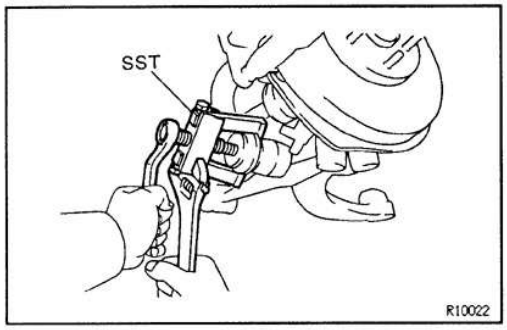
7. DISCONNECT LOWER BALL JOINT ATTACHMENT

Remove the nut and 2 bolts and disconnect the lower ball joint attachment from steering knuckle.

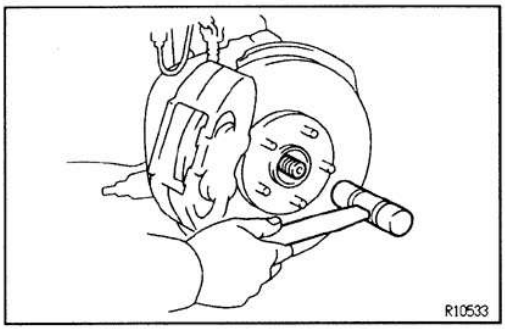


8. DISCONNECT CAMBER CONTROL ARM

(a) Remove the cotter pin and lock cap, remove the nut.



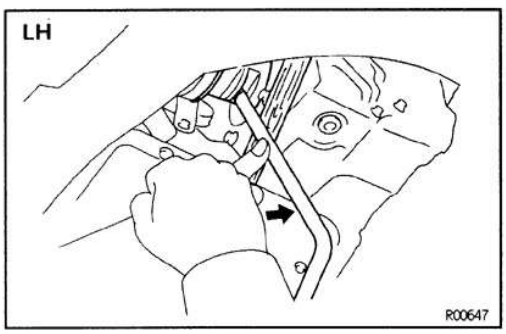
(b) Using SST, disconnect the camber control arm from shock absorber.
SST 09628–62011



9. DISCONNECT DRIVE SHAFT

Using a plastic hammer, disconnect the drive shaft from axle hub.

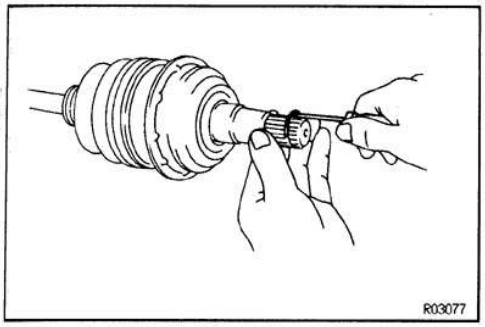
NOTICE: Cover the drive shaft boot with cloth to protect it from damage.



10. REMOVE DRIVE SHAFT

(a) Using hub nut wrench and hammer handle or an equivalent, pull out the drive shaft, as shown.

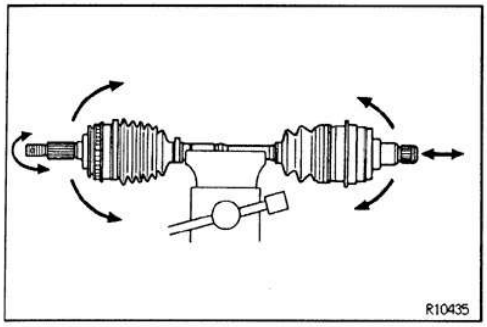
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(b) Using a screwdriver, remove the snap ring.
(c) RH drive shaft:
Remove the O–ring.

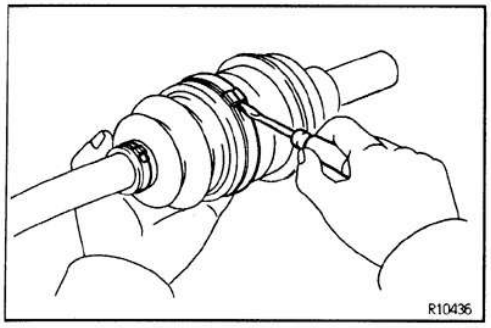
FRONT DRIVE SHAFT DISASSEMBLY

SA1GK-01



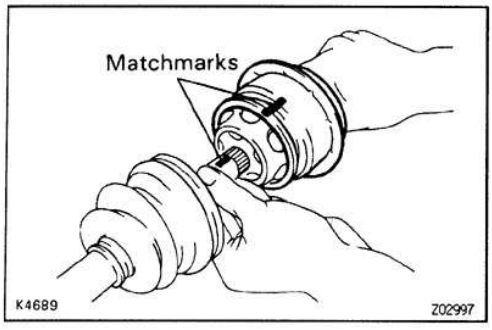
1. CHECK DRIVE SHAFT

(a) Check to see that there is no play in the outboard joint.
(b) Check to see that the inboard joint slides smoothly in the thrust direction.
(c) Check to see that there is no noticeable play in the radial direction of the inboard joint.
(d) Check for damage to boots.



2. REMOVE INBOARD JOINT BOOT CLAMPS

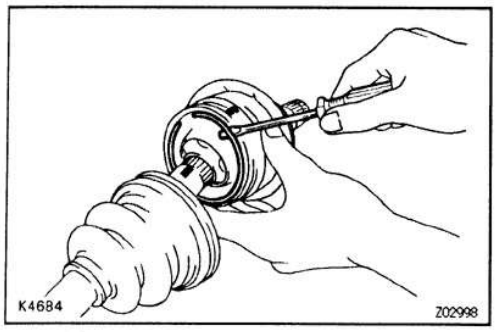
(a) Using a screwdriver, remove the 2 boot clamps.
(b) Slide the inboard joint boot toward joint.



3. DISASSEMBLE INBOARD JOINT TULIP

Place matchmarks on the drive shaft and inboard joint tulip.

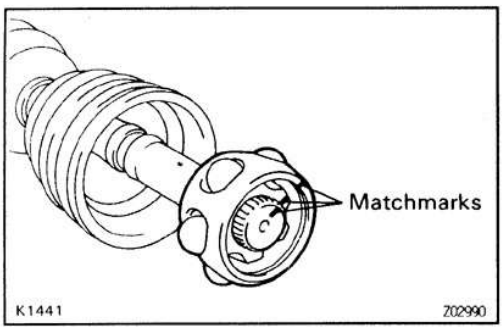
NOTICE: Do not punch the marks.



4. REMOVE SNAP RING

(a) Using a screwdriver, remove the snap ring.
(b) Remove inboard joint tulip from drive shaft.

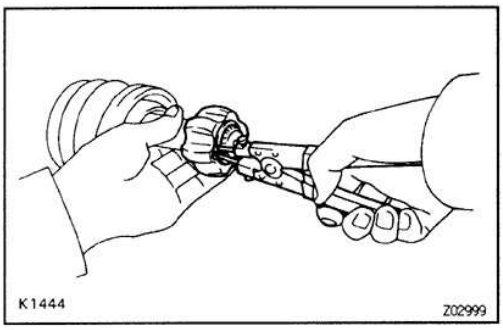
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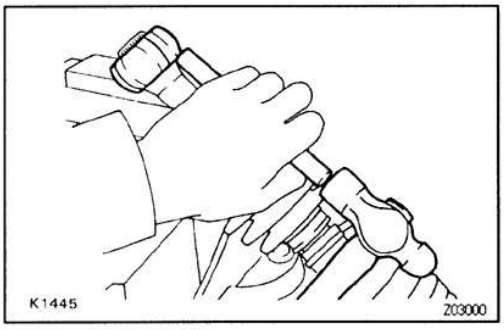
5. DISASSEMBLE INBOARD JOINT

(a) Place the matchmarks on the drive shaft, inner race and cage.

(b) Remove the 6 balls and cage.

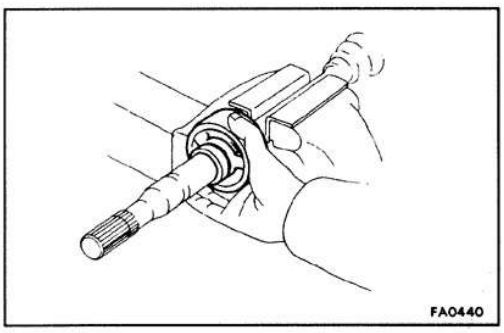


(c) Using a snap ring expander, remove the snap ring.



(d) Using a brass bar and hammer, remove the inner race.

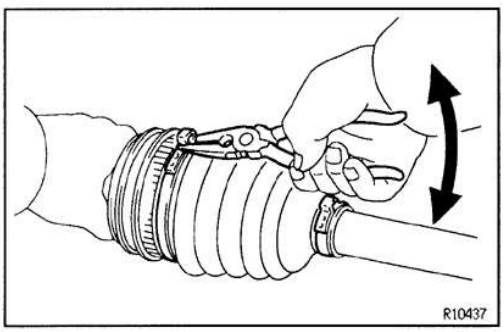
6. REMOVE INBOARD JOINT BOOT



7. RH Drive shaft:
REMOVE DYNAMIC DAMPER

(a) Using a screwdriver, remove the clamp of the dynamic damper.

(b) Remove the dynamic damper.



8. REMOVE OUTBOARD JOINT BOOT

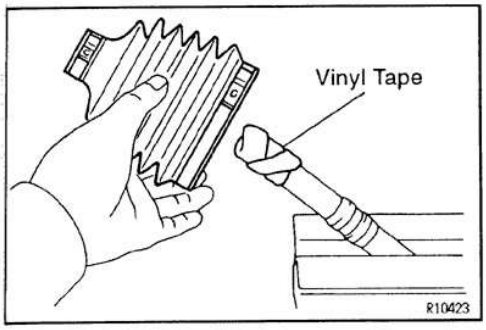
(a) Using a side cutter or pliers, remove the 2 boot clamps.

(b) Remove the outboard joint boot.

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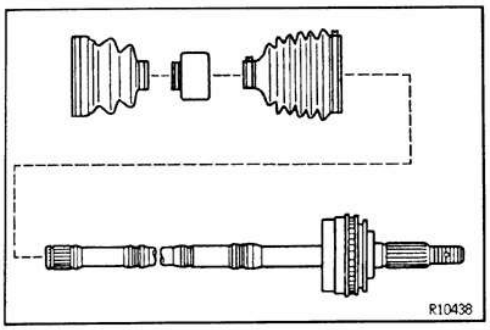
SA1GZ-01

FRONT DRIVE SHAFT ASSEMBLY



1. TEMPORARILY INSTALL BOOTS AND DAMPER

HINT: Before installing the boot, wrap vinyl tape around the spline of the drive shaft to prevent damaging the boots and damper.

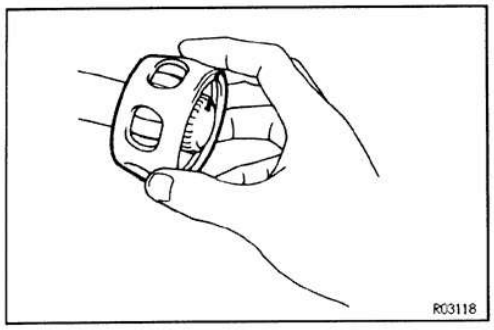


(a) Place 2 new boot clamps to new outboard joint boot and temporarily install it to the drive shaft.

(b) RH drive shaft:
Temporarily install the dynamic damper to the drive shaft.

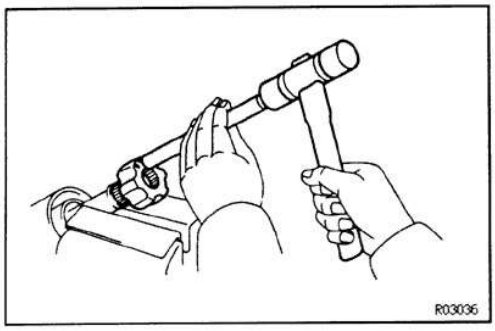
(c) Temporarily install a new inboard joint boot to the drive shaft.

SA



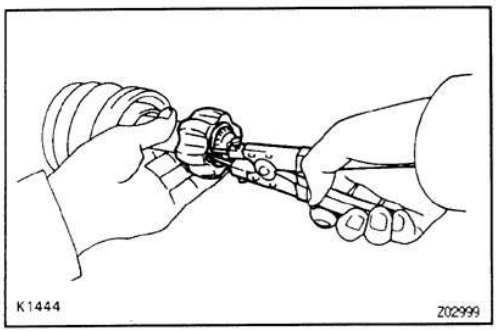
2. INSTALL CAGE

NOTICE: The side with smaller diameter must face outboard.



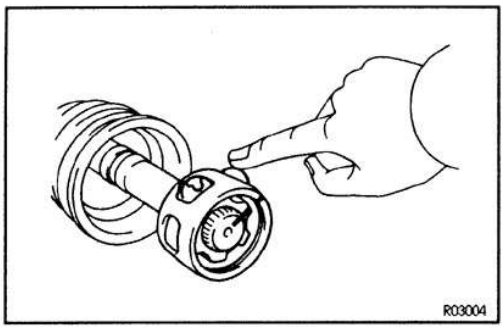
(a) Align the matchmarks placed before remove.

(b) Using a brass bar and hammer, tap in the inner race to the drive shaft.
NOTICE: Be careful not to damage the inner race.

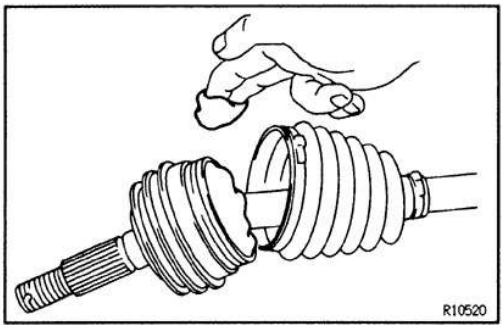


(c) Using a snap ring expander, install a new snap ring.

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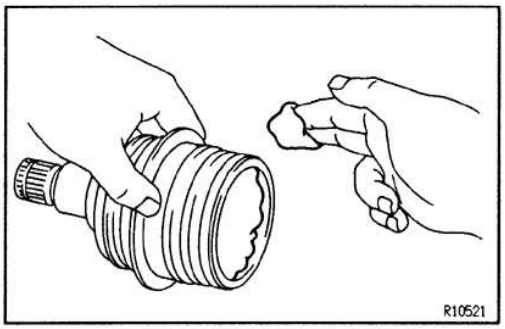
(d) Align the matchmarks placed before assembly.
(e) Install the cage to the inner race.
(f) Install the 6 balls.
HINT: Apply grease onto the balls to keep them from falling.



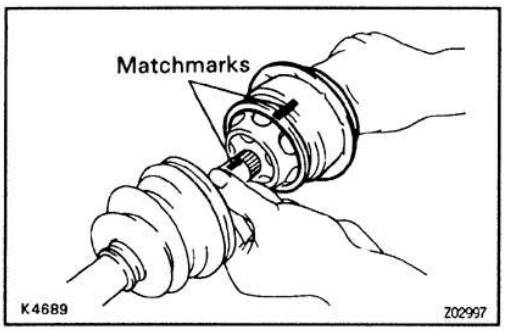
SA

3. PACK BOOTS AND JOINTS WITH GREASE

(a) Pack the outboard joint and boot with grease.
HINT: Use the grease supplied in the boot kit.
Grease capacity (Color=black):
120–140 g (4.2–4.9 oz.)

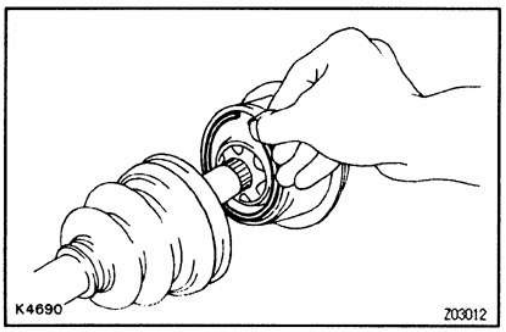


(b) Pack the inboard joint tulip and boot with grease.
HINT: Use the grease supplied in the boot kit.
Grease capacity (Color=yellow ocher):
100–120 g (3.5–4.2 oz.)



4. INSTALL INBOARD JOINT TULIP

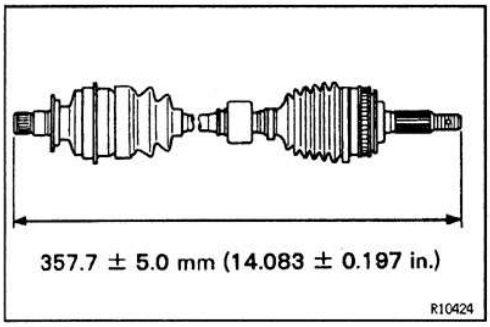
(a) Align the matchmarks placed before assembly.
(b) Install the inboard joint tulip to the drive shaft.



5. INSTALL SNAP RING

Install a new snap ring.

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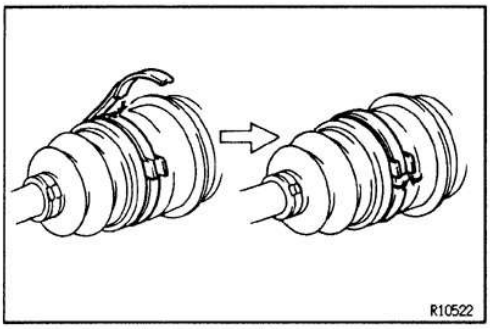
6. ASSEMBLE BOOT CLAMPS TO BOTH BOOTS

(a) Check that the boot is on the shaft groove.

(b) Ensure that the boot is not stretched or contracted when the drive shaft is at standard length.

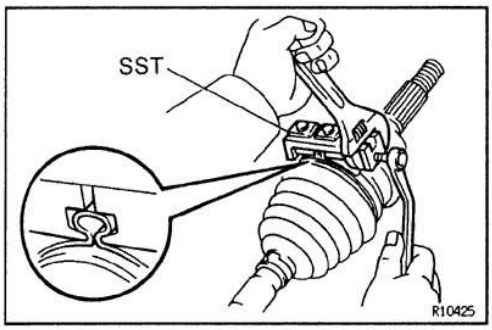
Drive shaft standard length:

357.7 ± 5.0 mm (14.083 ± 0.197 in.)



(c) Using a screwdriver, bend the band and lock the inboard joint boot clamps, as shown in the illustration.

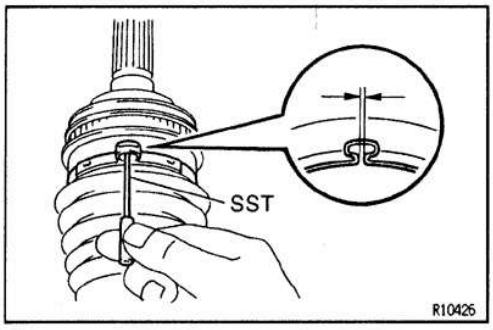
SA



(d) Place SST onto the outboard joint clamp.
SST 09521–24010

(e) Tighten SST so that the clamp is pinched.

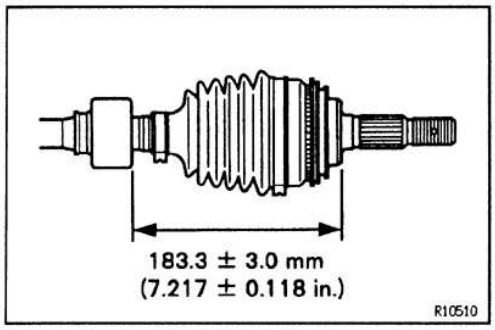
NOTICE: Do not overtighten the SST.



(f) Using SST, adjust the clearance of the clamp.
SST 09240–00020

Clearance:

2.6 ± 1.4 mm (0.102 ±0.055 in.)



7. ASSEMBLE DAMPER CLAMP

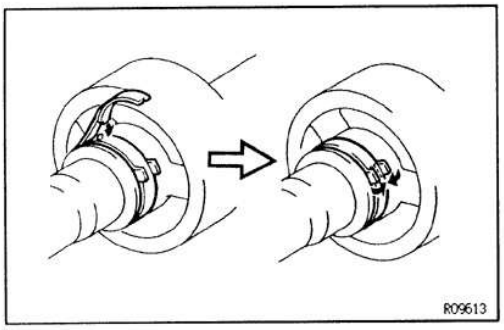
(a) Check that the damper clamp is on the shaft groove.

(b) Check the distance, as shown.

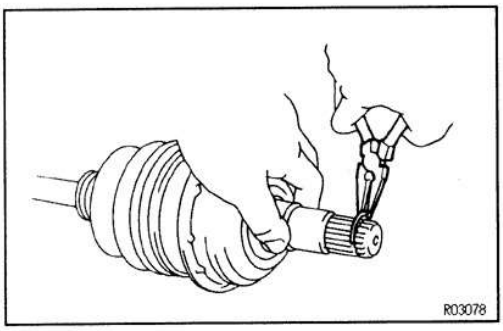
Distance:

183.3 ± 3.0 mm (7.217 ± 0.118 in.)

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(c) Using a screwdriver, bend the band and lock it, as shown in the illustration.



FRONT DRIVE SHAFT INSTALLATION

SA1GL-01

SA

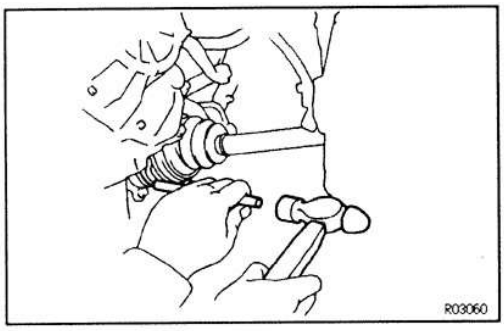
1. INSTALL DRIVE SHAFT

(a) Using pliers, install a new snap ring.

(b) RH drive shaft:
Install a new O–ring.

(c) Coat gear oil to the inboard joint tulip and differential case sliding surface.

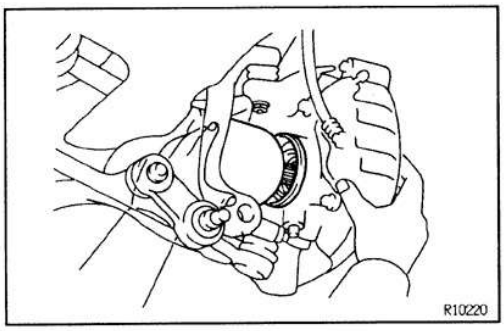
(d) Using a brass bar and hammer, tap in the drive shaft until it makes contact with the pinion shaft.
HINT:
- Before installing the drive shaft, set the snap ring opening side facing downward.
- Whether or not the drive shaft is making contact with the pinion shaft can be known by the sound or feeling when driving it in.



2. CHECK INSTALLATION OF DRIVE SHAFT

(a) Check that there is 2–3 mm (0.08–0.12 in.) of play in axial direction.

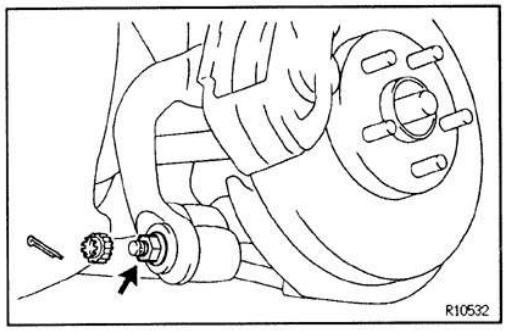
(b) Check that the drive shaft will not come out by trying to pull it completely out by hand.



3. CONNECT DRIVE SHAFT

Install the outboard joint side of the drive shaft to the axle hub.

NOTICE: Be careful not to damage the inner oil seal.

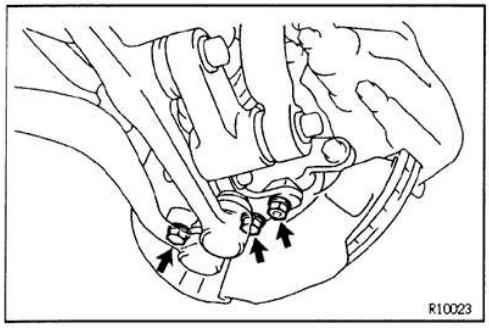


4. CONNECT CAMBER CONTROL ARM

(a) Connect the camber control arm to the shock absorber and tighten the nut.
Torque: 172 N·m (1,750 kgf·cm, 127 ft·lbf)

(b) Install the lock cap and a new cotter pin.

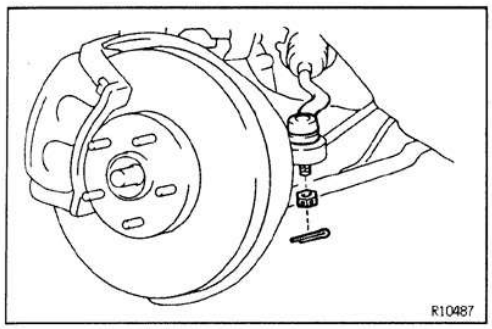
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5. CONNECT LOWER BALL JOINT ATTACHMENT

Connect the lower ball joint attachment to the steering knuckle and tighten the 2 bolts and nut.

Torque: 108 N·m (1,100 kgf·cm, 80 ft·lbf)



6. CONNECT TIE ROD END

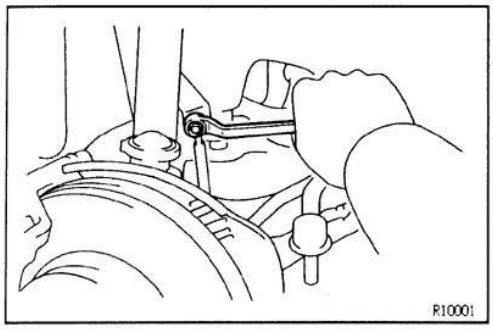
(a) Connect the tie rod end to the steering knuckle and torque the nut.

Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

(b) Install a new cotter pin.

HINT: If the cotter pin hole does not line up, correct by tightening the nut by the smallest amount possible.

SA

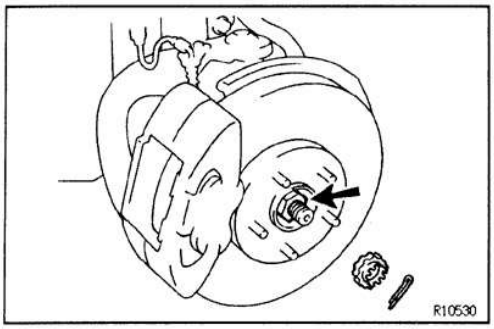


7. CONNECT STABILIZER BAR LINK

Connect the stabilizer bar link to the shock absorbar and tighten the nut.

Torque: 64 N·m (650 kgf·cm, 47 ft·lbf)

HINT: If the ball joint stud turns together with the nut, use a hexagon wrench to hold the stud.



8. INSTALL DRIVE SHAFT LOCK NUT, LOCK NUT CAP AND NEW COTTER PIN

(a) Install and torque the drive shaft lock nut.

Torque: 276 N·m (2,700 kgf·cm, 195 ft·lbf)

(b) Install the lock nut cap and secure it with a new cotter pin.

9. FILL TRANSAXLE WITH FLUID

10. INSTALL ENGINE UNDER COVERS

11. CHECK FRONT WHEEL ALIGNMENT
(See page SA–4)

12. CHECK ABS SPEED SENSOR SIGNAL
(See Pub. No.RM380E, page BR–82)

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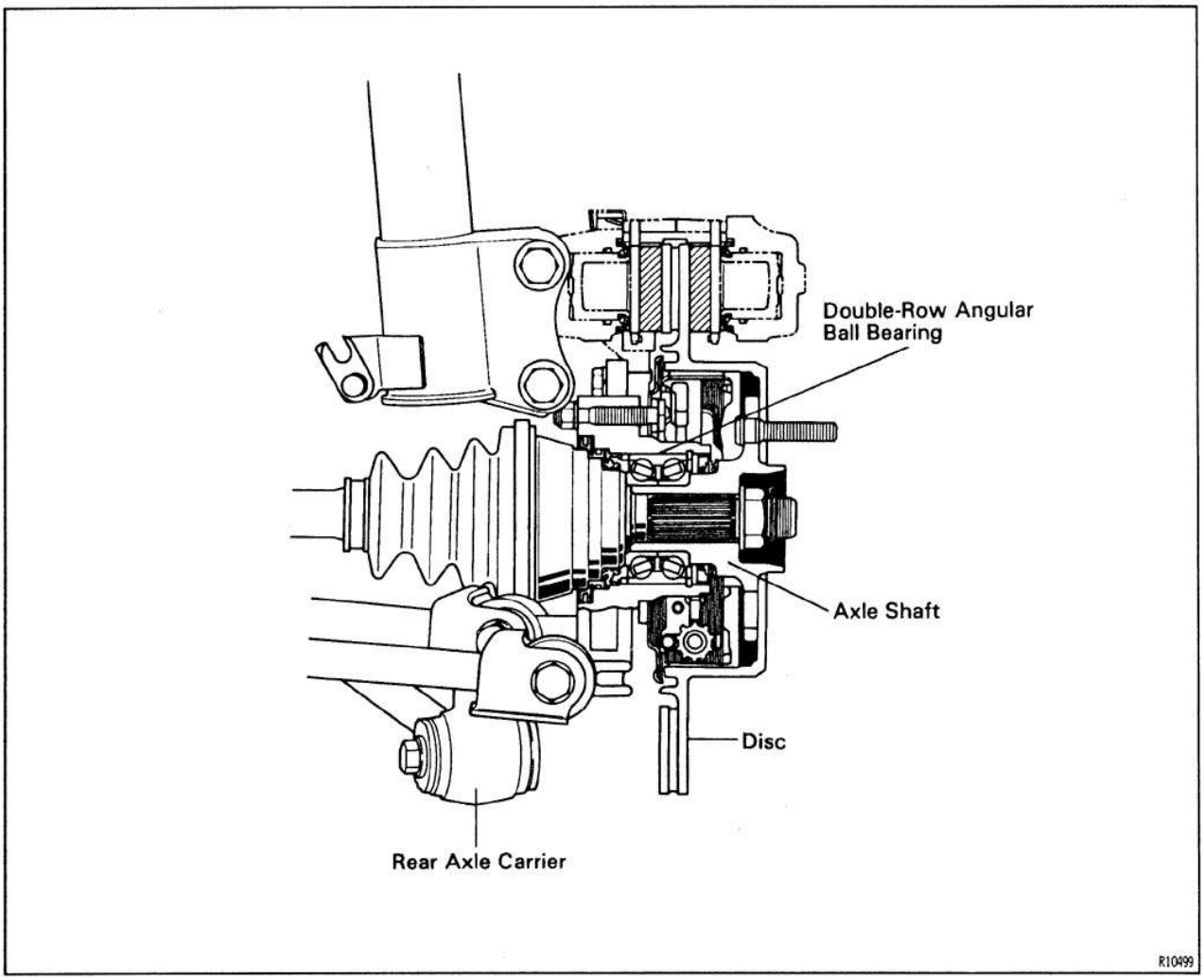
REAR AXLE HUB AND CARRIER

DESCRIPTION

SA037-08

The wheel bearings in the rear axle are of the double—row angular ball bearing type. There is no need for bearing grease maintenance or preload adjustment.

SA

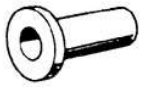
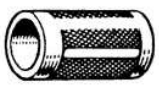


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PREPARATION

SST (SPECIAL SERVICE TOOLS)

SA01U-06

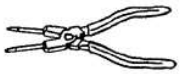
	09308–00010	Oil Seal Puller	
	09608–30012	Front Hub & Drive Pinion Bearing Tool Set	
	(09608–04020)	Handle	
	09608–32010	Steering Knuckle Oil Seal Replacer	
	09309–36010	Transmission Rear Bearing Replacer	
	09631–20040	Oil Seal "B" Replacer	
	09636–20010	Upper Ball Joint Dust Cover Replacer	
	09950–00020	Bearing Remover	
	09950–40010	Puller B Set	

SA

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RECOMMENDED TOOLS

SA01V-05

	09905–00013 Snap Ring Pliers	

EQUIPMENT

SA039-01

Dial indicator	
Torque wrench	

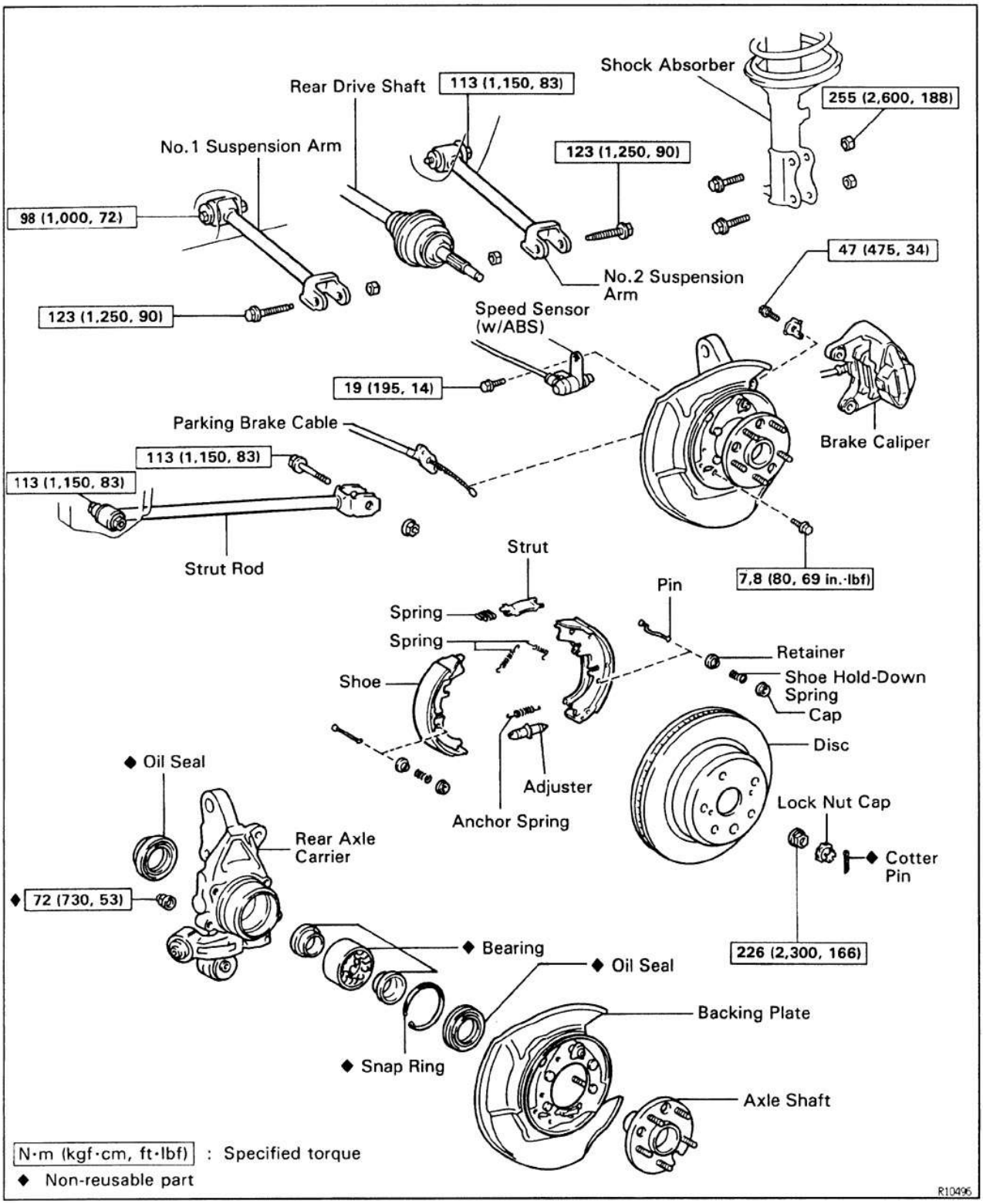
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REAR AXLE HUB AND CARRIER

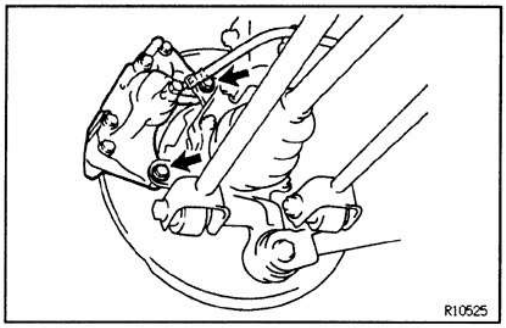
SA03F-0C

COMPONENTS



SA

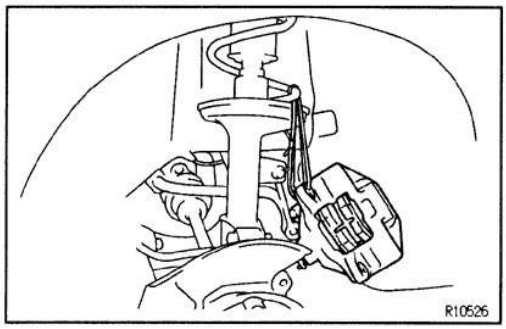
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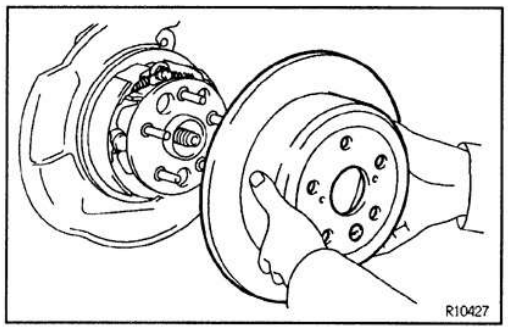
REAR AXLE HUB AND CARRIER REMOVAL SA1QQ-01

1. **JACK UP VEHICLE AND REMOVE REAR WHEEL**
2. **REMOVE BRAKE CALIPER AND DISC**

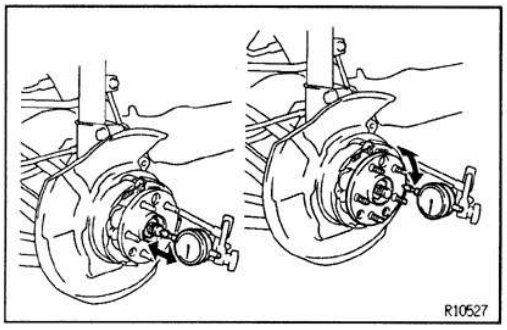
(a) Remove the 2 brake caliper set bolts.



(b) Support the brake caliper securely.



(c) Remove the disc.



3. **CHECK BEARING BACKLASH AND AXLE HUB DEVIATION**

(a) Place the dial indicator near the center of the drive shaft and check the backlash in the bearing shaft direction.

Maximum:

0.05 mm (0.0020 in.)

If greater than the specified maximum, replace the bearing.

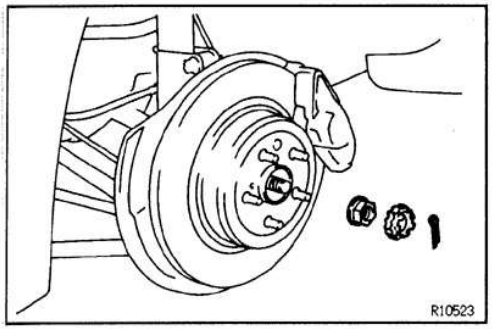
(b) Using a dial indicator, check the deviation at the surface of the axle hub outside the hub bolt.

Maximum:

0.07 mm (0.0028 in.)

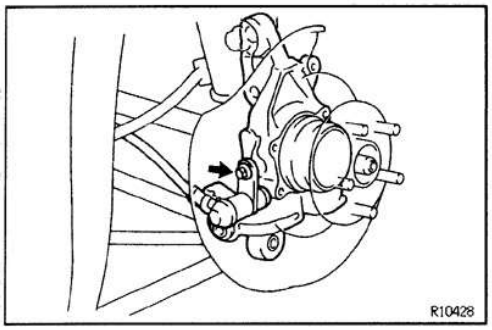
If greater then the specified maximum, replace the axle shaft and bearing.

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4. REMOVE DRIVE SHAFT LOCK NUT

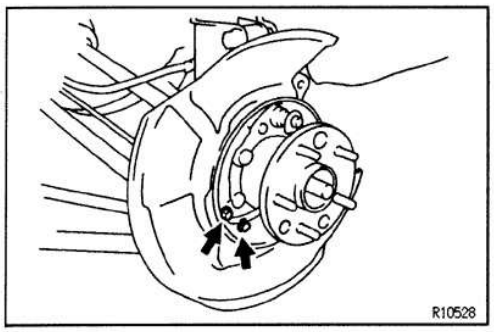
(a) Install the disc.
(b) Install the brake caliper with the 2 bolts.
Torque: 47 N·m (475 kgf·cm, 34 ft·lbf)
(c) Remove the cotter pin and lock cap.
(d) While applying the brakes, remove the nut.
(e) Remove the brake caliper and disc.



5. REMOVE ABS SPEED SENSOR

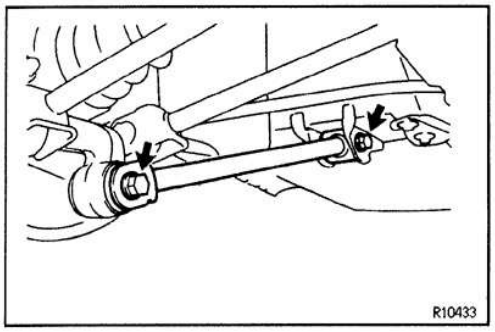
Remove the bolt and ABS speed sensor from the axle carrier.

6. DISASSEMBLE PARKING BRAKE
(See Pub No.RM380E, page BR–60)



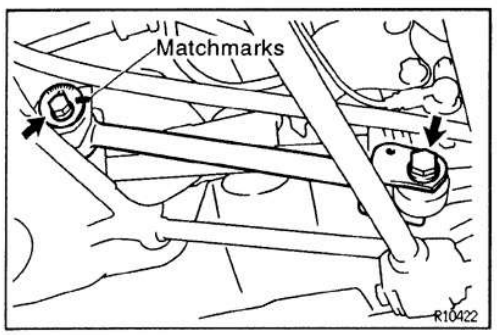
7. DISCONNECT PARKING BRAKE CABLE

Remove the 2 bolts and disconnect parking brake cable from the backing plate.



8. DISCONNECT STRUT ROD

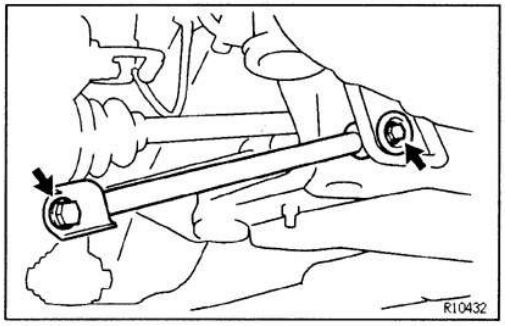
(a) Loosen the strut rod front bolt.
(b) Remove the strut rod rear bolt and nut.
(c) Disconnect the strut rod from the axle carrier.



9. DISCONNECT NO. 1 SUSPENSION ARM.

(a) Place matchmarks on the toe adjusting cam and suspension member.
(b) Loosen the toe adjusting cam nut.
(c) Remove the No.1 suspension arm set bolt and nut from the axle carrier.
(d) Disconnect the No.1 suspension arm from the axle carrier.

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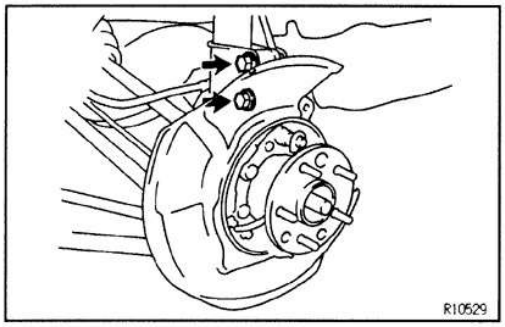


10. DISCONNECT NO.2 SUSPENSION ARM.

(a) Loosen the No.2 suspension arm set bolt from the suspension member.

(b) Remove the No.2 suspension arm set bolt and nut from the axle carrier.

(c) Disconnect the No.2 suspension arm from the axle carrier.



11. REMOVE REAR AXLE HUB AND CARRIER

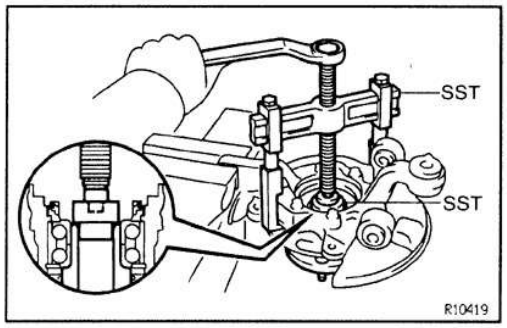
(a) Remove the 2 bolt and nut.

(b) Remove the rear axle carrier with axle hub.

SA

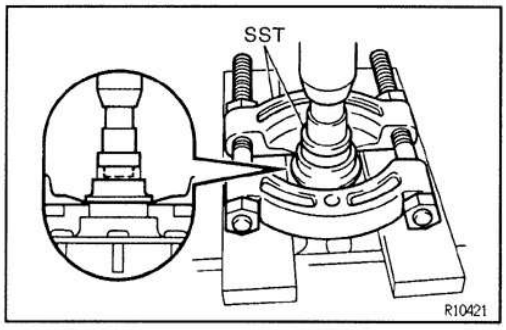
8A1GM-01

REAR AXLE HUB AND CARRIER DISASSEMBLY

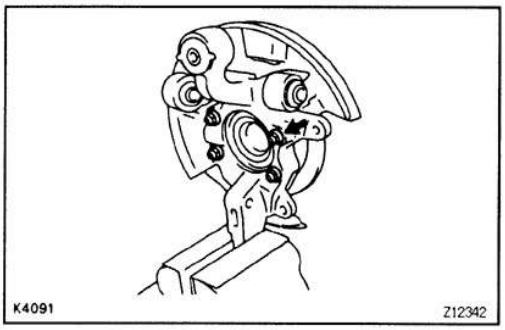


1. REMOVE AXLE SHAFT FROM AXLE CARRIER

(a) Using SST, remove the axle shaft from the axle carrier.
SST 09631 – 20040, 09950 – 40010



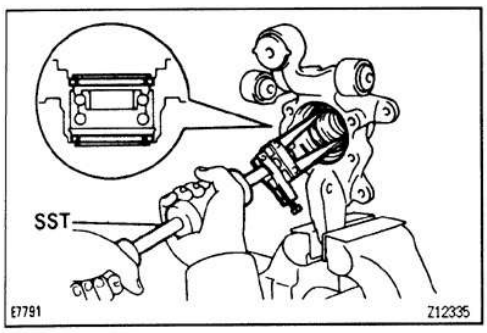
(b) Using SST and a press, remove the inner race from the axle shaft.
SST 09631 – 20040, 09950 – 00020



2. DISCONNECT BACKING PLATE

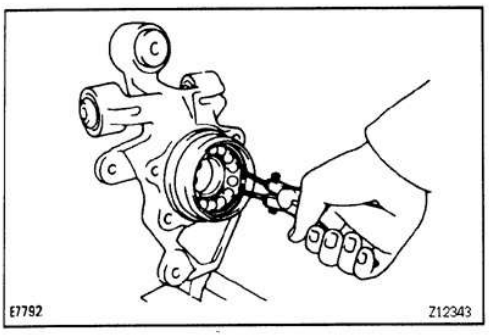
Remove the 4 nuts and disconnect backing plate.

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3. REMOVE INNER AND OUTER OIL SEALS

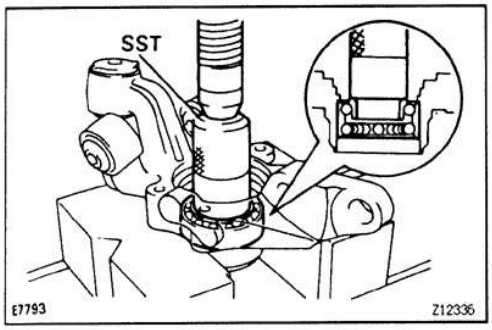
Using SST, remove the oil seal from the axle carrier.
SST 09308–00010



4. REMOVE SNAP RING

Using snap ring pliers, remove the snap ring from the axle carrier.

SA

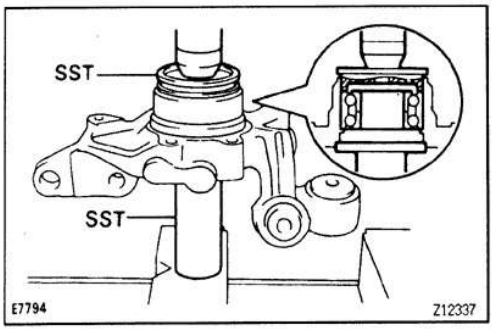


5. REMOVE BEARING

Using SST, remove the bearing from the axle carrier.
SST 09636–20010

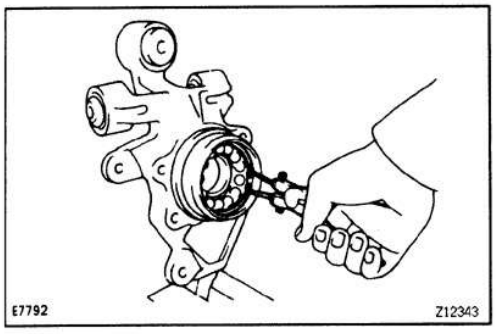
SA1GN–01

REAR AXLE HUB AND CARRIER ASSEMBLY



1. INSTALL AXLE BEARING

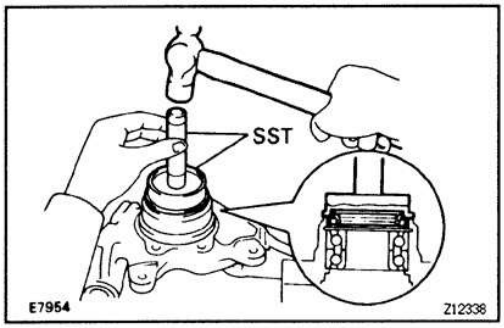
(a) Using SST and a press, install a new bearing.
SST 09309–36010, 09608–32010



2. INSTALL SNAP RING

Using a snap ring pliers, install a new snap ring.

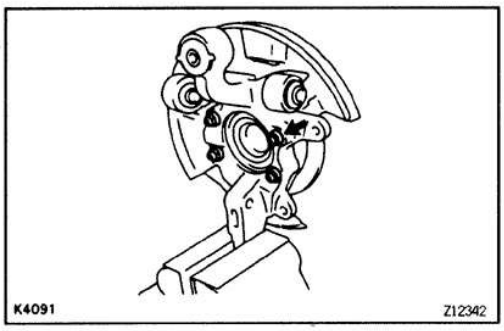
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3. INSTALL OUTER OIL SEAL

(a) Using SST, install a new oil seal.
SST 09608–30012 (09608–04020),
09608–32010

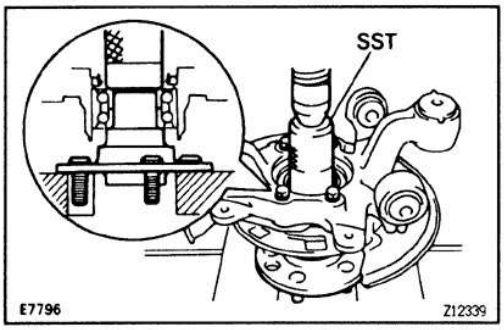
(b) Apply MP grease to the oil seal lip.



SA

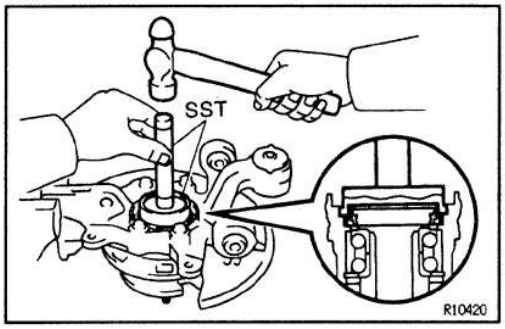
4. INSTALL BACKING PLATE

Install the backing plate with 4 new nuts.
Torque: 72 N·m (730 kgf·cm, 53 ft·lbf)



5. INSTALL AXLE SHAFT

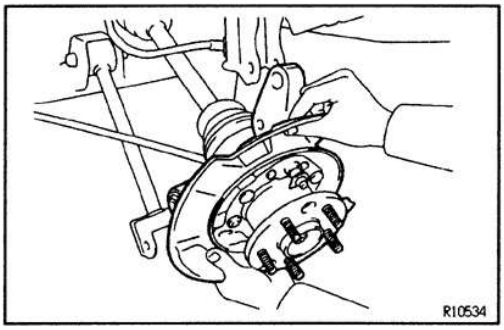
Using SST and a press, install the axle shaft.
SST 09636–20010



6. INSTALL INNER OIL SEAL

(a) Using SST, install a new oil seal.
SST 09608–30012 (09608–04020),
09608–32010

(b) Apply MP grease to the oil seal lip.



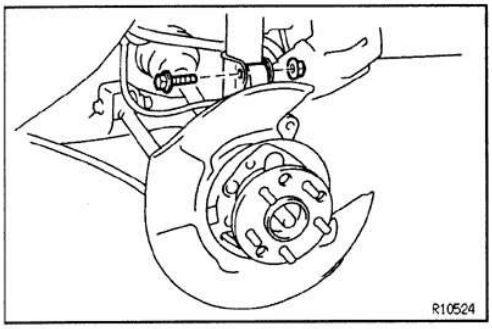
REAR AXLE SHAFT AND CARRIER INSTALLATION

1. INSTALL REAR AXLE HUB AND CARRIER

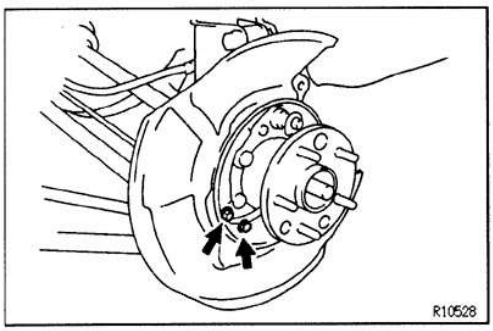
(a) Install the axle hub and carrier to the drive shaft.
NOTICE: Be careful not to damage the oil seal and drive shaft boot.

(b) Place the No.1 and No.2 suspension arms to the axle carrier and temporaily install the bolts and nuts.

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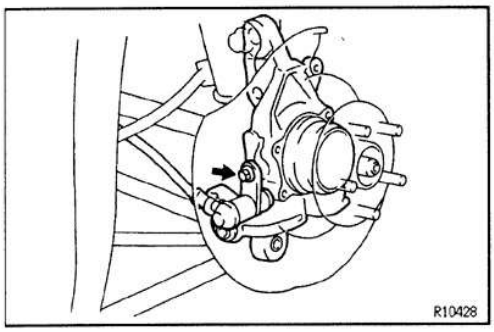


(b) Connect the axle carrier to the shock absorber with the 2 bolt and nuts.
Torque: 255 N·m (2,600 kgf·cm, 188 ft·lbf)



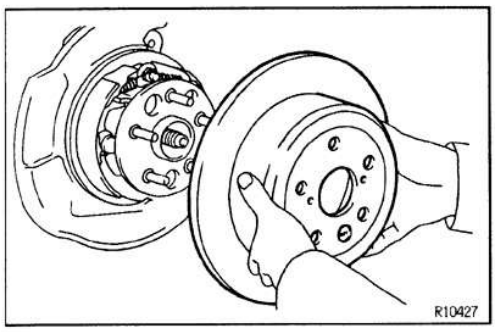
2. CONNECT PARKING BRAKE CABLE
Connect the parking brake cable with the 2 bolts.
Torque: 7.8 N·m (80 kgf·cm, 69 in.·lbf)

SA

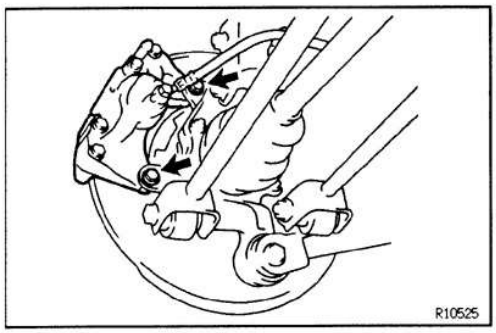


3. INSTALL ABS SPEED SENSOR
Install the ABS speed sensor to the rear axle carrier.
Torque: 19 N·m (195 kgf·cm, 14 ft·lbf)

4. ASSEMBLE PARKING BRAKE
(See Pub. No.RM380E, page BR–60)

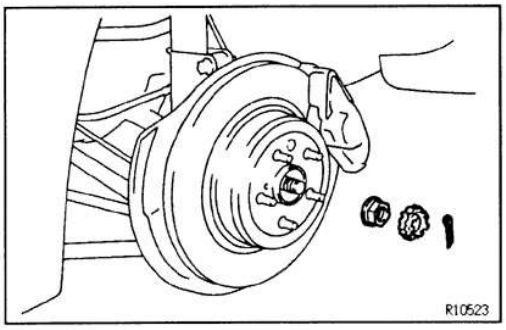


5. INSTALL DISC AND BRAKE CALIPER
(a) Install the disc to the axle shaft.



(b) Install the brake caliper with the 2 bolts.
Torque: 47 N·m (475 kgf·cm, 34 ft·lbf)

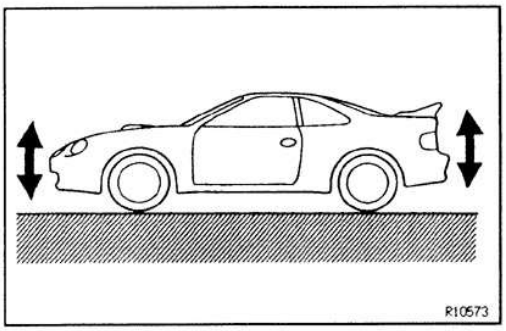
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6. INSTALL DRIVE SHAFT LOCK NUT

(a) While applying the brakes, install and torque the lock nut.
Torque: 226 N·m (2,300 kgf·cm, 166 ft·lbf)

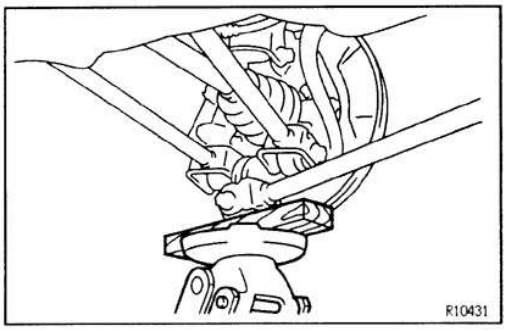
(b) Install the lock cap and new cotter pin.



7. STABILIZE SUSPENSION

(a) Install the rear wheel and lower the vehicle.
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

(b) Bounce the vehicle up and down several times to stabilize the suspension.

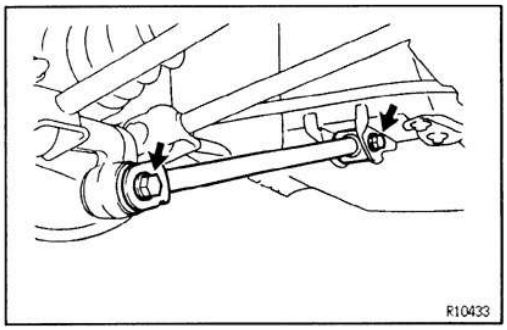


8. TORQUE BOLTS AND NUT

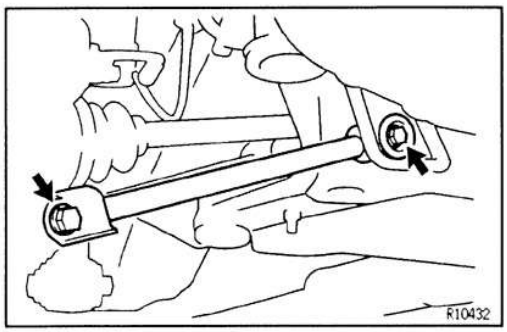
(a) Jack up vehicle and support the body with stands.

(b) remove rear wheel.

(c) Support the rear axle carrier with a jack.

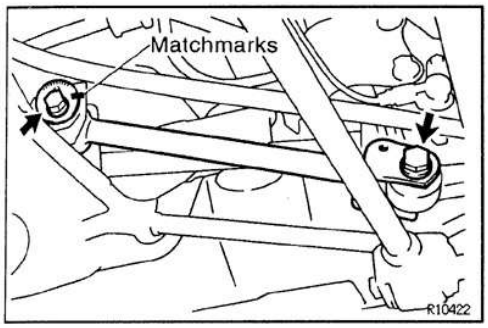


(d) Torque the 2 strut bar set bolts.
Torque: 113 N·m (1,150 kgf·cm, 83 ft·lbf)



(e) Torque the No.2 suspension arm set bolt and nut.
Torque:
Suspension member side:
113 N·m (1,150 kgf·cm, 83 ft·lbf)
Axle carrier side:
123 N·m (1,250 kgf·cm, 90 ft·lbf)

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(f) Torque the No.1 suspension arm set bolt of the axle carrier side.
Torque: 123 N·m (1,250 kgf·cm, 90 ft·lbf)

(g) Align the matchmarks and torque the toe adjusting cam.
Torque: 98 N·m (1,000 kgf·cm, 72 ft·lbf)

9. INSTALL REAR WHEEL AND LOWER VEHICLE
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

10. CHECK AND ADJUST REAR WHEEL ALIGNMENT
(See page SA–6)

11. CHECK ABS SPEED SENSOR SIGNAL
(See Pub. No.RM380E, page BR–82)

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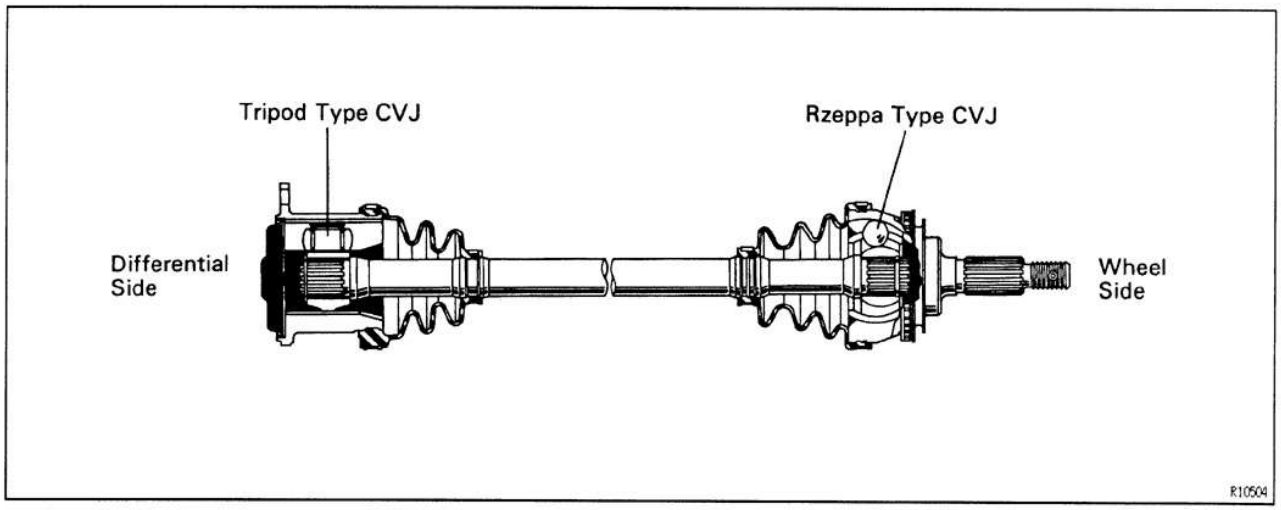
REAR DRIVE SHAFT

DESCRIPTION

SA08A-02

The drive shaft has a tripod type CVJ (Constant Velocity Joint) on the differential side and Rzeppa type CVJ on the wheel side.

SA

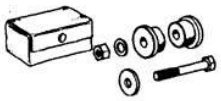


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PREPARATION

SST (SPECIAL SERVICE TOOLS)

SA02E-0A

	09608-16041 Front Hub Bearing Adjusting Tool	
	(09608-02020) Bolt & Nut	
	(09608-02040) Retainer	

SA

RECOMMENDED TOOLS

SA02F-02

	09905-00012 Snap Ring No. 1 Expander	For removing and installing snap ring

EQUIPMENT

SA02G-02

Torque wrench	

LUBRICANT

SA02H-0J

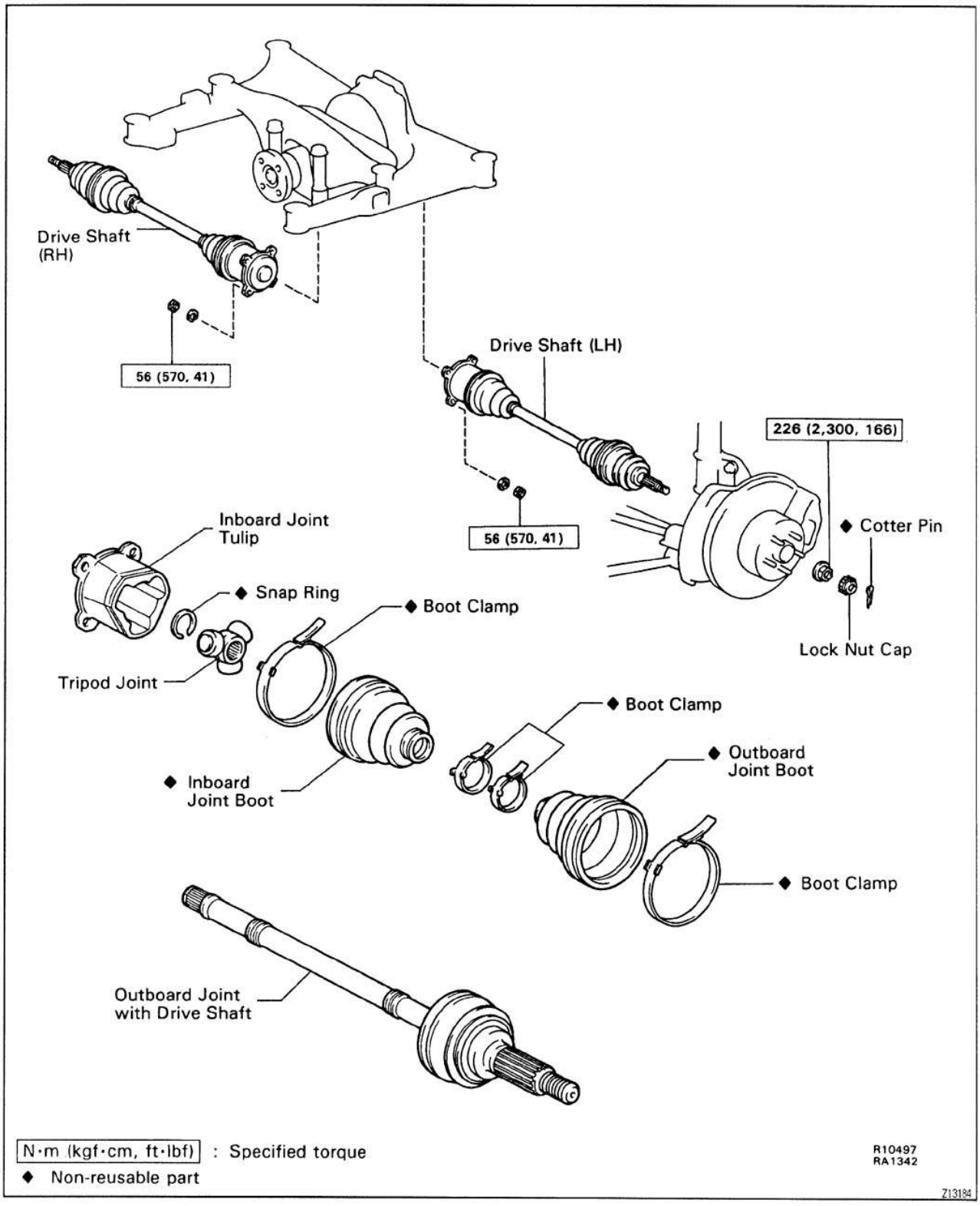
Item	Capacity	Classification
Outboard joint grease	120-130 g (4.2-4.6 oz.)	
Inboard joint grease	215-225 g (7.6-7.9 oz.)	

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REAR DRIVE SHAFT
COMPONENTS

BA007-08

SA



N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

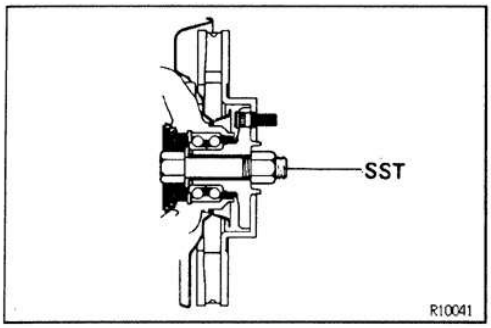
R10497
RA1342

Z13184

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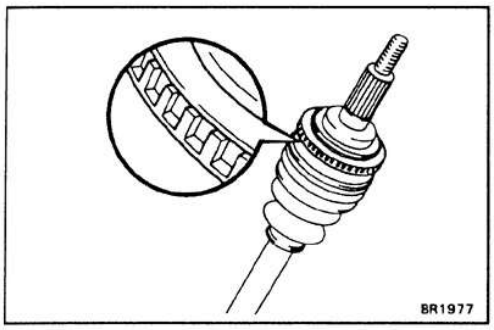
SA1GR-01

REAR DRIVE SHAFT REMOVAL



NOTICE: The hub bearing could be damaged if it is subjected to the vehicle weight, such as when moving the vehicle with the drive shaft removed. Therefore, if it is absolutely necessary to place the vehicle weight on the hub bearing, first support it with SST.

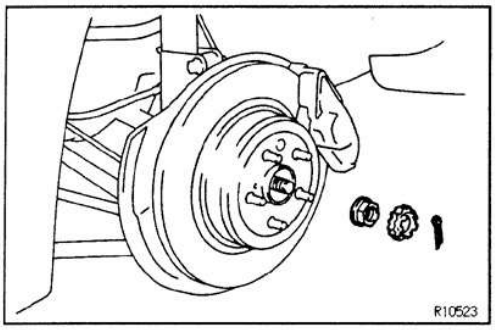
SST 09608–16041 (09608–02020, 09608–02040)



After disconnecting the drive shaft from the axle hub, work carefully so as not to damage the sensor rotor serrations on the drive shaft.

SA

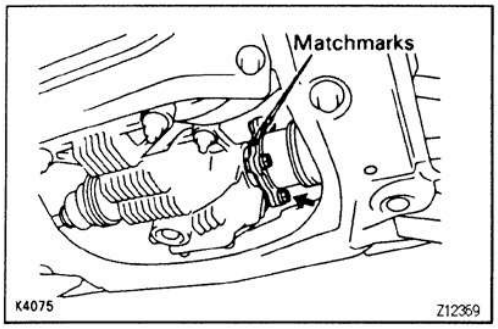
1. **JACK UP VEHICLE AND REMOVE REAR WHEEL**



2. **REMOVE DRIVE SHAFT LOCK NUT**

(a) Remove the cotter pin and lock nut cap.

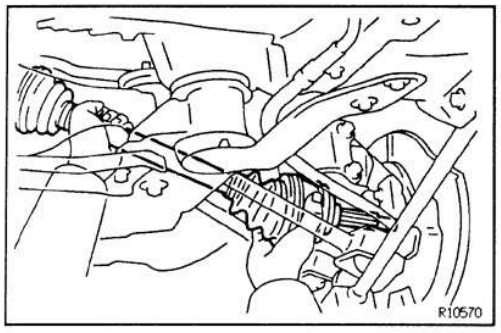
(b) Loosen the bearing lock nut while depressing the brake pedal.



3. **REMOVE DRIVE SHAFT**

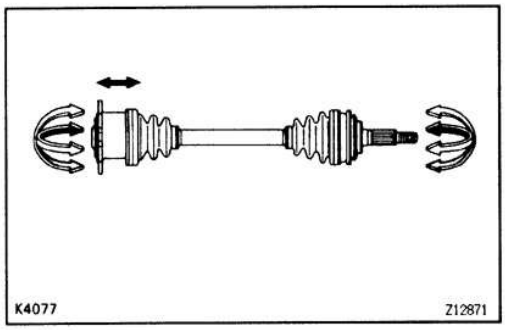
(a) Place the matchmarks on the drive shaft and differential side gear shaft.

(b) Remove the 4 nuts and disconnect the drive shaft from the differential side gear shaft.



(c) Remove the drive shaft from the axle carrier.
HINT: Push the axle carrier towards the outside of vehicle, and separate the drive shaft from the axle carrier.

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REAR DRIVE SHAFT DISASSEMBLY

1. **CHECK DRIVE SHAFT**

(a) Check to see that there is no play in the outboard joint.

(b) Check to see that the inboard joint slides smoothly in the thrust direction.

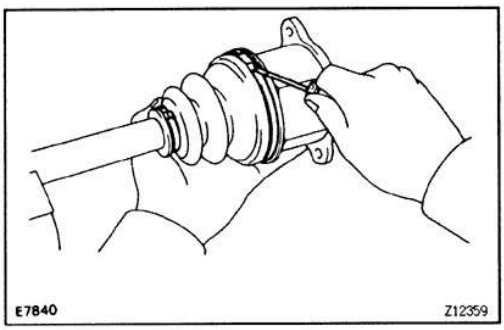
(c) Check to see that there is no noticeable play in the radial direction of the inboard joint.

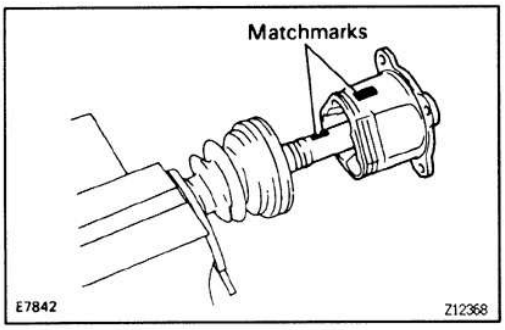
(d) Check for damage to the boots.

2. **REMOVE INBOARD JOINT BOOT CLAMPS**

(a) Using a screwdriver, remove the 2 boot clamps.

(b) Slide the inboard joint boot toward the outboard joint.

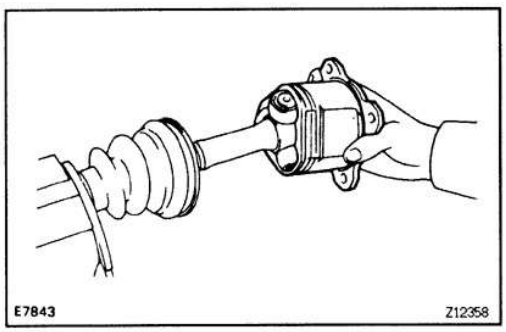




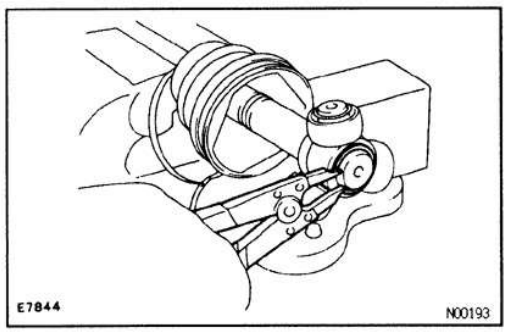
3. **REMOVE INBOARD JOINT TULIP**

(a) Place matchmarks on the inboard joint tulip and drive shaft.

NOTICE: Do not punch the marks.



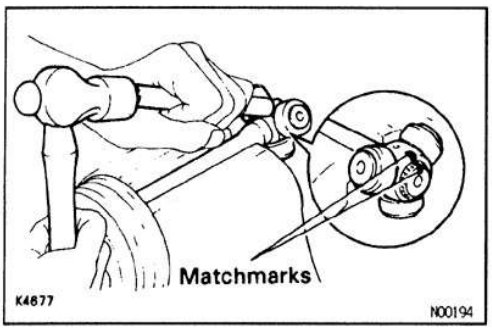
(b) Remove the inboard joint tulip from the drive shaft.



4. **REMOVE TRIPOD JOINT**

(a) Using a snap ring expander, remove the snap ring.

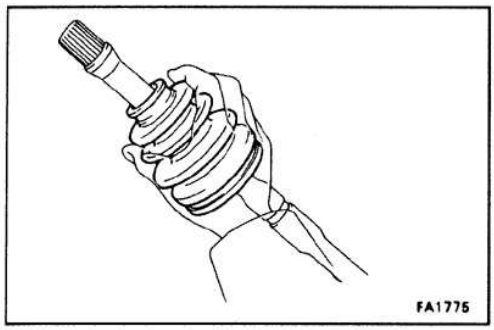
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(b) Place matchmarks on the shaft and tripod.
NOTICE: Do not punch the marks.

(c) Using a brass bar and hammer, remove the tripod joint from the drive shaft.
NOTICE: Do not tap the roller.

5. REMOVE INBOARD JOINT BOOT

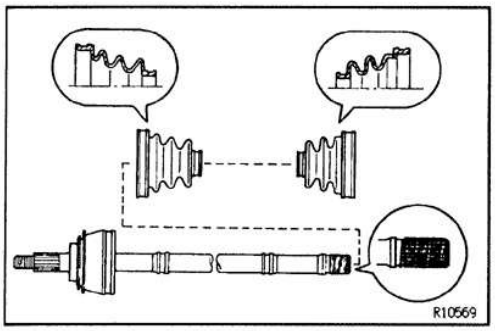


6. REMOVE OUTBOARD JOINT BOOT

(a) Using a screwdriver, remove the 2 boot clamps from the outboard joint boot.

(b) Remove the boot from the outboard joint.
NOTICE: Do not disassemble the outboard joint.

SA



REAR DRIVE SHAFT ASSEMBLY

SA19T-01

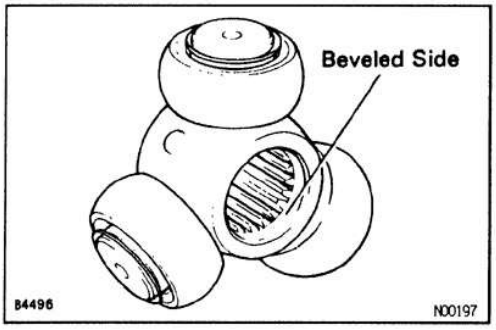
1. TEMPORARILY INSTALL BOOTS
HINT: Before installing the outboard joint boot, wrap vinyl tape around the spline of the drive shaft to prevent damaging the boots.

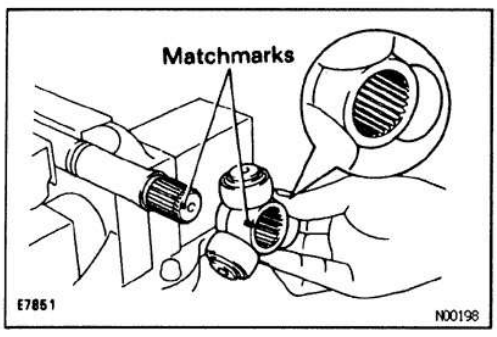
(a) Temporarily install a new outboard joint boot to the drive shaft.

(b) Temporarily install a new inboard joint boot to the drive shaft.

2. INSTALL TRIPOD JOINT

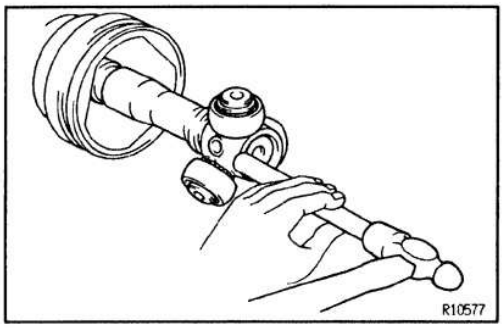
(a) Place the beveled side of the tripod joint axial spline toward the outboard joint.



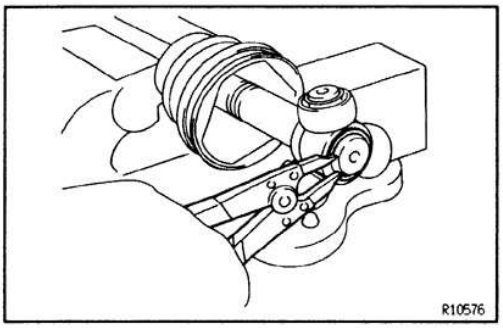


(b) Align the matchmarks placed before removal.

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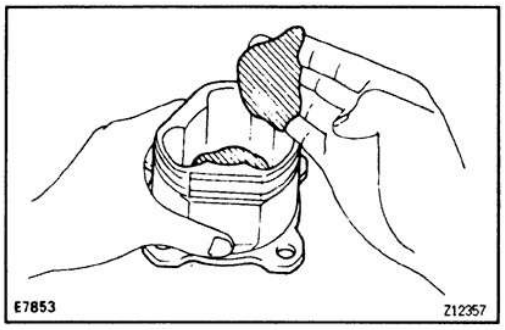


(c) Using a brass bar and hammer, tap in the tripod joint to the drive shaft.
NOTICE: Do not tap the roller.



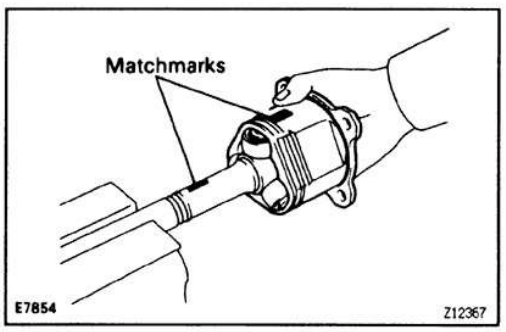
(d) Using a snap ring expander, install a new snap ring.

SA

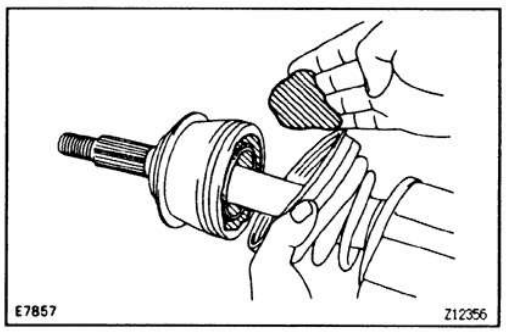


3. INSTALL INBOARD JOINT TULIP

(a) Pack the inboard joint tulip and boot with grease.
HINT: Use the grease supplied in the boot kit.
Grease capacity:
215–225 g (7.6–7.9 oz.)



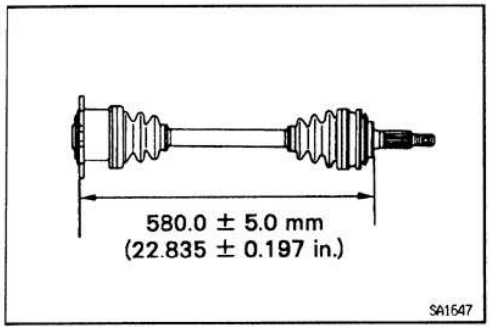
(b) Align the matchmarks placed before disassembly.
(c) Install the inboard joint tulip to the drive shaft.



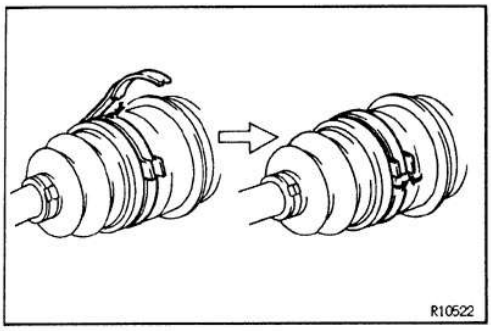
4. ASSEMBLE BOOT CLAMPS TO BOTH BOOTS

(a) Before assembling the boots, pack the outboard joint and boot with grease.
HINT: Use the grease supplied in the boot kit.
Grease capacity:
120–130 g (4.2–4.6 oz.)

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(b) Check that the boots are on the shaft groove.
(c) Ensure thst the boot is not strethed or cntracted when the drive shaft is at standard length.
Standard length:
580.0 ± 5.0 mm (22.835 ± 0.197 in.)

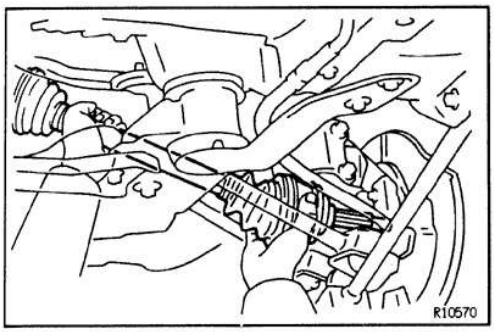


(d) Using a screwdriver, bend the band and lock the boot clamps, as shown in the illustration.

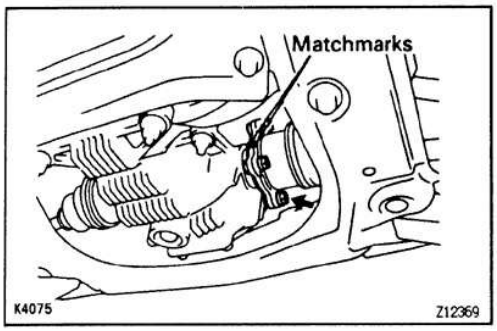
SA

REAR DRIVE SHAFT INSTALLATION

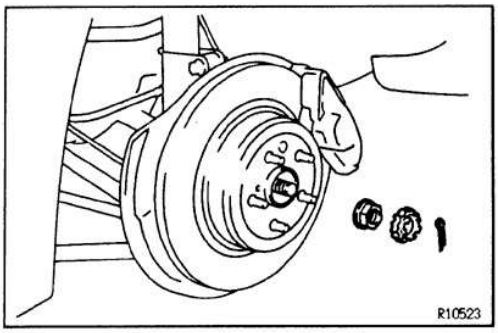
SA1GU-01



1. INSTALL DRIVE SHAFT
(a) Install the drive shaft to the axle carrier.
HINT: Be careful not to damage the boots and ABS speed sensor rotor.



(b) Align the matchmarks and connect the drive shaft to the side gear shaft with the 4 nuts.
Torque: 56 N·m (570 kgf·cm, 41 ft·lbf)



2. INSTALL LOCK NUT
(a) Install and torque the lock nut.
Torque: 226 N·m (2,300 kgf·cm, 166 ft·lbf)
(b) Install the lock cap and secure it with a new cotter pin.
3. INSTALL REAR WHEEL AND LOWER VEHICLE
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
4. CHECK ABS SPEED SENSOR SIGNAL
(See Pub. No.RM380E, page BR–82)

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REAR DIFFERENTIAL

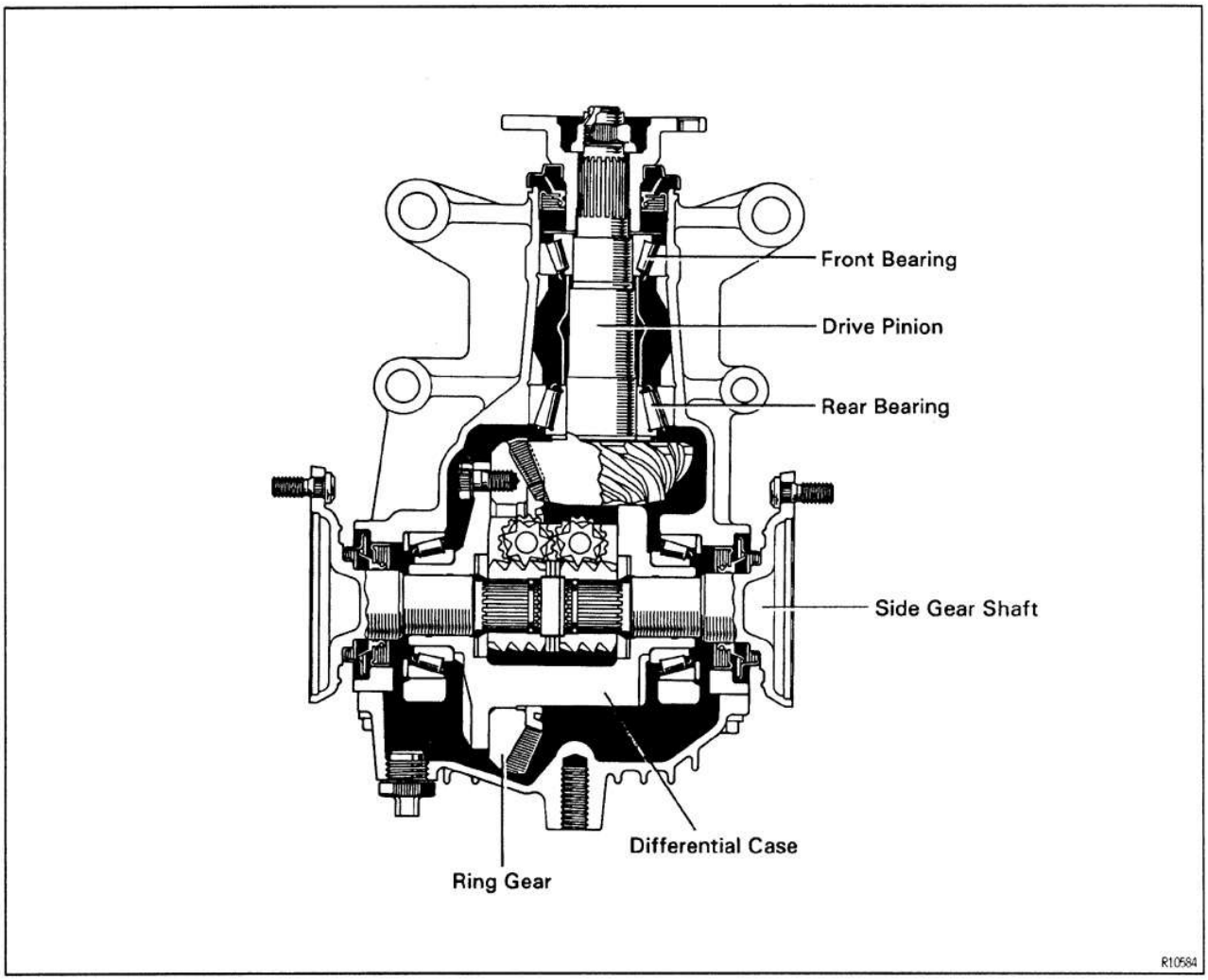
DESCRIPTION

SA091-08

The differential used the Torque Sensing LSD (Limited Slip Differential) type.
The Torque Sensing LSD has the following features:

- Good traction by high bias ratio design
- Quick response and minimum time lag until differential limiting force is generated
- A compact differential case sub–assembly that is interchangeable with the normal differential
- It has been designed to be lubricated by conventional differential oil.
  Special LSD oil must not be used.

SA

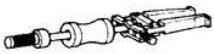
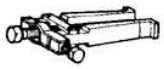
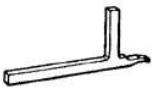
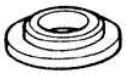
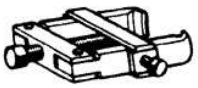


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PREPARATION

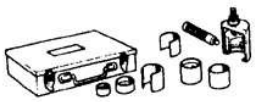
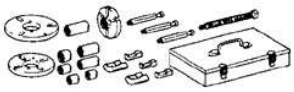
SST (SPECIAL SERVICE TOOLS)

SA092-06

	09308–00010 Oil Seal Puller	
	09308–10010 Oil Seal Puller	
	09330–00021 Companion Flange Holding Tool	
	09504–22011 Differential Side Bearing Replacer	
	09506–30012 Differential Drive Pinion Rear Bearing Cone Replacer	
	09520–24010 Differential Side Gear Shaft Puller	
	09550–22011 Rear Axle Bearing & Differential Tool Set	
	(09550–00020) Handle	
	(09550–00031) Replacer	
	09554–22010 Differential Oil Seal Replacer	
	09556–22010 Drive Pinion Front Bearing Remover	
	09608–30012 Front Hub & Drive Pinion Bearing Tool Set	
	(09608–04020) Handle	

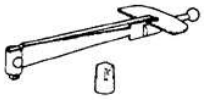
SA

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	(09608–04100) Drive Pinion Front Bearing Cup Replacer	
	(09608–06110) Front Hub Inner & Drive Pinion Front Bearing Cup Replacer	
	09710–22020 Front Suspension Bushing Tool Set	
	(09710–01030) Upper Arm Bushing Replacer	
	09950–00020 Bearing Remover	
	09950–30010 Puller A Set	

SA

RECOMMENDED TOOLS

	09025–00010 Small Torque Wrench	Differential preload

EQUIPMENT

Dial indicator with magnetic base
Micrometer
Torque wrench

LUBRICANT

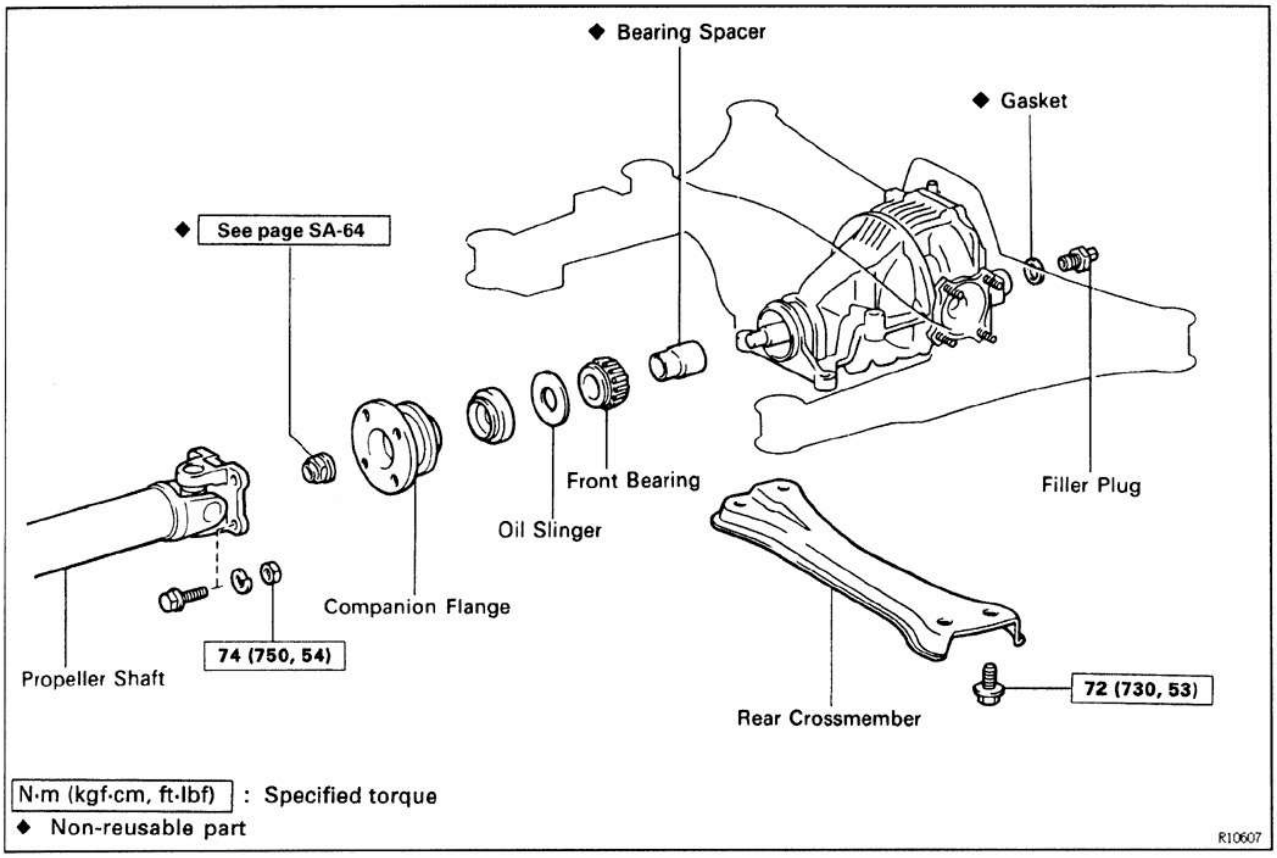
Item	Capacity	Classification
Differential oil	1.1 liters (1.2 US qts, 1.0 Imp.qts)	API GL–5 Hypoid gear oil [Above – 18 °C (0 °F)] SAE 90 [Below – 18 °C (0 °F)] SAE 80W or 80W–90

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ON–VEHICLE REPAIR

COMPONENTS

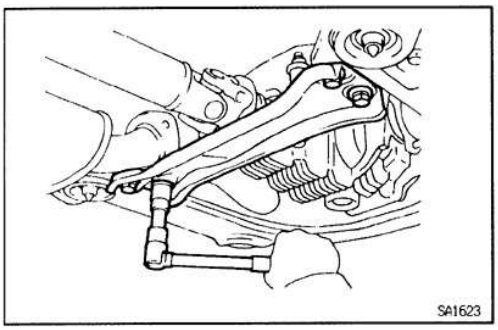
SA097-04



SA

SA1QV-01

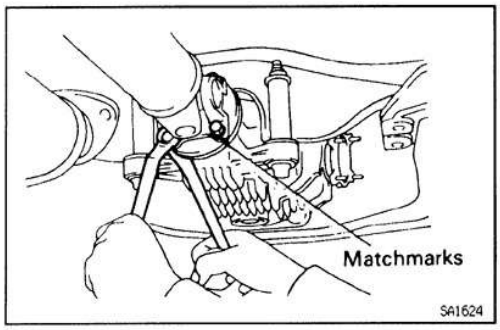
FRONT OIL SEAL REPLACEMENT



1. DRAIN DIFFERENTIAL OIL

2. DISCONNECT PROPELLER SHAFT

(a) Remove the 4 bolts and rear crossmember.

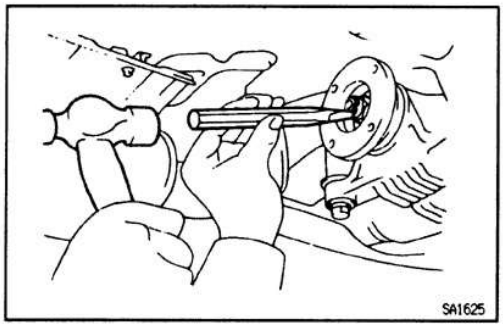


(b) Place matchmarks on the flanges.

(c) Remove the 4 bolts, washers and nuts.

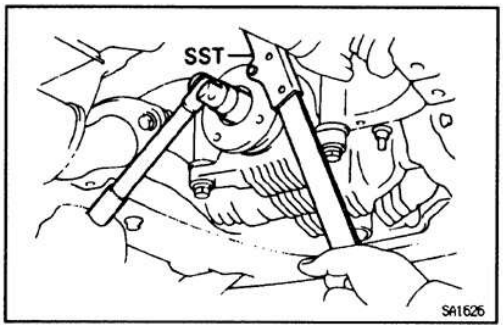
(d) Disconnect the propeller shaft and support it securely.

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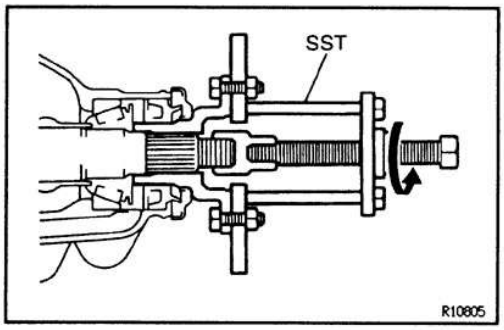


3. REMOVE COMPANION FLANGE

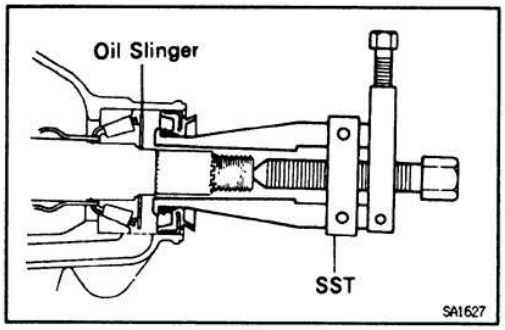
(a) Using a chisel and hammer, unstake the staked part of the nut.



(b) Using SST to hold the flange, remove the nut.
SST 09330–00021



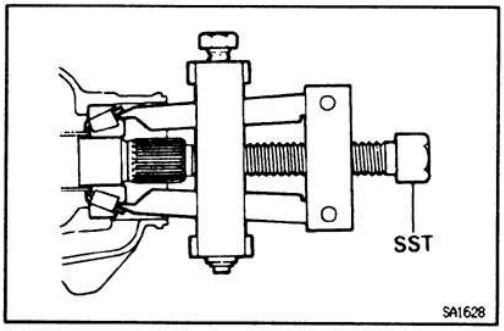
(c) Using SST, remove the companion flange.
SST 09950–30010



4. REMOVE FRONT OIL SEAL AND OIL SLINGER

(a) Using SST, remove the oil seal.
SST 09308–10010

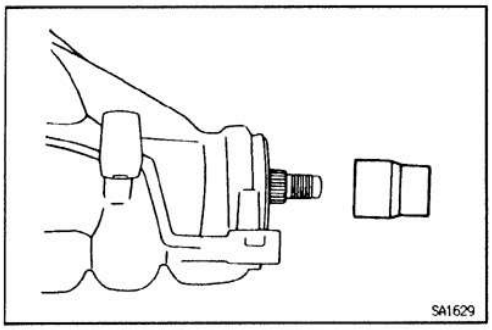
(b) Remove the oil slinger.



5. REMOVE FRONT BEARING AND BEARING SPACER

(a) Using SST, remove the front bearing.
SST 09556–22010

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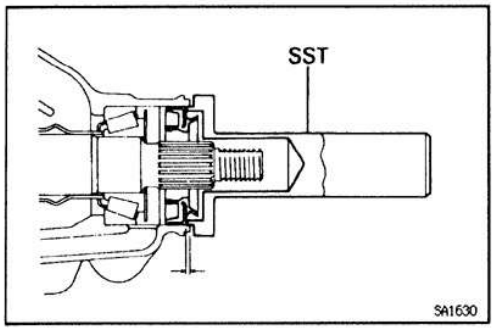


(b) Remove the bearing spacer.

6. INSTALL NEW BEARING SPACER AND FRONT BEARING

(a) Install a new bearing spacer on the shaft.

(b) Install the front bearing on the shaft.



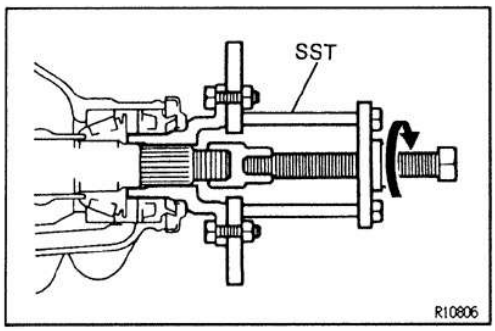
7. INSTALL OIL SLINGER AND NEW OIL SEAL

(a) Install the oil slinger.

(b) Using SST, drive in a new oil seal.
SST 09554–22010
Oil seal drive in depth:
2.0 mm (0.079 in.)

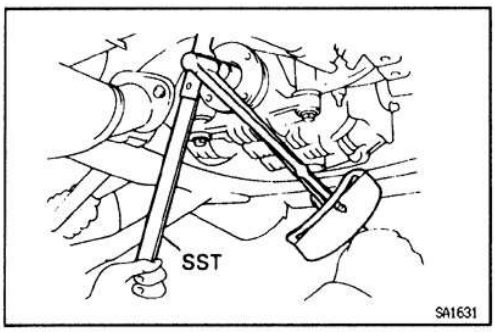
(c) Apply MP grease to the oil seal lip.

SA



8. INSTALL COMPANION FLANGE

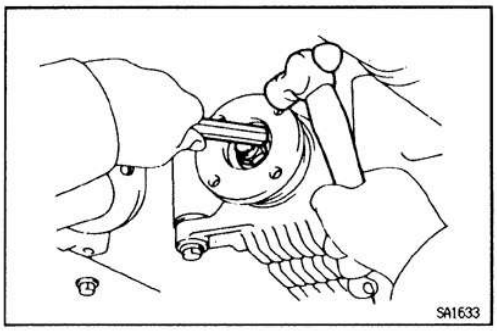
(a) Using SST, install the companion flange on the shaft.
SST 09950–30010



(b) Coat the threads of a new nut with MP grease.

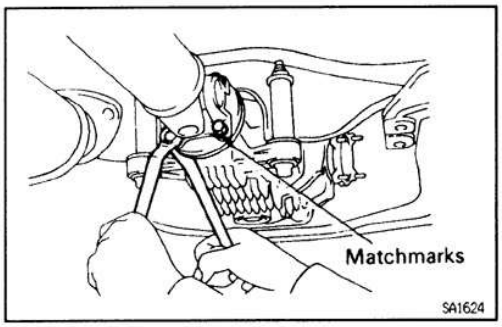
(c) Using SST to hold the flange, torque the nut.
SST 09330–00021
Torque: 108 N·m (1,100 kgf·cm, 80 ft·lbf)

(d) Adjust the drive pinion bearing preload.
(See page SA–64)



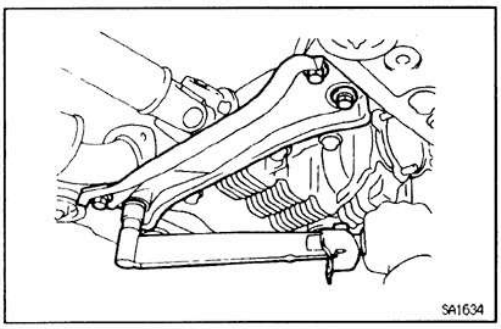
9. STAKE DRIVE PINION NUT

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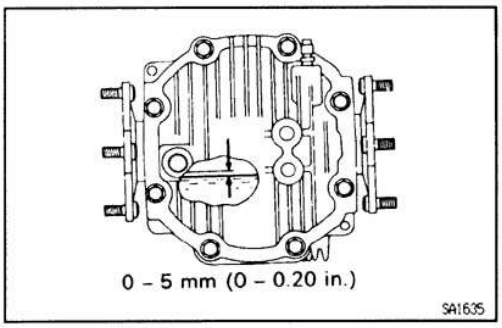


10. CONNECT PROPELLER SHAFT

(a) Align the matchmarks on the flanges and connect the propeller shaft with the 4 bolts, washers and nuts.
Torque: 74 N·m (750 kgf·cm, 54 ft·lbf)



(b) Install the rear crossmember with the 4 bolts.
Torque: 72 N·m (730 kgf·cm, 53 ft·lbf)



11. FILL DIFFERENTIAL WITH HYPOID GEAR OIL

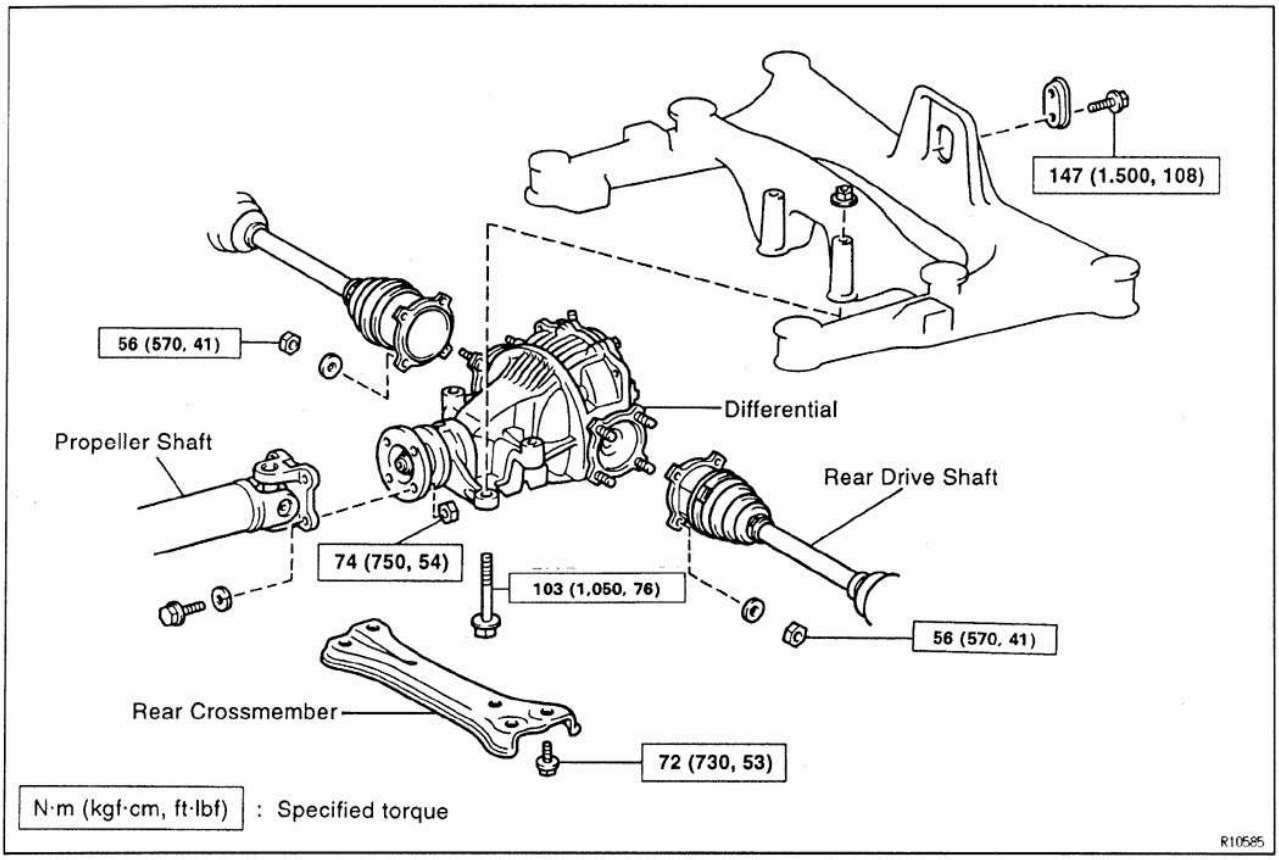
Oil grade:
Hypoid gear oil API GL–5
Recommended oil viscosity:
Above –18°C (0°F) SAE 90
Below –18°C (0°F) SAE 80W or 80W–90
Capacity:
1.1 liter (1.2 US qts, 1.0 Imp. qts)

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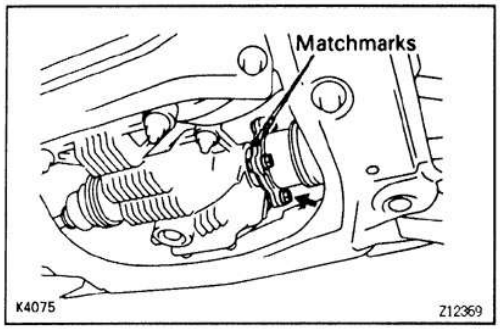
ASSEMBLY REMOVAL AND INSTALLATION

COMPONENTS

SA09A-0A



SA



SA1GW-01

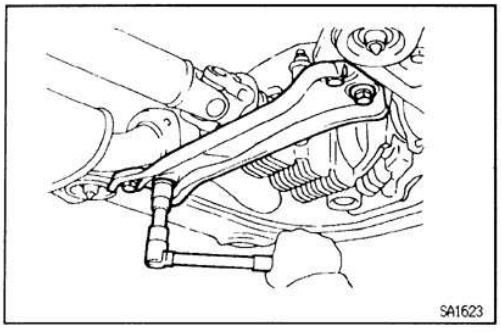
REAR DIFFERENTIAL REMOVAL

1. **JACK UP VEHICLE**
2. **DISCONNECT DRIVE SHAFT**

(a) Place matchmarks on the drive shafts and side gear shafts.

(b) Remove the nuts, and disconnect the drive shafts from the differential.

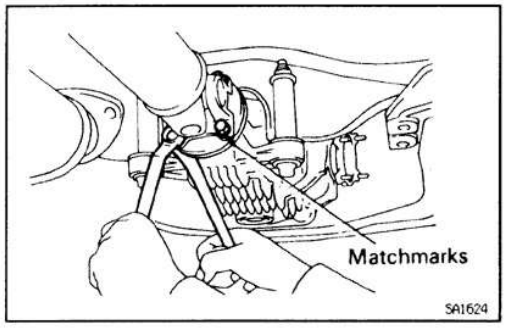
(c) Support the drive shafts securely.



3. **REMOVE REAR CROSSMEMBER**

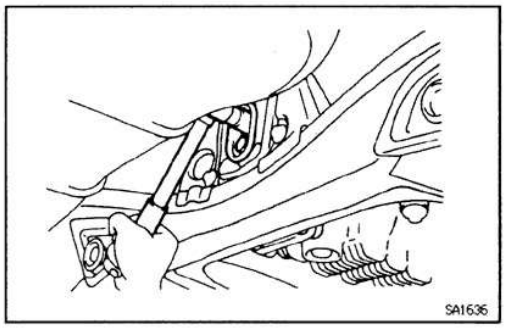
Remove the 4 bolts and rear crossmember.

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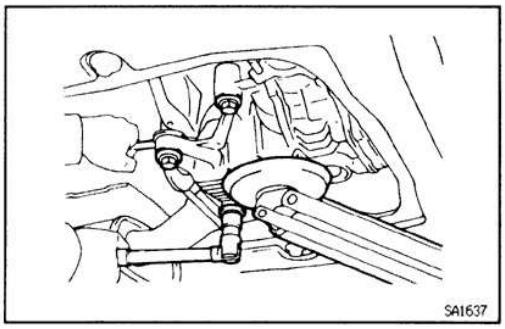
4. DISCONNECT PROPELLER SHAFT

(a) Place matchmarks on the flanges.
(b) Remove the 4 bolts, washers and nut.
(c) Disconnect the propeller shaft and support it securely.



5. REMOVE DIFFERENTIAL

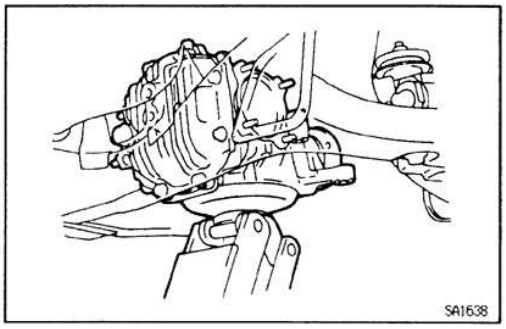
(a) Support the differential with a jack.
(b) Remove the 2 rear bracket bolts.



(c) Remove the 4 differential bolts, and remove the differential.

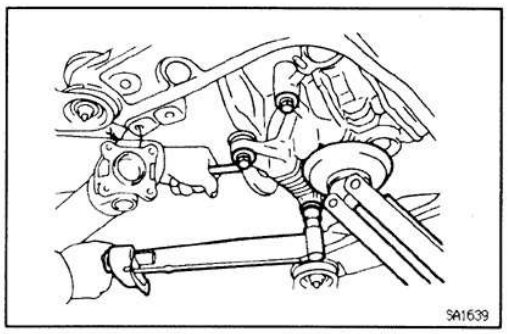
DIFFERENTIAL INSTALLATION

Z0056622



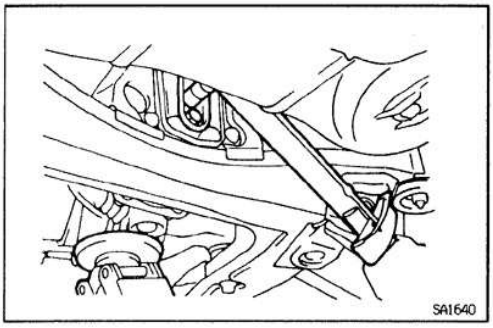
1. INSTALL DIFFERENTIAL

(a) Position the differential with a jack.

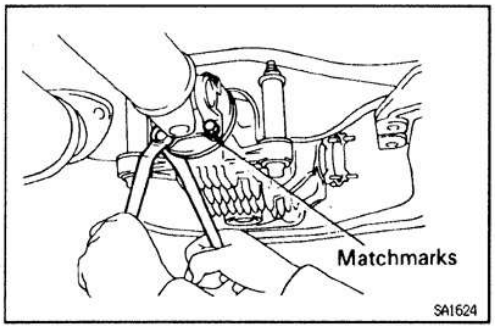


(b) Install and torque the 4 differential bolts.
Torque: 95 N·m (970 kgf·cm, 76 ft·lbf)

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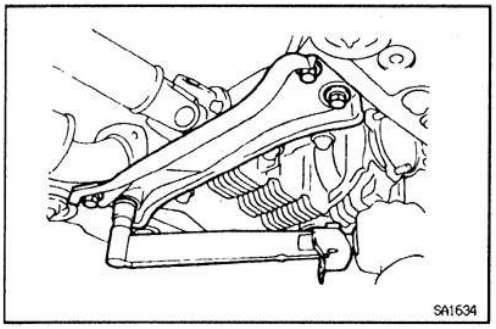
(c) Install and torque the 2 rear bracket bolts.
Torque: 147 N·m (1,500 kgf·cm, 108 ft·lbf)



2. CONNECT PROPELLER SHAFT

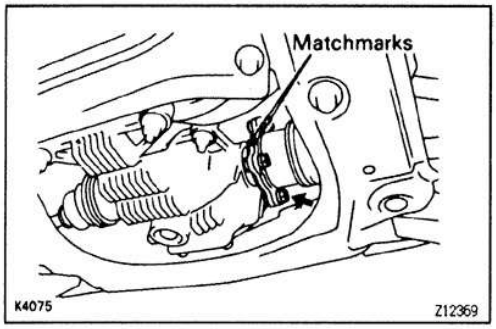
Align the matchmarks on the flanges and connect the propeller shaft with the 4 bolts, washers and nuts.
Torque: 74 N·m (750 kgf·cm, 54 ft·lbf)

SA



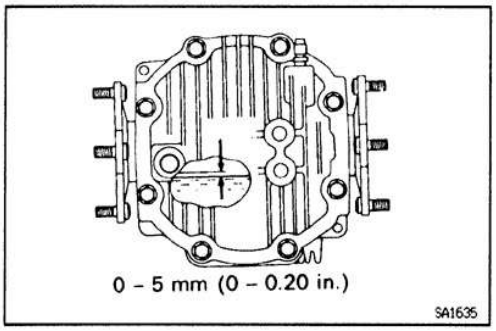
3. INSTALL REAR CROSSMEMBER

Install the rear crossmember with the 4 bolts.
Torque: 72 N·m (730 kgf·cm, 53 ft·lbf)



4. CONNECT DRIVE SHAFTS

(a) Align the matchmarks and connect the drive shafts to the differential.
(b) Install and torque the nuts.
Torque: 56 N·m (570 kgf·cm, 41 ft·lbf)



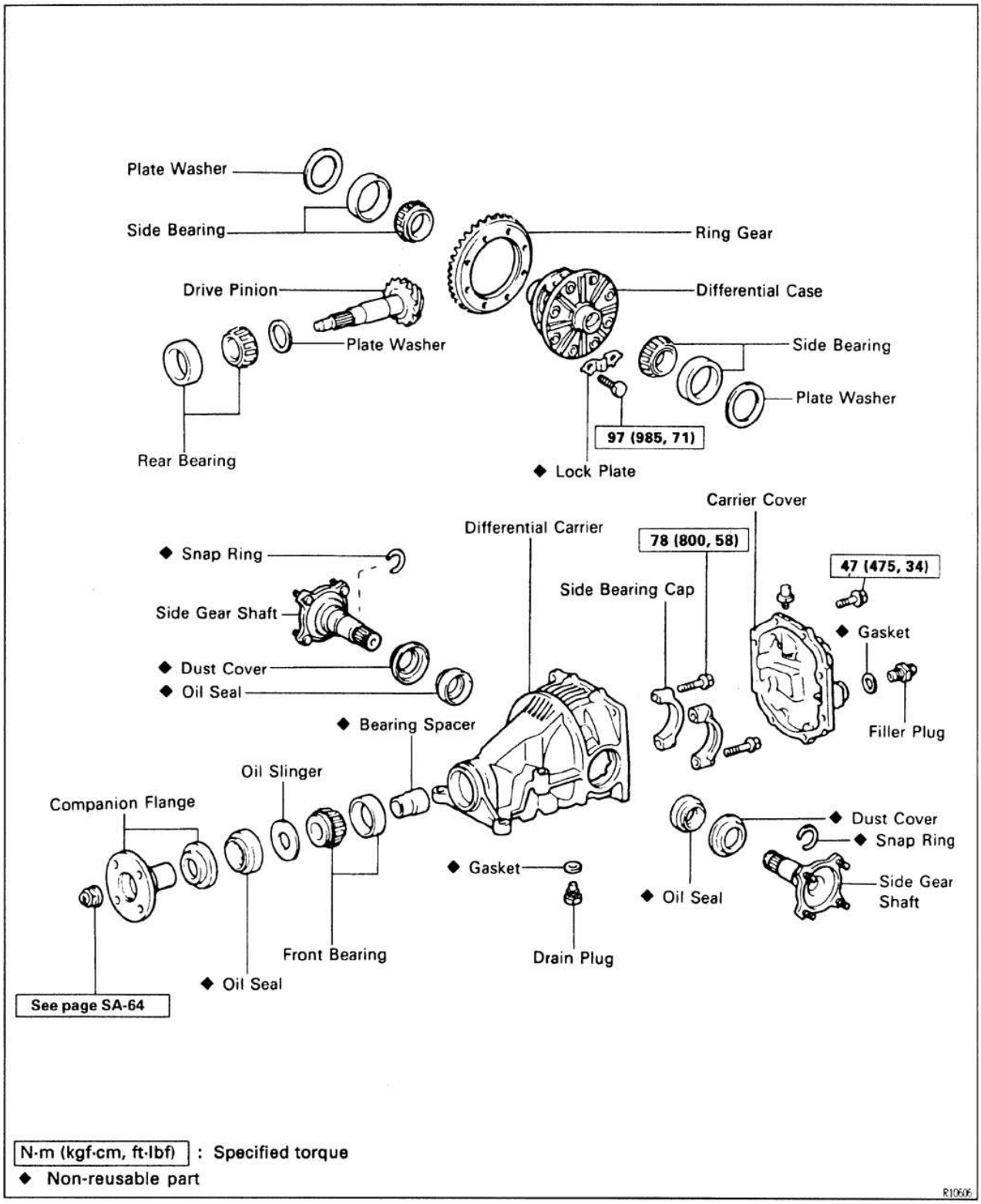
5. FILL DIFFERENTIAL WITH HYPOID GEAR OIL

Oil grade:
Hypoid gear oil API GL–5
Recommended oil viscosity:
Above –18°C (0°F) SAE 90
Below –18°C (0°F) SAE 80W or 80W–90
Capacity:
1.1 liter (1.2 US qts, 1.0 Imp. qts)

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DIFFERENTIAL CARRIER
COMPONENTS

SA

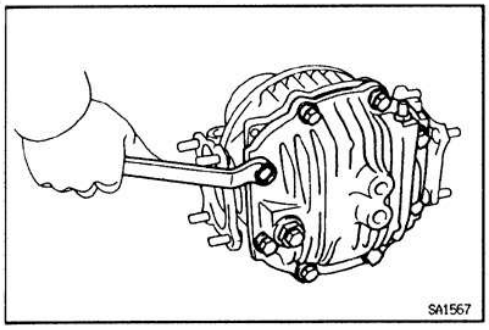


N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non-reusable part

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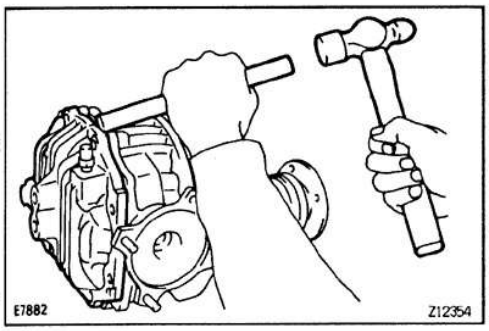
SA1GX-01

DIFFERENTIAL CARRIER INSPECTION



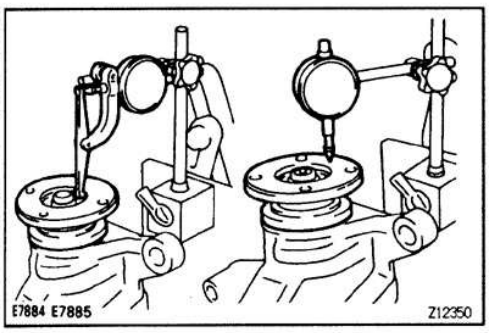
1. REMOVE DIFFERENTIAL CARRIER COVER

(a) Remove the 8 bolts from carrier cover.



(b) Using a brass bar and hammer, separate the cover and carrier.

SA



2. CHECK RUNOUT OF COMPANION FLANGE

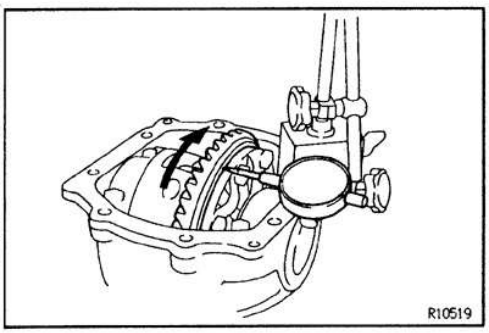
Using a dial indicator, measure the vertical and lateral runout of the companion flange.

Maximum vertical runout:

0.10 mm (0.0039 in.)

Maximum lateral runout:

0.10 mm (0.0039 in.)



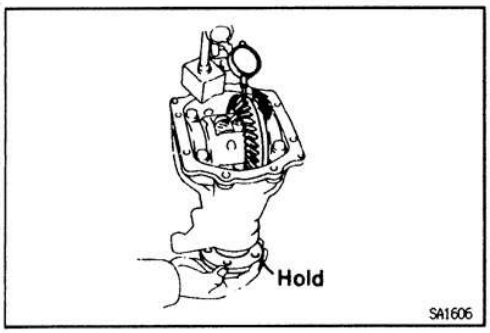
3. CHECK RING GEAR RUNOUT

Using a dial indicator, check the runout of the ring gear.

Maximum runout:

0.07 mm (0.0028 in.)

If the runout is greater than maximum, replace with a new ring gear.



4. CHECK RING GEAR BACKLASH

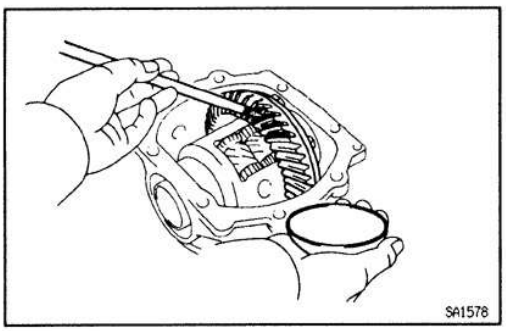
Using a dial indicator, check the backlash of the ring gear.

Backlash:

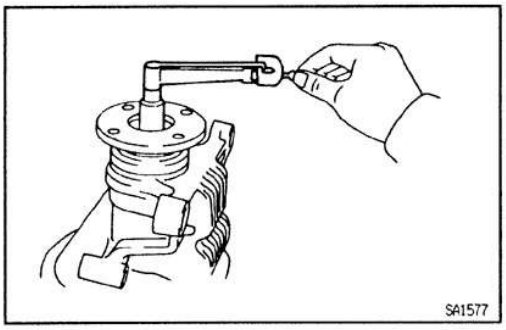
0.13—0.18 mm (0.0051—0.0071 in.)

If the backlash is not within specification, adjust the side bearing preload or repair as necessary.

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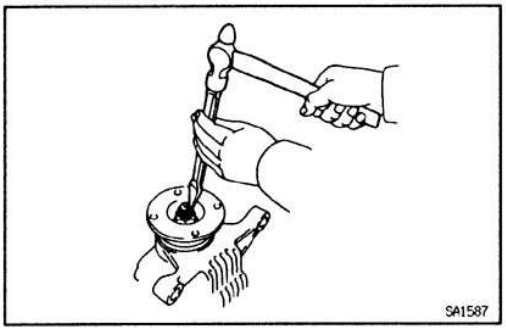
5. **CHECK TOOTH CONTACT**
(See page SA–62)



6. **MEASURE DRIVE PINION PRELOAD**
Using a torque wrench, measure the preload of the backlash between the drive pinion and ring gear.
Preload (at start):
0.5–0.8 N·m (5–8 kgf·cm, 4.3–6.9 in.·lbf)

7. **CHECK TOTAL PRELOAD**
Using a torque wrench, measure the total preload.
Total preload (at start):
In addition to drive pinion preload.
0.3–0.5 N·m (3–5 kgf·cm, 2.6–4.3 in.·lbf)

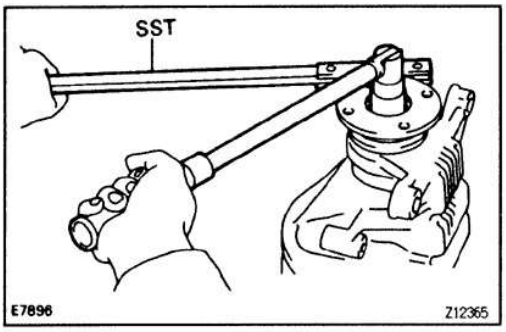
If necessary, disassemble and inspect the differential.



DIFFERENTIAL CARRIER DISASSEMBLY

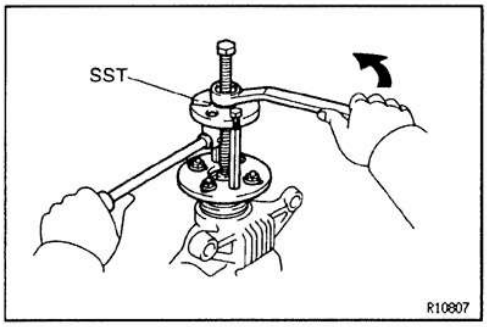
1. **REMOVE COMPANION FLANGE**

(a) Using a hammer and chisel, unstake the staked part of the nut.

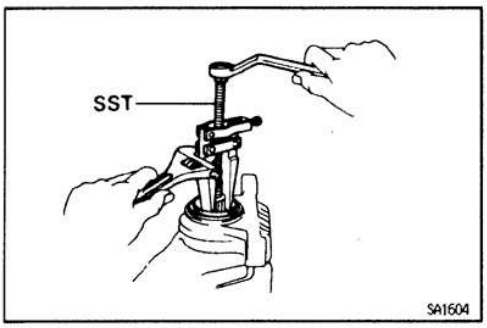


(b) Using SST to hold the flange, remove the nut and plate washer.
SST 09330–00021

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(c) Using SST, remove the companion flange.
SST 09950–30010

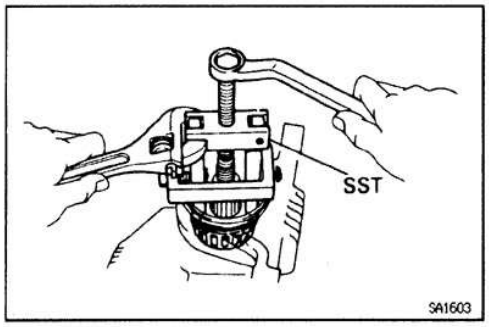


2. REMOVE FRONT OIL SEAL AND OIL SLINGER

(a) Using SST, remove the oil seal from the housing.
SST 09308–10010

(b) Remove the oil slinger.

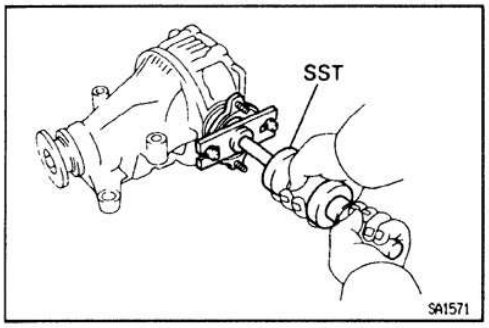
SA



3. REMOVE FRONT BEARING AND BEARING SPACER

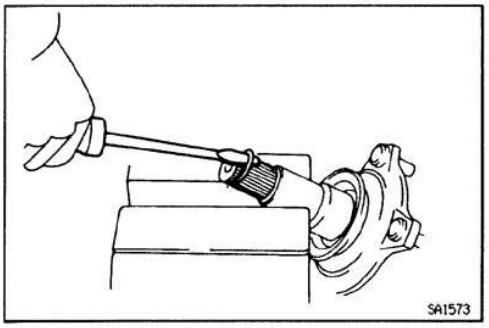
(a) Using SST, remove the bearing from the housing.
SST 09556–22010

(b) Remove the bearing spacer.



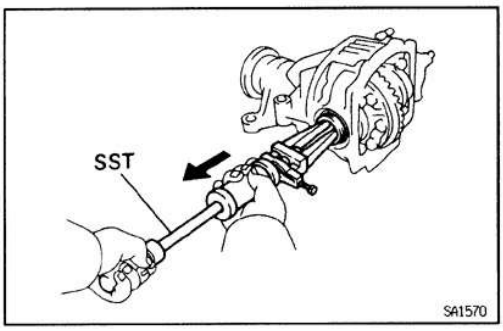
4. REMOVE SIDE GEAR SHAFT

(a) Using SST, pull out the side gear shaft from the differential.
SST 09520–24010



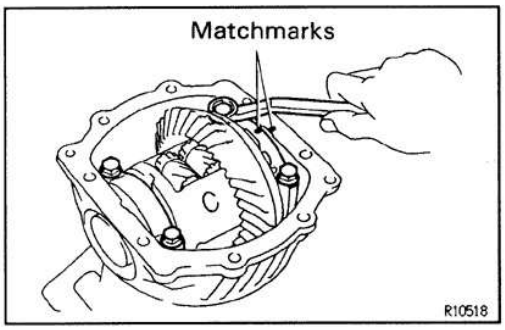
(b) Using a screw driver, remove the snap ring from the side gear shaft.

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5. REMOVE SIDE GEAR SHAFT OIL SEAL

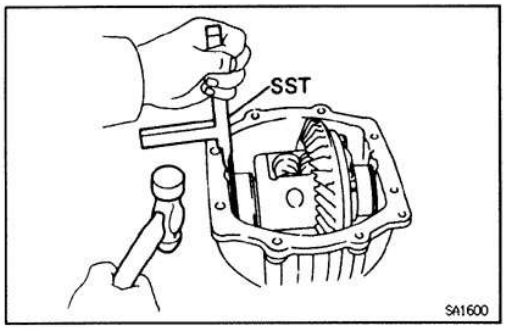
Using SST, remove the oil seal from the housing.
SST 09308–00010



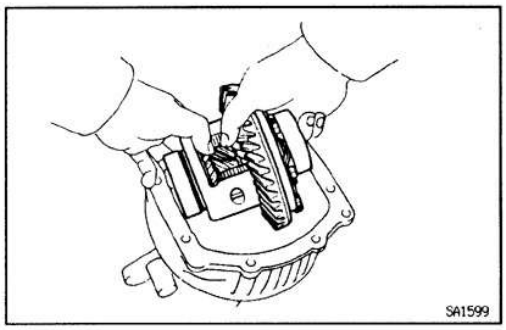
6. REMOVE DIFFERENTIAL CASE

(a) Place the matchmarks on the bearing cap and differential carrier.

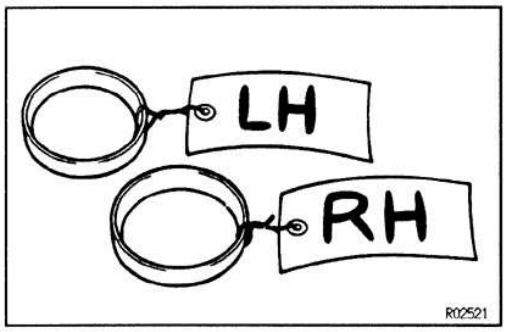
(b) Remove the 2 bearing caps.



(c) Using SST, remove the 2 side bearing preload adjusting plate.
SST 09504–22010
HINT: Measure the adjusting plate washer and note the thickness.

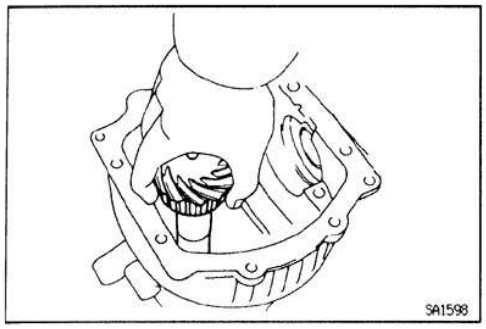


(d) Remove the differential case and bearing outer race from the carrier.

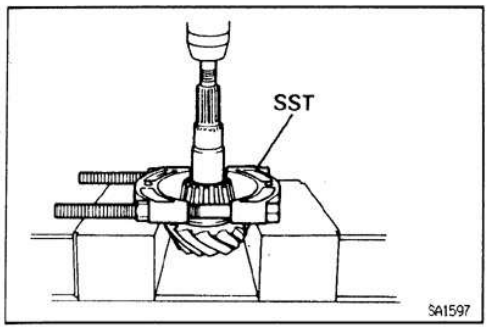


HINT: Tag the bearing outer races to show the location for reassembly.

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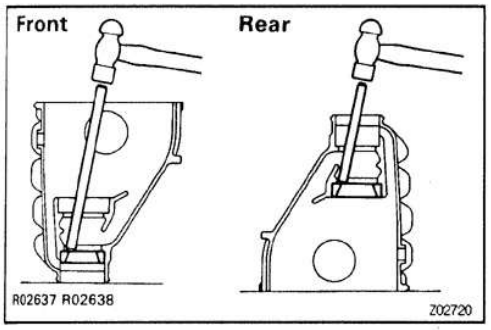
7. REMOVE DRIVE PINION FROM DIFFERENTIAL CARRIER



8. REMOVE DRIVE PINION REAR BEARING

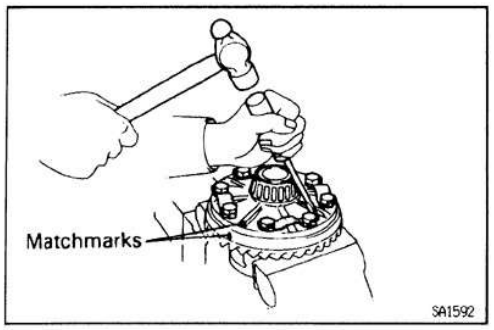
(a) Using SST and a press, remove the bearing from the drive pinion.
SST 09950–00020
HINT: If the drive pinion or ring gear are damaged replace them a set.

(b) Remove the plate washer.



9. REMOVE FRONT AND REAR BEARING OUTER RACE

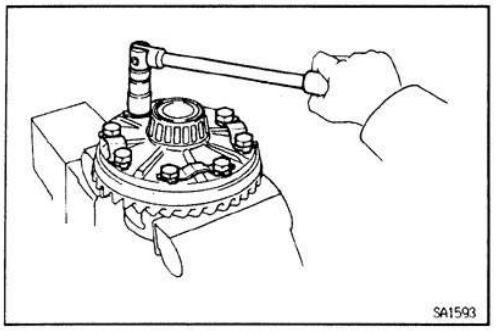
Using a hammer and brass bar, drive out the outer races from the carrier.



10. REMOVE RING GEAR

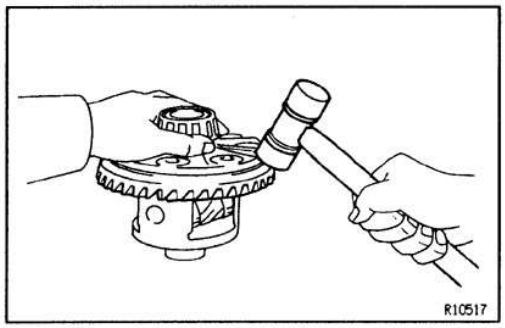
(a) Place the matchmarks on the ring gear and differential case.

(b) Using a screwdriver, unstake the lock plates.

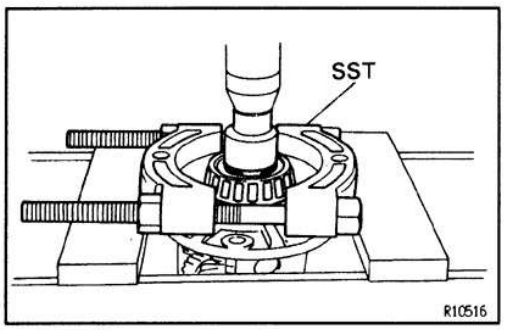


(c) Remove the 8 ring gear set bolts and 4 lock plates.

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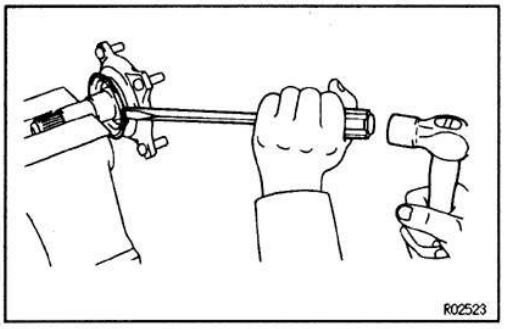


(d) Using a plastic hammer, tap on the ring gear to separate it from the differential case.



11. REMOVE SIDE BEARING

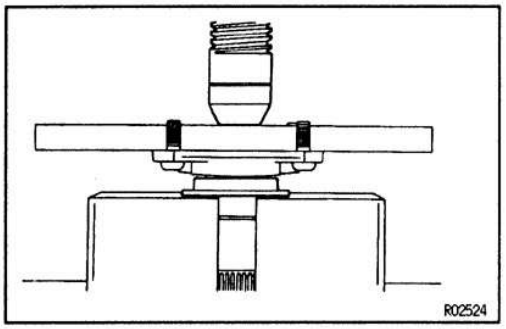
Using SST and a press, remove the 2 side bearings from the differential case.
SST 09950–00020



SIDE GEAR SHAFT DUST COVER REPLACEMENT

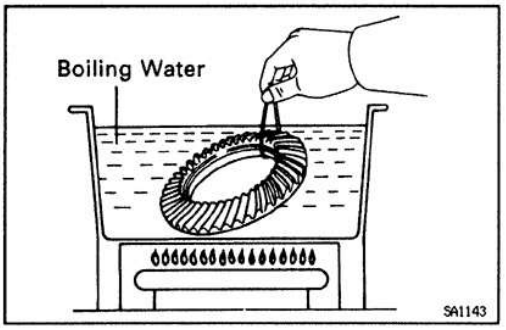
1. REMOVE DUST COVER

Using a screwdriver and hammer, remove the dust cover.



2. INSTALL DUST COVER

Using a press, install a new dust cover to the side gear shaft.
NOTICE: Be careful not to damage the dust cover.

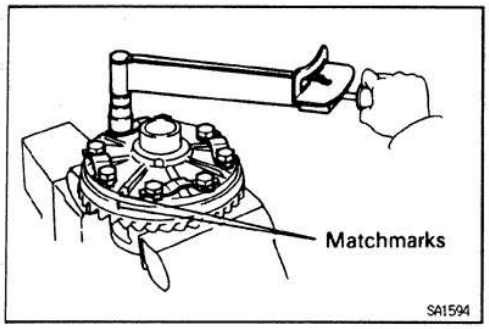


DIFFERENTIAL CARRIER ASSEMBLY

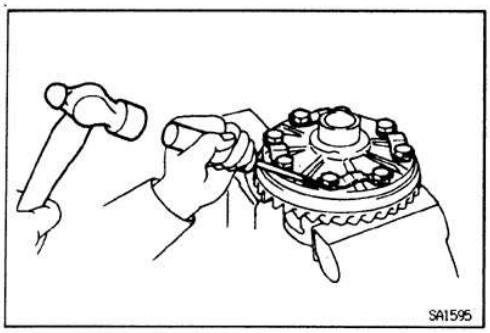
1. INSTALL RING GEAR ON DIFFERENTIAL CASE

(a) Clean the contact surfaces of the differential case and ring gear.
(b) Heat the ring gear in boiling water.
(c) Carefully remove the ring gear from the boiling water.

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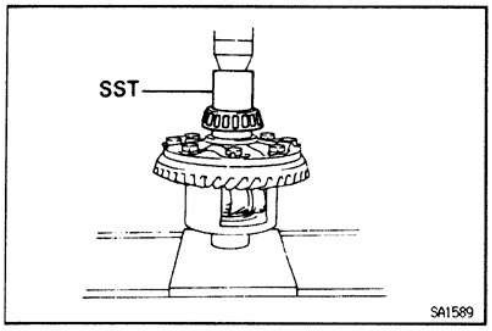


(d) After the moisture on the ring gear has completely evaporated, quickly install the ring gear to the differential case.
(e) Align the matchmarks on the ring gear and differential case.
(f) Temporarily install the lock plates and set bolts.
(g) After the ring gear cools down enough, torque the set bolts uniformly and a little at a time.
Torque: 97 N·m (985 kgf·cm, 71 ft·lbf)

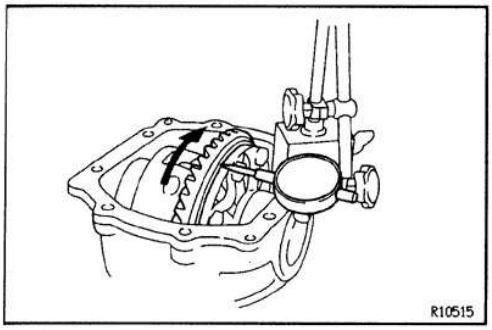


(h) Using a hammer and chisel, stake the lock plates.
HINT: Stake one claw flush with the flat surface of the bolt. For the claw contacting the protruding portion of the bolt, stake only the half on the tightening side.

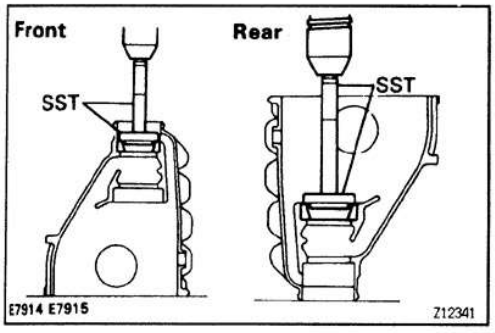
SA



2. INSTALL SIDE BEARINGS
Using SST and a press, install the 2 side bearings into the differential case.
SST 09710–22020 (09710–01030)

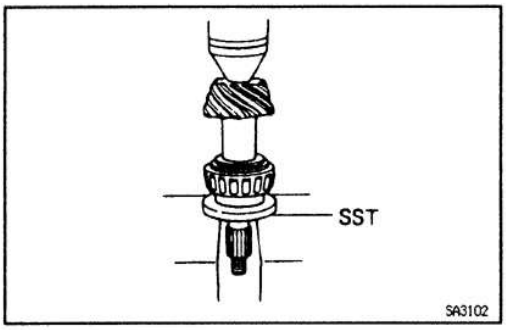


3. INSPECT RING GEAR RUNOUT
Maximum runout:
0.07 mm (0.0028 in.)



4. INSTALL FRONT AND REAR BEARING OUTER RACES
Using SST and a press, drive in a new outer race to the carrier.
Front side
SST 09608–30012 (09608–04020, 09608–06110)
Rear side
SST 09608–30012 (09608–04020, 09608–04100)

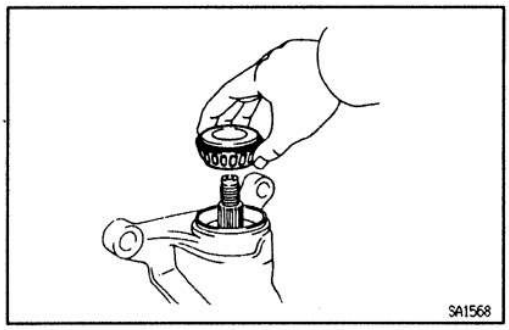
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5. INSTALL DRIVE PINION REAR BEARING

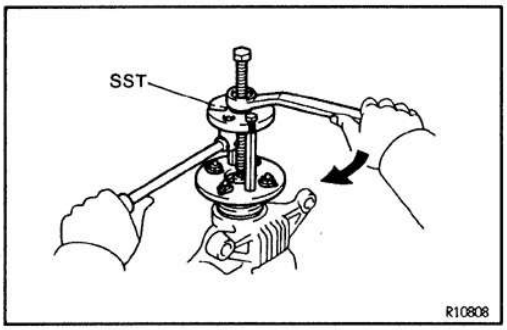
(a) Install the reused washer on the drive pinion.

(b) Using SST and a press, press in the rear bearing onto the drive pinion.
SST 09506–30012



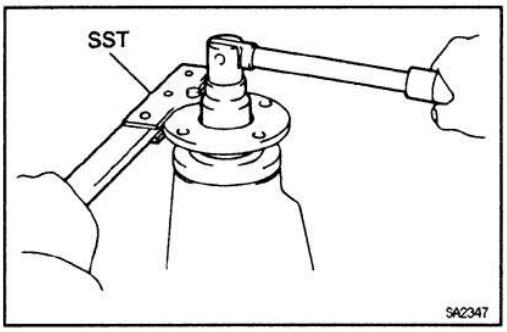
6. TEMPORARILY ADJUST DRIVE PINION PRELOAD

(a) Install the drive pinion and front bearing.
HINT: Assemble the spacer, oil slinger and oil seal after adjusting the gear contact pattern.

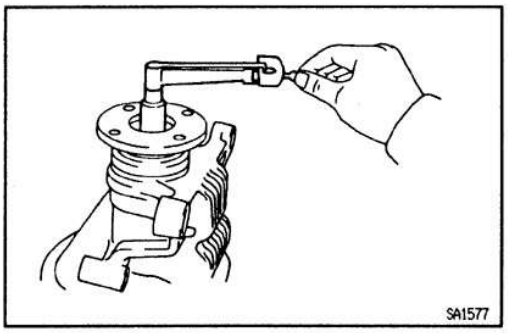


(b) Using SST, install the companion flange.

(c) Coat the threads of the nut with MP grease.
SST 09550–30010

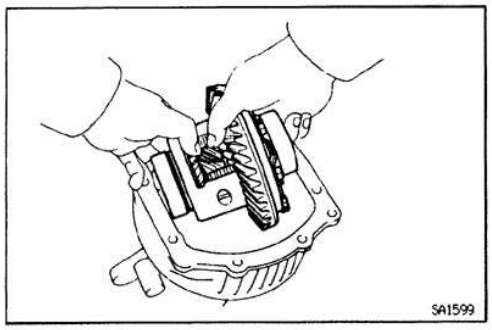


(d) Adjusting the drive pinion preload by tightening the companion flange nut.
Using SST to hold the flange, torque the nut.
SST 09330–00021
NOTICE: As there is no spacer, torque a little at a time, being careful not to overtighten it.



(e) Using a torque wrench, measure the preload.
Preload (at start):
New bearing
1.0–1.6 N·m (10–16 kgf·cm, 8.7–13.9 in.·lbf)
Reused bearing
0.5–0.8 N·m (5–8 kgf·cm, 4.3–6.9 in.·lbf)

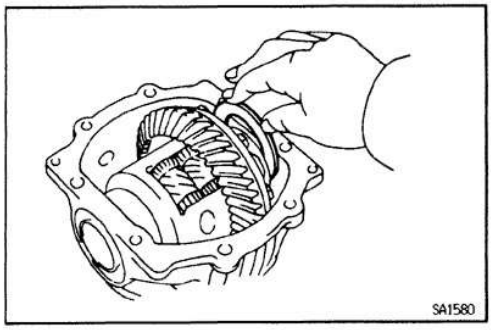
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7. INSTALL DIFFERENTIAL CASE IN CARRIER

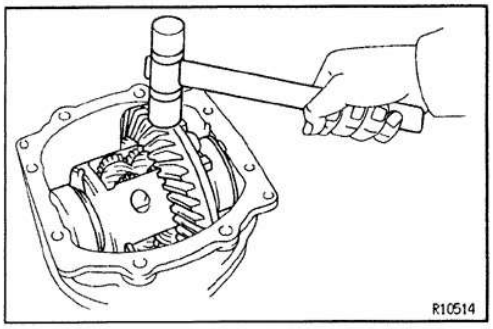
(a) Place the bearing outer races on their respective bearings. Make sure the left and right races are not interchanged.

(b) Install the differential case in the carrier.

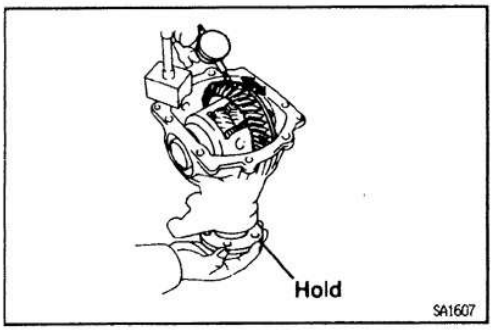


8. ADJUST RING GEAR BACKLASH

(a) Install only the plate washer on the ring gear back side.



(b) Snug down the washer and bearing by tapping on the ring gear with a plastic hammer.



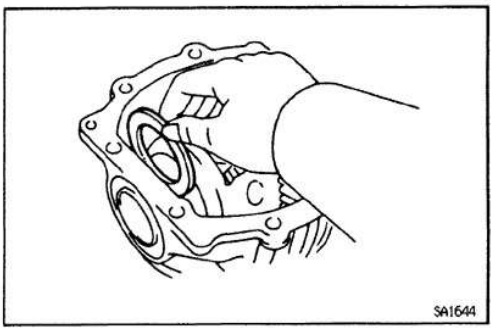
(c) Hold the side bearing boss on the teeth surface of the ring gear and measure the backlash.

Backlash (reference):

0.13—0.18 mm (0.0051—0.0071 in.)

(d) Using a dial indicator, measure the backlash.

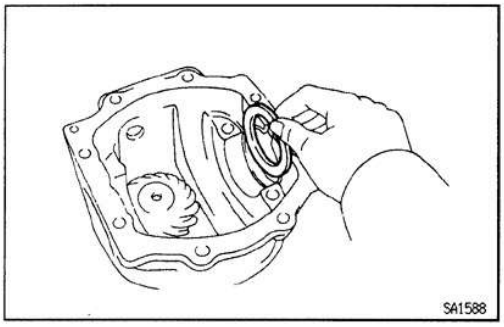
(e) Select a ring gear back side plate washer so that the backlash is 0.13 mm (0.0051 in.)



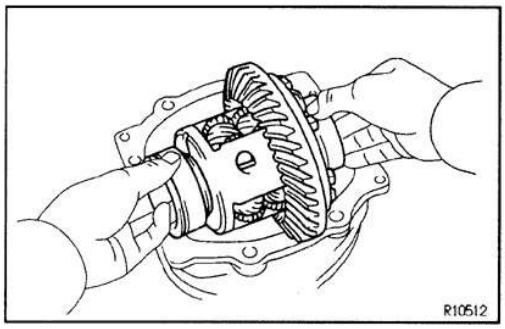
(f) Select a ring gear teeth side washer with a thickness which eliminates any clearance between the outer race and case.

(g) Remove the plate washer and differential case.

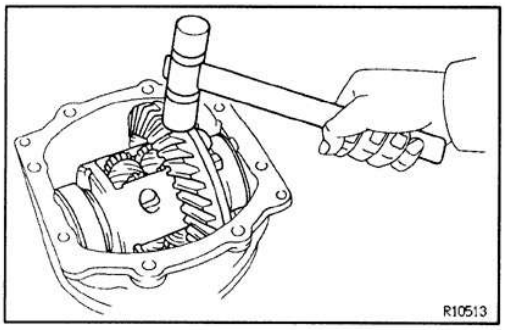
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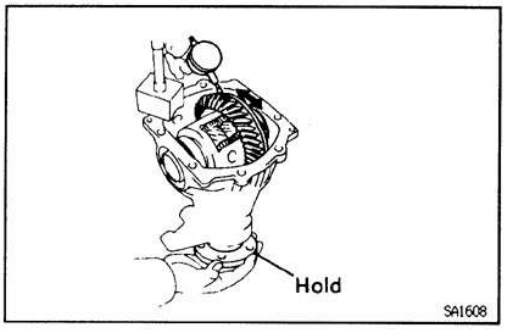
(h) Install the plate washer into the ring gear back side.



(i) Place the outer plate washer onto the differential case together with the outer race, and install the differential case with the outer race into the carrier.

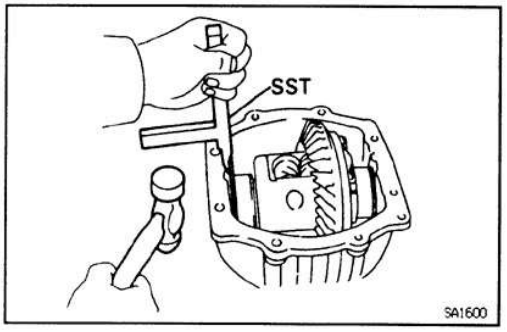


(j) Using a plastic hammer, snug down the washer and bearing by tapping the ring gear.



(k) Using a dial indicator, measure the ring gear backlash.
Backlash:
0.13–0.18 mm (0.0051–0.0071 in.)

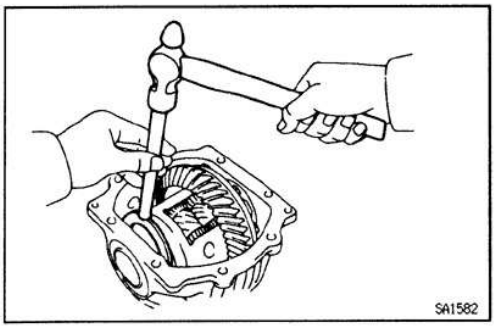
(l) If not within the specification, adjust by either increasing or decreasing the number of washers on both sides by an equal amount.
HINT: There should be clearance between the plate washer and case.
Ensure that there is ring gear backlash.



9. ADJUST SIDE BEARING PRELOAD

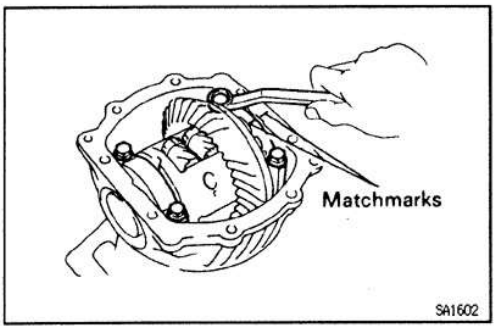
(a) Using SST, remove the ring gear teeth side plate washer and measure the thickness.
SST 09504–22011

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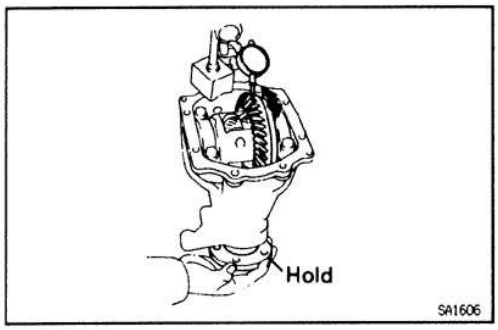
(b) Install a new washer 0.06 – 0.09 mm (0.00024 – 0.0035 in.) thicker than the removed washer.
HINT: Select a washer which can be pressed in 2/3 of the way by finger.

(c) Using hammer and brass bar, tap in the side washer.



(d) Align the matchmarks on the cap and carrier and install the 2 side bearing caps.
Torque: 78 N·m (800 kgf·cm, 58 ft·lbf)

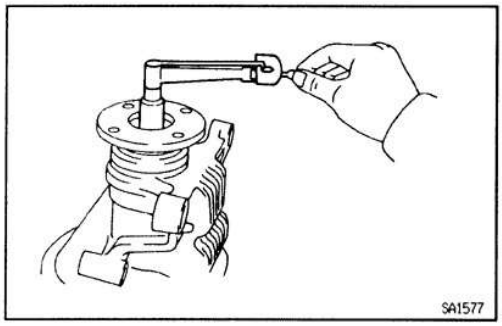
SA



(e) Recheck the ring gear backlash.
Backlash:
0.13 – 0.18 mm (0.0051 – 0.0071 in.)
If not within standard, adjust by either increasing or decreasing the washers on both sides by equal amounts.
HINT: The backlash will change by about 0.02 mm (0.0008 in.) with every 0.03 mm (0.0012 in.) chenge in the side washer thickness.
Washer thickness

Thickness mm (in.)	Thickness mm (in.)	Thickness mm (in.)
2.21 – 2.23 (0.0870 – 0.0878)	2.57 – 2.59 (0.1021 – 0.1020)	2.93 – 2.95 (0.1154 – 0.1161)
2.24 – 2.26 (0.0882 – 0.0890)	2.60 – 2.62 (0.1024 – 0.1031)	2.96 – 2.98 (0.1165 – 0.1173)
2.27 – 2.29 (0.0894 – 0.0902)	2.63 – 2.65 (0.1035 – 0.1043)	2.99 – 3.01 (0.1171 – 0.1185)
2.30 – 2.32 (0.0906 – 0.0913)	2.66 – 2.68 (0.1047 – 0.1055)	3.02 – 3.04 (0.1189 – 0.1197)
2.33 – 2.35 (0.0917 – 0.0925)	2.69 – 2.71 (0.1059 – 0.1067)	3.05 – 3.07 (0.1201 – 0.1209)
2.36 – 2.38 (0.0929 – 0.0937)	2.72 – 2.74 (0.1071 – 0.1079)	3.08 – 3.10 (0.1201 – 0.1209)
2.39 – 2.41 (0.0941 – 0.0949)	2.75 – 2.77 (0.1083 – 0.1091)	3.11 – 3.13 (0.1224 – 0.1232)
2.42 – 2.44 (0.0953 – 0.0961)	2.78 – 2.80 (0.1094 – 0.1102)	3.14 – 3.16 (0.1236 – 0.1244)
2.45 – 2.47 (0.0965 – 0.0972)	2.81 – 2.83 (0.1106 – 0.1114)	3.17 – 3.19 (0.1248 – 0.1256)
2.48 – 2.50 (0.0976 – 0.0984)	2.84 – 2.86 (0.1118 – 0.1126)	3.20 – 3.22 (0.1260 – 0.1268)
2.51 – 2.53 (0.0988 – 0.0996)	2.87 – 2.89 (0.1130 – 0.1138)	–
2.54 – 2.56 (0.1000 – 0.1008)	2.90 – 2.92 (0.1142 – 0.1150)	–

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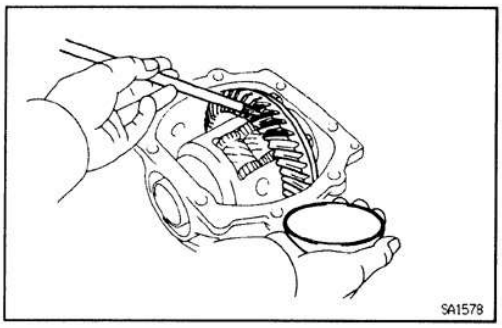
10. MEASURE TOTAL PRELOAD

Using a torque wrench, measure the total preload.

Total preload (at start):

Add drive pinion preload

0.3–0.5 N·m (3–5 kgf·cm, 2.6–4.3 in.·lbf)

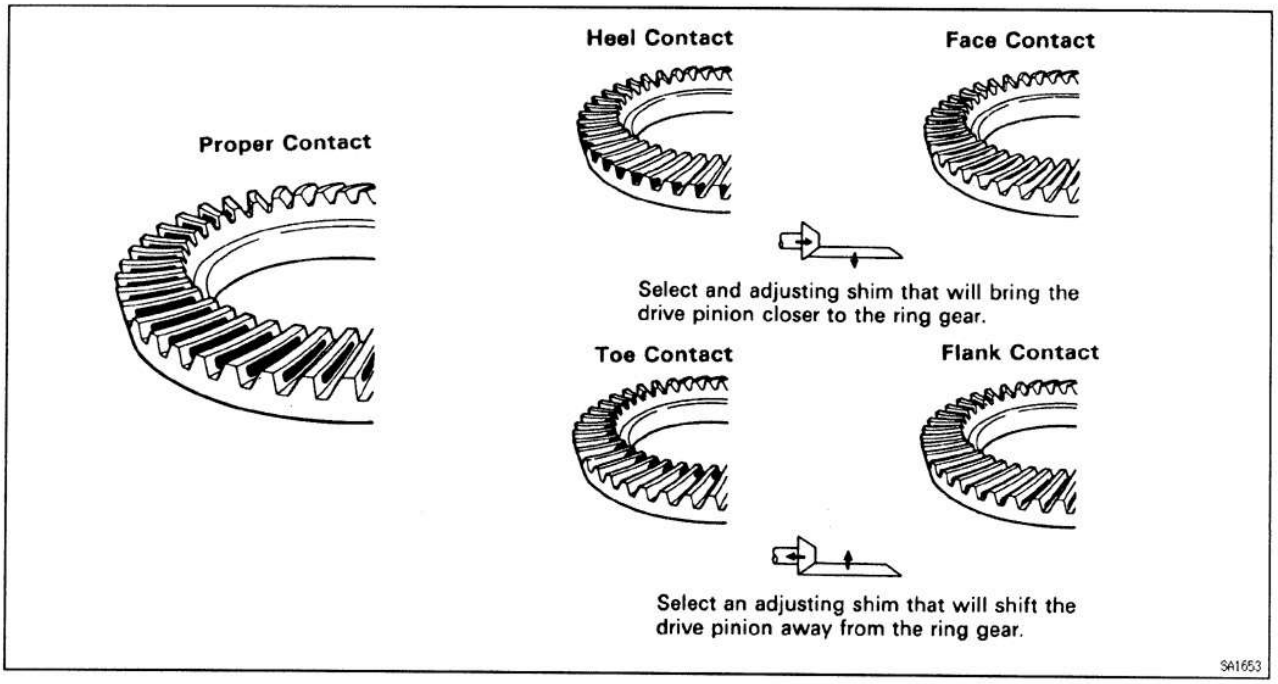


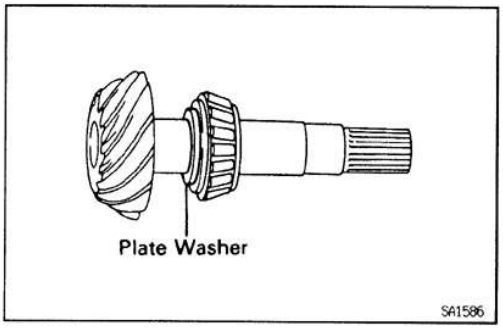
11. INSPECT TOOTH CONTACT BETWEEN RING GEAR AND DRIVE PINION

(a) Coat 3 or 4 teeth at three different position on the ring gear with red lead.

(b) Hold the companion flange firmly and rotate the ring gear in both directions.

(c) Inspect the tooth contact.





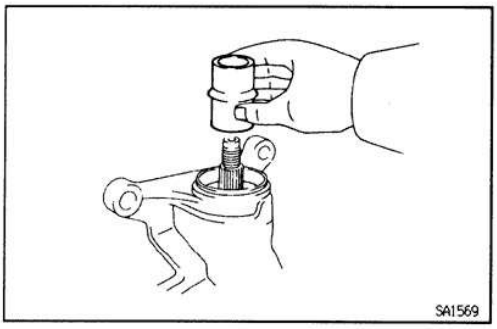
If the teeth are not contacting properly, use the following chart to select a proper washer for correction.

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Washer thickness

Thickness mm (in.)	Thickness mm (in.)	Thickness mm (in.)
2.30 (0.0905)	2.44 (0.0961)	2.58 (0.1016)
2.31 (0.0909)	2.45 (0.0965)	2.59 (0.1020)
2.32 (0.0913)	2.46 (0.0969)	2.60 (0.1024)
2.33 (0.0917)	2.47 (0.0972)	2.61 (0.1028)
2.34 (0.0921)	2.48 (0.0976)	2.62 (0.1032)
2.35 (0.0925)	2.49 (0.0980)	2.63 (0.1035)
2.36 (0.0929)	2.50 (0.0984)	2.64 (0.1039)
2.37 (0.0933)	2.51 (0.0989)	2.65 (0.1043)
2.38 (0.0937)	2.52 (0.0992)	2.66 (0.1047)
2.39 (0.0941)	2.53 (0.0996)	2.67 (0.1051)
2.40 (0.0945)	2.54 (0.1000)	2.78 (0.1055)
2.41 (0.0949)	2.55 (0.1004)	2.79 (1.1059)
2.42 (0.0953)	2.56 (0.1008)	2.70 (0.1063)
2.43 (0.0957)	2.57 (0.1012)	2.71 (0.1067)

SA

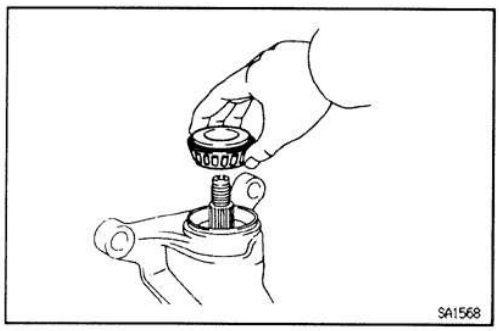


12. REMOVE COMPANION FLANGE
(See page SA—52)

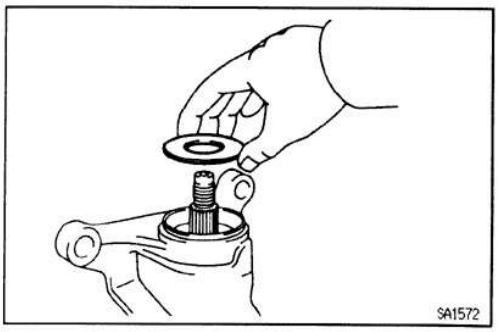
13. REMOVE FRONT BEARING
(See page SA—53)

14. INSTALL NEW BEARING SPACER AND FRONT BEARING

(a) Install a new bearing spacer on the drive pinion.



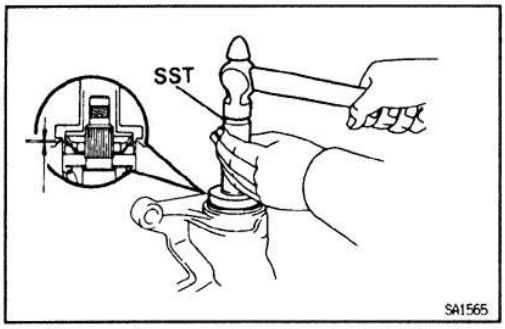
(b) Install the front bearing on the drive pinion.



15. INSTALL OIL SLINGER AND NEW FRONT OIL SEAL

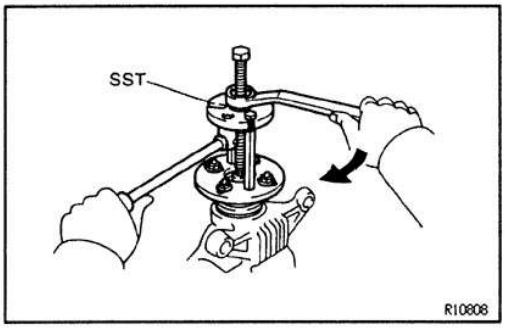
(a) Install the oil slinger.

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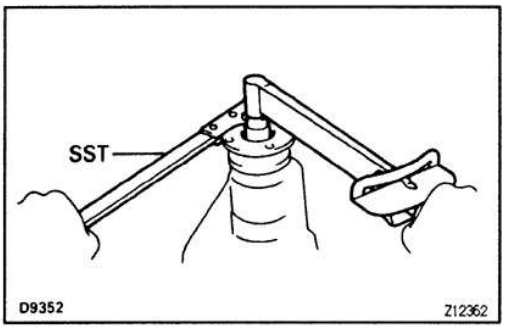
(b) Using SST, drive in a new oil seal.
SST 09554–22010
Oil seal drive in depth:
2.0 mm (0.079 in.)

(c) Apply MP grease to the oil seal lip.



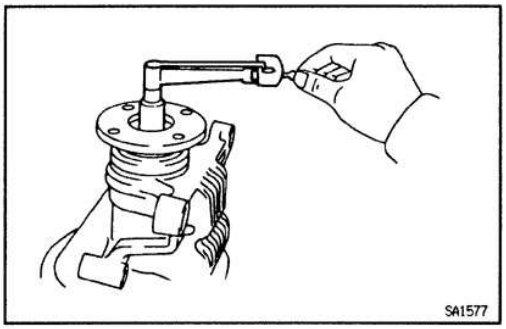
16. INSTALL COMPANION FLANGE

(a) Using SST, install the companion flange on the shaft.
SST 09950–30010



(b) Coat the threads of a new nut with MP grease.

(c) Using SST to hold the flange, torque the nut.
SST 09330–00021
Torque: 108 N·m (1,100 kgf·cm, 80 ft·lbf)

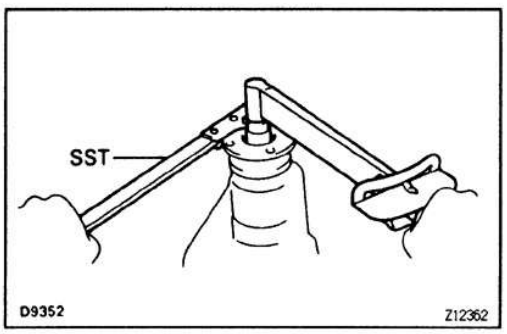


17. CHECK DRIVE PINION BEARING PRELOAD

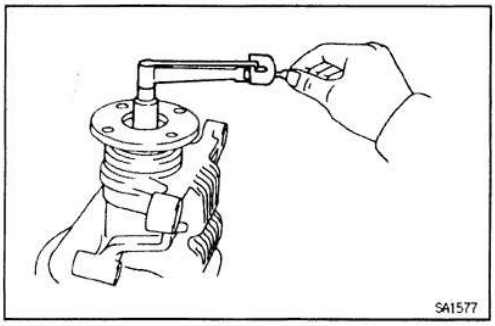
(a) Using a torque wrench, measure the preload of the backlash between the drive pinion and ring gear.
Preload (at start):
New bearing
1.0–1.6 N·m (10–16 kgf·cm, 8.7–13.9 in.·lbf)
Reused bearing
0.5–0.8 N·m (5–8 kgf·cm, 4.3–6.9 in.·lbf)

- If preload is greater than specification, replace the bearing spacer.
- If preload is less than specification, retorque the nut 13 N·m (130 kgf·cm, 9 ft·lbf) at a time until the specified preload is reached.

If the maximum torque is exceeded while retightening the nut, replace the bearing spacer and repeat the preload procedure. Do not back off the pinion nut to reduce the preload.
Maximum torque:
338 N·m (3,450 kgf·cm, 250 ft·lbf)



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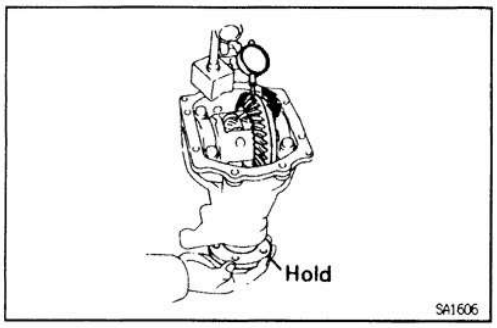


18. RECHECK TOTAL PRELOAD

Total preload (at start):

Add drive pinion preload

0.3–0.5 N·m (3–5 kgf·cm, 2.6–4.3 in.·lbf)



19. RECHECK RING GEAR BACKLASH

Using a dial indicator, check the ring gear backlash.

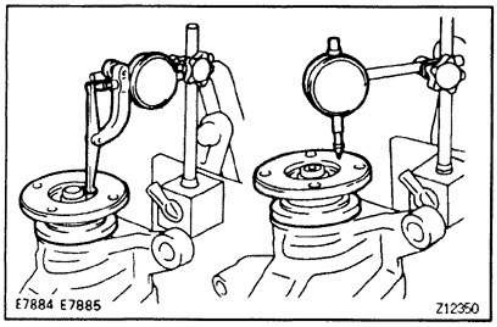
Ring gear backlash:

0.13–0.18 mm (0.0051–0.0071 in.)

If the backlash is not within specification, readjust the side bearing preload.

20. RECHECK TOOTH CONTACT BETWEEN RING GEAR AND DRIVE PINION

(See page SA–62)



21. CHECK COMPANION FLANGE RUNOUT

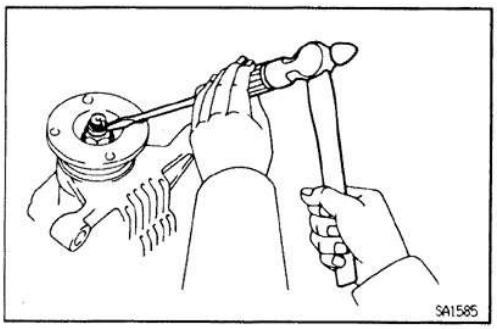
Using a dial indicator, measure the vertical and lateral runout of the companion flange.

Maximum vertical runout:

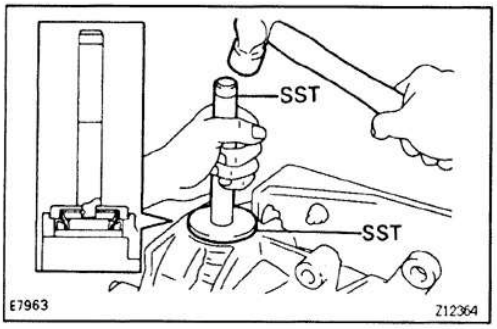
0.10 mm (0.0039 in.)

Maximum lateral runout:

0.10 mm (0.0039 in.)



22. STAKE DRIVE PINION NUT

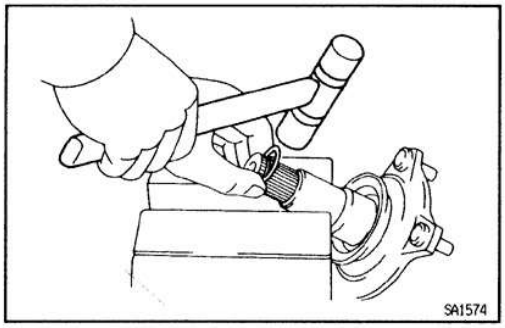


23. INSTALL SIDE GEAR SHAFT OIL SEAL

(a) Using SST, drive in 2 oil seals until they are flush with the carrier end surface.
SST 09550–22011 (09550–00020, 09550–00031)

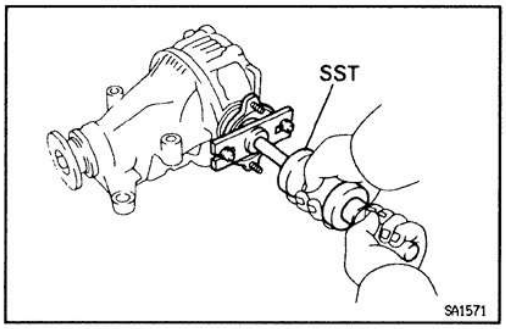
(b) Coat MP grease to the oil seal lip.

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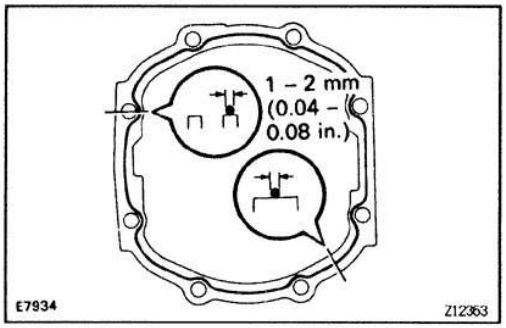
24. INSTALL SIDE GEAR SHAFT

(a) Install a new snap ring to the side gear shaft.



SA

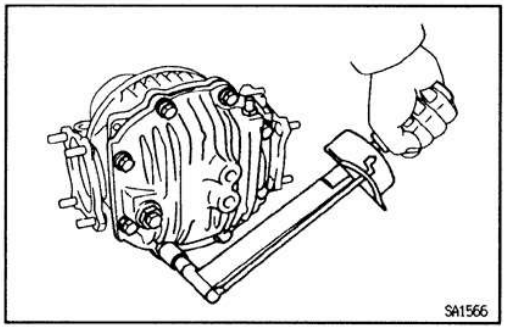
(b) Using SST, drive in the side gear shaft until it contacts the pinion shaft.
SST 09520–24010
HINT: Check that the shaft is fully inserted by confirming the noise it should make when it is tapped.



25. INSTALL DIFFERENTIAL CARRIER COVER

(a) Clean contacting surfaces of any residual packing material using gasoline or alcohol.

(b) Apply FIPG to the carrier.
FIPG:
Part No.08826–00090, THREE BOND 1281 or equivalent
HINT: Install the carrier cover within 3 minutes after applying seal packing.



(c) Torque the 8 set bolts.
Torque: 47 N·m (475 kgf·cm, 34 ft·lbf)

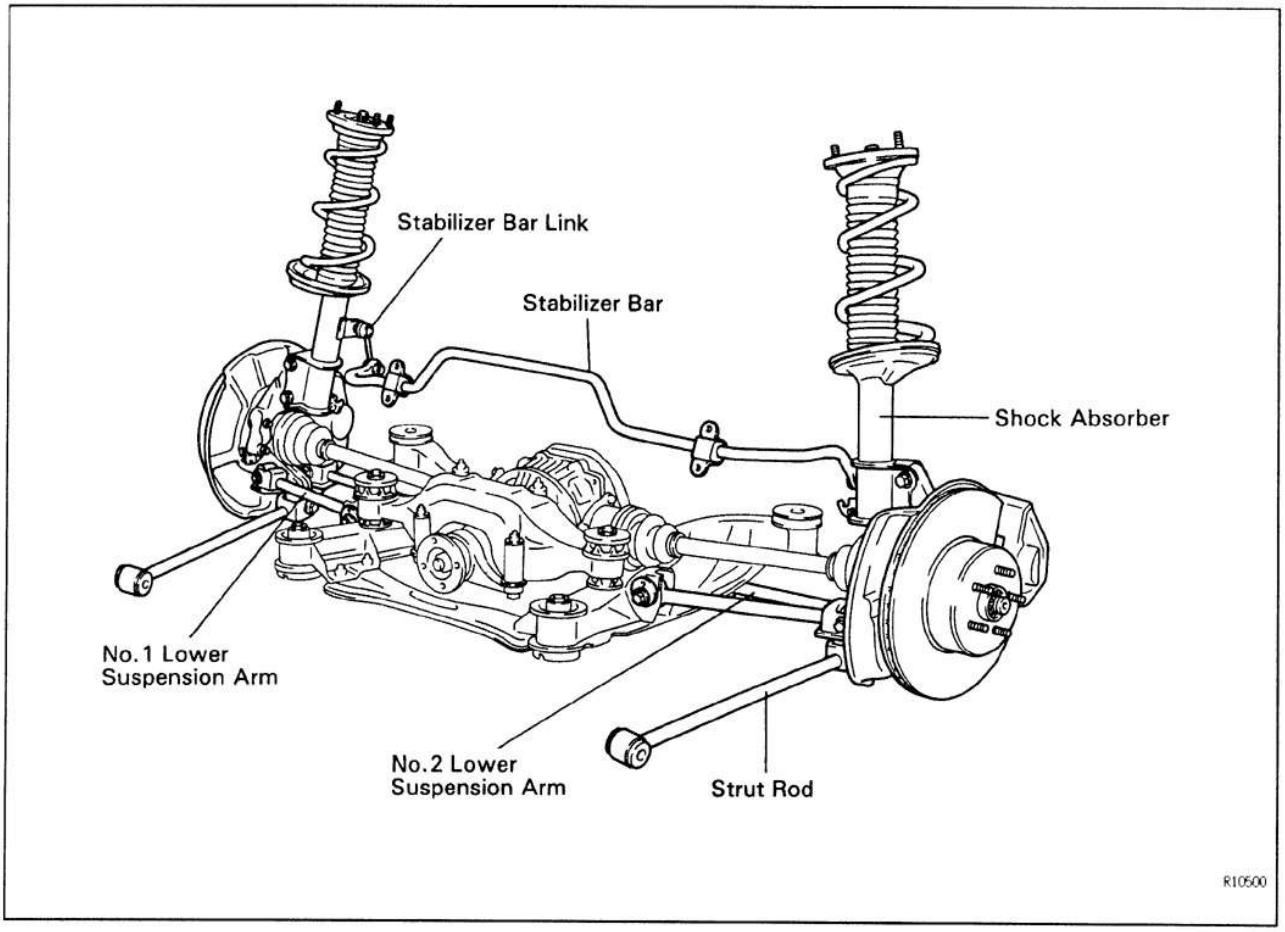
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REAR SUSPENSION

DESCRIPTION

SA03J-08

The rear suspension is dual–link strut independent suspension composed of two lower arms in parallel at the side, and strut rods which extend forward.



SA

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PREPARATION

RECOMMENDED TOOLS

8AG0L-01

	09025–00010 Small Torque Wrench	

EQUIPMENT

8AG0M-01

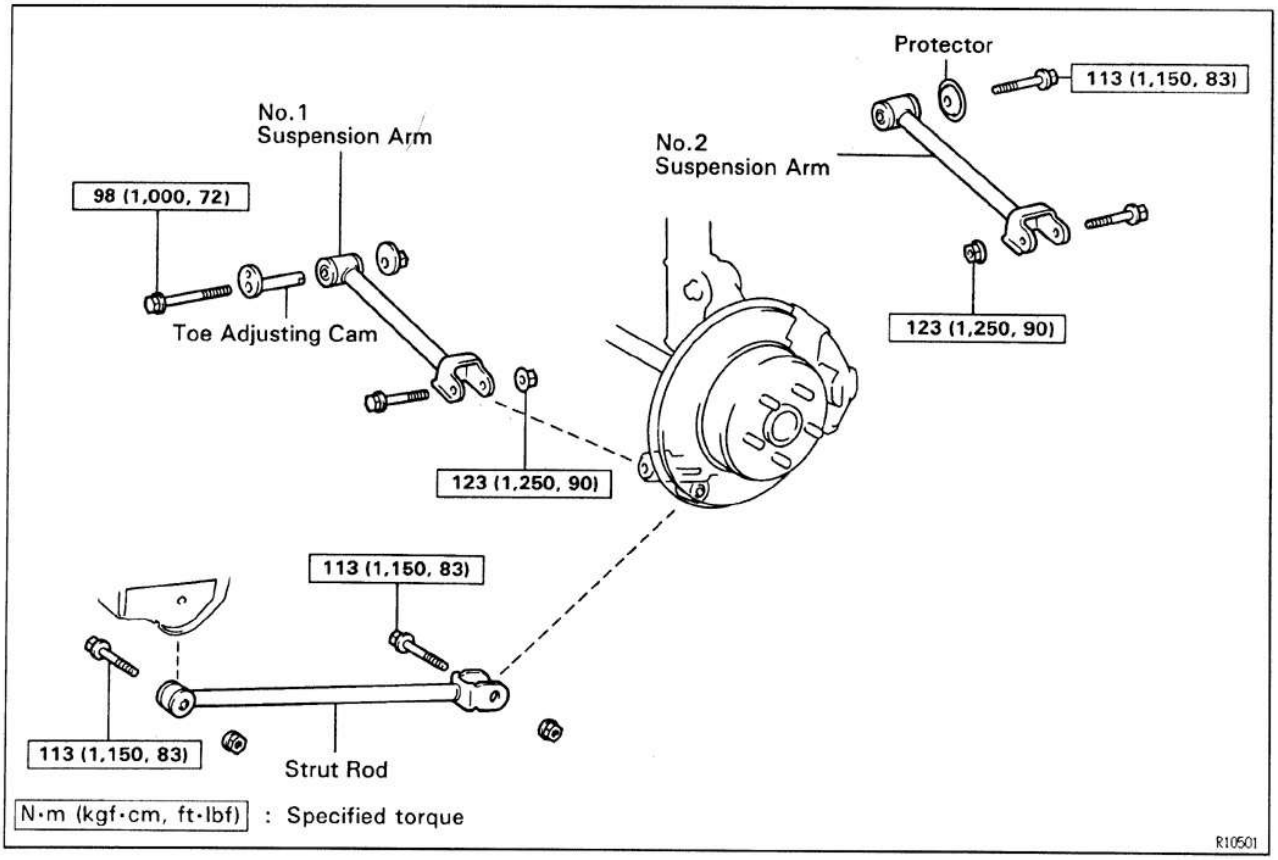
Torque wrench	

SA

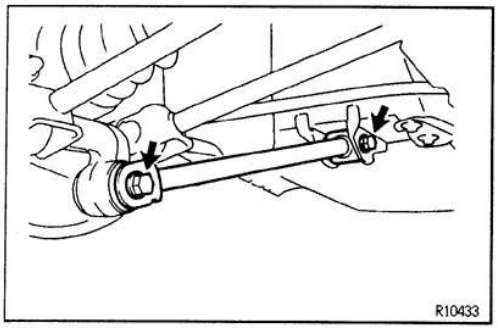
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LOWER SUSPENSION ARM AND STRUT ROD
COMPONENTS

SA038-0A



SA

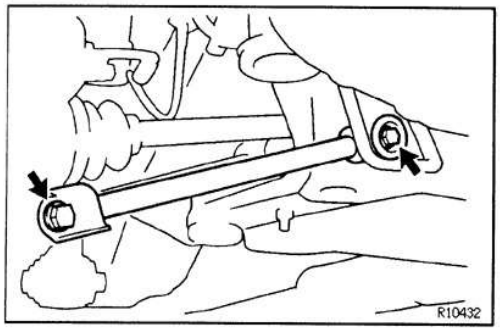


SA1H0-01

LOWER SUSPENSION ARM AND STRUT ROD REMOVAL

1. **JACK UP VEHICLE AND REMOVE REAR WHEEL**
2. **REMOVE STRUT ROD**

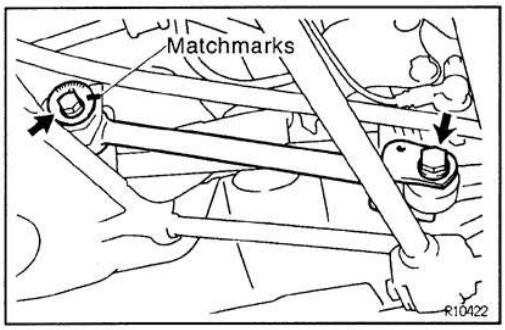
(a) Remove the 2 bolts and nuts.
(b) Remove the strut rod.



3. **REMOVE NO.2 SUSPENSION ARM**

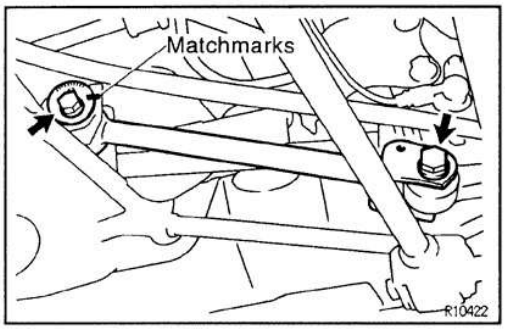
(a) Remove the bolt and protector.
(b) Remove the bolt, nut and No.2 suspension arm.

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4. REMOVE NO.1 SUSPENSION ARM

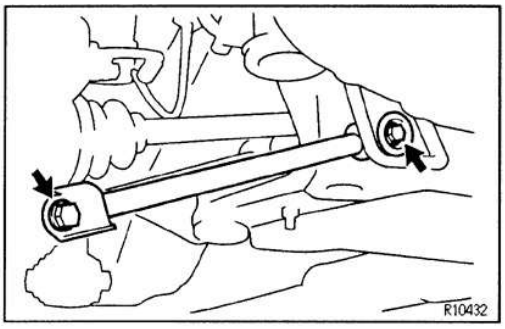
(a) Place matchmarks on the toe adjusting cam and suspension member.
(b) Remove the nut and toe adjusting cam.
(c) Remove the bolt, nut and No.1 suspension arm.



LOWER SUSPENSION ARM AND STRUT ROD INSTALLATION

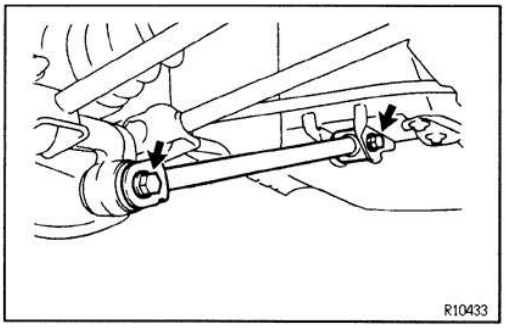
1. INSTALL NO.1 SUSPENSION ARM

(a) Place the No.1 suspension arm and temporaily install the toe adjusting cam.
(b) Temporarily install the axle carrier side bolt and nut.



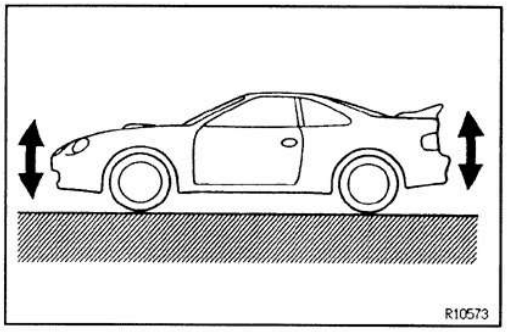
2. INSTALL NO.2 SUSPENSION ARM

(a) Place the No.2 suspension arm and temporarily install the protector and bolt.
(b) Temporarily install the axle carrer side bolt and nut.



3. INSTALL STRUT ROD

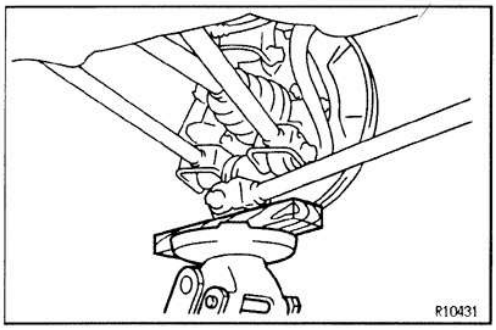
Place the strut rod and temporarily install the 2 bolts and nuts.



4. STABILIZE SUSPENSION

(a) Install the rear wheel and lower the vehicle.
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
(b) Bounce the vehicle up and down several times to stabilize the suspension.

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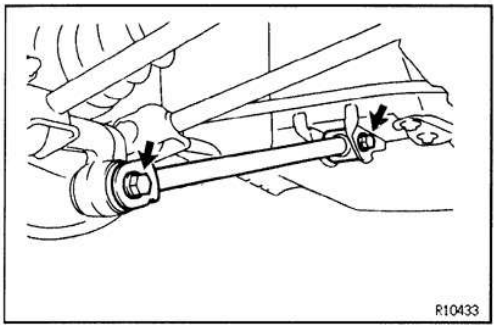


5. TORQUE BOLTS AND NUTS

(a) Jack up the vehicle and support the body with stands.

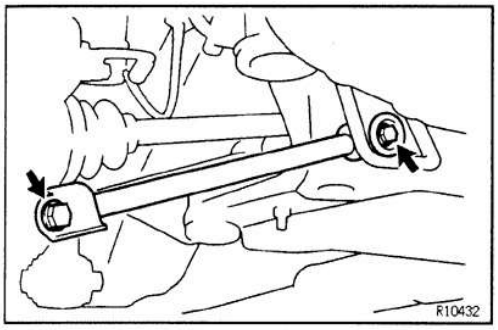
(b) Remove the rear wheel.

(c) Support the rear axle carrier with a jack.



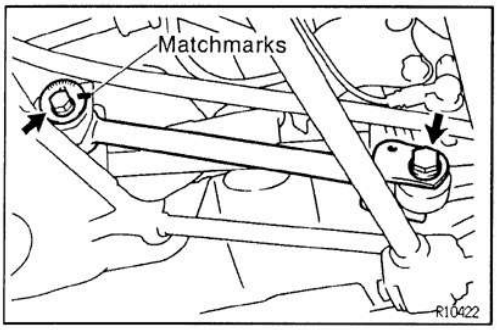
(d) Torque the strut rod set bolts.
Torque: 113 N·m (1,150 kgf·cm, 76 ft·lbf)

SA



(e) Torque the No.2 suspension arm set bolt of the axle carrier side.
Torque: 123 N·m (1,250 kgf·cm, 90 ft·lbf)

(f) Torque the No.2 suspension arm set bolt of the suspension member side.
Torque: 113 N·m (1,150 kgf·cm, 83 ft·lbf)



(g) Torque the No.1 suspension arm set bolt of the axle carrier side.
Torque: 123 N·m (1,250 kgf·cm, 90 ft·lbf)

(h) Align the matchmarks and torque the toe adjusting cam.
Torque: 98 N·m (1,000 kgf·cm, 72 ft·lbf)

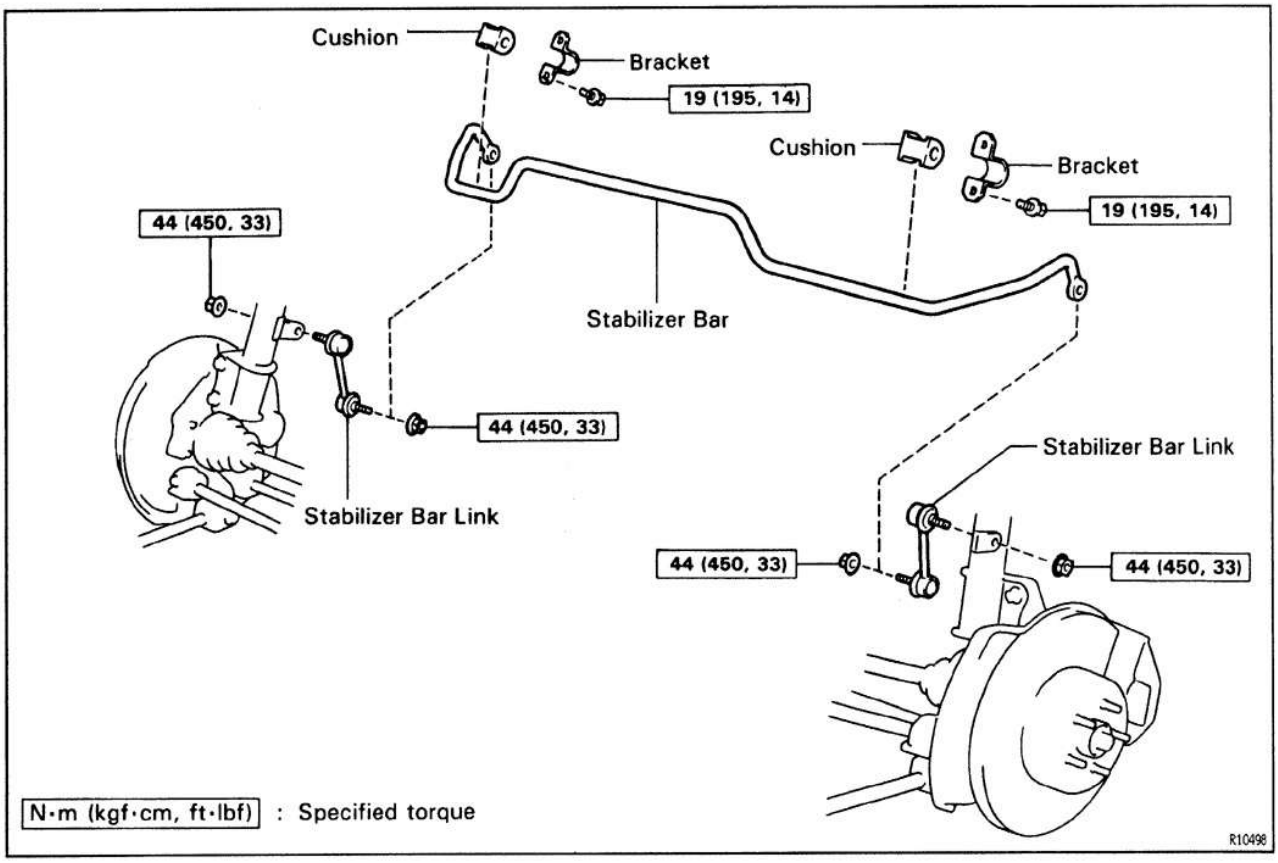
6. INSTALL REAR WHEEL AND LOWER VEHICLE
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

7. CHECK AND ADJUST REAR WHEEL ALIGNMENT
(See page SA–6)

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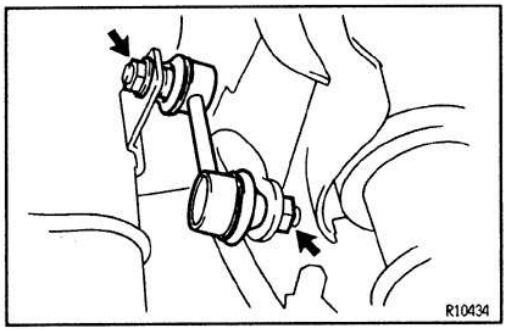
STABILIZER BAR
COMPONENTS

SA08X-06

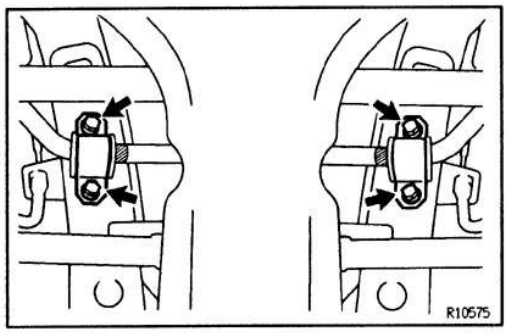


SA1H2-01

STABILIZER BAR REMOVAL

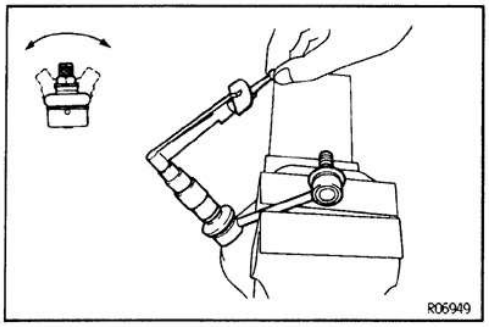


1. **REMOVE BOTH STABILIZER BAR LINKS**
   Remove the 4 nuts and 2 stabilizer bar links.
   HINT: If the ball joint turns together with the nut, use a hexagon wrench to hold the stud.



2. **REMOVE STABILIZER BAR**
   Remove the 4 bolts and stabilizer bar from the body.
3. **REMOVE BOTH CUSHIONS AND BRACKETS**
   Remove the cushions and brackets from the stabilizer bar.

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STABILIZER BAR LINK BALL JOINT INSPECTION

SA0UT-03

INSPECT BALL JOINT FOR ROTATION CONDITION

(a) Flip the ball joint stud back and forth 5 times, as shown in the illustration, before installing the nut.

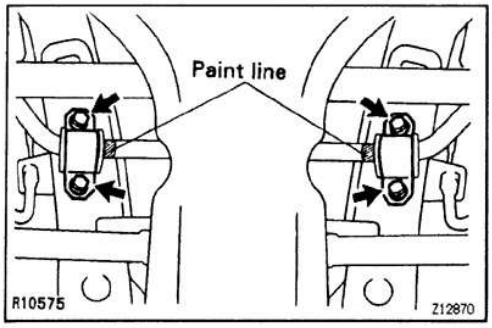
(b) Using a torque wrench, turn the nut continuously one turn every 2 – 4 seconds and take the torque reading on the 5th turn.

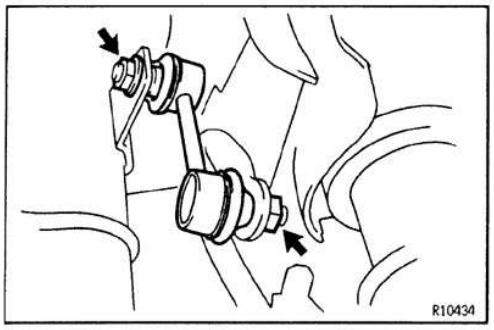
Torque (turning):

0.05 – 1.0 N·m (0.5 – 10 kgf·cm, 2.6 – 8.7 in.·lbf)

If not within specification, replace the stabilizer bar link.

SA





STABILIZER BAR INSTALLATION

SA1CD-03

1. **INSTALL STABILIZER BAR**

(a) Install the 2 cushions to the stabilizer bar.
HINT: Install the cushion to the outside of the paint line.

(b) Install the brackets.

(c) Install the stabilizer bar with the brackets, cushions and bolts.
Torque: 19 N·m (195 kgf·cm, 14 ft·lbf)

2. **INSTALL BOTH STABILIZER BAR LINKS**

Install the stabilizer bar links to the stabilizer bar and shock absorber.
Torque: 44 N·m (450 kgf·cm, 33 ft·lbf)
HINT: If the ball joint stud turns together with the nut, use a hexagon wrench to hold the stud.

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SERVICE SPECIFICATIONS

SERVICE DATA

SA10L-02

SA

Cold tire inflation pressure	Tire size		Pressure kPa (kgf/cm^2, psi)	
			Front	Rear
	215/50 R16 90W		240 (2.4, 35)	240 (2.4, 35)
Vehicle height	Tire size		Height mm (in.)	
			Front	Rear
	215/50 R16		183.2 (7.21)	231.8 (9.13)
Front wheel alignment	Toe-in		0°12′ ± 12′ (2 ± 2 mm, 0.08 ± 0.08 in.)	
		Tie rod end left-right error	1.5 mm (0.059 in.) or less	
	Camber		−0°21′ ± 45′	
		Left-right error	45′ or less	
	Caster		2°44′ ± 45′	
		Left-right error	45′ or less	
	Steering axis inclination		3°01′ ± 45′	
		Left-right error	45′ or less	
	Wheel angle (Max.)	Inside wheel	34°32′ ± 2°	
		Outside wheel	28°18′ (reference)	
Front axle	Bearing axial play		0.05 mm (0.0020 in.) or less	
	Axle hub runout		0.07 mm (0.0028 in.) or less	
Rear wheel alignment	Toe-in		0°27′ ± 12′ (4.5 ± 2 mm, 0.18 ± 0.08 in.)	
	Camber		−1°21′ ± 45′	
		Left-right error	45′ or less	
Rear axle	Bearing axial play		0.05 mm (0.0020 in.) or less	
	Axle hub runout		0.07 mm (0.0028 in.) or less	

V05449

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Rear differential	Drive pinion oil seal drive in depth		2 mm (0.079 in.)
	Side gear shaft oil seal drive in depth		0 mm (0 in.)
	Companion flange vertical runout		0.10 mm (0.0039 in.) or less
	Companion flange lateral runout		0.10 mm (0.0039 in.) or less
	Ring gear runout		0.07 mm (0.0028 in.) or less
	Drive pinion to ring gear backlash		0.13 – 0.18 mm (0.0051 – 0.0071 in.)
	Drive pinion preload (at start)	New bearing	1.0 – 1.6 N·m (10 – 16 kgf·cm, 8.7 – 13.9 in.·lbf)
		Reused bearing	0.5 – 0.8 N·m (5 – 8 kgf·cm, 4.3 – 6.9 in.·lbf)
	Total preload (add drive pinion preload)		0.3 – 0.5 N·m (3 – 5 kgf·cm, 2.6 – 4.3 in.·lbf)

Side bearing plate washer thickness mm (in.)		
2.21 – 2.23 (0.0870 – 0.0878)	2.57 – 2.59 (0.1012 – 0.1020)	2.93 – 2.95 (0.1154 – 0.1161)
2.24 – 2.26 (0.0882 – 0.0890)	2.60 – 2.62 (0.1024 – 0.1031)	2.96 – 2.98 (0.1165 – 0.1173)
2.27 – 2.29 (0.0894 – 0.0902)	2.63 – 2.65 (0.1035 – 0.1043)	2.99 – 3.01 (0.1171 – 0.1185)
2.30 – 2.32 (0.0906 – 0.0913)	2.66 – 2.68 (0.1047 – 0.1055)	3.02 – 3.04 (0.1189 – 0.1197)
2.33 – 2.35 (0.0917 – 0.0925)	2.69 – 2.71 (0.1059 – 0.1067)	3.05 – 3.07 (0.1201 – 0.1209)
2.36 – 2.38 (0.0929 – 0.0937)	2.72 – 2.74 (0.1071 – 0.1079)	3.08 – 3.10 (0.1213 – 0.1220)
2.39 – 2.41 (0.0941 – 0.0949)	2.75 – 2.77 (0.1083 – 0.1091)	3.11 – 3.13 (0.1224 – 0.1232)
2.42 – 2.44 (0.0953 – 0.0961)	2.78 – 2.80 (0.1094 – 0.1102)	3.14 – 3.16 (0.1236 – 0.1244)
2.45 – 2.47 (0.0965 – 0.0972)	2.81 – 2.83 (0.1106 – 0.1114)	3.17 – 3.19 (0.1248 – 0.1256)
2.48 – 2.50 (0.0976 – 0.0984)	2.84 – 2.86 (0.1118 – 0.1126)	3.20 – 3.22 (0.1260 – 0.1268)
2.51 – 2.53 (0.0988 – 0.0996)	2.87 – 2.89 (0.1130 – 0.1138)	–
2.54 – 2.56 (0.1000 – 0.1008)	2.90 – 2.92 (0.1142 – 0.1150)	–

Drive pinion plate washer thickness mm (in.)				
2.30 (0.0905)	2.39 (0.0941)	2.48 (0.0976)	2.57 (0.1012)	2.66 (0.1047)
2.31 (0.0909)	2.40 (0.0945)	2.49 (0.0980)	2.58 (0.1016)	2.67 (0.1051)
2.32 (0.0913)	2.41 (0.0949)	2.50 (0.0984)	2.59 (0.1020)	2.68 (0.1055)
2.33 (0.0917)	2.42 (0.0953)	2.51 (0.0989)	2.60 (0.1024)	2.69 (0.1059)
2.34 (0.0921)	2.43 (0.0957)	2.52 (0.0992)	2.61 (0.1028)	2.70 (0.1063)
2.35 (0.0925)	2.44 (0.0961)	2.53 (0.0996)	2.62 (0.1032)	2.71 (0.1067)
2.36 (0.0929)	2.45 (0.0965)	2.54 (0.1000)	2.63 (0.1035)	–
2.37 (0.0933)	2.46 (0.0969)	2.55 (0.1004)	2.64 (0.1039)	–
2.38 (0.0937)	2.47 (0.0972)	2.56 (0.1008)	2.65 (0.1043)	–

SA

V05450

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SA042-0C

TORQUE SPECIFICATIONS

(FRONT)

Part tightened	N·m	kgf·cm	ft·lbf
Tie rod end lock nut	56	570	42
Steering knuckle x Tie rod end	49	500	36
Axle shaft x Drive shaft	276	2,700	195
Steering knuckle x Lower ball joint attachment	108	1,100	80
ABS speed sensor set bolt	8.0	82	71in.·lbf
Camber control arm x Shock absorber	172	1,750	127
Stabilizer bar link set nut	64	650	47

SA

(REAR)

Part tightened		N·m	kgf·cm	ft·lbf
Brake caliper x Axle carrier		47	475	34
Backing plate x Axle carrier		72	730	53
Backing plate x Parking brake cable		7.8	89	69in.·lbf
Shock absorber x Axle carrier		255	2,600	188
ABS speed sensor set bolt		19	195	14
Drive shaft x Rear axle shaft		226	2,300	166
Drive shaft x Side gear shaft		56	570	41
Propeller shaft x Companion flange		74	750	54
Rear crossmember x Suspension member		72	730	53
Differential x Suspension member	Front	103	1,050	76
Differential x Suspension member	Rear	147	1,500	108
Differential case x Ring gear		97	985	71
Differential carrier x Side bearing cap		78	800	58
Differential carrier x Carrier cover		47	475	34
No.1 lower suspension arm x Suspension member		98	1,000	72
No.1 lower suspension arm x Axle carrier		123	1,250	90
No.2 lower suspension arm x Suspension member		113	1,150	83
No.2 lower suspension arm x Rear axle carrier		123	1,250	90
Strut rod x Body		113	1,150	83
Strut rod x Rear axle carrier		113	1,150	83
Stabilizer bar cushion bracket		19	195	14 〈e〉
Stabilizer bar link set nut		44	450	33

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BRAKE SYSTEM

PREPARATION ..... BR– 2
FRONT BRAKE ..... BR– 3
REAR BRAKE ..... BR– 10
PROPORTIONING VALVE (P VALVE) ..... BR– 16
ANTI–LOCK BRAKE SYSTEM (ABS) ..... BR– 17
REAR SPEED SENSOR ..... BR– 17
SERVICE SPECIFICATIONS ..... BR– 20

BR

REFER TO CELICA REPAIR MANUAL FOR CHASSIS AND BODY (Pub. No. RM380E)

NOTE: The above pages contain only the points which differ from the above listed manual.

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PREPARATION

SST(SPECIAL SERVICE TOOLS)

BR03J-0C

	09709–29017 LSPV Gauge Set	

RECOMMENDED TOOLS

BR0E8-05

	09082–00050 TOYOTA Electrical Tester Set	

BR

EQUIPMENT

BR03K-04

Torque wrench	
Micrometer	Brake disc
Dial indicator	Brake disc
Vernier calipers	Brake disc

LUBRICANT

BR03L-03

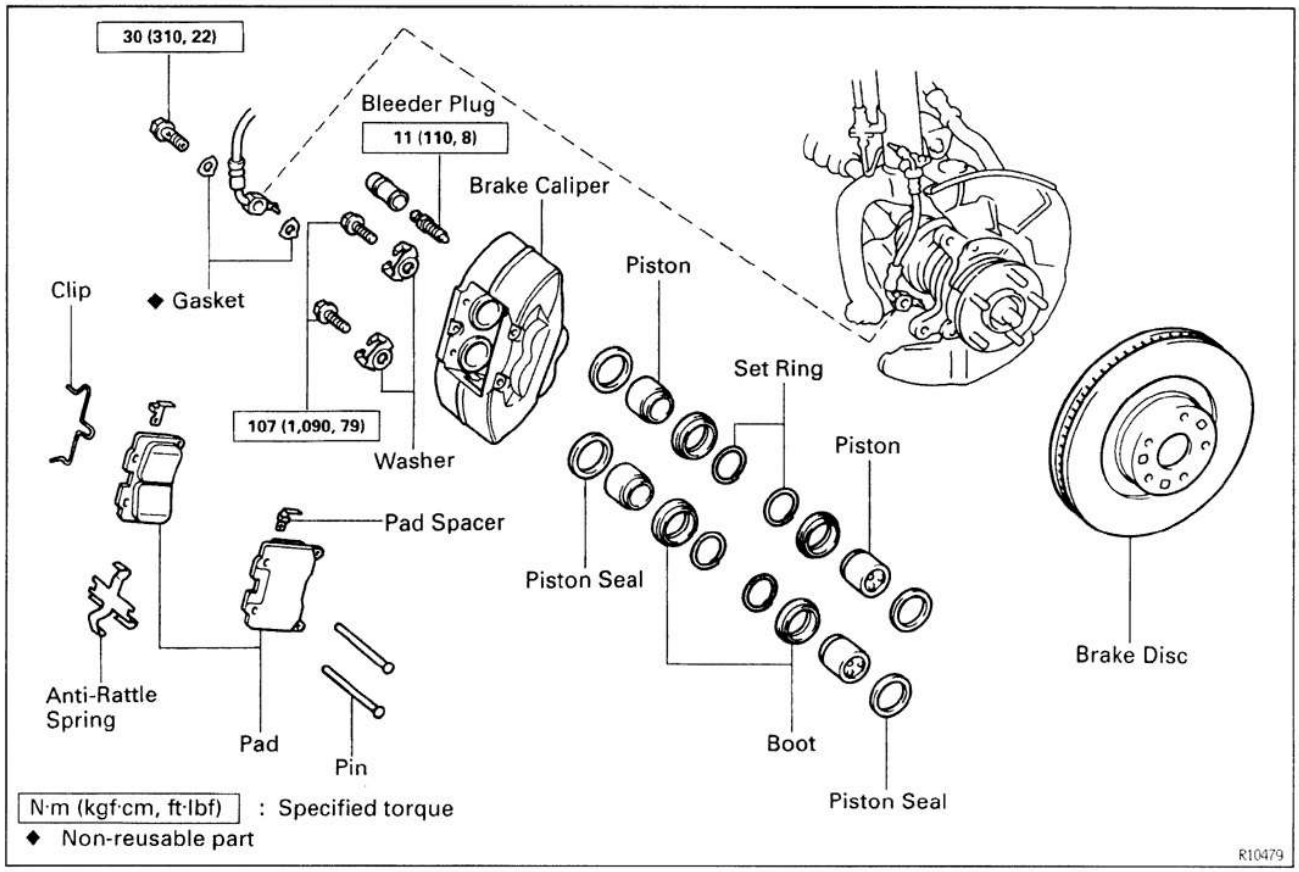
Item	Capacity	Classification
Brake fluid	–	SAEJ1703 or FMVSS No.116, DOT 3

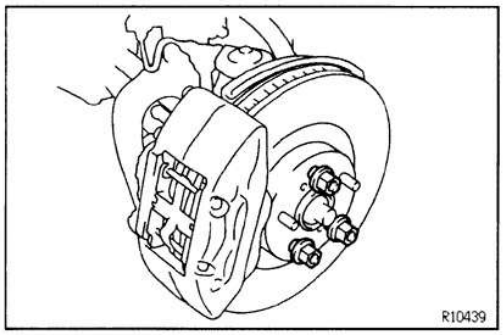
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FRONT BRAKE

COMPONENTS

BROAX-06

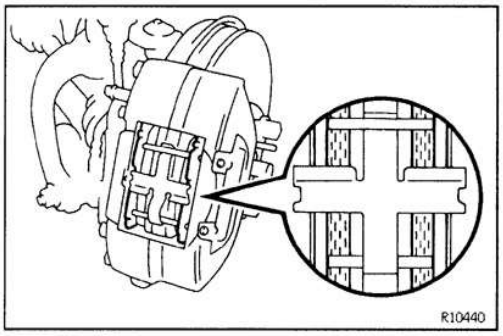




BRAKE PADS REPLACEMENT

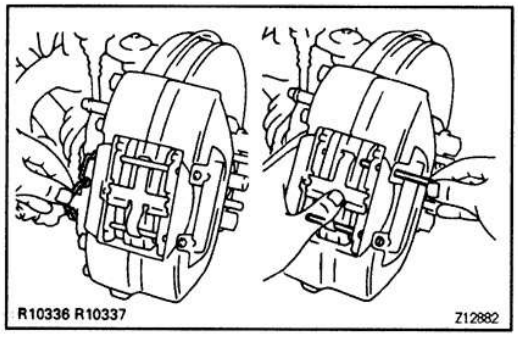
BROAY-06

1. **REMOVE FRONT WHEEL**
   Remove the wheel and temporarily fasten the disc with the hub nuts.



2. **INSPECT PAD LINING THICKNESS**
   Check the pad thickness and replace pads if not within specification.
   Minimum thickness:
   1.0 mm (0.039 in.)

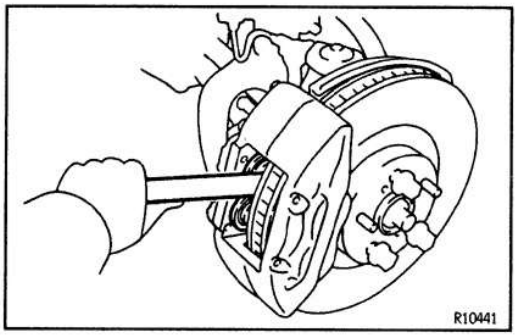
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3. REMOVE THESE PARTS:

(a) Clip
(b) 2 pins
(c) Anti–rattle spring
(d) 2 pads
(e) 2 pad spacers

4. CHECK DISC THICKNESS AND RUNOUT
(See pages BR–6 and BR–7)

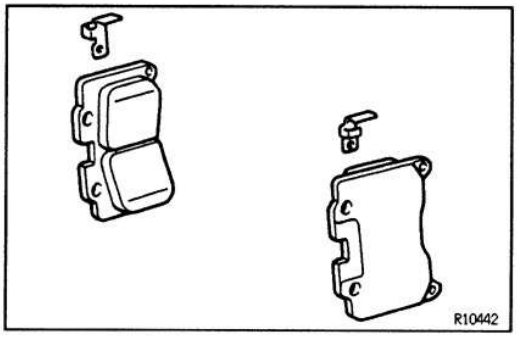


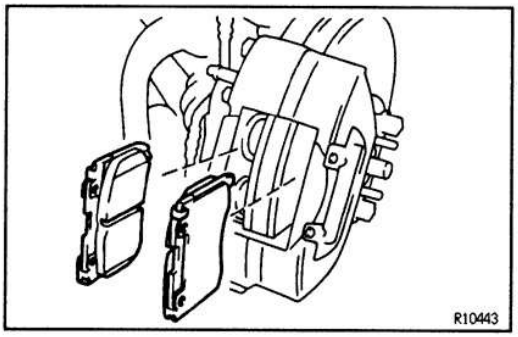
5. INSTALL NEW PADS

(a) Draw out a small amount of brake fluid from the reservoir.

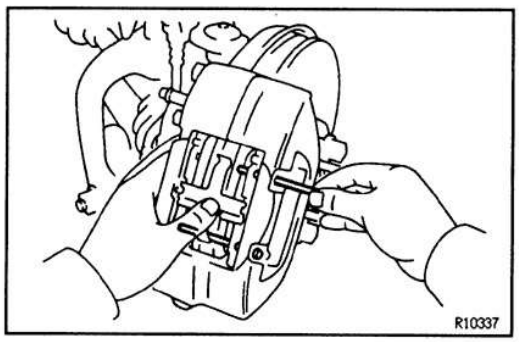
(b) Press in the pistons with a hammer handle or equivalent.
HINT:
- Always change the pads on one wheel at a time as there is a possibility of the opposite piston flying out.
- If the piston is difficult to push in, loosen the bleeder plug and push in the piston while letting some brake fluid escape.

(c) Install a pad spacer on upper side of each pad.



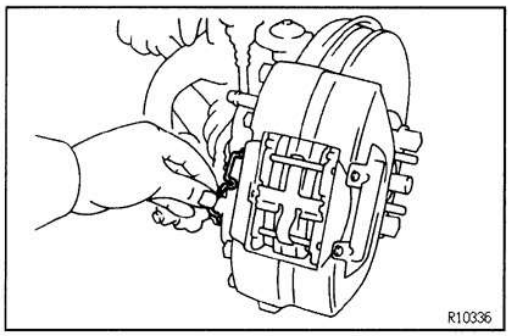


(d) Install the 2 pads.
NOTICE: Do not allow oil or grease to get on the rubbing face.

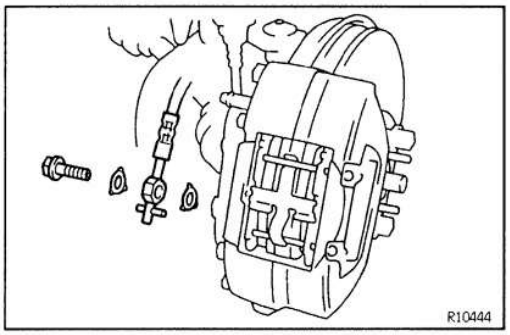


6. INSTALL ANTI–RATTLE SPRING AND 2 PINS

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7. INSTALL CLIP



CALIPER REMOVAL

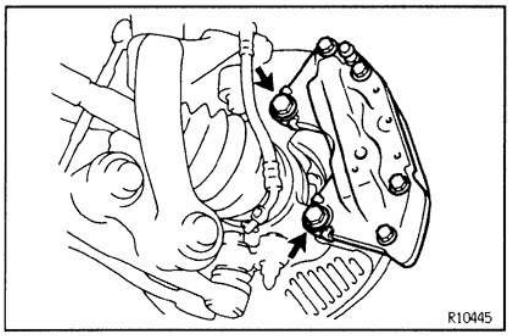
BR0AZ-09

1. REMOVE FRONT WHEEL

2. DISCONNECT BRAKE HOSE

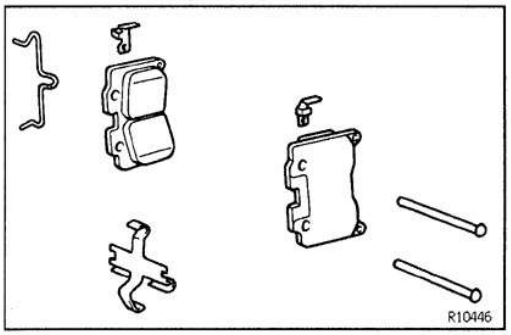
(a) Remove the union bolt and 2 gaskets from the brake caliper, then disconnect the brake hose from the brake caliper.

(b) Use a container to catch the brake fluid as it drains out.



3. REMOVE CALIPER

Remove the 2 mounting bolts and caliper.



4. REMOVE THESE PARTS:

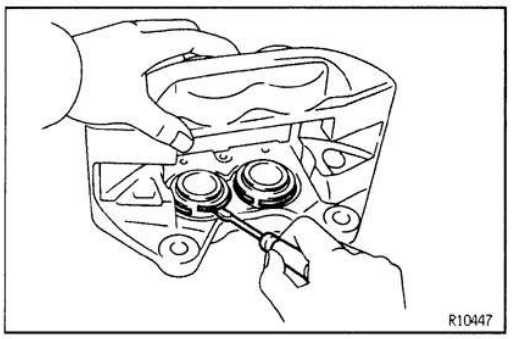
(a) Clip

(b) 2 pins

(c) Anti–rattle spring

(d) 2 pads

(e) 2 pad spacers



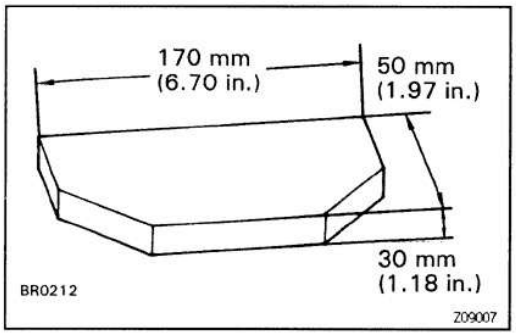
CALIPER DISASSEMBLY

BR0B0-0C

1. REMOVE CYLINDER BOOT SET RINGS AND BOOTS

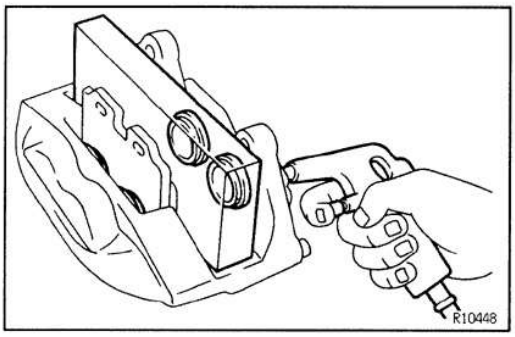
Using a screwdriver, remove the 4 cylinder boot set rings and 4 boots.

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2. REMOVE PISTONS FROM CYLINDER

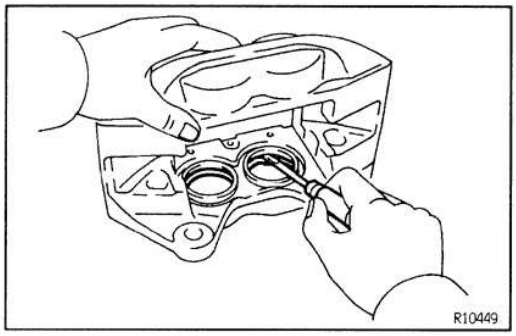
(a) Prepare a wooden plate to hold the pistons.



(b) Place the plate between the pistons and insert a pad on one side.

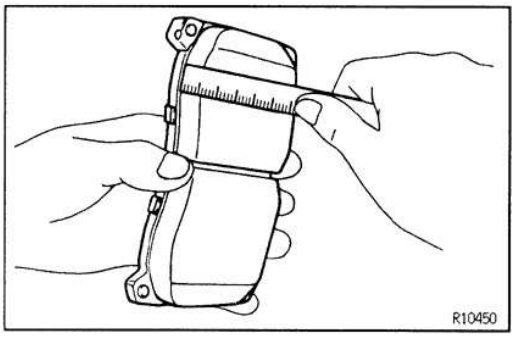
(c) Use compressed air to remove the pistons alternately from the cylinder.

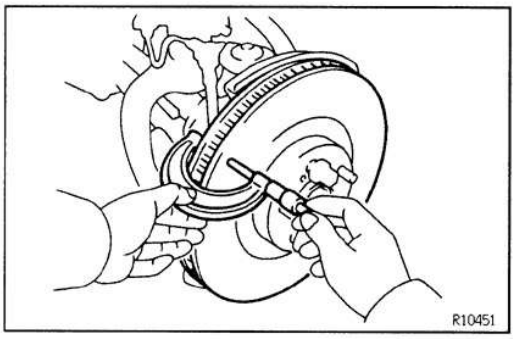
CAUTION: Do not place your fingers in front of the pistons when using compressed air.



3. REMOVE PISTON SEALS

Using a screwdriver, remove the 4 piston seals from the cylinder.





BR05W-01

FRONT BRAKE COMPONENTS INSPECTION AND REPAIR

1. MEASURE PAD LINING THICKNESS

Standard thickness:

12.0 mm (0.472 in.)

Minimum thickness:

1.0 mm (0.039 in.)

Replace the pads if the thickness is less than the minimum (the 1.0 mm slit is no longer visible) or if it shows signs of uneven wear.

2. MEASURE DISC THICKNESS

Standard thickness:

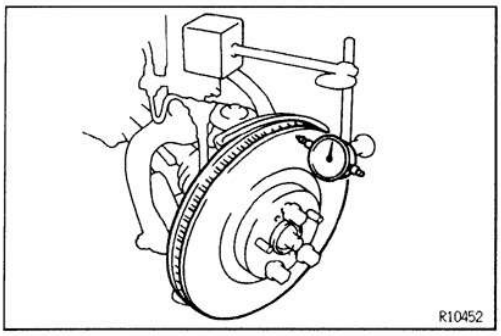
32.0 mm (1.260 in.)

Minimum thickness:

30.0 mm (1.181 in.)

Replace the disc if the thickness of the disc is at the minimum thickness or less. Replace the disc or grind it on a lathe if it is badly scored or worn unevenly.

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3. MEASURE DISC RUNOUT

Using a dial indicator, measure disc runout 10 mm (0.39 in.) from the outer edge of the disc.

Maximum disc runout:

0.05 mm (0.0020 in.)

If the disc's runout is at the maximum value or greater, check the bearing play in the axial direction and check the axle hub runout (See Pub.No. RM380E on page SA —2). If the bearing play and axle hub runout are not abnormal, adjust the disc runout.

4. IF NECESSARY, ADJUST DISC RUNOUT

(a) Remove the hub nuts and the disc. Reinstall the disc 1/5 of a turn round from its original position on the hub. Install and torque the hub nuts.

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

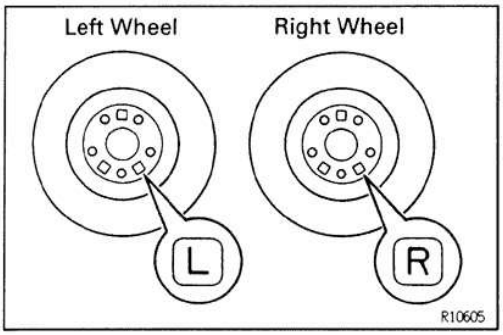
Remesure the disc runout. Make a not of the runout and the disc's position on the hub.

(b) Repeat (a) until the disc has been installed on the 3 remaining hub positions.

(c) If the minimum runout recorded in (a) and (b) is less than 0.05 mm (0.0020 in.), install the disc in that position.

(d) If the minimum runout recorded in (a) and (b) is greater than 0.05 mm (0.0020 in.), replace the disc and repeat step 3.

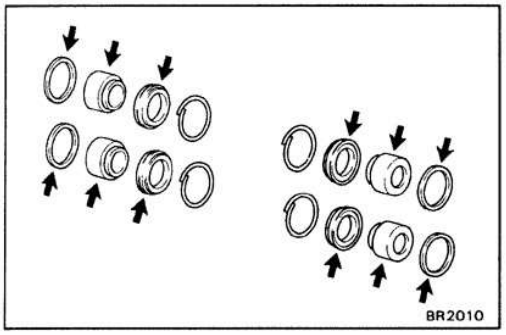
HINT: Install a disc marked with "R" on the right wheel, and a disc marked with "L" on the left wheel.



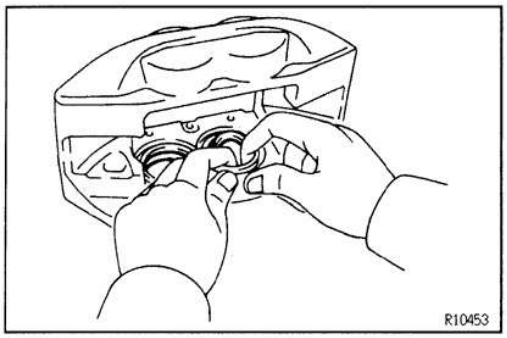
BR

CALIPER ASSEMBLY

BR082-07

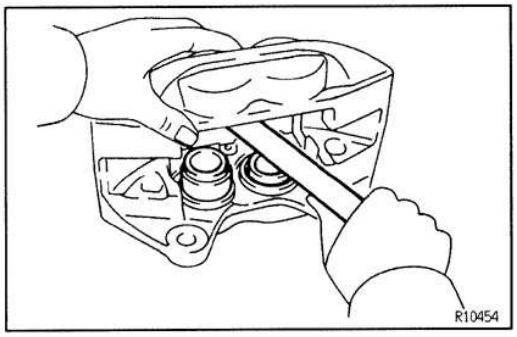


1. APPLY LITHIUM SOAP BASE GLYCOL GREASE TO PARTS INDICATED WITH ARROWS

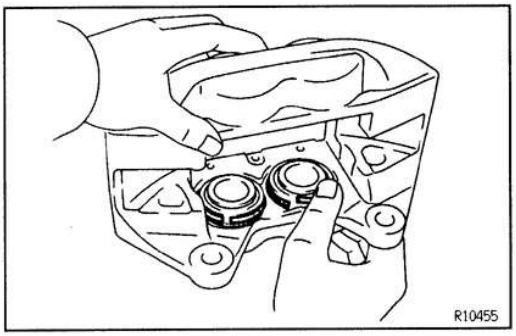


2. INSTALL PISTON SEALS INTO CYLINDER

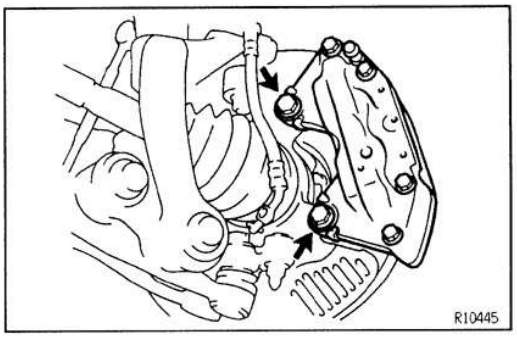
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3. INSTALL PISTONS INTO CYLINDER



4. INSTALL CYLINDER BOOTS AND SET RINGS INTO CYLINDER



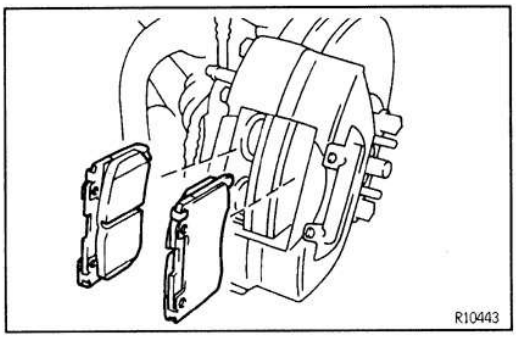
CALIPER INSTALLATION

BR0B3-09

1. INSTALL CALIPER

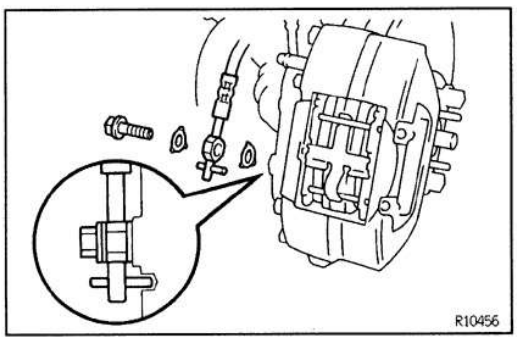
Install the brake caliper, and torque the 2 mounting bolts.

Torque: 107 N·m (1,090 kgf·cm, 79 ft·lbf)



2. INSTALL PADS

(See steps 5 to 7 on page BR–4)



3. CONNECT BRAKE HOSE

Install the brake hose on the brake caliper with 2 new gaskets.

Torque: 30 N·m (310 kgf·cm, 22 ft·lbf)

NOTICE: Connect the brake hose so that the clearance between the caliper and the hose becomes 28 mm (1.102 in.) or less.

HINT: Insert the brake hose lock securely in the lock hole in the brake caliper.

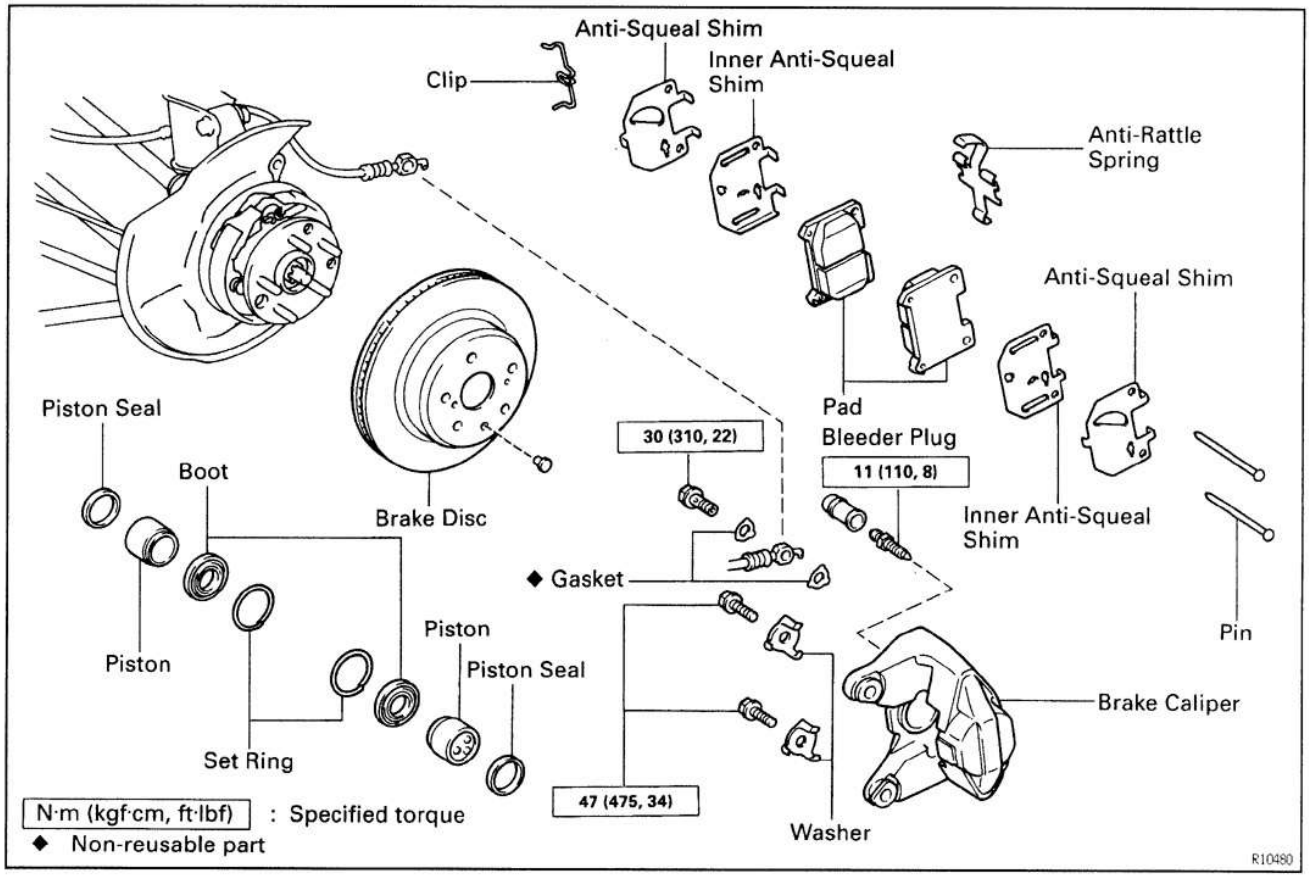
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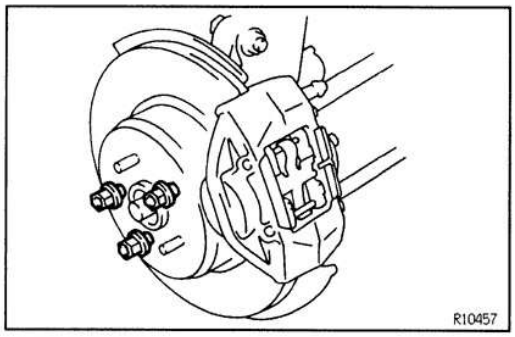
4. FILL BRAKE RESERVOIR WITH BRAKE FLUID AND BLEED BRAKE SYSTEM
5. CHECK FOR FLUID LEAKAGE
6. INSTALL FRONT WHEEL

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REAR BRAKE
COMPONENTS

BR0AX-07



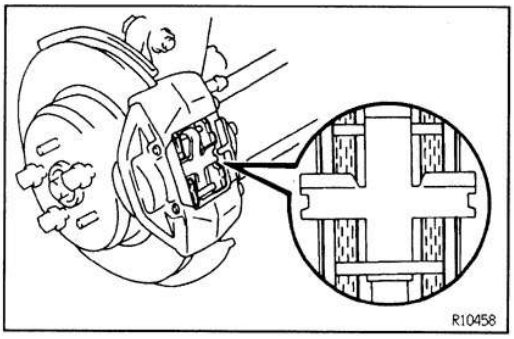


BR0N2-03

BRAKE PADS REPLACEMENT

1. REMOVE REAR WHEEL

Remove the wheel and temporarily fasten the disc with the hub nuts.



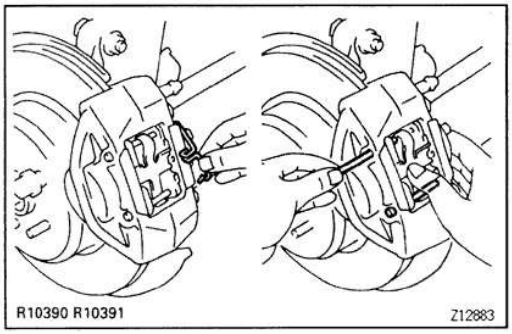
2. INSPECT PAD LINING THICKNESS

Check the pad thickness and replace pads if not within specification.

Minimum thickness:

1.0 mm (0.039 in.)

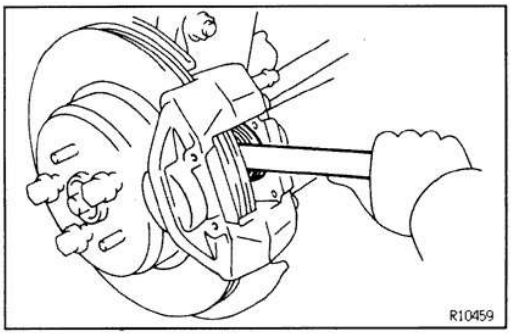
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3. REMOVE THESE PARTS:

(a) Clip
(b) 2 pins
(c) Anti—rattle spring
(d) 2 pads
(e) 4 anti—squeal shims

4. CHECK DISC THICKNESS AND RUNOUT
(See pages BR—13 and BR—14)



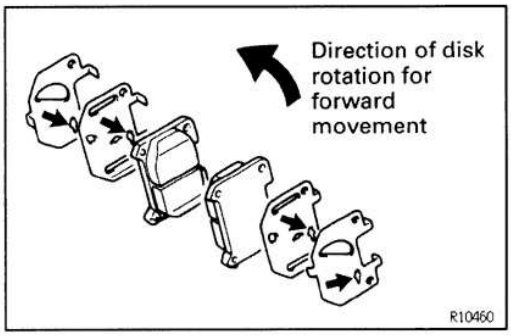
5. INSTALL NEW PADS

(a) Draw out a small amount of brake fluid from the reservoir.

(b) Press in the pistons with a hammer handle or equivalent.

HINT:

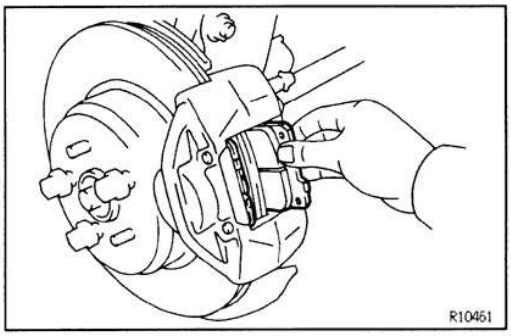
- Always change the pads on one wheel at a time as there is a possibility of the opposite piston flying out.
- If the piston is difficult to push in, loosen the bleeder plug and push in the piston while letting some brake fluid escape.



(c) Install the 2 anti—squeal shims on each pad.

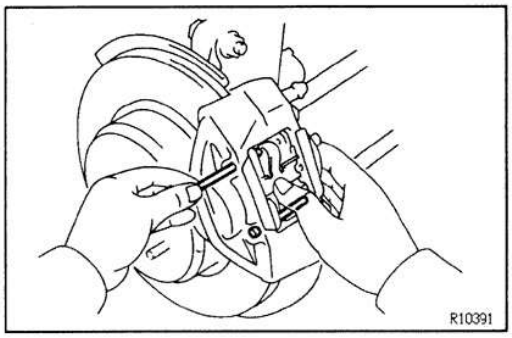
HINT:

- Apply disc brake grease to both sides of the inner anti—squealshim.
- Make sure that an arrow on the shims show the direction of disc rotation for the vehicle's forward movement.



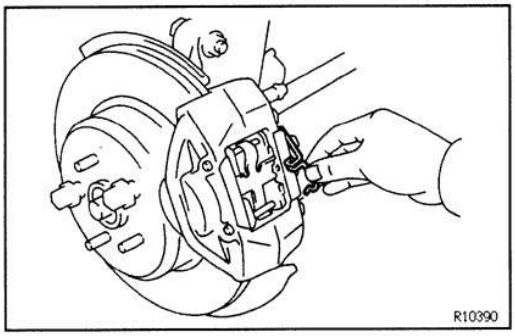
(d) Install the 2 pads.

NOTICE: Do not allow oil or grease to get on the rubbing face.

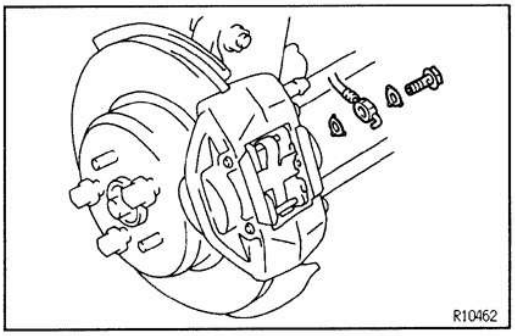


6. INSTALL ANTI—RATTLE SPRING AND 2 PINS

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7. INSTALL CLIP



BR0AZ-0A

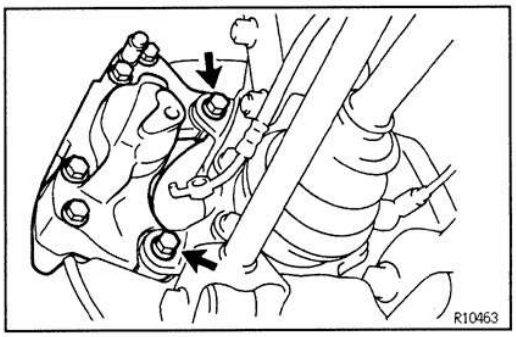
CALIPER REMOVAL

1. REMOVE REAR WHEEL

2. DISCONNECT BRAKE HOSE

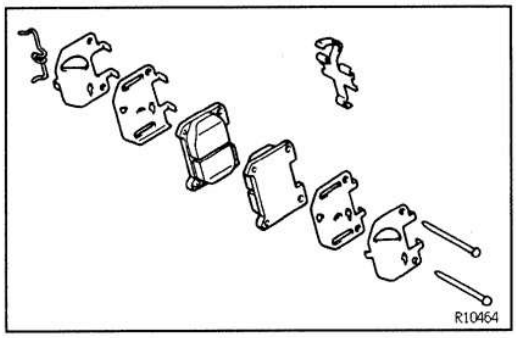
(a) Remove the union bolt and 2 gaskets from the brake caliper, then disconnect the brake hose from the brake caliper.

(b) Use a container to catch the brake fluid.



3. REMOVE CALIPER

Remove the 2 mounting bolts and caliper.



4. REMOVE THESE PARTS:

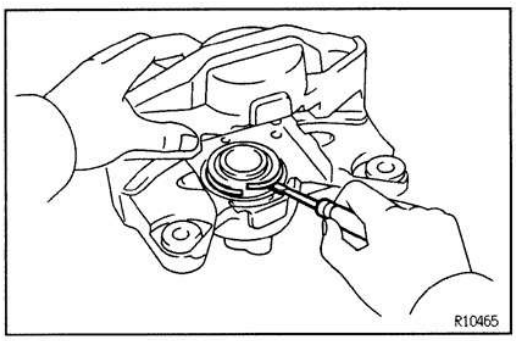
(a) Clip

(b) 2 pins

(c) Anti–rattle spring

(d) 2 pads

(e) 4 anti–squeal shims



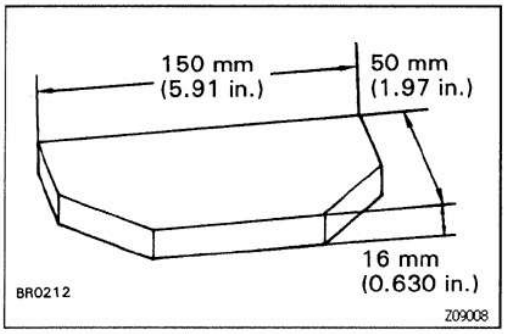
BR0BO-0D

CALIPER DISASSEMBLY

1. REMOVE CYLINDER BOOT SET RINGS AND BOOTS

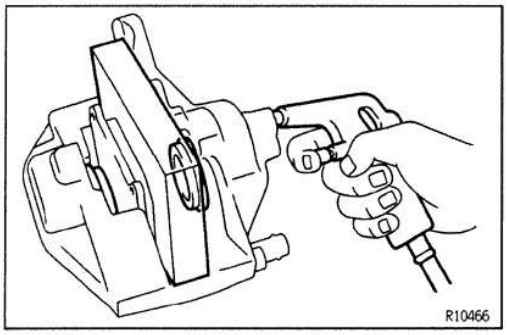
Using a screwdriver, remove the 2 cylinder boot set rings and 2 boots.

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2. REMOVE PISTONS FROM CYLINDER

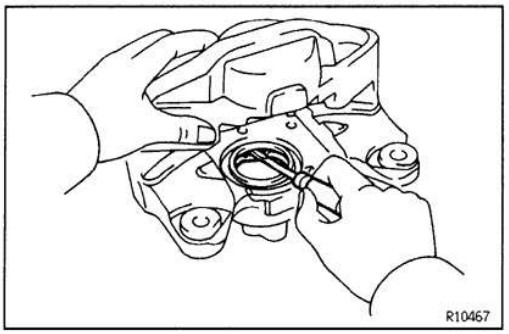
(a) Prepare a wooden plate to hold the pistons.



(b) Place the plate between the pistons and insert a pad on one side.

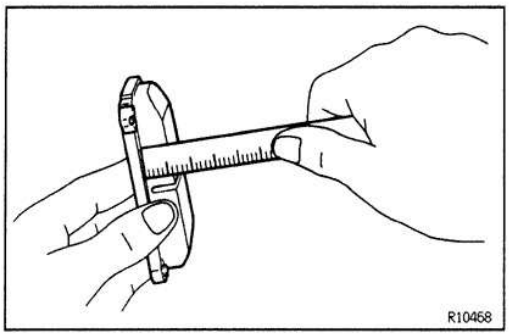
(c) Use compressed air to remove the pistons alternately from the caliper.

CAUTION: Do not place your fingers in front of the pistons when using compressed air.



3. REMOVE PISTON SEALS

Using a screwdriver, remove the 2 seals from the caliper.



REAR BRAKE COMPONENTS INSPECTION AND REPAIR

1. MEASURE PAD LINING THICKNESS

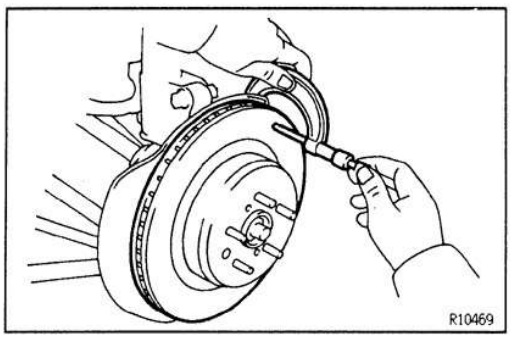
Standard thickness:

12.0 mm (0.472 in.)

Minimum thickness:

1.0 mm (0.039 in.)

Replace the pads if the thickness is less than the minimum (the 1.0 mm slit is no longer visible) or if it shows signs of uneven wear.



2. MEASURE DISC THICKNESS

Standard thickness:

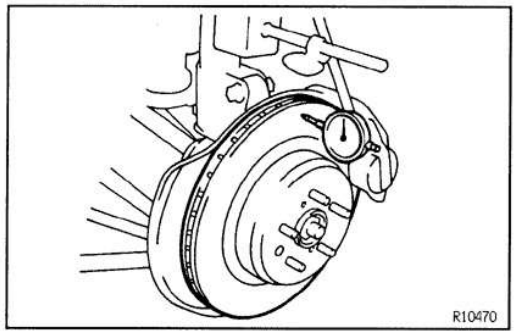
16.0 mm (0.630 in.)

Minimum thickness:

15.0 mm (0.591 in.)

Replace the disc if the thickness of the disc is at the minimum thickness or less. Replace the disc or grind it on a lathe if it is badly scored or worn unevenly.

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3. MEASURE DISC RUNOUT

Using a dial indicator, measure disc runout 10 mm (0.39 in.) from the outer edge of the disc.

Maximum disc runout:

0.15 mm (0.0059 in.)

If the disc's runout is at the maximum value or greater, check the bearing play in the axial direction and check the axle hub runout (See page SA–24). If the bearing play and axle hub runout are not abnormal, adjust the disc runout.

4. IF NECESSARY, ADJUST DISC RUNOUT

(a) Remove the hub nuts and the disc. Reinstall the disc 1/5 of a turn round from its original position on the hub. Install and torque the hub nuts.

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

Remeasure the disc runout. Make a note of the runout and the disc's position on the hub.

(b) Repeat (a) untill the disc has been installed on the 3 remaining hub positions.

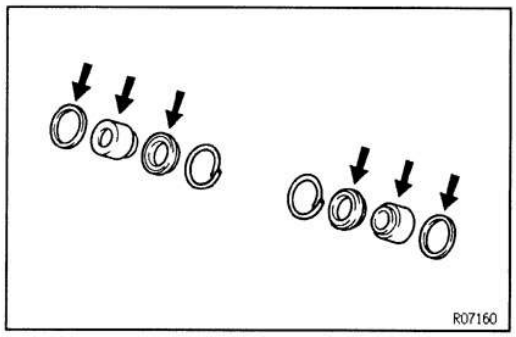
(c) If the minimum runout recorded in (a) and (b) is less than 0.15 mm (0.0059 in.), install the disc in that position.

(d) If the minimum runout recorded in (a) and (b) is greater than 0.15 mm (0.0059 in.), replace the disc and repeat step 3.

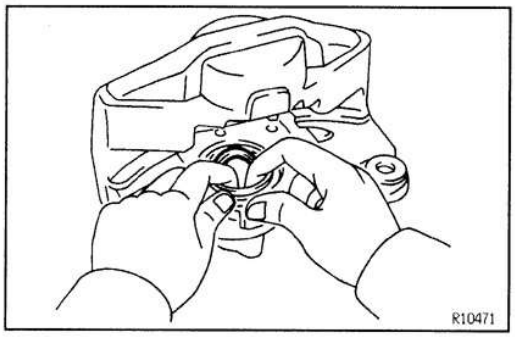
BR

CALIPER ASSEMBLY

BR0B2-08

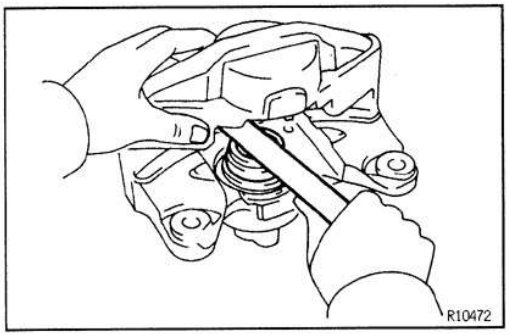


1. APPLY LITHIUM SOAP BASE GLYCOL GREASE TO PARTS INDICATED WITH ARROWS

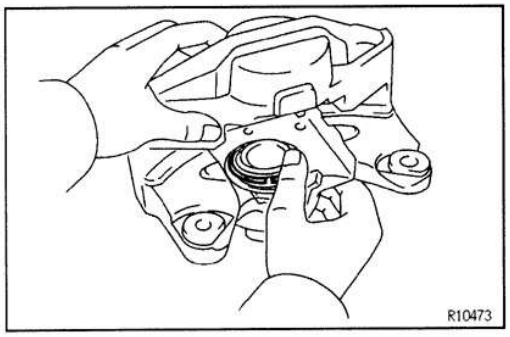


2. INSTALL PISTON SEALS INTO CYLINDER

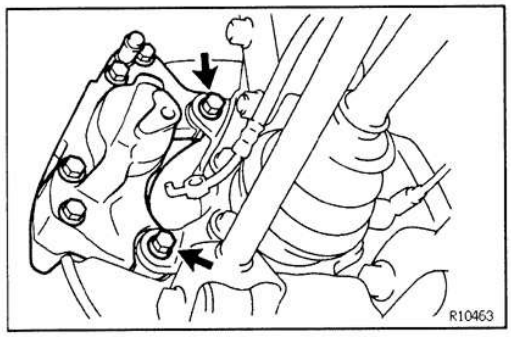
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3. **INSTALL PISTONS INTO CYLINDER**



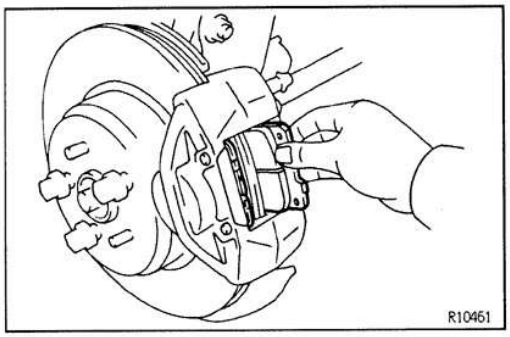
4. **INSTALL CYLINDER BOOTS AND SET RINGS INTO CYLINDER**



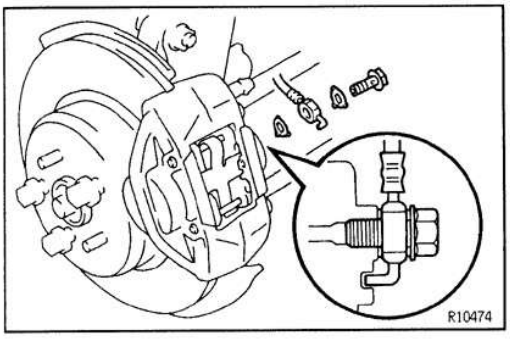
BR0B3-0A

CALIPER INSTALLATION

1. **INSTALL CALIPER**
   Install the brake caliper, and torque the 2 mounting bolts.
   Torque: 47 N·m (475 kgf·cm, 34 ft·lbf)



2. **INSTALL PADS**
   (See steps 5 to 8 on page BR–11)



3. **CONNECT BRAKE HOSE**
   Install the brake hose on the brake caliper with 2 new gaskets.
   Torque: 30 N·m (310 kgf·cm, 22 ft·lbf)
   HINT: Insert the brake hose lock securely in the lock hole in the brake caliper.
4. **FILL BRAKE RESERVOIR WITH BRAKE FLUID AND BLEED BRAKE SYSTEM**
5. **CHECK FOR FLUID LEAKAGE**
6. **INSTALL REAR WHEEL**

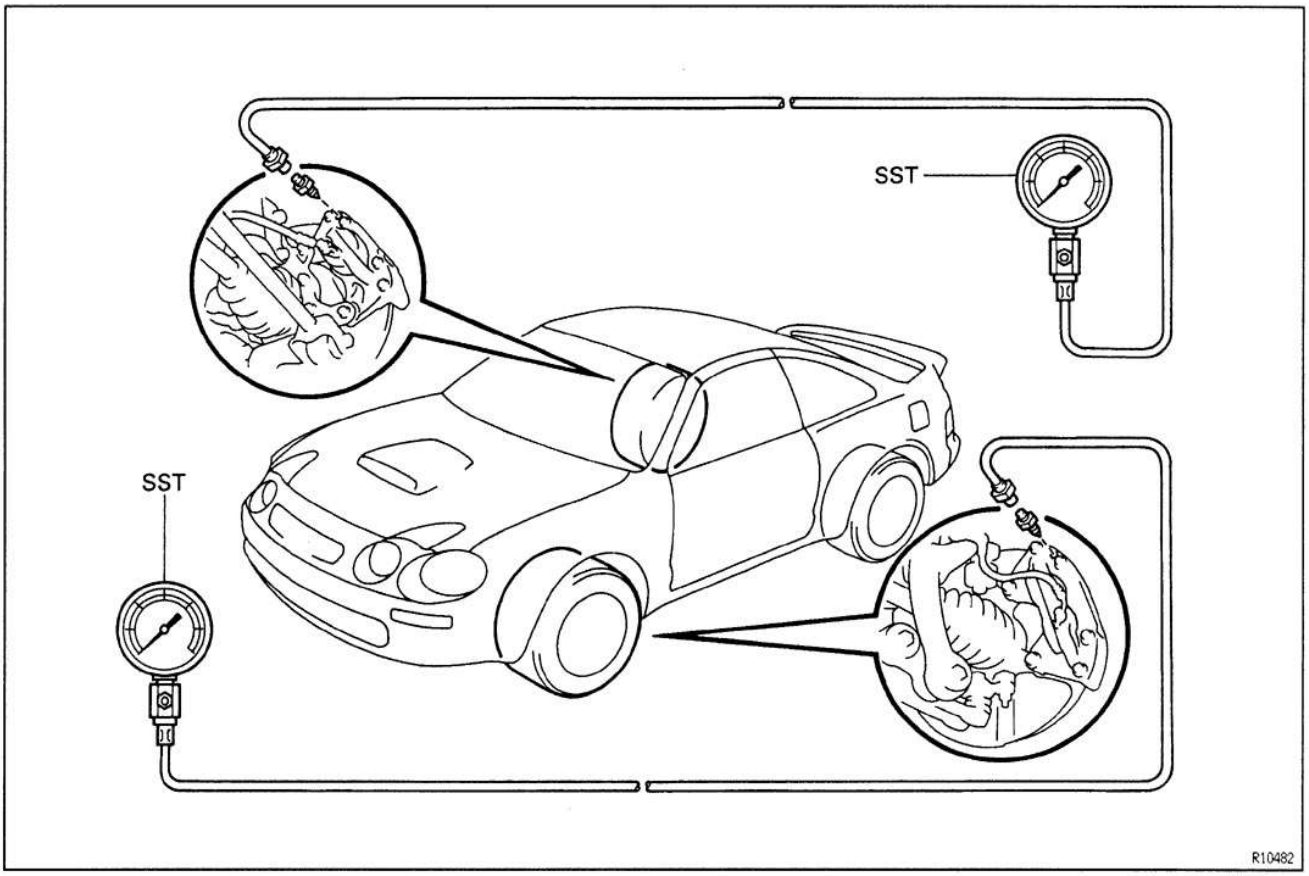
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PROPORTIONING VALVE (P VALVE)

B1002Z-01

FLUID PRESSURE CHECK

1. **INSTALL LSPV GAUGE (SST) AND BLEED AIR**
   SST 09709–29017



2. **BLEED AIR FROM FLUID PRESSURE GAUGE**
3. **RAISE MASTER CYLINDER PRESSURE AND CHECK REAR WHEEL CYLINDER PRESSURE**

Master cylinder pressure	Rear wheel cylinder pressure
2,942 kPa (30 kgf/cm², 427 psi)	2,942 kPa (30 kgf/cm², 427 psi)
7,845 kPa (80 kgf/cm², 1,138 psi)	4,756 kPa (48.5 kgf/cm², 690 psi)

When inspecting the fluid pressure, inspect the left front and right rear together, and the right front and left rear together.
If the rear wheel cylinder pressure is incorrect, replace the P valve assembly.

4. **BLEED BRAKE SYSTEM**
5. **CHECK FOR LEAKS**

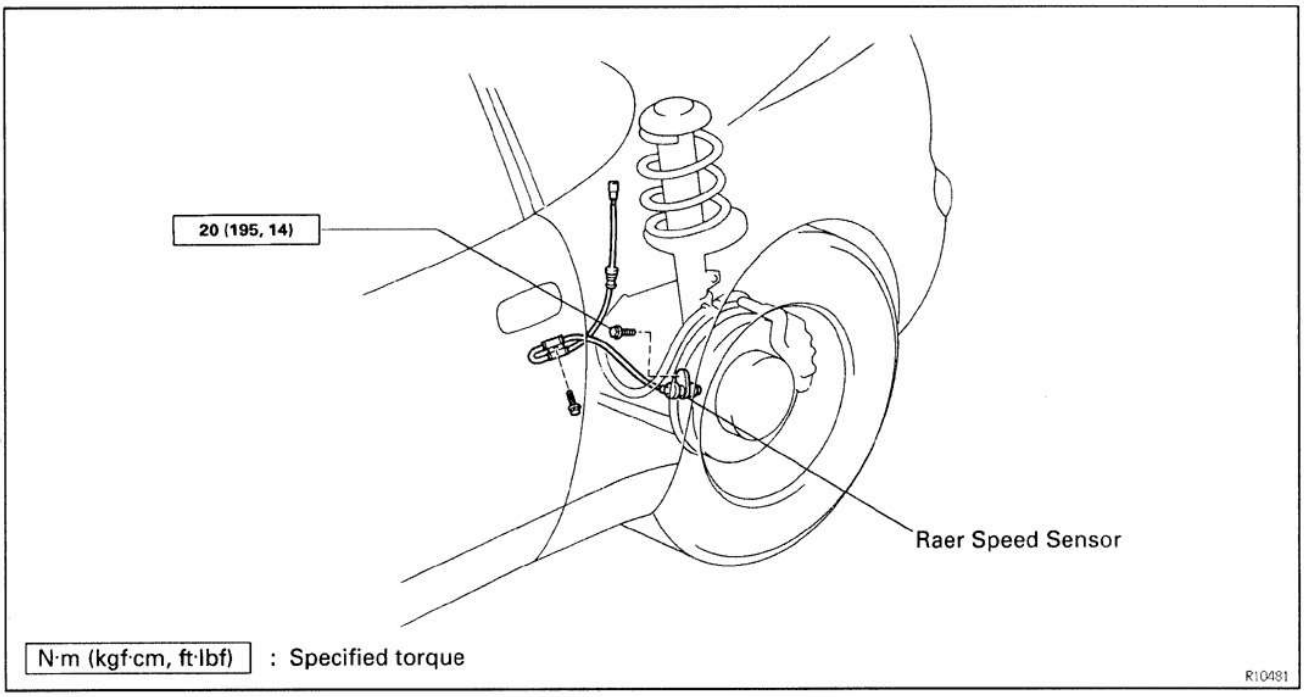
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ANTI–LOCK BRAKE SYSTEM (ABS)

REAR SPEED SENSOR

BR034–00

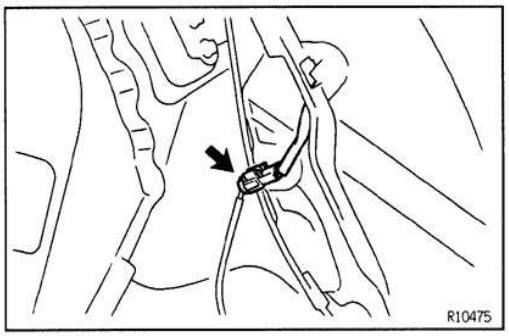
COMPONENTS



BR

BR035–00

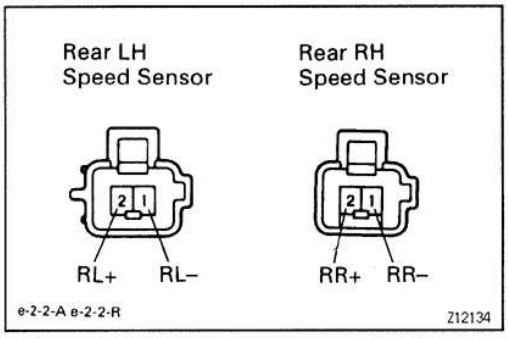
REAR SPEED SENSOR INSPECTION



1. **INSPECT SPEED SENSOR**

(a) Remove the rear seat back and deck trim side panel.

(b) Disconnect the speed sensor connector, and pull out the sensor wire harness with grommet.



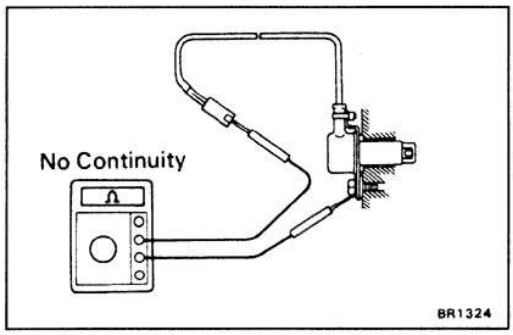
(c) Measure the resistance between terminals.

Resistance:

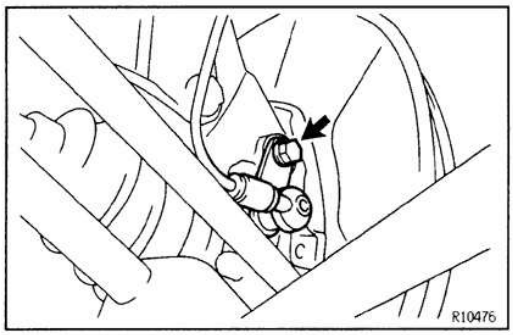
0.65–1.8 kΩ

If resistanve value is not as specified, replace the sensor.

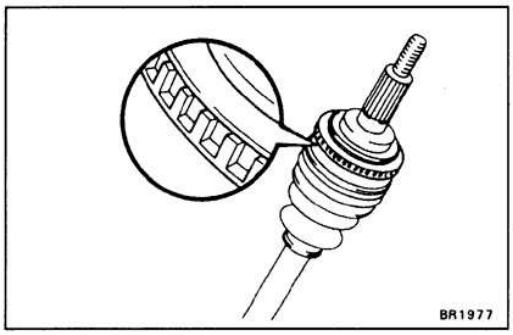
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(d) Check that there is no continuity between each terminal and sensor body.
(e) Connect the speed sensor connector.

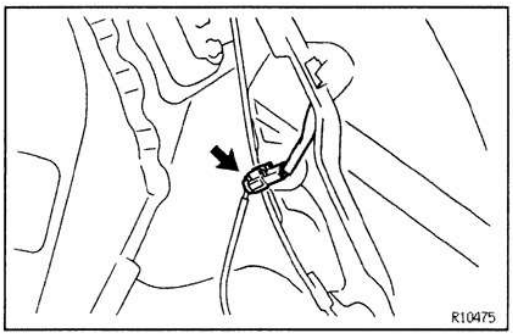


2. INSPECT SENSOR INSTALLATION
Check that the sensor installation bolt is tightened properly. If not, tighten the bolt.
Torque: 20 N·m (195 kgf·cm, 14 in.·lbf)



3. VISUALLY INSPECT SENSOR ROTOR SERRATIONS
(a) Remove the drive shaft. (See page SA–35)
(b) Inspect the sensor rotor serrations for scratches, cracks, warping or missing teeth.
(c) Install the drive shaft. (See page SA–39)
NOTICE: To prevent damage to the serrations, do not strike the drive shaft.

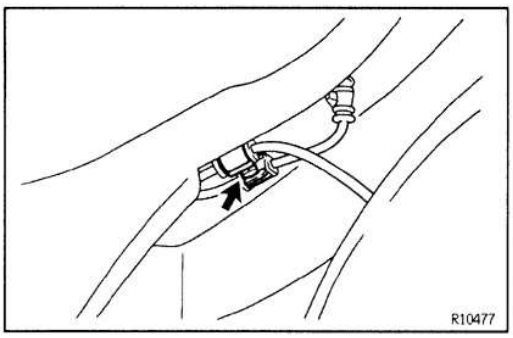
4. PERFORM SPEED SENSOR SIGNAL CHECK
(See Pub.No. RM380E on page BR–82)



REAR SPEED SENSOR REMOVAL

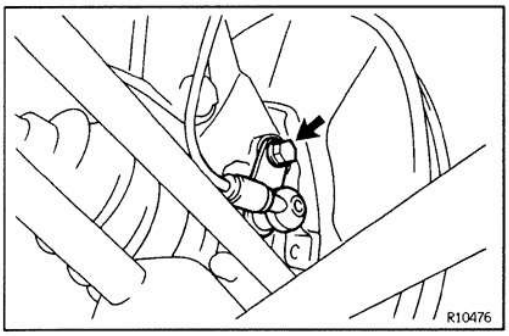
BR037-0E

1. DISCONNECT SPEED SENSOR CONNECTOR
(a) Remove the rear seat back and deck trim side panel.
(b) Disconnect the speed sensor connector, and pull out the sensor wire harness with grommet.



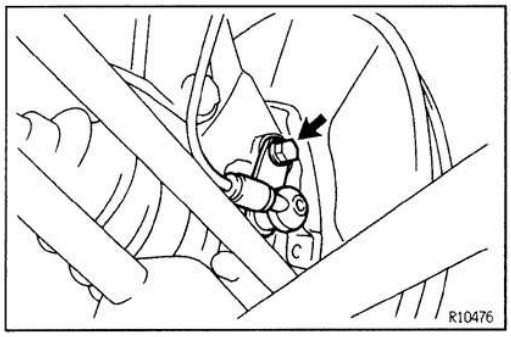
(c) Remove the clamp bolt holding the sensor wire harness from the body.

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2. REMOVE SPEED SENSOR

Remove the speed sensor from the axle carrier.



REAR SPEED SENSOR INSTALLATION

BRORL–02

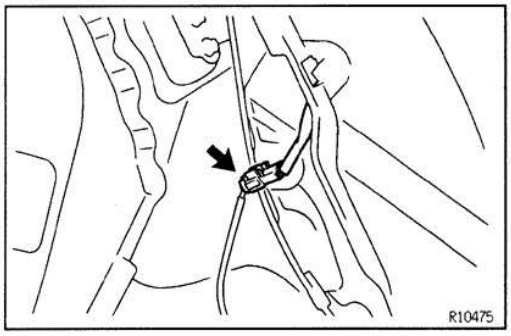
1. INSTALL SPEED SENSOR

Install the speed sensor to the axle carrier.

Torque: 20 N·m (195 kgf·cm, 14 in.·lbf)

NOTICE: Make sure that–

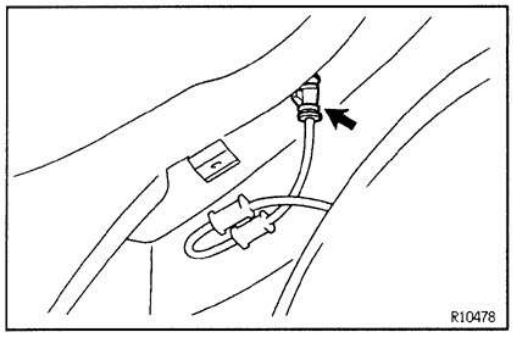
- **There are no foreign objects on the sensor or the part of the knuckle to which the sensor is to be installed.**
- **The sensor is installed flat against the knuckle when you tighten the bolt.**



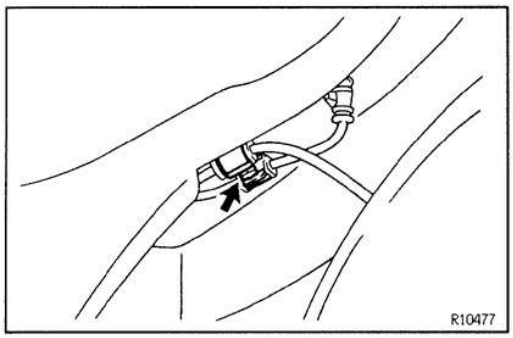
2. CONNECT SPEED SENSOR CONNECTOR

(a) Feed the sensor harness connector back inside the vehicle, connect the connector.

(b) Install the deck trim side panel and rear seat back.



(c) Install the grommet securely.



(d) Install the sensor harness with clamp and bolt.

3. PERFORM SPEED SENSOR SIGNAL CHECK

(See Pub.No. RM380E on page BR–82)

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SERVICE SPECIFICATIONS

SERVICE DATA

BR03A-14

Front brake pad thickness	STD	12.0 mm (0.472 in.)
Front brake pad thickness	Limit	1.0 mm (0.039 in.)
Front brake disc thickness	STD	32.0 mm (1.260 in.)
Front brake disc thickness	Limit	30.0 mm (1.181 in.)
Front brake disc runout	Limit	0.05 mm (0.0020 in.)
Rear brake disc pad thickness	STD	12.0 mm (0.472 in.)
Rear brake disc pad thickness	Limit	1.0 mm (0.039 in.)
Rear brake disc thickness	STD	16.0 mm (0.630 in.)
Rear brake disc thickness	Limit	15.0 mm (0.591 in.)
Rear brake disc runout	Limit	0.15 mm (0.0059 in.)

TORQUE SPECIFICATIONS

BR03B-16

Part tightened	N·m	kgf·cm	ft·lbf
Bleeder plug	11	110	8
Front disc brake caliper x Steering knuckle	107	1,090	79
Front disc brake caliper x Flexible hose union bolt	30	310	22
Rear disc brake caliper x Axle carrier	47	475	34
Rear disc brake caliper x Flexible hose union bolt	30	310	22
Rear speed sensor installation bolt	20	195	14

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STEERING

POWER STEERING ..... SR– 2
PREPARATION ..... SR– 2
ON–VEHICLE INSPECTION ..... SR– 3
GEAR HOUSING ..... SR– 9
SERVICE SPECIFICATIONS ..... SR– 14

REFER TO CELICA REPAIR MANUAL FOR CHASSIS AND BODY (Pub. No. RM380E)

SR

NOTE: The above pages contain only the points which differ from the above listed manual.

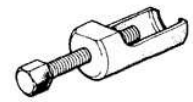
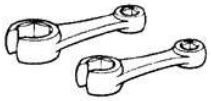
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POWER STEERING

PREPARATION

SST (SPECIAL SERVICE TOOLS)

SR0FV-09

	09610—20012	Pitman Arm Puller	Tie rod end
	09631—22020	Power Steering Hose Nut 14 x 17 mm Wrench Set	Pressure feed and return tubes Return tube No.1 sub—assembly

SR

RECOMMENDED TOOLS

SR0FW-07

	09216—00021	Belt Tension Gauge	Checking drive belt tension
	09216—00030	Belt Tension Gauge Cable	Checking drive belt tension

LUBRICANT

SR015-07

Item	Capacity	Classification
Power steering fluid Total	0.8 liters (0.85 US qts, 0.70 Imp.qts)	ATF DEXRON® II

EQUIPMENT

SR0FX-05

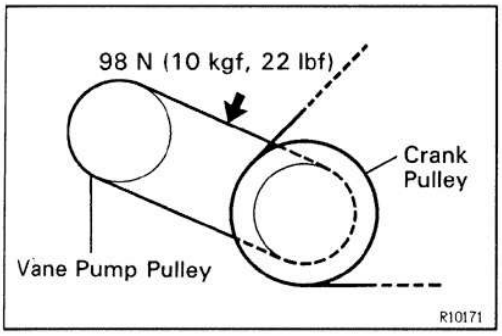
Oil pressure gauge	Measuring oil pressure
Torque wrench	

SSM (SPECIAL SERVICE MATERIALS)

SR0FY-02

08833—00080	Adhesive 1344, THREE BOND 1344, LOCTITE 242 or equivalent	Rack housing cap Rack housing cap lock nut Rack guide spring cap Rack guide spring cap lock nut

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ON–VEHICLE INSPECTION

DRIVE BELT TENSION CHECK

SR089–02

Measure the drive belt deflection.

Drive belt deflection: at 98 N (10 kgf, 22 lbf)

New belt

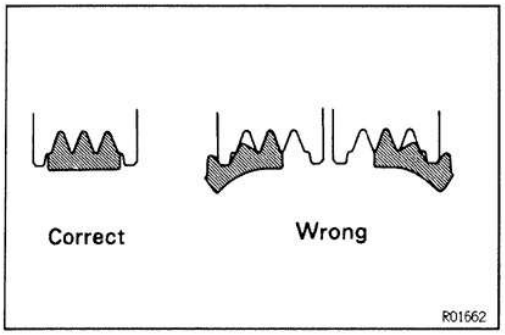
8–10 mm (0.31–0.39 in.)

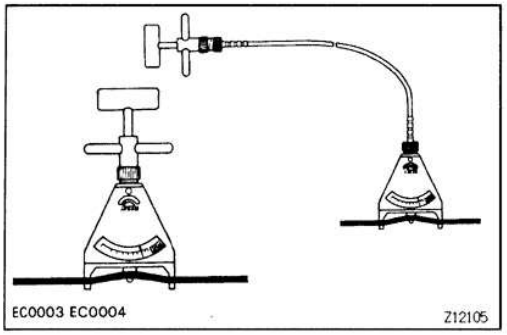
Used belt

10–13 mm (0.39–0.51 in.)

HINT:

- "New belt" refers to a belt which has been less than 5 minutes on a running engine.
- "Used belt" refers to a belt which has been used on a running engine for 5 minutes or more.
- After installing the drive belt, check that it fits properly in the ribbed grooves.





Reference:

- Using a belt tension gauge, check the drive belt tension.

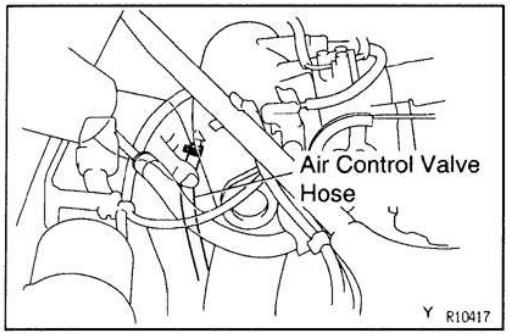
Drive belt tension:

New belt

45–55 kgf

Used belt

20–35 kgf



IDLE–UP CHECK

SR0FZ–07

1. **WARM UP ENGINE**
2. **TURN AIR CONDITIONER SWITCH OFF**
3. **CHECK IDLE–UP**

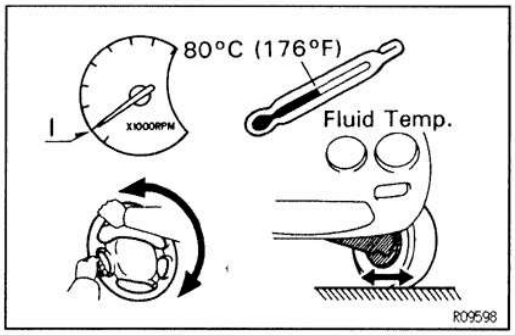
(a) Fully turn the steering wheel.

(b) Check that the engine rpm decreases when the air control valve hose is pinched.

(c) Check that the engine rpm increases when the hose is released.

SR

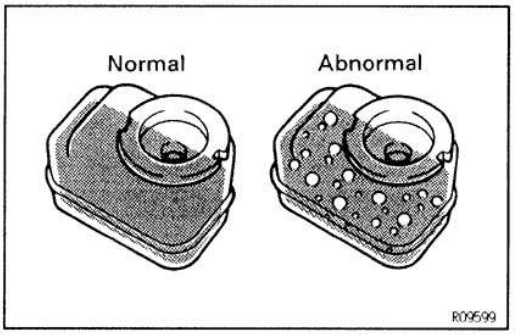
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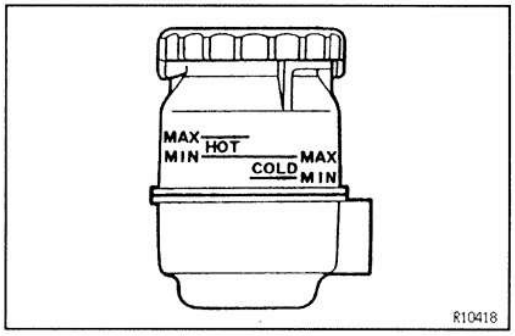
FLUID LEVEL CHECK

BR0G0-07

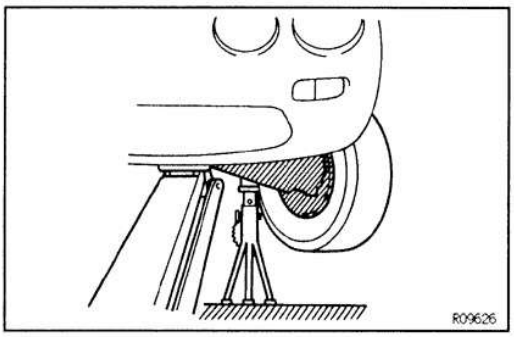
1. **KEEP VEHICLE LEVEL**
2. **BOOST FLUID TEMPERATURE**
   With the engine idling at 1,000 rpm or less, turn the steering wheel from lock to lock several times to boost fluid temperature.
   Fluid temperature:
   80 °C (176 °F)
3. **STOP ENGINE**
4. **CHECK FOR FOAMING OR EMULSIFICATION**
   HINT: Foaming and emulsification indicate either the existence of air in the system or that the fluid level is too low.



SR



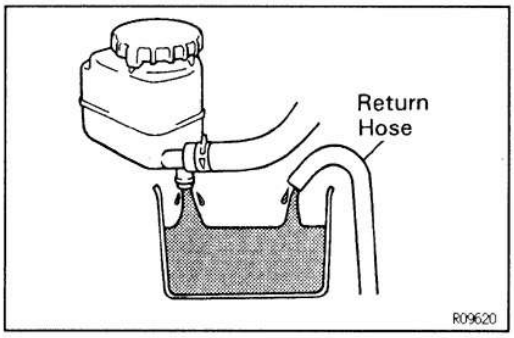
5. **CHECK FLUID LEVEL IN OIL RESERVOIR**
   Check the fluid level and add fluid if necessary.
   Fluid:
   ATF DEXRON® II
   HINT:
   Check that the fluid level is within the HOT LEVEL of the reservoir. If the fluid is cold, check that it is within the COLD LEVEL of the reservoir.



POWER STEERING FLUID REPLACEMENT

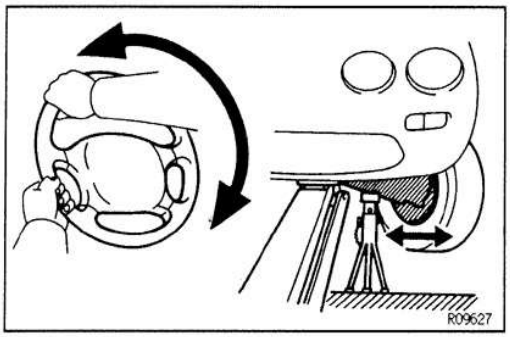
BR0G1-08

1. **JACK UP FRONT OF VEHICLE AND SUPPORT IT WITH STANDS**

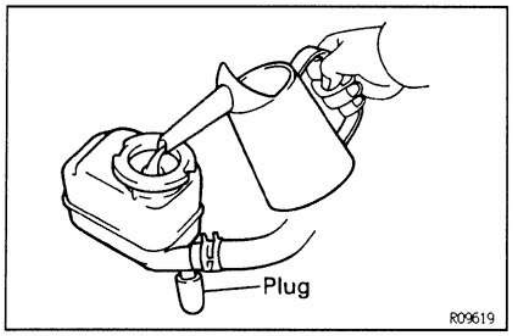


2. **REMOVE FLUID RETURN HOSE FROM OIL RESERVOIR AND DRAIN FLUID INTO CONTAINER**
   NOTICE: Take care not to spill fluid on the drive belt.

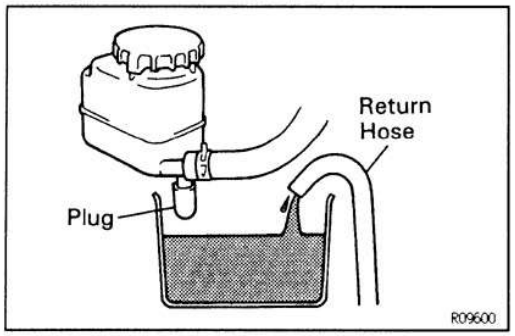
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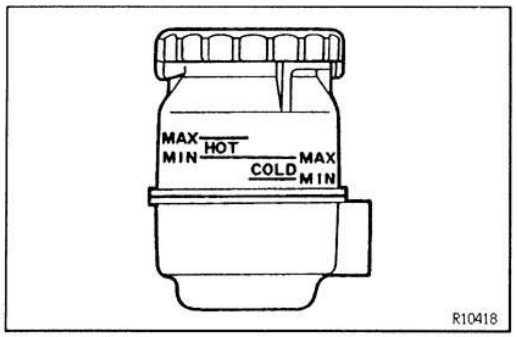
3. **TURN STEERING WHEEL FROM LOCK TO LOCK WHILE DRAINING FLUID**



4. **FILL OIL RESERVOIR WITH FRESH FLUID**
Fluid:
ATF DEXRON® II

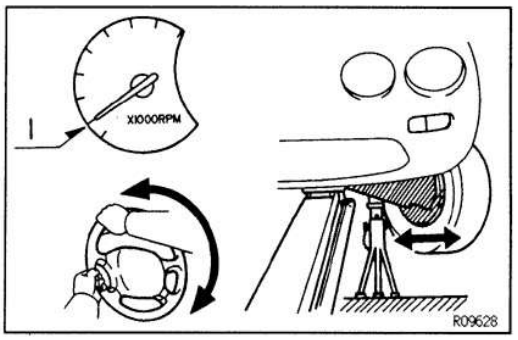


5. **START ENGINE AND RUN IT AT 1,000 RPM**
After 1 or 2 seconds, fluid will begin to discharge from the return hose. Stop the engine immediately at this time.
NOTICE: Take care that some fluid remains left in the oil reservoir.
6. **REPEAT STEPS 4 AND 5 FOUR OR FIVE TIMES UNTIL THERE IS NO MORE AIR IN FLUID**
7. **CONNECT RETURN HOSE TO OIL RESERVOIR**
8. **BLEED POWER STEERING SYSTEM**
(See page SR–5)



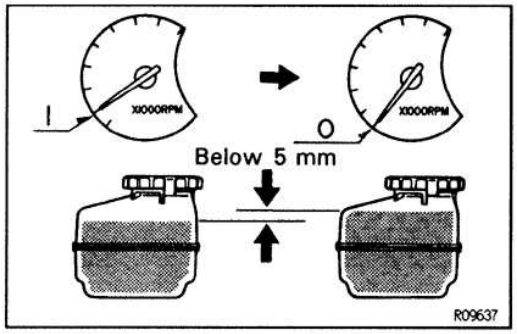
POWER STEERING SYSTEM BLEEDING SR0G2-04

1. **CHECK FLUID LEVEL IN OIL RESERVOIR**
Check the fluid level and add fluid if necessary.
Fluid:
ATF DEXRON® II
HINT:
Check that the fluid level is within the HOT LEVEL of the reservoir. If the fuild is cold, check that it is within the COLD LEVEL of the reservoir.



2. **START ENGINE AND TURN STEERING WHEEL FROM LOCK TO LOCK 3 OR 4 TIMES**
With the engine speed below 1,000 rpm, turn the steering wheel to right or left full lock and keep it there for 2 – 3 seconds, then turn the wheel to the opposite full lock and keep it there for 2 – 3 seconds.

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3. CHECK THAT FLUID IN OIL RESERVOIR IS NOT FOAMY OR CLOUDY AND DOES NOT RISE OVER MAXIMUM WHEN ENGINE IS STOPPED

Measure the fluid level with the engine running. Stop the engine and measure the fluid level.

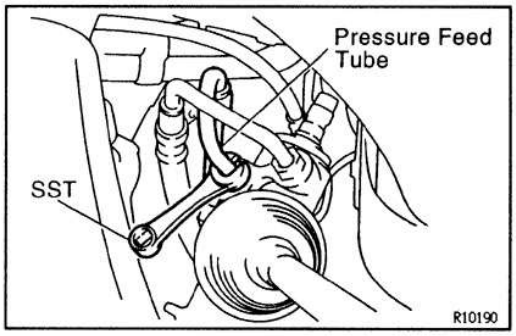
Maximum rise:

5 mm (0.20 in.)

If a problem is found, repeat "POWER STEERING FLUID REPLACEMENT" on pages SR – 4 and 5. Repair the PS if the problem persists.

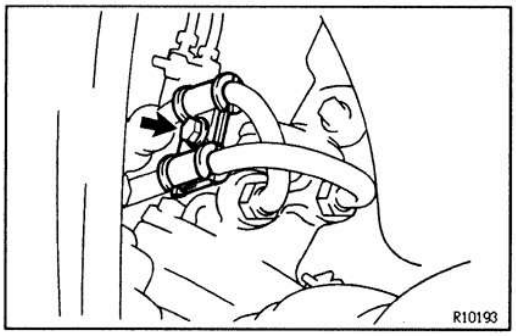
SR0UX-01

OIL PRESSURE CHECK

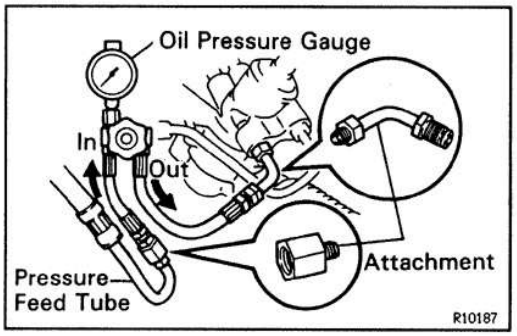


1. CONNECT OIL PRESSURE GAUGE

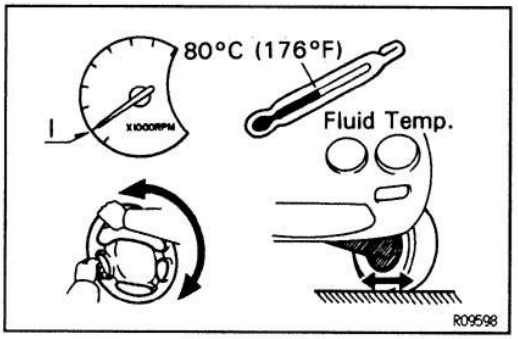
(a) Using SST, disconnect the pressure feed tube.
SST 09631–22020



(b) Remove the tube clamp.



(c) Connect the gauge, as shown in the illustration.
(d) Bleed the power steering system.
(See page SR–5)



2. START ENGINE AND RUN IT AT IDLE

3. BOOST FLUID TEMPERATURE

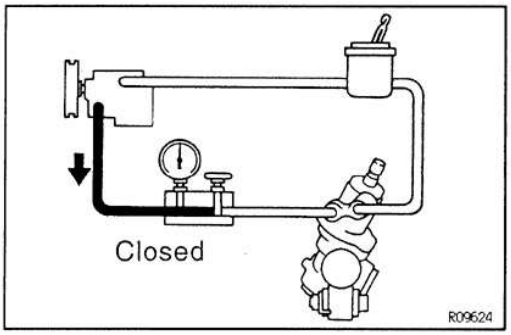
With the engine idling at 1,000 rpm or less, turn the steering wheel from lock to lock several times to boost fluid temperature.

Fluid temperature:

80 °C (176 °F)

4. CHECK FLUID PRESSURE READING WITH VALVE CLOSED

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Close the valve of the oil pressure gauge and observe the reading on the gauge.

Minimum pressure:

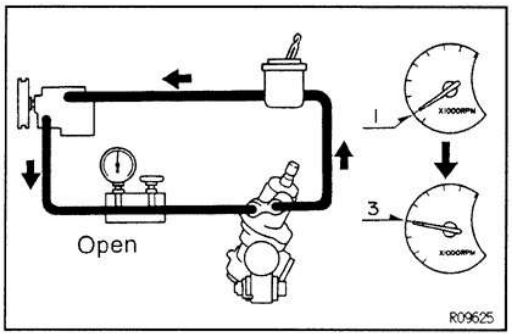
8,826 kPa (90 kgf/cm², 1,280 psi)

NOTICE:

- **Do not keep the valve closed for more than 10 seconds.**
- **Do not let the fluid temperature become too high.**

If pressure is low, repair or replace the PS vane pump.

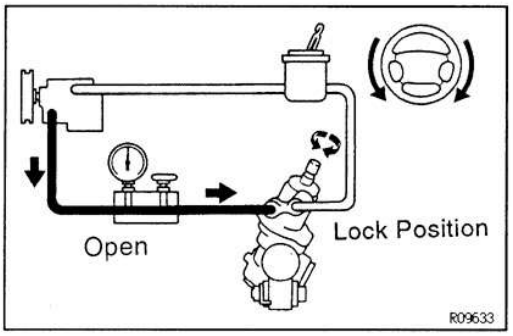
5. **OPEN VALVE FULLY**
6. **CHECK AND RECORD PRESSURE READING AT 1,000 RPM**
7. **CHECK AND RECORD PRESSURE READING AT 3,000 RPM**



Check that the pressure difference between the 1,000 rpm and 3,000 rpm checks is less than 490 kPa (5 kgf/cm², 71 psi). If the difference is excessive, repair or replace the flow control valve of the PS vane pump.

NOTICE: Do not operate the steering wheel.

SR



8. **CHECK PRESSURE READING WITH STEERING WHEEL TURNED TO FULL LOCK**

Be sure the valve of the oil pressure gauge is fully opened, and the engine idling.

Minimum pressure:

6,865 kPa (70 kgf/cm², 996 psi)

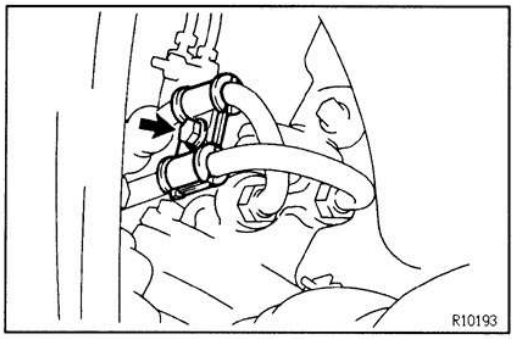
Minimum pressure:

8,826 kPa (90 kgf/cm², 1,280 psi)

NOTICE:

- **Do not maintain lock position for more than 10 seconds.**
- **Do not let the fluid temperature become too high.**

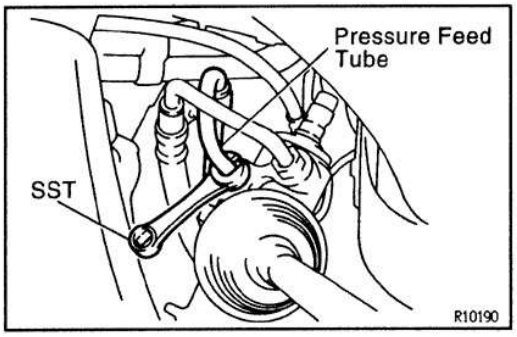
If pressure is low, the PS gear housing has an internal leak and must be repaired or replaced.



9. **DISCONNECT OIL PRESSURE GAUGE**

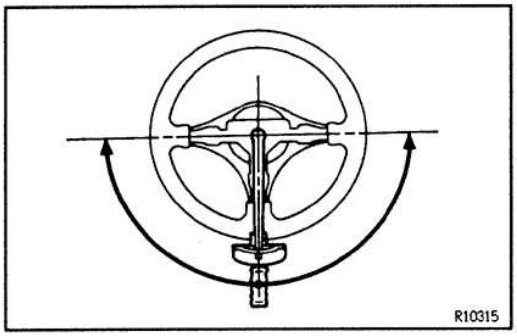
(a) Install the tube clamp.

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(b) Using SST, connect the tube to the control valve housing.
SST 09631–22020
Torque: 36 N·m (365 kgf·cm, 26 ft·lbf)
HINT: Use a torque wrench with a fulcrum length of 300 mm (11.81 in.).

(c) Bleed the power steering system.
(See page SR–5)



MEASURE STEERING EFFORT

1. CENTER STEERING WHEEL AND RUN ENGINE AT IDLE

2. MEASURE STEERING EFFORT

(a) Remove the steering wheel pad.
(See pub No.RM380E on page SR–8)

(b) Measure the steering effort in both directions.
Maximum steering effort:
6.9 N·m (70 kgf·cm, 61 in.·lbf)
If steering effort is excessive, repair the power steering unit.
HINT: Be sure to consider the tire type, pressure and contact surface before making your diagnosis.

(c) Torque the steering wheel set nut.
Torque: 34 N·m (350 kgf·cm, 25 ft·lbf)

(d) Install the steering wheel pad.
(See pub No.RM380E on page SR–9)

SR

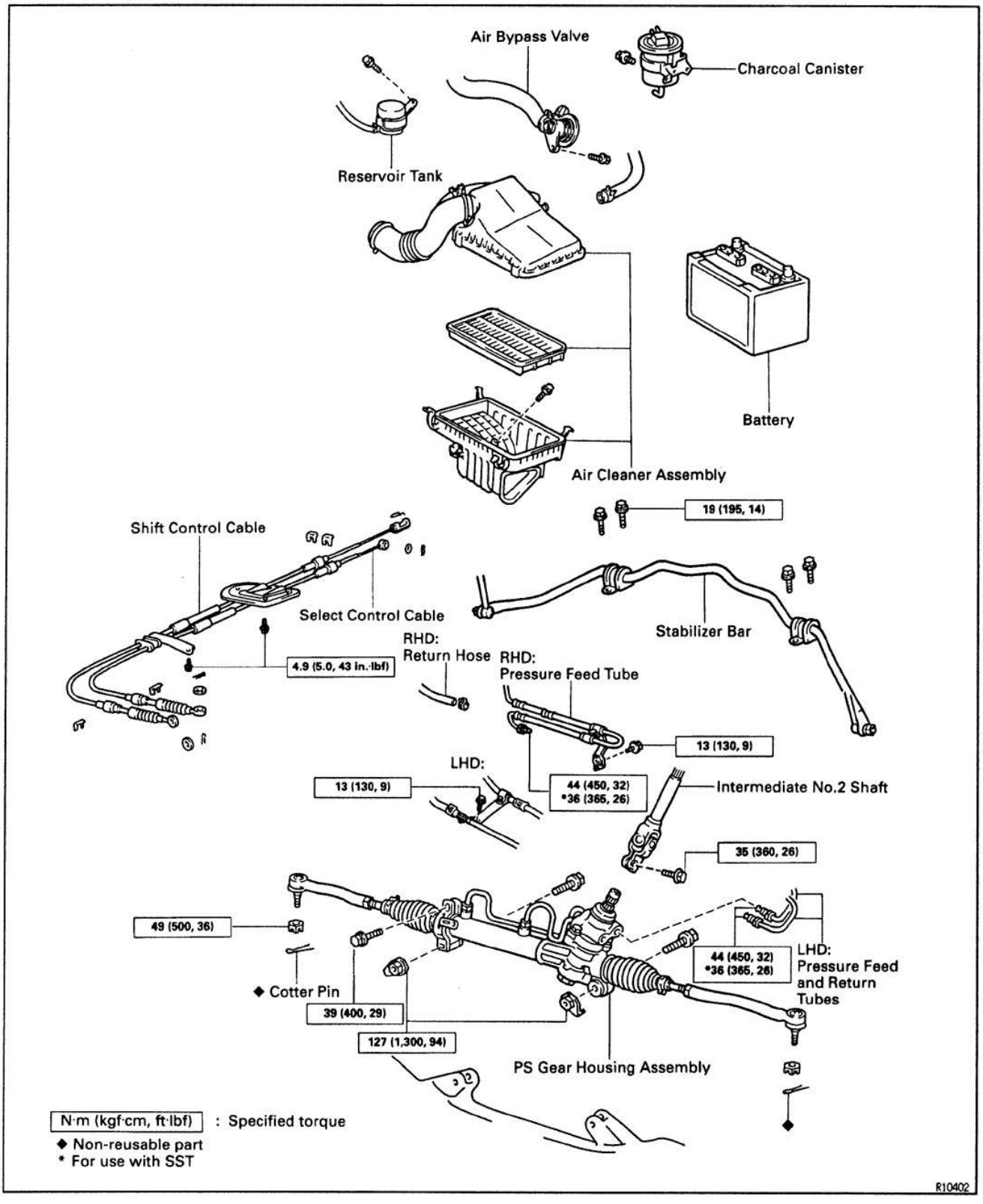
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GEAR HOUSING

PS GEAR HOUSING REMOVAL AND INSTALLATION

SR0SH-02

Remove and install the parts, as shown.



SR

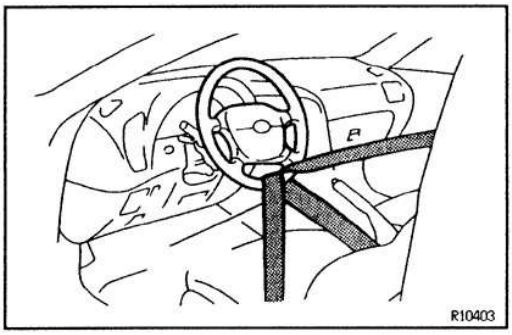
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SR0RS-04

MAIN POINTS OF REMOVAL AND INSTALLATION

NOTICE: If the centering is done without removing the steering wheel, use the procedure below to make sure the steering wheel is firmly fixed in position and cannot turn.

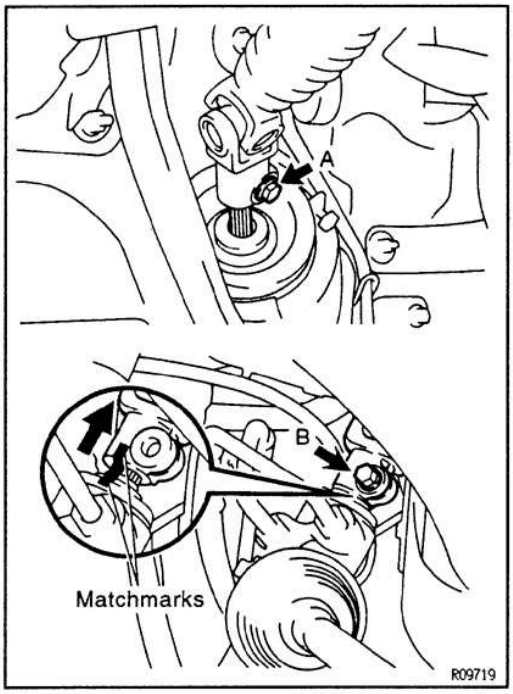
1. **REMOVE SHAFT AND SELECT CONTROL CABLE** **(See page MX–84)**



2. **DISCONNECT INTERMEDIATE NO.2 SHAFT**

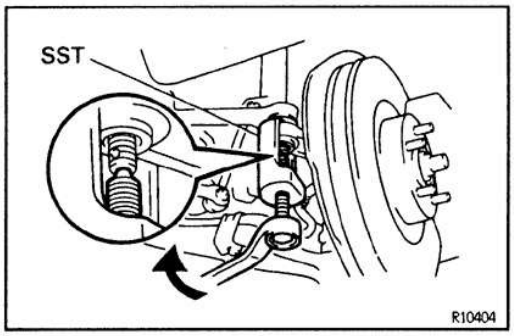
(a) Position the front wheels facing straight ahead.

(b) Using the seat belt of the driver's seat, fix the steering wheel so that it does not turn.



(c) Place matchmarks on the No.2 shaft and control valve shaft.

(d) Loosen bolt A and remove bolt B.

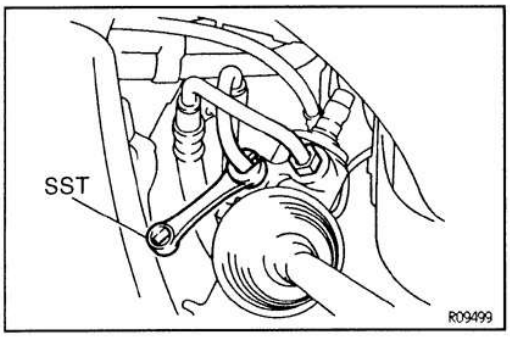


3. **DISCONNECT TIE ROD ENDS**

(a) Remove the cotter pin and nut.

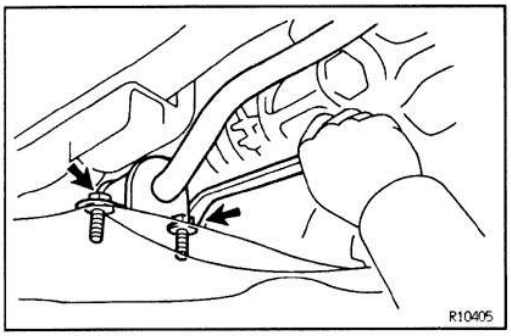
(b) Using SST, disconnect the tie rod end from the knuckle arm.
SST 09610–20012

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4. DISCONNECT PRESSURE FEED AND RETURN TUBES

Using SST, disconnect the tube.
SST 09631–22020



5. DISCONNECT RIGHT AND LEFT STABILIZER BAR BUSHINGS

(a) Remove the 2 bolts and bushing retainer.
(b) Remove the bushing.

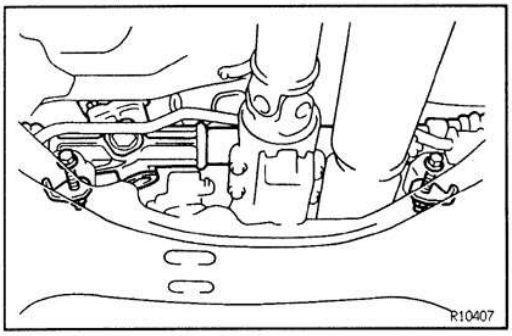
6. RHD Models:
DISCONNECT CHARCOAL CANISTER

SR

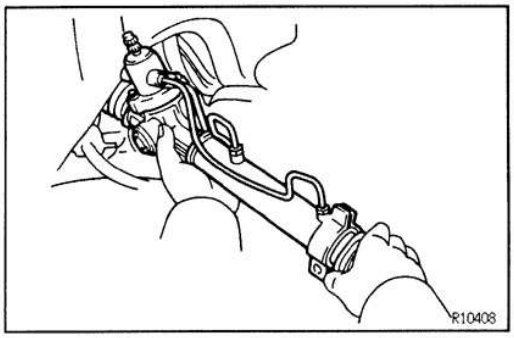


7. REMOVE PS GEAR HOUSING ASSEMBLY

(a) Remove the bolt and bracket No.2.

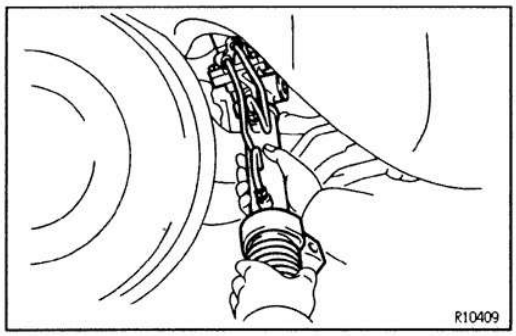


(b) Remove the 2 bolts and nuts.



(c) LHD Models:
Move the housing assembly to the right side.
(d) RHD Models:
Move the housing assembly to the left side.
(e) LHD Models:
Remove the housing assembly through the RH hole.
NOTICE: Take care to not damage the turn pressure tubes.

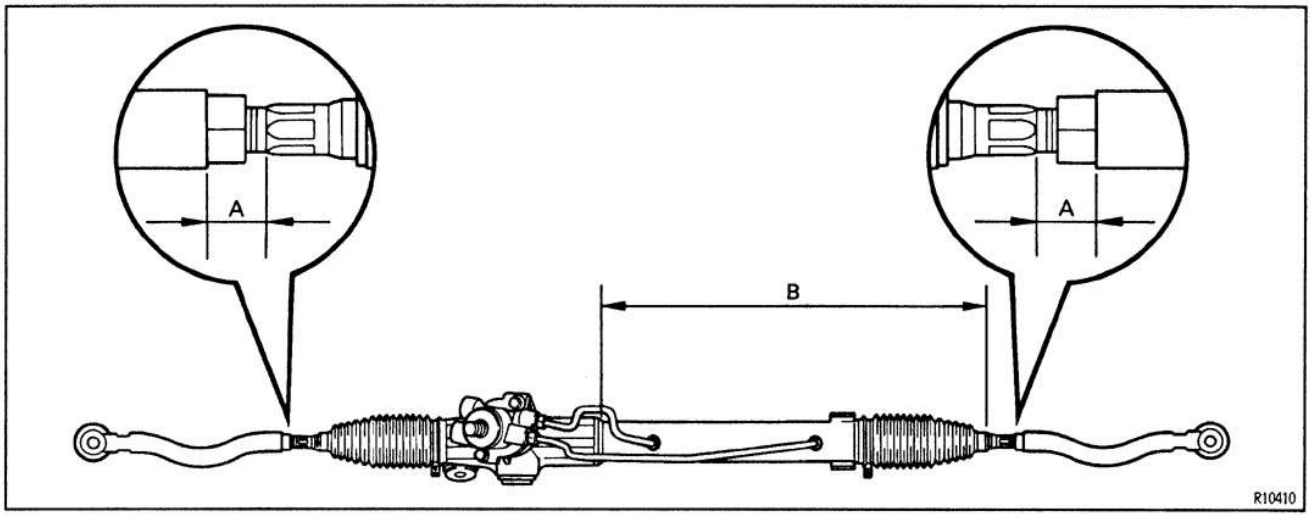
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(f) RHD Models:
Remove the housing assembly through the LH hole.
NOTICE: Take care to not damage the turn pressure tubes.

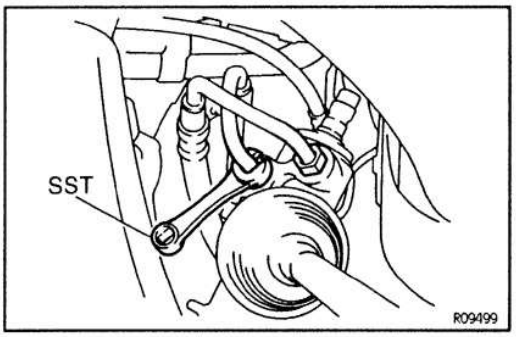
8. INSTALL PS GEAR HOUSING ASSEMBLY

(a) Set the housing assembly so that it matches the dimensions shown below, with the housing assembly at the center point.
Dimension A: 30.5 mm (1.20 in.)
Dimension B: 451.5 mm (17.78 in.)



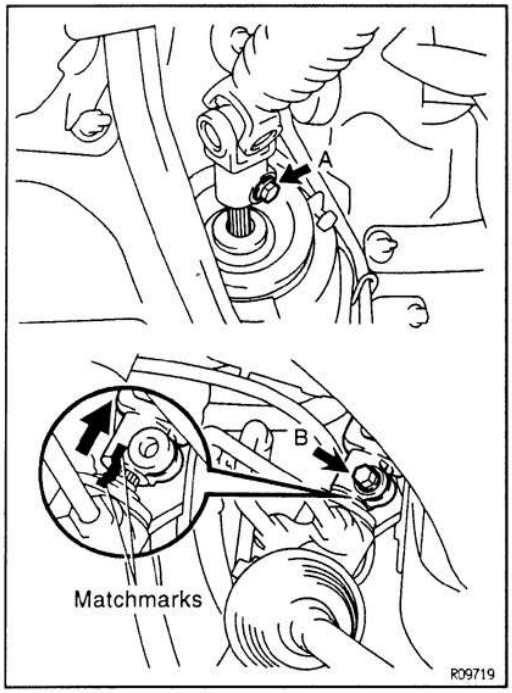
SR

(b) Install the housing assembly to the front sub–frame with the 2 bolts and nuts.
Torque: 127 N·m (1,300 kgf·cm, 94 ft·lbf)



9. CONNECT PRESSURE FEED AND RETURN TUBES
Using SST, connect the tube.
SST 09631–22020
Torque: 36 N·m (365 kgf·cm, 26 ft·lbf)
HINT: Use a torque wrench with a fulcrum length of 300 mm (11.81 in.)

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10. CONNECT INTERMEDIATE NO.2 SHAFT

(a) Align the matchmarks on the No.2 shaft and control valve shaft, and connect them.

(b) Torque the 2 bolts.
Torque: 35 N·m (360 kgf·cm, 26 ft·lbf)

11. BLEED POWER STEERING SYSTEM
(See page SR–5)

12. CHECK STEERING WHEEL CENTER POINT

13. CHECK FRONT WHEEL ALIGNMENT
(See page SA–4)

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SERVICE SPECIFICATIONS

SERVICE DATA

SR0GP-08

PS ON–VEHICLE INSPECTION		
Drive belt tension at 98 N (10 kgf, 22 lbf)	New belt	8 – 10 mm (0.31 – 0.39 in.)
Drive belt tension at 98 N (10 kgf, 22 lbf)	Used belt	10 – 13 mm (0.39 – 0.51 in.)
*Drive belt tension	New belt	441 – 539 N (45 – 55 kgf, 99 – 121 lbf)
*Drive belt tension	Used belt	196 – 343 N (20 – 35 kgf, 44 – 77 lbf)
Oil level rise	Maximum	Below 5 mm (0.20 in.)
Oil pressure at idle speed with valve closed	Minimum	8,826 kPa (90 kgf/cm², 1,280 psi)
Steering effort at idle speed	Maximum	6.9 N·m (70 kgf·cm, 61 in.·lbf)

* : For use with belt tension gauge

SR

TORQUE SPECIFICATIONS

SR0SS-08

Part tightened	N·m	kgf·cm	ft·lbf
PS GEAR HOUSING			
Tie rod end x Steering knuckle	49	500	36
Control valve shaft x Intermediate No.2 shaft	35	360	26
Pressure feed and return tube union nuts	44 (36)	450 (365)	32 (26)
Gear housing set bolt x nut	127	1,300	94

( ): For use with SST

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BODY ELECTRICAL SYSTEM

COMBINATION METER ..... BE– 2
SERVICE SPECIFICATIONS ..... BE– 20

REFER TO CELICA REPAIR MANUAL FOR CHASSIS AND BODY (Pub. No. RM380E)

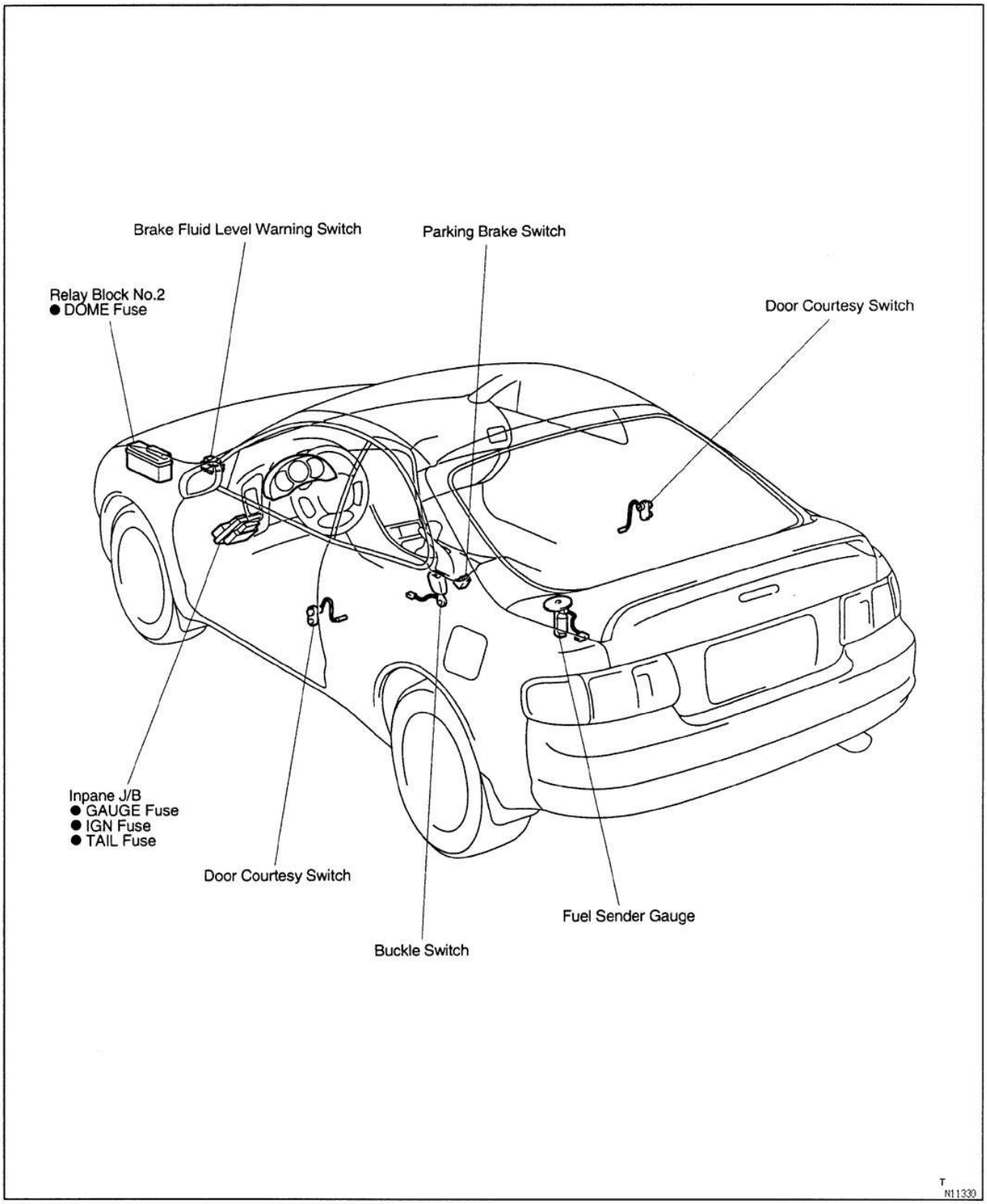
NOTE: The above pages contain only the points which differ from the above listed manual.

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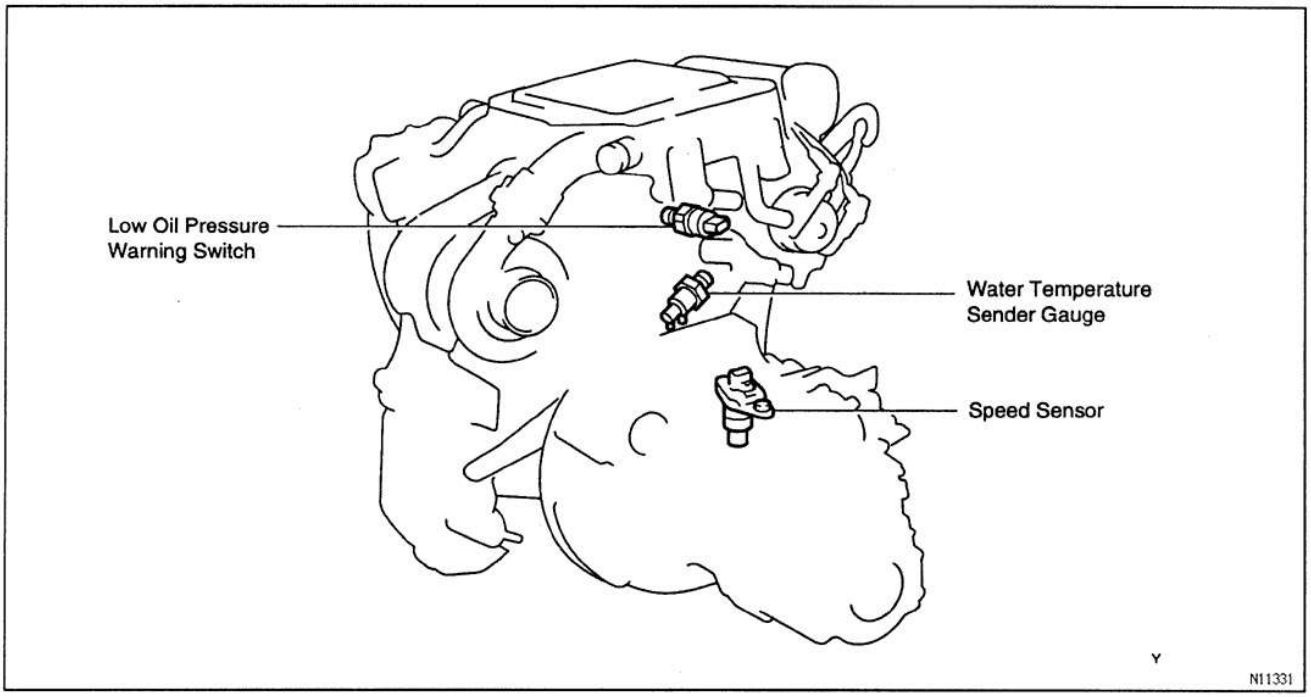
COMBINATION METER

PARTS LOCATION

BE1DK–06



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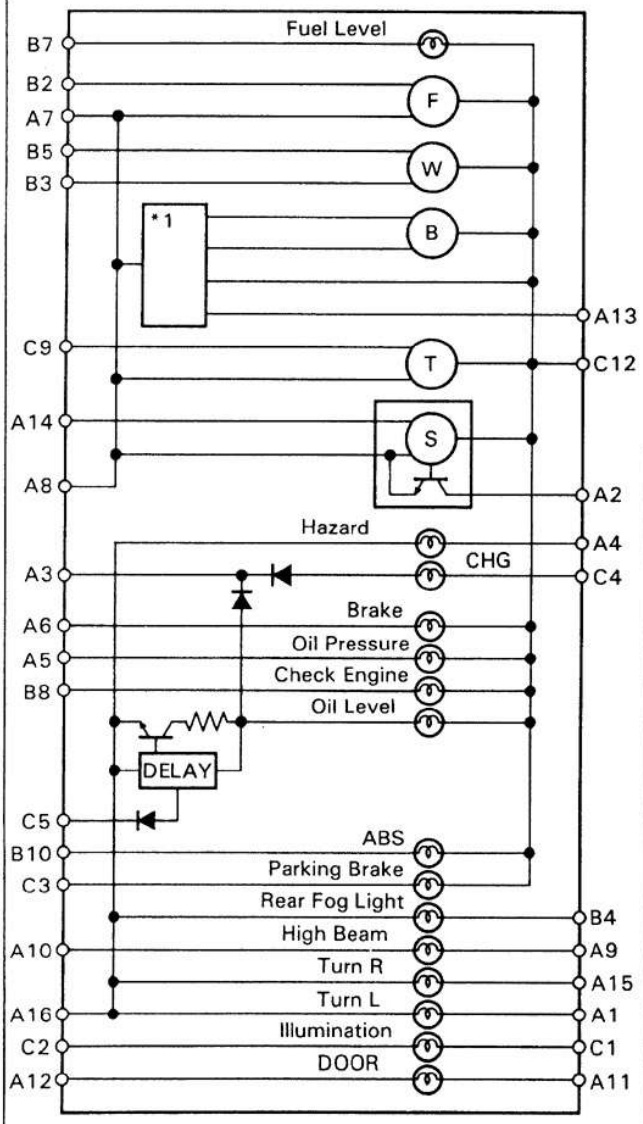


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BE285-01

METER CIRCUIT

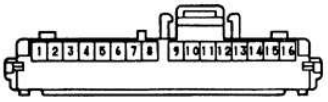
Europe



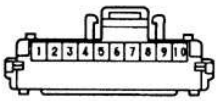
*1 : Turbo Boost Pressure Gauge Drive Circuit
Ⓕ : Fuel Receiver Gauge
Ⓦ : Water Temperature Receiver Gauge
Ⓑ : Turbo Booster Pressure Gauge
Ⓣ : Tachometer
Ⓢ : Speedometer

j-16-1
j-10-1
N11336 j-13-1-A

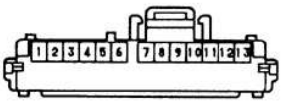
Connector "A"



Connector "B"



Connector "C"

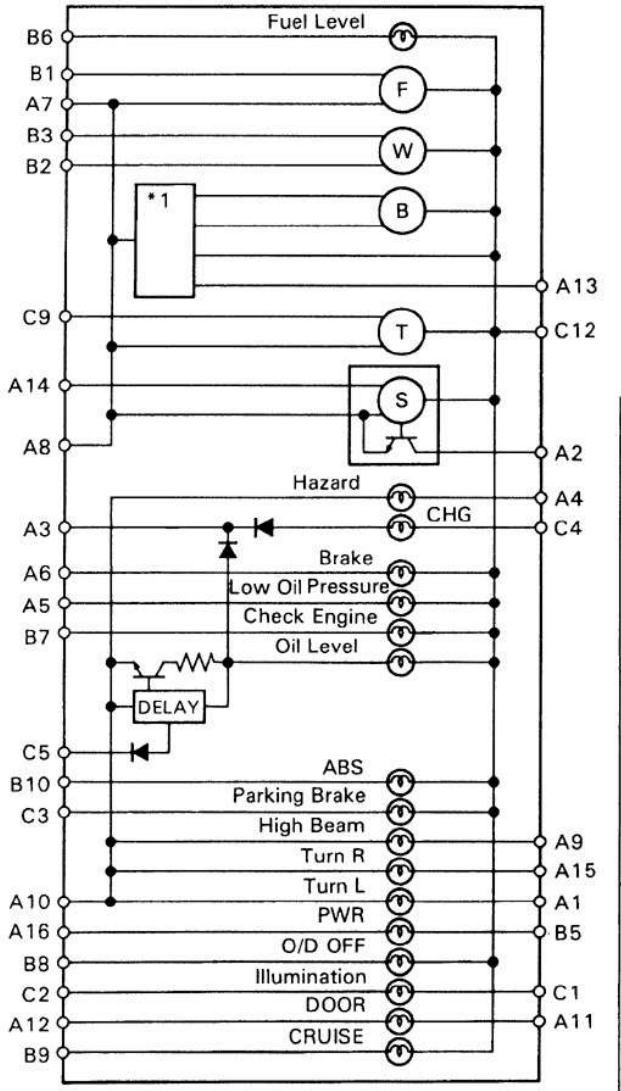


No.		Wiring Connector Side
A	1	Turn Signal Switch
	2	Engine ECU
	3	Alternator
	4	Hazard Switch
	5	Low Oil Pressure Warning Switch
	6	Brake Fluid Level Warning Switch
	7	Ground
	8	Ground
	9	HEAD Fuse
	10	Headlight Dimmer Switch
	11	DOME Fuse
	12	Door Courtesy Switch
	13	Turbo Pressure Sensor
	14	Speed Sensor
	15	Turn Signal Switch
	16	Ground
B	2	Fuel Sender Gauge
	3	Water Temperature Sender Gauge
	4	Rear Fog Light Relay
	5	Ground
	7	Fuel Sender Gauge
	8	Engine ECU
	10	ABS ECU
C	1	Taillight Control Relay
	2	Light Control Rheostat
	3	Parking Brake Switch
	4	IGN Fuse
	5	Engine Oil Level Sensor
	9	Ignition
	12	GAUGE Fuse

V05500

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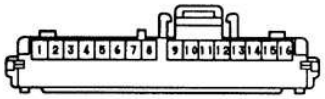
Australia



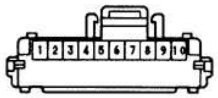
*1 : Turbo Boost Pressure Gauge Drive Circuit
Ⓕ : Fuel Receiver Gauge
Ⓦ : Water Temperature Receiver Gauge
Ⓑ : Turbo Booster Pressure Gauge
Ⓣ : Tachometer
Ⓢ : Speedometer

j-16-1
j-10-1
N11337 j-13-1-A

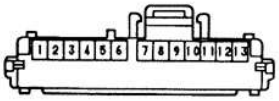
Connector "A"



Connector "B"



Connector "C"



No.		Wiring Connector Side
A	1	Turn Signal Switch
	2	Engine ECU
	3	Alternator
	4	Hazard Switch
	5	Low Oil Pressure Warning Switch
	6	Brake Fluid Level Warning Switch
	7	Ground
	8	Ground
	9	HEAD Fuse
	10	Headlight Dimmer Switch
	11	DOME Fuse
	12	Door Courtesy Switch
	13	Turbo Pressure Sensor
	14	Speed Sensor
	15	Turn Signal Switch
	16	Ground
B	1	Fuel Sender Gauge
	2	Ground
	3	Water Temperature Sender Gauge
	5	Engine ECU
	6	Fuel Sender Gauge
	7	Engine ECU
	8	O/D OFF Switch
	9	Cruise Control ECU
	10	ABS ECU
C	1	Taillight Control Relay
	2	Light Control Rheostat
	3	Parking Brake Switch
	4	IGN Fuse
	5	Engine Oil Level Sensor
	9	Ignition
	12	GAUGE Fuse

BE

V05501

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TROUBLESHOOTING

BE1DL-09

The table below will be useful for you in troubleshooting these electrical problems. The most likely causes of the malfunction are shown in the order of their probability. Inspect each part in the order shown, and replace the part when it is found to be faulty.

METER, GAUGES AND ILLUMINATION

Trouble	Parts name	See page
Tachometer, Fuel Gauge and Water Temperature Gauge do not operate	1. GAUGE Fuse	*(BE-14)
	2. Meter Circuit Plate	(BE-4)
	3. Wire Harness	
Speedometer does not operate	1. Speed Sensor	(BE-10)
	2. Meter Circuit Plate	(BE-4)
	3. Wire Harness	
Tachometer does not operate	1. Igniter	
	2. Engine ECU	
	3. Meter Circuit Plate	(BE-4)
	4. Wire Harness	
Turbo meter does not operate	1. GAUGE Fuse	*(BE-14)
	2. Turbo Meter	(BE-11)
	3. Meter Circuit Plate	(BE-4)
	4. Wire Harness	
Fuel Gauge does not operate or abnormal operation	1. Fuel Receiver Gauge	(BE-13)
	2. Fuel Sender Gauge	(BE-14)
	3. Meter Circuit Plate	(BE-4)
	4. Wire Harness	
Water Temperature Gauge does not operate or abnormal operation	1. Water Temperature Receiver Gauge	(BE-15)
	2. Water Temperature Sender Gauge	(BE-16)
	3. Meter Circuit Plate	(BE-4)
	4. Wire Harness	
All illumination lights do not light up	1. TAIL Fuse	*(BE-14)
	2. Light Control Rheostat	(BE-18)
	3. Meter Circuit Plate	(BE-4)
	4. Wire Harness	
Only one illumination light does not light up	1. Bulb	
	2. Meter Circuit Plate	(BE-4)

*: See pub. No. RM380E

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WARNING LIGHTS

Trouble	Parts name	See page
Warning light do not light up (Except Discharge and Door Open)	1. Bulb	
	2. IGN Fuse	*(BE−14)
	3. Ignition Switch	*(BE−18)
	4. Meter Circuit Plate	(BE−4)
	5. Wire Harness	
	6. Alternator	
Brake Warning Light does not light up	1. Bulb	
	2. Brake Fluid Level Warning Switch	(BE−17)
	3. Parking Brake Switch	(BE−17)
	4. Bulb Check Relay	
	5. Meter Circuit Plate	(BE−4)
	6. Wire Harness	
Seat Belt Warning Light does not light up	1. Bulb	
	2. Integration Relay	(BE−19)
	3. Meter Circuit Plate	(BE−4)
	4. Wire Harness	
Low Oil Pressure Warning Light does not light up	1. Bulb	
	2. Low Oil Pressure Warning Switch	(BE−16)
	3. Meter Circuit Plate	(BE−4)
	4. Wire Harness	
Door Open Warning Light does not light up	1. Bulb	
	2. DOME Fuse	*(BE−15)
	3. Door Courtesy Switch	(BE−18)
	4. Luggage Room Light Switch	
	5. Integration Relay	(BE−19)
	6. Meter Circuit Plate	(BE−4)
	7. Wire Harness	

*: See pub. No. RM380E

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INDICATOR LIGHTS

Trouble	Parts name	See page
ABS Indicator Light does not light up	1. Bulb 2. Wire Harness	
Check Engine Warning Light does not light up	1. Bulb 2. Engine ECU 3. Wire Harness	
PWR Indicator Light does not light up.	1. Bulb 2. Engine ECU 3. Wire Harness	
O/D OFF Indicator Light does not light up	1. Bulb 2. O/D Main Switch 3. Engine ECU 4. Meter Circuit Plate 5. Wire Harness	(BE–4)
Turn Indicator Light does not light up	1. Bulb 2. Turn Signal and Hazard Warning System 3. Meter Circuit Plate 4. Wire Harness	*(BE–36) (BE–4)
High Beam Indicator Light does not light up	1. Bulb 2. Headlight System 3. Meter Circuit Plate 4. Wire Harness	*(BE–19) (BE–4)
CRUISE Indicator Light does not light up	1. Bulb 2. Cruise Control ECU 3. Meter Circuit Plate 4. Wire Harness	*(BE–105) (BE–4)

*: See pub. No. RM380E

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BE0BQ-0C

SPEEDOMETER INSPECTION

INSPECT SPEEDOMETER OPERATION ON VEHICLE

(a) Using a speedometer tester, inspect the speedometer for allowable indication error and check the operation of the odometer.
HINT: Tire wear and tire over or under inflation will increase the indication error.
If error is excessive, replace the speedometer.

(b) Check the speedometer for pointer vibration and abnormal noise.

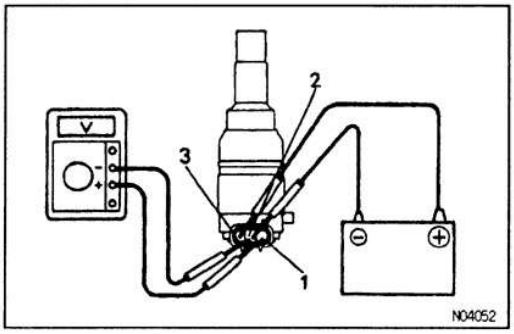
EUROPE

Standard indication (km/h)	Allowable range (km/h)	Standard indication (mph)	Allowable range (mph)
20	20 – 26	20	20 – 24.5
40	40 – 48	40	40 – 46.5
60	60 – 70	60	60 – 68.5
80	80 – 92	80	80 – 90.5
100	100 – 114	100	100 – 112.5
120	120 – 136	–	
140	140 – 158	–	
160	160 – 180	–	

AUSTRALIA

Standard indication (km/h)	Allowable range (km/h)
40	36 – 44
60	54 – 66
80	72 – 88
100	90 – 110
120	108 – 132
140	126 – 154
160	144 – 176

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SPEED SENSOR INSPECTION

BE1DP-07

INSPECT SPEED SENSOR OPERATION

(a) Connect the positive (+) lead from battery to terminal 1 and negative (−) lead to terminal 2.
(b) Connect the positive (+) lead from tester to terminal 3 and negative (−) lead to terminal 2.
(c) Rotate shaft.
(d) Check that there is a voltage change from approx. 0 V to 11 V or more between terminals 2 and 3.
HINT: The voltage change should be 4 times for every revolution of the speed sensor shaft.
If operation is not as specified, replace the sensor.

TACHOMETER INSPECTION

BE0BT-08

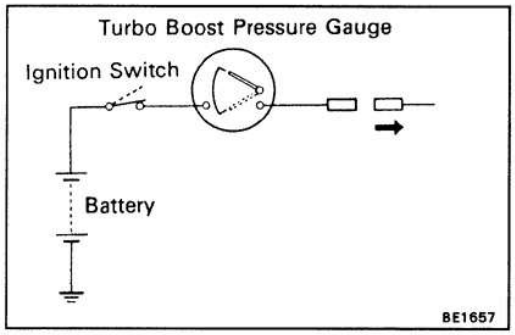
BE

INSPECT TACHOMETER
ON−VEHICLE

(a) Connect a tune−up test tachometer, and start the engine.
NOTICE: Reversing the connection of the tachometer will damage the transistors and diodes inside.
(b) Compare the tester and tachometer indications.
If error is excessive, replace the tachometer.
DC 13.5 V, 25 °C (77°F)

Standard indication (rpm)	Allowable range (rpm)
700	630 – 770
1000	900 – 1100
2000	1850 – 2150
3000	2800 – 3200
4000	3800 – 4200
5000	4800 – 5200
6000	5750 – 6250
7000	6700 – 7300

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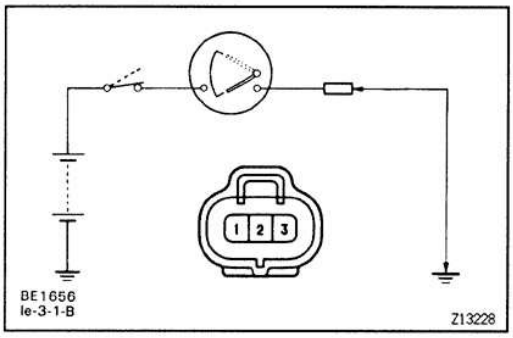
TURBO METER INSPECTION

BE256-01

1. INSPECT TURBO METER OPERATION

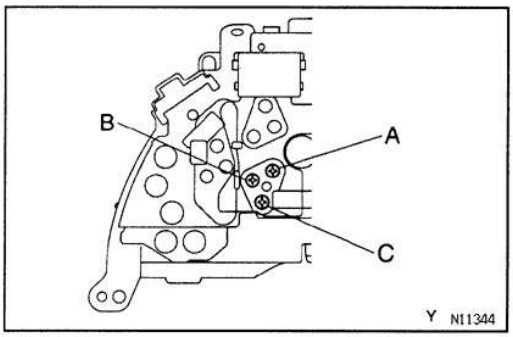
(a) Disconnect the connector from the pressure sensor.

(b) Turn the ignition switch ON, check that the meter needle moves to upper position.



(c) Ground terminal 2 on the wire harness side, check that the meter needle moves to lower position.
If operation is not as specified, inspect the turbo meter circuit and resistance.

BE



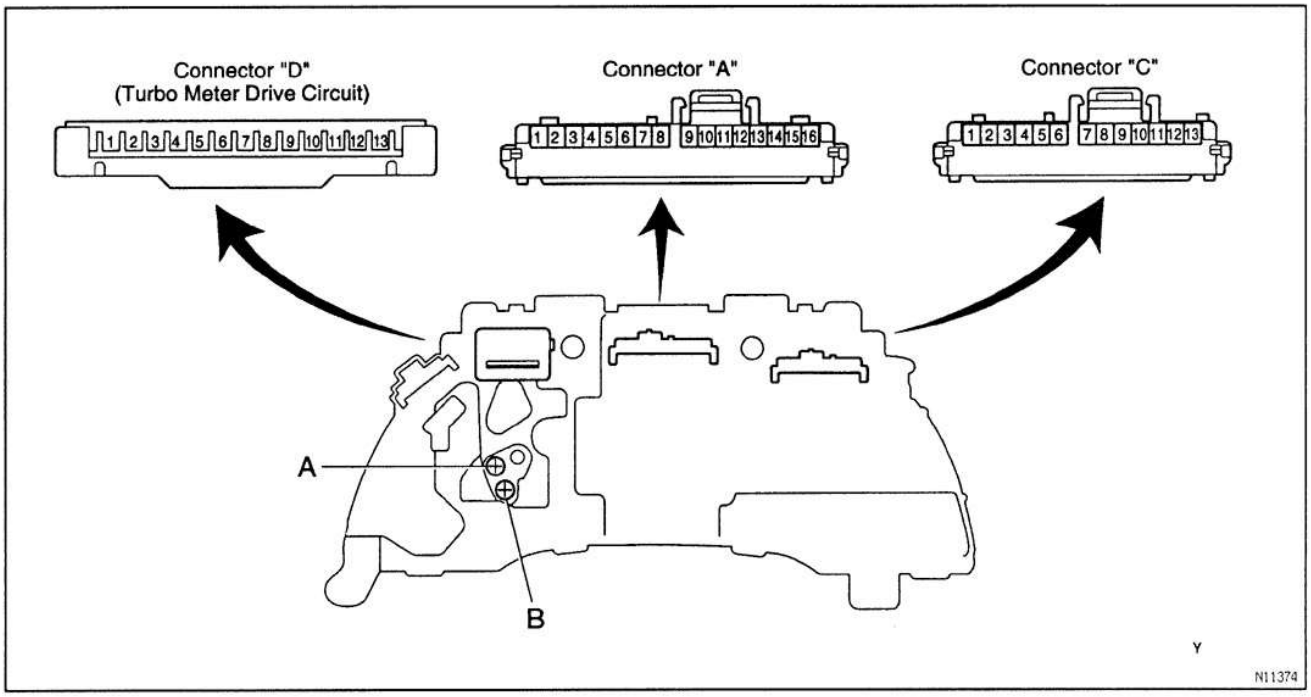
2. INSPECT TURBO METER RESISTANCE

Measure the resistance between terminals A and B.

Between terminals	Resistance (Ω)
A – B	Approx. 87.7
A – C	Approx. 79.7

If resistance value is not as specified, replace the turbo meter.

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BE

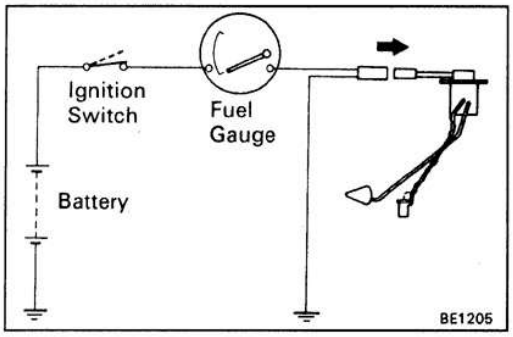
INSPECT TURBO METER DRIVE CIRCUIT

(a) Remove the cover.
(b) Disconnect the 3 connectors from the combination meter.
(c) Inspect the connector on the wire harness side and terminals of the turbo meter drive circuit, as shown in the chart.

Tester connection to terminal number	Condition	Specified value
D2 – A	Constant	Continuity
D5 – B	Constant	Continuity
D7 – C12	Constant	Continuity
D9 – A7	Constant	Continuity
D12 – A13	Constant	Continuity

If circuit is as specified, replace the drive circuit.

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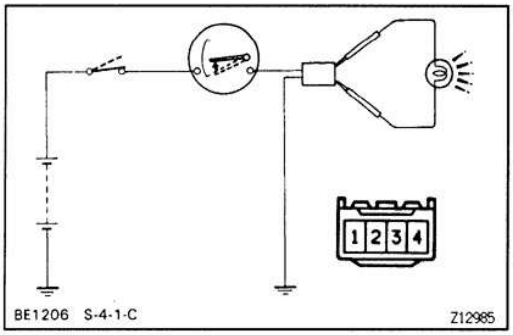
FUEL RECEIVER GAUGE INSPECTION

BE0BW-0C

1. INSPECT FUEL RECEIVER GAUGE OPERATION

(a) Disconnect the connector from the sender gauge assembly.

(b) Turn the ignition switch ON, check that the receiver gauge needle indicates EMPTY.

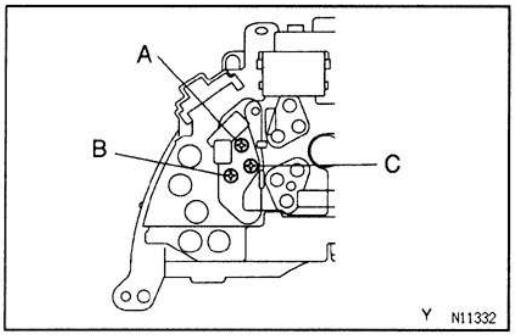


(c) Connect terminals 3 and 4 on the wire harness side connector through a 3.4 W test bulb.

(d) Turn the ignition switch ON, check that the bulb lights up and receiver gauge needle moves toward the full side.

HINT: Because of the silicon oil in the gauge, it will take a short time for the needle to stabilize.

If operation is not as specified, inspect the receiver gauge resistance.



2. INSPECT FUEL RECEIVER GAUGE RESISTANCE

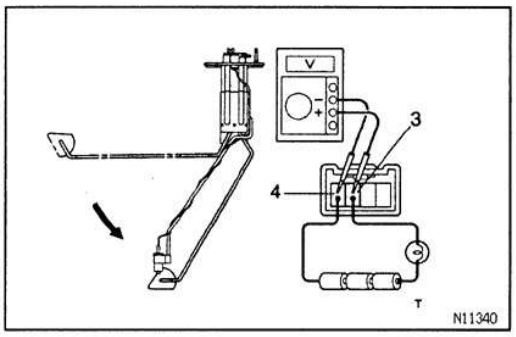
Measure the resistance between terminals.

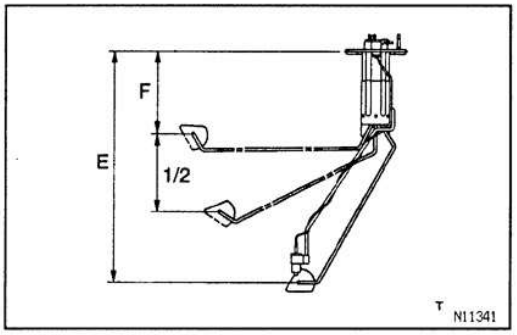
Between terminals	Resistance (Ω)
A – B	Approx. 154.3
A – C	Approx. 126.2
B – C	Approx. 280.5

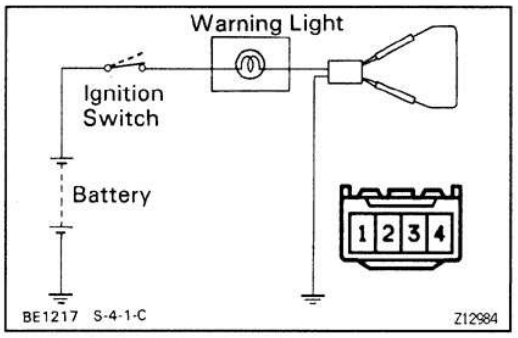
If resistance value is not as specified, replace the fuel receiver gauge.

BE

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FUEL SENDER GAUGE INSPECTION

BE0BY-0D

1. INSPECT FUEL SENDER GAUGE OPERATION

(a) Connect a series of three 1.5 V dry cell batteries.
(b) Connect the positive (+) lead from the dry cell batteries to terminal 3 through a 3.4 W test bulb and the negative (−) lead to terminal 4.
(c) Check that the voltage rises between terminals 3 and 4 as the float is moved from the top to bottom position.

2. INSPECT FUEL SENDER GAUGE RESISTANCE

Measure the resistance between terminals 3 and 4 for each float position.

Float position mm (in.)		Resistance (Ω)
F	Approx. 27.6 (1.09)	Approx. 3.0
1/2	Approx. 33.7 (1.33)	Approx. 31.6
E	Approx. 92.7 (3.65)	Approx. 110.0

If resistance value is not as specified, replace the sender gauge.

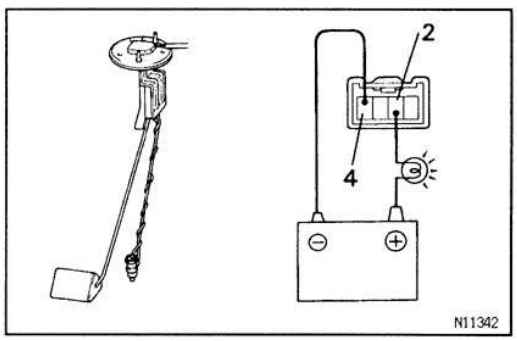
BE

FUEL LEVEL WARNING LIGHT INSPECTION

BE0C0-0A

INSPECT FUEL LEVEL WARNING LIGHT

(a) Disconnect the connector from the sender gauge.
(b) Connect terminals 2 and 4 on the wire harness side connector.
(c) Turn the ignition switch ON, check that the warning light lights up.
If the warning light does not light up, test the bulb or inspect wire harness.



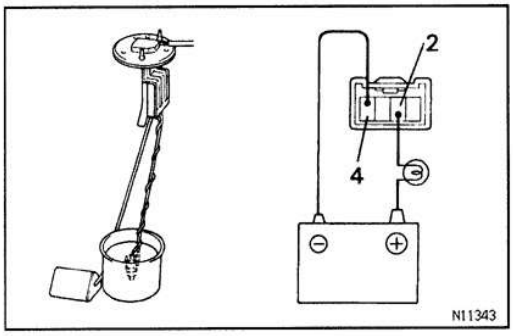
FUEL LEVEL WARNING SWITCH INSPECTION

BE0BZ-0C

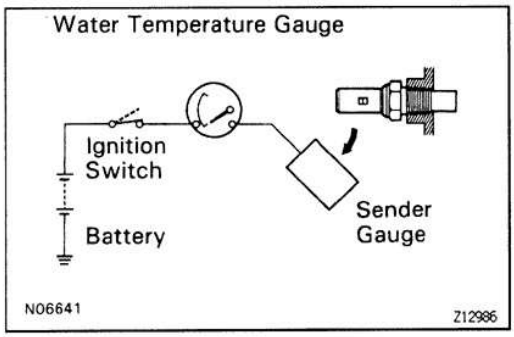
INSPECT FUEL LEVEL WARNING SWITCH

(a) Apply battery voltage between terminals 2 and 4 through a 3.4 W test bulb, check that the bulb lights up.
HINT: It will take a short time for the bulb to light up.

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(b) Submerge the switch in fuel, check that the bulb goes out.
If operation is not as specified, replace the sender gauge.



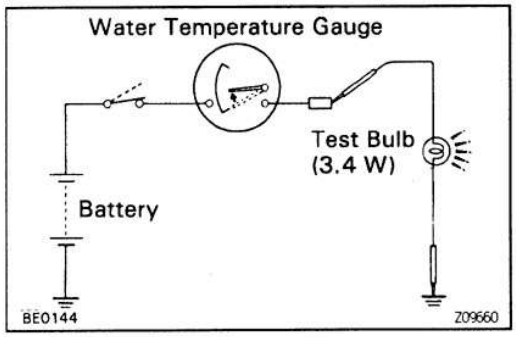
WATER TEMPERATURE RECEIVER GAUGE INSPECTION

BE0C1-08

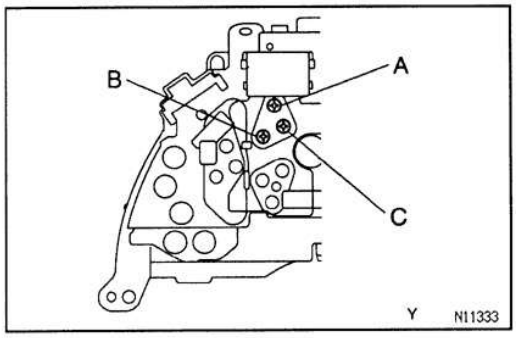
1. INSPECT WATER TEMPERATURE RECEIVER GAUGE OPERATION

(a) Disconnect the connector from the sender gauge.
(b) Turn the ignition switch ON, check that the receiver gauge needle indicates COOL.

BE



(c) Ground terminal on the wire harness side connector through a 3.4W test bulb.
(d) Turn the ignition switch ON, check that the bulb lights up and the receiver gauge needle moves toward the hot side.
If operation is not as specified, replace the sender gauge.
Then recheck the system.
If operation is not as specified, measure the receiver gauge resistance.



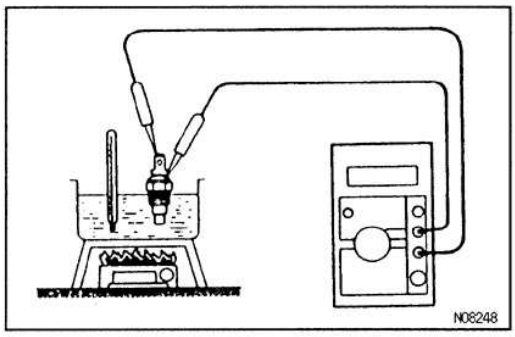
2. INSPECT WATER TEMPERATURE RECEIVER GAUGE RESISTANCE

Measure the resistance between terminals.
HINT: Connect the test leads so that the current from the ohmmeter can flow according to the chart order.

Between terminals	Resistance (Ω)
A – B	Approx. 229.7
A – C	Approx. 54.0
B – C	Approx. 175.7

If resistance value is not as specified, replace the engine coolant temperature receiver gauge.

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WATER TEMPERATURE SENDER GAUGE INSPECTION

BE11L-07

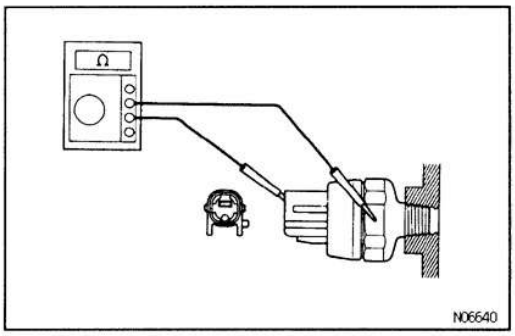
INSPECT WATER TEMPERATURE SENDER GAUGE

Measure the resistance between terminal and gauge body.

Temperature °C (°F)	Resistance (Ω)
50 (122.0)	160 ~ 240
120 (248.0)	17.1 ~ 21.2

If resistance value is not as specified, replace the engine coolant temperature sender gauge.

BE



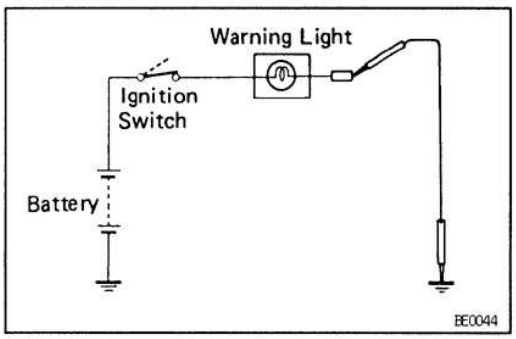
LOW OIL PRESSURE WARNING SWITCH INSPECTION

BE0C4-0A

1. INSPECT LOW OIL PRESSURE WARNING SWITCH

(a) Check that there is continuity between terminal and ground with the engine stopped.

(b) Check that there is no continuity between terminal and ground with the engine running.
HINT: Oil pressure should be over 20 kPa (0.2 kgf/cm², 2.9 psi)
If operation is not as specified, replace the switch.

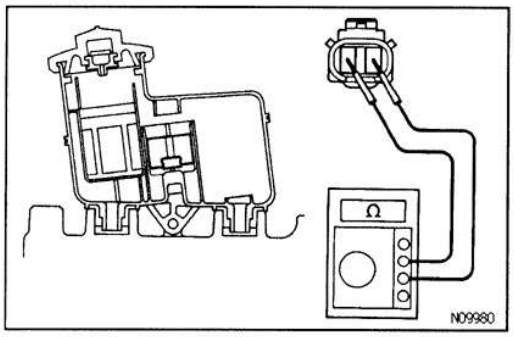


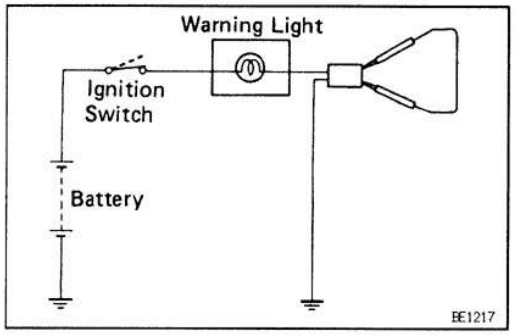
2. INSPECT LOW OIL PRESSURE WARNING LIGHT

(a) Disconnect the connector from the warning switch and ground terminal on the wire harness side connector.

(b) Turn the ignition switch ON, check that the warning light lights up.
If the warning light does not light up, test the bulb or inspect wire harness.

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BRAKE FLUID LEVEL WARNING SWITCH INSPECTION

BE0C6-09

1. INSPECT BRAKE FLUID LEVEL WARNING SWITCH

(a) Remove the reservoir tank cap and strainer.
(b) Disconnect the connector.
(c) Check that there is no continuity between terminals with the switch OFF (float up).
(d) Use syphon, etc. to take fluid out of the reservoir tank.
(e) Check that there is continuity between terminals with the switch ON (float down).
(f) Pour the fluid back in the reservoir tank.

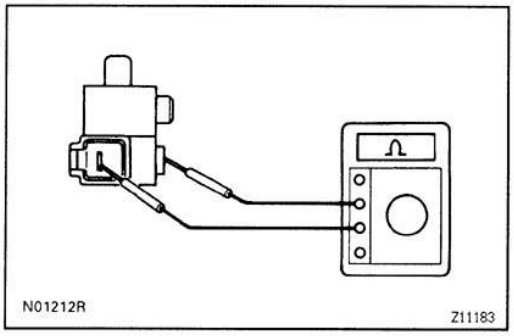
If operation is not as specified, replace the switch.

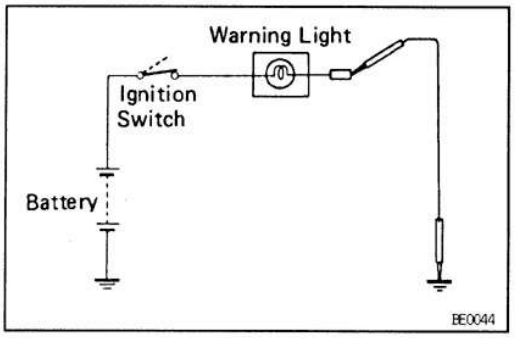
2. INSPECT BRAKE WARNING LIGHT

(a) Disconnect the connector from the brake fluid warning switch.
(b) Release the parking brake pedal.
(c) Connect terminals on the wire harness side of the level warning switch connector.
(d) Start the engine, check that the warning light lights up.

If the warning light does not light up, test the bulb or wire harness.

BE





PARKING BRAKE SWITCH INSPECTION

BE0C8-06

1. INSPECT PARKING BRAKE SWITCH

(a) Check that there is continuity between terminal and switch body with the switch ON (switch pin released).
(b) Check that there is no continuity between terminal and switch body with the switch OFF (switch pin pushed in).

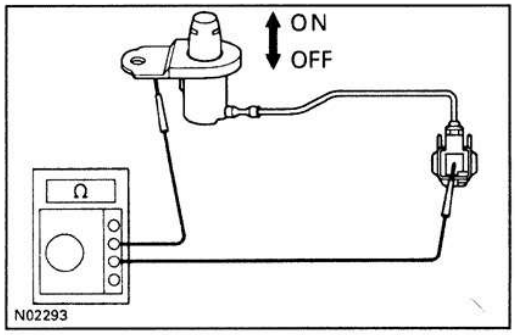
If operation is not as specified, replace the switch or inspect ground point.

2. INSPECT BRAKE WARNING LIGHT

(a) Disconnect the connector from the parking brake switch and the brake fluid warning switch.
(b) Ground terminal on the wire harness side connector.
(c) Start the engine, check that the warning light lights up.

If the warning light does not light up, test the bulb or inspect wire harness.

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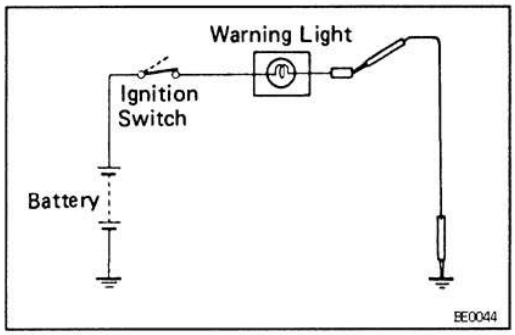
DOOR COURTESY SWITCH INSPECTION BE11P-07

1. INSPECT DOOR COURTESY SWITCH

(a) Check that there is continuity between terminal and switch body with the switch ON (switch pin released).

(b) Check that there is no continuity between terminal and switch body with the switch OFF (switch pin pushed).

If continuity is not as specified, replace the switch.

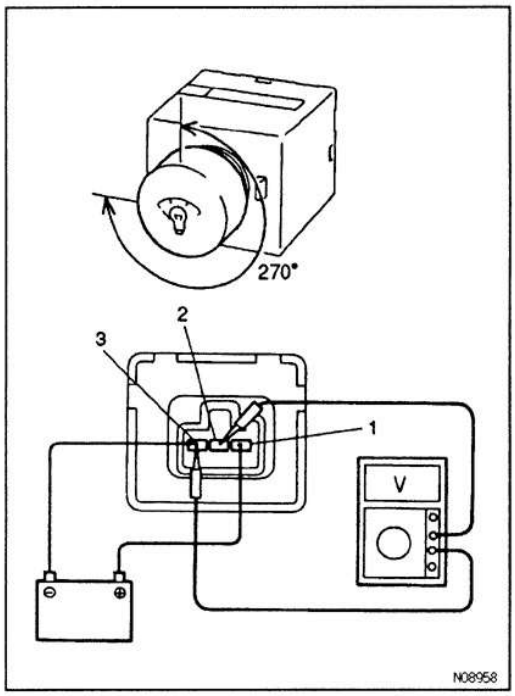


2. INSPECT OPEN DOOR WARNING LIGHT

Disconnect the connector from the door courtesy switch, and ground terminal 1 on the wire harness side connector and check that the warning light lights up.

If the warning light does not light up, inspect the bulb or wire harness.

BE



LIGHT CONTROL RHEOSTAT INSPECTION BE1DS-03

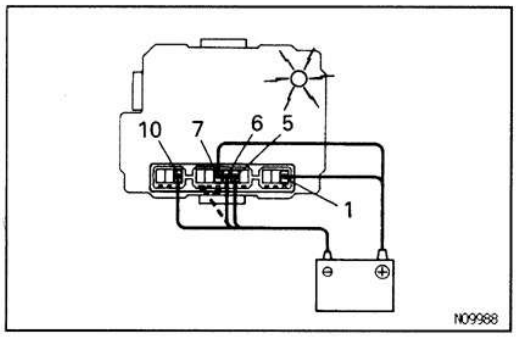
INSPECT LIGHT CONTROL RHEOSTAT

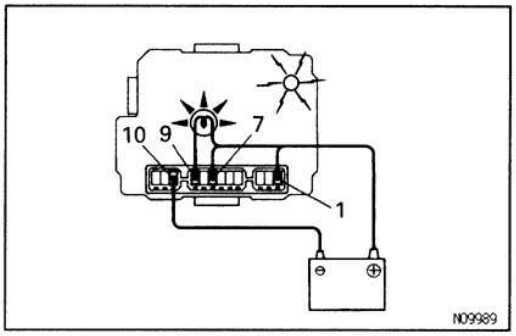
(a) Connect the positive (+) lead from the battery to terminal 1 and negative lead (–) to terminal 3.

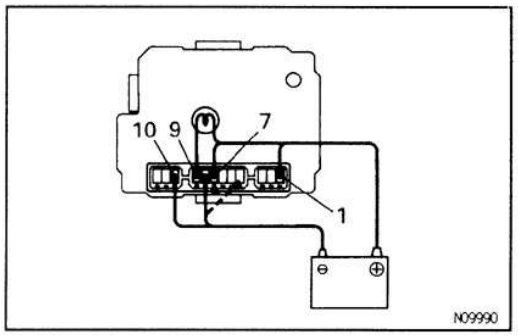
(b) Connect the positive (+) lead from the voltmeter to terminal 2 and negative lead to terminal 3.

(c) Turn the rheostat knob and check that the voltage changes.

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INTEGRATION RELAY INSPECTION

BE1YR-02

1. INSPECT UNLOCK WARNING OPERATION

(a) Connect the positive (+) lead from the battery to terminal 1 and 7, the negative lead to terminals 5 and 10.

(b) Check that the buzzer sounds when the negative (−) lead from the battery is connected to terminal 6.
If operation is not as specified, replace the relay.

2. INSPECT SEAT BELT WARNING OPERATION

(a) Connect the positive (+) lead from the battery to terminals 1 and 7.

(b) Connect the positive (+) lead from the battery to terminal 9 through a 3.4W test bulb.

(c) Check that the test bulb lights up and buzzer sounds for 4 – 8 seconds when the negative (−) lead from the battery is connected to terminal 10.

(d) Check that the buzzer sounding in (c) stops when the negative (−) lead from the battery is connected to terminal 8.
If operation is not as specified, replace the integration relay.

BE

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SERVICE SPECIFICATIONS

SERVICE DATA

BE1E1-06

SPEEDOMETER (USING A SPEEDOMETER TESTER)			
EUROPE			
Standart indication (km/h)	Allowable range (km/h)	Standart indication (mph)	Allowable range (mph)
20	20 – 26	20	20 – 24.5
40	40 – 48	40	40 – 46.5
60	60 – 70	60	60 – 68.5
80	80 – 92	80	80 – 90.5
100	100 – 114	100	100 – 112.5
120	120 – 136	–	
140	140 – 158	–	
160	160 – 180	–	
AUSTRALIA			
Standard indication (km/h)		Allowable range (km/h)	
40		36 – 44	
60		54 – 66	
80		72 – 88	
100		90 – 110	
120		108 – 132	
140		126 – 154	
160		144 – 176	
TACHOMETER (ON–VEHICLE)			
Standard indication (rpm)		Allowable range (rpm)	
700		630 – 770	
1000		900 – 1100	
2000		1850 – 2150	
3000		2800 – 3200	
4000		3800 – 4200	
5000		4800 – 6200	
6000		5750 – 6250	
7000		6700 – 7300	
TURBO METER			
A – B		Approx. 87.7 Ω	
A – C		Approx. 79.7 Ω	
FUEL RECEIVER GAUGE			
A – B		Approx. 154.3 Ω	
A – C		Approx. 126.2 Ω	
B – C		Approx. 280.5 Ω	
FUEL SENDER GAUGE			
Float position: F		Approx. 3.0 Ω	
Float position: 1/2		Approx. 31.6 Ω	
Float position: E		Approx. 110.0 Ω	

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WATER TEMPERATURE RECEIVER GAUGE	
A – B	Approx. 229.7 Ω
A – C	Approx. 54.0 Ω
B – C	Approx. 175.7 Ω
WATER TEMPERATURE SENDER GAUGE	
50 °C (122.0 °F)	160 – 240 Ω
120 °C (248.0 °F)	17.1 – 21.2 Ω

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BODY

FRONT BUMPER ..... BO– 2
SERVICE SPECIFICATIONS ..... BO– 4

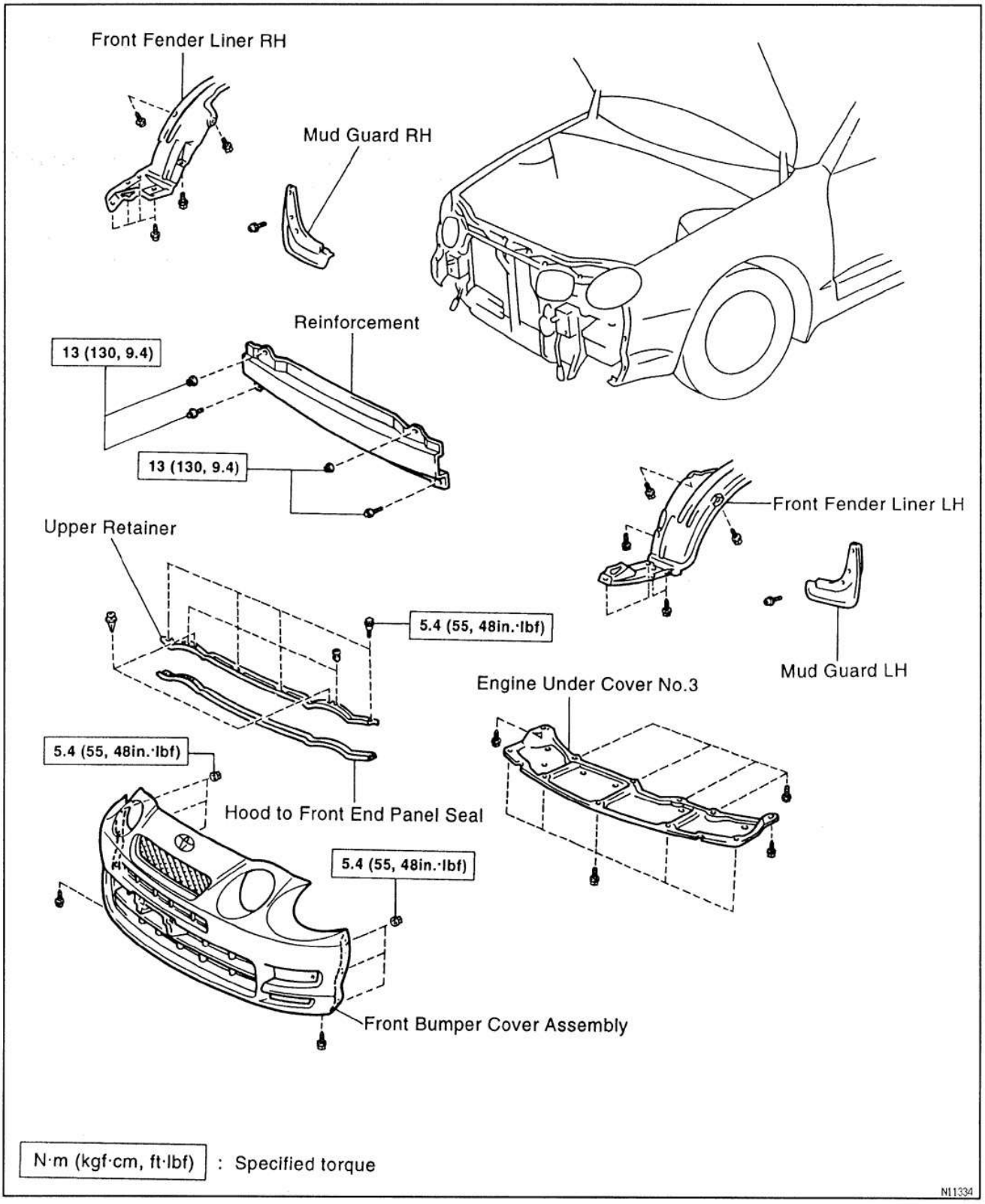
REFER TO CELICA REPAIR MANUAL FOR CHASSIS AND BODY (Pub. No. RM380E)

NOTE: The above pages contain only the points which differ from the above listed manual.

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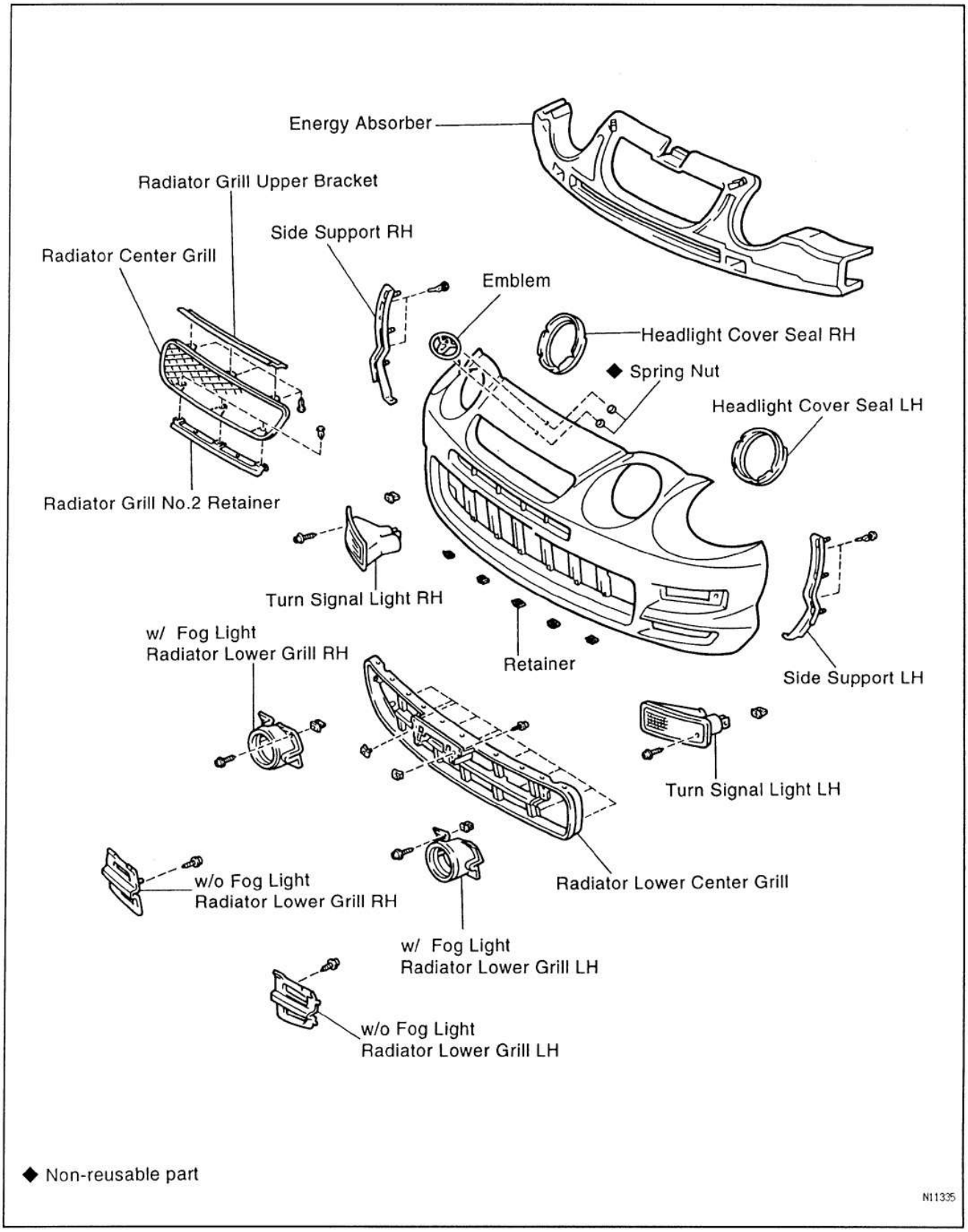
FRONT BUMPER
COMPONENTS

B00B3-04



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COMPONENTS (Cont'd)



BO

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SERVICE SPECIFICATIONS

TORQUE SPECIFICATIONS

BO03J-0A

Part tightened	N·m	kgf·cm	ft·lbf
FRONT BUMPER	–	–	–
Front bumper reinforcement x Body	13	130	9.4
Front bumper cover x Body	5.4	55	48 in.·lbf
Uppper retainer x Body	5.4	55	48 in.·lbf

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AIR CONDITIONING SYSTEM

COMPRESSOR ..... AC– 2
SERVICE SPECIFICATIONS ..... AC– 5

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NOTE: The above pages contain only the points which differ from the above listed manual.

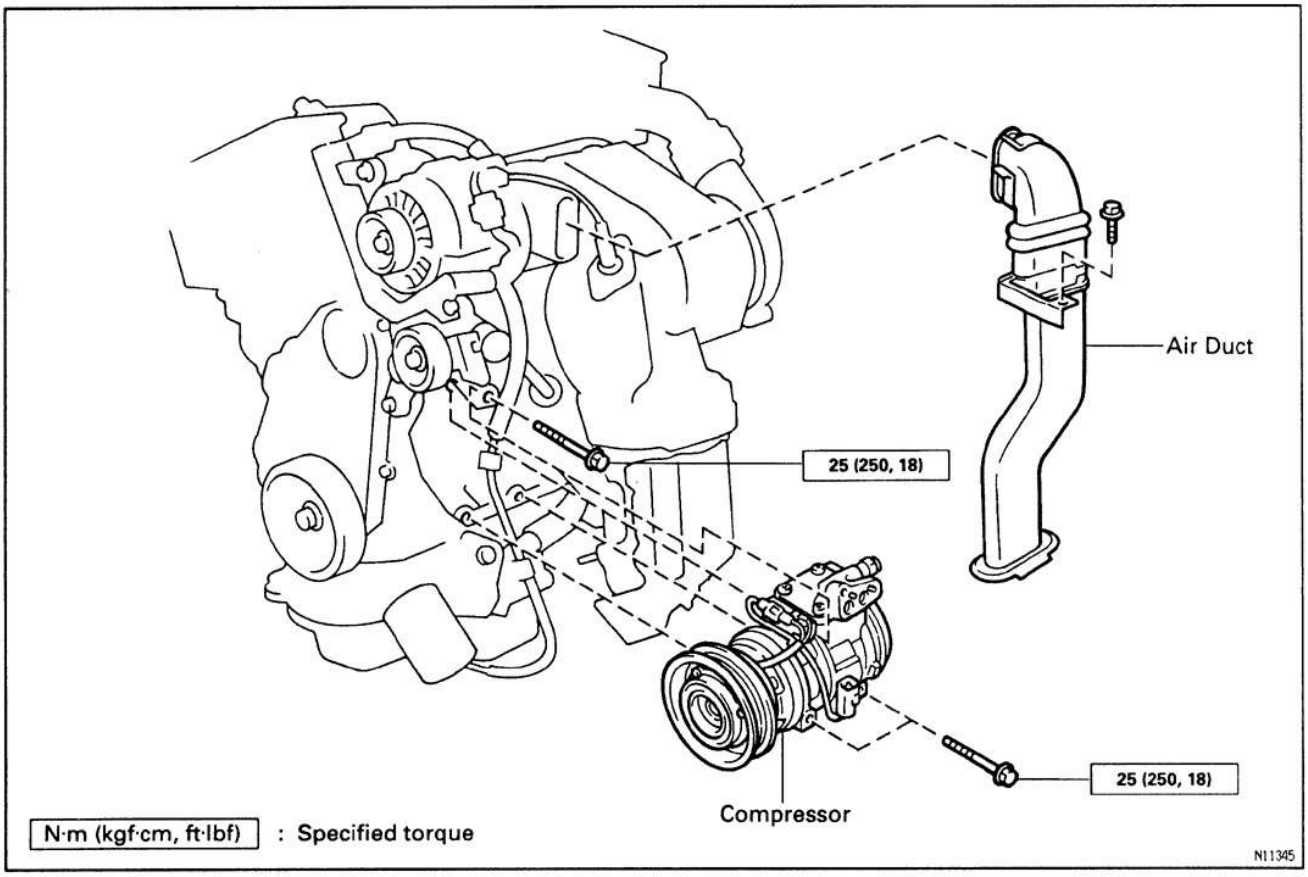
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COMPRESSOR

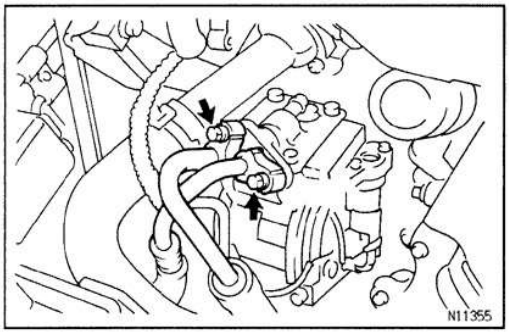
COMPRESSOR REMOVAL

AC18X-01

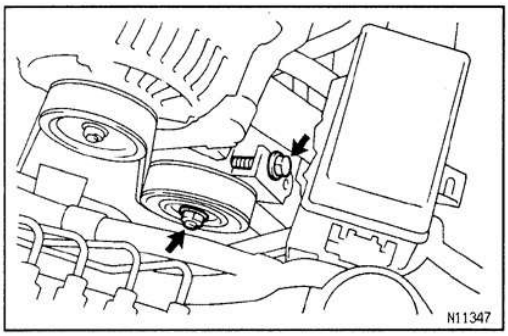


1. RUN ENGINE AT IDLE SPEED WITH A/C ON FOR APPROX. 10 MINUTES
2. STOP ENGINE
3. DISCONNECT NEGATIVE (−) TERMINAL CABLE FROM BATTERY
4. DISCHARGE REFRIGERANT FROM REFRIGERANT SYSTEM
5. REMOVE AIR DUCT FROM ALTERNATOR
6. DISCONNECT CONNECTOR FROM MAGNETIC CLUTCH

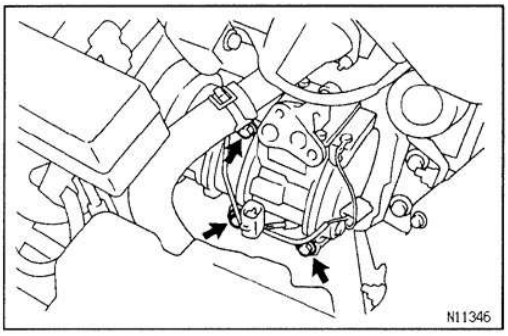
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7. **DISCONNECT DISCHARGE TUBE AND SUCTION TUBE**



8. **LOOSEN IDLE PULLEY LOCK NUT AND COMPRESSOR DRIVE BELT**
9. **REMOVE COMPRESSOR DRIVE BELT**



10. **REMOVE COMPRESSOR**
    Remove the 3 bolts and compressor.

AC

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AC18Y-01

COMPRESSOR INSTALLATION

1. **INSTALL COMRESSOR**
   Install compressor with the 3 bolts.
   Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)
2. **INSTALL DRIVE BELT**
3. **INSPECT DRIVE BELT TENTION**
4. **CONNECT DISCHARGE HOSE AND SUCTION HOSE TO COMPRESSOR**
   NOTICE: Hoses should be connected immediately after the caps have been removed.
   Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)
5. **CONNECT CONNECTOR TO MAGNETIC CLUTCH**
6. **INSTALL AIR DUCT TO ALTERNATOR**
7. **EVACUATE AIR IN REFRIGERATION SYSTEM AND CHARGE WITH REFRIGERANT**
   Specified ammount:
   650 ± 50 (22.92 ± 1.76 oz)
8. **INSPECT FOR LEAKAGE OF REFRIGERANT**
   Using a gas leak taster, check for leakage of refrigerant.
   If there is leakage, check the tightening torque at the joints.
9. **CONNECT NAGATIVE (−) TERMINAL CABLE TO BATTERY**
10. **INSPECT A/C OPERATION**

AC

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SERVICE SPECIFICATIONS

SERVICE DATA

AC1BV-01

Refrigerant charge volume	650 ± 50 g (22.92, 1.76 oz.)

TORQUE SPECIFICATIONS

AC1BW-01

Part tightned	N·m	kgf·cm	ft·lbf
Suction hose x Compressor	10	100	7
Discharge hose x Compressor	10	100	7
Compressor x Engine	25	250	18

AC

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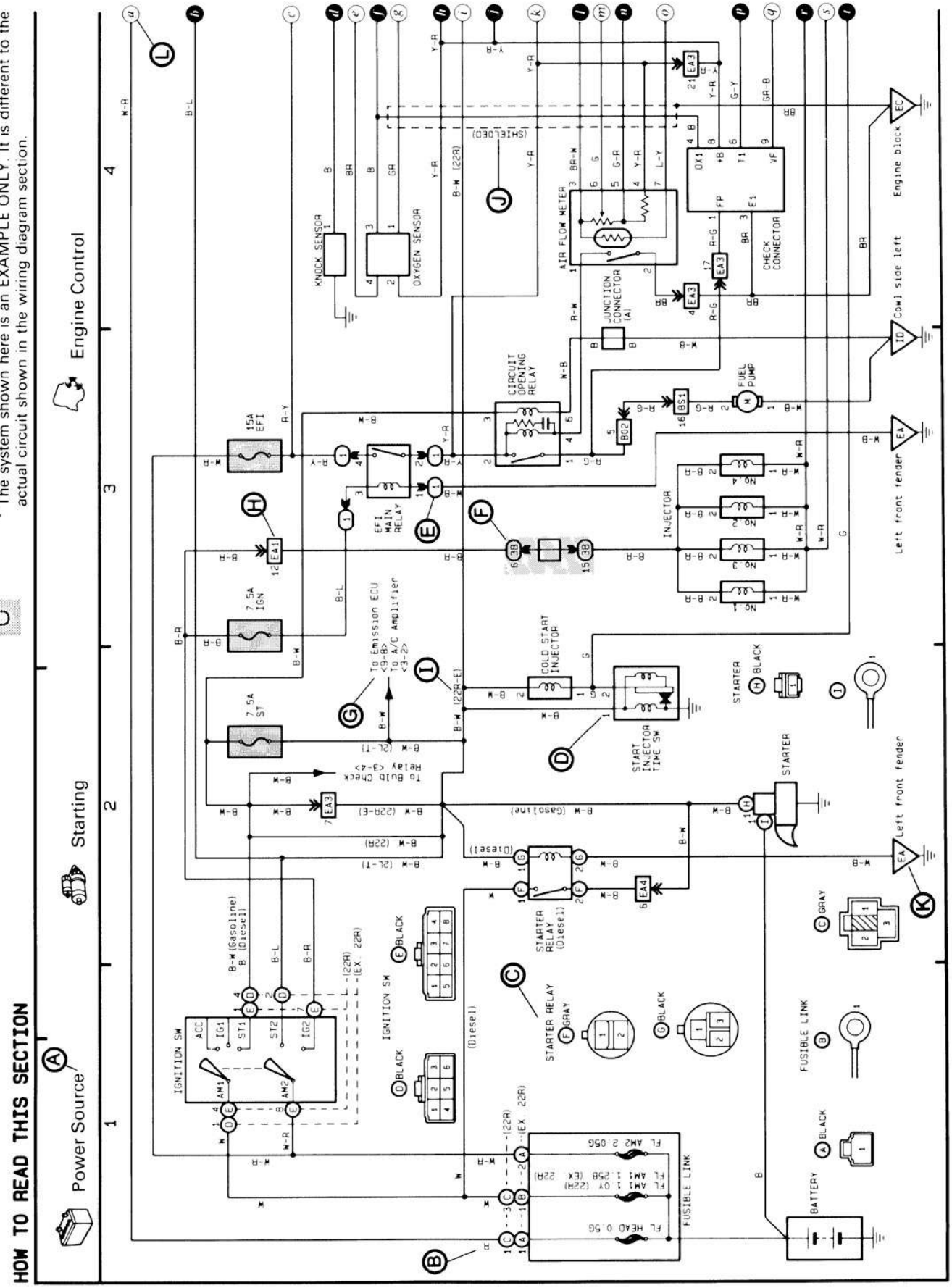
ELECTRICAL WIRING DIAGRAMS

ABBREVIATION

The following abbreviations are used in this wiring diagram.

ABS	= Anti-Lock Brake System
A/C	= Air Conditioner
COMB.	= Combination
ECU	= Electronic Control Unit
EFI	= Electronic Fuel Injection
EGR	= Exhaust Gas Recirculation
Ex.	= Except
FL	= Fusible Link
ISC	= Idle Speed Control
J/B	= Junction Block
LH	= Left-Hand
LHD	= Left-Hand Drive
R/B	= Relay Block
RH	= Right-Hand
RHD	= Right-Hand Drive
SW	= Switch
TEMP.	= Temperature
TVSS	= Toyota Vehicle Security System
VSV	= Vacuum Switching Valve
w/	= With
w/o	= Without

* The system shown here is an EXAMPLE ONLY. It is different to the actual circuit shown in the wiring diagram section.



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Ⓐ: System Title

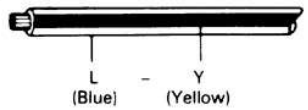
Ⓑ: Indicates the wiring color.

Wire colors are indicated by an alphabetical code.

B	= Black	L	= Blue	R	= Red
BR	= Brown	LG	= Light Green	V	= Violet
G	= Green	O	= Orange	W	= White
GR	= Gray	P	= Pink	Y	= Yellow

The first letter indicates the basic wire color and the second letter indicates the color of the stripe.

Example: L – Y



Ⓒ: Indicates the connector to be connected to a part (the numeral indicates the pin No.)

Ⓓ: Indicates the pin number of the connector. The numbering system is different for female and male connectors.

Example: Numbered in order from upper left to lower right / Numbered in order from upper right to lower left



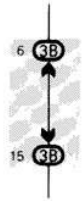
The numbering system for the overall wiring diagram is the same as above.

Ⓔ: Indicates a Relay Block. No shading is used and only the Relay Block No. is shown to distinguish it from the J/B.

Example: Ⓘ Indicates Relay Block No. 1.

Ⓕ: Junction Block (The number in the circle is the J/B No. and the connector code is shown beside it). Junction Blocks are shaded to clearly separate them from other parts (different junction blocks are shaded differently for further clarification).

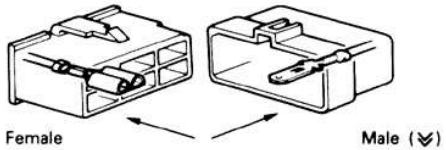
Example:



3B indicates that it is inside Junction Block No. 3.

Ⓖ: Indicates related system.

Ⓗ: Indicates the wiring harness and wiring harness connector. The wiring harness with male terminal is shown with arrows (⩔). Outside numerals are pin numbers.



Ⓘ: ( ) is used to indicate different wiring and connector, etc. when the vehicle model, engine type, or specification is different.

Ⓙ: Indicates a shielded cable.



Ⓚ: Indicates a ground point.

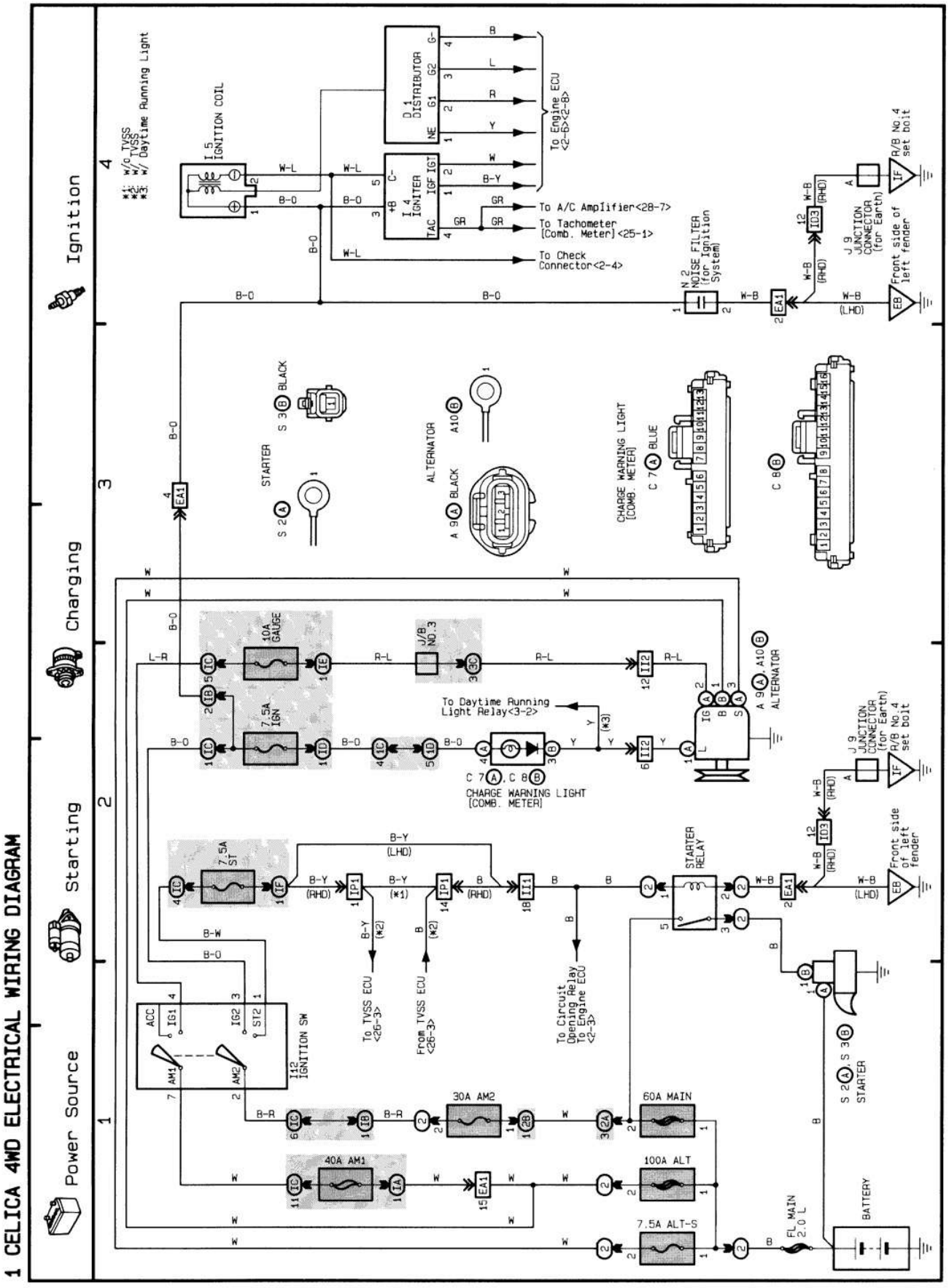
Ⓛ: The same code occuring on the next page indicates that the wire harness is continuous.

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SYSTEM INDEX

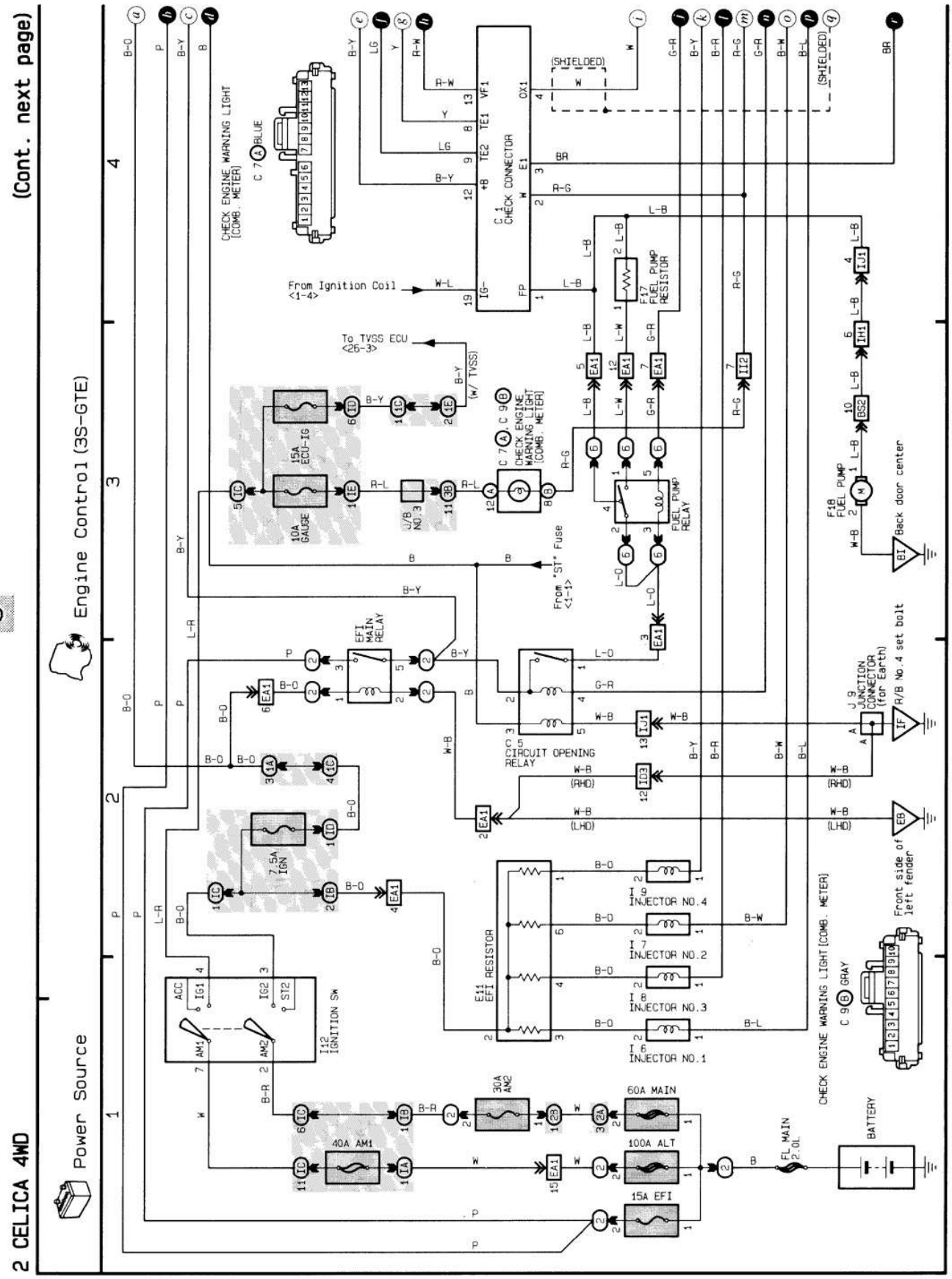
(Location No. 1 to 33)

SYSTEMS	LOCATION	SYSTEMS	LOCATION	SYSTEMS	LOCATION
ABS (Anti-Lock Brake System)	15-3	Headlight Cleaner	12-2	Rear Wiper and Washer	16-4
Air Conditioner	28-3	Horn	11-4	Remote Control Mirror	20-3
Auto Antenna	18-4	Ignition	1-4	Seat Heater	12-3
Back-Up Light	13-2	Illumination	9-3	Starting	1-2
Charging	1-3	Interior Light	10-3	Stop Light	13-3
Cigarette Lighter	23-3	Light Auto Turn Off (Australia)	6-4	Taillight	11-2
Clock	23-4	Light Reminder Buzzer	7-2	Turn Signal and Hazard Warning Light	14-3
Combination Meter	25-3	Moon Roof	23-2	TVSS (Toyota Vehicle Security System)	26-3
Door Lock Control	21-3 (LHD) 22-3 (RHD)	Power Source	1~28-1	Junction Block and Wire Harness Connector	29~30-1
Engine Control	2-3 (3S-GTE)	Power Window	19-3	Connector Joining Wire Harness and Wire Harness	30~33-1
Front Fog Light	7-3	Radiator Fan and Condenser Fan	27-3		
Front Wiper and Washer	16-2	Radio and Player	17-3 (w/ Power Amplifier) 18-2 (w/o Power Amplifier)		
Headlight	3-3 (w/ Daytime Running Light) 4-3 (Germany) 6-3 (w/o Daytime Running Light)	Rear Fog Light	8-3		
Headlight Beam Level Control	5-3	Rear Window Defogger and Mirror Heater	24-3		



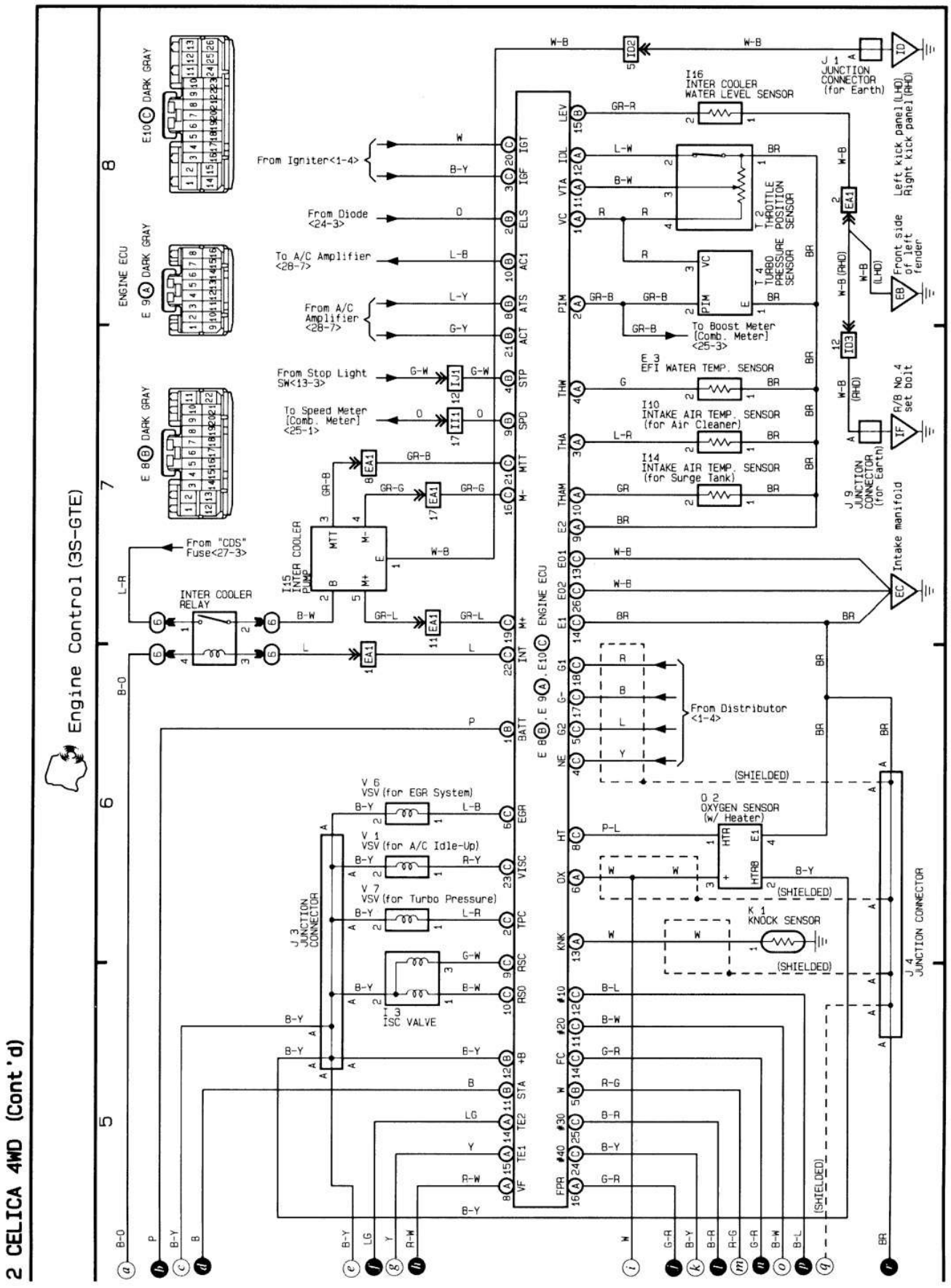
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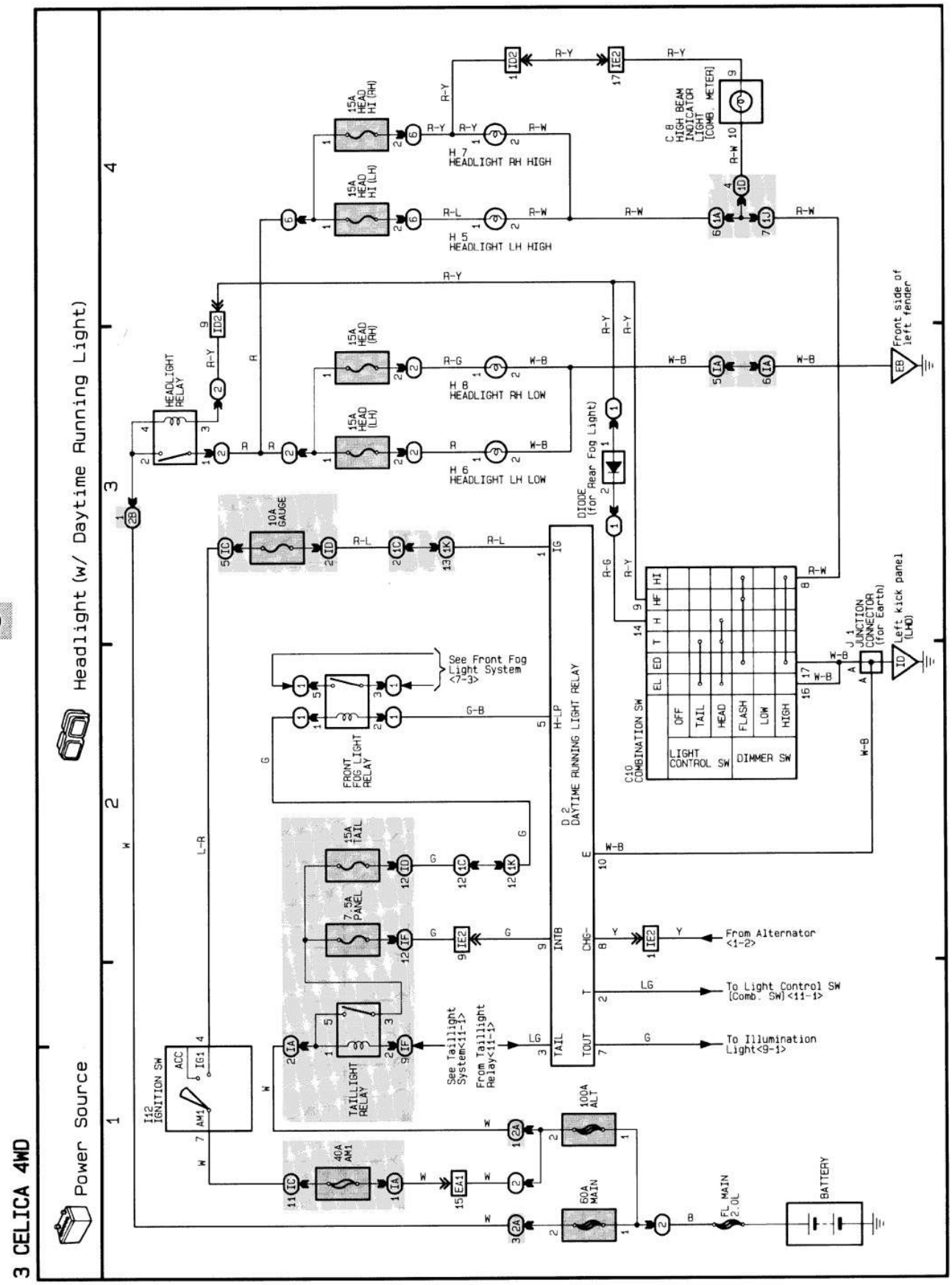
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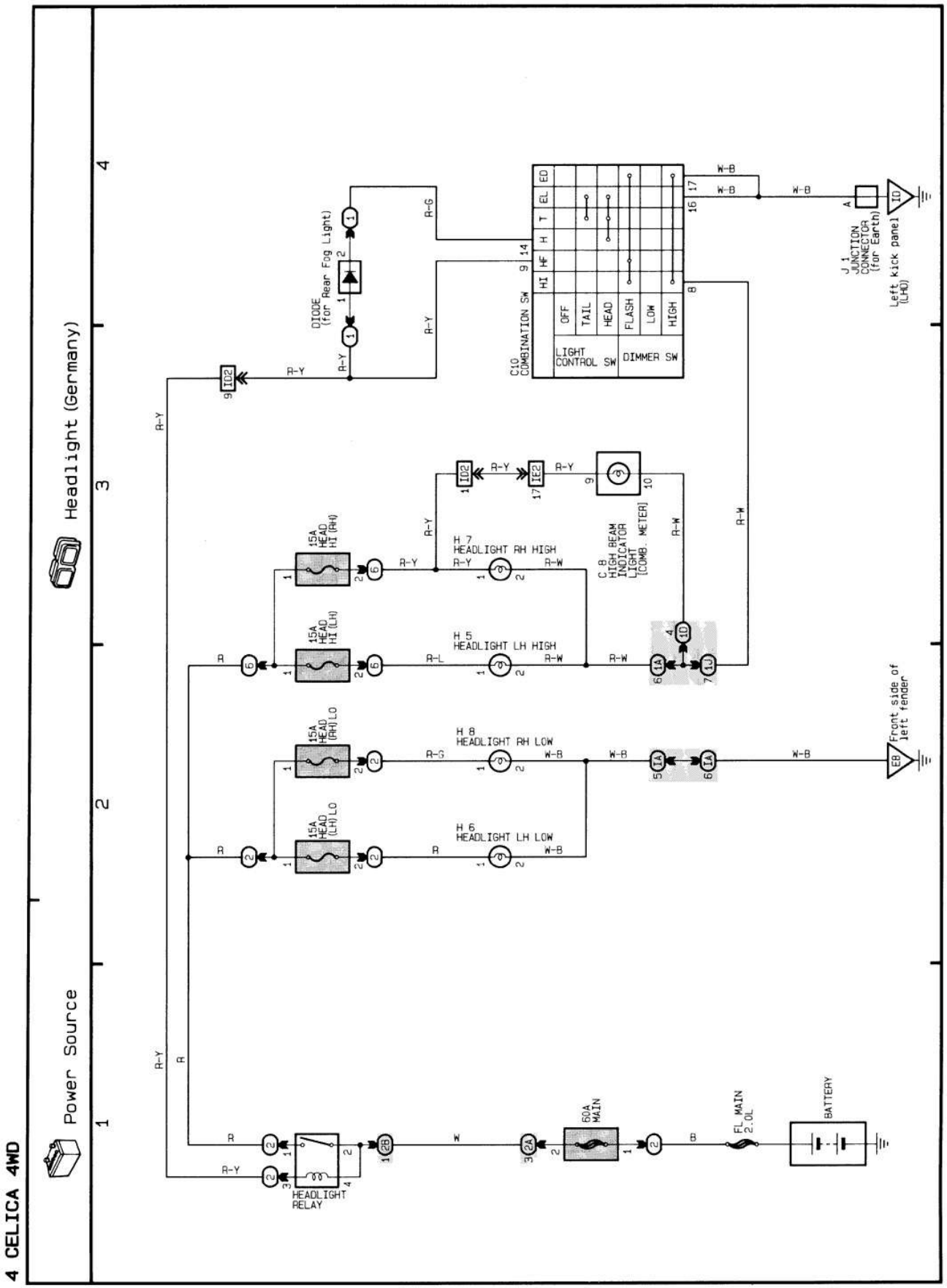
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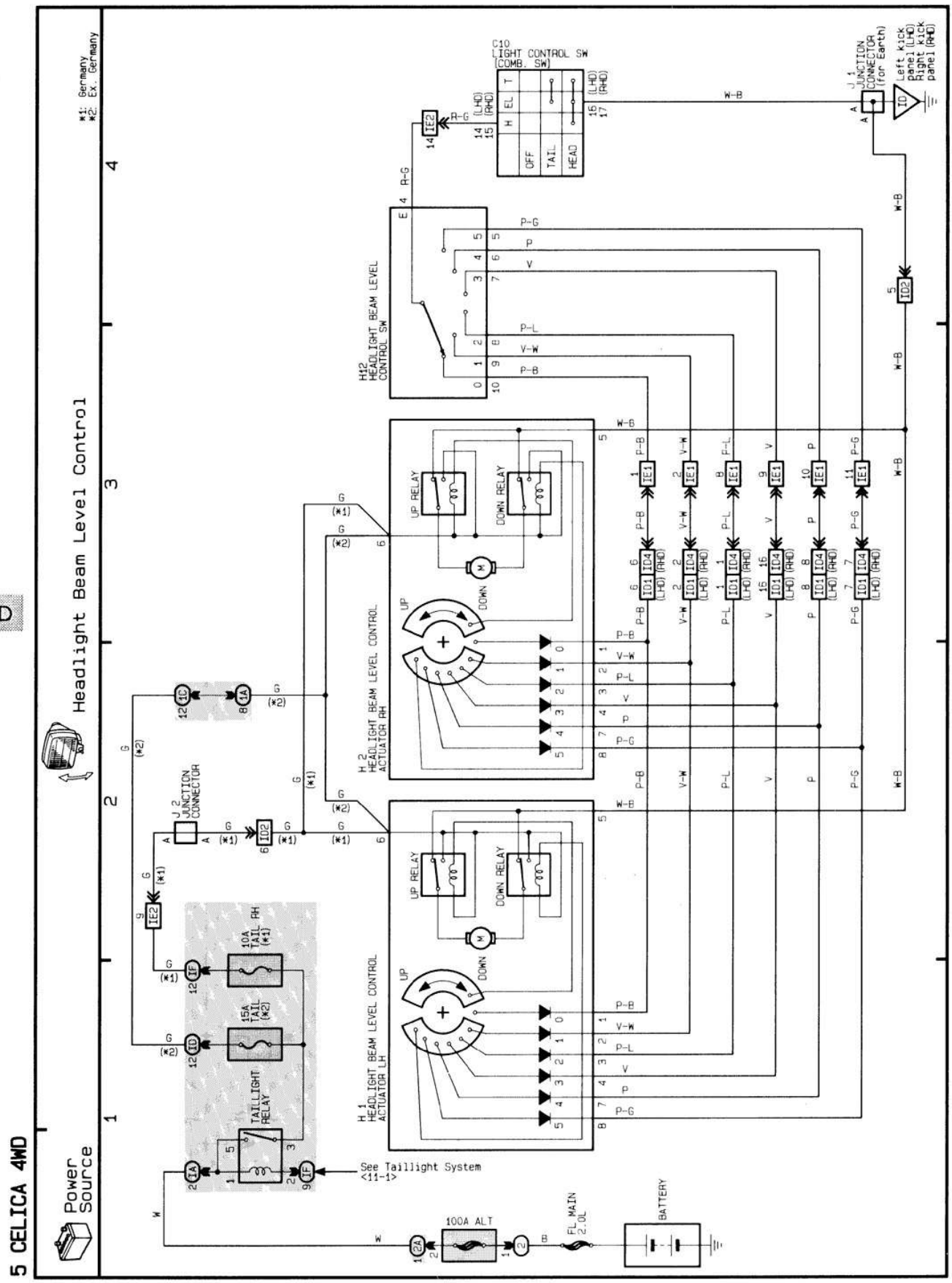


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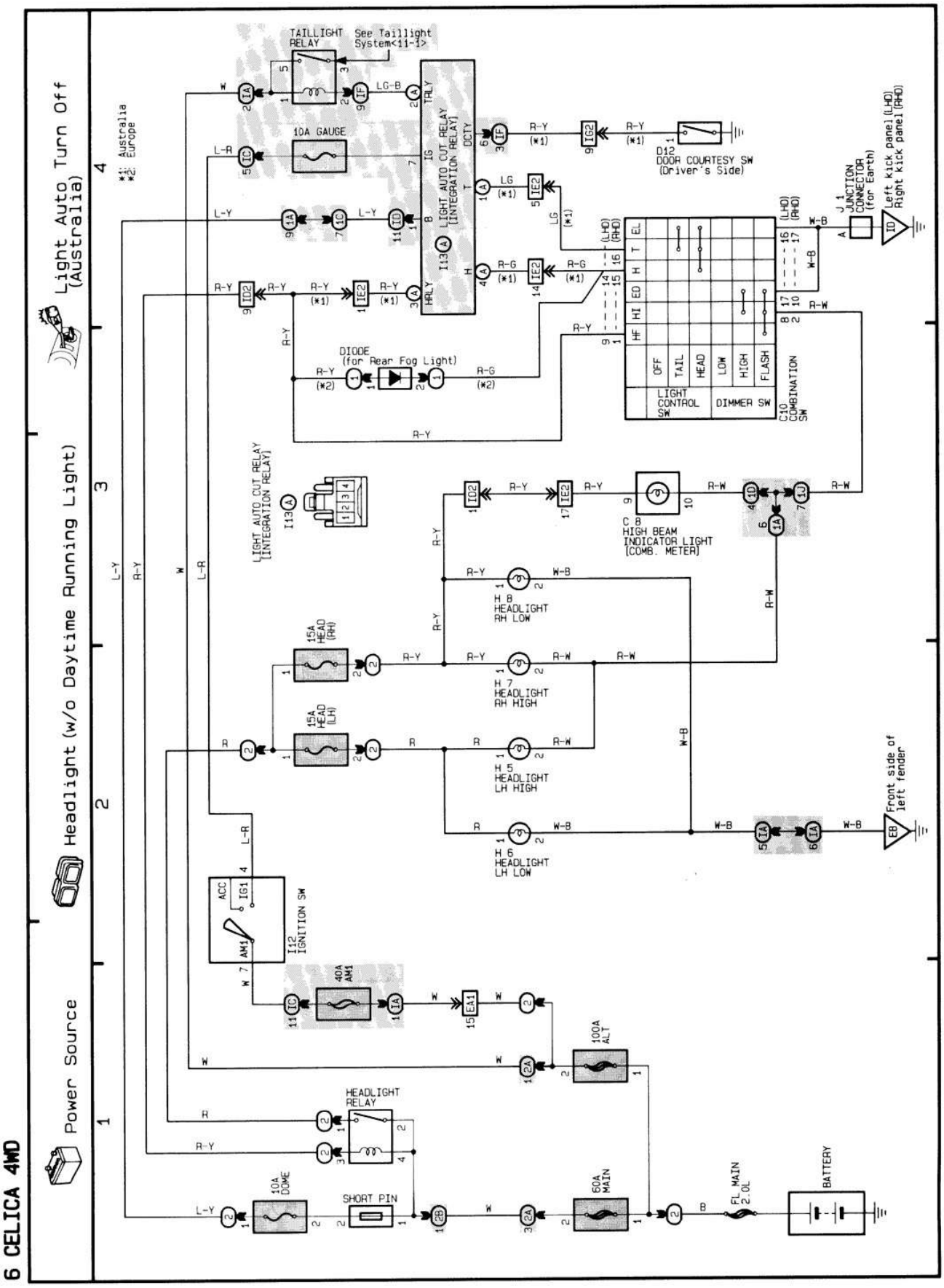


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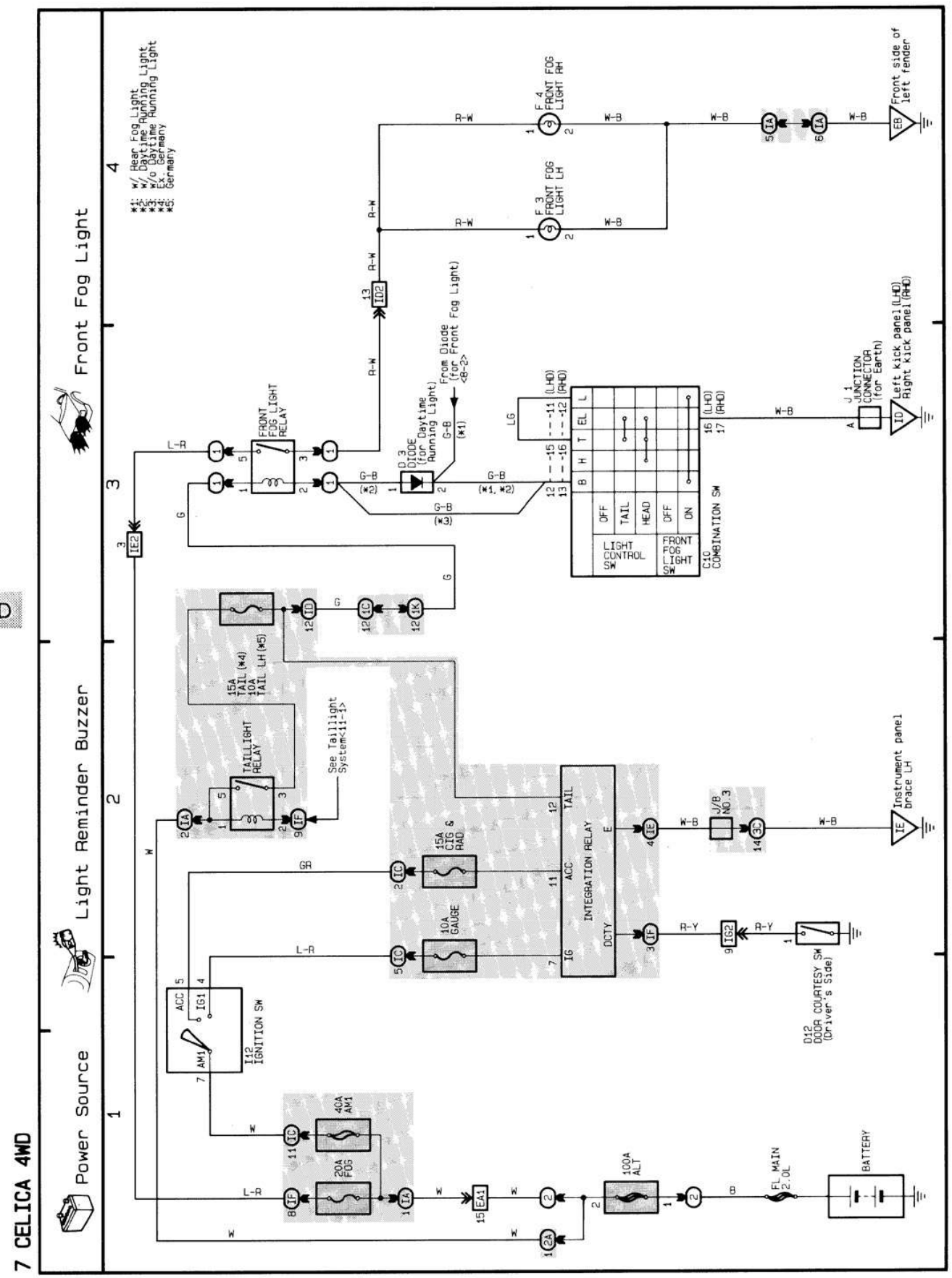


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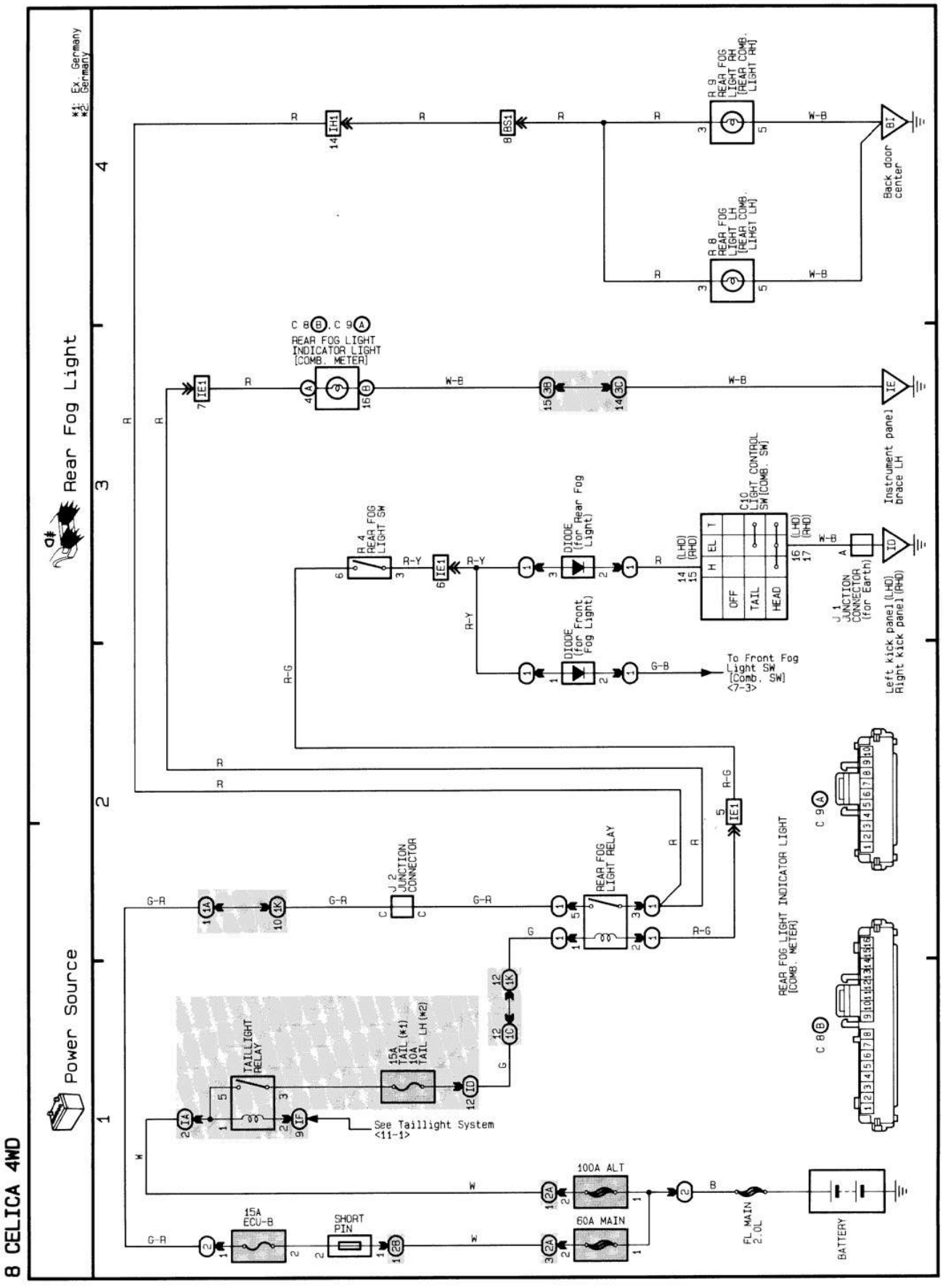


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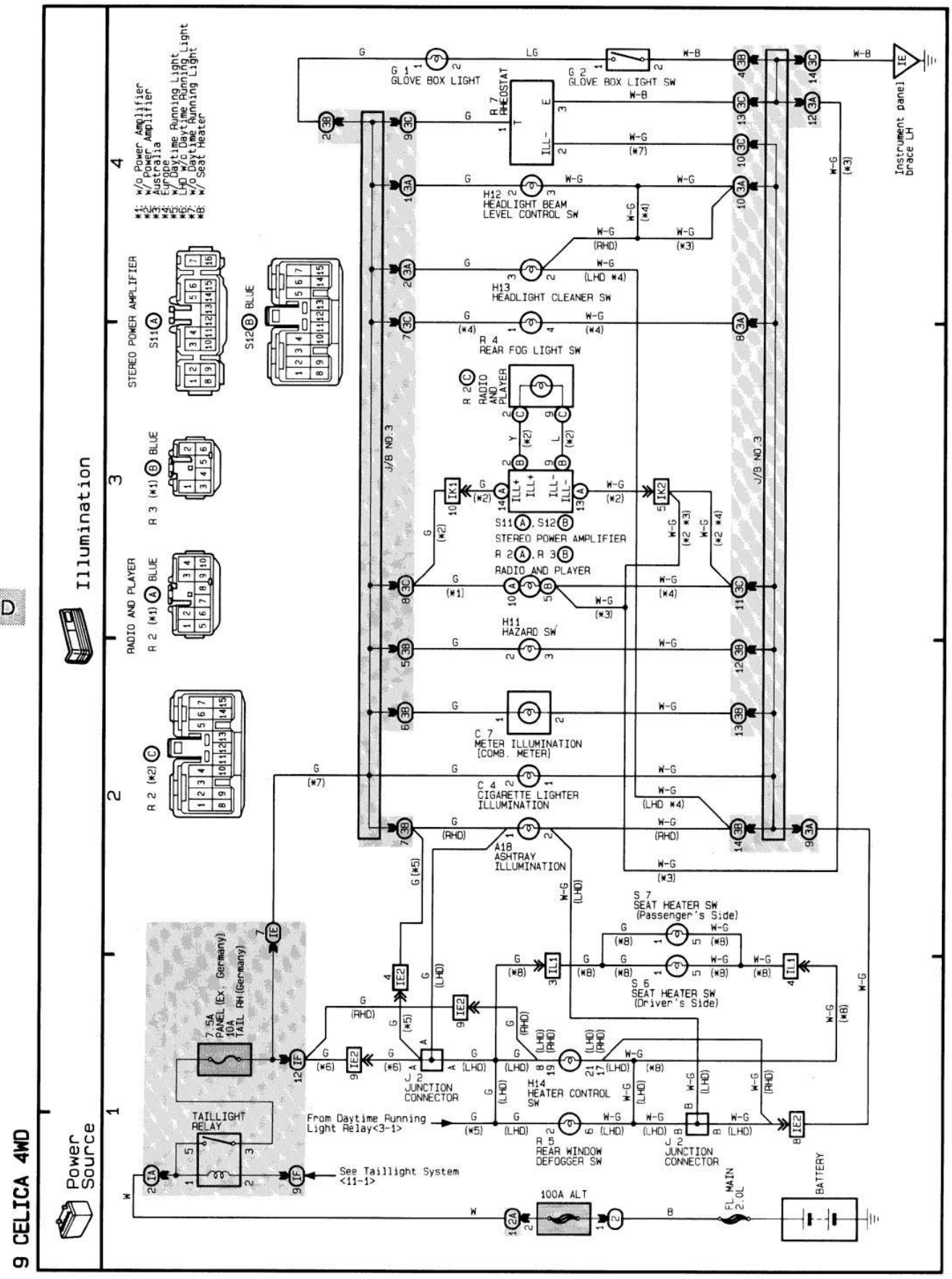


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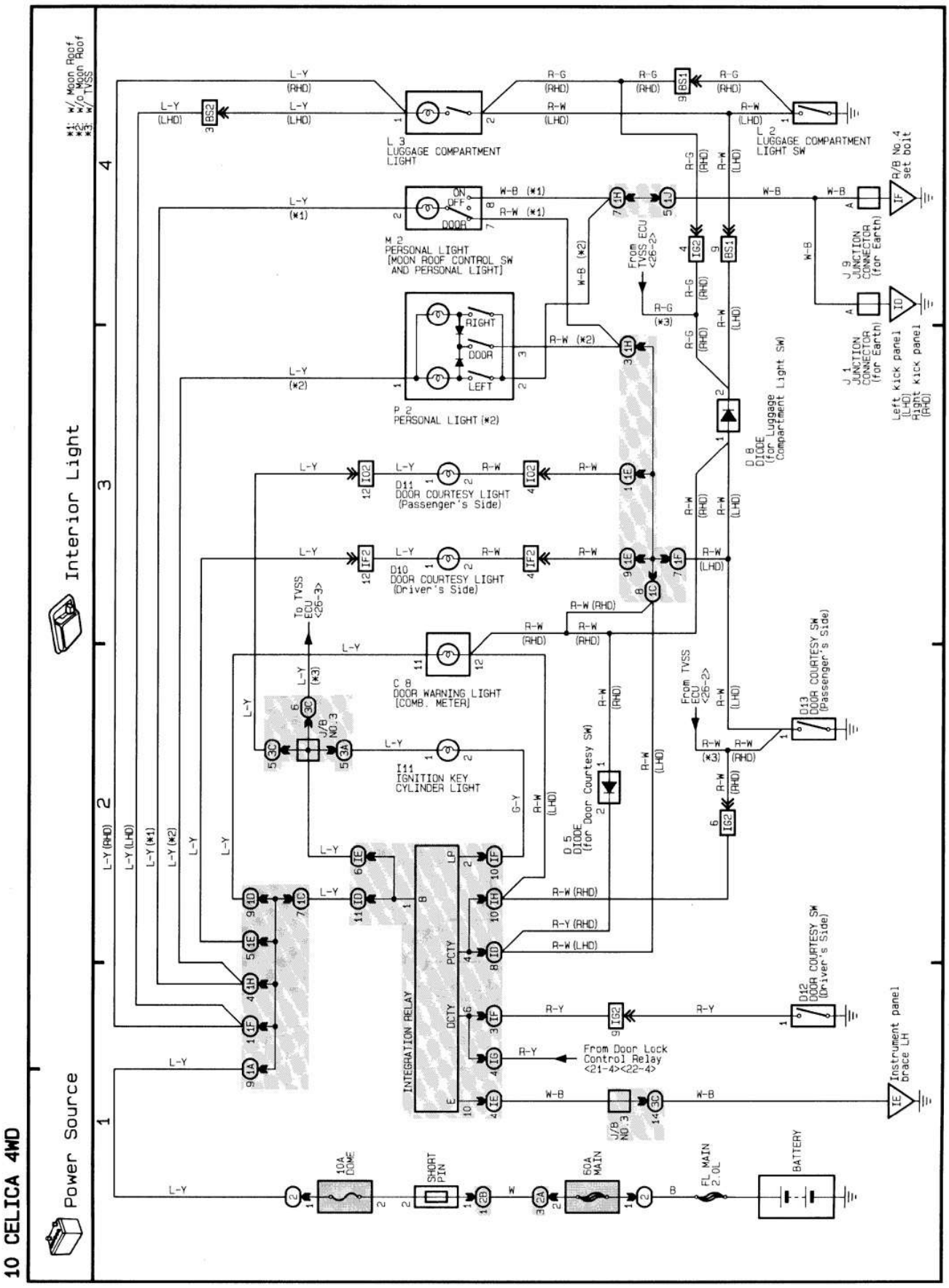


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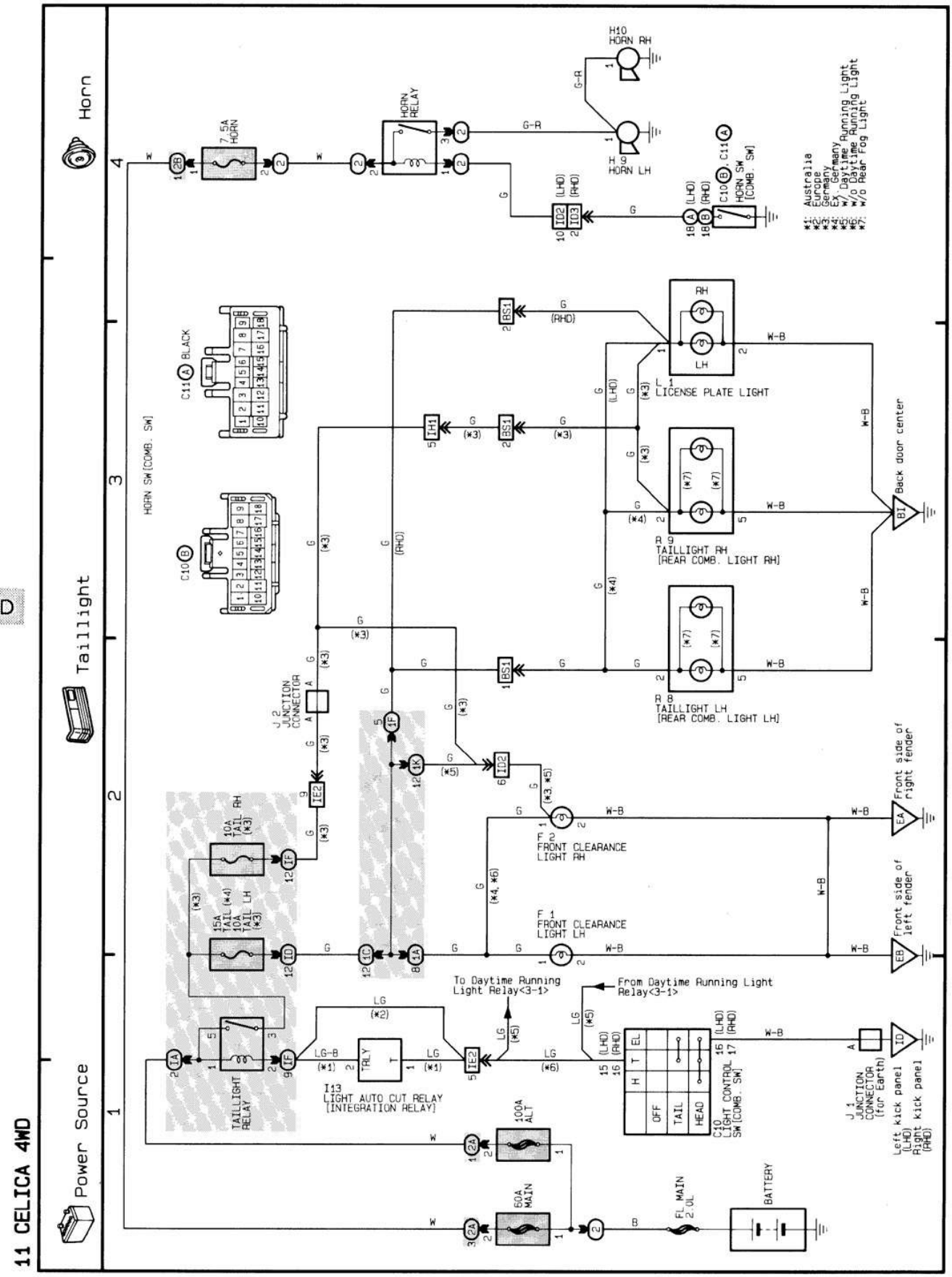
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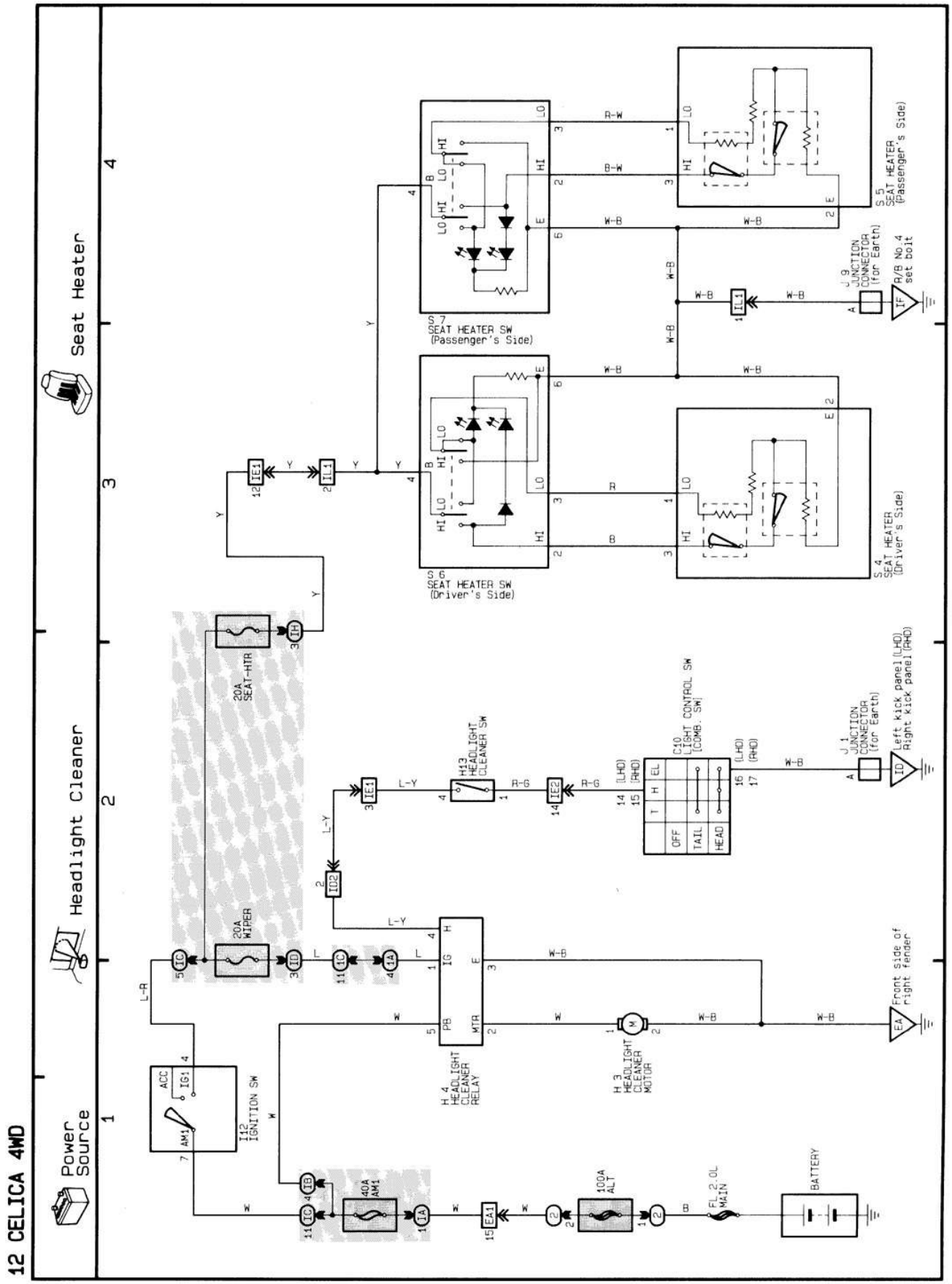
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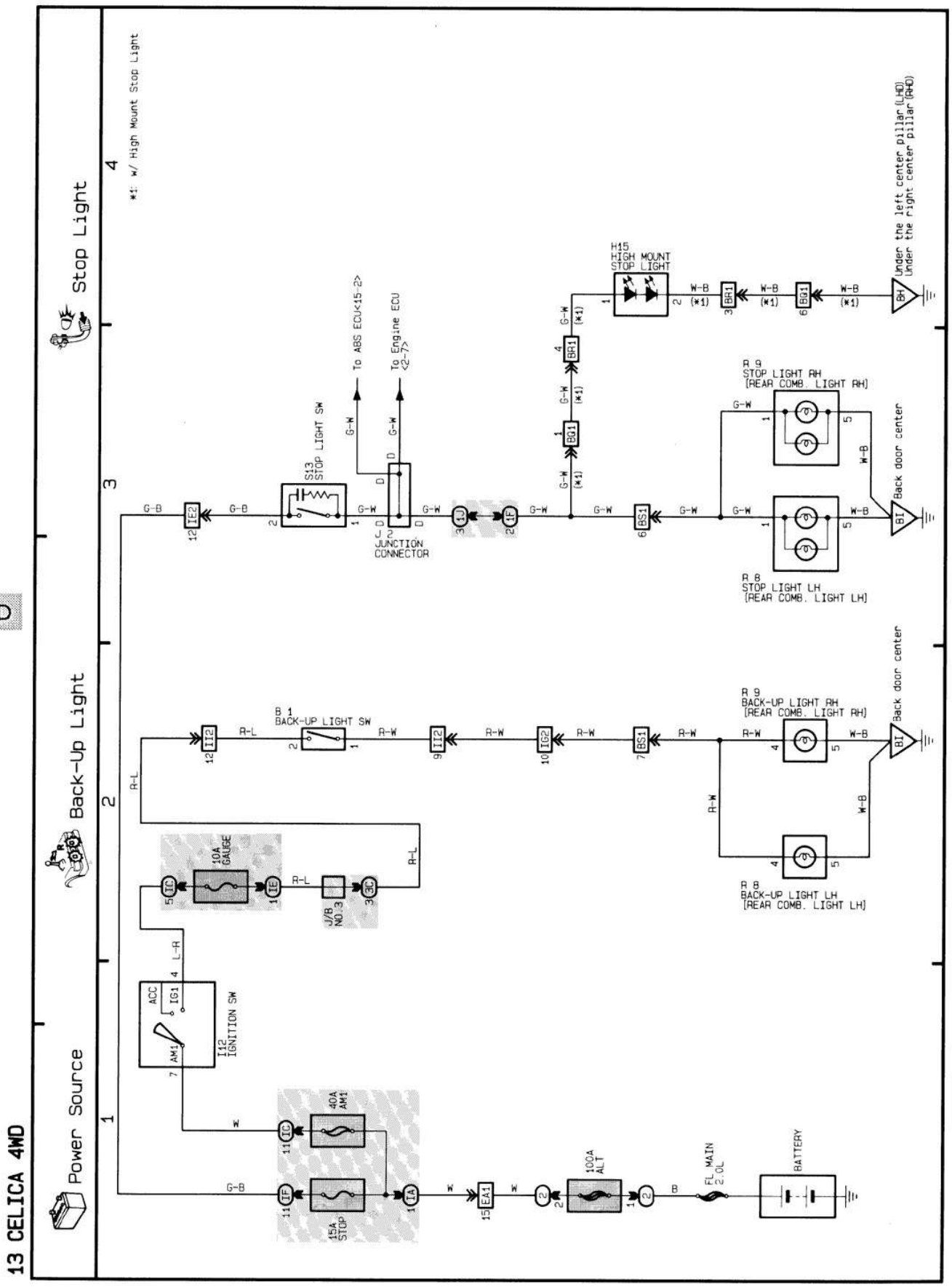
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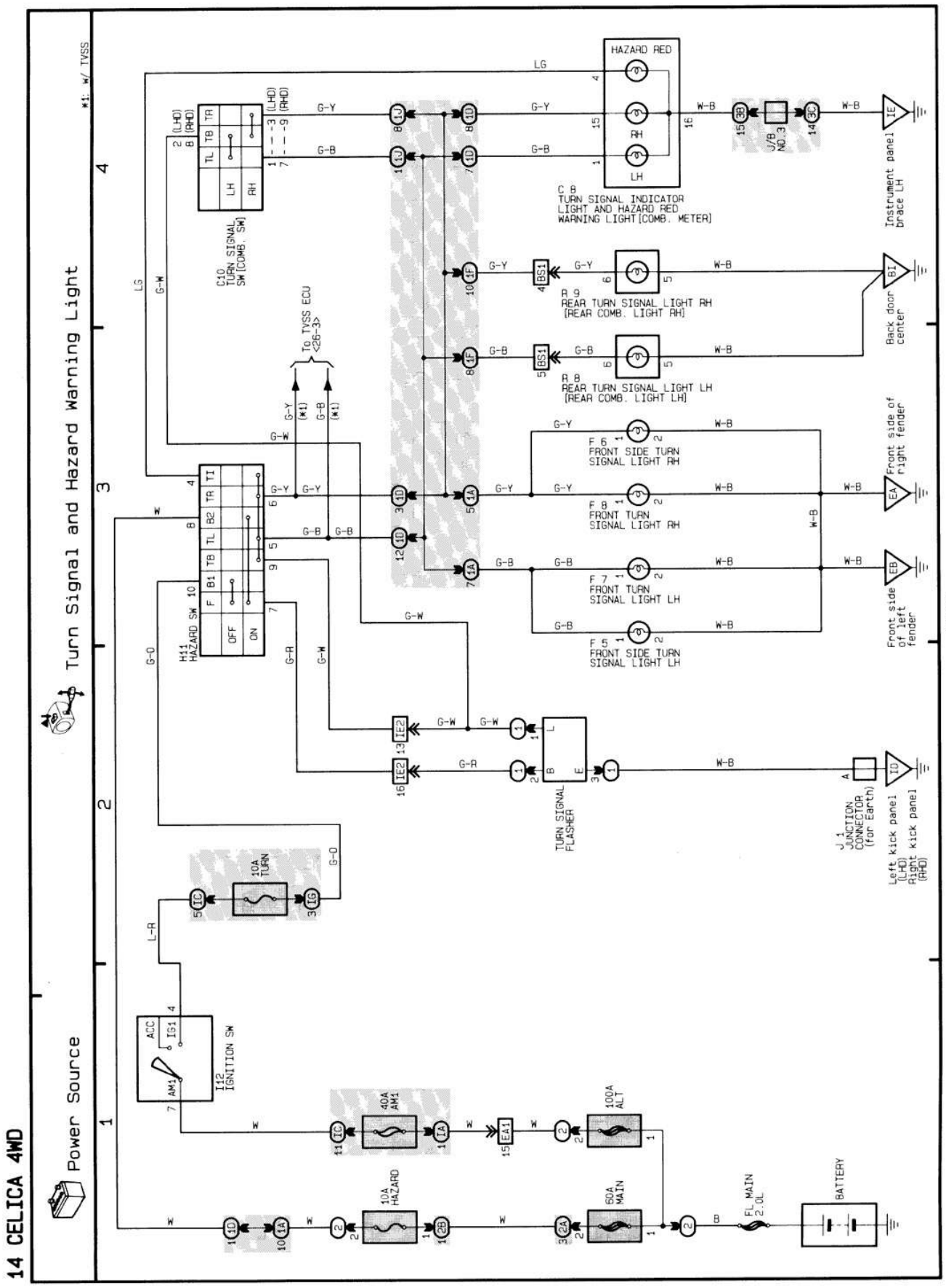
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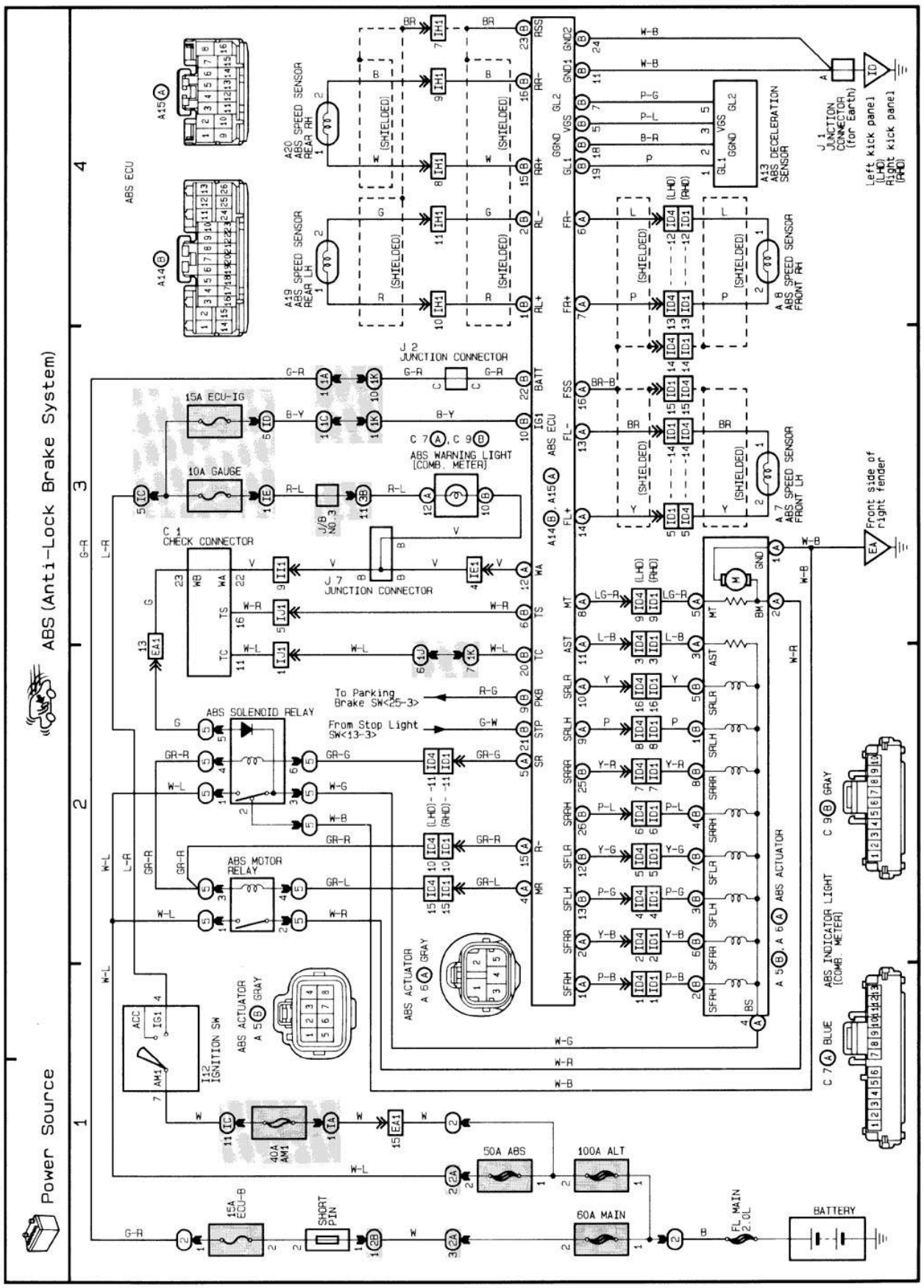
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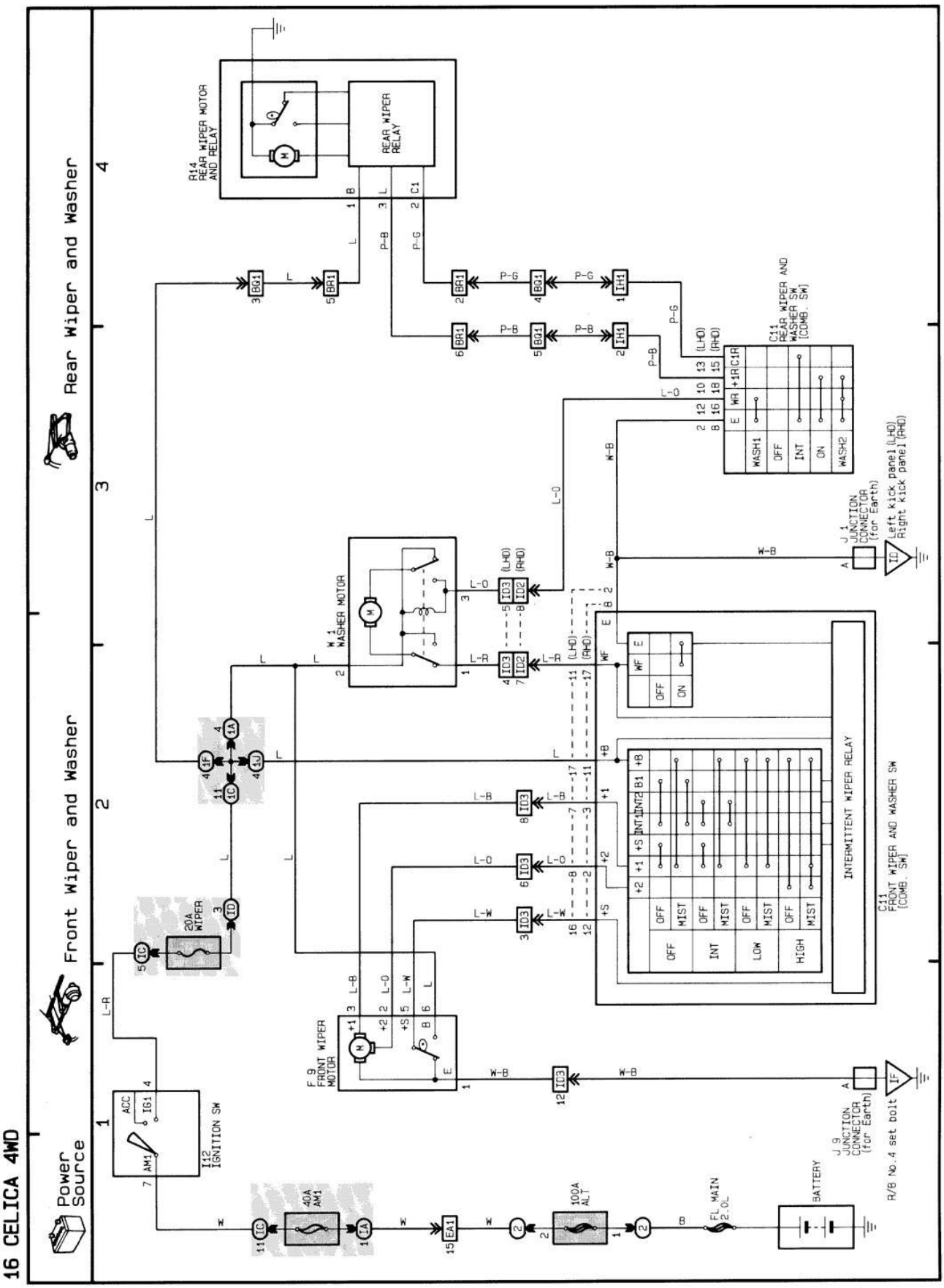
15 CELICA 4WD

Power Source

ABS (Anti-Lock Brake System)



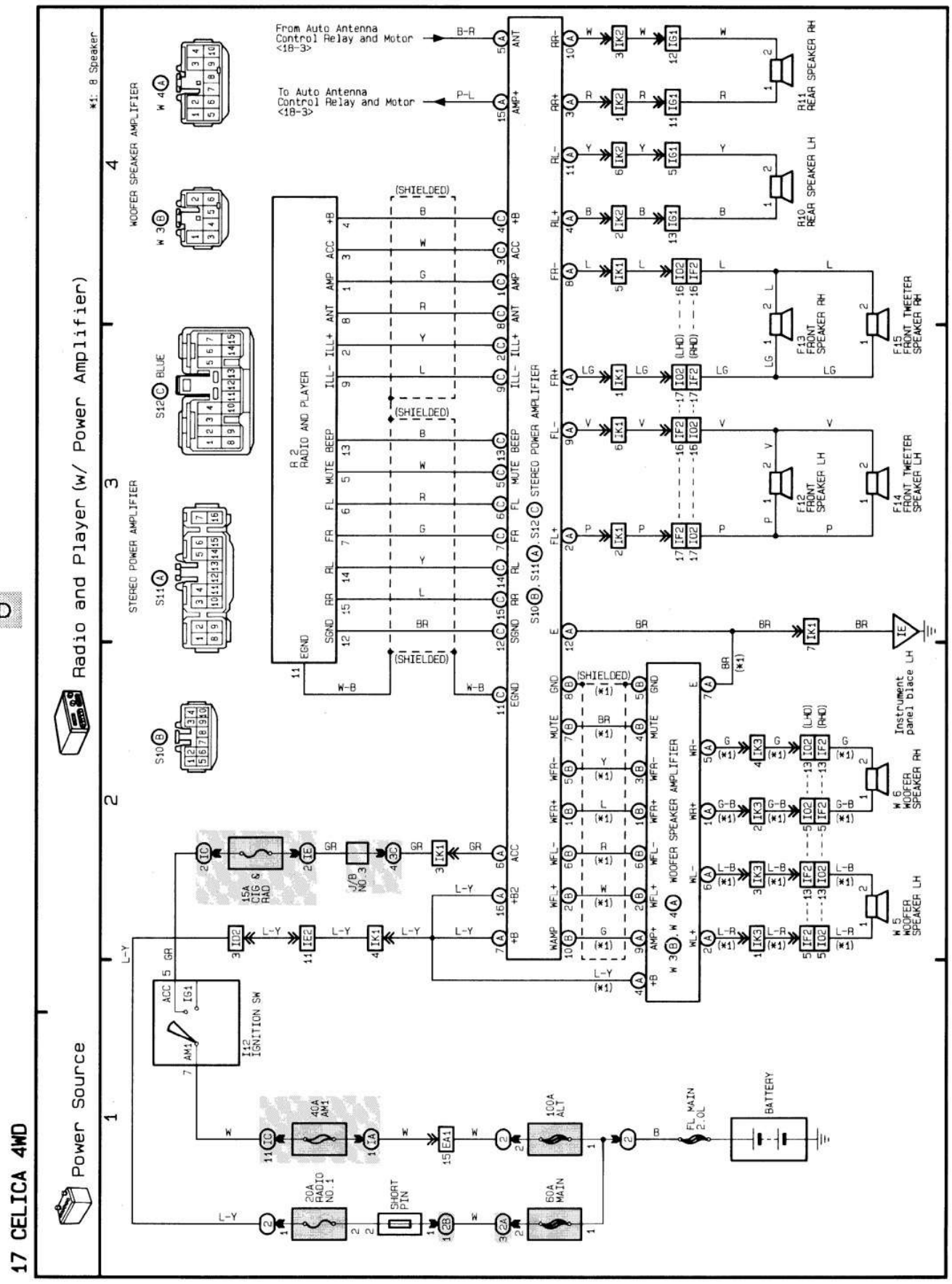
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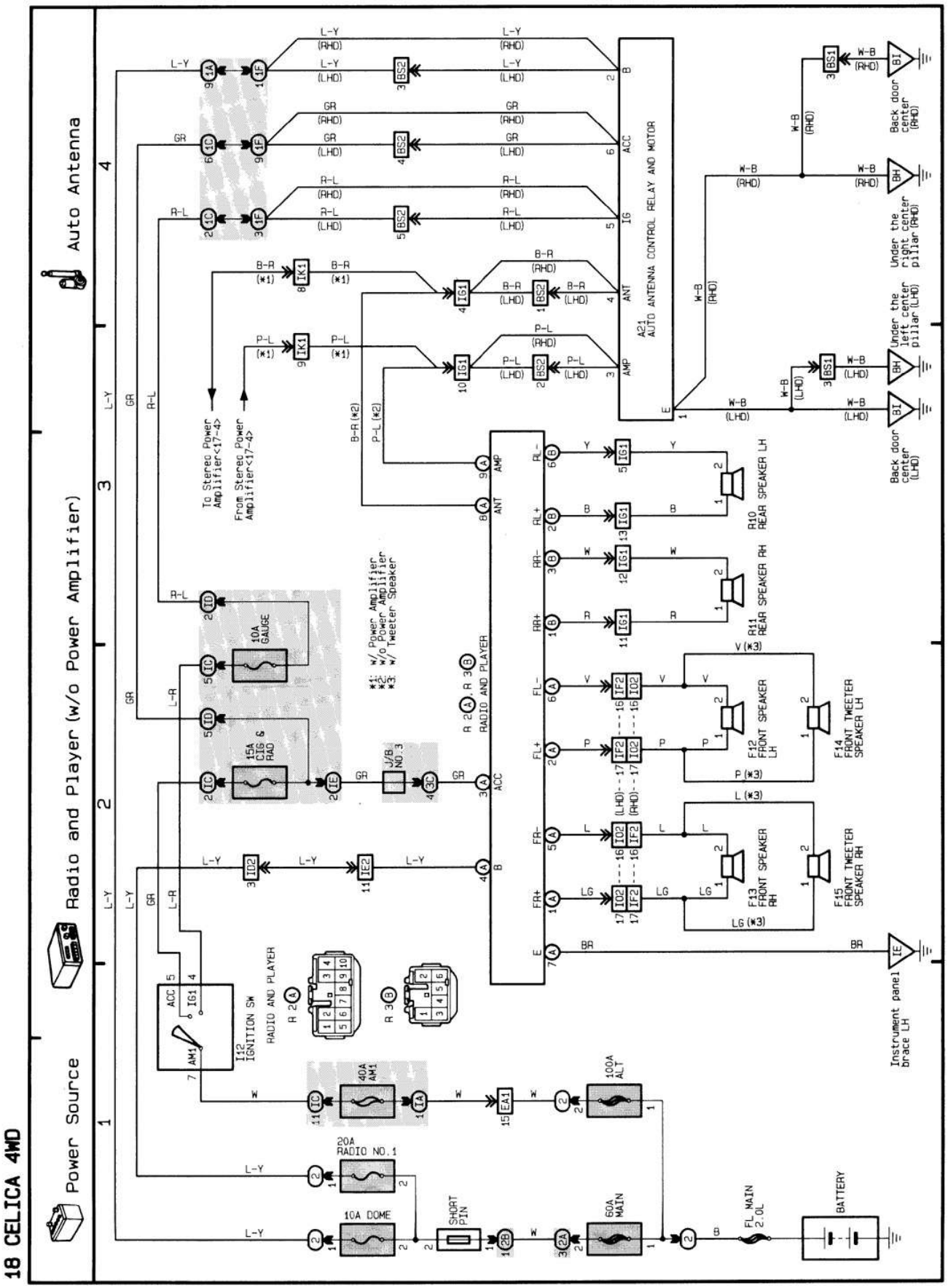
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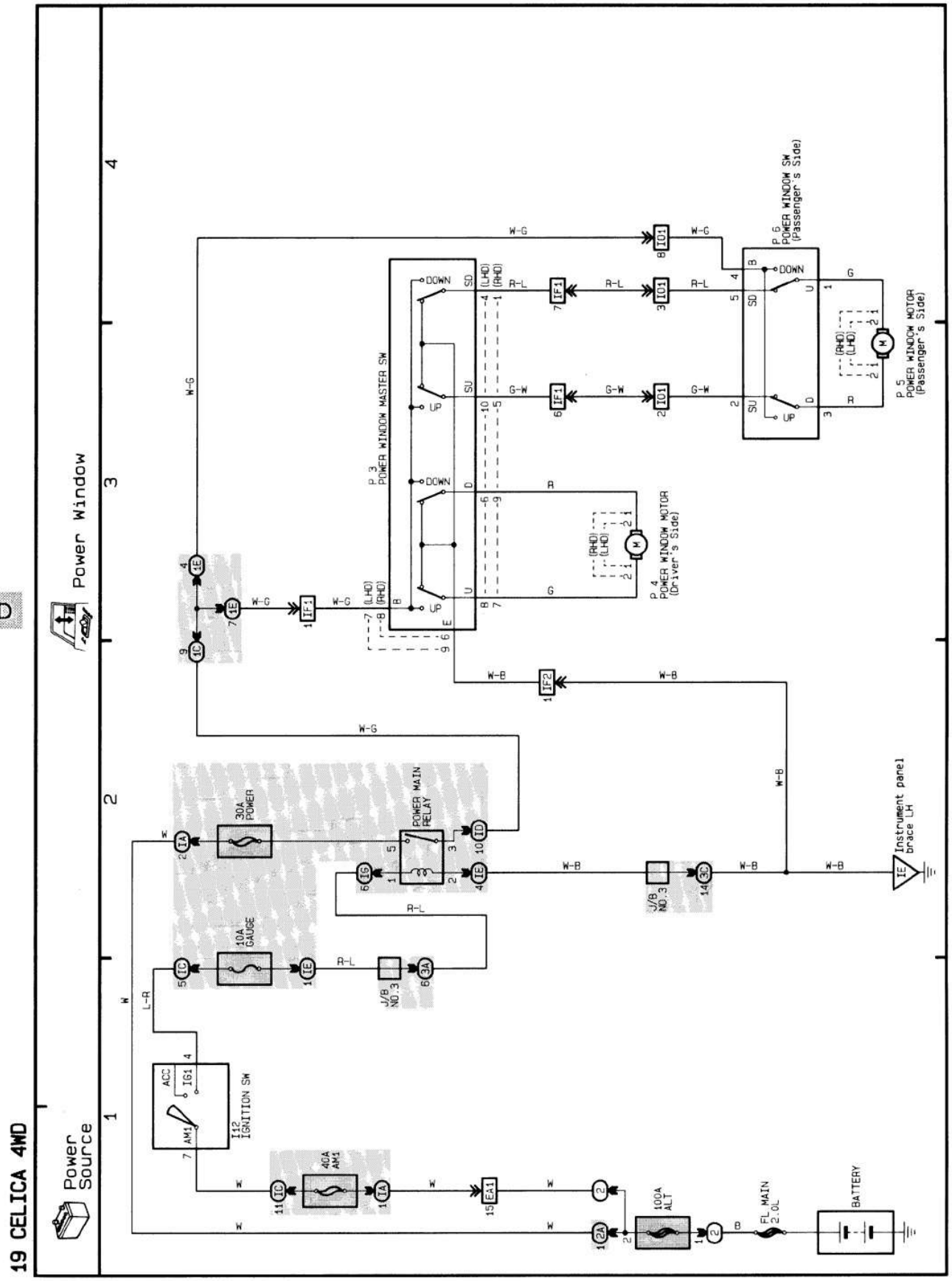
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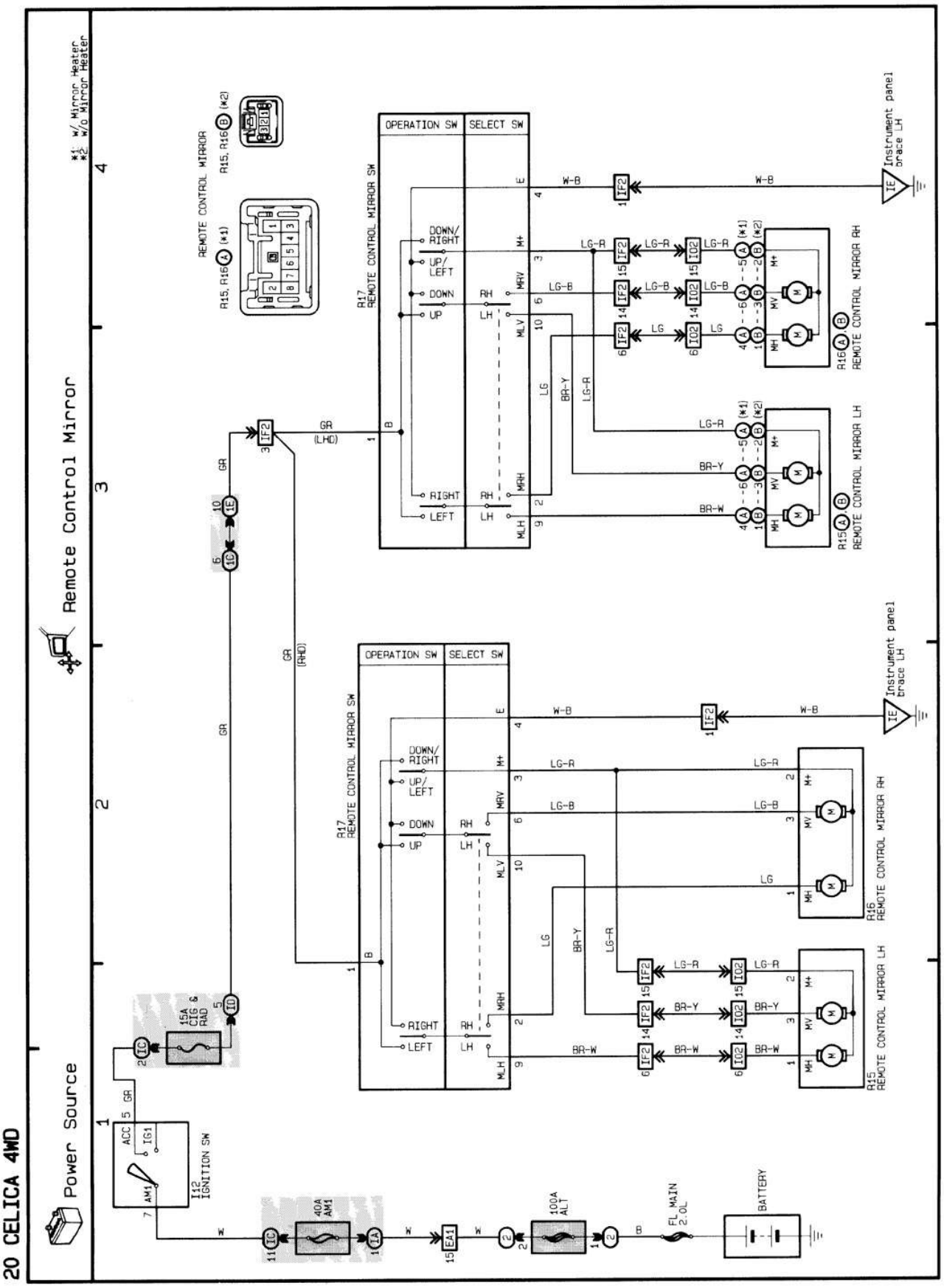
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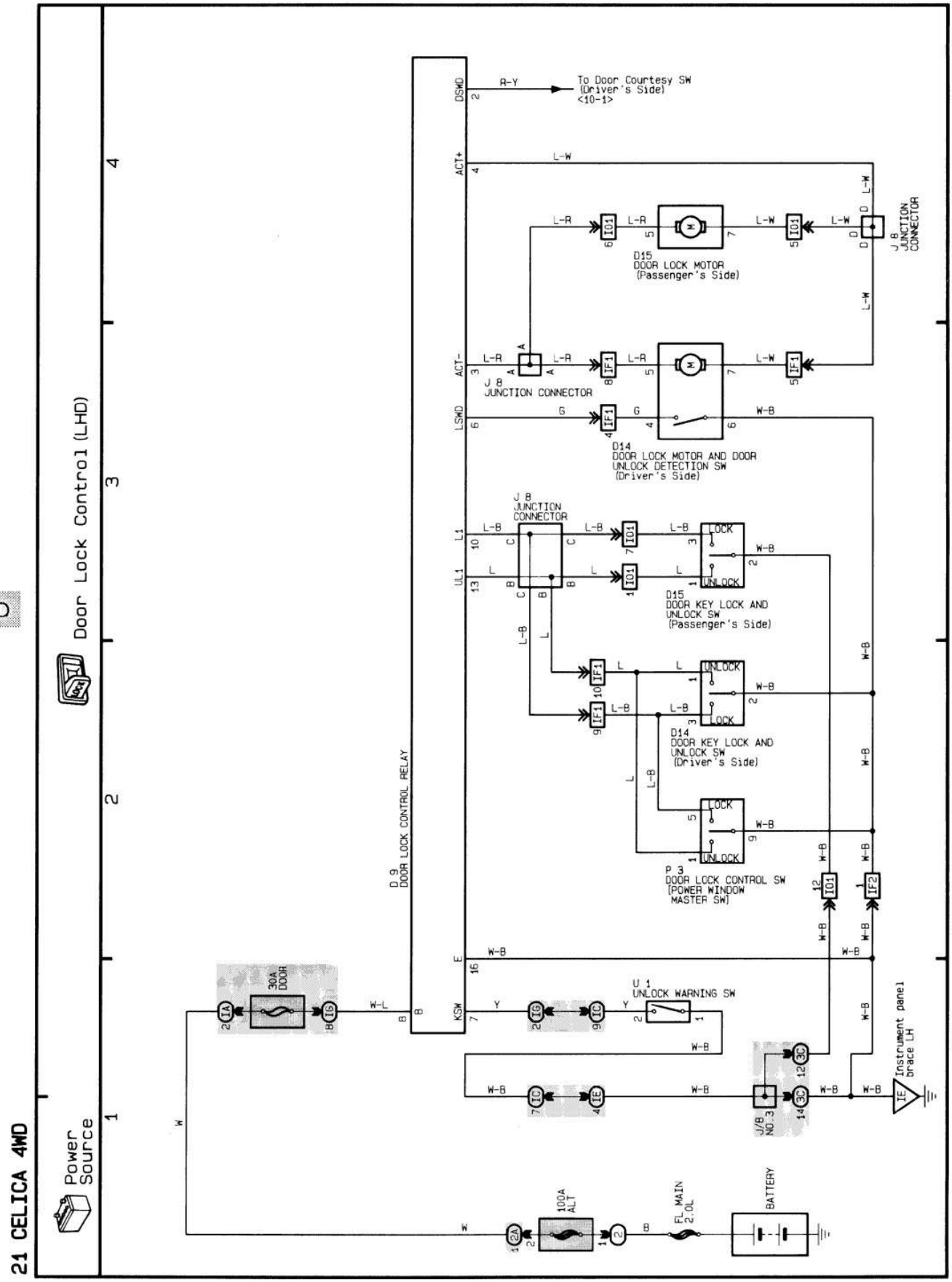
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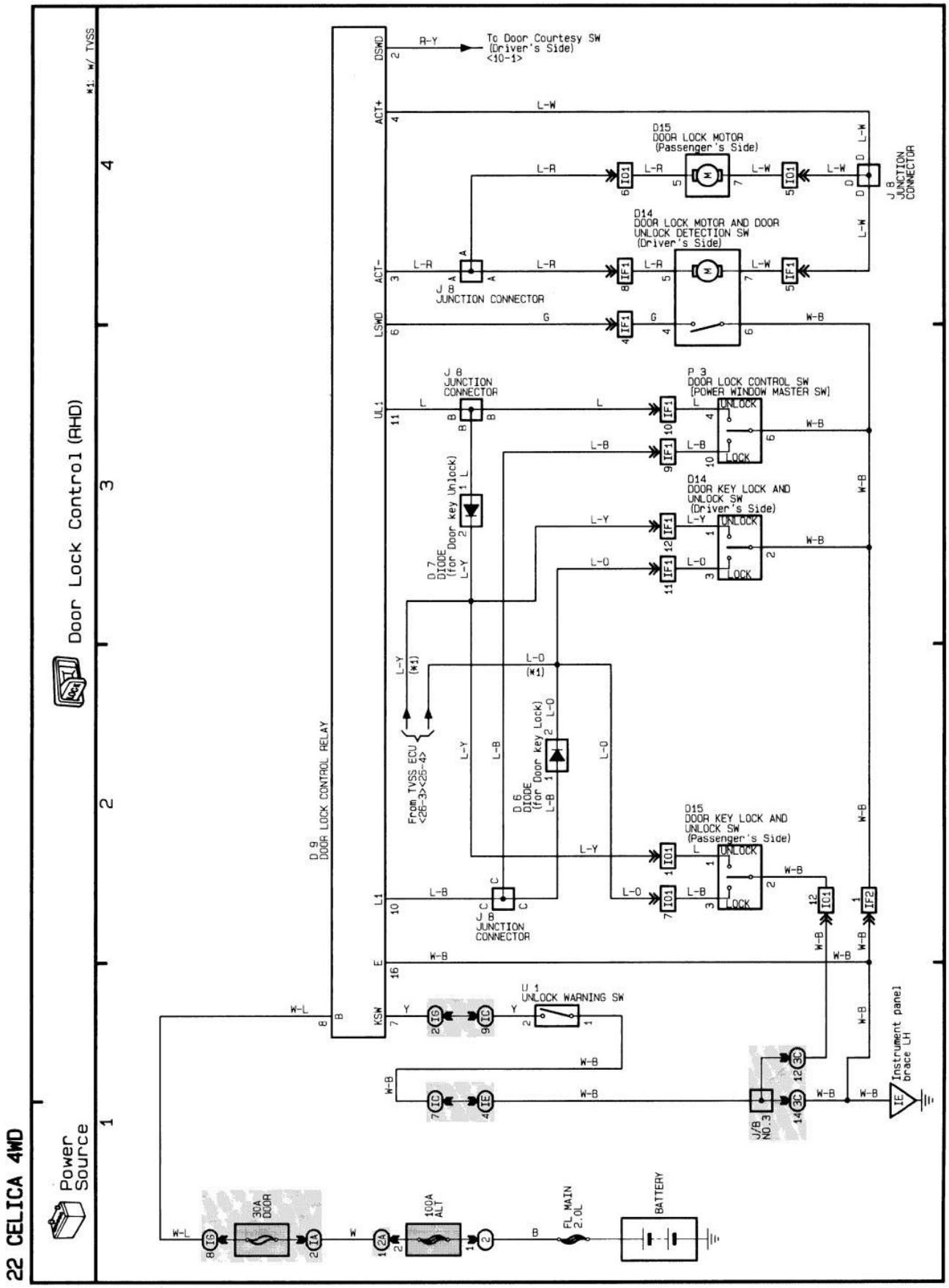
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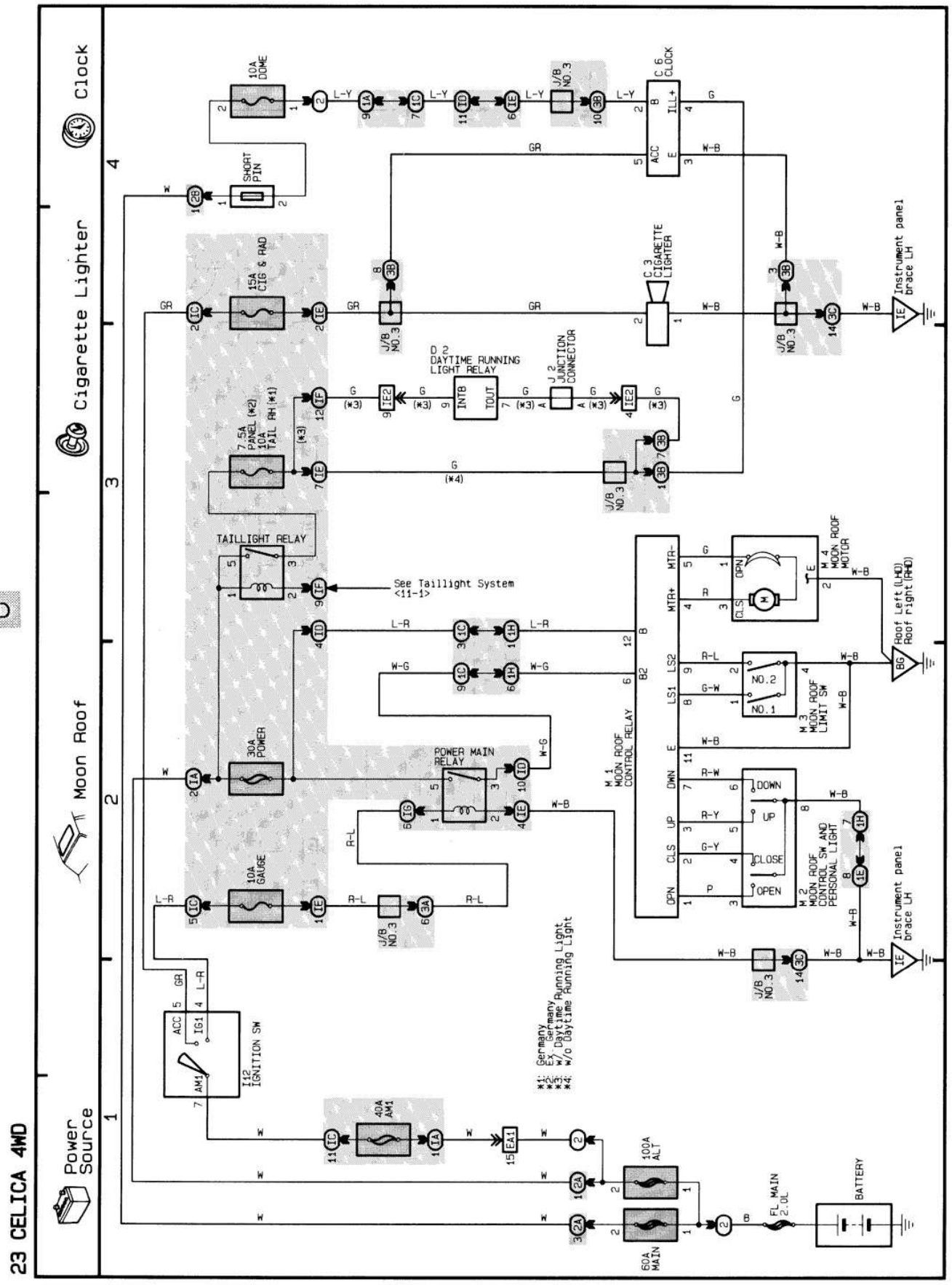


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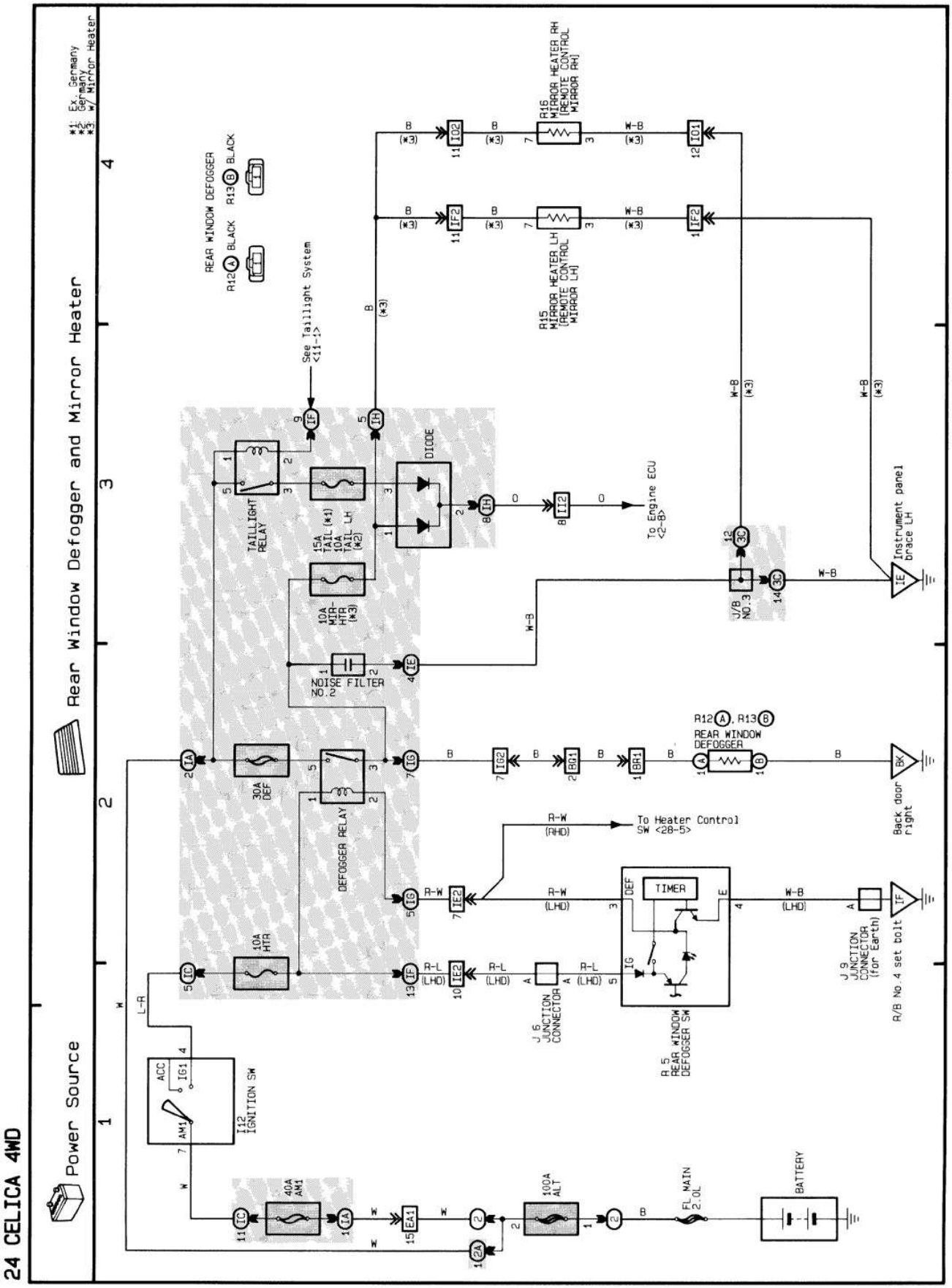


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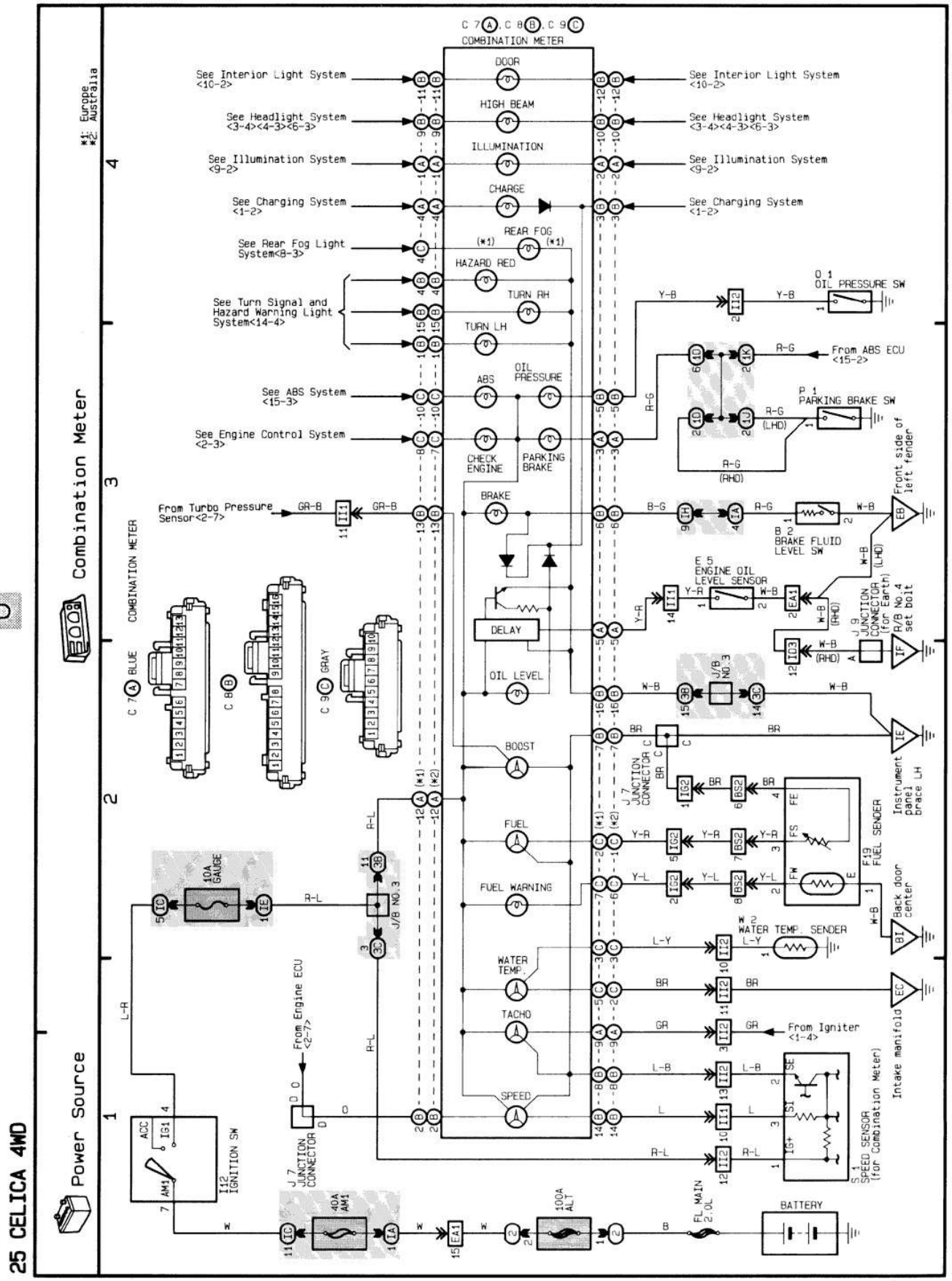
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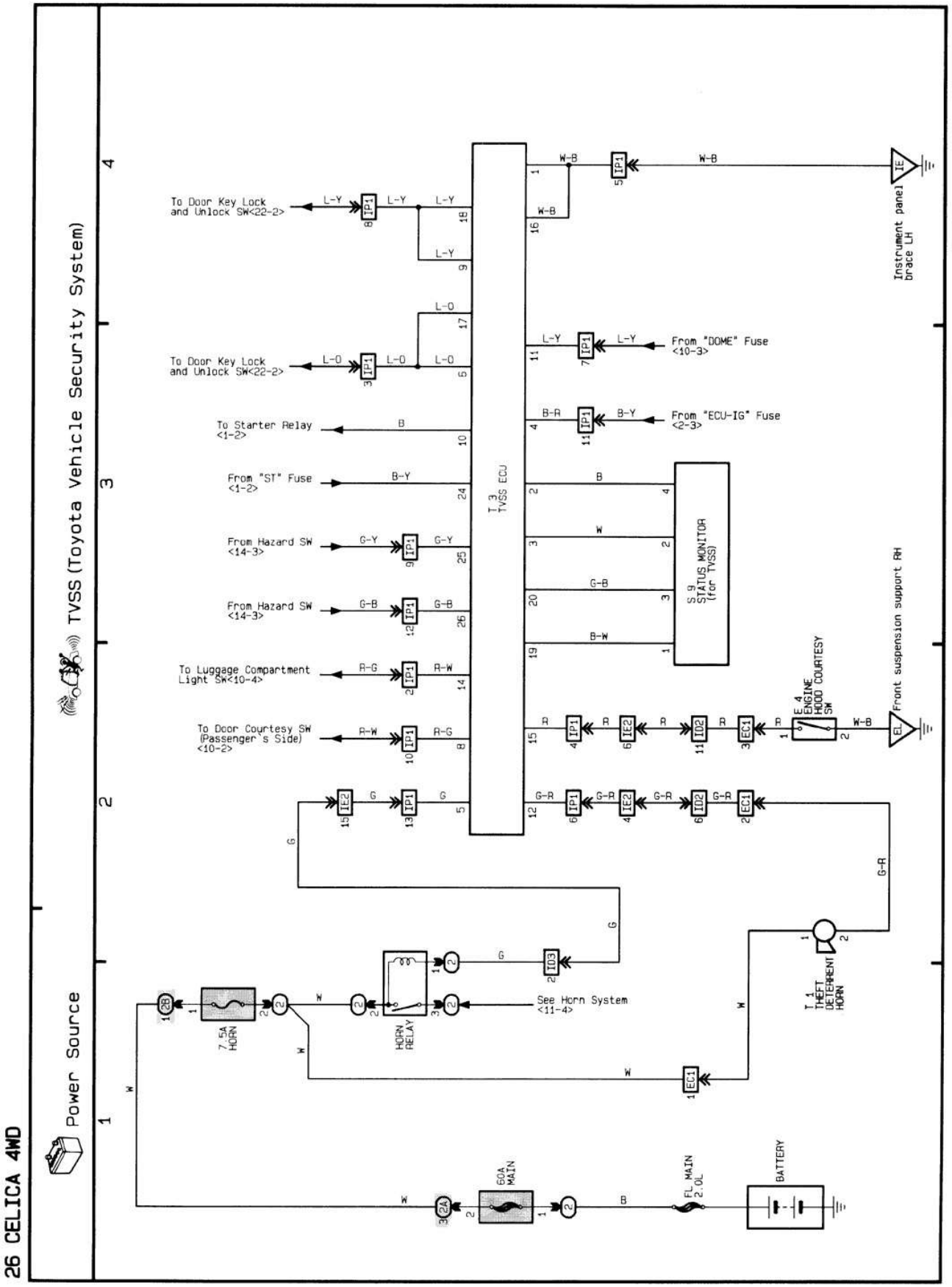
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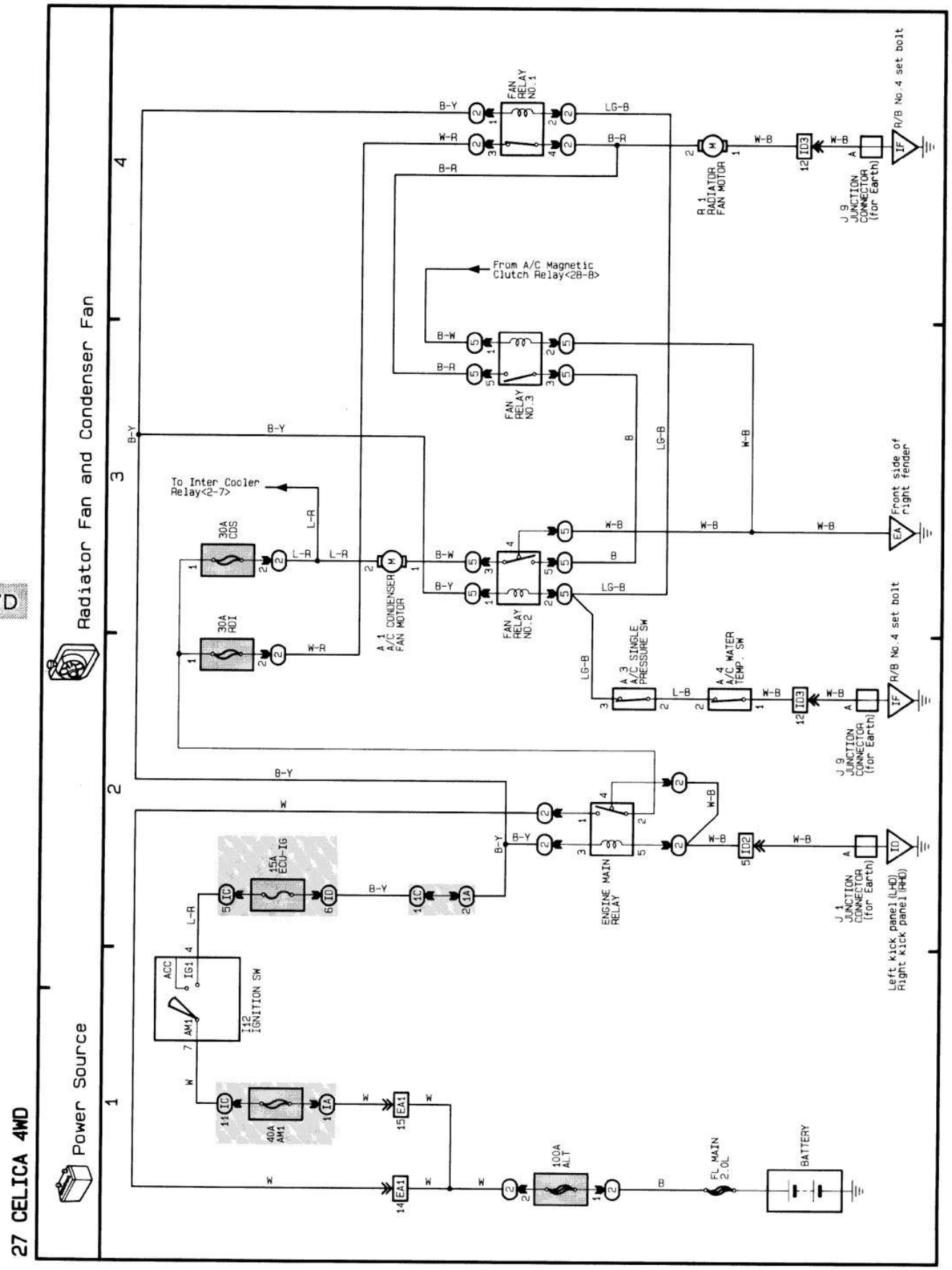


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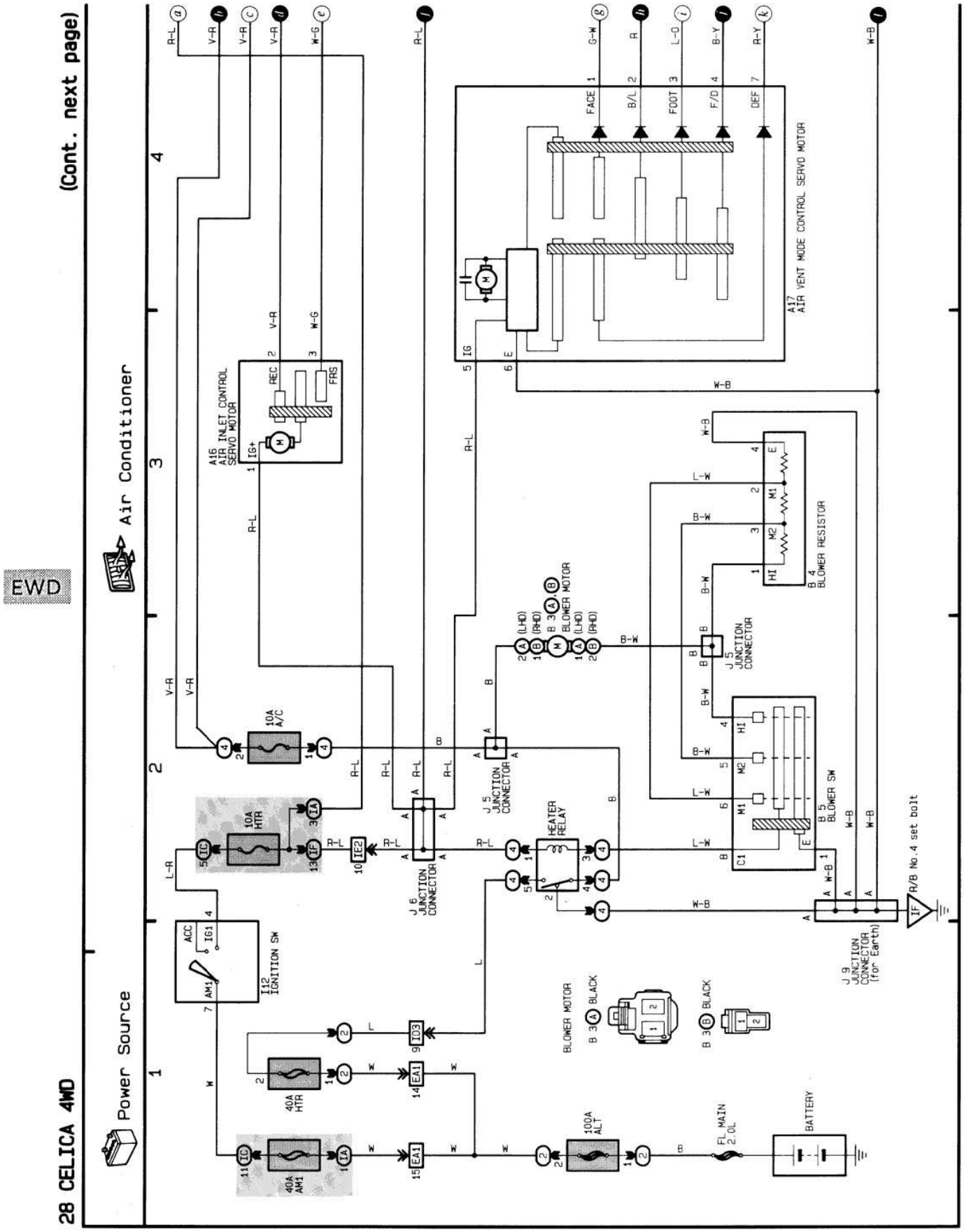
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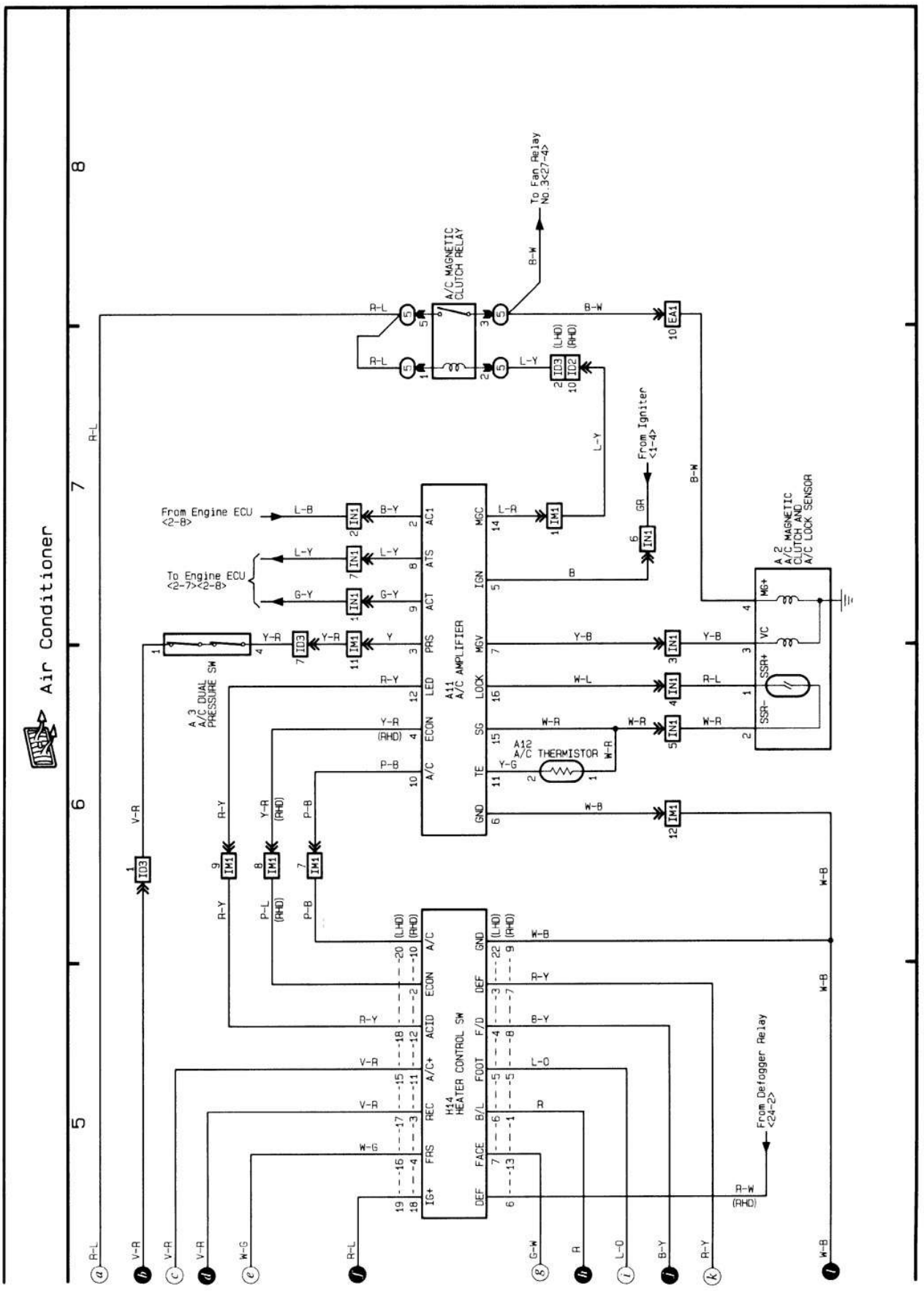
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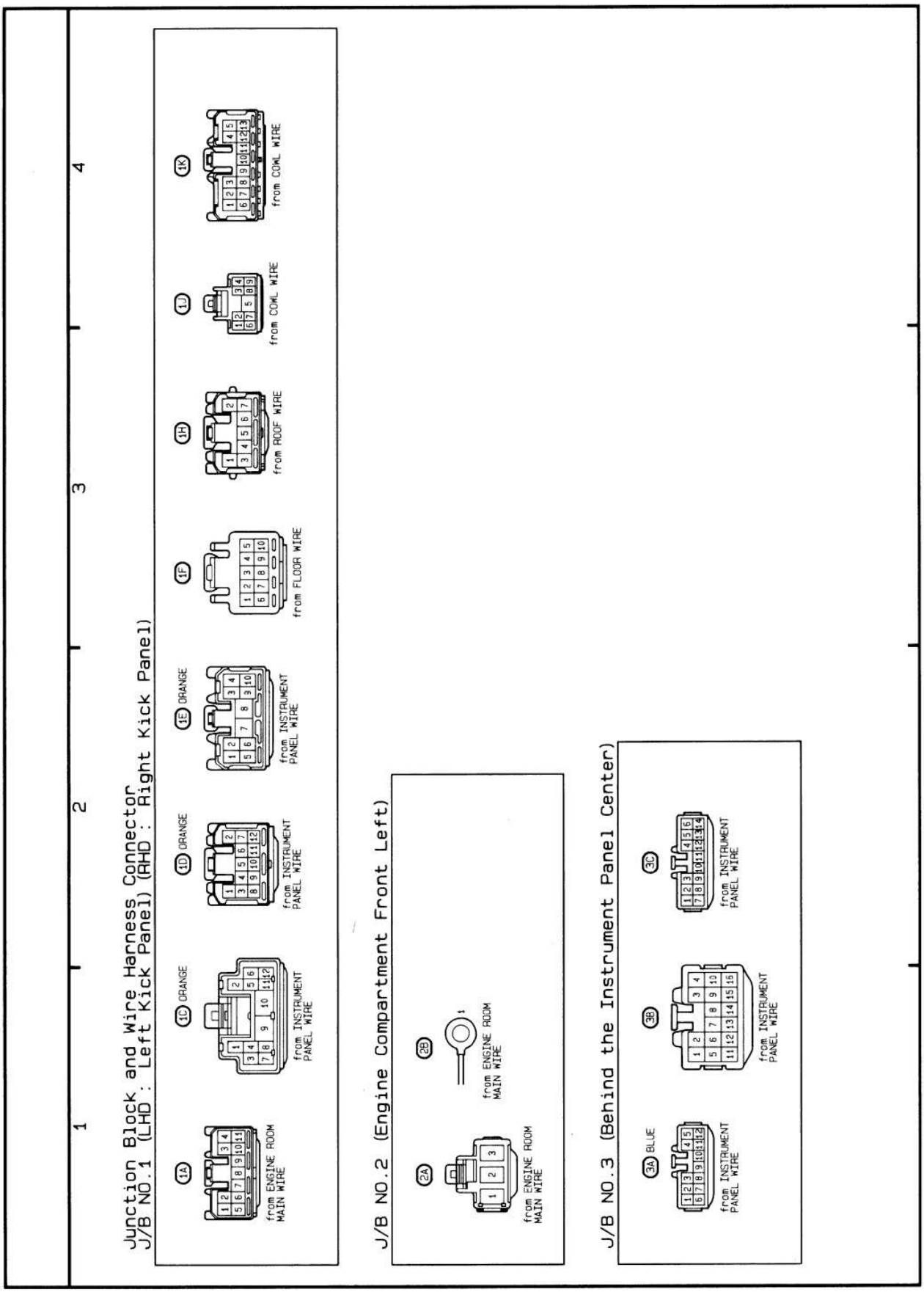
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28 CELICA 4WD (Cont'd)

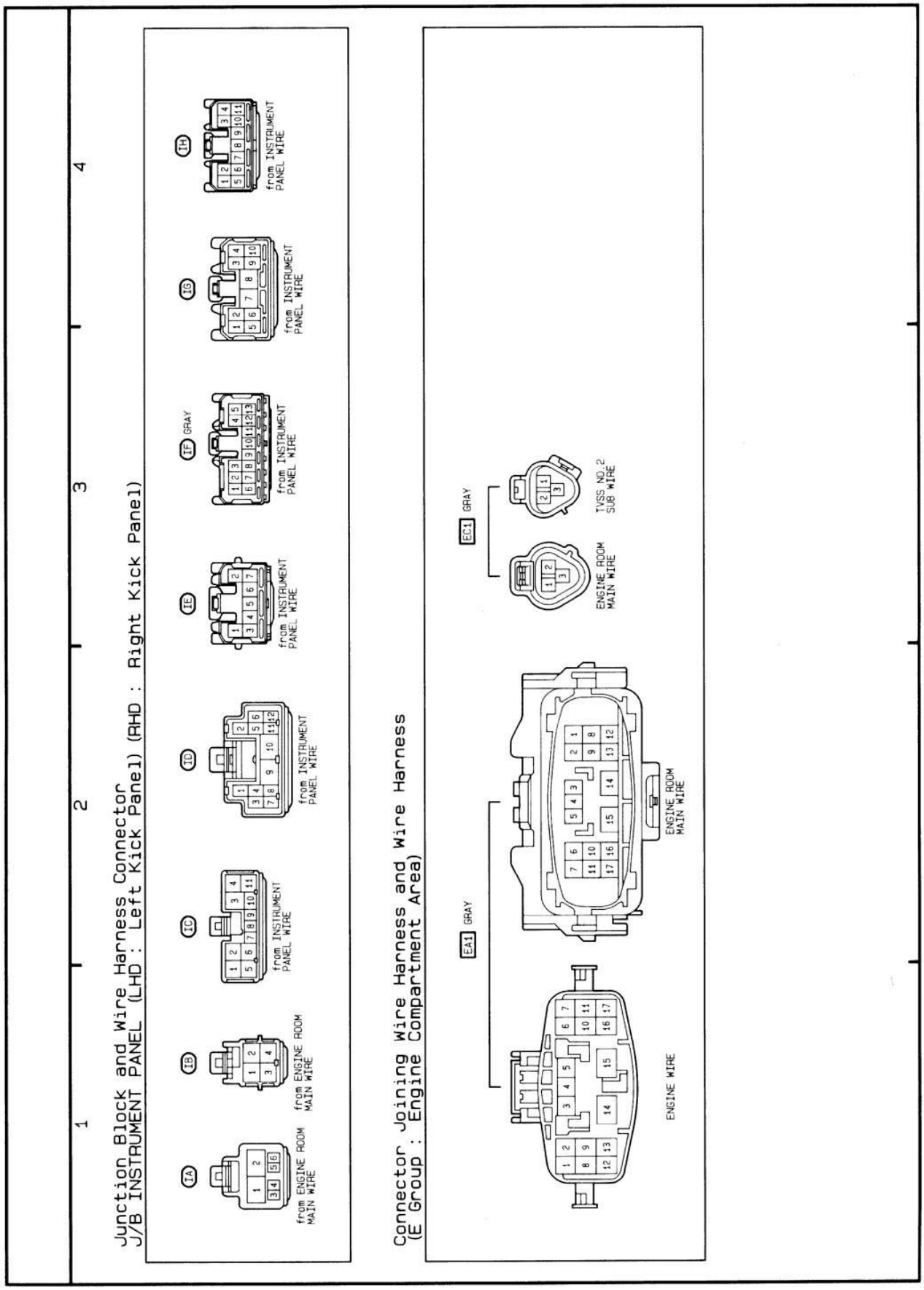


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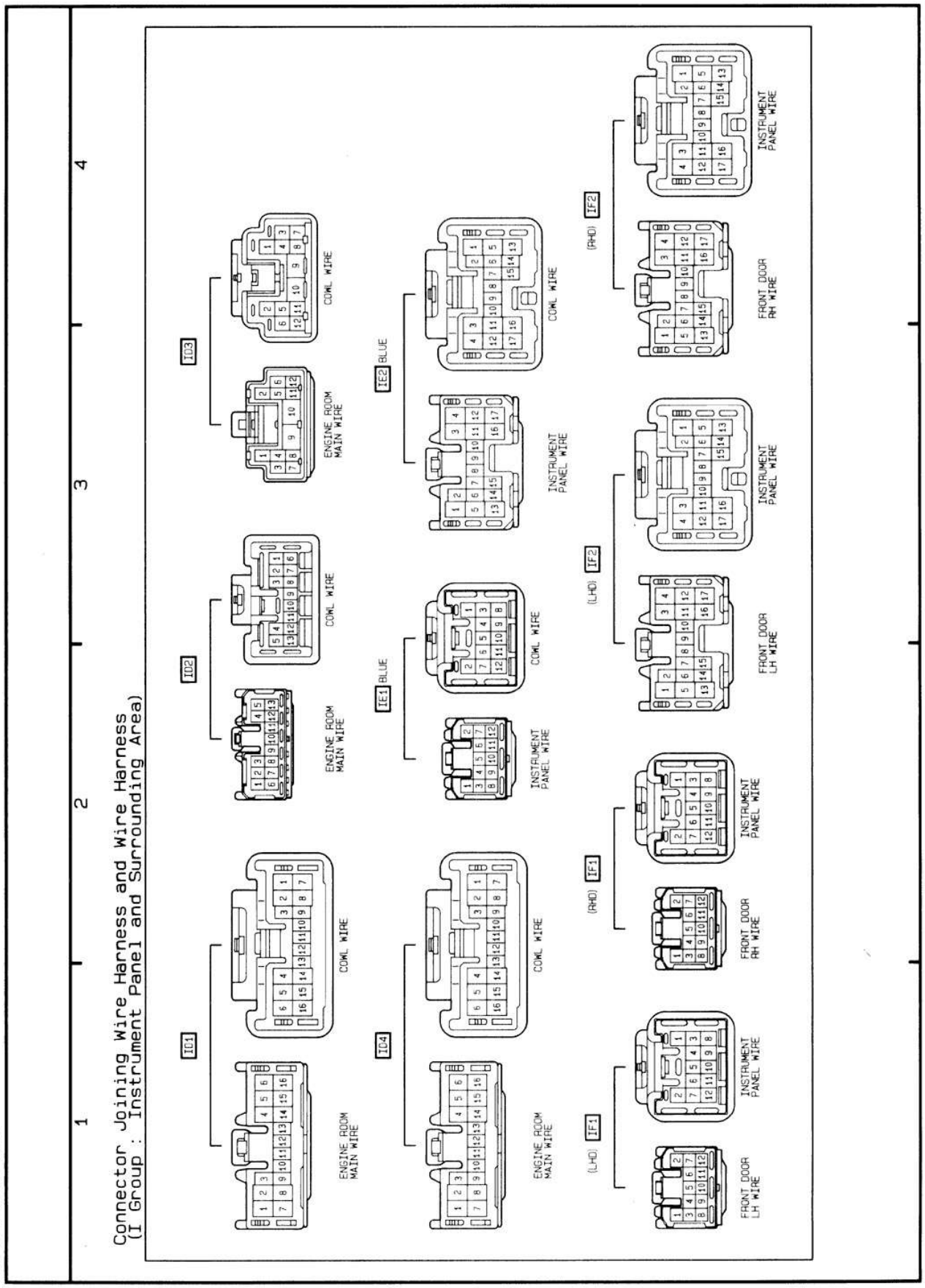


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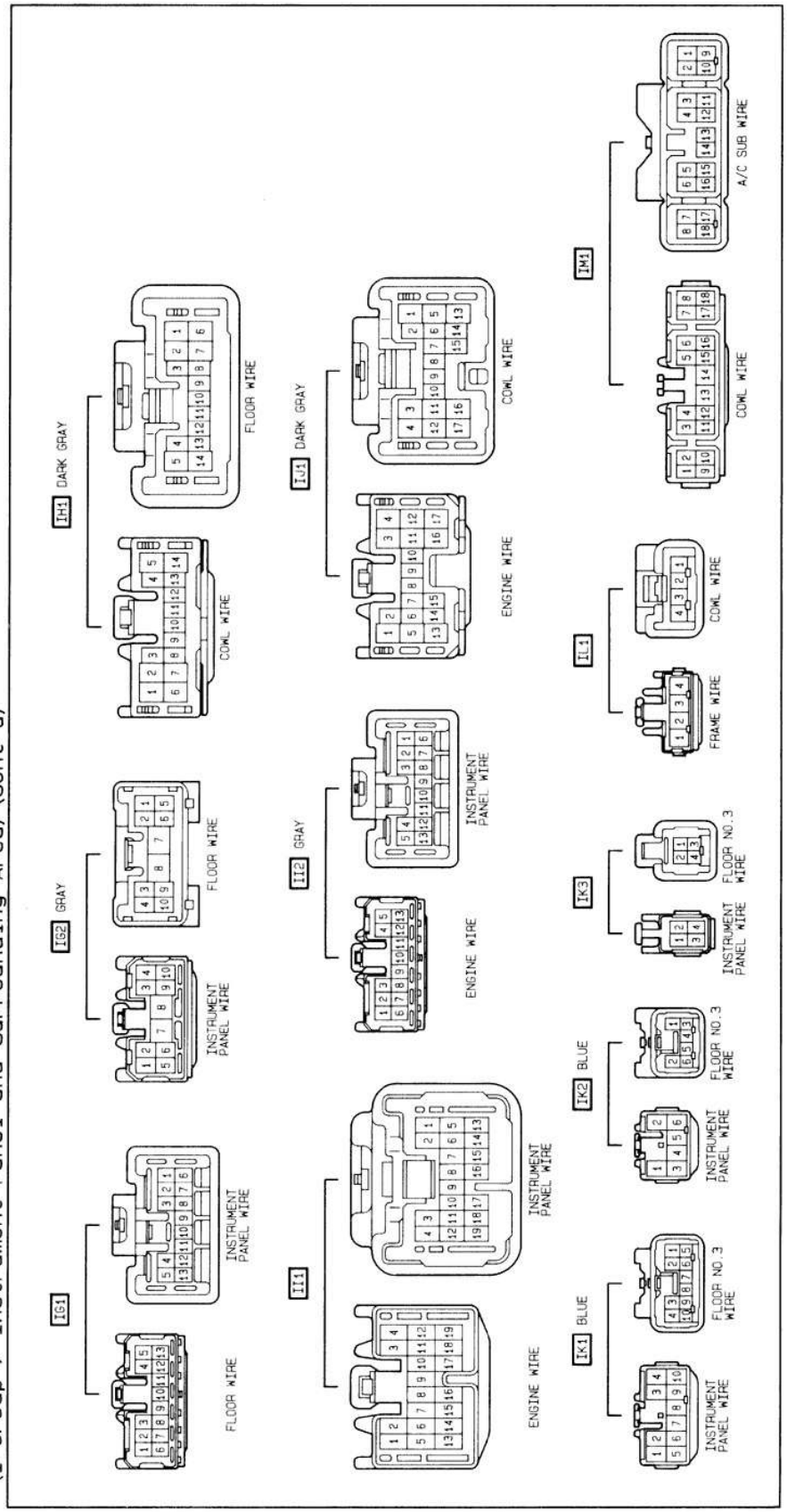
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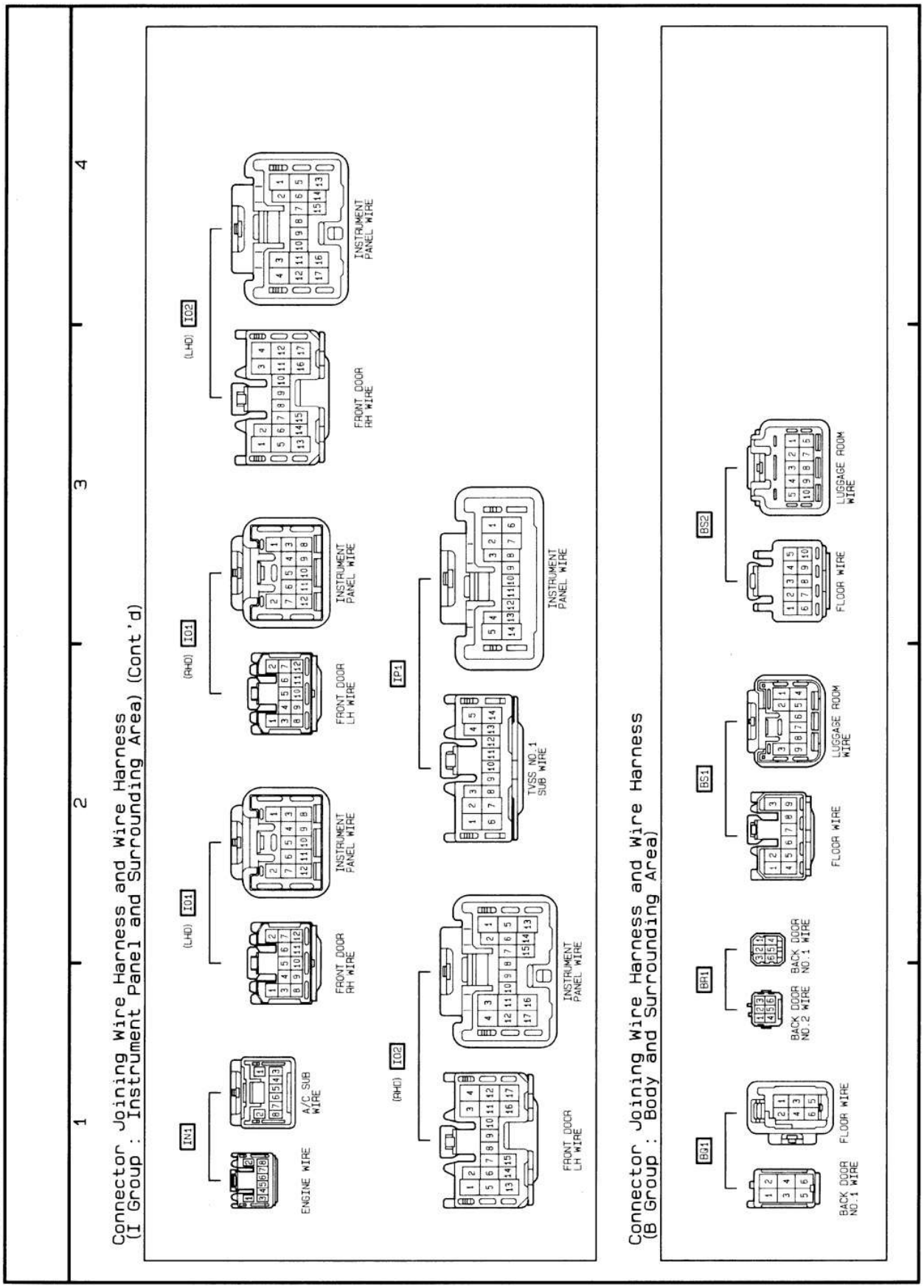
32 CELICA 4WD

Connector Joining Wire Harness and Wire Harness
(I Group : Instrument Panel and Surrounding Area) (Cont'd)



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