Mazda MX-5 Workshop Manual

FOREWORD

This workshop manual is intended for use by service technicians of Authorized Mazda Dealers to help them service Mazda vehicles. It can also be useful to owners and operators of Mazda vehicles in diagnosing some problems and performing limited repair and maintenance on Mazda vehicles.

For proper repair and maintenance, a thorough familiarization with this manual is important, and it should always be kept in a handy place for quick and easy reference.

All the contents of this manual, including drawings and specifications, are the latest available at the time of printing. As modifications affecting repair or maintenance occur, relevant information supplementary to this volume will be made available at Authorized Mazda Dealers. This manual should be kept up-to-date.

Mazda Motor Corporation reserves the right to alter the specifications and contents of this manual without obligation or advance notice.

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Mazda Motor Corporation
HIROSHIMA, JAPAN

APPLICATION:
This manual is applicable to vehicles beginning with the Vehicle Identification Numbers (VIN) shown on the following page.

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The section Z is published separate from this manual.

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VEHICLE IDENTIFICATION NUMBERS (VIN)

JMZ NA18B2 00 100001 ~

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IMPORTANT INFORMATION

BASIC ASSUMPTIONS

This workshop manual assumes that you have certain special tools that are necessary for the safe and efficient performance of service operations on Mazda vehicles and that you know how to use them properly. It also assumes that you are familiar with automobile systems and basic service and repair procedures. You should not attempt to use this manual unless these assumptions are correct and you understand the consequences described below.

SAFETY RISK

This manual contains certain notes, warnings, and other precautionary information that you should carefully read and follow to reduce the risk of personal injury to yourself or others and the risk of improper service that may damage the vehicle or render it unsafe. If there is no such information in regard to any specific service method, this does not mean there is no possibility that personal safety or vehicle safety will be jeopardized by the use of incorrect methods or tools.

POSSIBLE LOSS OF WARRANTY

The manufacturer's warranty on Mazda vehicles and engines can be voided if improper service or repairs are performed by persons other than those at an Authorized Mazda Dealer.

WARNING ON LUBRICANTS AND GREASES

Avoid all prolonged and repeated contact with mineral oils, especially used oils. Used oils contaminated during service (e.g., engine sump oils) are more irritating and more likely to cause serious effects, including skin cancer, in the event of gross and prolonged skin contact.

Wash skin thoroughly after work involving oil.
Protective hand cleaners may be of value provided they can be removed from the skin with water. Do not use gasoline, paraffin, or other solvents to remove oil from the skin.

Lubricants and greases may be slightly irritating to the eyes.

Repeated or prolonged skin contact should be avoided by wearing protective clothing. Particular care should be taken with used oils and greases containing lead. Do not allow work clothing to be contaminated with oil. Dry clean or launder such clothing at regular intervals.

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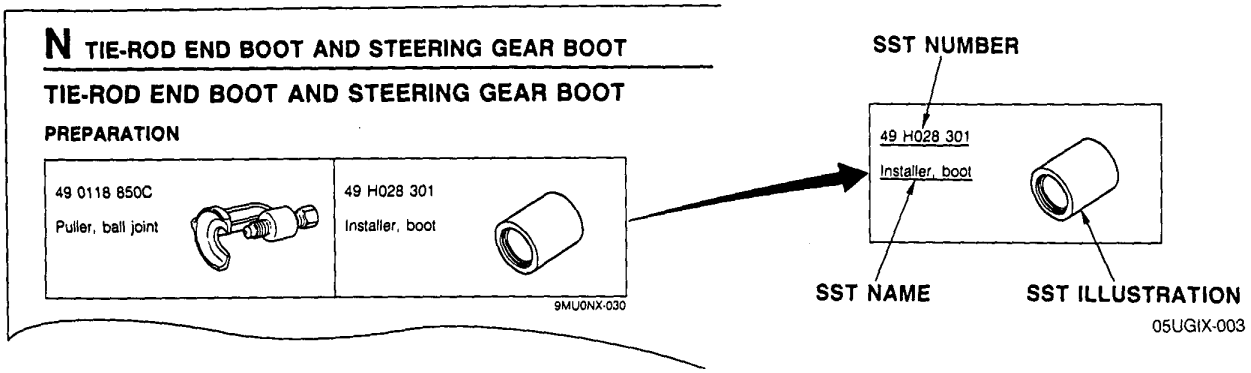
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HOW TO USE THIS MANUAL

PREPARATION

PREPARATION points out the needed **Special Service Tool (SST)** for the service operation that it preceeds. Gather all necessary **SST** before beginning work.

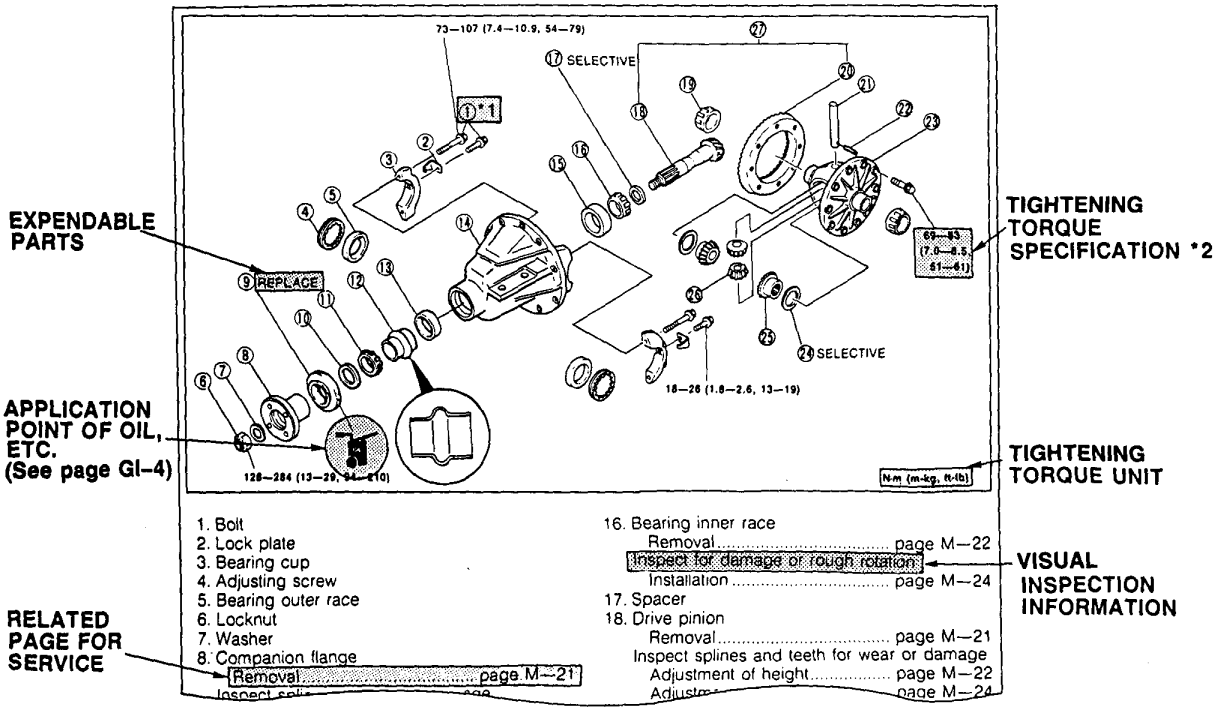
Example:



REPAIR PROCEDURE

1. Most repair operations begin with an overview illustration. It identifies the components, shows how the parts fit together, and describes visual parts inspections. If a damaged or worn part is found, repair or replace it as necessary.
2. Expendable parts, tightening torques, and symbols for oil, grease, and sealant are shown in the overview illustration.
3. Pages related to service procedures are shown under the illustration. Refer to this information when servicing the related part.

Example:



*1: The numbers (① ex.) refer to parts identification and where necessary servicing procedure.
*2: Units are in N·m (m-kg, ft-lb) unless otherwise specified.

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SYMBOLS

There are six symbols indicating oil, grease, and sealant. These symbols show the points of applying such materials during service.

Symbol	Meaning	Kind
	Apply oil	New engine oil or gear oil as appropriate
	Apply brake fluid	Only brake fluid
	Apply automatic transmission fluid	Only ATF
	Apply grease	Appropriate grease
	Apply sealant	Appropriate sealant
Ⓟ	Apply petroleum jelly	Only petroleum jelly

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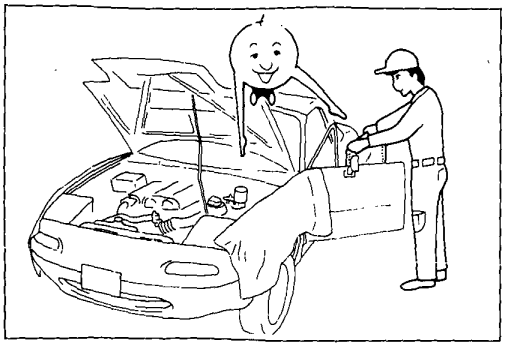
Note

- **When special oil or grease is needed, this is shown in the illustration.**

NOTES, CAUTIONS, AND WARNINGS

As you read through the procedures, you will come across NOTES, CAUTIONS, and WARNINGS. Each one is there for a specific purpose. **NOTES** give you **added information** that will help you to complete a particular procedure. **CAUTIONS** are given to prevent you from making an error that could **damage the vehicle. WARNINGS** remind you to be especially careful in those areas where carelessness can cause **personal injury.** The following list contains some general WARNINGS you should follow when you work on a vehicle.

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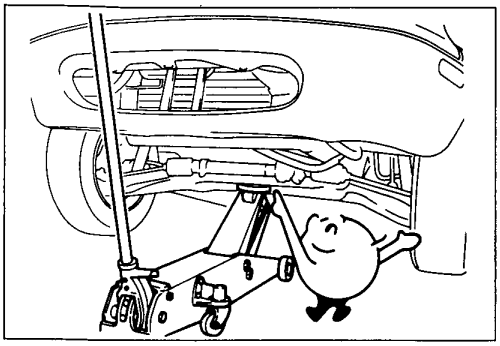
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FUNDAMENTAL PROCEDURES

PROTECTION OF VEHICLE

Always be sure to cover fenders, seats, and floor areas before starting work.

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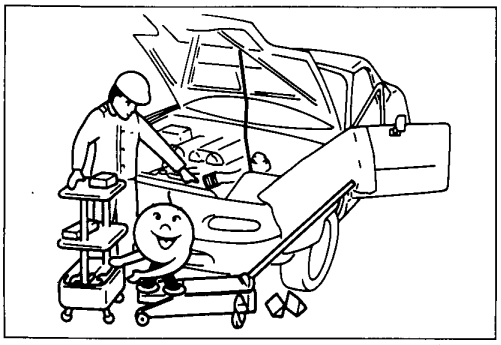
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A WORD ABOUT SAFETY

The following precautions must be followed when jacking up the vehicle.

1. Block the wheels.
2. Use only the specified jacking positions.
3. Support the vehicle with safety stands.

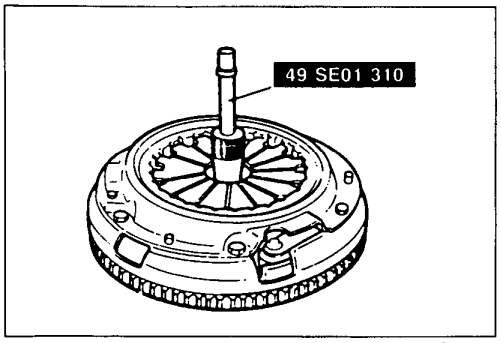
Start the engine only after making certain the engine compartment is clear of tools and people.



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PREPARATION OF TOOLS AND MEASURING EQUIPMENT

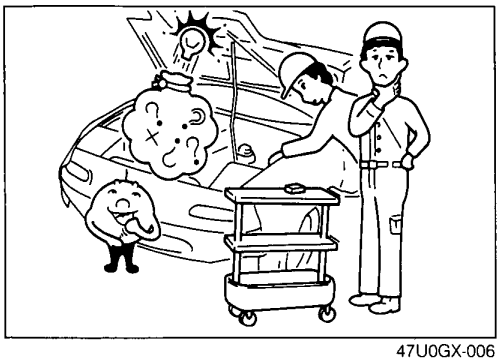
Be sure that all necessary tools and measuring equipment are available before starting any work.



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SPECIAL TOOLS

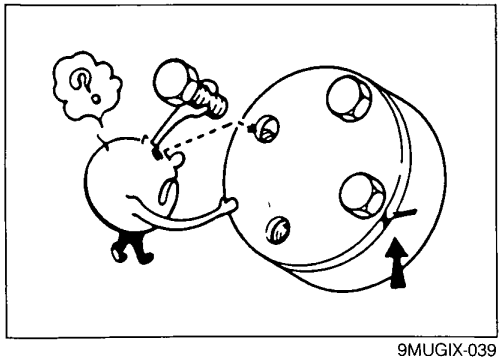
Use special tools when they are required.



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REMOVAL OF PARTS

While correcting a problem, try also to determine its cause. Begin work only after first learning which parts and subassemblies must be removed and disassembled for replacement or repair.

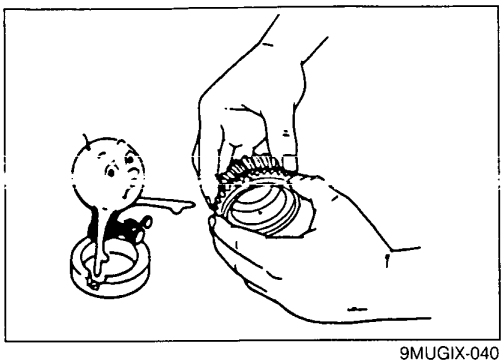


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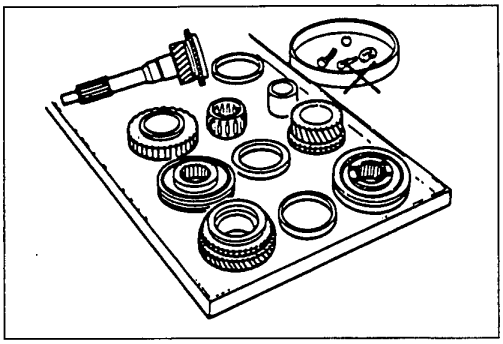
DISASSEMBLY

If the disassembly procedure is complex, requiring many parts to be disassembled, all parts should be disassembled in a way that will not affect their performance or external appearance and identified so that reassembly can be performed easily and efficiently.

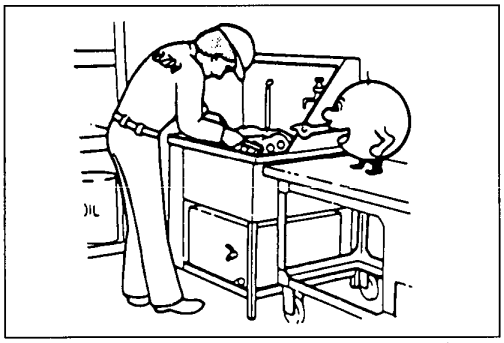
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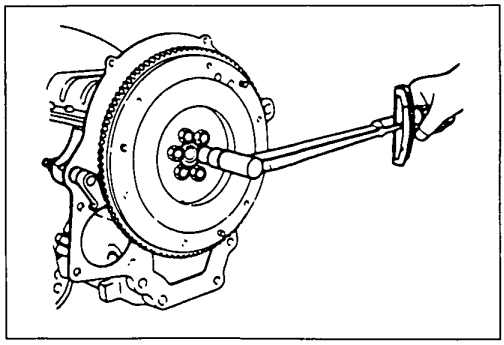
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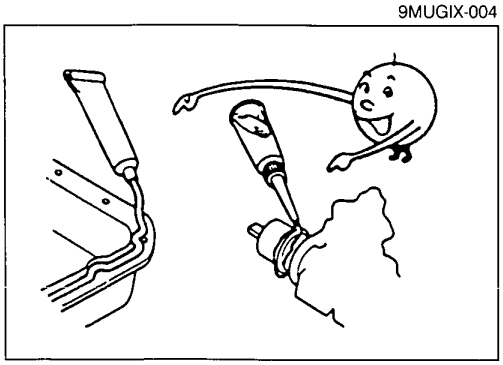
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1. Inspection of parts

When removed, each part should be carefully inspected for malfunctioning, deformation, damage, and other problems.

2. Arrangement of parts

All disassembled parts should be carefully arranged for re-assembly.

Be sure to separate or otherwise identify the parts to be replaced from those that will be reused.

3. Cleaning parts for reuse

All parts to be reused should be carefully and thoroughly cleaned in the appropriate method.

REASSEMBLY

Standard values, such as torques and certain adjustments, must be strictly observed in the reassembly of all parts.

Refer to STANDARD BOLT AND NUT TIGHTENING TORQUE in Section TD for tightening torques not mentioned in the main text.

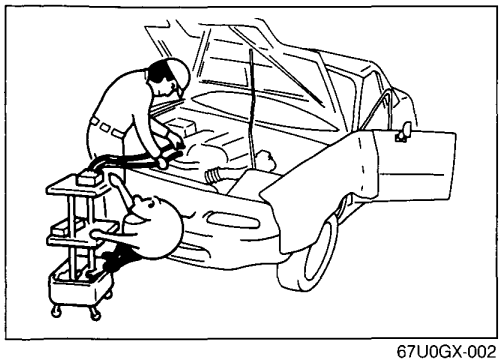
If removed, these parts should be replaced with new ones:

1. Oil seals
2. Gaskets
3. O-rings
4. Lock washers
5. Cotter pins
6. Nylon nuts

Depending on location:

1. Sealant should be applied to gaskets.
2. Oil should be applied to the moving components of parts.
3. Specified oil or grease should be applied at the prescribed locations (such as oil seals) before reassembly.

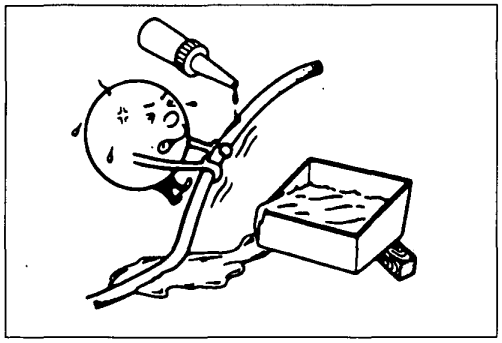
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ADJUSTMENTS

Use suitable gauges and/or testers when making adjustments.



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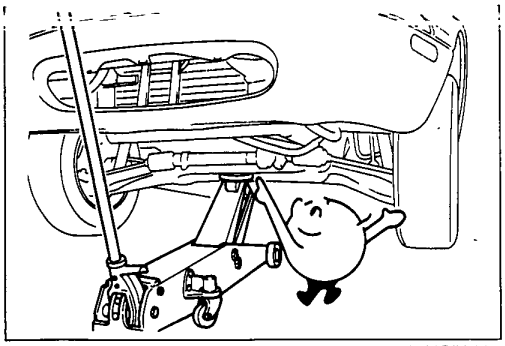
RUBBER PARTS AND TUBING

Prevent gasoline or oil from getting on rubber parts or tubing.

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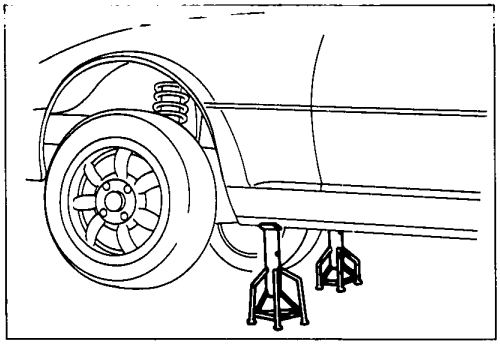
JACK AND SAFETY STAND POSITIONS

FRONT
Jack position:
At center of crossmember



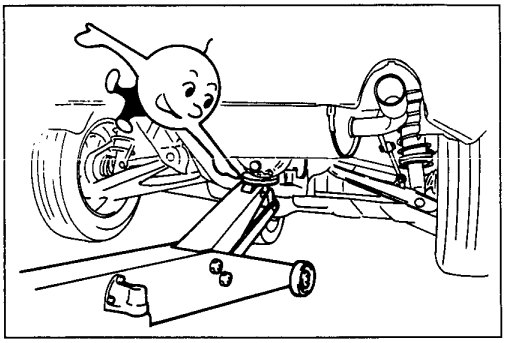
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Safety stand positions:
Side sills



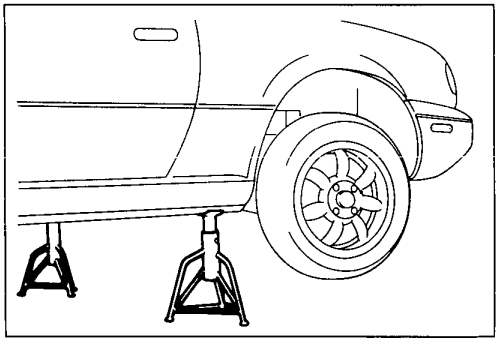
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REAR
Jack position:
At center of differential



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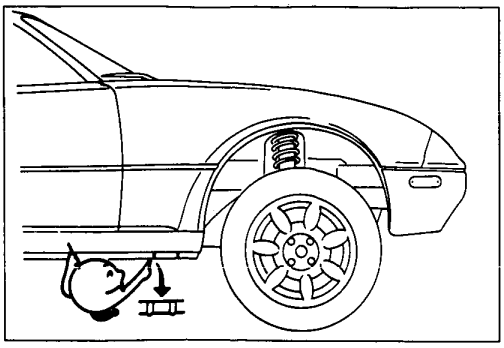
Safety stand positions:
Side sills



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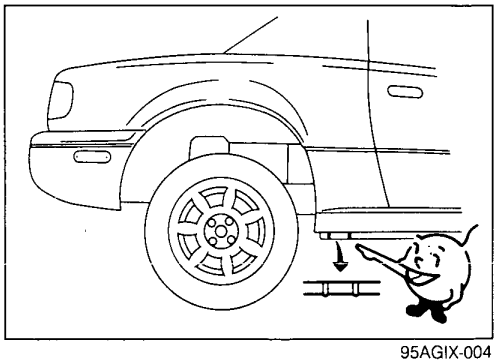
VEHICLE LIFT (2-SUPPORT TYPE) POSITIONS

FRONT
Side sills



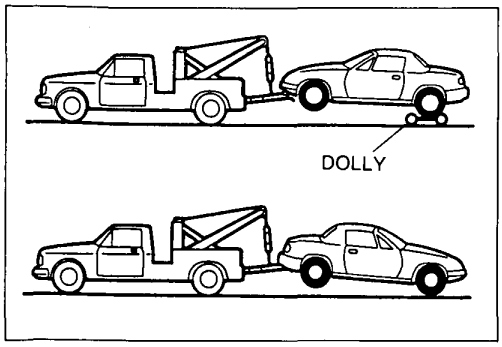
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REAR
Side sills

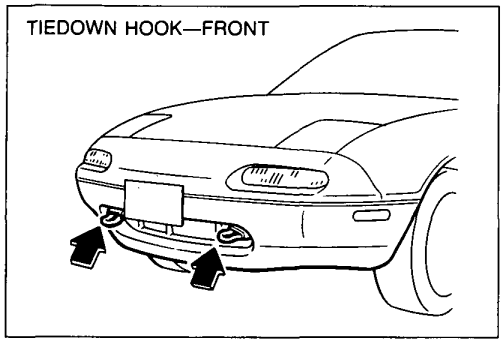


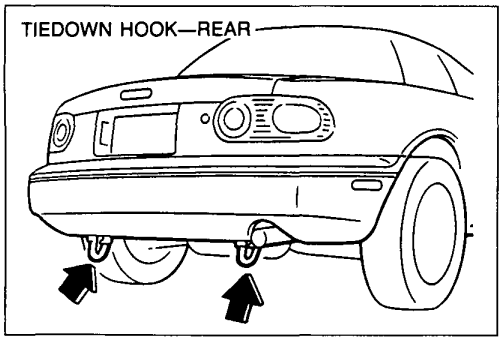
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TOWING

Proper towing equipment is necessary to prevent damage to the vehicle during any towing operation.
Laws and regulations applicable to vehicles in tow must always be observed.
As a rule, towed vehicles should be pulled with the driving wheels off the ground.
If towing with the front wheels on the ground, set the front wheels straight ahead and set the ignition switch to OFF.

WITH MANUAL TRANSMISSION

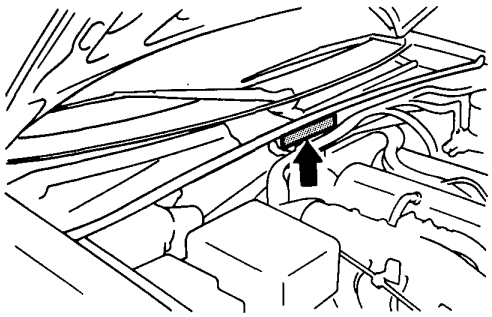
If the transmission, rear axle, and steering system are not damaged, the vehicle may be towed on all four wheels. If any of these components is damaged, use a towing dolly.
The following points are important when towing a vehicle with all wheels on the ground.
1. Set the ignition switch in the ACC(I) position.
2. Place the shift lever in Neutral.
3. Release the parking brake.

CAUTION

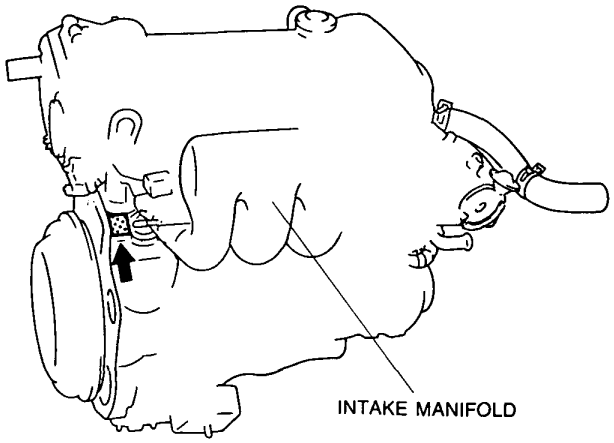
- **The power assists for the brakes and steering are inoperable while the engine is off.**
- **Do not use the tiedown hooks of the vehicle for towing. These hooks are designed ONLY for transport tiedown. If the tiedown hooks are used for towing, the front or rear skirt and bumper will be damaged.**

IDENTIFICATION NUMBER LOCATIONS

VEHICLE IDENTIFICATION NUMBER (VIN)



ENGINE MODEL AND NUMBER



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UNITS

N·m (m-kg or cm-kg, ft-lb or in-lb)	Torque
rpm	Revolutions per minute
A	Ampere(s)
V	Volt(s)
Ω	Ohm(s) (resistance)
kPa (kg/cm^2, psi)	Pressure (usually positive)
mmHg (inHg)	Pressure (usually negative)
W	Watt
liters (US qt, Imp qt)	Volume
mm (in)	Length

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ABBREVIATIONS

ABDC	After bottom dead center
A/C	Air conditioner
ACC	Accessories
ATDC	After top dead center
BBDC	Before bottom dead center
BTDC	Before top dead center
DRL	Daytime running light
ECU	Engine control unit
EGI	Electronic gasoline injection
E/L	Electrical load
EX	Exhaust
IC	Integrated circuit
IN	Intake
INT	Intermittent
ISC	Idle-speed control
LH	Left hand
LSD	Limited-slip differential
M	Motor, electric
MIL	Malfunction indicator lamp
M/T	Manual transmission
OFF	Switch off
ON	Switch on
PCV	Positive crankcase ventilation
PPF	Power plant frame
PRC	Pressure regulator control
P/S	Power steering
P/W	Power window
RH	Right hand
SST	Special service tool
TDC	Top dead center
VRIS	Variable resonance induction system

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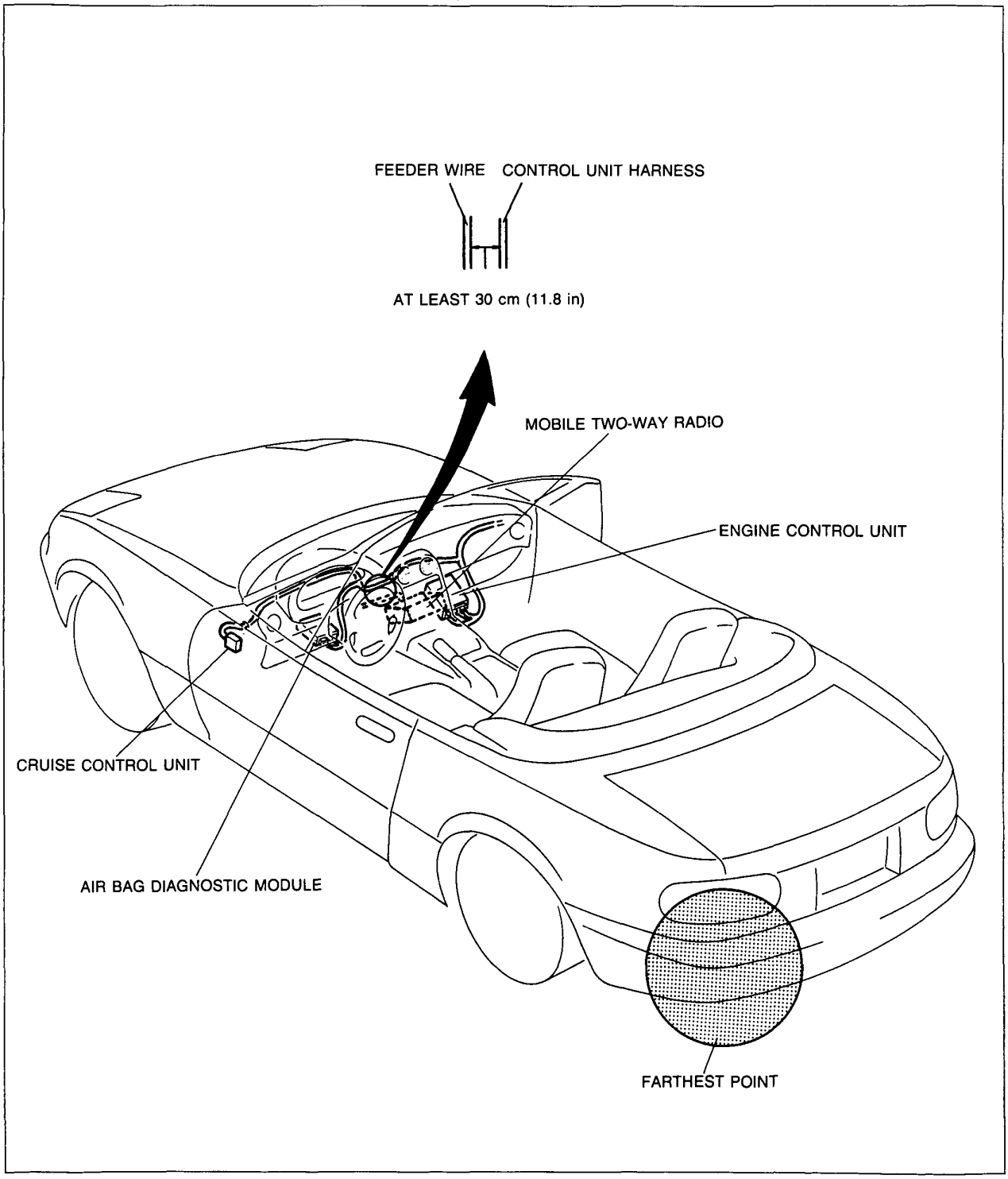
CAUTION

INSTALLATION OF MOBILE TWO-WAY RADIO SYSTEM

If a mobile two-way radio system is installed improperly or if a high-powered type is used, the EGI system and other systems may be affected.

When the vehicle is to be equipped with a mobile two-way radio, observe the following precautions:

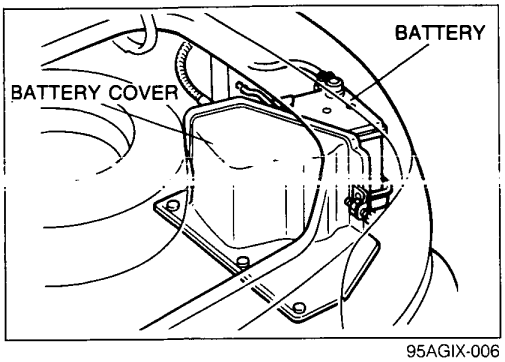
1. Install the antenna at the farthest point from control units.
2. Install the antenna feeder as far as possible from the control unit harnesses **(at least 30 cm [11.8 in])**.
3. Ensure that the antenna and feeder are properly adjusted.
4. Do not install a high-powered mobile two-way radio system.



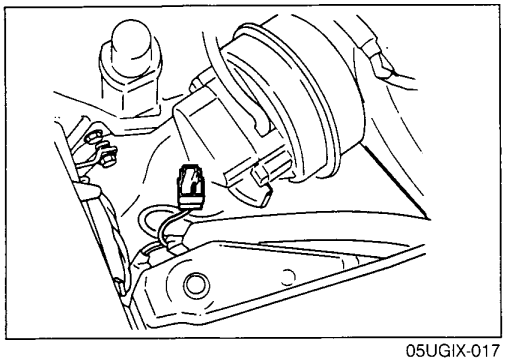
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CAUTION



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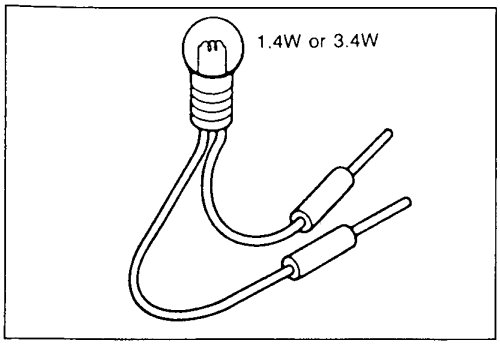
BATTERY

1. The battery is installed in the right rear of the trunk.
2. The battery installed in the MX-5 is unique.
   When a replacement battery is installed, install it with a Mazda genuine battery replacement kit or equivalent.
   (Refer to page G-10 for replacement.)

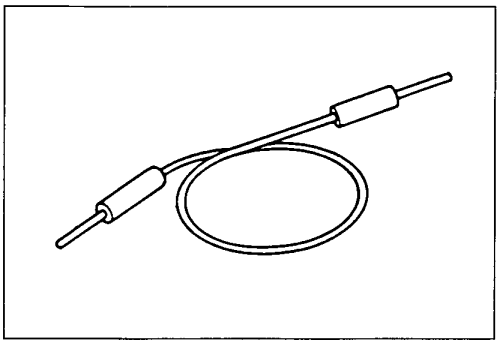
POWER CONNECTOR IN ENGINE COMPARTMENT

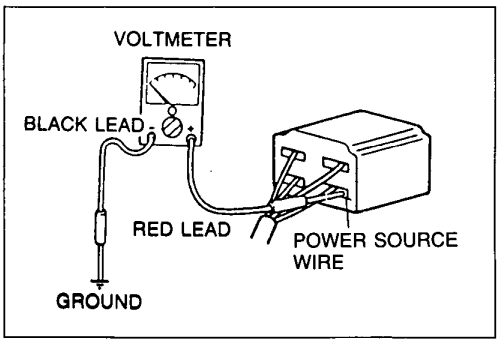
1. When using externally powered test equipment, connect it to the special power connector (Blue: 1-pin) for battery voltage.
2. Do not ground the power connector terminal; the WIPER 20A fuse will be burned.

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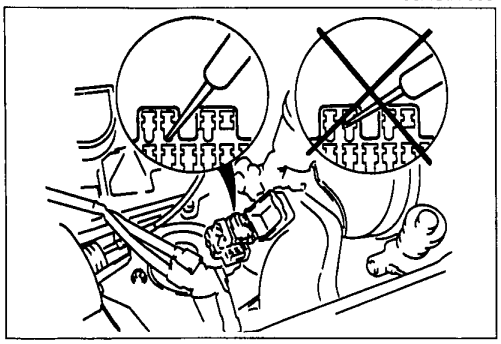


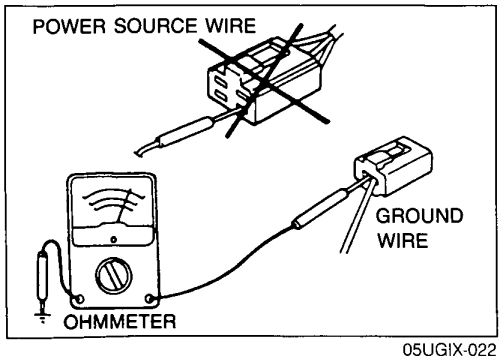
95AGIX-007


9MUGIX-020



95AGIX-008


95AGIX-009



05UGIX-022

ELECTRICAL TROUBLESHOOTING TOOLS

Test Light

The test light, as shown in the figure, uses a 12V bulb. The two leads should be connected to probes.
The test light is used for simple voltage checks and for checking for short circuits.

Caution
- **When checking a control unit, never use a bulb over 3.4W.**

Jumper Wire

The jumper wire is used for testing by shorting across switch terminals and ground connections.

Caution
- **Do not connect a jumper wire from the power source line to a body ground; this may cause burning or other damage to harnesses or electronic components.**

Voltmeter

The DC voltmeter is used to measure circuit voltage. A voltmeter with a range of 15V or more is used by connecting the positive (+) probe (red lead) to the point where voltage is to be measured and the negative (–) probe (black lead) to a body ground.

Diagnosis Connector

Insert the probe into the service hole when connecting a jumper wire or tester to the diagnosis connector.

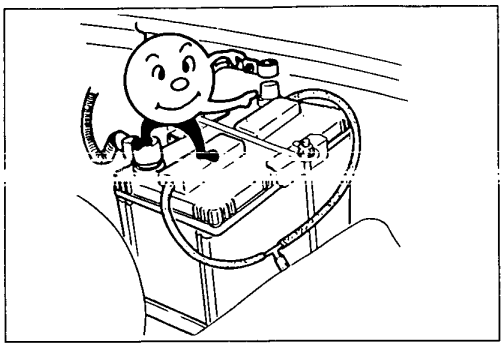
Caution
- **Do not insert the wire probe into the diagnosis connector terminal, which may damage the terminal.**

Ohmmeter

The ohmmeter is used to measure the resistance between two points in a circuit, and to check for continuity and short circuits.

Caution
- **Do not attempt to connect the ohmmeter to any circuit to which voltage is applied; this may burn or otherwise damage the ohmmeter.**

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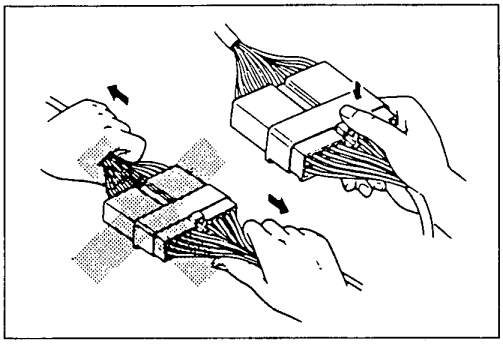


05UGIX-023

CAUTION WITH ELECTRICAL PARTS

Battery Cable

Before disconnecting connectors or removing electrical parts, disconnect the negative battery cable.

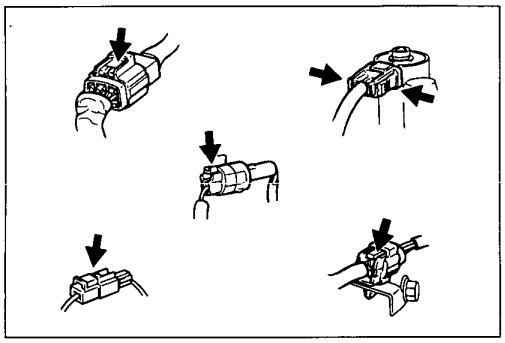


95AGIX-010

Connectors

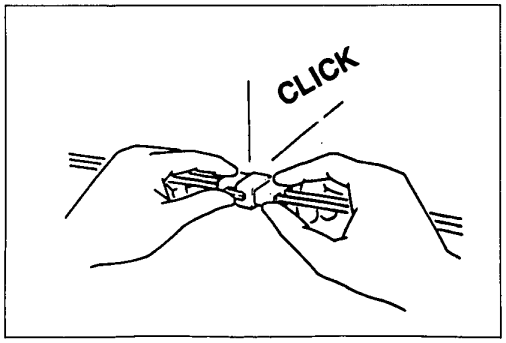
Disconnecting connectors

Never pull on the wiring harness when disconnecting connectors.



05UGIX-025

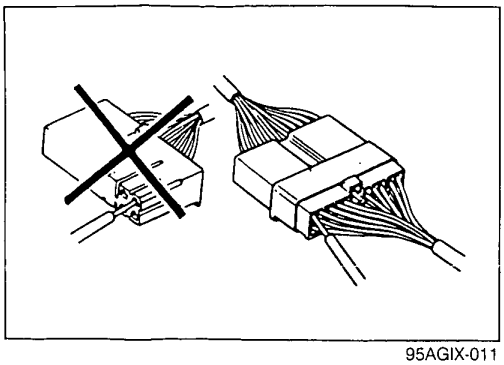
Connectors can be disconnected by pressing or pulling the lock lever as shown.



05UGIX-026

Locking connectors

When locking connectors, listen for a click that will indicate they are securely locked.

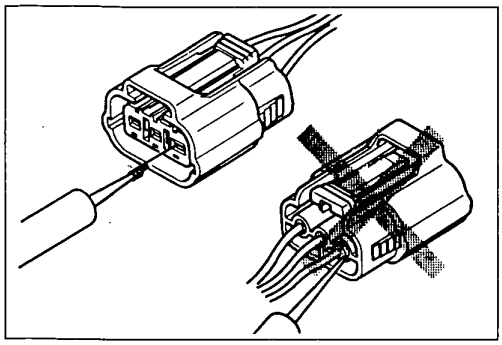


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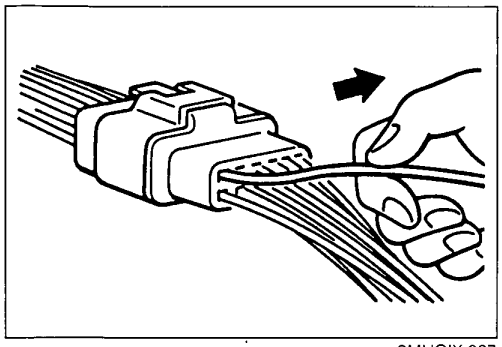
Inspection

1. When a tester is used to check for continuity or to measure voltage, insert the tester probe from the wiring harness side.

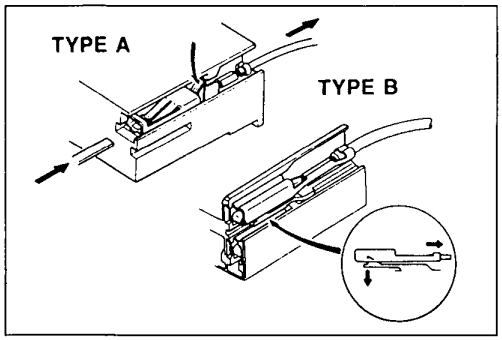
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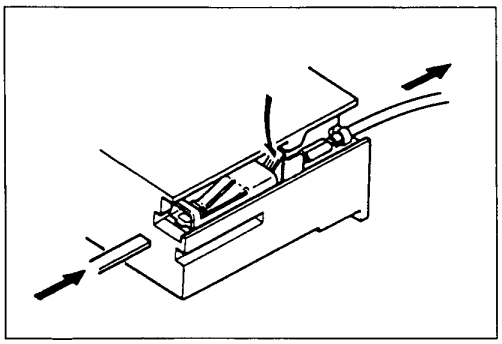
05UGIX-028

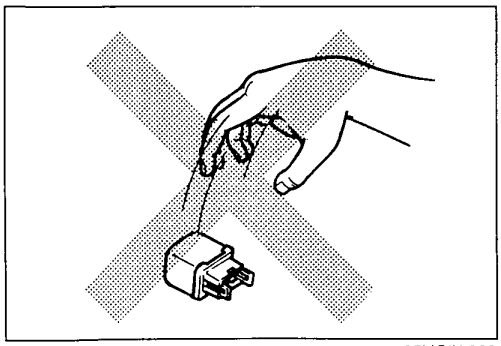


9MUGIX-027



9MUGIX-028





05UGIX-029

2. Check the terminals of waterproof connectors from the connector side, as they cannot be accessed from the wire harness side.

Caution
- **Use fine wire to prevent damage to the terminal.**
- **Do not damage the terminal when inserting the tester lead.**

Terminals
Inspection
Pull lightly on individual wires to check that they are secured in the terminal.

Replacement of terminals
Use the appropriate tools to remove the terminal as shown. When installing the terminal, be sure to insert it until it locks securely.

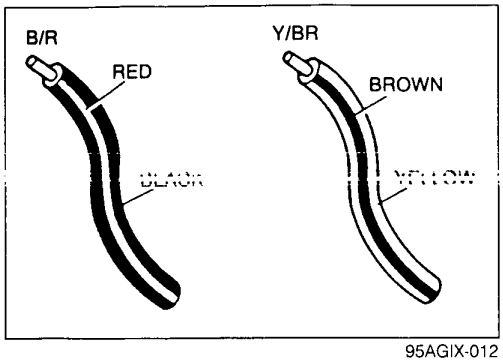
<Female>
Insert a thin piece of metal from the terminal side of the connector, and then, with the terminal locking tab pressed down, pull the terminal out from the connector.

<Male>
Same as the female type.

Sensors, Switches, and Relays
Handle sensors, switches, and relays carefully. Do not drop them or strike them against other objects.

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CAUTION

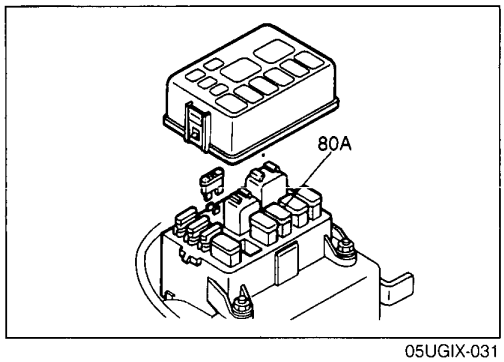


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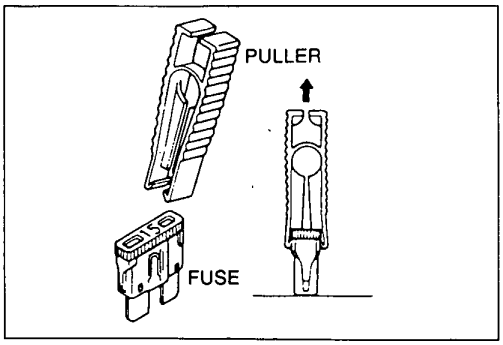
Wiring Harness
Wiring color codes

Two-color wires are indicated by a two-color code symbol. The first letter indicates the base color of the wire and the second the color of the stripe.

CODE	COLOR		CODE	COLOR
B	Black		O	Orange
BR	Brown		P	Pink
G	Green		R	Red
GY	Gray		V	Violet
L	Blue		W	White
LB	Light Blue		Y	Yellow
LG	Light Green		—	—



05UGIX-031



9MUGIX-032

Fuse
Replacement

1. When replacing a fuse, be sure to replace it with one of the specified capacity.
   If a fuse again fails after it has been replaced, the circuit probably has a short and the wiring should be checked.
2. Be sure the negative battery terminal is disconnected before replacing a main fuse (80A).
3. When replacing a pullout fuse, use the fuse puller supplied in the fuse box cover.

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PRE-DELIVERY INSPECTION AND SCHEDULED MAINTENANCE SERVICES

PRE-DELIVERY INSPECTION ..... A– 2
SCHEDULED MAINTENANCE SERVICES.. A– 3

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PRE-DELIVERY INSPECTION

PRE-DELIVERY INSPECTION TABLE

EXTERIOR

INSPECT and **ADJUST**, if necessary, the following items to specification:
- ☐ Glass, exterior bright metal and paint for damage
- ☐ Convertible top and detachable hard top (if equipped) for damage
- ☐ Wheel lug nuts
  88—118 N·m (9—12 m-kg, 65—87 ft-lb)
- ☐ Tire pressure (Refer to Section Q)
- ☐ All weatherstrips for damage or detachment
- ☐ Operation of hood release and lock
- ☐ Operation of fuel lid
- ☐ Door operation and alignment
- ☐ Headlight aiming

INSTALL the following parts:
- ☐ Wheel caps or rings (if equipped)
- ☐ Outside rearview mirror(s)
- ☐ Mast antenna

UNDER HOOD—ENGINE OFF

INSPECT and **ADJUST**, if necessary, the following items to specification:
- ☐ Fuel, coolant and hydraulic lines, fittings, connections and components for leaks
- ☐ Engine oil level
- ☐ Power steering fluid level (if equipped)
- ☐ Brake and clutch master cylinder fluid level
- ☐ Windshield washer reservoir fluid level
- ☐ Radiator coolant level and specific gravity

Protection °C (°F)	Specific gravity at 20°C (68°F)
−16 (3)	1.054
−26 (−15)	1.066
−40 (−40)	1.078

- ☐ Tightness of water hose clamps (including heater hoses)
- ☐ Tightness of battery terminals
- ☐ Drive belt tensions (Refer to Section B)
- ☐ Accelerator cable and linkage for free movement

CLEAN spark plugs

INTERIOR

INSTALL the following parts:
- ☐ Fuse for accessories

CHECK operation of the following items:
- ☐ Seat controls (sliding and reclining)
- ☐ Door locks
- ☐ Seat belts and warning system
- ☐ Ignition switch and steering lock
- ☐ Starter interlock switch (clutch pedal)
- ☐ All lights, including warning and indicator lights
- ☐ Audible warning system
- ☐ Horn, wipers and washer
- ☐ Audio system (if equipped)
- ☐ Cigarette lighter
- ☐ Power windows (if equipped)
- ☐ Heater, defroster and air conditioner at all mode selections (if equipped)

CHECK the following items:
- ☐ Presence of spare fuses
- ☐ Upholstery and interior finish

CHECK and **ADJUST**, if necessary, the following items:
- ☐ Operation and fit of windows
- ☐ Pedal height and free play of brake and clutch pedals

	Pedal height mm (in)	Free play mm (in)
Clutch pedal	175—185 (6.89—7.28) (with carpet)	0.6—3.1 (0.02—0.12)
Brake pedal	171—181 (6.73—7.13) (with carpet)	4—7 (0.16—0.28)

- ☐ Parking brake
  5—7 notches/98 N (10 kg, 22lb)

UNDER HOOD—ENGINE RUNNING AT OPERATING TEMPERATURE

CHECK the following items:
- ☐ Initial ignition timing
  10° ± 1° BTDC (with diagnosis connector TEN and GND terminals connected)
  (Refer to Section F)
- ☐ Idle speed
  850 ± 50 rpm (with diagnosis connector TEN and GND terminals connected)
  (Refer to Section F)

ON HOIST

CHECK the following items:
- ☐ Underside fuel, coolant and hydraulic lines, fittings, connections and components for leaks
- ☐ Tires for cuts or bruises
- ☐ Steering linkage, suspension, exhaust system and all underside hardware for looseness or damage
- ☐ Manual transmission oil level
- ☐ Rear axle oil level

ROAD TEST

CHECK the following items:
- ☐ Brake operation
- ☐ Clutch operation
- ☐ Steering control
- ☐ Operation of meters and gauges
- ☐ Squeaks, rattles and unusual noise
- ☐ Overall engine performance
- ☐ Seat belt emergency locking retractors
- ☐ Cruise control system (if equipped)

AFTER ROAD TEST

REMOVE seat and floor mat protective covers

CHECK for necessary owner information materials, tools and spare tire in vehicle

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SCHEDULED MAINTENANCE SERVICES

MAINTENANCE TABLE

Chart symbols:

I : Inspect, and if necessary correct, clean or replace
A: Adjust
R: Replace or change
T: Tighten

REMARKS

After 80,000 km or 48 months, continue to follow the described maintenance at the recommended intervals.
As for * marked items in this maintenance chart, note the following points.

*1 Major service interval at 12 months/20,000 km (12,000 miles).
Lubrication service based on distance only 10,000 km (6,000 miles) not time.

*2 Adjust or inspect alternator and water pump drive belt, and power steering and air conditioner drive belt if equipped.

*3 Replacement of the timing belt is required at every 100,000 km (60,000 mile). Failure to replace the timing belt may result in damage to the engine.

*4 If the vehicle is operated under any of the following conditions, it is suggested that the engine oil and oil filter be changed more often than the recommended intervals.
a) Driving in dusty conditions.
b) Extended periods of idling or low speed operation.
c) Driving for a prolonged periods in cold temperatures or regularly driving only short distances.

*5 If the vehicle is operated in very dusty or sandy areas, inspect and, if necessary, replace more often than at usual recommended intervals.

*6 This is a full function check of all electrical systems, i.e, all lights, washers (including condition of blades) electric windows, sunroof, horn etc.

*7 Replace every two years.
If there has been continuous hard driving, mountain driving, or if the brakes are used extensively or the vehicle is operated in extremely humid climates, the brake fluid should be changed annually.

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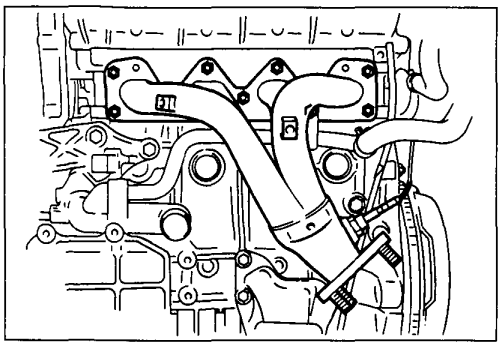
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SCHEDULED MAINTENANCE SERVICES

Interval / Maintenance operation	Number of months or km (miles), whichever comes first								
Months*1	—	6	12	18	24	30	36	42	48
Kilometers	1,000	10,000	20,000	30,000	40,000	50,000	60,000	70,000	80,000
(Miles)	(600)	(6,000)	(12,000)	(18,000)	(24,000)	(30,000)	(36,000)	(42,000)	(48,000)
Intake and exhaust manifold nuts (Bolts)	T				T				T
Drive belts	A		A		A		A		A
Engine timing belt*3	Replace every 100,000 km (60,000 miles)								
Engine oil*4	R	R	R	R	R	R	R	R	R
Oil filter*4		R	R	R	R	R	R	R	R
Cooling system (Including coolant level adjustment)			I		I		I		I
Engine coolant	Replace every 2 years								
Idle speed			A		A		A		A
Air cleaner element*5					R				R
Fuel filter					R				R
Fuel lines and hoses					I				I
Initial ignition timing					I				I
Spark plugs			A		A		A		A
Spark plugs (Only for sweden)	Adjust every 30,000 km (18,000 mils)								
Throttle sensor			A		A		A		A
Throttle sensor (Only for sweden)	Adjust every 80,000 km (48,000 miles)								
Evaporative system			I		I		I		I
Evaporative system (Only for sweden)	Inspect every 80,000 km (48,000 miles)								
Dashpot			A		A		A		A
Dashpot (Only for sweden)	Adjust every 80,000 km (48,000 miles)								
All electrical system*6		I	I	I	I	I	I	I	I
Headlight alignment			A		A		A		A
Clutch pedal (With cable adjustment)		I	I	I	I	I	I	I	I
Clutch fluid		I	I	I	I	I	I	I	I
Brake lines, hoses and connections			I		I		I		I
Brake pedal		I	I	I	I	I	I	I	I
Brake fluid*7		I	I	I	R	I	I	I	R
Parking brake			A		A		A		A
Power brake unit and hoses			I		I		I		I
Disc brakes			I		I		I		I
Power steering fluid		I	I	I	I	I	I	I	I
Power steering system and hoses			I		I		I		I
Steering and front suspension			I		I		I		I
Manual transmission oil					A				R
Rear axle oil					A				R
Rear suspension ball joints					I				
Wheel bearing grease (If applicable)									A
Bolts, nuts on chassis and body	T		T		T		T		T
Body condition (Visual only)	Inspect annually								
Exhaust system heat shields					I				I
Tyres (Including spare tyres) with inflation pressure adjustment			I		I		I		I
Hinges and catches			A		A		A		A
Underside of vehicle			I		I		I		I
Seat belt			I		I		I		I
Road test			I		I		I		I

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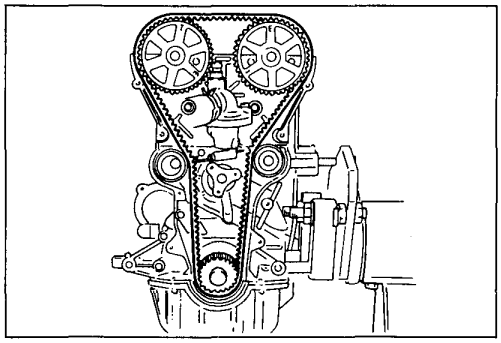
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95A0AX-004

TIGHTENING EXHAUST MANIFOLD NUTS

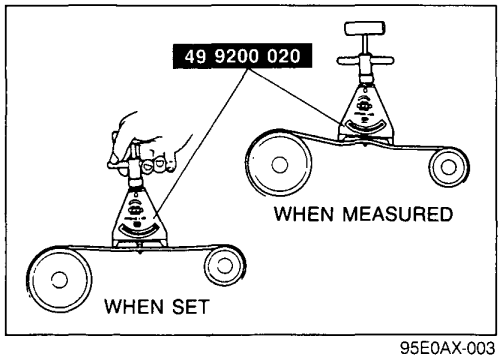
Tightening torque:
38—46 N·m (3.9—4.7 m-kg, 28—34 ft-lb)



95A0AX-005

REPLACEMENT TIMING BELT

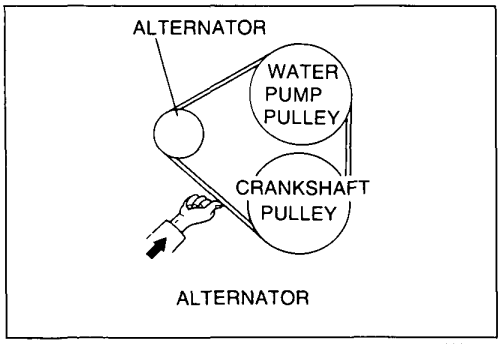
Refer to Section B of the Workshop Manual for the replacement procedure of the timing belt.



95E0AX-003

INSPECTION AND ADJUSTMENT OF DRIVE BELTS (Alternator and water pump drive belt, power steering pump)

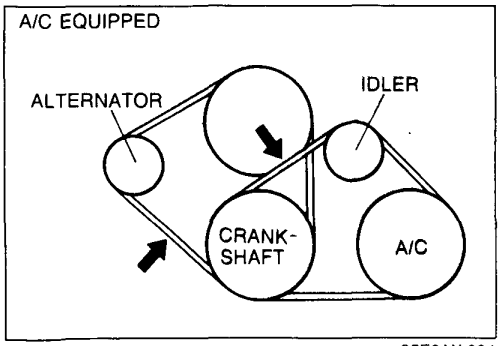
1. Check the belt for cracks or any other damage.
2. Adjust or replace, if necessary.
3. Check the drive belt tension with thumb pressure of about **98 N (10 kg, 22 lb)** at each arrow points.



95A0AX-006

Belt deflection

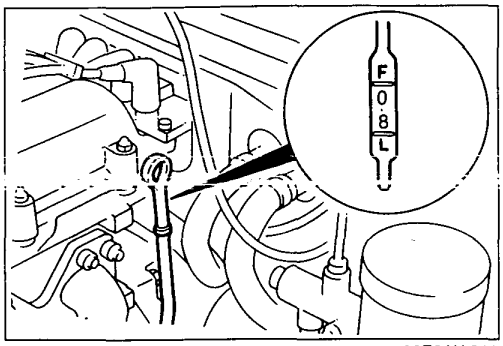
Alternator drive belt
New belt : 8—9mm (0.31—0.35 in)
Used belt: 9—10mm (0.35—0.39 in)



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Power steering oil pump drive belt (if equipped)
New belt : 8—9mm (0.31—0.35 in)
Used belt: 9—10mm (0.35—0.39 in)

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93E0AX-016

REPLACEMENT OF ENGINE OIL

1. Warm up the engine.
2. Drain the oil by removing the drain plug and oil filler cap.

Warning
- **Wait a while for the engine is too hot. And be careful to drain.**

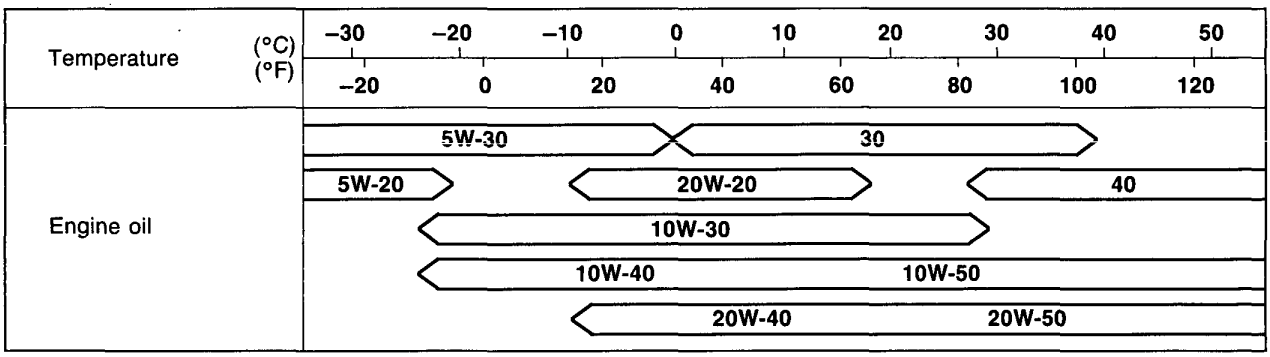
3. Reinstall the drain plug securely.

Tightening torque:
29—41 N·m (3.0—4.2 m-kg, 22—30 ft-lb)

4. Refill the engine with the specified oil to the "F" level marked on the level gauge.
5. Refit the oil filler cap securely.

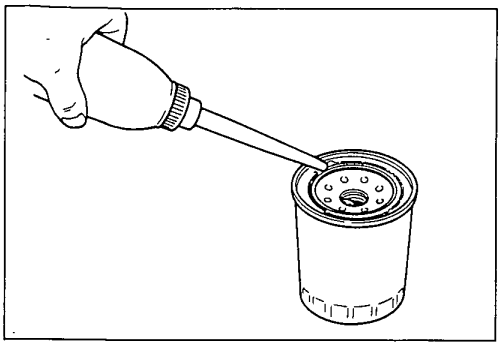
Oil pan capacity:
3.2 liters (3.4 US qt, 2.8 Imp qt)

Typical specification: API service SD, SE or SF

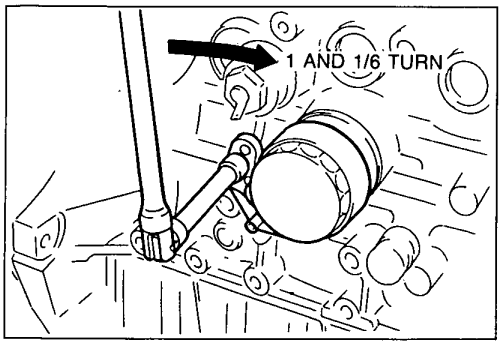


95A0AX-008

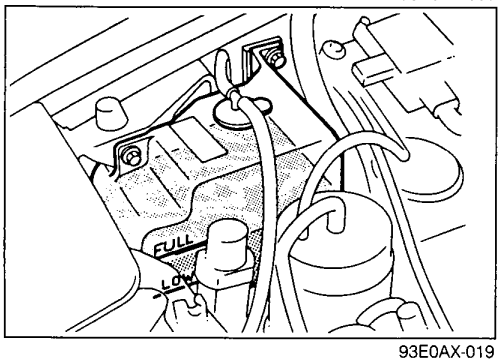
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93E0AX-018



95A0AX-009



93E0AX-019

REPLACEMENT OF ENGINE OIL FILTER

1. Remove the oil filter with the **SST** a suitable wrench.
2. Use a clean rag to wipe off the mounting surface on the engine.
3. Apply a small amount of clean engine oil to the rubber seal of the new filter.
4. Install the oil filter and tighten it by hand until the rubber seal contacts the base.
5. Tighten the filter 1 and 1/6 turns with a filter wrench.
6. Start the engine and check for leaks.
7. Check the oil level and add oil if necessary.

Oil filter capacity:
0.17 liter (0.18 US qt, 0.15 Imp qt)

INSPECTION OF COOLING SYSTEM

Warning

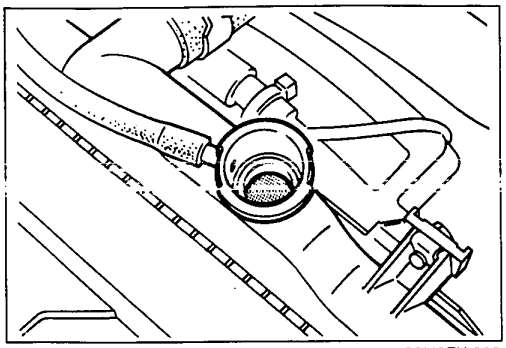
- **Never remove the radiator cap while the engine is hot.**
- **Wrap a thick cloth around the cap when removing it.**
- **When removing the radiator cap, loosen it slowly to the first stop until the pressure in the radiator is released, and then remove it.**

Coolant Level (Engine cold)

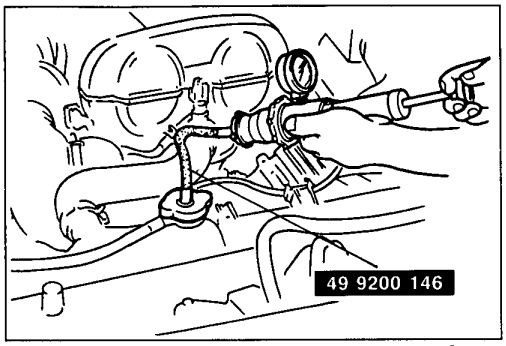
1. Verify that the coolant level is near the radiator filler neck.
2. Verify that the coolant level in the coolant reservior is between the FULL and LOW marks.
3. Add coolant if necessary.

95A0AX-010

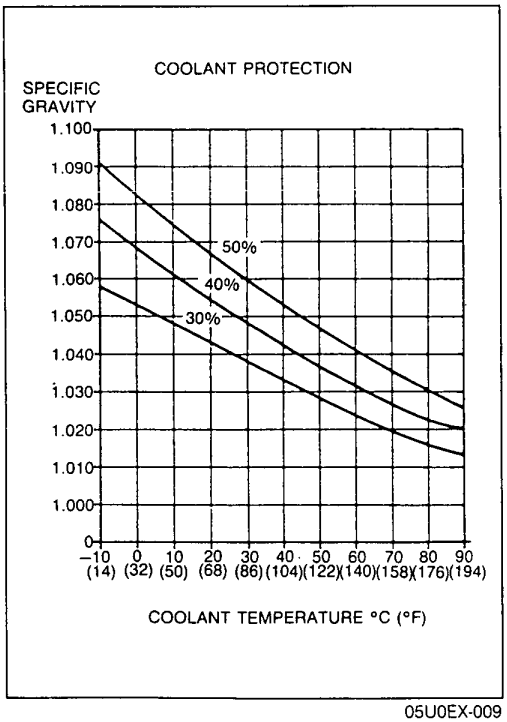
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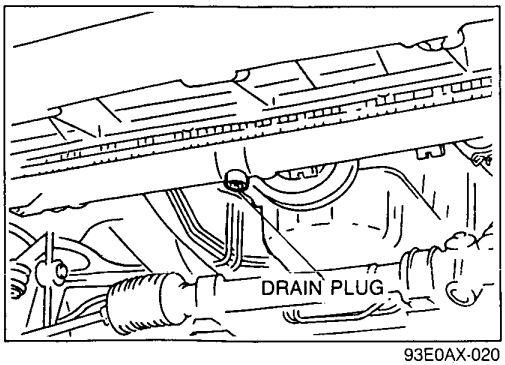
03U0EX-008



03U0EX-009



05U0EX-009



93E0AX-020

Coolant Quality

1. Verify that there is no buildup of rust or scale around the radiator cap or radiator filler neck.
2. Verify that coolant is free of oil. Replace the coolant if necessary.

Coolant Leakage

1. Connect a radiator tester (commercially available) and the **SST** to the radiator filler neck.
2. Apply **103 kPa (1.05 kg/cm^2, 15 psi)** pressure to the system.
3. Verify that the pressure is held.
   If not, check for coolant leakage.

Coolant Protection

Caution
- **Do not use alcohol- or methanol-based coolant.**
- **Use only soft (demineralized) water in the coolant mixture.**

1. Measure the coolant temperature and specific gravity with a thermometer and a hydrometer.
2. Determine the coolant protection by referring to the graph shown.
   If the coolant protection is not proper, add water or coolant.

Antifreeze solution mixture percentage

Coolant protection	Volume percentage		Gravity at 20°C (68°F)
	Water	Coolant	
Above −16°C (3°F)	65	35	1.054
Above −26°C (−15°F)	55	45	1.066
Above −40°C (−40°F)	45	55	1.078

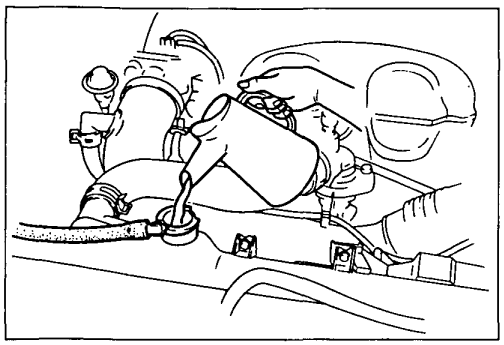
05U0EX-010

REPLACEMENT OF ENGINE COOLANT

Warning
- **Never open the radiator cap while the engine is hot.**
- **Wrap a thick cloth around the cap when loosening.**
- **Use caution when draining hot coolant.**

Caution
- **Do not use alcohol- or methanol-based coolant.**
- **Use only soft (demineralized) water in the coolant mixture.**

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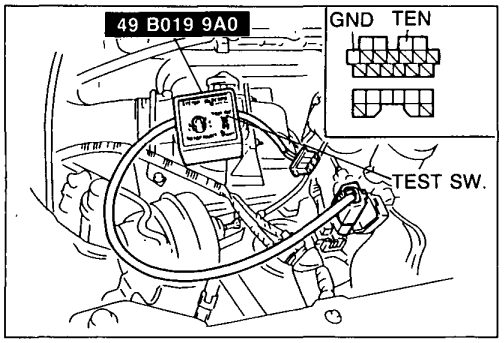


95A0AX-011

1. Remove the radiator cap and loosen the drain plug.
2. Drain the coolant into a suitable container.
3. Flush the cooling system with water until all traces of color are gone; then let the system drain completely.
4. Install the drain plug.
5. Fill with the proper amount and mixture of ethylene glycol based coolant by referring to the table above.

Coolant capacity:
6.0 liters (6.3 US qt, 5.3 Imp qt)

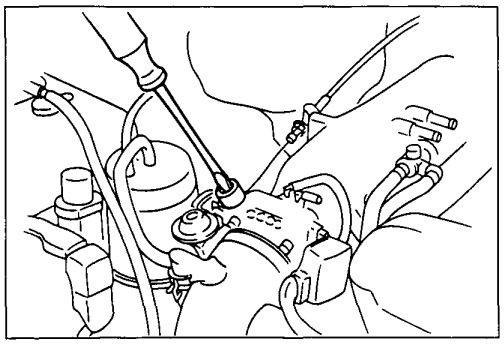
6. Run the engine with the radiator cap removed until the upper radiator hose is hot.
7. With the engine idling, add coolant to the radiator until it reaches the bottom of the filler neck.
8. Install the radiator cap.



95A0AX-012

INSPECTION OF IDLE SPEED

1. Connect the **SST** and set the TEST SW to "SELF TEST" or connect diagnosis connector terminals TEN and GND with a jumper wire.

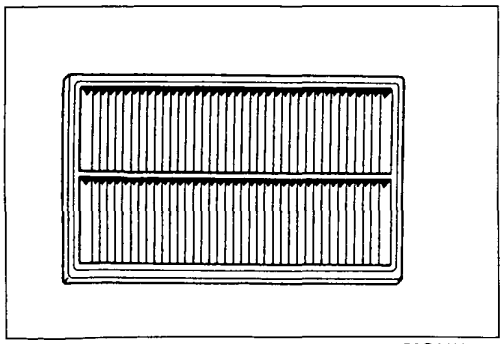


05U0FX-065

2. Verify that the idle speed is within specification.

Idle speed: 850 ± 50 rpm

3. If the idle speed is not within specification, remove the blind cap from the air adjusting screw and adjust it.
4. After adjusting the idle speed, install the blind cap and disconnect the **SST** or jumper wire from the diagnosis connector.



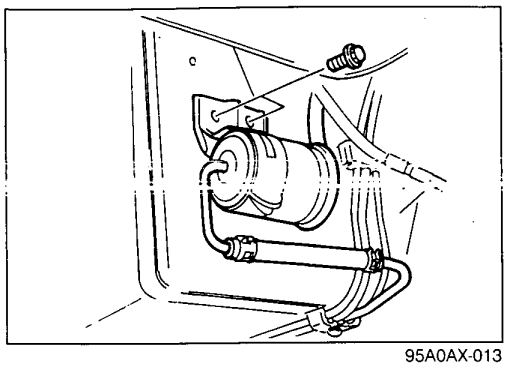
53G00X-519

REPLACEMENT OF AIR CLEANER ELEMENT

Visually check the air cleaner element for excessive dirt, damage or oil, replace if necessary.

Caution
- **Do not clean the element with compressed air.**

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95A0AX-013

PEPLACEMENT OF FUEL FILTER

Warning
- **Keep sparks and open flames away from the fuel area.**
- **After replacing the fuel filter, check that the filter joints are not leaking.**

To replace the fuel filter, proceed as follows:
1. Disconnect the fuel hoses.
2. Remove the fuel filter with the bracket.
3. Install a new filter in the reverse order of removal.

Note
- **When installing the fillter make sure the hoses are pushed on as far as possible. Secure the hoses with clips.**

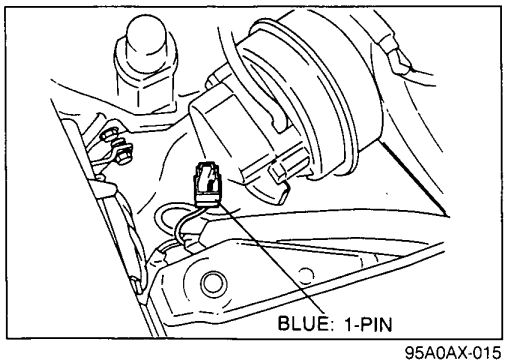
INSPECTION OF FUEL LINES

Check the fuel line fittings, connections and components for leaks.

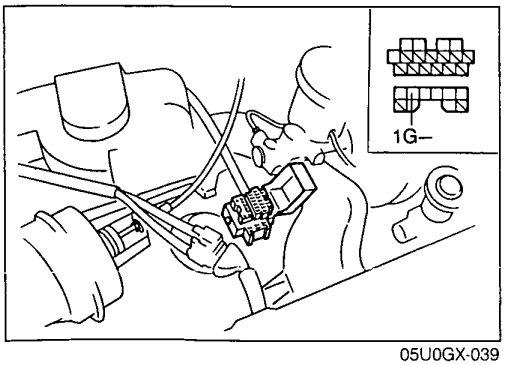
There should be no wetness or stained areas that might indicate leaks.

Replace any defective hoses or clips.

95A0AX-014



95A0AX-015



05U0GX-039

INSPECTION OF INITIAL IGNITION TIMING

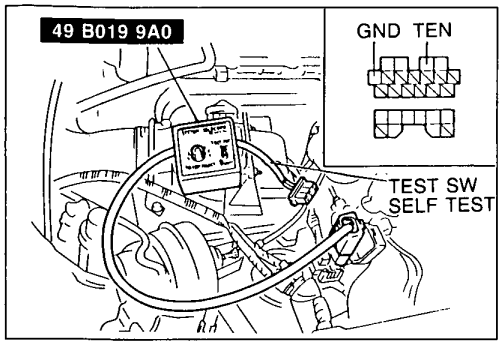
1. Check the condition of the engine (spark plugs, leaks in hoses, etc.).
2. Verify that all accessories are OFF.
3. Warm up the engine to the normal operating temperature.

Note
- **When using an externally powered timing light and/ or tachometer connect it to the power connector (Blue: 1-pin).**

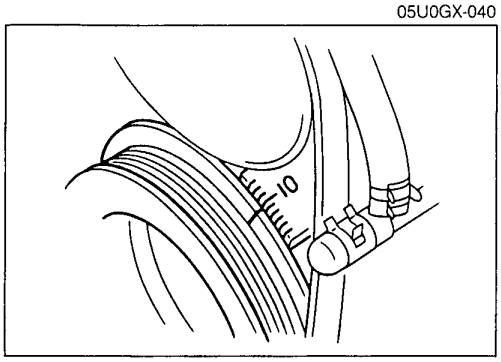
Warning
- **Do not ground the power connector terminal (Blue: 1-pin); the wiper 20A fuse will be burned.**

4. Connect a timing light and tachometer to the diagnosis connector terminal (IG–).

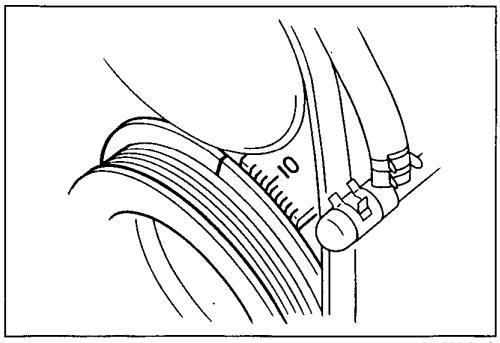
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05U0GX-040



05U0GX-041



95A0AX-016

Caution
- **Be extremely careful when making connections to the diagnosis connector as a mistaken connection will cause a malfunction.**

5. Connect the **SST** and set TEST SW to "SELF TEST" or connect diagnosis connector terminals (TEN) and (GND) with a jumper wire.
6. Check the idle speed, and set it to specification if necessary.

   Idle speed: 850 ± 50 rpm

7. Check if the timing mark (Yellow) on the crankshaft pulley and the timing belt cover are aligned.

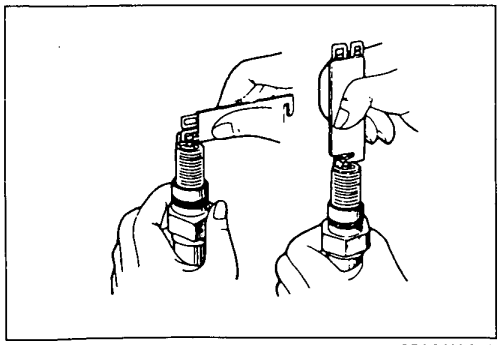
   Ignition timing: 10° ± 1° BTDC (at idle)

8. If the marks are not aligned, loosen the crank angle sensor lock bolt, and turn the crank angle sensor to make the adjustment.
9. Tighten the crank angle sensor lock bolt to the specified torque.

   Tightening torque:
   19—25 N·m (1.9—2.6 m-kg, 14—19 ft-lb)

10. After adjusting the ignition timing, disconnect the jumper wire or **SST** from the diagnosis connector.

11. Increase the engine speed and verify that the ignition timing advances.

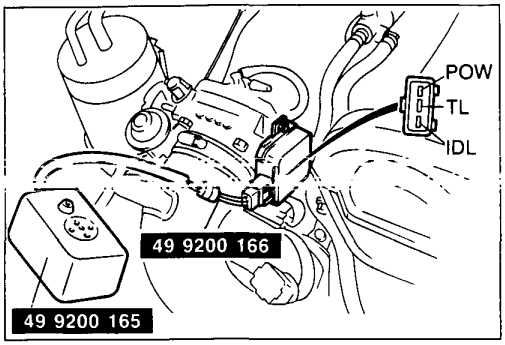

95A0AX-017

INSPECTION OF SPARK PLUGS

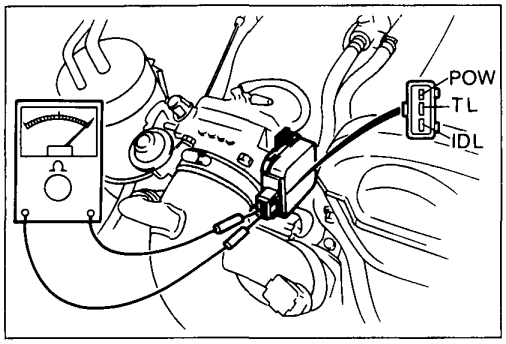
1. Check the plugs for burned or eroded electrodes, fouling or cracked porcelain.
2. Measure the electrode gap. If necessary, adjust the gap to specifications or replace the spark plugs.

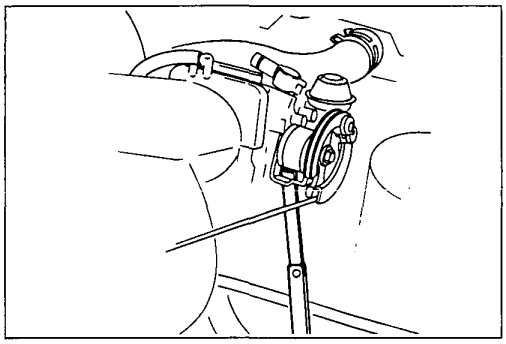
Caution
- **When installing a new plug or reinstalling old plugs, use a small amount of anti-seize compound or molybdenum-based thread lubricant on the first few threads.**
- **Do not pull the spark plug cables to remove them, pull on the spark plug boots.**

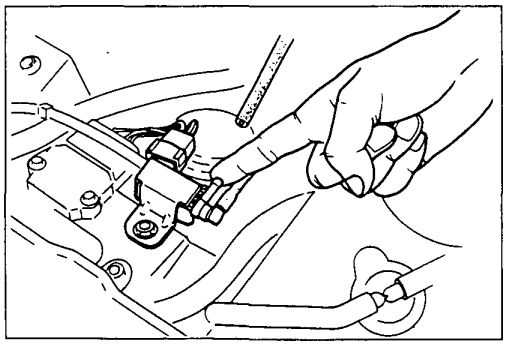
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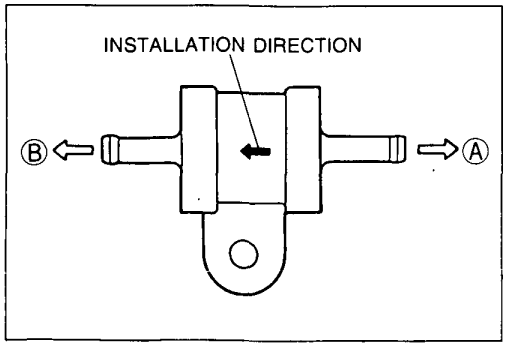


95A0AX-018




05U0FX-212


95A0AX-019



95A0AX-020

INSPECTION OF THROTTLE SENSOR

Inspection

1. Disconnect the connector from the throttle sensor.
2. Connect the **(SSTs)** or an ohmmeter to the throttle sensor.
3. Insert a feeler gauge between the throttle stop screw and the stop lever.
4. Note the operation of the buzzer or the continuity between terminals.

Feeler gauge	Buzzer	Continuity between terminals	
		IDL↔TL	POW↔TL
0.4mm (0.016 in)	Yes	Yes	No
0.7mm (0.027 in)	No	No	No
Wide-open throttle	Yes	No	Yes

INSPECTION OF EVAPORATIVE SYSTEM

Solenoid Valve (Purge Control)

On-vehicle inspection

1. Warm up the engine to normal operating temperature.
2. Run the engine at idle.
3. Disconnect the vacuum hose from the solenoid valve and verify that no vacuum is felt at the solenoid valve.
4. If not as specified, check the solenoid valve.

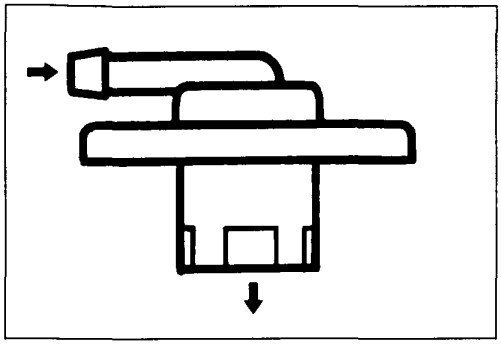
Two-way Check Valve

Inspection

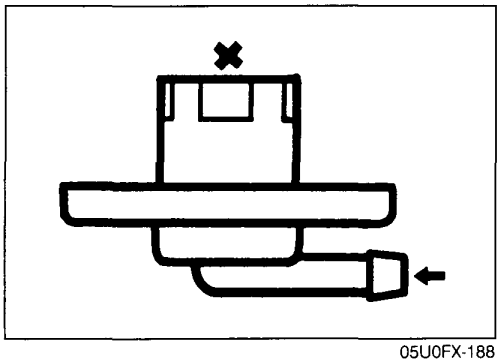
1. Remove the valve.
2. Check the operation of the valve with a vacuum pump.

Apply approx. 37 mmHg (1.46 inHg) vacuum at port A	Airflow
Apply approx. 44 mmHg (1.73 inHg) vacuum at port B	Airflow

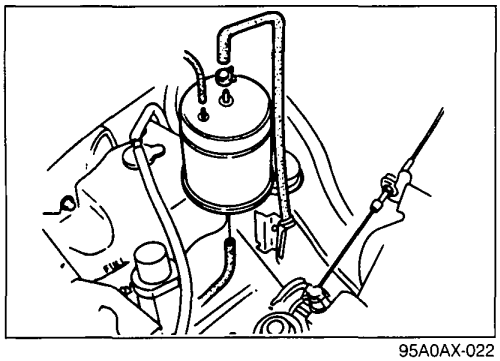
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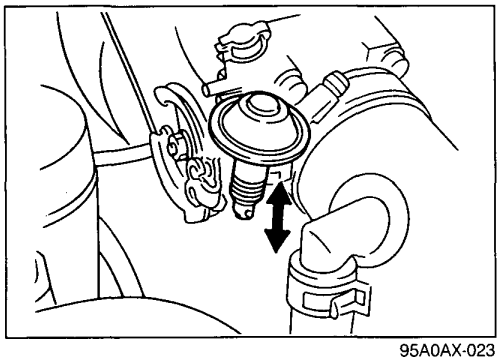
95A0AX-021



05U0FX-188



95A0AX-022



95A0AX-023

Fuel Vapor Valve
Inspection

1. Remove the valve.
2. Blow through the valve and verify that air flows in the direction shown.
3. Turn the valve over and blow through the valve. Verify that no air flows.
4. Replace the valve if necessary.

Charcoal Canister
Inspection

Visually check for damage and replace the charcoal canister if necessary.

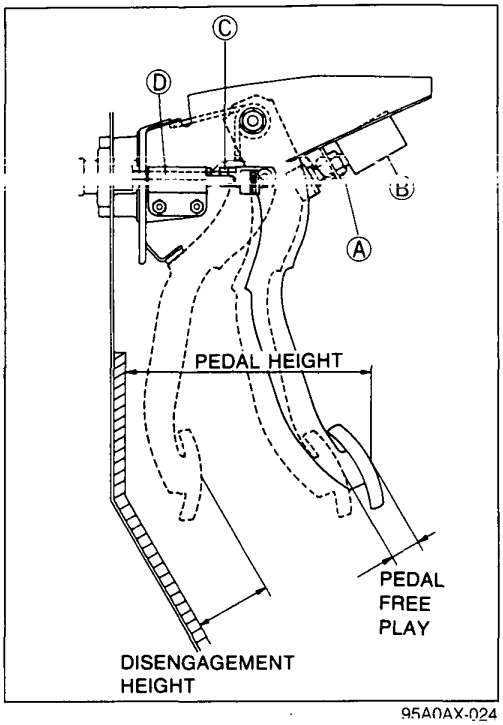
INSPECTION OF DASHPOT
Inspection

1. Open the throttle valve fully. Push the dashpot rod with a finger and verify that it goes into the dashpot slowly.
2. Release the rod and check that it comes out quickly.
3. Replace the dashpot if necessary.
4. Warm up the engine and run it at idle.
5. Connect a tachometer to the engine, and increase the engine speed to **4,000 rpm**.
6. Slowly decrease the engine speed and check that the lever touches the dashpot rod as specified.

   Specification: 2,500 ± 150 rpm

7. If not as specified, loosen the locknut and turn the adjusting screw to adjust.

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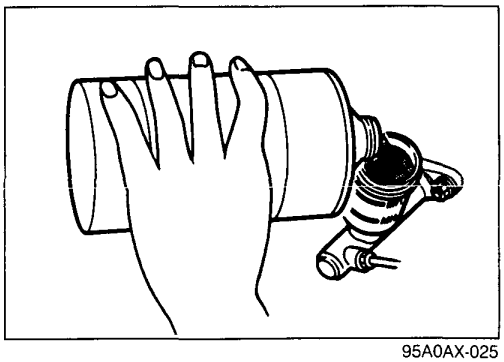
INSPECTION OF CLUTCH PEDAL

1. Check the pedal for smooth operation.
2. Check the pedal height. If necessary, adjust the pedal height by loosening locknut Ⓐ and turn clutch switch Ⓑ, until the tighten the locknut Ⓐ.
3. Check the pedal free play. If necessary, adjust the pedal free play by loosening locknut Ⓒ and turning push rod Ⓓ, retighten the locknut.

Pedal height: 175—185mm (6.89—7.28 in) (With carpet)

Pedal free play: 0.6—3.1mm (0.02—0.12 in)

Disengagement height: 68mm (2.68 in) minimum (With carpet)

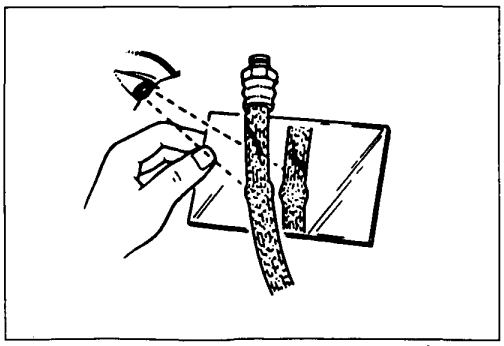

95A0AX-025

INSPECTION OF CLUTCH FLUID

Fluid Level

1. Clean the area around the reservoir and the reservoir cap.
2. Check the fluid level. If the level is near or below the "MIN" mark, add brake fluid to the "MAX" mark.

Fluid specification: DOT-3 (FMVSS 116, or SAE J1703a)

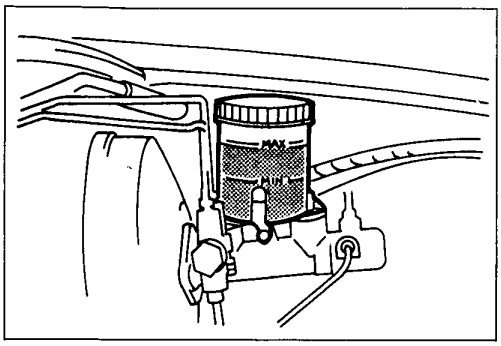

73G00X-052

INSPECTION OF BRAKE LINES, HOSES AND CONNECTIONS

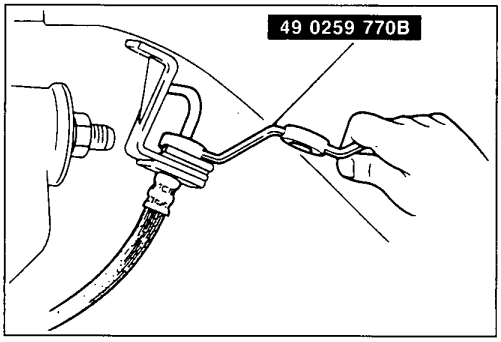
Check the points below, replace parts if necessary.

1. Cracking, damage or corrosion of the brake hose.
2. Damage to the brake hose threads.
3. Scars, cracks or swelling of the flexible hose.
4. All lines for fluid leakage.

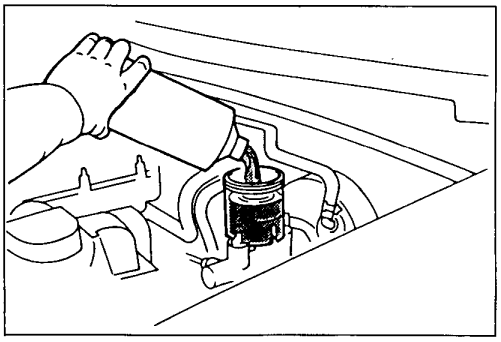
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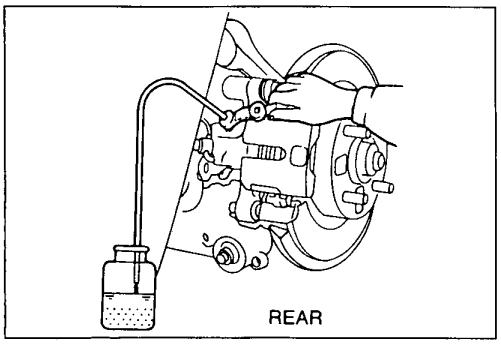
73G00X-053



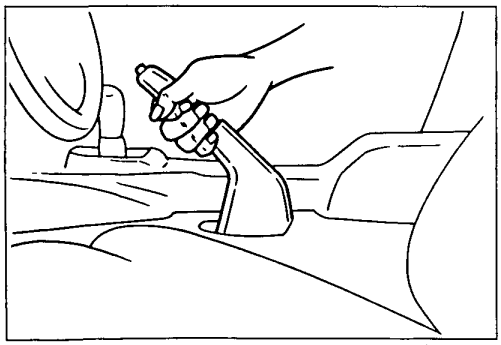
93E0AX-034



63U11X-023



95A0AX-026



73G00X-056

INSPECTION OF BRAKE FLUID

Check fluid level in reservoir. The level should be between the Max. and Min. lines on the reservoir.
If the fluid level is extremely low, check the brake system for leaks.

REPLACEMENT OF BRAKE FLUID

1. Remove the brake fluid from the reservoir by using a suction pump.
2. Fill the reservoir with new brake fluid.

Fluid specification: FMVSS 116: DOT-3
SAE: J1703

3. Attach a vinyl tube to the bleeder screw and place the other end of the vinyl tube in a container.
4. Pump out the old brake fluid by loosening each bleeder screw (one by one) and pumping the brake pedal.
5. Bleed air as described below.

Caution
- **The fluid in the reservoir must be maintained at the 2/4 level or higher during air bleeding.**
- **Be careful not to spill brake fluid onto painted surfaces.**

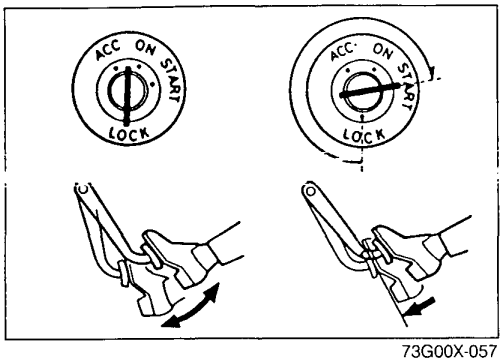
6. Jack up the vehicle and support it with safety stands.
7. Remove the bleeder cap and attach a vinyl hose to the bleeder plug.
8. Place the other end of the vinyl tube in a container.
9. Slowly pump the brake pedal several times.
10. While the brake pedal is pressed, loosen the bleeder screw to let fluid and air escape.
11. Repeat steps 4 and 5 until there are no air bubbles in the fluid.
12. Check for correct brake operation.
13. Check to be sure that there is no fluid leakage. Be sure to clean away any spilled fluid with rags.
14. After bleeding the air, add brake fluid to the reservoir up to the specified level.

INSPECTION OF PARKING BRAKE

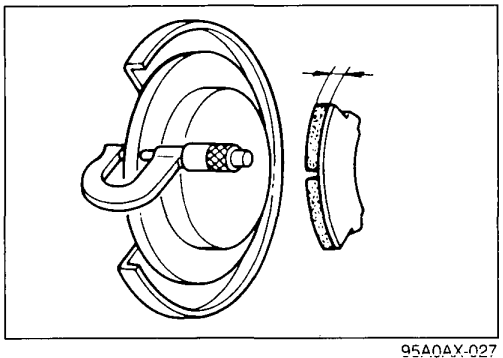
1. Pull the brake lever with **98 N (10 kg, 22 lb)** of force and measure the lever stroke.
2. If necessary, adjust the lever stroke by turning the adjusting nut.

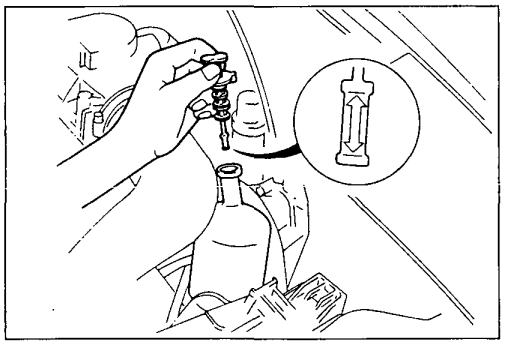
Stroke: 5—7 notches

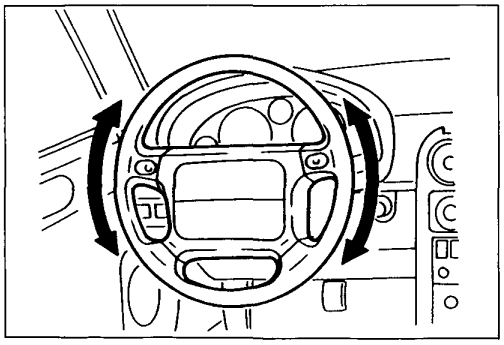
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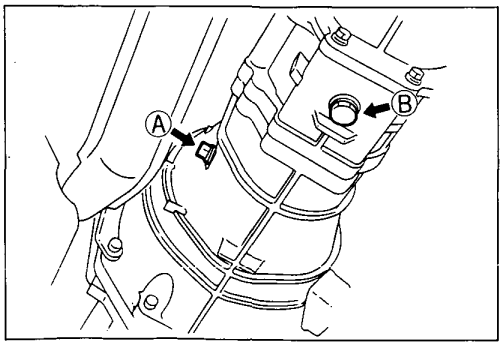


73G00X-057


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93E0AX-037


95A0AX-028



95A0AX-029

INSPECTION OF POWER BRAKE UNIT AND HOSES

1. Check the vacuum hose, connectors and check-valve for cracks, chafing, deterioration etc.
2. With the engine stopped, depress the pedal a few times.
3. With the pedal depressed, start the engine.
4. If, immediately after the engine starts, the pedal moves down slightly, the unit is good.

INSPECTION OF DISC BRAKE

Check the following disc brake components.

1. Check the caliper operation and inspect for leaks.
2. Check the pads for wear.
3. Check the condition and thickness of the disc plate.

Limit
Brake pad: 1.0mm (0.04 in)
Disc plate thickness: *Front* 16.0mm (0.63 in)
Rear 7.0mm (0.28 in)

INSPECTION OF POWER STEERING FLUID AND LINES (If equipped)

1. Check the fluid hoses, lines and connections for cracks, chafing, deterioration, etc.
2. Check the fluid level on the level gauge.
   The level should be between the "F" and "L" level. Add fluid if necessary.

Fluid specification:
ATF type F (M2C33-F) or DEXRON-II

INSPECTION OF STEERING OPERATION AND LINKAGE

1. Check the steering wheel free play.

Free play: 0—30mm (0—1.18 in)

2. Check the steering for proper operation and for looseness of the steering housing.
3. Check the steering gear housing for fluid leakage or seepage.
4. Check for excessive play on the tie rod ends and rack guide.
5. Check for damage of the dust boots.
6. Check for looseness or grease leakage of the tie rod ends.

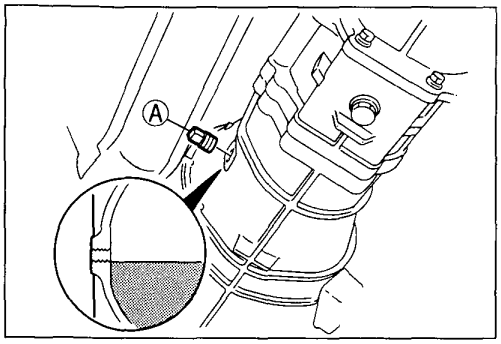
REPLACEMENT OF MANUAL TRANSAXLE OIL

Note
- **Replace drain plug Ⓑ washer with a new one whenever the drain plug is removed.**

1. Remove the plugs (Ⓐ and Ⓑ with washer).
2. Drain the oil into a suitable container.
3. Wipe all plugs clean.
4. Apply sealant to plug thread Ⓐ.
5. Install the drain plug (Ⓑ with new washer).

Tightening torque:
Ⓑ 39—59 N·m (4.0—6.0 m-kg, 29—43 ft-lb)

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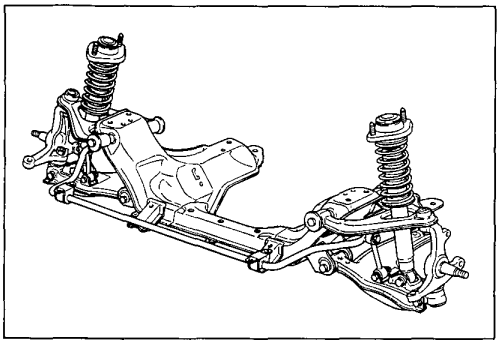
95A0AX-030

6. Add the specified oil from check plug Ⓐ port until the level reaches the bottom of check plug hole.

Specified oil:
API service GL-4 or GL-5
All-season: SAE 75W-90
Above 10°C (50°F): SAE 80W-90

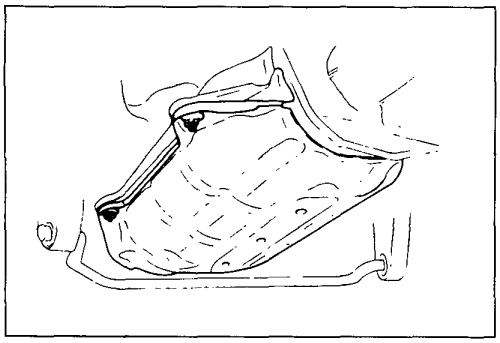
7. Install plug Ⓐ.

Capacity: 2.0 liters (2.1 US qt, 1.8 Imp qt)


93E0AX-040

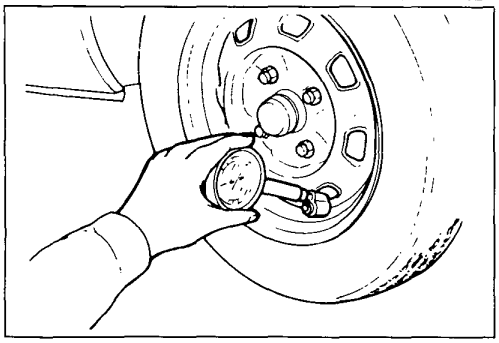
TIGHTENING OF BOLTS AND NUTS ON CHASSIS AND BODY

1. Tighten all seat mounting bolts.
2. Retighten any loose nuts and bolts on the chassis and body to the specified torque. (Refer to Section TD.)


63U00X-024

INSPECTION OF EXHAUST SYSTEM HEAT SHIELD

Check the clearance between the insulator and body and also between the insulator and the exhaust system.


93E0AX-041

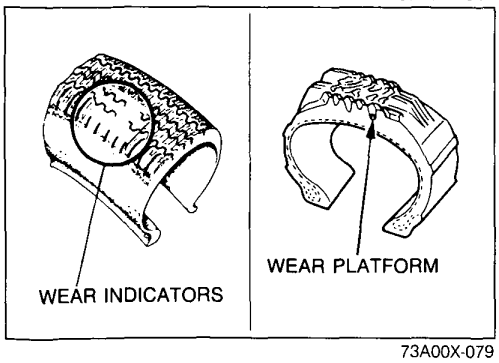
INSPECTION OF TIRES

Inspection and Adjustments

Check the following, and adjust or replace as necessary.

1. Air pressure
   Check the air pressure of all tires, including the spare tire, with an air pressure gauge. (Refer to Section Q.)

Caution
- **The air pressure must be measured when the tire is cold.**



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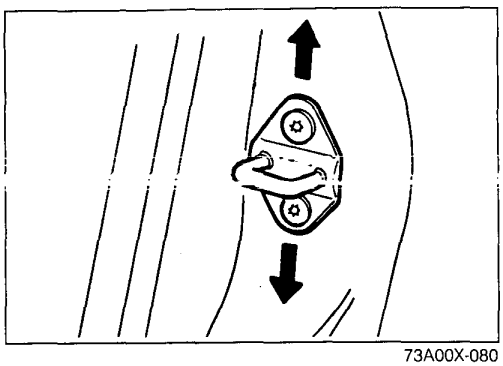
2. Tire wear.

Remaining tread
Ordinary tires: 1.6mm (0.063 in) min.
(Tire should be replaced if wear indicators are exposed.)

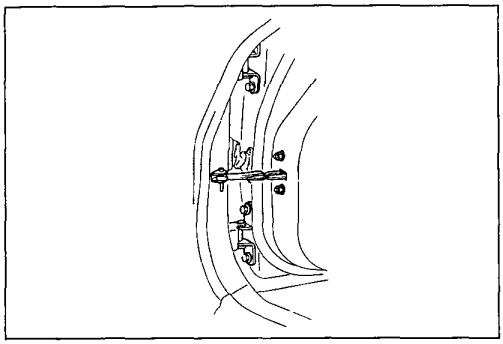
Snow tires: 50% of tread
(Tire should be replaced if wear platform is exposed)

3. Check damage, cracks or foreign matter (metal pieces, nails, stone, etc) in the tire and cracks or damage to the wheel.
4. Air leakage from the valve.

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73A00X-080



63U14X-029

INSPECTION AND ADJUSTMENT OF DOOR HINGES AND STRIKERS

Door Lock Striker

1. Check whether the door can be closed easily and whether there is any play. If there is a problem loosen the striker installation screws and adjust it by moving the striker up and down or side to side.
2. Check the rear offset of the door to the body. If there is a problem adjust it by moving the door lock striker side to side.

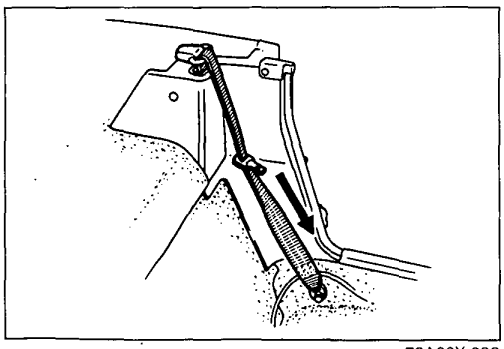
Door Hinges

1. Open the door. If there is play in the hinges, tighten the door hinge installation bolts (arrows).
2. To adjust the door-to-body offset, loosen the door hinge installation bolts and make the adjustment.

INSPECTION OF UNDERSIDE OF VEHICLE

Check the paint condition of the underbody.
If the rust or corrosion is found, advise the customer to repair or replace as soon as possible.

73A00X-081



73A00X-082

INSPECTION OF SEAT BELTS

1. Pull each seat belt to be sure it moves smoothly.
2. Check for scratches, tears, or wear of the webbing, and for bent metal fittings.

Caution
- **Do not disassemble the buckle or ELR assembly.**

3. Check tightness of belt anchor bolts.

Anchor bolt tightening torque:
38—54 N·m (3.9—5.5 m-kg, 28.2—39.8 ft-lb)

ROAD TEST (test drive)

Check the following items on the test drive:
1. Starter motor function normally and engine start smoothly, without noise.
2. Clutch engage smoothly and does not slip.
3. Shift gear smoothy and shift up and down smoothly.
4. Brake operate securely, without noise and vibration.
5. Position of steering wheel correctly and turn the steering wheel smoothly.
6. Meters and swithes operate correctly.
7. There are no abnormal noise or smell.
8. Parking brake operate correctly.
9. There are no oil leakage.
10. There no coolant leakage from the cooling system.
11. There are no fuel leakage from the fuel system.

73A00X-083

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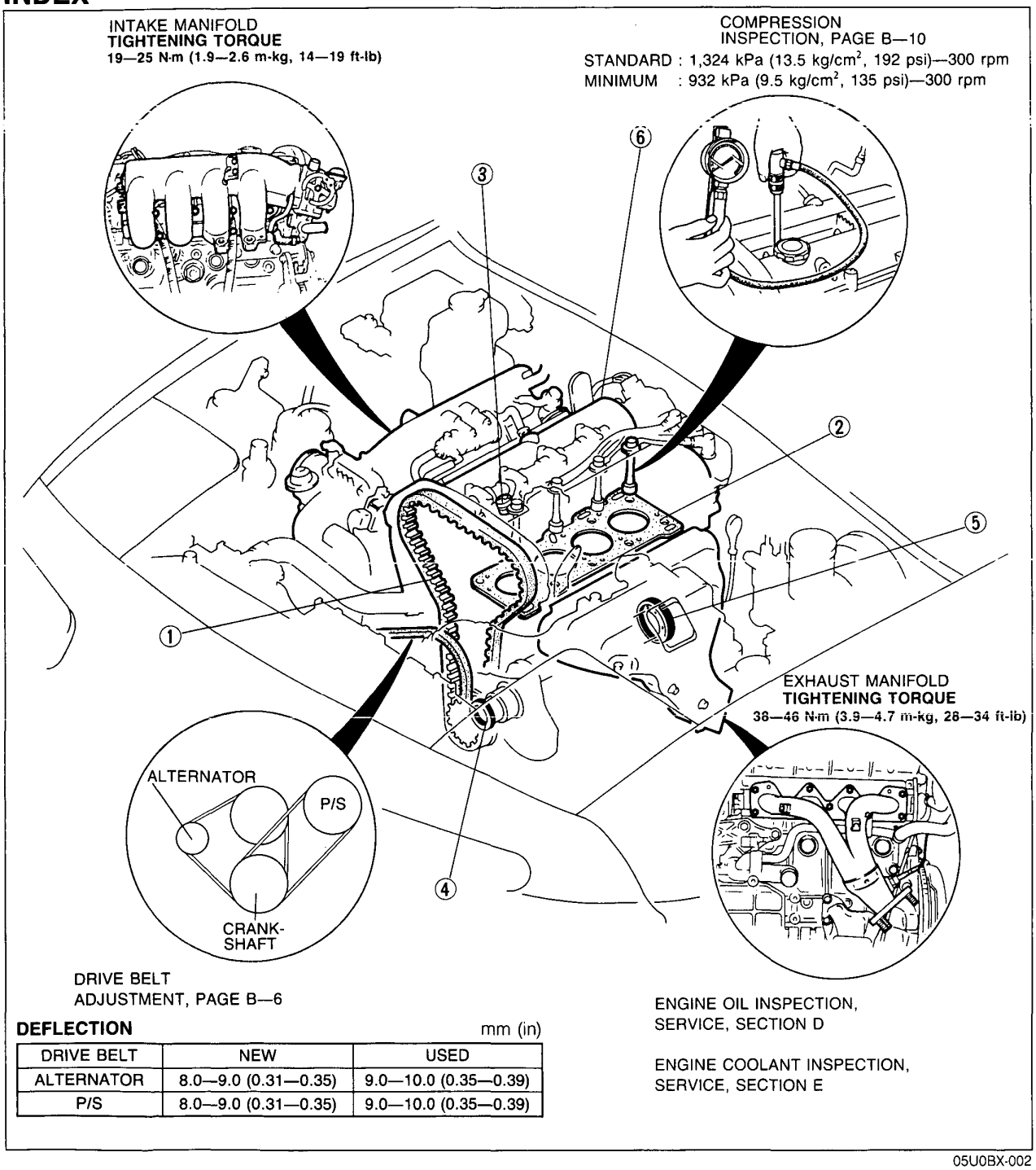
ENGINE

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ENGINE TUNE-UP PROCEDURE ..... **B– 5**
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DEFLECTION mm (in)

DRIVE BELT	NEW	USED
ALTERNATOR	8.0—9.0 (0.31—0.35)	9.0—10.0 (0.35—0.39)
P/S	8.0—9.0 (0.31—0.35)	9.0—10.0 (0.35—0.39)

05U0BX-002

1. Timing belt
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2. Cylinder head gasket
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3. HLA
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5. Rear oil seal
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6. Engine
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Inspection / Repair ..... page B–48
Assembly ..... page B–60
Engine stand dismounting ..... page B–82
Installation ..... page B–84

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OUTLINE

SPECIFICATIONS

Item \ Engine				B6 DOHC
Type				Gasoline, 4-cycle
Cylinder arrangement and number				In-line, 4-cylinders
Combustion chamber				Pentroof
Valve system				DOHC, belt-driven
Displacement			cc (cu in)	1,597 (97.42)
Bore and stroke			mm (in)	78.0 x 83.6 (3.07 x 3.29)
Compression ratio				9.4
Compression pressure			kPa (kg/cm^2, psi)-rpm	1,324 (13.5, 192)-300
Valve timing	IN	Open	BTDC	5°
		Close	ABDC	51°
	EX	Open	BBDC	53°
		Close	ATDC	15°
Valve clearance		IN	mm (in)	0: Maintenance-free
		EX		0: Maintenance-free
Idle speed			rpm	850 ± 50 (Neutral)*
Ignition timing			BTDC	10° ± 1°*
Firing order				1—3—4—2

* With System Selector (49 B019 9A0) test switch at SELF TEST.

05U0BX-003

TROUBLESHOOTING GUIDE

Problem	Possible Cause	Remedy	Page
Difficult starting	**Malfunction of engine-related components**		
	Burned valve	Replace	B–49
	Worn piston, piston ring, or cylinder	Replace or repair	B–54, 56
	Failed cylinder head gasket	Replace	B–16
	Malfunction of fuel system	Refer to Section F	
	Malfunction of ignition system	Refer to Section G	
Poor idling	**Malfunction of engine-related components**		
	Malfunction of HLA*	Replace	B–20
	Poor valve-to-valve seat contact	Replace or repair	B–51
	Failed cylinder head gasket	Replace	B–16
	Malfunction of fuel system	Refer to Section F	
	Malfunction of ignition system	Refer to Section G	
Excessive oil consumption	**Oil working up**		
	Worn piston ring groove or sticking piston ring	Replace	B–56
	Worn piston or cylinder	Replace or repair	B–54, 56
	Oil working down		
	Worn valve seal	Replace	B–40, 71
	Worn valve stem or guide	Replace	B–49
	Oil leakage	Refer to Section D	

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Problem	Possible Cause	Remedy	Page
Insufficient power	**Insufficient compression**		
	Malfunction of HLA*	Replace	B–20
	Compression leakage from valve seat	Repair	B–51
	Seized valve stem	Replace	B–49
	Weak or broken valve spring	Replace	B–52
	Failed cylinder head gasket	Replace	B–16
	Cracked or distorted cylinder head	Replace	B–48
	Sticking, damaged, or worn piston ring	Replace	B–56
	Cracked or worn piston	Replace	B–56
	Malfunction of fuel system	Refer to Section F	
	Malfunction of ignition system	Refer to Section G	
	Others		
	Slipping clutch	Refer to Section H	
	Dragging brakes	Refer to Section P	
	Wrong size tires	Refer to Section Q	
Abnormal combustion	**Malfunction of engine-related components**		
	Malfunction of HLA*	Replace	B–20
	Sticking or burned valve	Replace	B–49
	Weak or broken valve spring	Replace	B–52
	Carbon accumulation in combustion chamber	Eliminate carbon	—
	Malfunction of fuel system	Refer to Section F	
	Malfunction of ignition system	Refer to Section G	
Engine noise	**Crankshaft- or bearing-related parts**		
	Excessive main bearing oil clearance	Replace or repair	B–63
	Main bearing seized or heat-damaged	Replace	B–58
	Excessive crankshaft end play	Replace or repair	B–64
	Excessive connecting rod bearing oil clearance	Replace or repair	B–65
	Connecting rod bearing seized or heat-damaged	Replace	B–58
	Piston-related parts		
	Worn cylinder	Replace or repair	B–54
	Worn piston or piston pin	Replace	B–57
	Seized piston	Replace	B–56
	Damaged piston ring	Replace	B–56
	Bent connecting rod	Replace	B–57
	Valves or timing-related parts		
	Malfunction of HLA*	Replace	B–20
	Broken valve spring	Replace	B–52
	Excessive valve guide clearance	Replace	B–49
	Malfunction of cooling system	Refer to Section E	
	Malfunction of fuel system	Refer to Section F	
	Others		
	Malfunction of water pump bearing	Refer to Section E	
	Improper drive belt tension	Adjust	B– 6
	Malfunction of alternator bearing	Refer to Section G	
	Exhaust gas leakage	Refer to Section F	
	Malfunction of timing belt tensioner	Replace	B–12

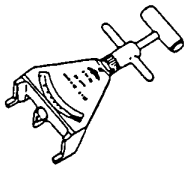
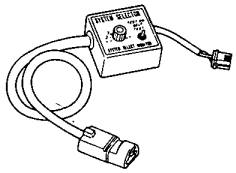
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* Tappet noise may occur if the engine has set idle for an extended period. The noise should dissipate after the engine has reached normal operating temperature. (HLA troubleshooting: Refer to page B–7)

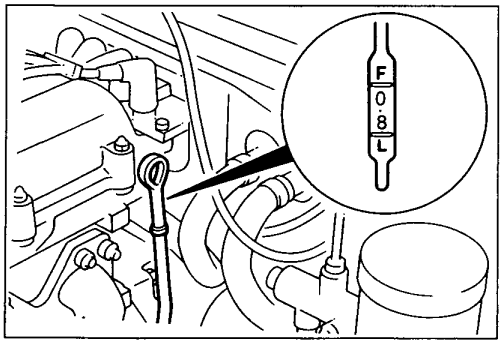
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ENGINE TUNE-UP PROCEDURE

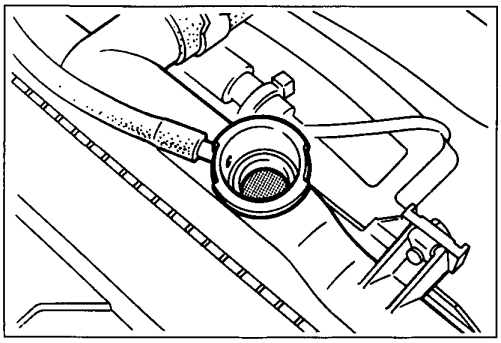
PREPARATION
SST

49 9200 020 Tension gauge, V-ribbed belt 	For inspection of drive belt tension	49 B019 9A0 System selector 	For inspection of ignition timing and idle speed

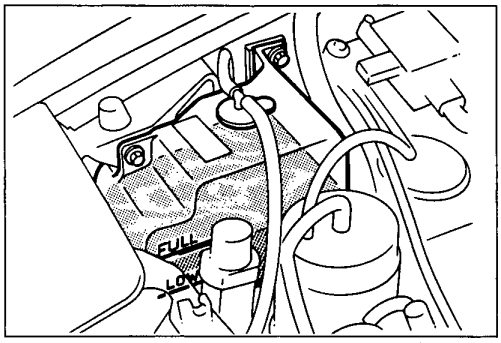
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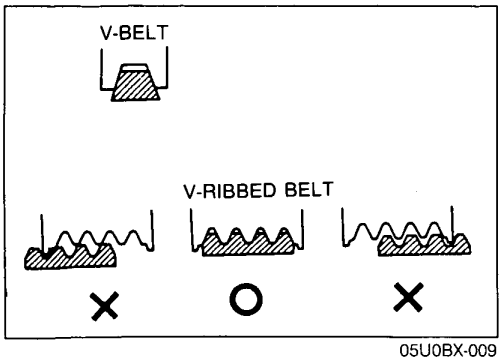
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05U0BX-007



05U0BX-008



05U0BX-009

ENGINE OIL
Inspection

1. Be sure the vehicle is on level ground.
2. Warm up the engine to normal operating temperature and stop it.
3. Wait for five minutes.
4. Remove the oil level gauge and check the oil level and condition.
5. Add or replace oil if necessary.

Note
- **The distance between the L and F marks on the level gauge represents 0.8 liter (0.85 US qt, 0.70 Imp qt).**

ENGINE COOLANT
Inspection
Coolant level (engine cold)

Warning
- **Never remove the radiator cap while the engine is hot.**
- **Wrap a thick cloth around the cap when removing it.**

1. Verify that the coolant level is near the radiator filler neck.
2. Verify that the coolant level in the coolant reservoir is between the FULL and LOW marks.
3. Add coolant if necessary.

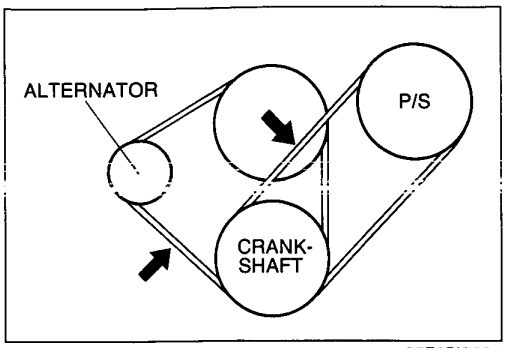
Coolant quality

1. Verify that there is no buildup of rust or scale around the radiator cap or radiator filler neck.
2. Verify that the coolant is free of oil.
3. Replace the coolant if necessary.

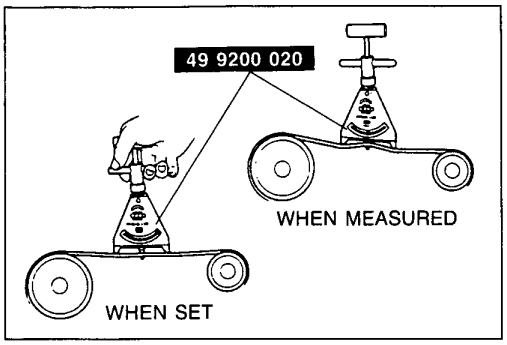
DRIVE BELT
Inspection

1. Remove the air intake pipe.
2. Check the drive belts for wear, cracks, and fraying. Replace if necessary.
3. Verify that the drive belts are correctly mounted on the pulleys.

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95E0BX-001



95E0BX-002

4. Check the drive belt deflection by applying moderate pressure **(98 N, 10 kg, 22 lb)** midway between the pulleys, as shown. Adjust if necessary.

Deflection

mm (in)

Drive belt	New	Used
Alternator	8.0—9.0 (0.31—0.35)	9.0—10.0 (0.35—0.39)
P/S	8.0—9.0 (0.31—0.35)	9.0—10.0 (0.35—0.39)

5. Check the drive belt tension with the **SST** (tension gauge).

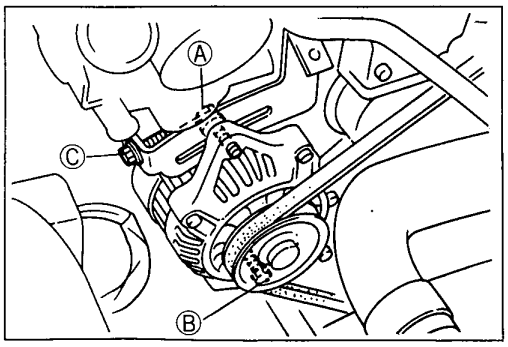
Note
- **Belt tension can be measured between any pulleys.**

Tension

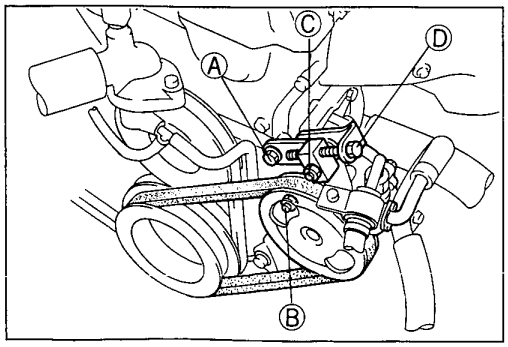
N (kg, lb)

Drive belt	New	Used
Alternator	491—589 (50—60, 110—132)	422—491 (43—50, 95—110)
P/S	491—589 (50—60, 110—132)	422—491 (43—50, 95—110)

6. Install the air intake pipe.



05U0BX-013



95E0BX-003

Adjustment

Caution
- **If a new belt is used, adjust the belt deflection at the midpoint of new belt specification.**

(1) Alternator belt
If necessary, loosen the alternator bolts Ⓐ and Ⓑ and adjust the belt deflection by turning the adjusting bolt Ⓒ.

Tightening torque:
Ⓐ 19—25 N·m (1.9—2.6 m-kg, 14—19 ft-lb)
Ⓑ 37—52 N·m (3.8—5.3 m-kg, 27—38 ft-lb)

(2) P/S belt
If necessary, loosen the P/S oil pump bolt Ⓐ and nuts Ⓑ and Ⓒ and adjust the belt deflection by turning the adjusting bolt Ⓓ.

Tightening torque:
Ⓐ 31—46 N·m (3.2—4.7 m-kg, 23—34 ft-lb)
Ⓑ 36—54 N·m (3.7—5.5 m-kg, 27—40 ft-lb)
Ⓒ 19—25 N·m (1.9—2.6 m-kg, 14—19 ft-lb)

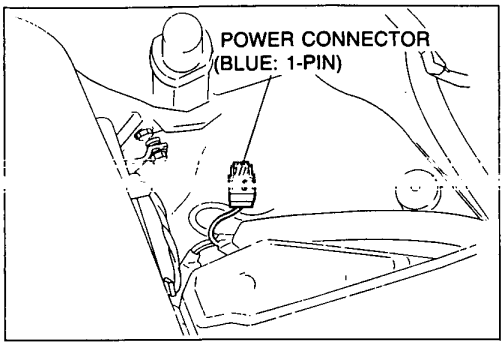
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HLA

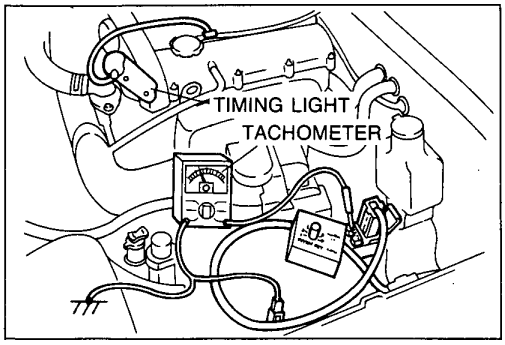
Problem	Possible Cause	Remedy
1. Tappet noise occurs when engine is started immediately after engine oil replacement 2. Tappet noise occurs when engine is started after setting more than one day 3. Tappet noise occurs when engine is started after cranking by starter more than three seconds 4. Tappet noise occurs when engine is started after HLA replacement	No oil in HLA	Tappet noise should dissipate from within a few seconds to ten minutes
5. Tappet noise continues more than ten minutes	Low oil pressure	Check oil pressure (Refer to Section D)
	Defective HLA	Inspect HLA (Refer to page B–54)
6. Tappet noise occurs at idle after high-speed driving	Low oil level	Add engine oil
	Degenerated oil	Replace engine oil

05U0BX-016

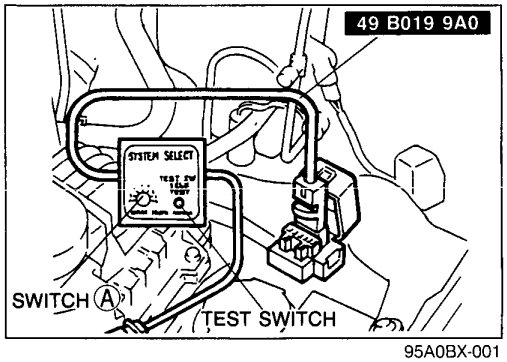
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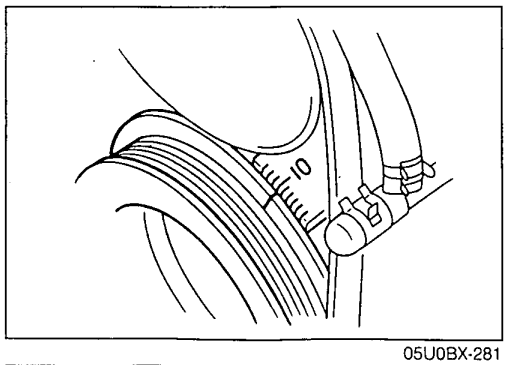
05U0BX-278

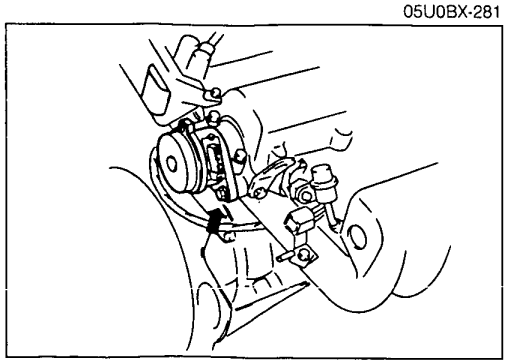


05U0BX-288



95A0BX-001


05U0BX-281


05U0BX-282

IGNITION TIMING, IDLE SPEED

Preparation

1. Check the engine condition (spark plugs, leaks in hoses, etc.).
2. Warm up the engine to normal operating temperature.
3. Make sure all accessories are OFF.

Note
- **When using an externally powered timing light and/or tachometer, connect it to the power connector (Blue: 1-pin).**

Caution
- **Do not ground the power connector terminal (Blue: 1-pin); the wiper 20A fuse will be burned.**

4. Connect a timing light and a tachometer to the diagnosis connector terminal IG–.

Caution
- **Be extremely careful when making connections to the diagnosis connector because a mistaken connection will cause a malfunction.**

5. Connect the **SST** to the diagnosis connector.
6. Set the **SST** switch Ⓐ to 1 position and test switch to SELF TEST position.

Note
- **If the SST is not used, jump across the (TEN) terminal and the (GND) terminal of the diagnosis connector.**

Ignition Timing Inspection / Adjustment

1. Check the idle speed and set it to specification if necessary.

Idle speed: 850 ± 50 rpm (Neutral)

2. Verify that the timing mark (Yellow) on the crankshaft pulley is aligned with the timing belt lower cover mark.

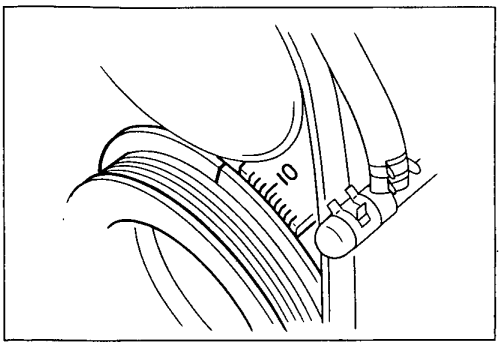
Ignition timing: 10° ± 1° BTDC (at idle speed)

3. If the marks are not aligned, loosen the crank angle sensor lock bolt and adjust by turning the crank angle sensor.
4. Tighten the crank angle sensor lock bolt.

Tightening torque:
19—25 N·m (1.9—2.6 m-kg, 14—19 ft-lb)

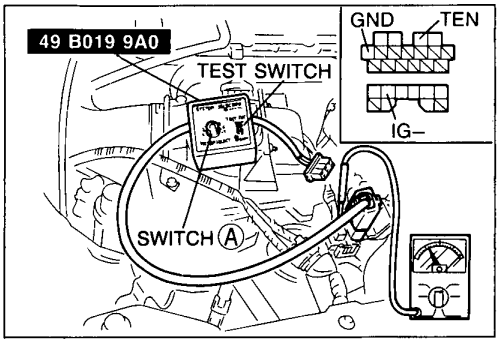
5. After adjusting the ignition timing, disconnect the **SST** or jumper wire from the diagnosis connector.

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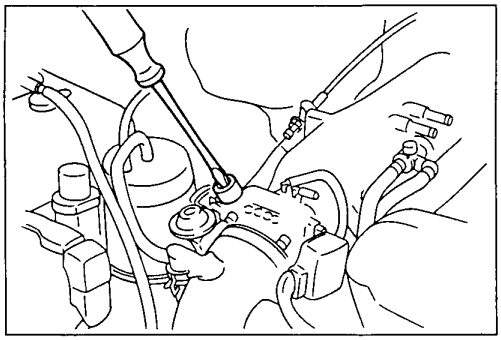
6. Increase the engine speed and verify that the ignition timing advances.



95A0BX-015

Idle Speed
Inspection / Adjustment

1. Connect the **SST** or jumper wire to the diagnosis connector. (Refer to page B–8.)
2. Set the **SST** switch Ⓐ to 1 position and test switch to SELF TEST position.



95A0BX-016

3. Verify that the idle speed is within specification.

   Idle speed: 850 ± 50 rpm (Neutral)

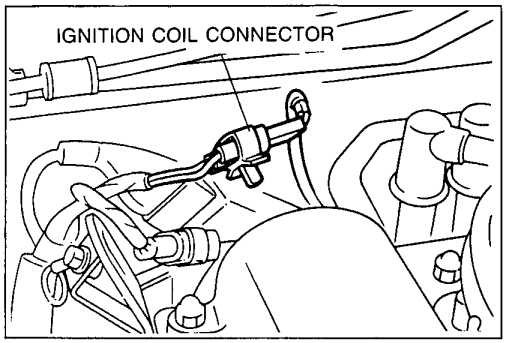
4. If the idle speed is not within specification, remove the blind cap from the air adjusting screw and adjust it.
5. After adjusting the idle speed, install the blind cap and disconnect the **SST** or jumper wire from the diagnosis connector.

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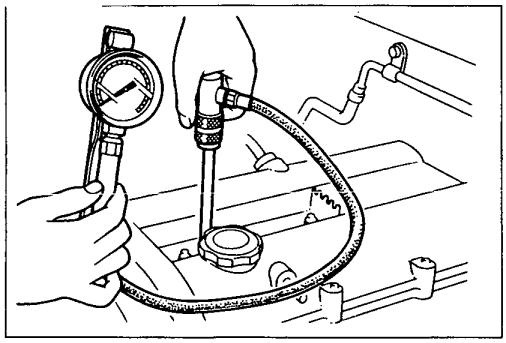
COMPRESSION

If the engine exhibits low power, poor fuel economy, or poor idle, check the following:
1. Ignition system (Refer to page G–17.)
2. Compression
3. Fuel system (Refer to page F 97.)

95E0BX-012



05U0BX-018



05U0BX-019

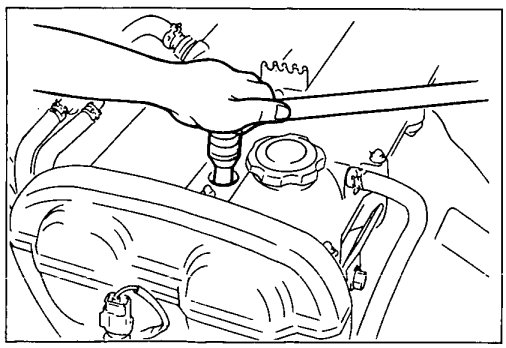
INSPECTION

1. Check that the battery is fully charged. Recharge it if necessary. (Refer to page G–8.)
2. Warm up the engine to the normal operating temperature.
3. Turn the engine OFF.
4. Remove all spark plugs.
5. Disconnect the ignition coil connector.
6. Connect a compression gauge to the No.1 spark plug hole.
7. Fully depress the accelerator pedal and crank the engine.
8. Record the maximum gauge reading.
9. Check each cylinder.

Compression:
1,324 kPa (13.5 kg/cm^2, 192 psi) - 300 rpm
Minimum:
932 kPa (9.5 kg/cm^2, 135 psi) - 300 rpm
Differential limit between cylinders:
196 kPa (2.0 kg/cm^2, 28 psi)

10. If the compression in one or more cylinders is low, pour a small amount of engine oil into the cylinder and recheck the compression.
    (1) If the compression increases, the piston, piston rings, or cylinder wall may be worn.
    (2) If the compression stays low, the valve may be stuck or seating improperly.
    (3) If the compression in adjacent cylinders stays low, the cylinder head gasket may be defective or the cylinder head distorted.
11. Connect the ignition coil connector.

05U0BX-020



05U0BX-021

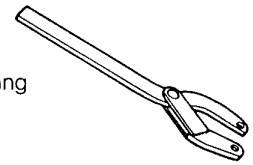
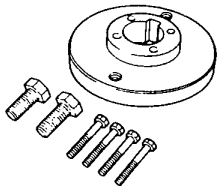
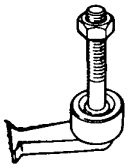
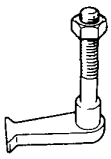
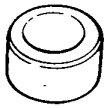
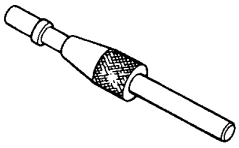
12. Apply antiseize compound or molybdenum-based lubricant to the spark plug threads.
13. Install the spark plugs.

Tightening torque:
15—23 N·m (1.5—2.3 m-kg, 11—17 ft-lb)

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ON-VEHICLE MAINTENANCE

PREPARATION
SST

49 S120 710 Holder, coupling flange 	For removal and installation of timing belt pulley	49 B011 102 Lock tool, crankshaft 	For removal and installation of timing belt pulley
49 E301 060 Brake, ring gear 	For prevention of engine rotation	49 E301 061 Body (Part of 49 E301 060) 	For prevention of engine rotation
49 E301 062 Collar (Part of 49 E301 060) 	For prevention of engine rotation	49 SE01 310 Centering tool, clutch disc 	For installation of clutch disc

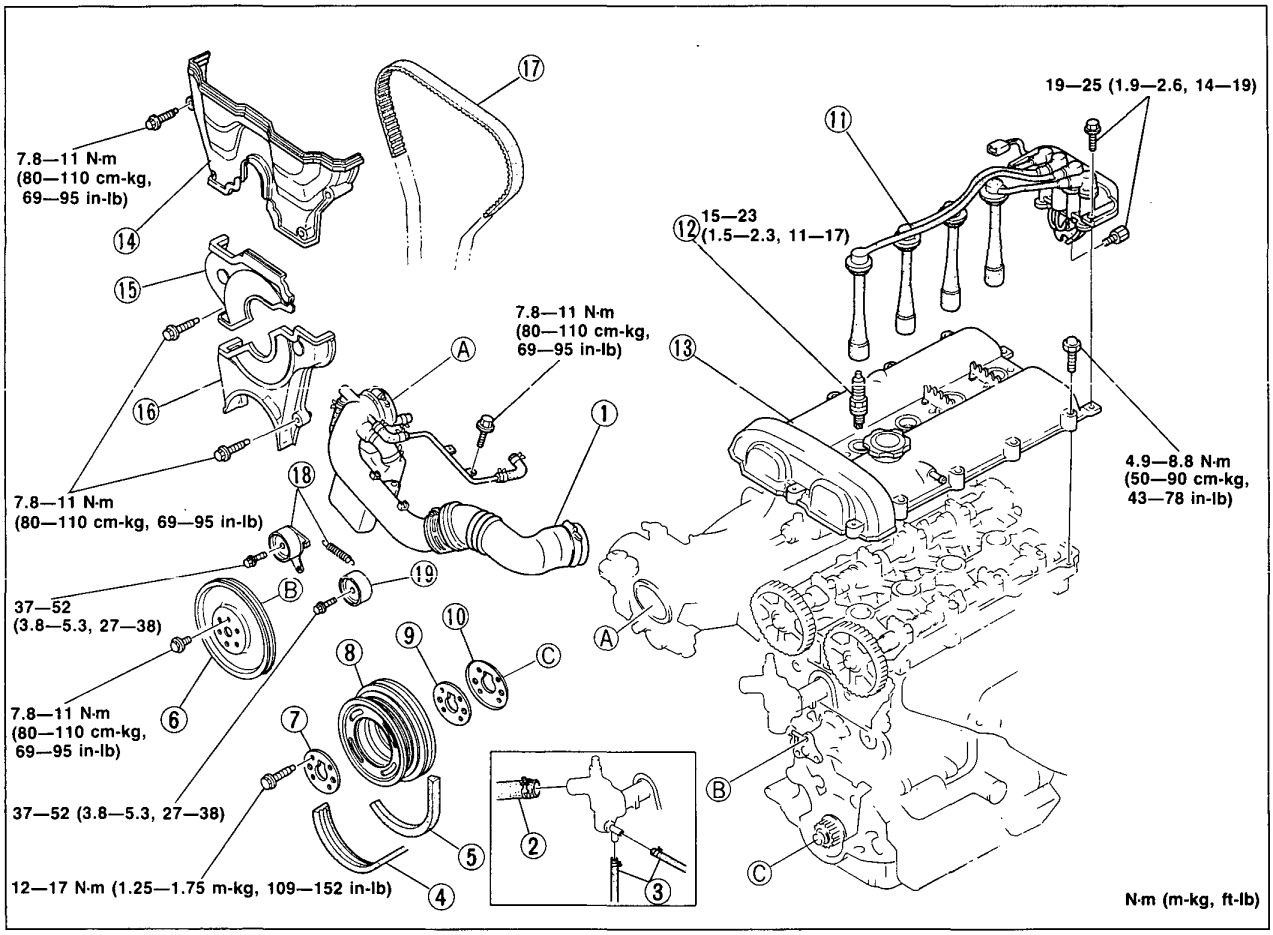
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TIMING BELT
Removal / Installation

Caution
- **Position the hose clamp in the original location on the hose, and squeeze the clamp lightly with large pliers to ensure a good fit.**

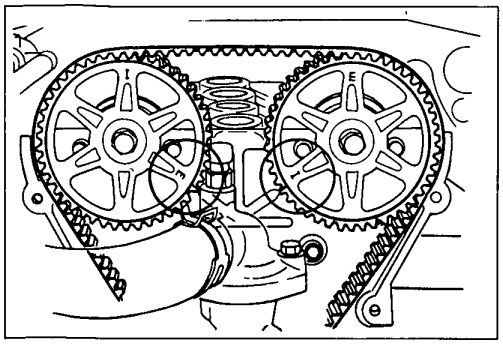
1. Disconnect the negative battery cable.
2. Drain the engine coolant.
3. Remove in the order shown in the figure, referring to **Removal Note**.
4. Install in the reverse order of removal, referring to **Installation Note**.



95E0BX-004

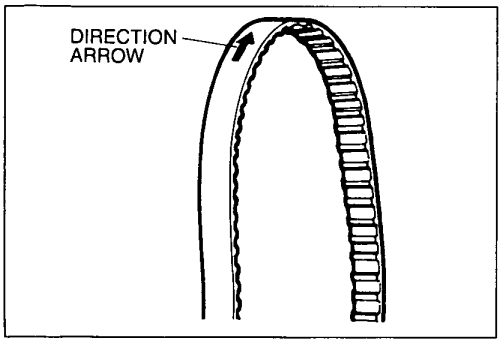
1. Air intake pipe
2. Upper radiator hose
3. Water hoses (Connect to thermostat housing)
4. P/S drive belt
   Removal / Installation ..... page B– 6
5. Alternator drive belt
   Removal / Installation ..... page B– 6
6. Water pump pulley
7. Plate
8. Crankshaft pulley
9. Timing belt guide plate, outer
10. Timing belt guide plate, inner
    Installation Note ..... page B–15
11. Ignition coil and high-tension lead
12. Spark plug
    Installation Note ..... page B–15
13. Cylinder head cover
    Installation Note ..... page B–15
14. Timing belt cover, upper
15. Timing belt cover, middle
16. Timing belt cover, lower
17. Timing belt
    Removal Note ..... page B–13
    Installation Note ..... page B–13
    Inspection ..... page B–59
18. Tensioner, tensioner spring
    Installation Note ..... page B–13
    Inspection ..... page B–59
19. Idler
    Inspection ..... page B–59

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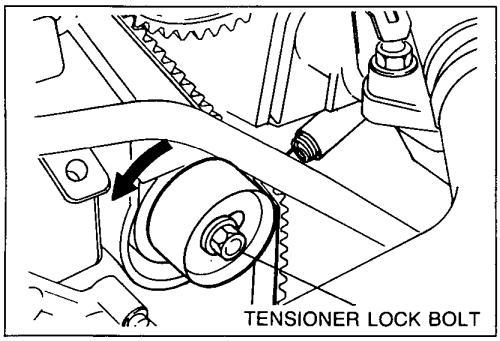
05U0BX-024

Removal note
Timing belt
1. Turn the crankshaft and align the marks.



05U0BX-025

Note
- **Mark the timing belt rotation for proper reinstallation.**

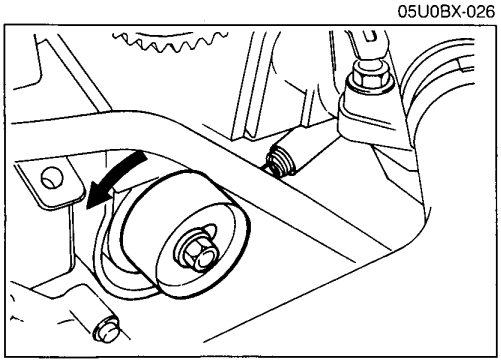


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2. Loosen the tensioner lock bolt.

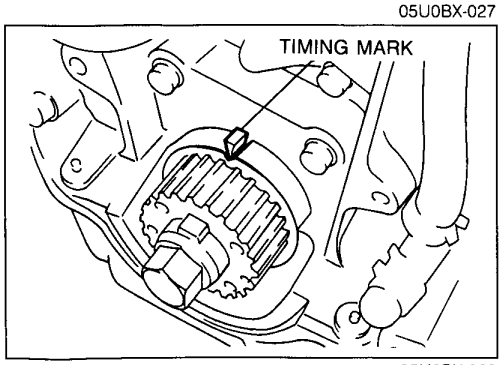
Caution
- **To prevent damage to the tensioner, secure it with a rag.**

3. Temporarily secure the tensioner with the spring fully extended.
4. Remove the timing belt.



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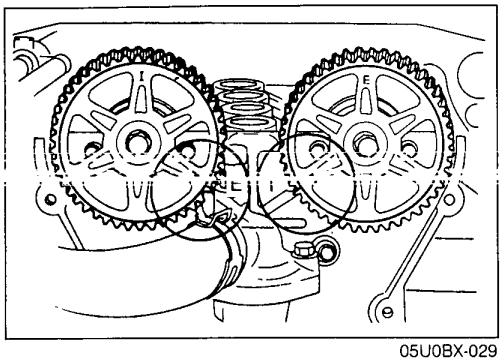
Installation note
Tensioner, tensioner spring
1. Install the tensioner and the tensioner spring.
2. Temporarily secure the tensioner with the spring fully extended.



05U0BX-028

Timing belt
1. Verify that the timing belt pulley mark is aligned with the timing mark.

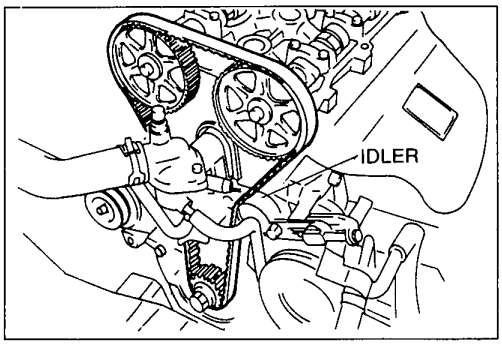
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05U0BX-029

2. Verify that the camshaft pulley marks are aligned with the seal plate marks.

Caution
- **For intake side, align the E mark.**
- **For exhaust side, align the I mark.**

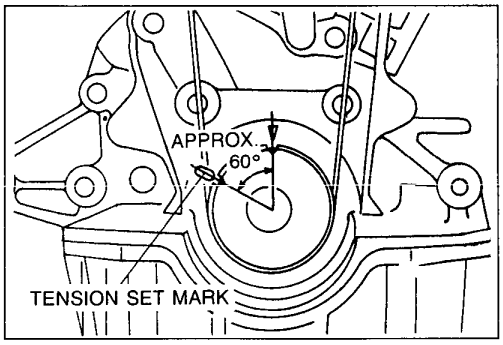


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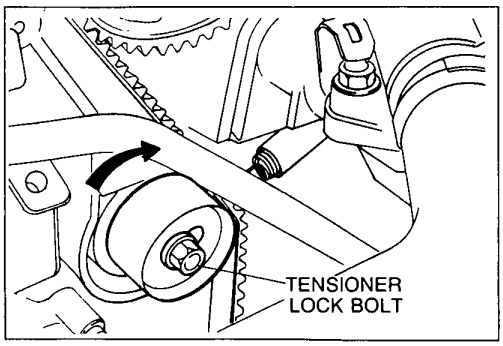
3. Install the timing belt so that there is no looseness at the idler side or between the two camshaft pulleys.

Caution
- **Do not turn the crankshaft counterclockwise.**

4. Turn the crankshaft two turns clockwise, and align the timing belt pulley mark with the timing mark.
5. Verify that the camshaft pulley marks are aligned with the seal plate marks.
   If not aligned, remove the timing belt and repeat from tensioner installation.
6. Turn the crankshaft 1 and 5/6 turn clockwise, and align the timing belt pulley mark with the tension set mark.



05U0BX-031

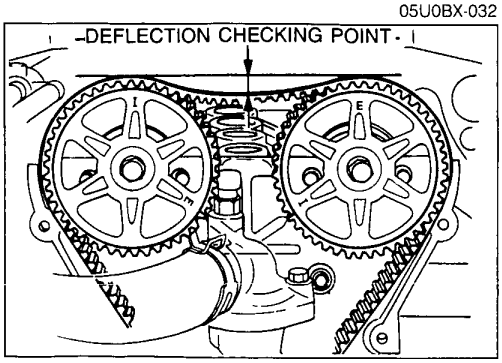


05U0BX-032

7. Loosen the tensioner lock bolt to apply tension to the timing belt.
8. Tighten the tensioner lock bolt.

Tightening torque:
37—52 N·m (3.8—5.3 m-kg, 27—38 ft-lb)

9. Turn the crankshaft 2 and 1/6 turns clockwise and verify that the timing marks are correctly aligned.

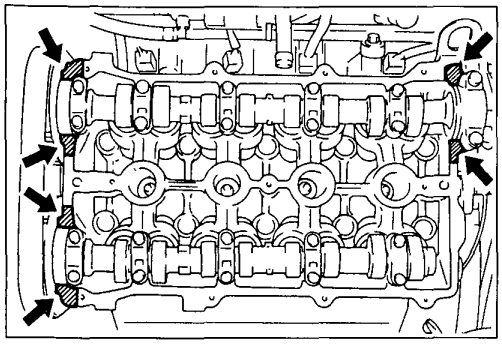


05U0BX-033

10. Measure the timing belt deflection by applying moderate pressure **(98 N, 10 kg, 22 lb)** midway between the two camshaft pulleys.
    If the deflection is not correct, repeat from Step 7 above.

Deflection:
9.0—11.5mm (0.35—0.45 in) at 98 N (10 kg, 22 lb)

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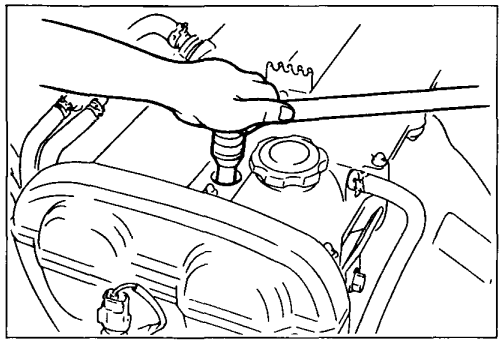


05U0BX-034

Cylinder head cover

1. Apply silicone sealant to the shaded areas as shown in the figure.
2. Install the cylinder head cover.

Tightening torque:
4.9—8.8 N·m (50—90 cm-kg, 43—78 in-lb)

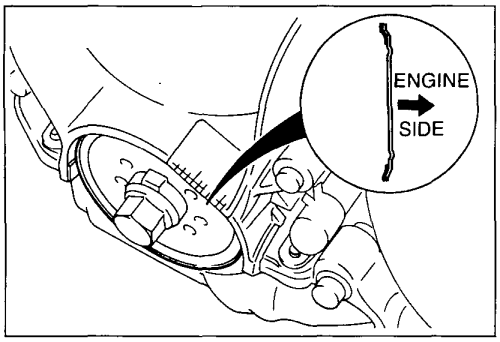


05U0BX-286

Spark plug

1. Apply antiseize compound or molybdenum-based lubricant to the spark plug threads.
2. Install the spark plugs.

Tightening torque:
15—23 N·m (1.5—2.3 m-kg, 11—17 ft-lb)



05U0BX-035

Timing belt guide plate, inner

Caution
- **Make sure the timing belt inner guide plate is installed in the proper direction.**

1. Install the timing belt inner guide plate.

Steps After Installation

1. Fill the radiator with the specified amount and type of engine coolant. (Refer to page E–5.)
2. Connect the negative battery cable.
3. Start the engine and check as follows:
   (1) Engine coolant leakage.
   (2) Ignition timing. (Refer to page B–8.)
4. Recheck the engine coolant levels.

05U0BX-036

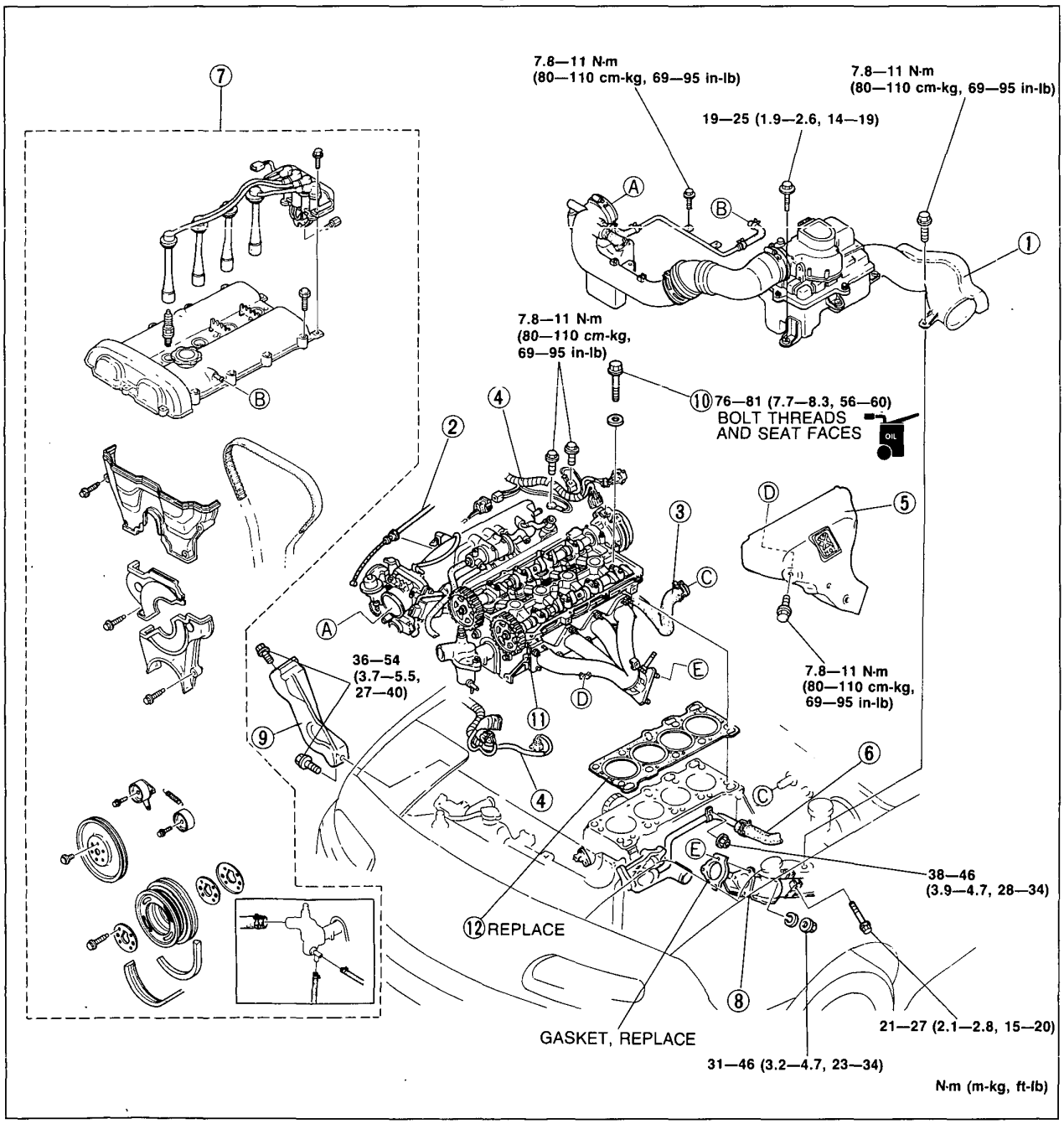
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CYLINDER HEAD GASKET
Replacement

Warning
- **Release the fuel pressure. (Refer to page F–98.)**
- **Keep sparks and open flame away from the fuel area.**

Caution
- **Position the hose clamp in the original location on the hose, and squeeze the clamp lightly with large pliers to ensure a good fit.**

1. Disconnect the negative battery cable.
2. Drain the engine coolant.
3. Remove in the order shown in the figure, referring to **Removal Note**.
4. Install in the reverse order of removal, referring to **Installation Note**.



95E0BX-013

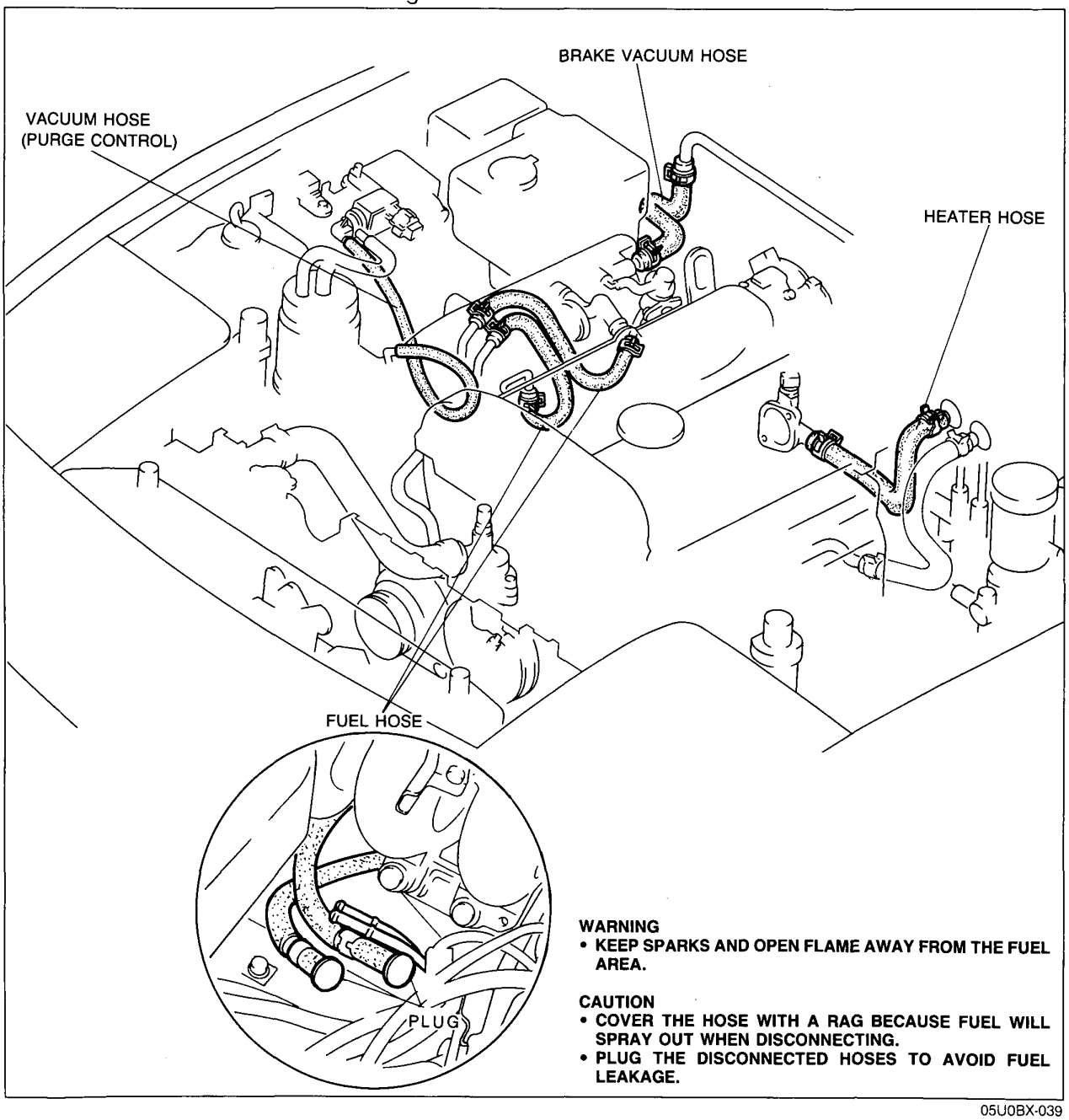
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1. Air cleaner assembly
2. Accelerator cable
   Installation Note ..... page B–19
3. Hoses
   Removal / Installation Note ..... page B–17
4. Harnesses
   Removal / Installation Note ..... page B–18
5. Exhaust manifold insulator
6. Water bypass pipe
   Removal Note ..... page B–18
7. Timing belt
   Removal / Installation ..... page B–12
8. Front exhaust pipe
9. Manifold bracket
10. Cylinder head bolt
    Removal Note ..... page B–18
    Installation Note ..... page B–19
11. Cylinder head
    Disassembly ..... page B–40
    Inspection ..... page B–48
    Assembly ..... page B–70
12. Cylinder head gasket

05U0BX-038

Removal / Installation note
Hoses

1. Disconnect the hoses shown in the figure.



WARNING
- **KEEP SPARKS AND OPEN FLAME AWAY FROM THE FUEL AREA.**

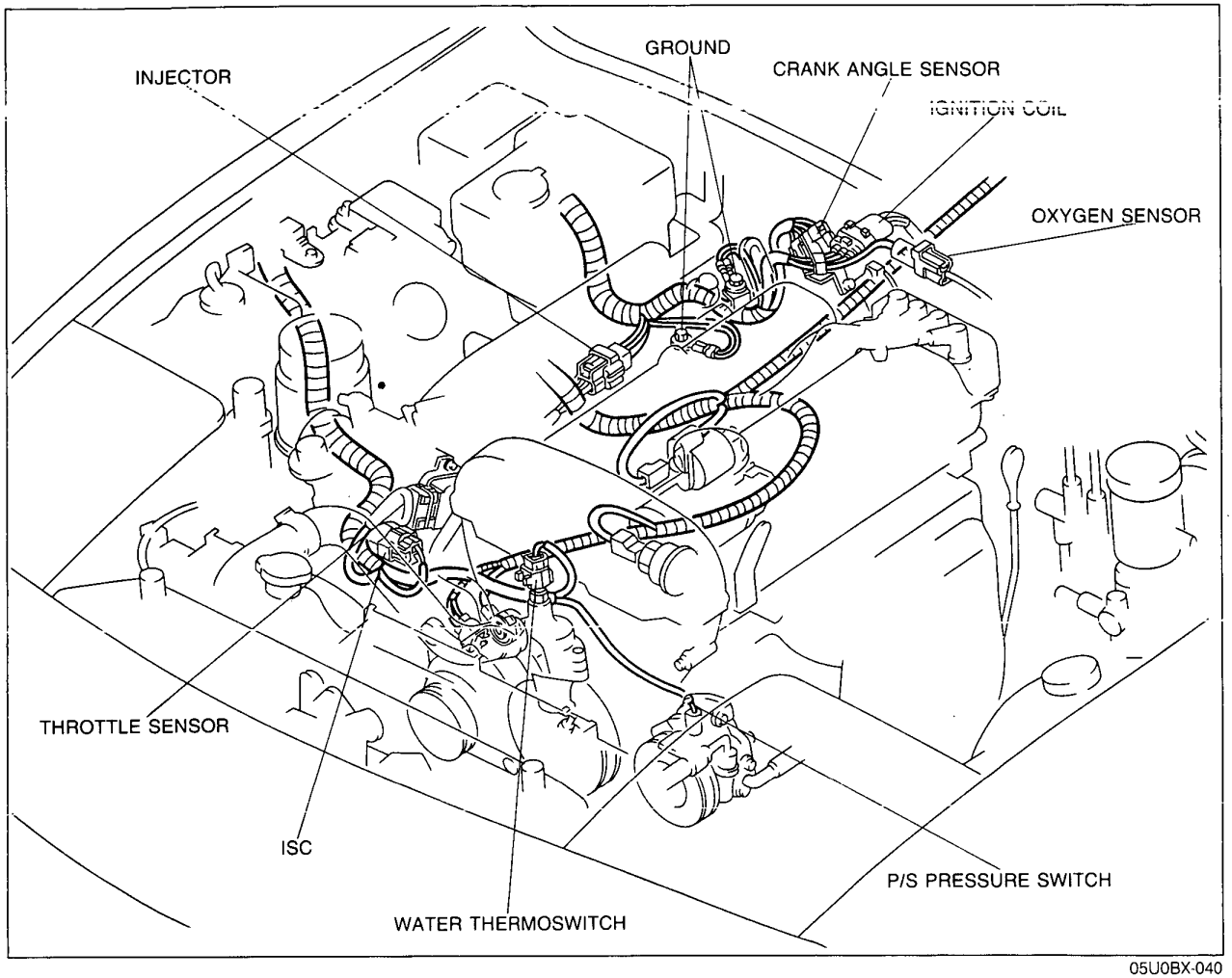
CAUTION
- **COVER THE HOSE WITH A RAG BECAUSE FUEL WILL SPRAY OUT WHEN DISCONNECTING.**
- **PLUG THE DISCONNECTED HOSES TO AVOID FUEL LEAKAGE.**

05U0BX-039

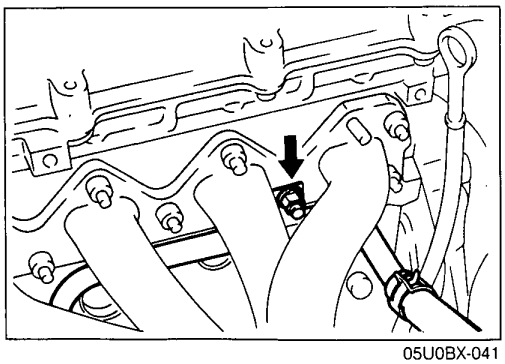
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Harnesses

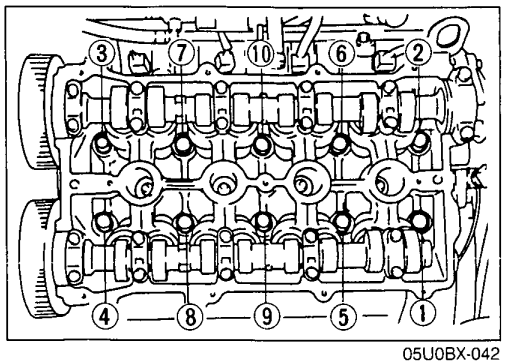
1. Disconnect the harness connectors shown in the figure.



05U0BX-040



05U0BX-041



05U0BX-042

Removal note

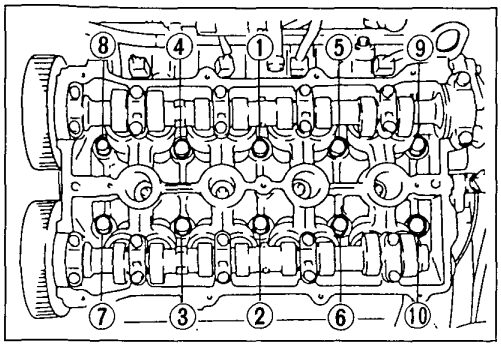
Water bypass pipe

1. Remove the exhaust manifold nut as shown in the figure.
2. Remove the water bypass pipe from the cylinder head assembly.

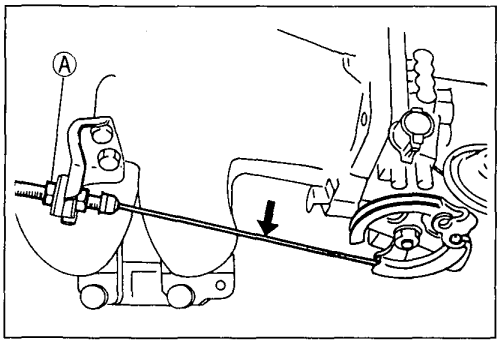
Cylinder head bolt

1. Loosen the cylinder head bolts in two or three steps in the order shown in the figure.
2. Remove the cylinder head bolts.

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05U0BX-043



05U0BX-045

Installation note
Cylinder head bolt
1. Apply clean engine oil to the bolt threads and seat faces.
2. Install the cylinder head bolts.
3. Tighten the cylinder head bolts in two or three steps in the order shown in the figure.

Tightening torque:
76—81 N·m (7.7—8.3 m-kg, 56—60 ft-lb)

Accelerator cable
1. Install the accelerator cable.
2. Check the accelerator cable deflection.
   If the deflection is not correct, adjust by turning nut A.

Deflection: 1—3mm (0.04—0.12 in)

Steps After Installation
1. Fill the radiator with the specified amount and type of engine coolant. (Refer to page E–5.)
2. Connect the negative battery cable.
3. Start the engine and check as follows:
   (1) Engine oil and engine coolant leakage.
   (2) Ignition timing, idle speed. (Refer to page B–8.)
   (3) Operation of emission control system.
4. Recheck the engine coolant levels.

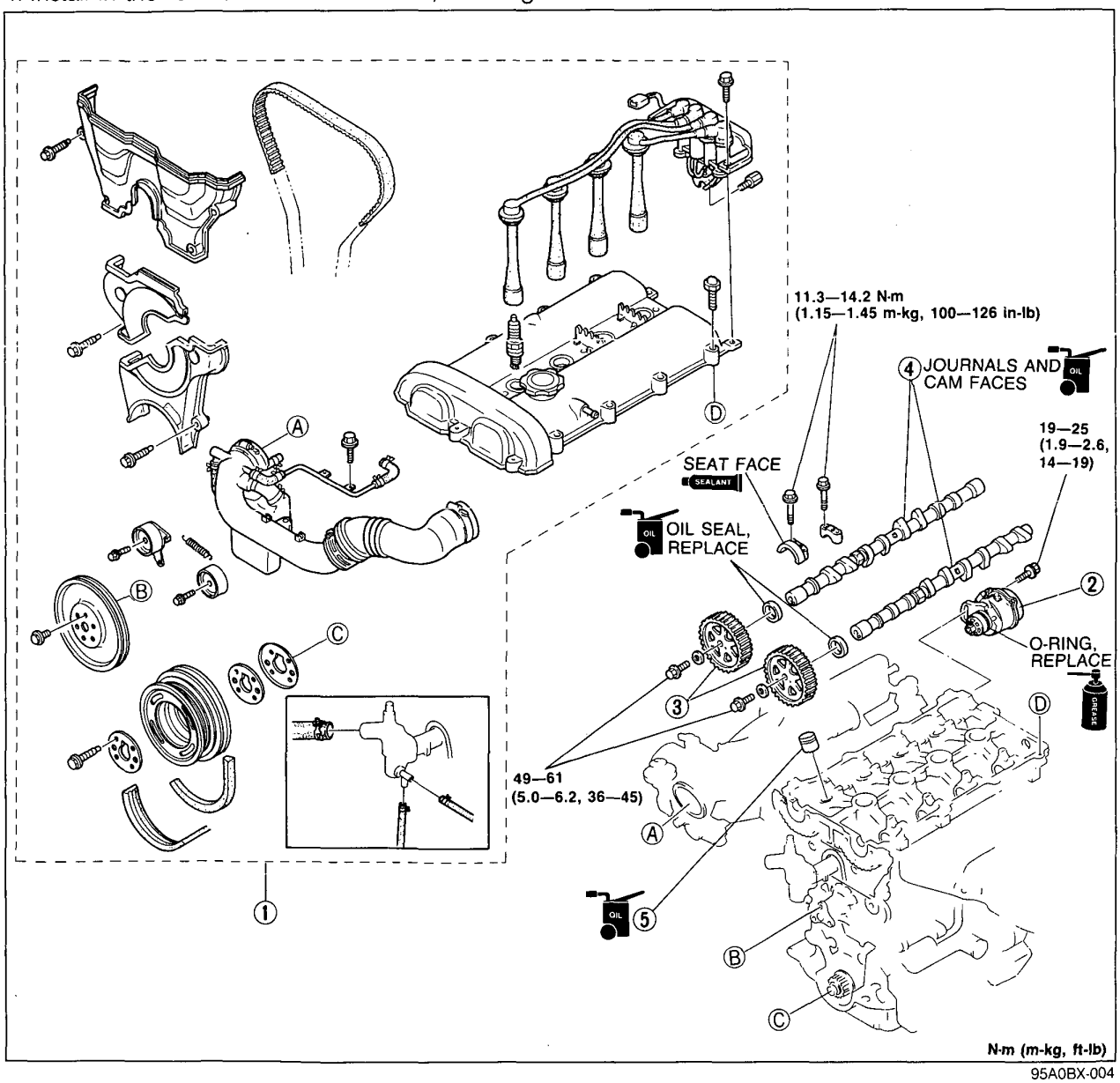
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HLA
Removal / Installation

Caution
- **Position the hose clamp in the original location on the hose, and squeeze the clamp lightly with large pliers to ensure a good fit.**

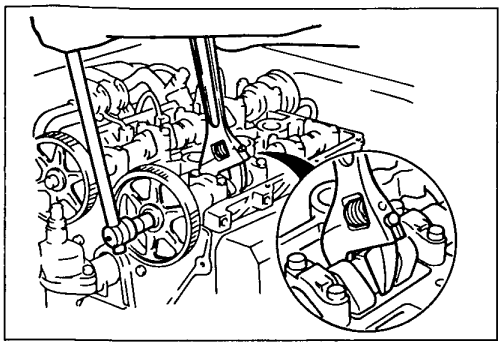
1. Disconnect the negative battery cable.
2. Drain the engine coolant.
3. Remove in the order shown in the figure, referring to **Removal Note**.
4. Install in the reverse order of removal, referring to **Installation Note**.



95A0BX-004

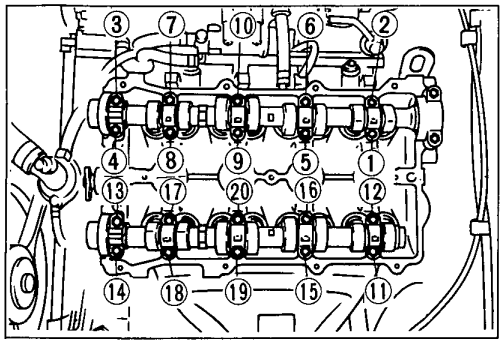
1. Timing belt
   Removal / Installation ..... page B–12
2. Crank angle sensor
   Installation Note ..... page B–23
3. Camshaft pulley
   Removal Note ..... page B–21
   Installation Note ..... page B–22
4. Camshaft
   Removal Note ..... page B–21
   Installation Note ..... page B–21
5. HLA
   Removal Note ..... page B–21
   Installation Note ..... page B–21
   Inspection ..... page B–54

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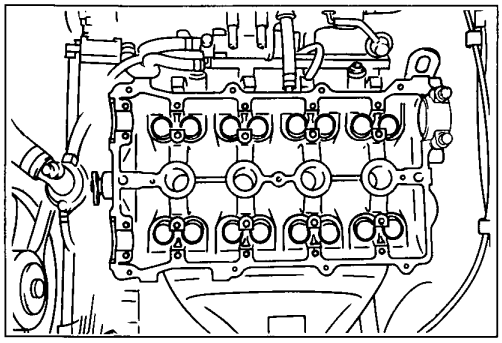
05U0BX-048

Removal note
Camshaft pulley
1. Hold the camshaft with a wrench.
2. Remove the camshaft pulley lock bolt.
3. Remove the camshaft pulley.



05U0BX-049

Camshaft
1. Loosen the camshaft cap bolts in two or three steps in the order shown in the figure.
2. Remove the camshaft caps.
3. Remove the camshaft.
4. Remove the camshaft oil seal from the camshaft.

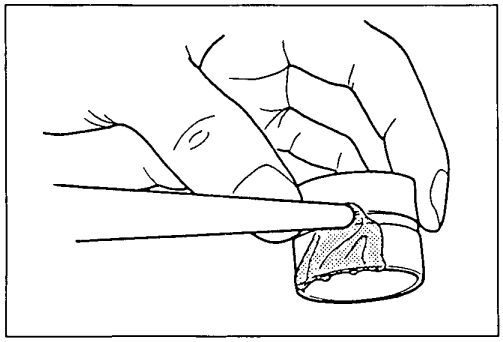


05U0BX-050

HLA

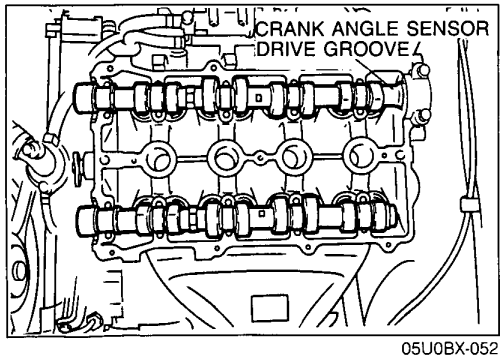
Caution
- **Mark the HLA with a felt pen so that they can be reinstalled in the position from which they were removed.**

1. Remove the HLA from the cylinder head.



05U0BX-051

Installation note
HLA
1. Apply clean engine oil to the friction surfaces.
2. If the HLA are being reused, install them in the position from which they were removed.
3. Verify that the HLA move smoothly in their bores.



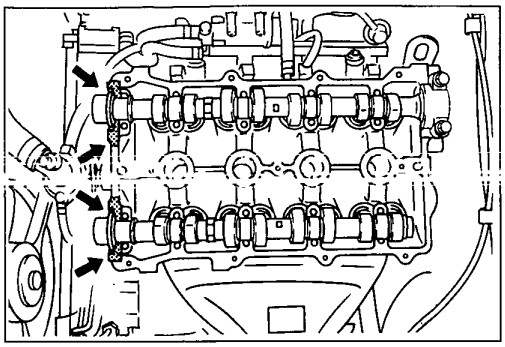
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Camshaft

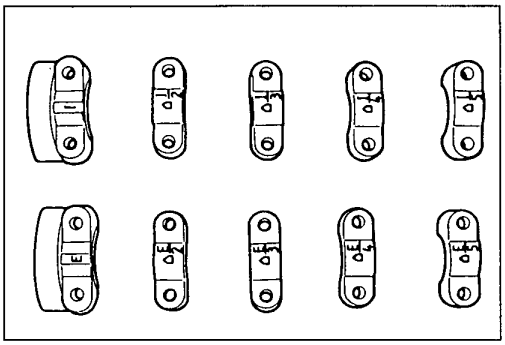
Note
- **The intake camshaft is grooved for the crank angle sensor drive.**

1. Apply clean engine oil to the camshaft journals and bearings.
2. Install the camshaft in position.

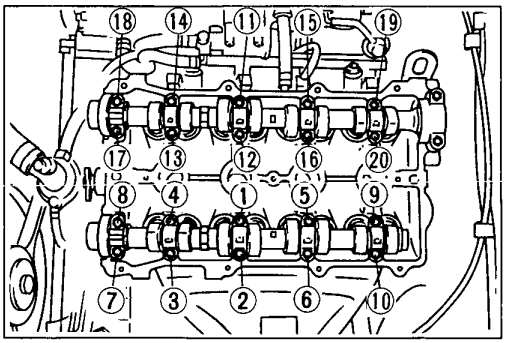
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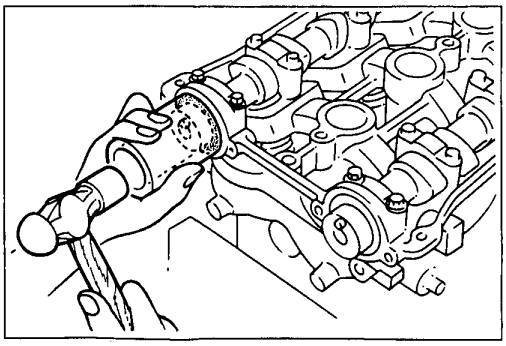
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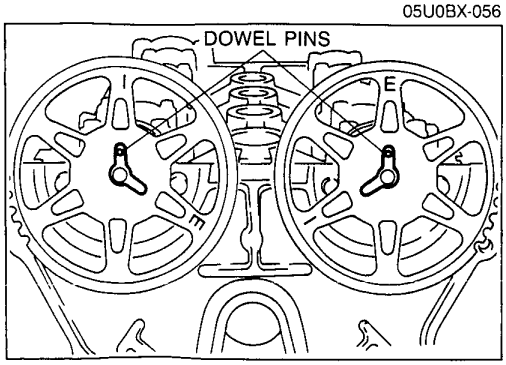
05U0BX-054



05U0BX-055



05U0BX-056



05U0BX-057

Caution
- **Do not allow any sealant on the camshaft journal surfaces.**

3. Apply silicone sealant to the shaded areas shown in the figure.

4. Install the camshaft caps according to the cap number and arrow mark.

5. Install the camshaft cap bolts and tighten them in two or three steps in the order shown in the figure.

Tightening torque:
11.3—14.2 N·m (1.15—1.45 m-kg, 100—126 in-lb)

6. Apply a small amount of clean engine oil to the lip of a new camshaft oil seal.
7. Push the oil seal slightly in by hand.

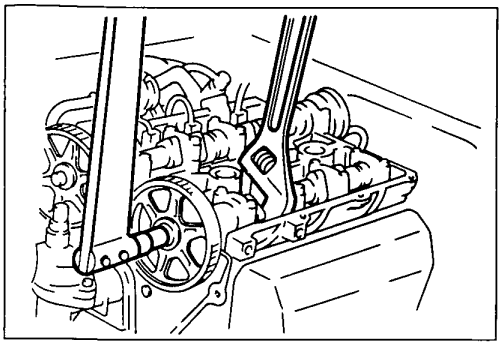
Caution
- **The oil seal must be tapped in until it is flush with the edge of the camshaft cap.**

8. Tap the oil seal in evenly with a suitable pipe and a hammer.

Oil seal outer diameter: 48mm (1.89 in)

Camshaft pulley
1. Turn the camshafts until the camshaft dowel pins face straight up.
2. Install the camshaft pulleys with the I mark (intake side) or the E mark (exhaust side) straight up.

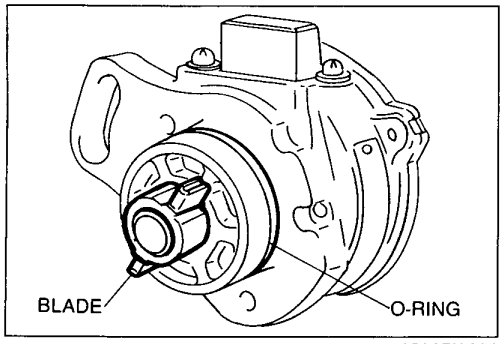
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05U0BX-058

3. Install the camshaft pulley lock bolts.
4. Hold the camshaft with a wrench.
5. Tighten the camshaft pulley lock bolt.

Tightening torque:
49—61 N·m (5.0—6.2 m-kg, 36—45 ft-lb)



95A0BX-005

Crank angle sensor
1. Apply clean engine oil to a new O-ring and the blade.
2. Install the crank angle sensor and loosely tighten the installation bolt.
3. Connect the crank angle sensor connector.

Steps After Installation
1. Fill the radiator with the specified amount and type of engine coolant. (Refer to page E–5.)
2. Connect the negative battery cable.
3. Start the engine and check as follows:
   (1) Engine coolant leakage.
   (2) Ignition timing. (Refer to page B–8.)
4. Recheck the engine coolant levels.

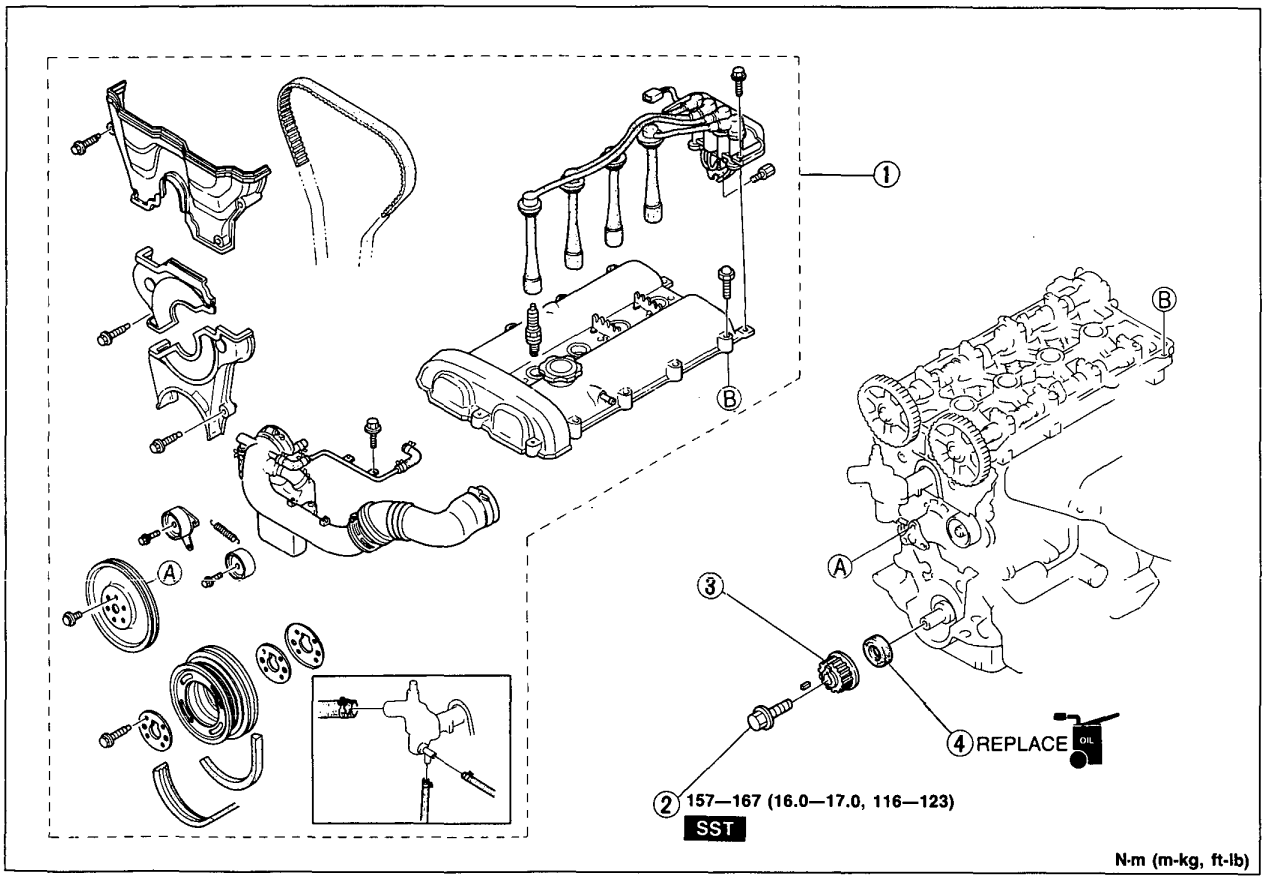
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FRONT OIL SEAL
Replacement

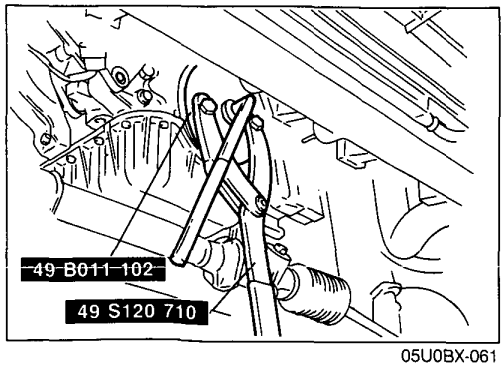
Caution
- **Position the hose clamp in the original location on the hose, and squeeze the clamp lightly with large pliers to ensure a good fit.**

1. Disconnect the negative battery cable.
2. Remove the under cover.
3. Remove in the order shown in the figure, referring to **Removal Note**.
4. Install in the reverse order of removal, referring to **Installation Note**.



95A0BX-006

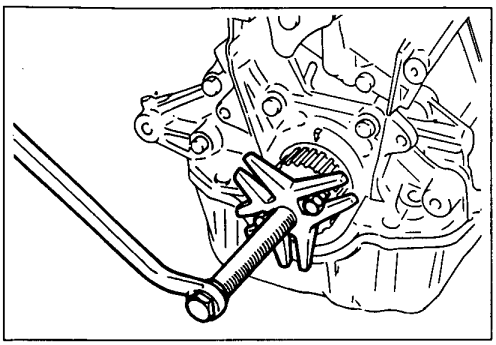
1. Timing belt
   Removal / Installation ..... page B–12
2. Pulley lock bolt
   Removal Note ..... page B–24
   Installation Note ..... page B–25
3. Timing belt pulley
   Removal Note ..... page B–25
   Installation Note ..... page B–25
4. Oil seal
   Removal Note ..... page B–25
   Installation Note ..... page B–25



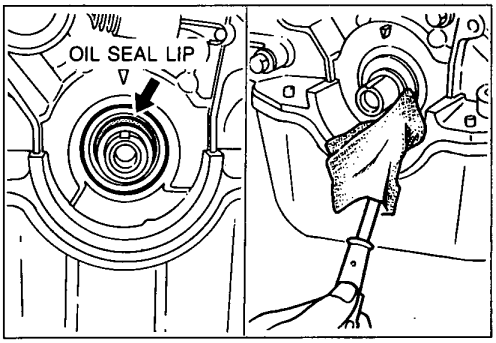
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Removal note
Pulley lock bolt
1. Hold the timing belt pulley with the **SST**.
2. Connect the **SST** and loosen the pulley lock bolt.
3. Remove the pulley lock bolt.

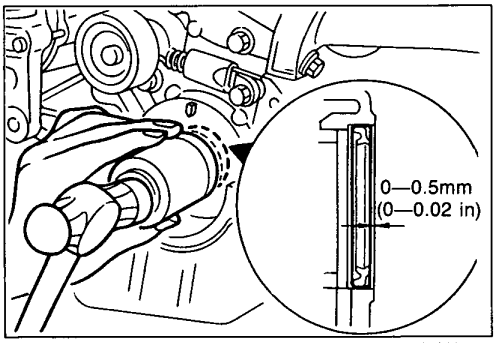
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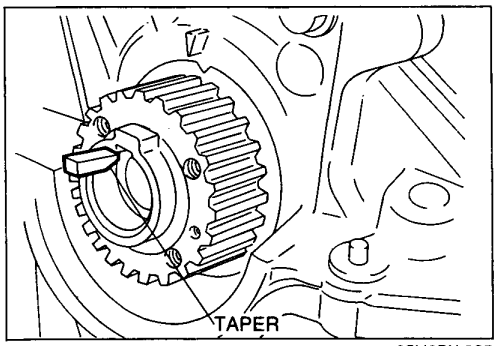
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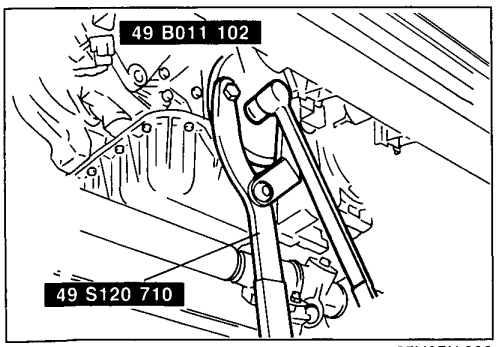
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05U0BX-064



05U0BX-065



05U0BX-066

Timing belt pulley

Note
- **If necessary, remove the pulley with a steering wheel puller (commercially available).**

1. Remove the timing belt pulley.
2. Remove the pulley Woodruff key.

Oil seal
1. Cut the oil seal lip with a razor knife.
2. Remove the oil seal with a screwdriver protected with a rag.

Installation note
Oil seal
1. Apply a small amount of clean engine oil to the lip of a new oil seal.
2. Push the oil seal slightly in by hand.

Caution
- **The oil seal must be tapped in until it is flush with the edge of the oil pump body.**

3. Tap the oil seal in evenly with a suitable pipe and a hammer.

Oil seal outer diameter: 44mm (1.73 in)

Timing belt pulley
1. Install the timing belt pulley.
2. Install the pulley Woodruff key with the tapered side toward the oil pump body.

Pulley lock bolt
1. Install the pulley lock bolt.
2. Tighten the pulley lock bolt using the two **SST**.

Tightening torque:
157—167 N·m (16.0—17.0 m-kg, 116—123 ft-lb)

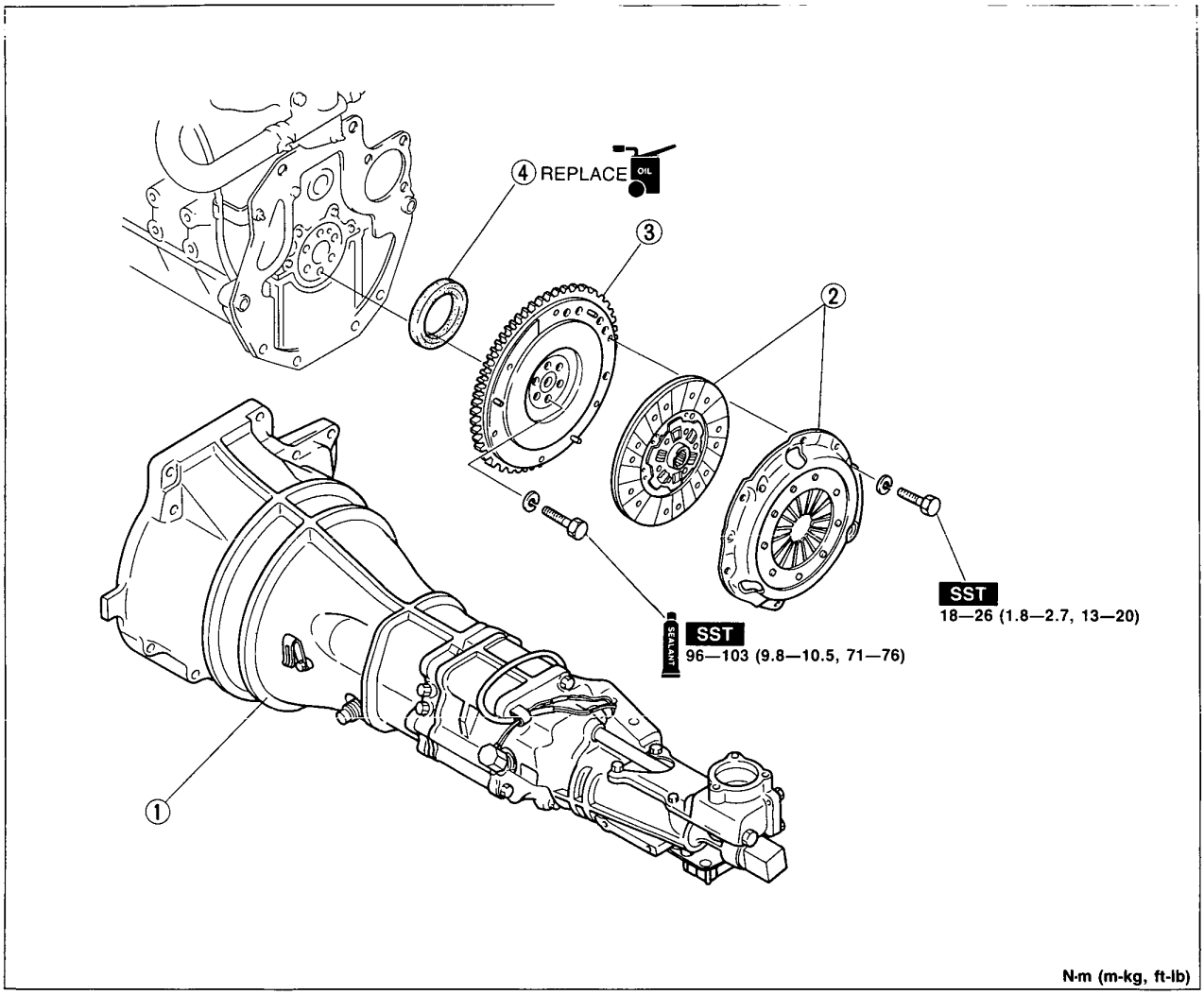
Steps After Installation
1. Install the under cover.
2. Fill the radiator with the specified amount and type of engine coolant. (Refer to page E–5.)
3. Connect the negative battery cable.
4. Start the engine and check as follows:
   (1) Engine coolant leakage.
   (2) Ignition timing. (Refer to page B–8.)
5. Recheck the engine coolant levels.

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REAR OIL SEAL

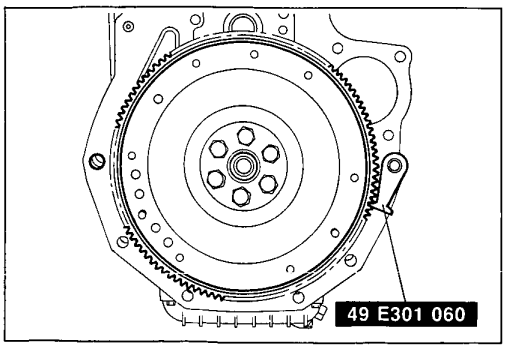
Replacement

1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure, referring to **Removal Note**.
3. Install in the reverse order of removal, referring to **Installation Note**.



95A0BX-007

1. Transmission
   Service..... page J–10, 45
2. Clutch cover, clutch disc
   Service..... page H–14
3. Flywheel
   Removal Note..... page B–26
   Installation Note..... page B–27
4. Oil seal
   Removal Note..... page B–27
   Installation Note..... page B–27



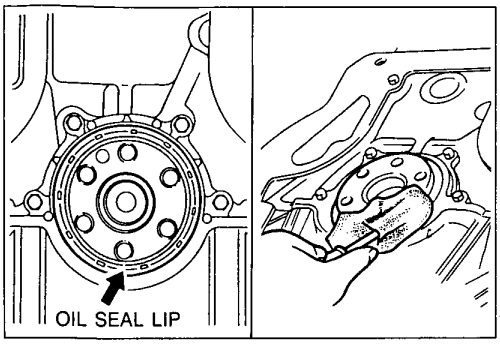
05U0BX-068

Removal note

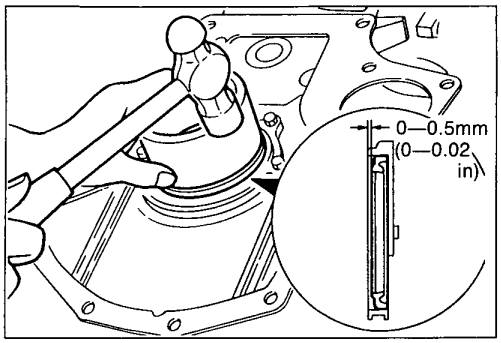
Flywheel

1. Hold the flywheel with the **SST**.
2. Remove the flywheel lock bolts.
3. Remove the flywheel.

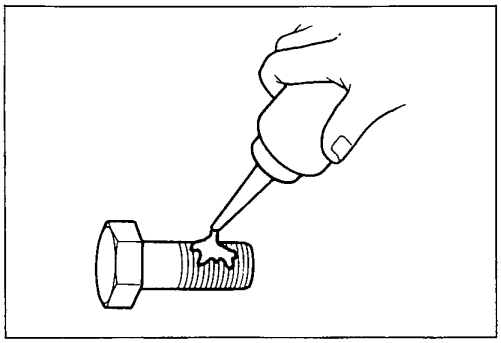
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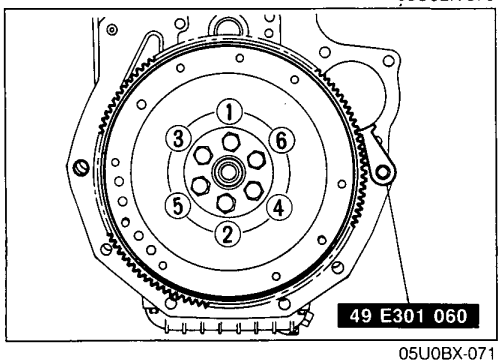
05U0BX-063



05U0BX-069



05U0BX-070



05U0BX-071

Oil seal

1. Cut the oil seal lip with a razor knife.
2. Remove the oil seal with a screwdriver protected with a rag.

Installation note

Oil seal

1. Apply a small amount of clean engine oil to the lip of a new oil seal.
2. Push the oil seal slightly in by hand.

Caution

- **The oil seal must be tapped in until it is flush with the edge of the rear cover.**

3. Tap the oil seal in evenly with a suitable pipe and a hammer.

Oil seal outer diameter: 100mm (3.94 in)

Flywheel

1. Remove the sealant from the flywheel bolt holes in the crankshaft and from the flywheel bolts.

Caution

- **If all the previous sealant cannot be removed from a bolt, replace the bolt.**
- **Do not apply sealant if a new bolt is used.**

2. Set the flywheel onto the crankshaft.
3. Apply sealant to the flywheel bolts and install them.
4. Hold the flywheel with the **SST**.
5. Tighten the bolts in two or three steps in the order shown in the figure.

Tightening torque:
96—103 N·m (9.8—10.5 m-kg, 71—76 ft-lb)

Steps After Installation

1. Connect the negative battery cable.
2. Start the engine and perform engine adjustments as necessary.

05U0BX-072

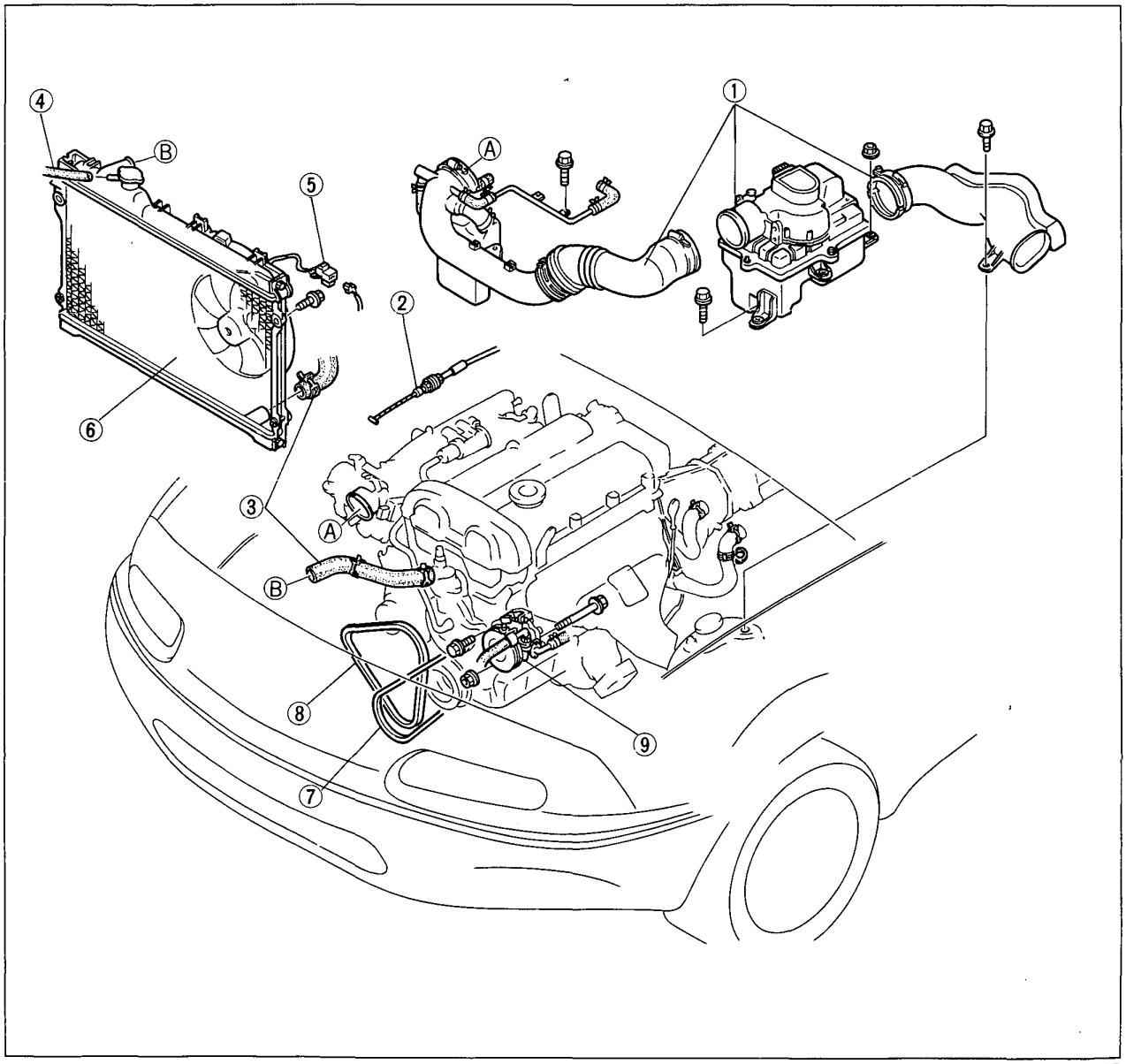
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REMOVAL

Warning
- **Release the fuel pressure. (Refer to page F–98.)**

PROCEDURE
1. Disconnect the negative battery cable.
2. Drain the engine coolant.
3. Remove the under cover.
4. Remove in the order shown in the figure, referring to **Removal Note**.

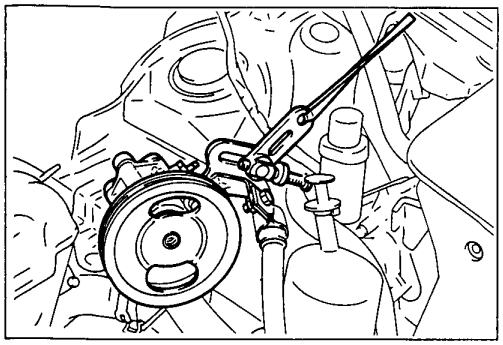
Step 1



95E0BX-005

1. Air cleaner assembly
2. Accelerator cable
3. Radiator hose
4. Coolant reservoir hose
5. Cooling fan connector
6. Radiator and cooling fan assembly
7. P/S drive belt
   Removal ..... page B– 6
8. Alternator drive belt
   Removal ..... page B– 6
9. P/S oil pump
   Removal Note..... page B–29

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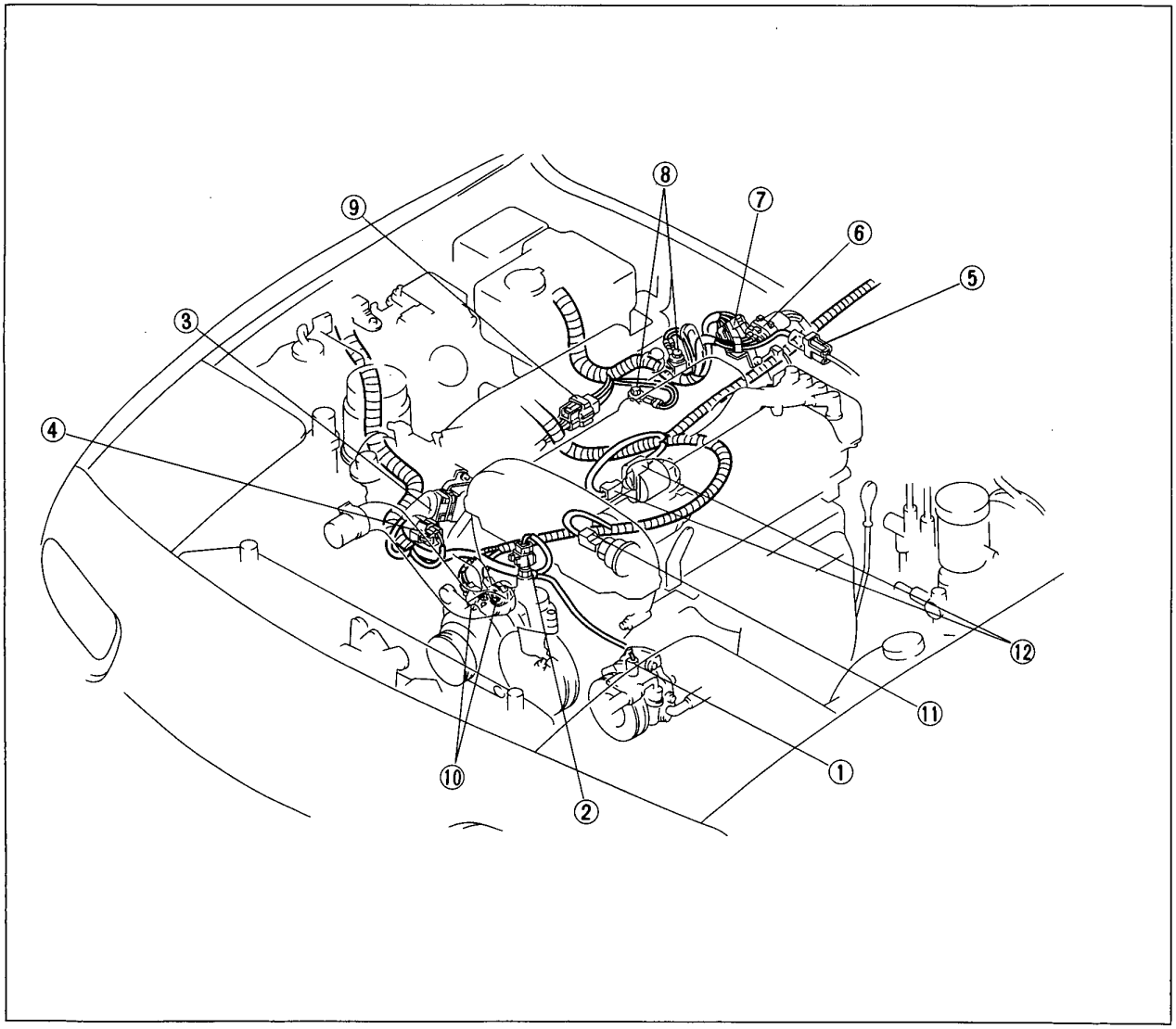

05U0BX-074

Removal note
P/S oil pump

Caution
- **Do not damage the hoses.**

1. Remove the P/S oil pump with the hoses still connected.
2. Position the pump away from the engine and affix it with wire.

Step 2
1. Disconnect the harness connectors shown in the figure.



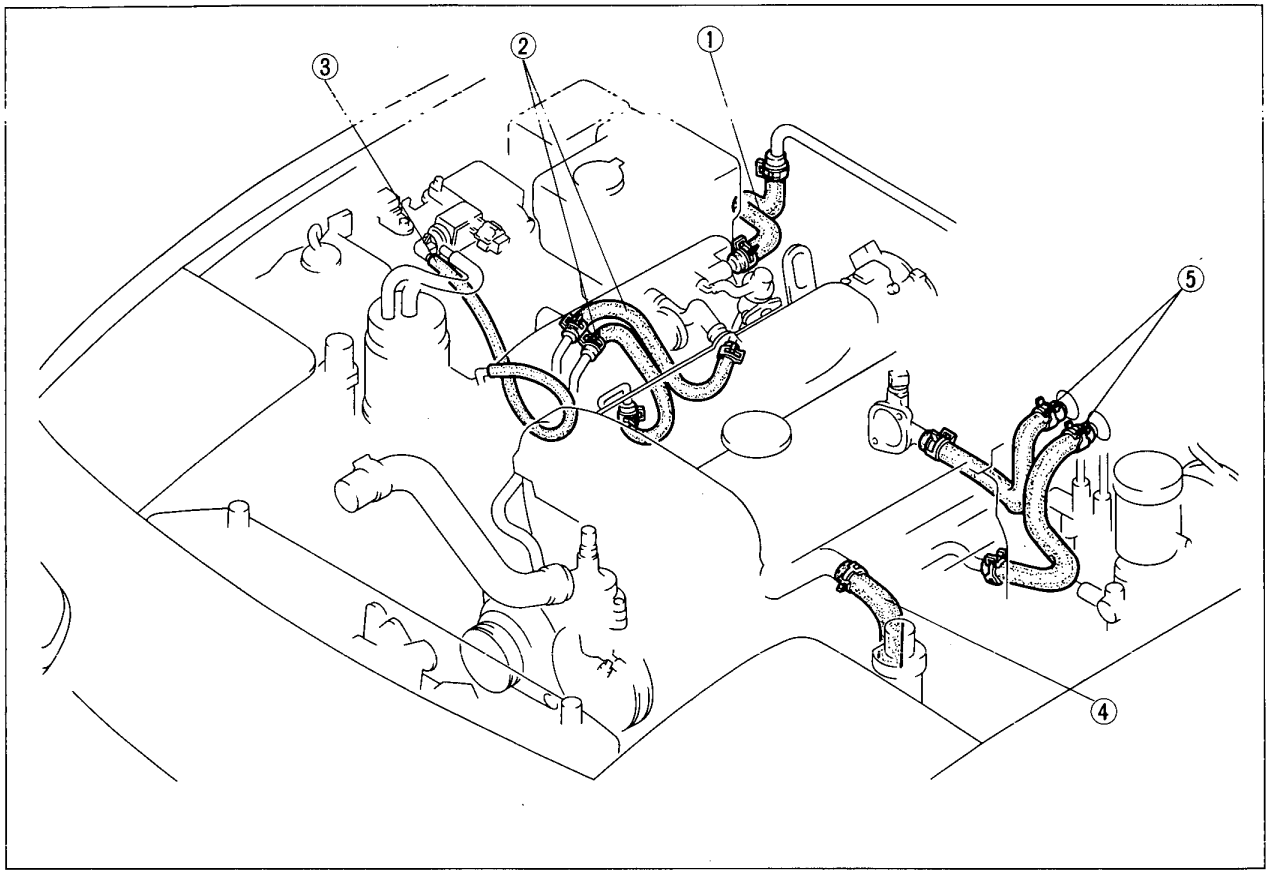
05U0BX-076

1. P/S pressure switch
2. Water thermoswitch
3. Throttle sensor
4. ISC
5. Oxygen sensor
6. Ignition coil
7. Crank angle sensor
8. Ground
9. Injector
10. Alternator
11. Oil pressure gauge
12. Starter

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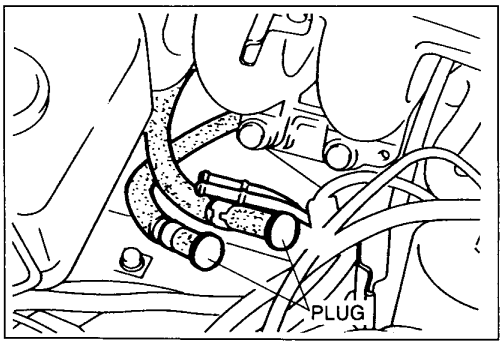
Step 3

1. Disconnect the hoses shown in the figure.



95A0BX-009

1. Brake vacuum hose
2. Fuel hose
   Removal Note..... page B–30
3. Vacuum hose (Purge control)
4. Water inlet hose
5. Heater hose



05U0BX-078

Removal note
Fuel hose

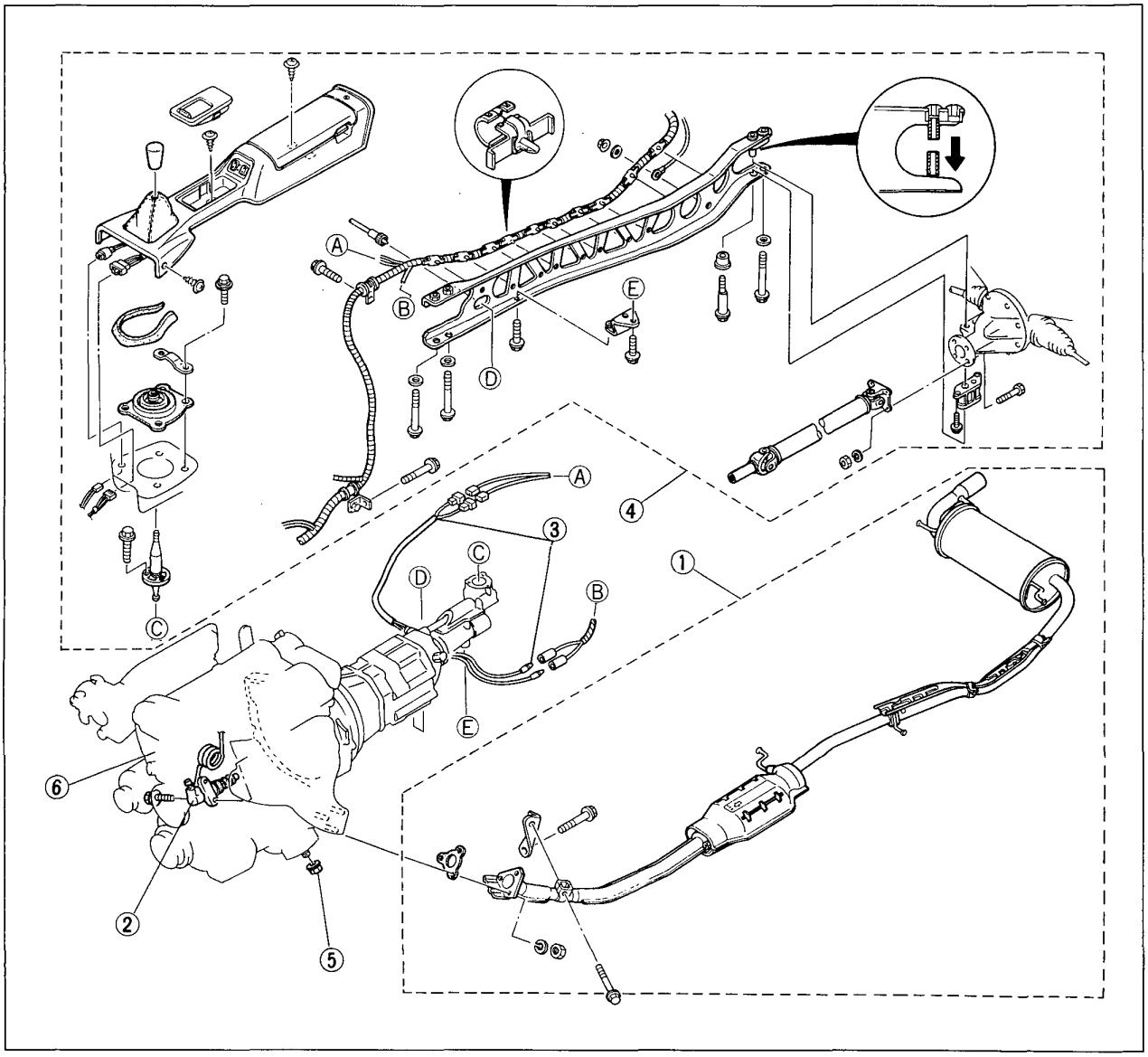
Warning
- **Keep sparks and open flame away from the fuel area.**

Caution
- **Cover the hose with a rag because fuel will spray out when disconnecting.**
- **Plug the disconnected hoses to avoid fuel leakage.**

1. Disconnect the fuel hoses.

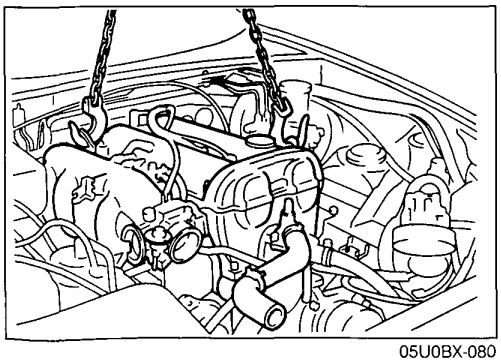
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Step 4



95E0BX-014

1. Exhaust pipe
   Service ..... page F–112
2. Clutch release cylinder
3. Transmission harness
4. Shift knob, speedometer cable, propeller shaft, and power plant frame
   Service ..... page J–10
5. Engine mount nut
6. Engine and transmission assembly
   Removal Note ..... page B–31



05U0BX-080

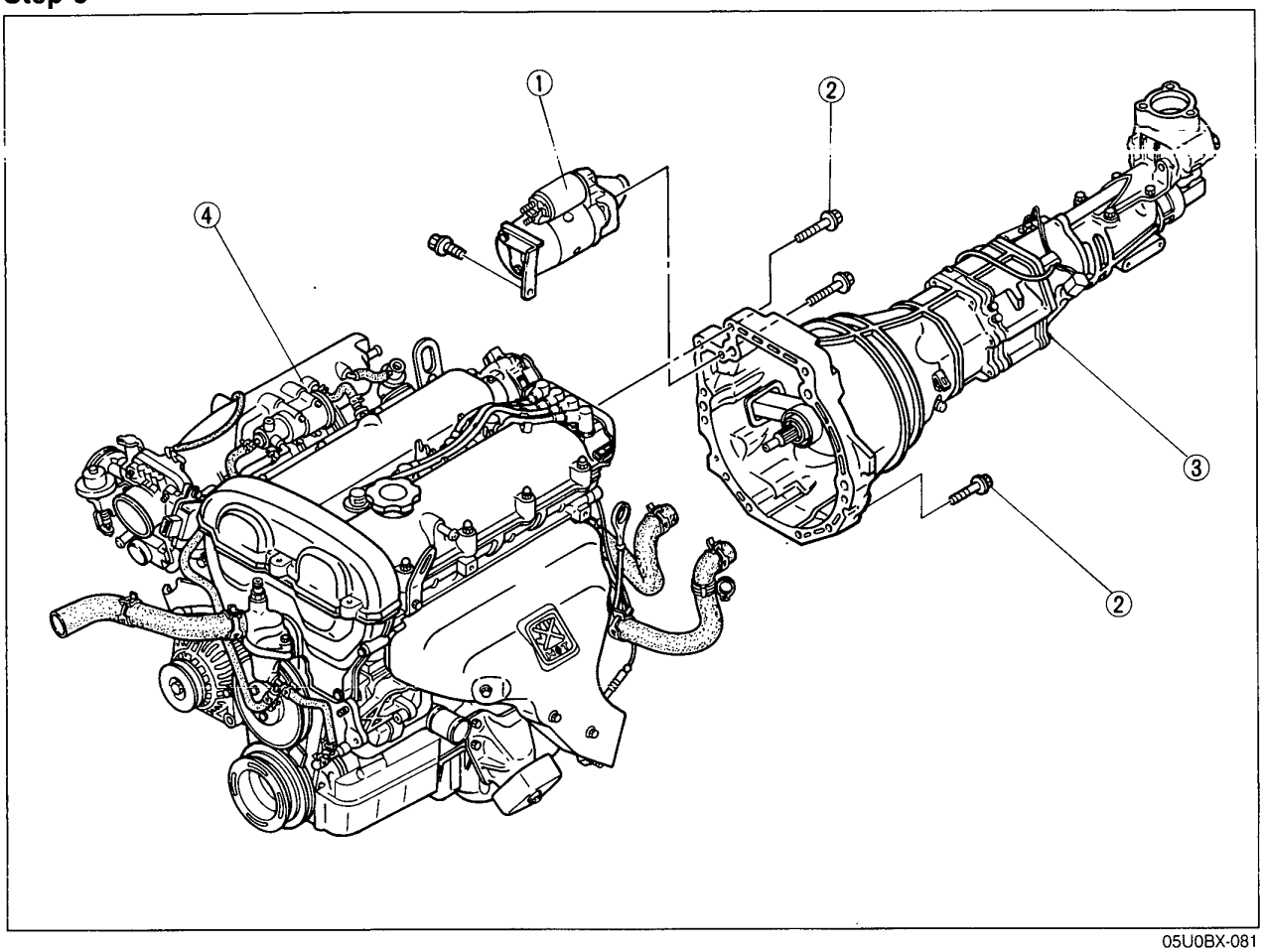
Removal note
Engine and transmission assembly

Caution
- **Do not damage any components in the engine compartment.**

1. Lift the engine and transmission assembly out as a unit.

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Step 5



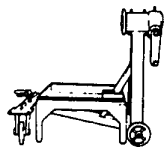
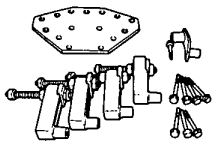
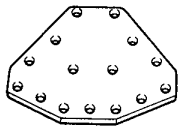
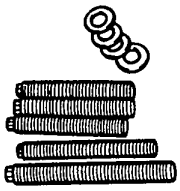
05U0BX-081

1. Starter
2. Transmission mounting bolt
3. Transmission
4. Engine assembly

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ENGINE STAND MOUNTING

PREPARATION
SST

49 0107 680A Engine stand 	For disassembly and assembly of engine	49 L010 1A0 Hanger set, engine stand 	For disassembly and assembly of engine
49 L010 101 Plate (Part of 49 L010 1A0) 	For disassembly and assembly of engine	49 L010 102 Arms (Part of 49 L010 1A0) 	For disassembly and assembly of engine
49 L010 103 Hooks (Part of 49 L010 1A0) 	For disassembly and assembly of engine	49 L010 104 Nuts (Part of 49 L010 1A0) 	For disassembly and assembly of engine
49 L010 105 Bolts (Part of 49 L010 1A0) 	For disassembly and assembly of engine	49 L010 106 Bolts (Part of 49 L010 1A0) 	For disassembly and assembly of engine

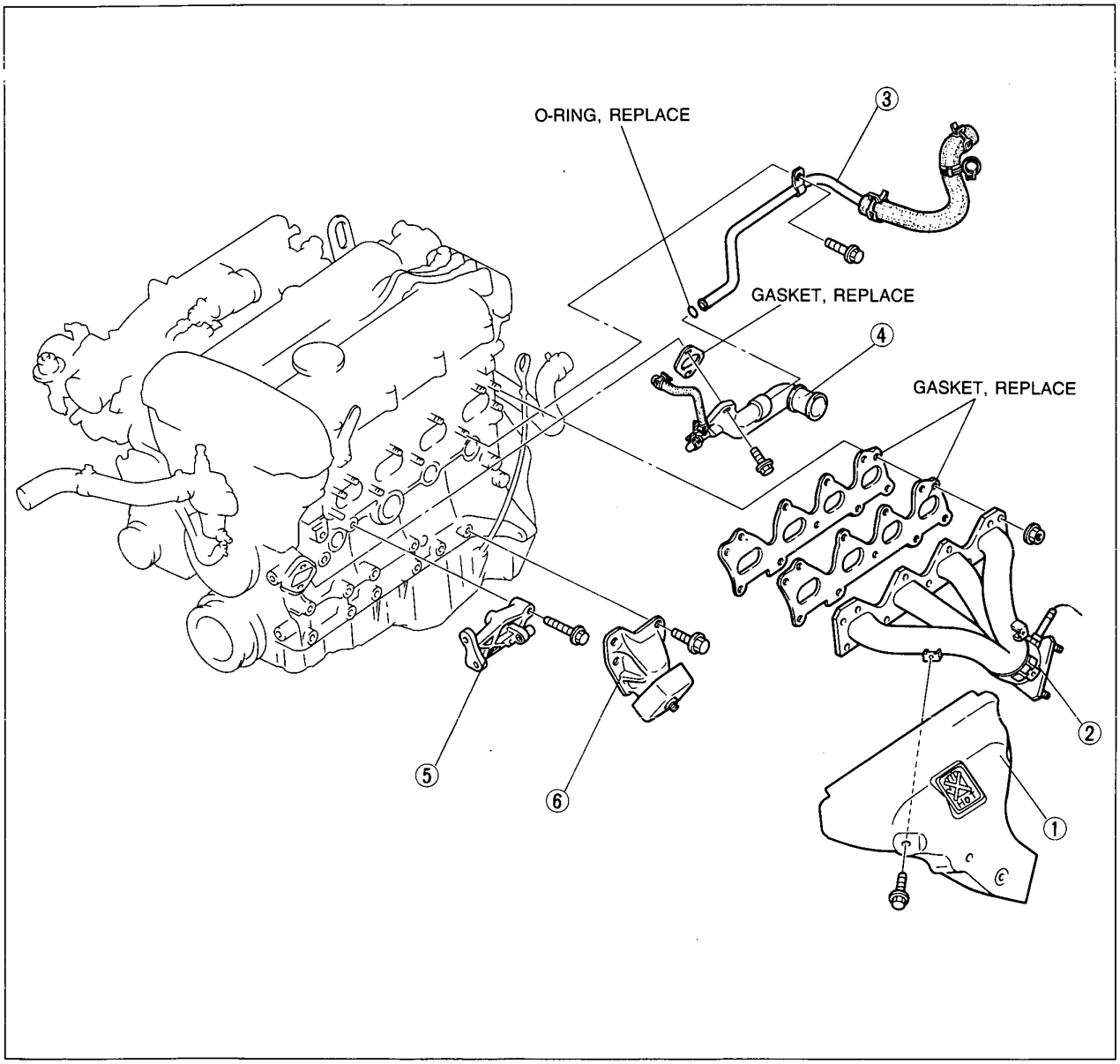
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PROCEDURE

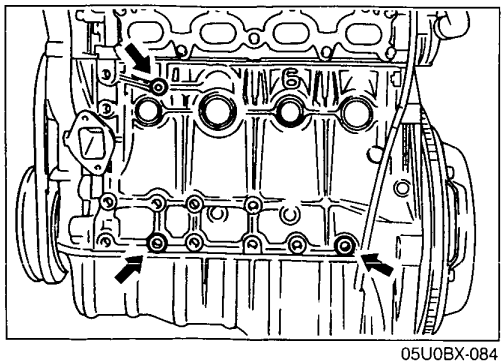
Step 1

1. Remove in the order shown in the figure.



95E0BX-006

1. Exhaust manifold insulator
2. Exhaust manifold
3. Water bypass pipe
4. Water inlet pipe
5. P/S oil pump bracket
6. Left engine mount



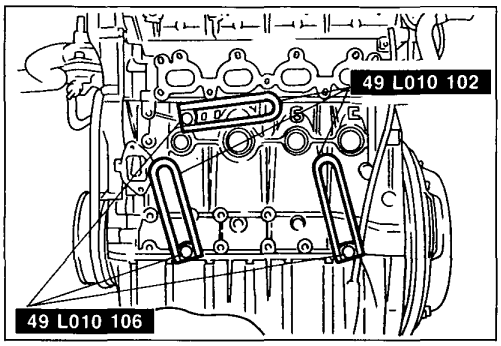
05U0BX-084

Step 2

Caution

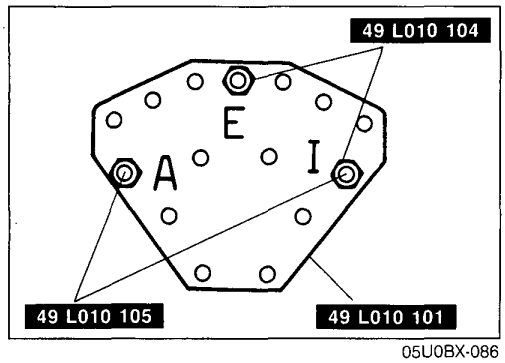
- **When installing the SST (engine hanger), use the holes shown in the figure.**

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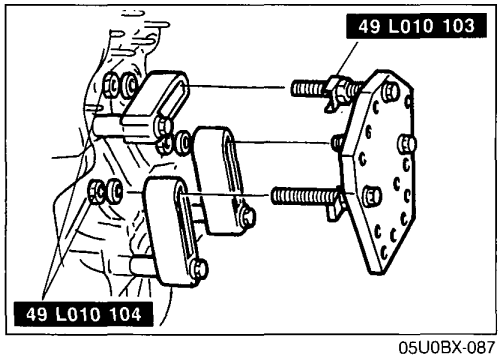
05U0BX-085

1. Install the **SST (arms)** to the holes as shown in the figure, and loosely tighten the **SST (bolts)**.



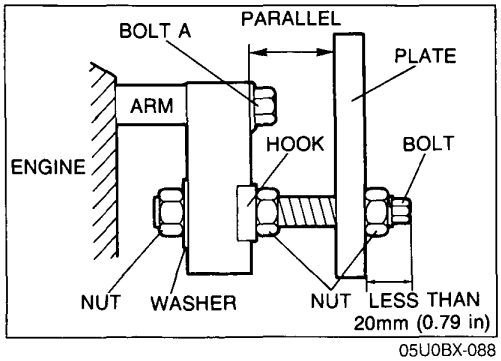
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2. Assemble the **SST (bolts and plate)** in the specified position.



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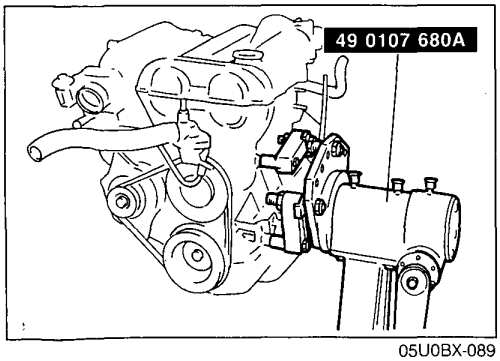
3. Assemble the **SST (nuts, hooks, and bolts)**.
4. Install the **SST** to the respective arms.



05U0BX-088

Note
- **Adjust the SST (bolts) so that less than 20mm (0.79 in) of thread is exposed.**
- **Make the SST (plate and arms) parallel by adjusting the SST (bolts and nuts).**

5. Tighten the **SST (bolts and nuts)** to affix the **SST** firmly.



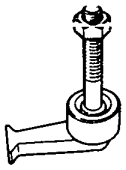
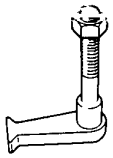
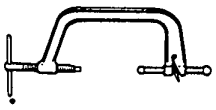
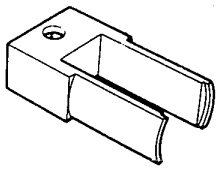
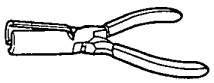
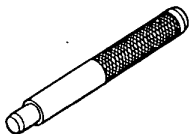
05U0BX-089

6. Mount the engine on the **SST (engine stand)**.

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DISASSEMBLY

PREPARATION
SST

49 E301 060 Brake, ring gear 	For prevention of engine rotation	49 E301 061 Body (Part of 49 E301 060) 	For prevention of engine rotation
49 E301 062 Collar (Part of 49 E301 060) 	For prevention of engine rotation	49 0636 100A Arm, valve spring lifter 	For removal and installation of valves
49 B012 006 Pivot, valve spring lifter 	For removal and installation of valves	49 S120 170 Remover, valve seal 	For removal of valve seals
49 0223 061A Remover & installer, piston pin 	For removal and installation of piston pins		

05U0BX-090

1. Code all identical parts (such as piston, piston rings, connecting rods, and valve springs) so that they can be reinstalled in the cylinder from which they were removed.
2. Clean the parts with a steam cleaner. Blow off any remaining water with compressed air.

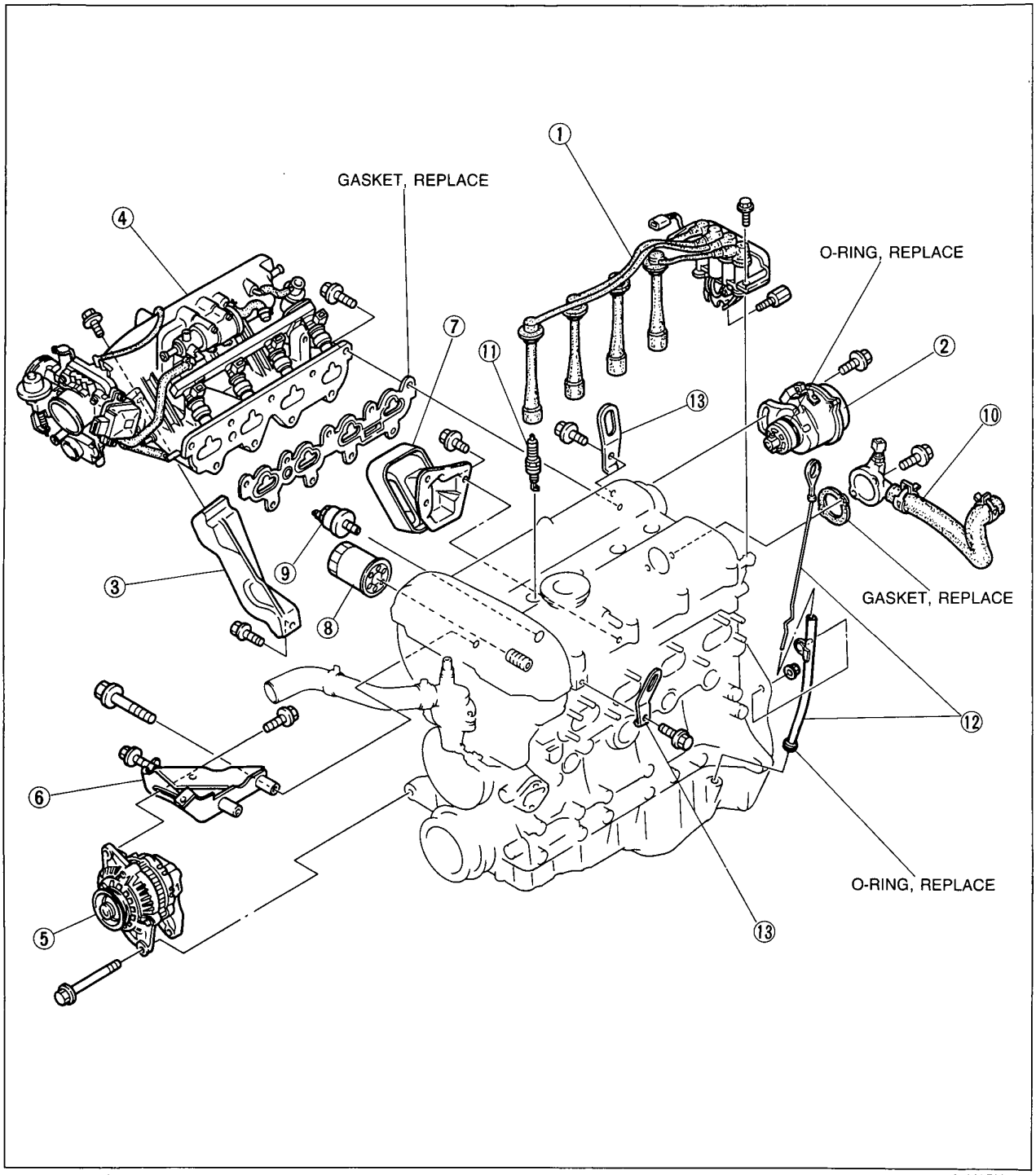
Note
- **During disassembly of any part or system, be sure to study its order of assembly. Also, note any deformation, wear, or damage.**

05U0BX-091

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AUXILIARY PARTS

1. Drain the engine oil.
2. Disassemble in the order shown in the figure.



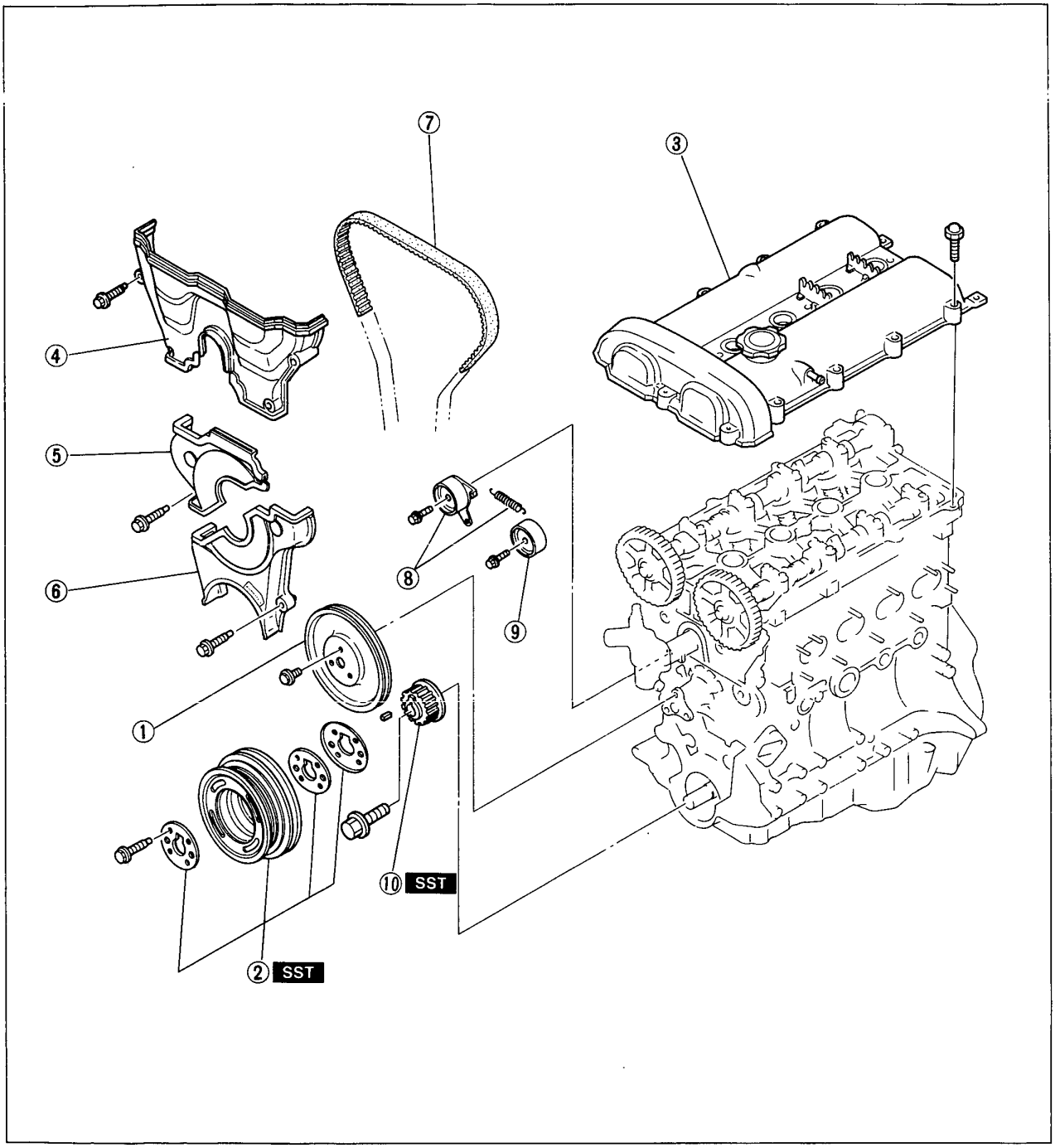
05U0BX-092

1. Ignition coil and high-tension lead
2. Crank angle sensor
3. Manifold bracket
4. Intake manifold assembly
5. Alternator
6. Alternator bracket
7. Right engine mount
8. Oil filter
9. Oil pressure gauge sender unit
10. Water outlet pipe
11. Spark plug
12. Oil level gauge and pipe
13. Engine hanger

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TIMING BELT

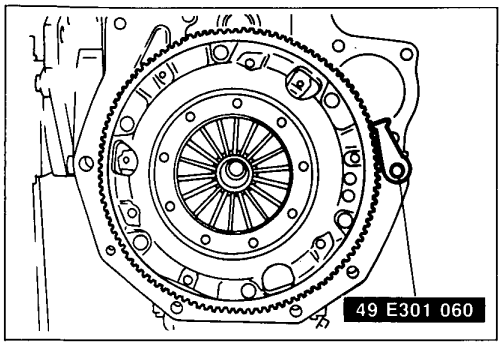
1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.



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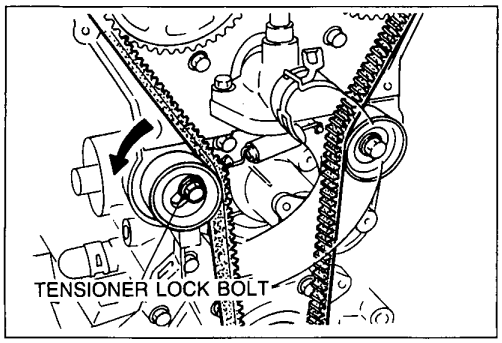
1. Water pump pulley
2. Crankshaft pulley
   Disassembly Note ..... page B–39
3. Cylinder head cover
4. Timing belt cover, upper
5. Timing belt cover, middle
6. Timing belt cover, lower
7. Timing belt
   Disassembly Note ..... page B–39
   Inspection ..... page B–59
8. Tensioner, tensioner spring
   Inspection ..... page B–59
9. Idler
   Inspection ..... page B–59
10. Timing belt pulley
    Disassembly Note ..... page B–39
    Inspection ..... page B–59

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05U0BX-094

Disassembly Note
Crankshaft pulley
1. Hold the flywheel with the **SST**.
2. Loosen the crankshaft pulley lock bolts.
3. Remove the plate, crankshaft pulley, timing belt outer guide plate, and timing belt inner guide plate.

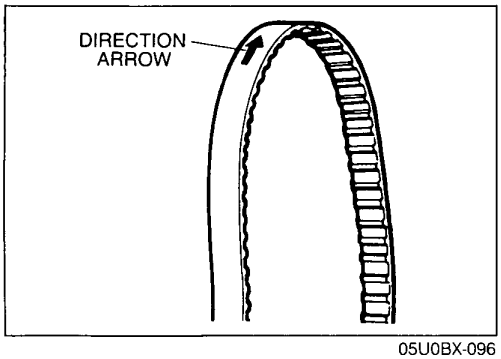


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Timing belt
1. Loosen the tensioner lock bolt.

Caution
- **To prevent damage to the tensioner, secure it with a rag.**

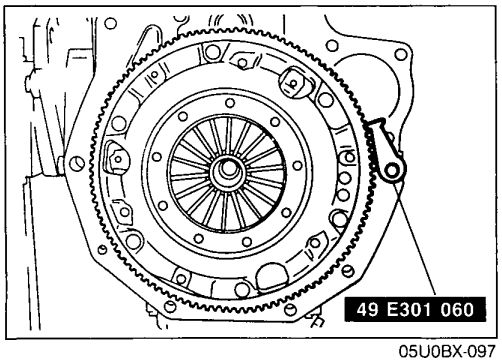
2. Temporarily secure the tensioner with the spring fully extended.



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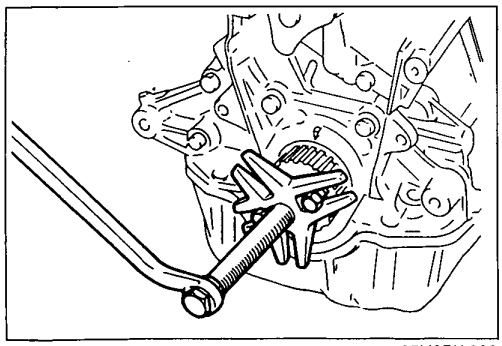
Note
- **Mark the timing belt rotation for proper reinstallation.**

3. Remove the timing belt.



05U0BX-097

Timing belt pulley
1. Hold the flywheel with the **SST**.
2. Loosen the pulley lock bolt.
3. Remove the pulley lock bolt.



05U0BX-098

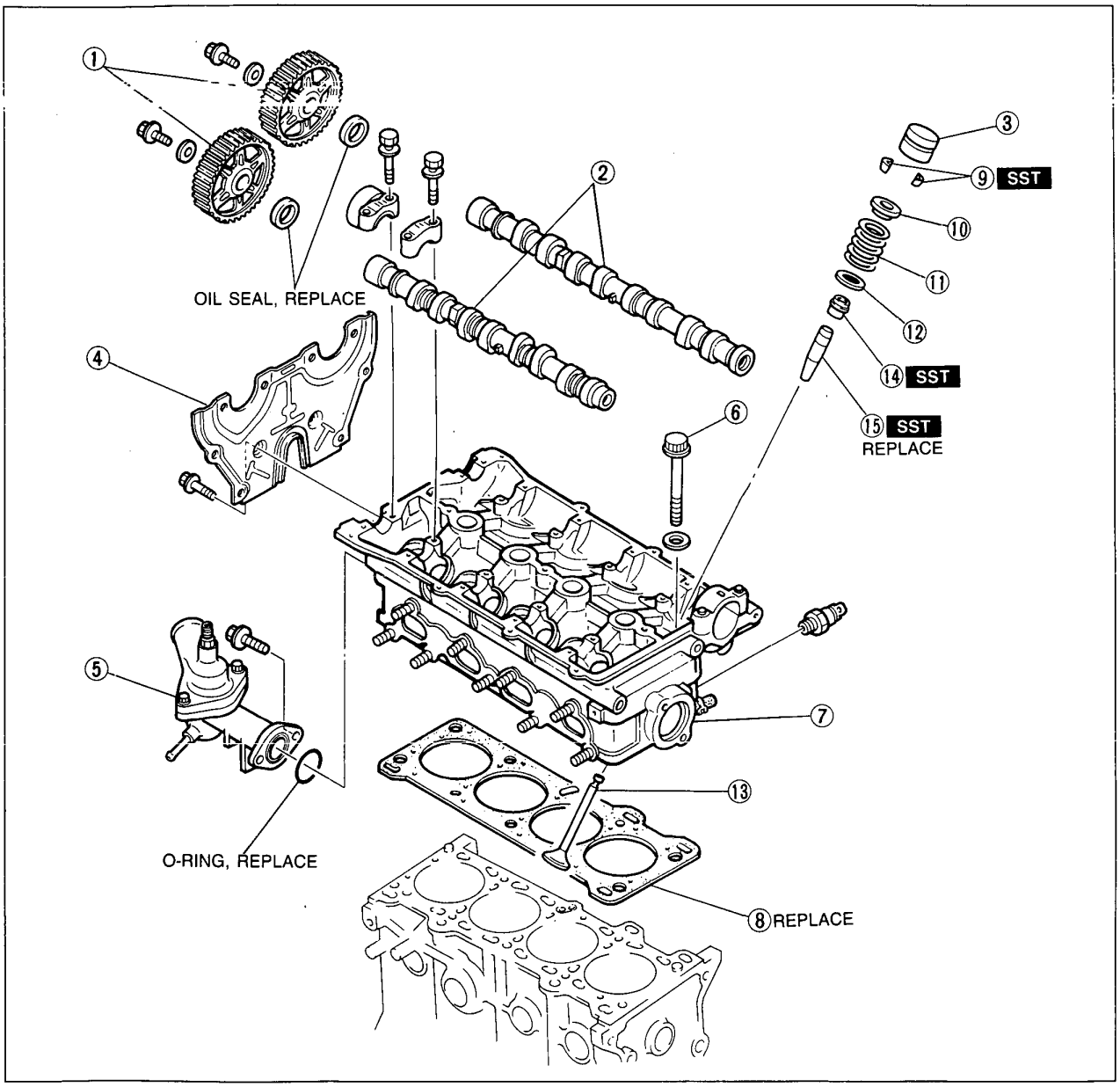
Note
- **If necessary, remove the pulley with a steering wheel puller (commercially available).**

4. Remove the timing belt pulley.
5. Remove the pulley Woodruff key.

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CYLINDER HEAD

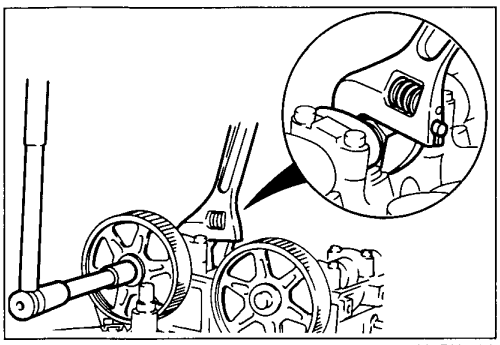
1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.



05U0BX-099

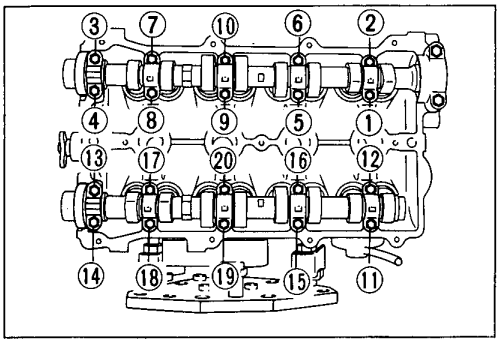
1. Camshaft pulley
   - Disassembly Note ..... page B–41
   - Inspection ..... page B–59
2. Camshaft
   - Disassembly Note ..... page B–41
   - Inspection ..... page B–52
3. HLA
   - Disassembly Note ..... page B–41
   - Inspection ..... page B–54
4. Seal plate
5. Thermostat housing
6. Cylinder head bolt
   - Disassembly Note ..... page B–41
7. Cylinder head
   - Inspection ..... page B–48
8. Cylinder head gasket
9. Valve keeper
   - Disassembly Note ..... page B–41
10. Valve spring seat, upper
11. Valve spring
    - Inspection ..... page B–52
12. Valve spring seat, lower
13. Valve
    - Inspection ..... page B–49
14. Valve seal
    - Disassembly Note ..... page B–42
    - Inspect for wear or damage
15. Valve guide
    - Inspection ..... page B–49
    - Replacement ..... page B–50

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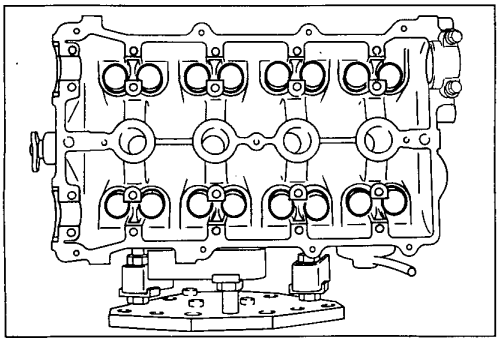
05U0BX-100

Disassembly Note
Camshaft pulley
1. Hold the camshaft with a wrench.
2. Remove the camshaft pulley lock bolt.
3. Remove the camshaft pulley.



05U0BX-049

Camshaft
1. Loosen the camshaft cap bolts in two or three steps in the order shown in the figure.
2. Remove the camshaft caps.
3. Remove the camshaft.
4. Remove the camshaft oil seal from the camshaft.

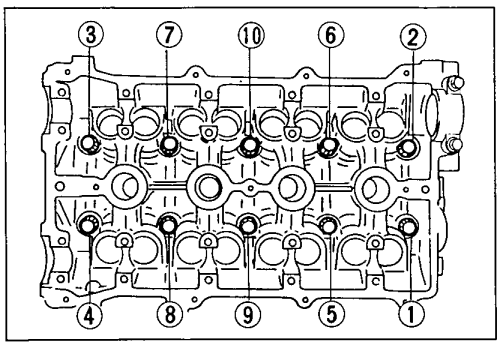


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HLA

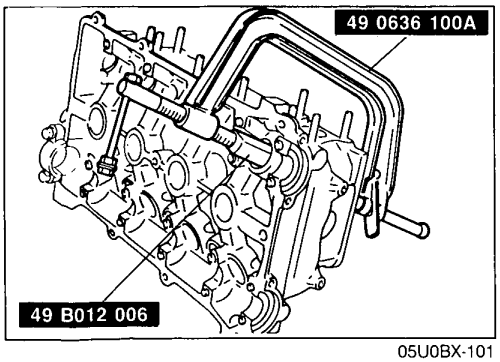
Caution
- **Mark the HLA with a felt pen so that they can be reinstalled in the position from which they were removed.**

1. Remove the HLA from the cylinder head.



05U0BX-042

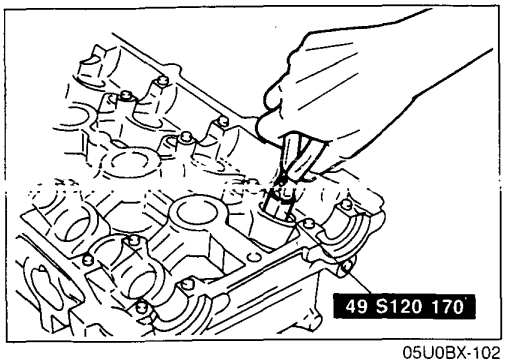
Cylinder head bolt
1. Loosen the cylinder head bolts in two or three steps in the order shown in the figure.
2. Remove the cylinder head bolts.



05U0BX-101

Valve keeper
1. Set the **SST** against the upper valve spring seat as shown in the figure.
2. Remove the valve keepers.

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05U0BX-102

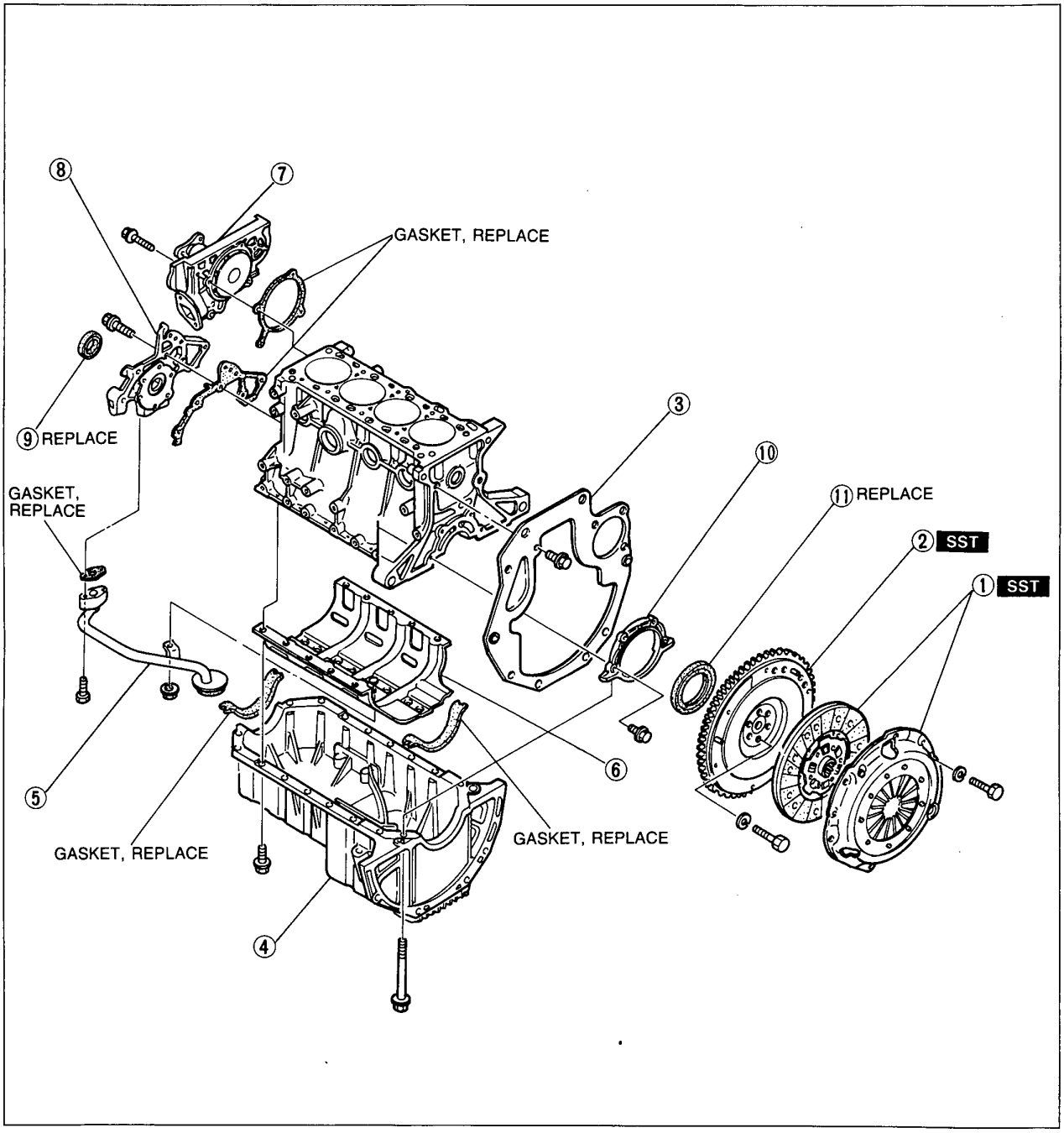
Valve seal

1. Remove the valve seal with the **SST**.

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CYLINDER BLOCK (EXTERNAL PARTS)

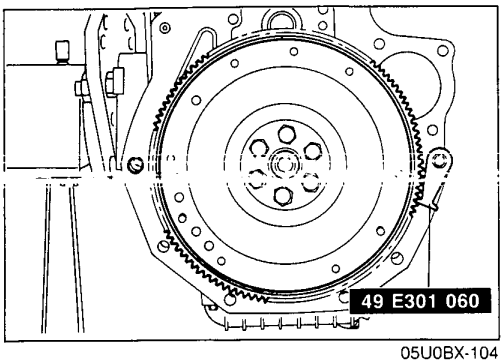
1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.



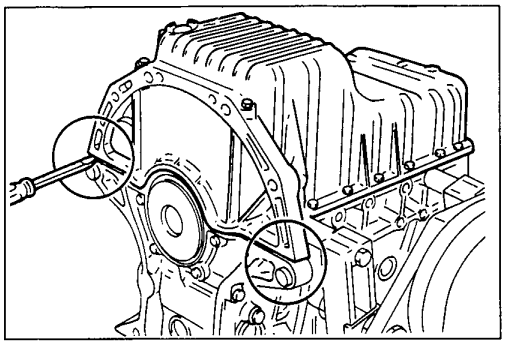
05U0BX-103

1. Clutch cover, clutch disc
   Service ..... page H–14
2. Flywheel
   Disassembly Note ..... page B–44
   Inspect for wear or damage
3. End plate
4. Oil pan
   Disassembly Note ..... page B–44
   Inspect for damage
5. Oil strainer
6. Oil pan baffle
   Disassembly Note ..... page B–44
7. Water pump
   Service ..... page E– 9
8. Oil pump
   Service ..... page D–11
9. Front oil seal
   Disassembly Note ..... page B–44
10. Rear cover
11. Rear oil seal
   Disassembly Note ..... page B–44

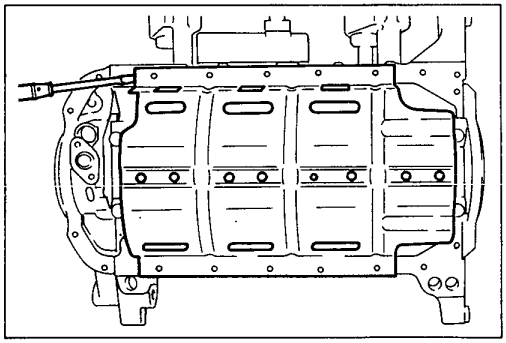
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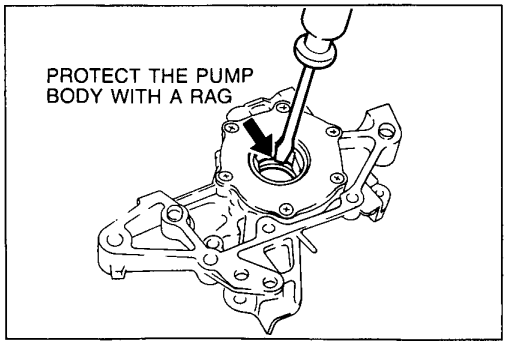
05U0BX-104



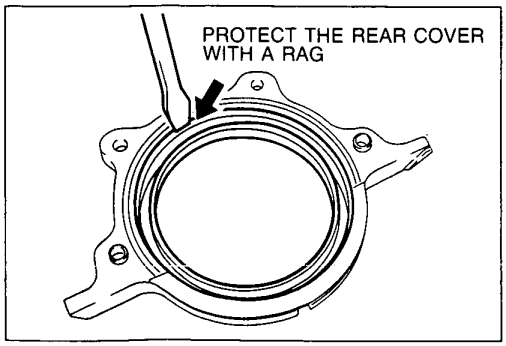
05U0BX-105



05U0BX-106



05U0BX-107



05U0BX-108

Disassembly Note

Flywheel

1. Hold the flywheel with the **SST**.
2. Remove the flywheel lock bolts.
3. Remove the flywheel.

Oil pan

1. Remove the oil pan mounting bolts.

Caution

- **Do not force a prying tool between the cylinder block and the oil pan, which may damage the contact surfaces.**
- **Do not damage or scratch the contact surfaces when removing the old sealant.**

2. Insert a screwdriver or a suitable tool only at the points shown in the figure.
3. Remove the oil pan.

Oil pan baffle

Caution

- **Do not bend the baffle when prying it loose.**

1. Insert a screwdriver or a suitable tool between the cylinder block and the baffle to separate them.
2. Remove the baffle.

Front oil seal

1. Remove the oil seal with a screwdriver protected with a rag.

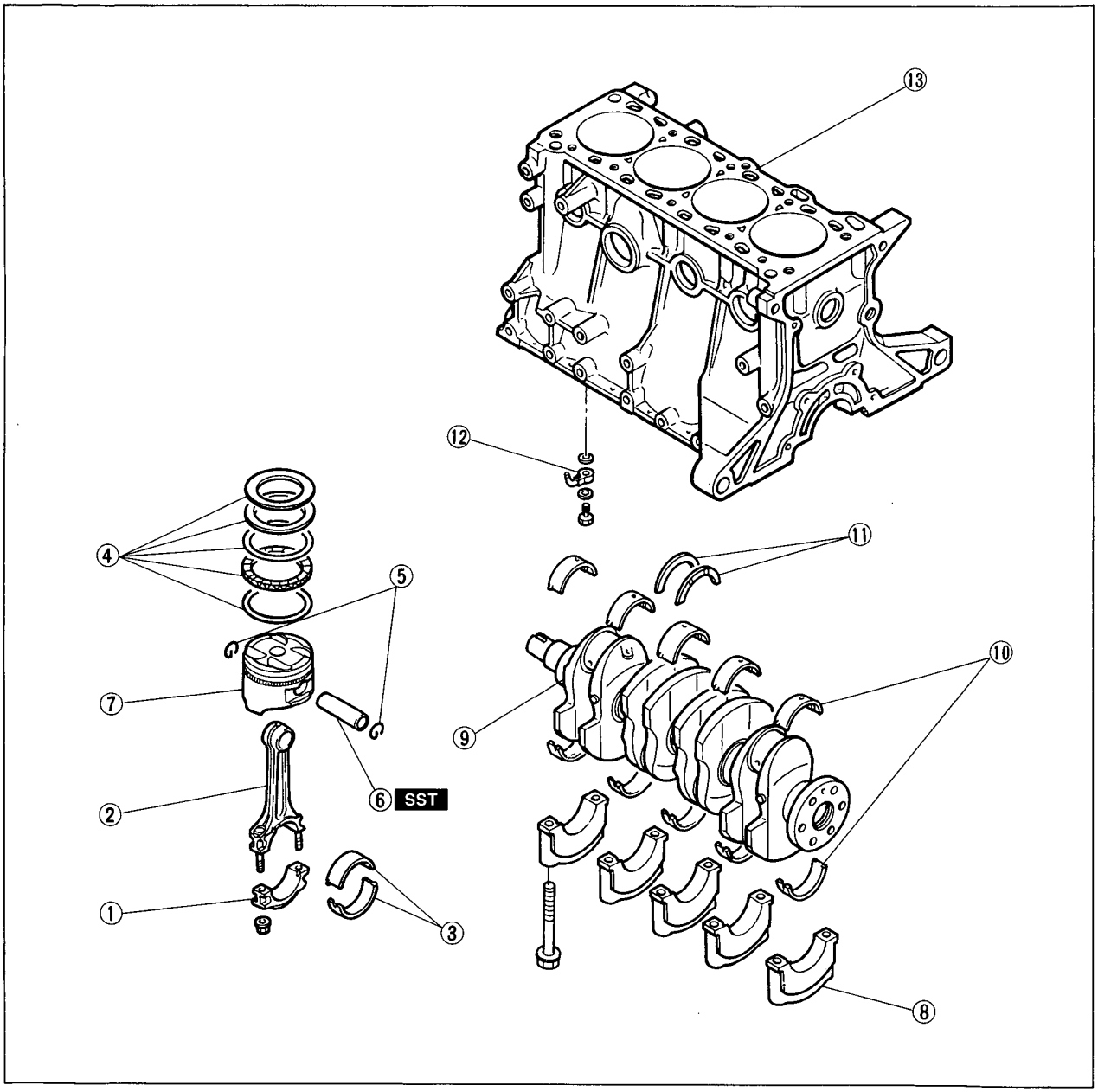
Rear oil seal

1. Remove the oil seal with a screwdriver protected with a rag.

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CYLINDER BLOCK (INTERNAL PARTS)

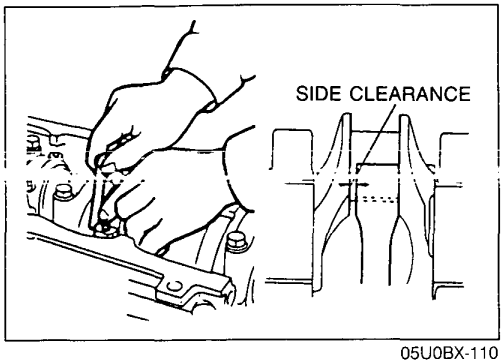
1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.



05U0BX-099

1. Connecting rod cap
   - Disassembly Note ..... page B–46
2. Connecting rod
   - Disassembly Note ..... page B–46
   - Inspection ..... page B–57
3. Connecting rod bearing
   - Inspection ..... page B–58
4. Piston ring
   - Disassembly Note ..... page B–46
   - Inspection ..... page B–56
5. Piston pin clip
6. Piston pin
   - Disassembly Note ..... page B–46
   - Inspection ..... page B–57
7. Piston
   - Inspection ..... page B–56
8. Main bearing cap
   - Disassembly Note ..... page B–47
9. Crankshaft
   - Disassembly Note ..... page B–47
   - Inspection ..... page B–58
10. Main bearing
    - Inspection ..... page B–58
11. Thrust bearing
12. Oil jet
    - Inspection ..... page B–55
13. Cylinder block
    - Inspection ..... page B–54

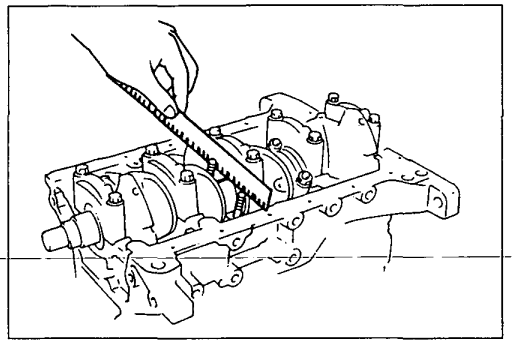
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05U0BX-110

Disassembly Note
Connecting rod cap

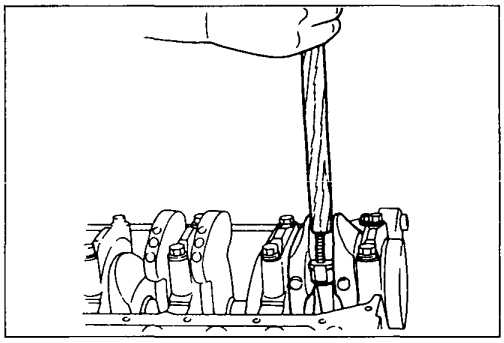
1. Before removing the connecting rod caps, measure the connecting rod side clearance. (Refer to page B–65.)



05U0BX-111

Connecting rod

1. Before removing the connecting rods, measure the connecting rod oil clearance. (Refer to page B–65.)

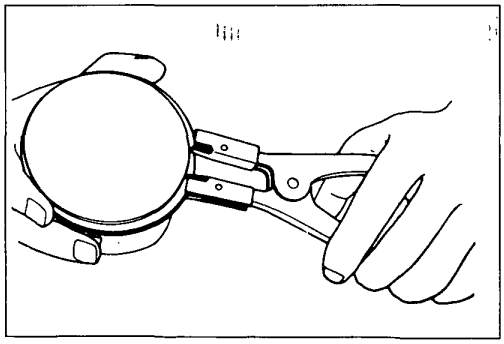


05U0BX-112

2. Remove the Plastigage from the crankpin journals.

Caution
- **Do not scratch the crankshaft journal or the cylinder wall.**

3. Use the handle of a hammer to remove the piston and connecting rod assembly through the top of the cylinder block.

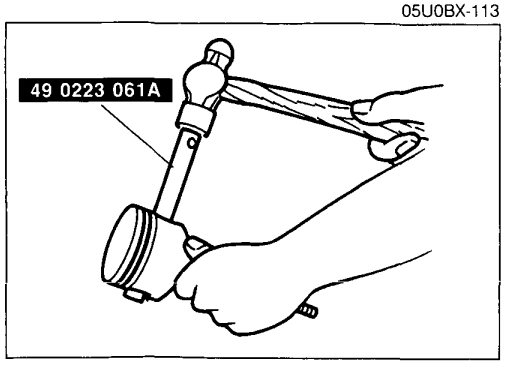


05U0BX-113

Piston ring

Caution
- **Do not apply excessive tension, which may cause the rings to snap out.**

1. Remove the piston rings with a piston ring expander (commercially available).



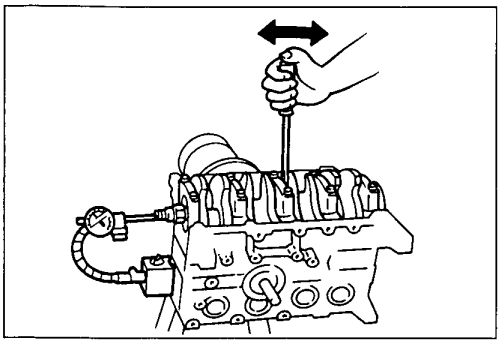
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Piston pin

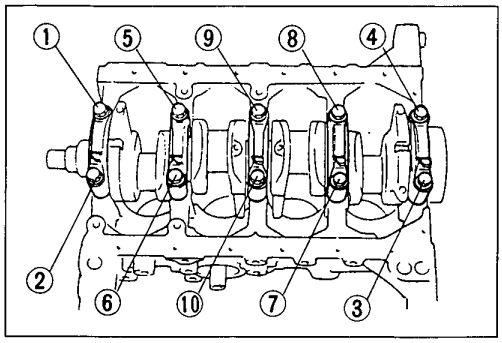
Caution
- **Mark the connecting rod direction for proper reassembly.**

1. Remove the piston pin with the **SST**.

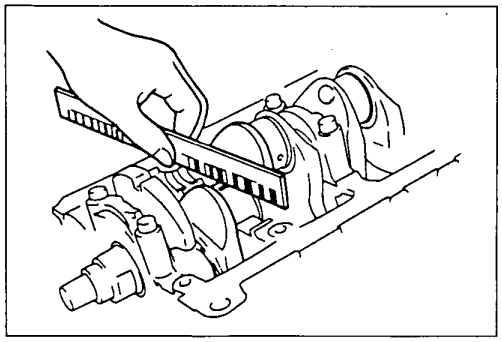
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05U0BX-115



05U0BX-116



05U0BX-117

Main bearing cap

1. Before removing the main bearing caps, measure the crankshaft end play. (Refer to page B–64.)
2. Loosen the main bearing cap bolts in two or three steps in the order shown in the figure.
3. Remove the main bearing caps.

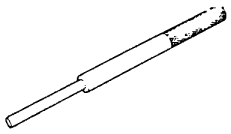
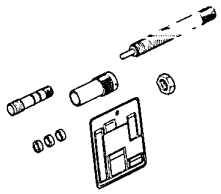
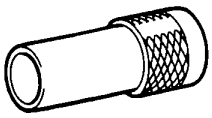
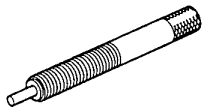
Crankshaft

1. Before removing the crankshaft, measure the main bearing oil clearances. (Refer to page B–63.)

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INSPECTION / REPAIR

PREPARATION
SST

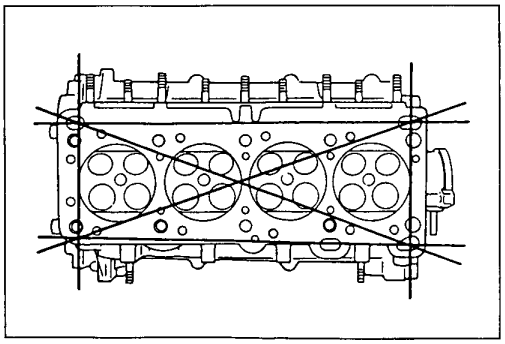
49 B012 005 Remover & installer, valve guide 	For removal of valve guide	49 L012 0A0 Installer set, valve seal & valve guide 	For installation of valve guide
49 L012 002 Body (Part of 49 L012 0A0) 	For installation of valve guide	49 L012 003 Installer (Part of 49 L012 0A0) 	For installation of valve guide
49 L012 004 Nut (Part of 49 L012 0A0) 	For installation of valve guide		

05U0BX-118

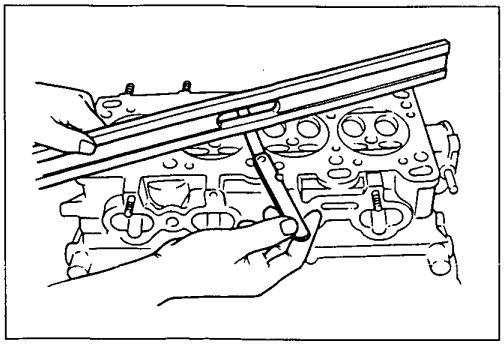
1. Clean all parts, being sure to remove all gasket fragments, dirt, oil or grease, carbon, moisture residue, and other foreign materials.
2. Inspection and repairs must be performed in the order specified.

Caution
- **Do not damage the joints or friction surfaces of aluminum alloy components (such as the cylinder head or pistons).**

05U0BX-119



05U0BX-120



05U0BX-121

CYLINDER HEAD

1. Inspect the cylinder head for damage, cracks, and leakage of water and oil. Replace the cylinder head if necessary.
2. Measure the cylinder head distortion in the six directions shown in the figure.

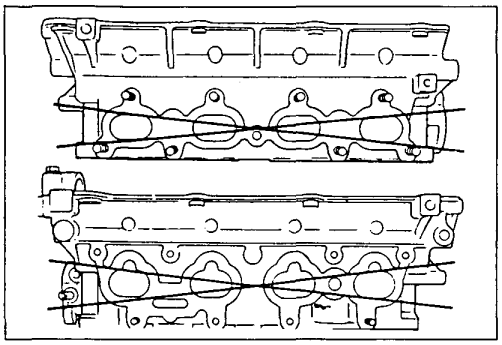
Distortion: 0.15mm (0.006 in) max.

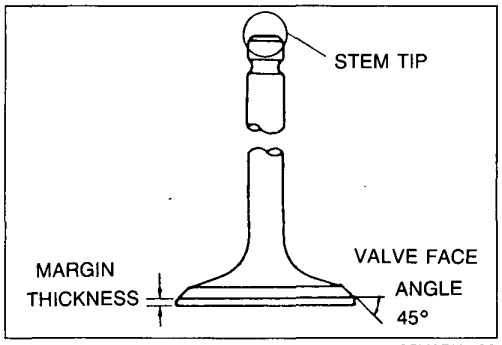
Caution
- **Before grinding the cylinder head, check the following and repair or replace the cylinder head as necessary.**
  Sinking of valve seats
  Damage of manifold contact surface
  Camshaft oil clearances and end play

3. If the cylinder head distortion exceeds specification, grind the cylinder head surface.
   If the cylinder head height is not within specification, replace it.

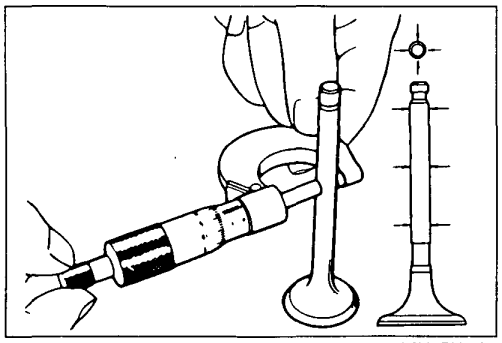
Height: 133.8—134.0mm (5.268—5.276 in)
Grinding: 0.20mm (0.008 in) max.

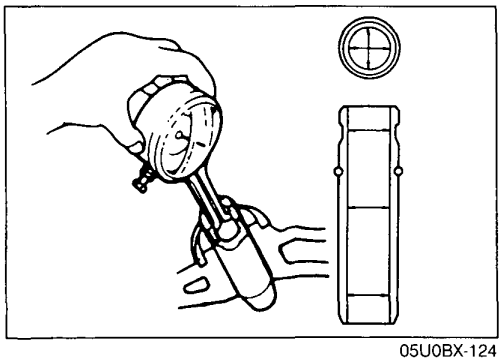
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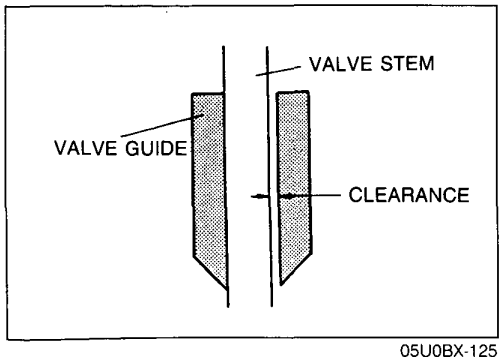

05U0BX-289



05U0BX-122


05U0BX-123


05U0BX-124



05U0BX-125

4. Measure the manifold contact surface distortion in the four directions shown in the figure.

Distortion: 0.15mm (0.006 in) max.

5. If distortion exceeds specification, grind the surface or replace the cylinder head.

VALVE MECHANISM

Valve and Valve Guide

1. Inspect each valve for the following. Replace or resurface the valve if necessary.
   (1) Damaged or bent stem.
   (2) Rough or damaged face.
   (3) Damaged or unevenly worn stem tip.
2. Measure the valve head margin thickness of each valve. Replace the valve if necessary.

Margin thickness
IN : 1.0mm (0.039 in)
EX: 1.0mm (0.039 in)

3. Measure the length of each valve at the points shown.

Length
Standard
IN : 105.29mm (4.1452 in)
EX: 105.39mm (4.1492 in)
Minimum
IN : 104.79mm (4.1256 in)
EX: 104.89mm (4.1295 in)

4. Measure the stem diameter of each valve.

Diameter
IN : 5.970—5.985mm (0.2350—0.2356 in)
EX: 5.965—5.980mm (0.2348—0.2354 in)

5. Measure the inner diameter of each valve guide at the points shown.

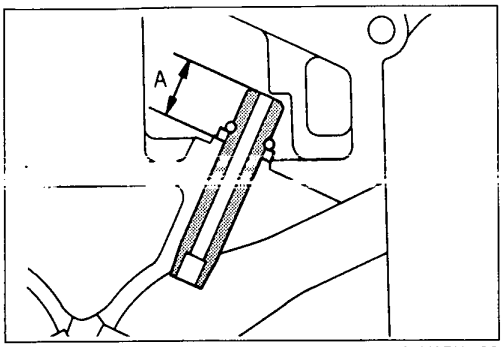
Inner diameter
IN : 6.01—6.03mm (0.2366—0.2374 in)
EX: 6.01—6.03mm (0.2366—0.2374 in)

6. Calculate the valve stem to guide clearance.
Subtract the outer diameter of the valve stem from the inner diameter of the corresponding valve guide.

Clearance
IN : 0.025—0.060mm (0.0010—0.0024 in)
EX: 0.030—0.065mm (0.0012—0.0026 in)
Maximum: 0.20mm (0.008 in)

7. If the clearance exceeds specification, replace the valve and/or valve guide.

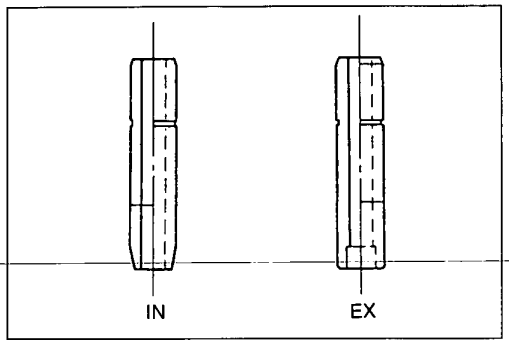
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05U0BX-126

8. Measure the height A of each valve guide. Replace the valve guide if necessary.

Height: 16.8—17.4mm (0.661—0.685 in)



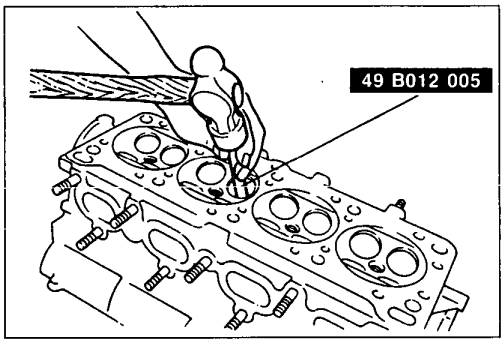
05U0BX-127

Replacement of valve guide

Note
- **Although the shapes of the intake and exhaust valve guides are different, use the exhaust valve guide on both sides as a replacement.**

Removal

1. Remove the valve guide from the side opposite the combustion chamber with the **SST**.



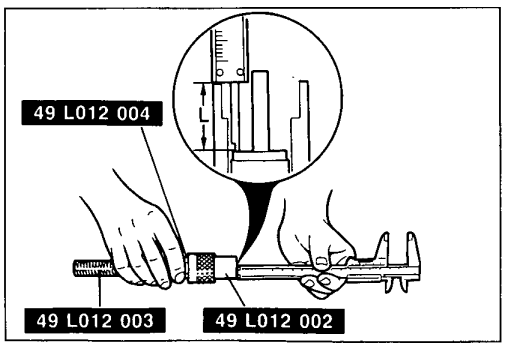
9MU0B2-112

Installation

1. Assemble the **SST** so that depth **L** is as specified.

Depth L: 16.8—17.4mm (0.661—0.685 in)

2. Tighten the locknut.

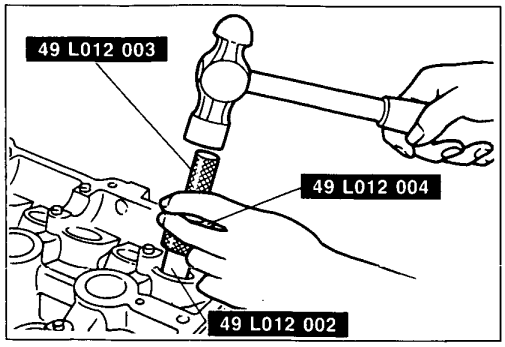


05U0BX-128

3. Tap the valve guide in from the side opposite the combustion chamber until the **SST** contacts the cylinder head.
4. Verify that the valve guide height is within specification.

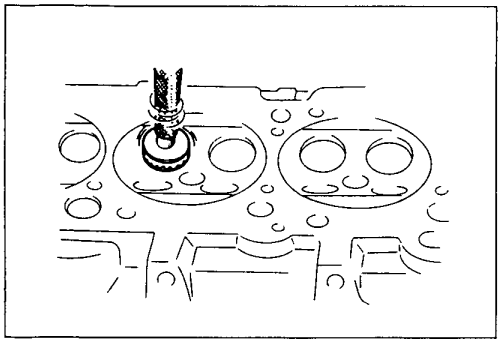
Height: 16.8—17.4mm (0.661—0.685 in)

5. If not within specification, repeat Steps 1—4.

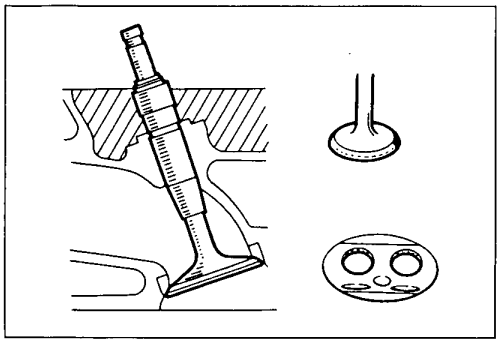


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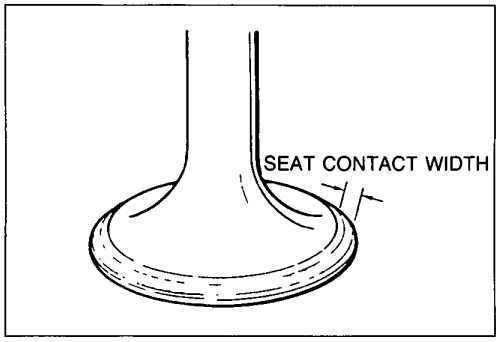
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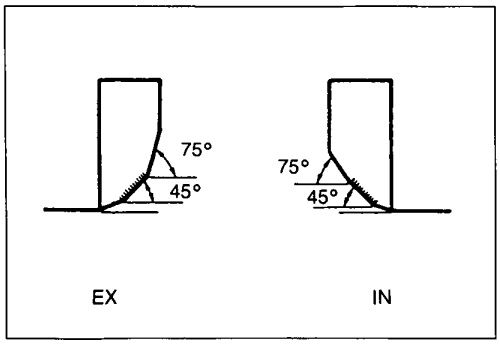
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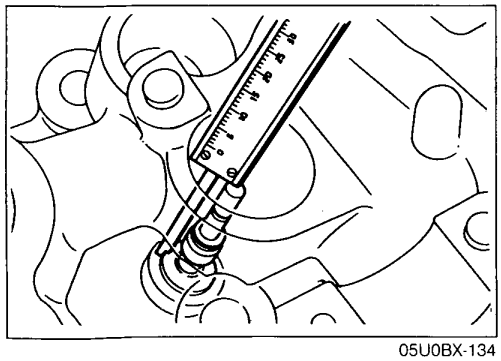
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05U0BX-133



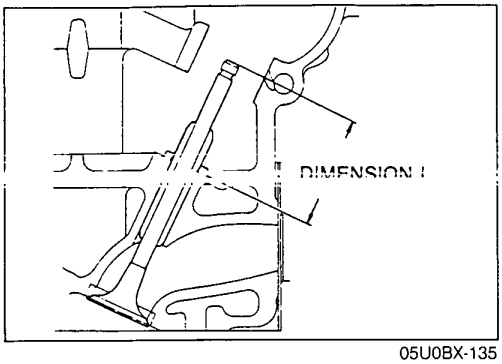
05U0BX-134

Valve Seat

1. Inspect the contact surface of each valve seat and valve face for the following:
   (1) Roughness.
   (2) Damage.
2. If necessary, resurface the valve seat with a **45°** valve seat cutter and/or resurface the valve face.
3. Apply a thin coat of Prussian blue to the valve face.
4. Inspect the valve seating by pressing the valve against the seat.
   (1) If blue does not appear 360° around the valve face, replace the valve.
   (2) If blue does not appear 360° around the valve seat, resurface the seat.
5. Measure the seat contact width.

   Width: 0.8—1.4mm (0.031—0.055 in)
6. Verify that the valve seating position is at the center of the valve face.
   (1) If the seating position is too high, correct the valve seat with a **75°** cutter and a **45°** cutter.
   (2) If the seating position is too low, correct the valve seat with a **35° (IN)** or **15° (EX)** cutter and a **45°** cutter.
7. Seat the valve to the valve seat with lapping compound.
8. Inspect the sinking of the valve seat.

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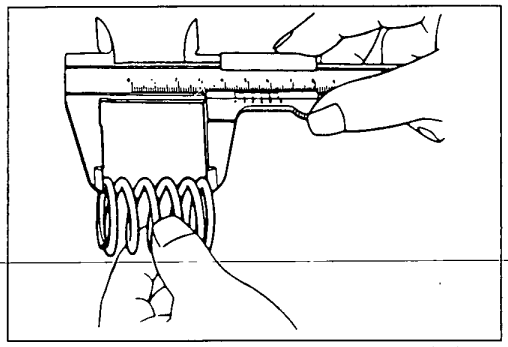


05U0BX-135

9. Measure the protruding length (dimension **L**) of the valve stem.

Dimension L: 43.5mm (1.713 in)

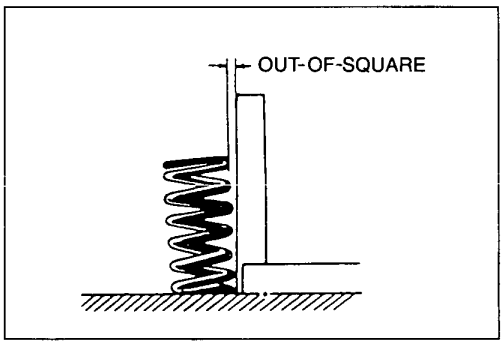
(1) If **L** is **43.5—44.0mm (1.713—1.732 in)**, no correction needed.
(2) If **L** is **44.1—45.0mm (1.736—1.772 in)**, adjust with washer on spring seat area of cylinder head.
(3) If **L** is **45.1mm (1.776 in) or more**, replace cylinder head.


05U0BX-136

Valve Spring

1. Inspect each valve spring for cracks or damage.
2. Measure the free length and out-of-square. Replace the valve spring if necessary.

Free length
Standard
IN : 48.0mm (1.890 in)
EX: 48.3mm (1.902 in)
Minimum
IN : 47.0mm (1.850 in)
EX: 47.3mm (1.862 in)

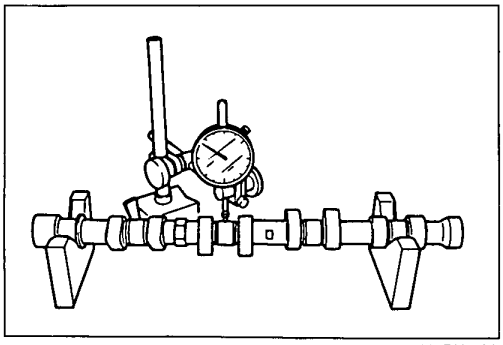


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Out-of-square
IN : 1.68mm (0.0661 in) max.
EX: 1.69mm (0.0665 in) max.

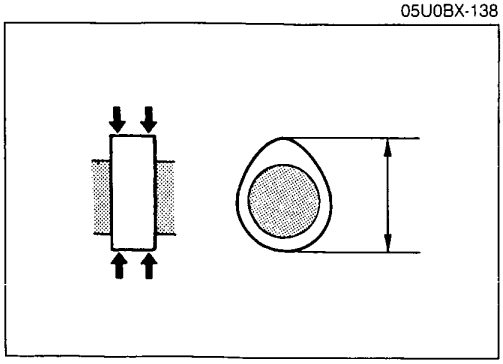
CAMSHAFT

1. Set the front and rear journals on V-blocks.
2. Measure the camshaft runout. Replace the camshaft if necessary.


05U0BX-138

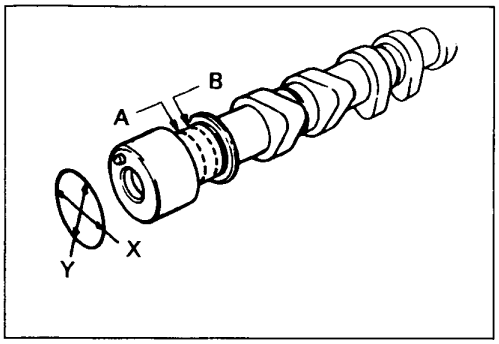
Runout: 0.03mm (0.0012 in) max.

3. Inspect the camshaft for wear or damage. Replace the camshaft if necessary.
4. Measure the cam lobe heights at the two points as shown.


05U0BX-139

Height
Standard
IN : 40.888mm (1.6098 in)
EX: 40.889mm (1.6098 in)
Minimum
IN : 40.688mm (1.6019 in)
EX: 40.689mm (1.6019 in)

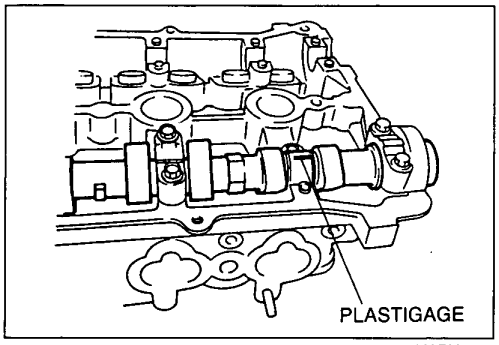
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05U0BX-140

5. Measure the journal diameters in X and Y directions at the two points (A and B) shown.

Diameter:
25.940—25.965mm (1.0213—1.0222 in)
Out-of-round: 0.05mm (0.002 in) max.

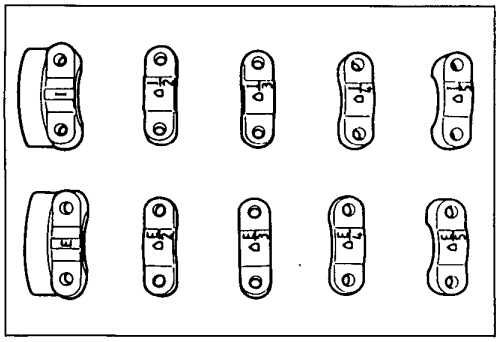


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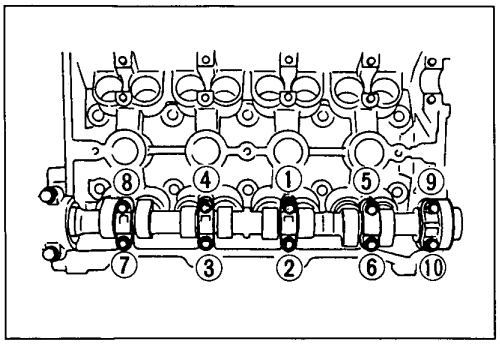
6. Measure the camshaft journal oil clearances.

Caution
- **Do not install the HLA when measuring the oil clearance.**

(1) Remove all foreign material and oil from the journals and bearing surface.
(2) Set the camshaft onto the cylinder head.
(3) Position Plastigage atop the journals in the axial direction.


05U0BX-142

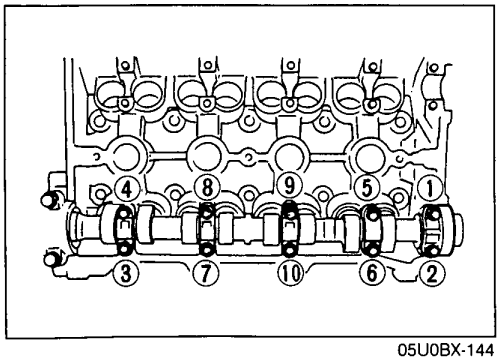
(4) Install the camshaft caps according to the cap number and arrow mark.



05U0BX-143

(5) Install the camshaft cap bolts and tighten them in two or three steps in the order shown in the figure.

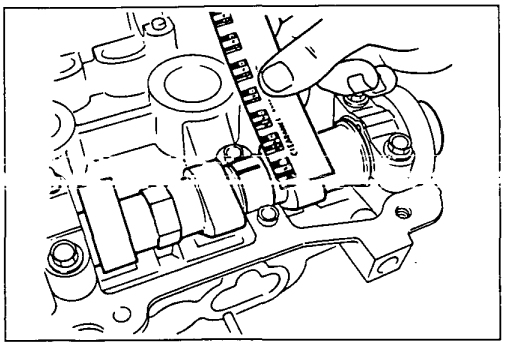
Tightening torque:
11.3—14.2 N·m (1.15—1.45 m-kg, 100—126 in-lb)



05U0BX-144

(6) Loosen the camshaft cap bolts in two or three steps in the order shown in the figure.
(7) Remove the camshaft caps.

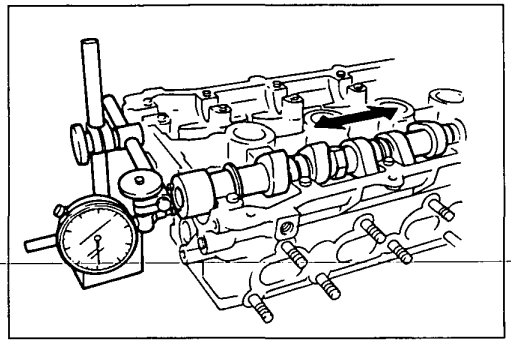
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(8) Measure the oil clearances.

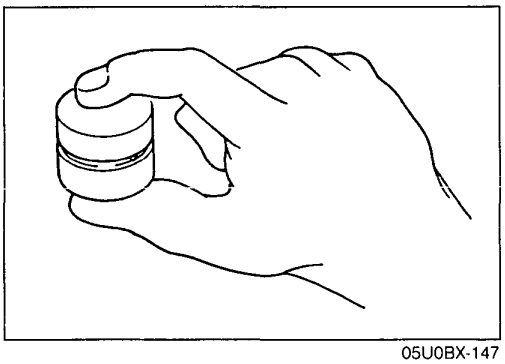
Oil clearance:
0.035—0.081mm (0.0014—0.0032 in)
Maximum: 0.15mm (0.006 in)

(9) If the oil clearance exceeds specification, replace the cylinder head.


05U0BX-146

7. Measure the camshaft end play. If the end play exceeds specification, replace the camshaft and/or the cylinder head.

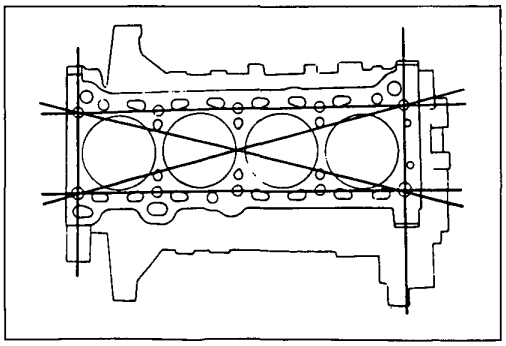
End play : 0.07—0.19mm (0.0028—0.0075 in)
Maximum: 0.20mm (0.008 in)


05U0BX-147

HLA

Caution
- **Do not attempt to repair the HLA.**

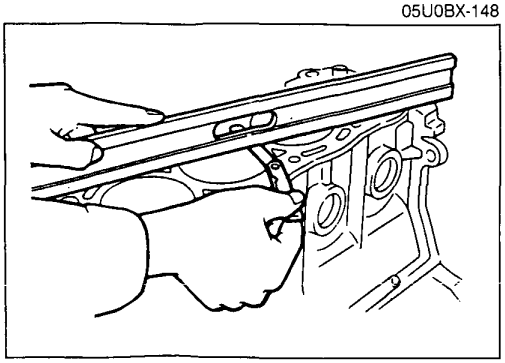
1. Inspect the HLA friction surfaces for wear or damage. Replace the HLA if necessary.
2. Hold the bucket body and press the plunger by hand. If the plunger moves, replace the HLA.


05U0BX-148

CYLINDER BLOCK

1. Inspect the cylinder block for the following. Repair or replace the cylinder block as necessary.
   (1) Leakage damage.
   (2) Cracks.
   (3) Scoring of wall.
2. Measure the distortion of the top surface of the cylinder block in the six directions shown in the figure.

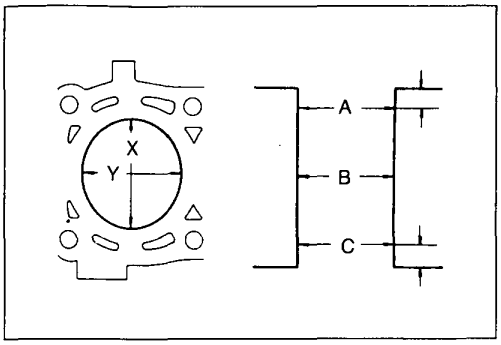
Distortion: 0.15mm (0.006 in) max.


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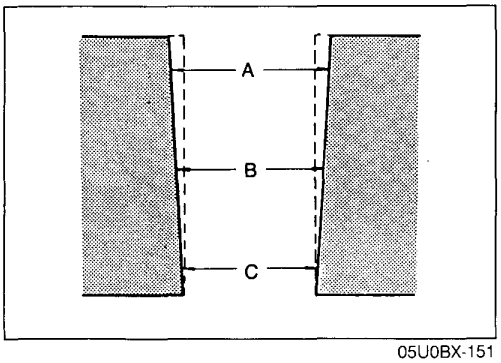
3. If the distortion exceeds specification, repair by grinding or replace the cylinder block.

Height : 221.5mm (8.720 in)
Grinding: 0.20mm (0.008 in) max.

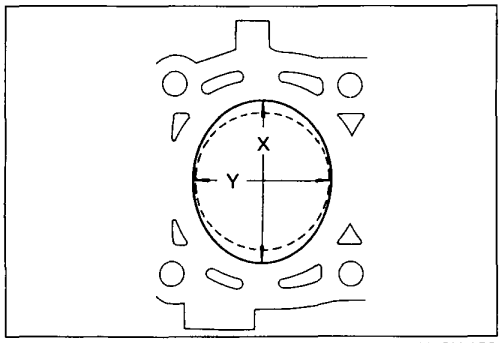
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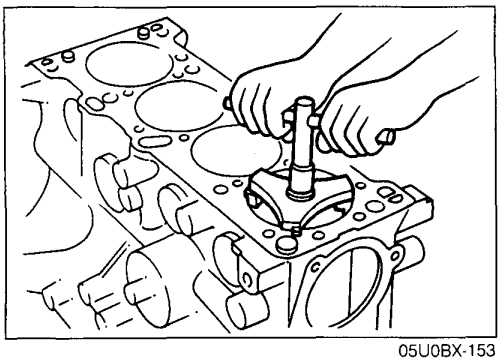
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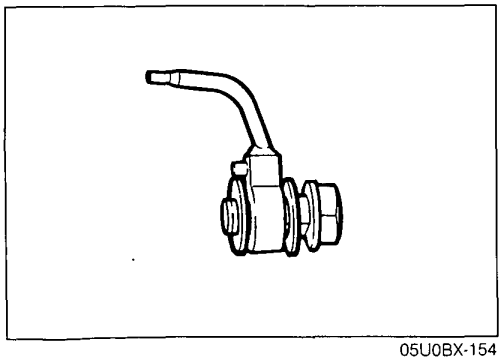


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05U0BX-153


05U0BX-154

4. Measure the cylinder bores in X and Y directions at three levels (A, B, and C) in each cylinder as shown.

Cylinder bore

mm (in)

Bore size	Diameter
Standard	78.006—78.013 (3.0711—3.0714)
0.25 (0.010) oversize	78.256—78.263 (3.0809—3.0812)
0.50 (0.020) oversize	78.506—78.513 (3.0908—3.0911)

Caution
- **The boring size should be based on the size of an oversize piston and be the same for all cylinders.**

(1) If the cylinder bore exceeds the maximum, rebore the cylinder to oversize.
(2) If the difference between measurements A and C exceeds the maximum taper, rebore the cylinder to oversize.

Taper: 0.019mm (0.0007 in) max.

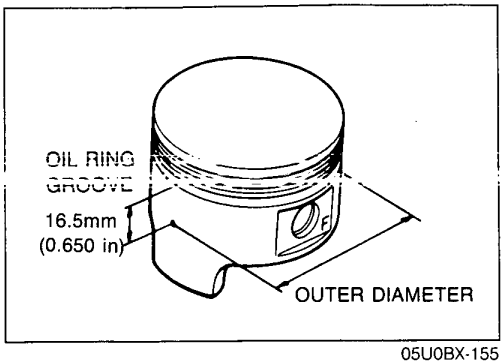
(3) If the difference between measurements X and Y exceeds the maximum out-of-round, rebore the cylinder to oversize.

Out-of-round: 0.019mm (0.0007 in) max.

5. If the upper part of a cylinder wall shows uneven wear, remove the ridge with a ridge reamer.

OIL JET
1. Push the check ball and verify that it moves smoothly.
2. Blow through the oil jet and verify that air flows.

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05U0BX-155

PISTON, PISTON RING, AND PISTON PIN

Piston

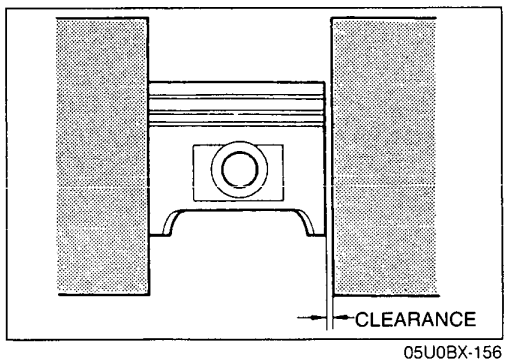
Caution
- **If the piston is replaced, the piston rings must also be replaced.**

1. Inspect the outer circumferences of all pistons for seizure or scoring. Replace the piston if necessary.
2. Measure the outer diameter of each piston at a right angle **(90°)** to the piston pin, **16.5mm (0.650 in)** below the oil ring land lower edge.

Piston diameter

mm (in)

Piston size	Diameter
Standard	77.954—77.974 (3.0690—3.0698)
0.25 (0.010) oversize	78.211—78.217 (3.0792—3.0794)
0.50 (0.020) oversize	78.461—78.467 (3.0890—3.0892)

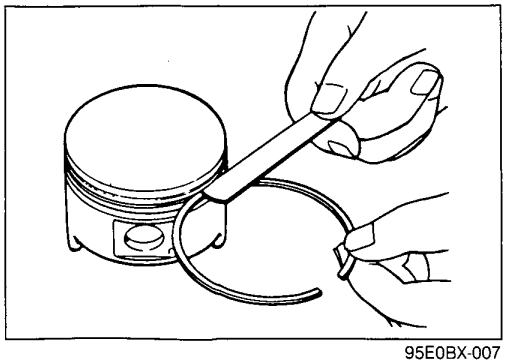


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3. Measure the piston-to-cylinder clearance.

Clearance: 0.039—0.052mm (0.0015—0.0020 in)
Maximum: 0.15mm (0.006 in)

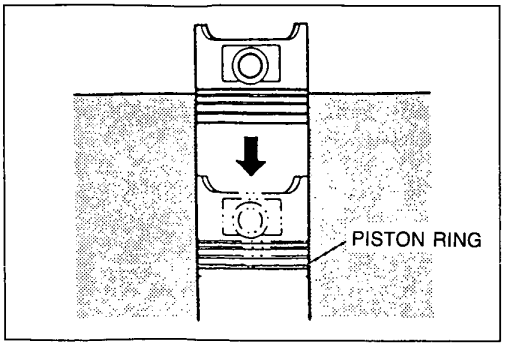
4. If the clearance exceeds the maximum, replace the piston or rebore the cylinders to fit oversize pistons.


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Piston and Piston Rings

1. Measure the piston ring to ring land clearance around the entire circumference using a new piston ring.

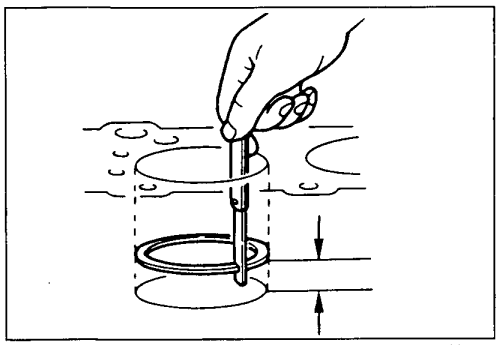
Clearance
Top : 0.040—0.070mm (0.0016—0.0028 in)
Second: 0.030—0.070mm (0.0012—0.0028 in)
Maximum: 0.15mm (0.006 in)



05U0BX-287

2. If the clearance exceeds the maximum, replace the piston.
3. Inspect the piston rings for damage, abnormal wear, or breakage. Replace the piston rings if necessary.
4. Insert the piston ring into the cylinder by hand and use the piston to push it to the bottom of the ring travel.

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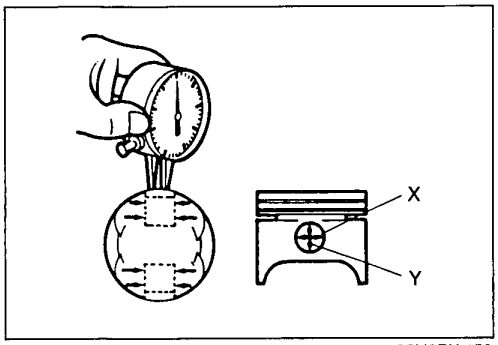
5. Measure each piston ring end gap with a feeler gauge. Replace the piston ring if necessary.

End gap
Top : 0.15—0.30mm (0.006—0.012 in)
Second: 0.3—0.45mm (0.012—0.018 in)
Oil rail : 0.20—0.70mm (0.008—0.028 in)
Maximum: 1.0mm (0.039 in)

Piston and Piston Pin

1. Measure each piston pin hole diameter in X and Y directions at four points.

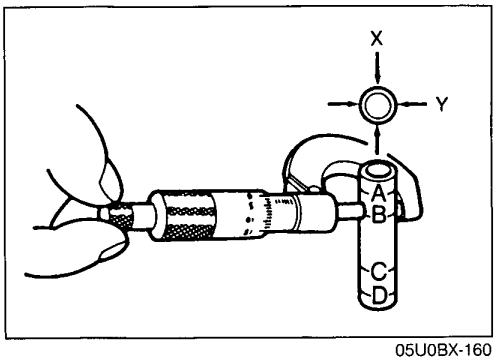
Diameter: 19.988—20.000mm (0.7869—0.7874 in)



05U0BX-159

2. Measure each piston pin diameter in X and Y directions at four points.

Diameter: 19.987—19.993mm (0.7869—0.7871 in)



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3. Calculate the piston pin-to-piston clearance.

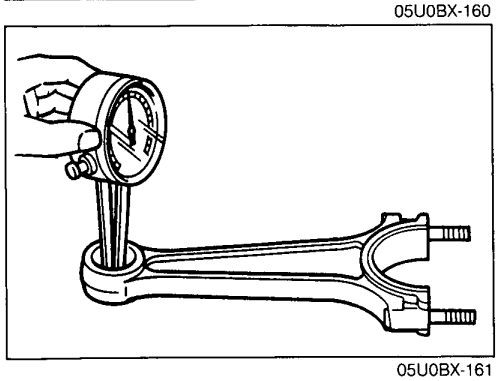
Clearance: -0.005—0.013mm (-0.0002—0.0005 in)

4. If the clearance exceeds specification, replace the piston and/or piston pin.

CONNECTING ROD

1. Measure each connecting rod bushing inner diameter.

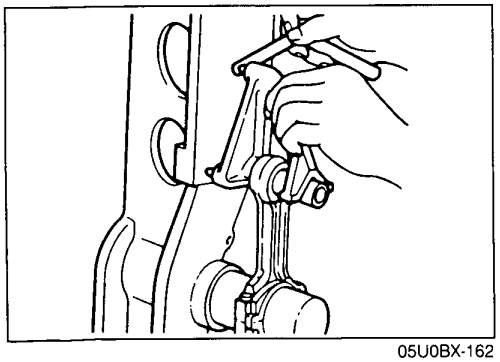
Diameter: 20.003—20.014mm (0.7875—0.7880 in)



05U0BX-161

2. Calculate the clearance between the connecting rod bushing and piston pin.

Clearance: 0.010—0.027mm (0.0004—0.0011 in)



05U0BX-162

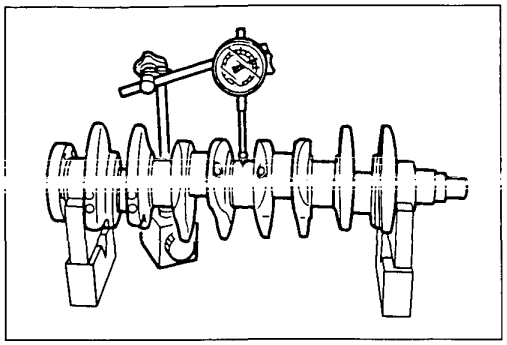
3. Measure each connecting rod for bending. Repair or replace the connecting rod if necessary.

Bending: 0.075mm (0.0030 in) max./50mm (1.97 in)

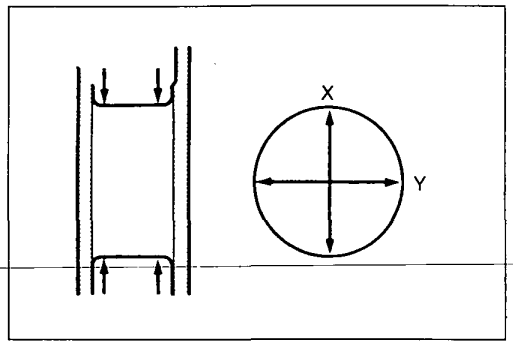
Length (Center to center):
132.85—132.95mm (5.230—5.234 in)

Caution
- **If the connecting rod is replaced, the connecting rod cap and bolts must also be replaced because they are a matched set.**

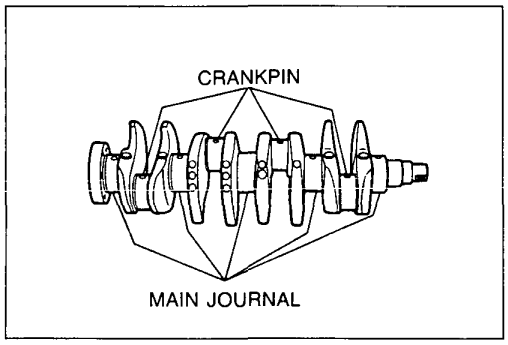
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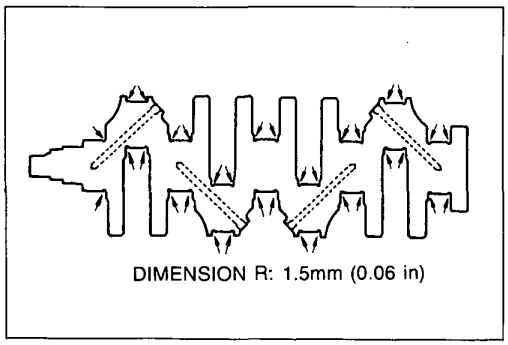
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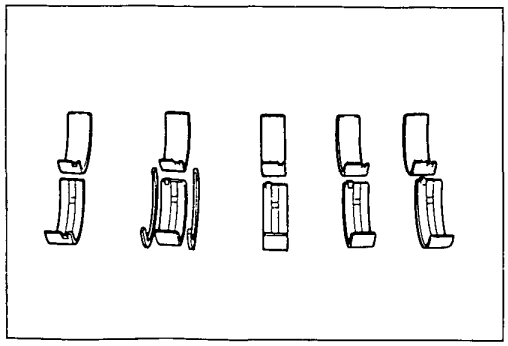
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05U0BX-165



05U0BX-166



05U0BX-167

CRANKSHAFT

1. Check the journals and pins for damage, scoring, and oil hole clogging.
2. Set the crankshaft on V-blocks.
3. Measure the crankshaft runout at the center journal. Replace the crankshaft if necessary.

Runout: 0.04mm (0.0016 in) max.

4. Measure each journal diameter in X and Y directions at two points.

Main journal
Diameter: 49.938—49.956mm (1.9661—1.9668 in)
Out-of-round: 0.05mm (0.0020 in) max.

Crankpin journal
Diameter: 44.940—44.956mm (1.7693—1.7699 in)
Out-of-round: 0.05mm (0.0020 in) max.

Caution
- **Do not remove the fillet roll area R when grinding.**

5. If the diameter is less than the minimum, grind the journals to match an undersize bearing.

Undersize bearing:
0.25mm (0.010 in), 0.50mm (0.020 in), 0.75mm (0.030 in)

Main journal diameter undersize

mm (in)

Bearing size	Journal diameter
0.25 (0.010) undersize	49.704—49.708 (1.9568—1.9570)
0.50 (0.020) undersize	49.454—49.458 (1.9470—1.9472)
0.75 (0.030) undersize	49.204—49.208 (1.9372—1.9373)

Crankpin journal diameter undersize

mm (in)

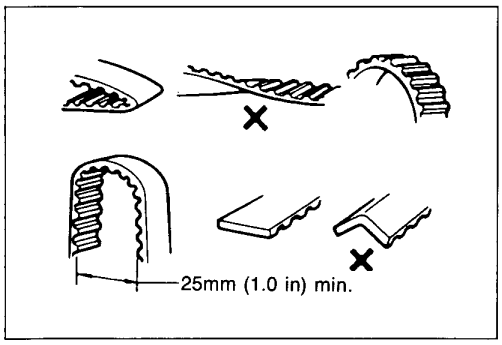
Bearing size	Journal diameter
0.25 (0.010) undersize	44.690—44.706 (1.7594—1.7601)
0.50 (0.020) undersize	44.440—44.456 (1.7496—1.7502)
0.75 (0.030) undersize	44.190—44.206 (1.7398—1.7404)

BEARING

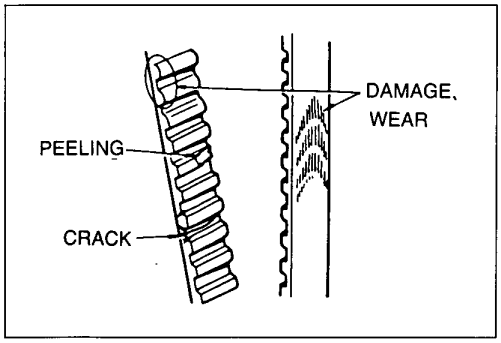
Main Bearing and Connecting Rod Bearing

1. Check the main bearings and the connecting rod bearings for peeling, scoring, and other damage.

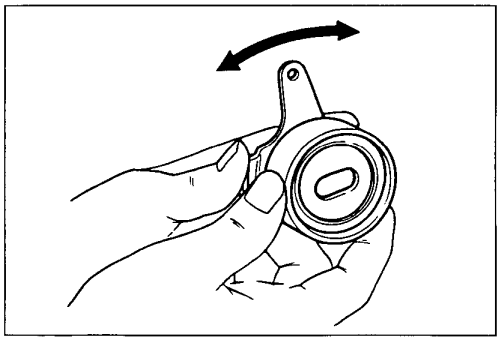
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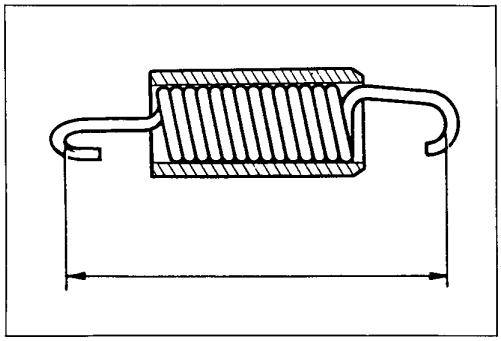
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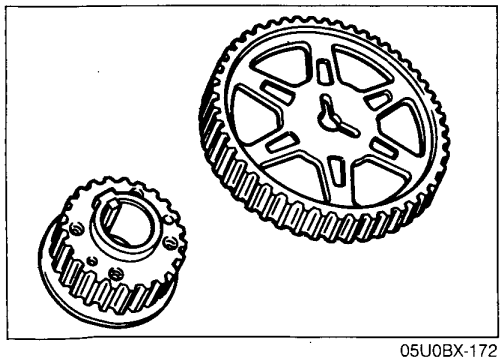
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TIMING BELT

Caution
- **Never forcefully twist, turn inside out, or bend the timing belt.**
- **Do not allow oil or grease on the belt.**

1. Replace the timing belt if there is any oil or grease on it.
2. Check the timing belt for damage, wear, peeling, cracks, and hardening. Replace the timing belt if necessary.

TENSIONER, IDLER

Caution
- **Do not clean the tensioner or idler with cleaning fluids. If necessary, use a soft rag to wipe them clean, and avoid scratching them.**

1. Check the tensioner and idler for smooth rotation and abnormal noise. Replace the tensioner or idler if necessary.

TENSIONER SPRING

1. Measure the free length of the tensioner spring. Replace the tensioner spring if necessary.

Free length: 58.8mm (2.315 in)

PULLEY

Timing Belt Pulley, Camshaft Pulley

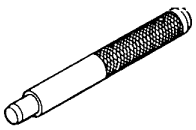
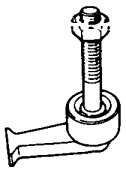
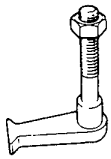
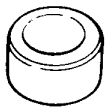
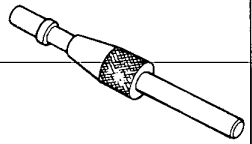
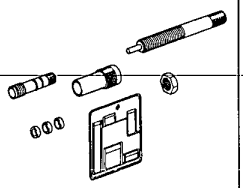
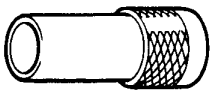
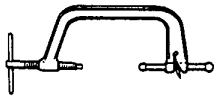
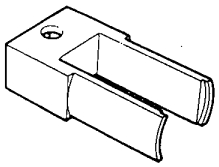
Caution
- **Do not clean the pulleys with cleaning fluids. If necessary, use a soft rag to wipe them clean, and avoid scratching them.**

1. Inspect the pulley teeth for wear, deformation, and other damage. Replace the pulley if necessary.

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ASSEMBLY

PREPARATION
SST

49 0223 061A Remover & installer, piston pin 	For removal and installation of piston pin	49 E301 060 Brake, ring gear 	For prevention of engine rotation
49 E301 061 Body (Part of 49 E301 060) 	For prevention of engine rotation	49 E301 062 Collar (Part of 49 E301 060) 	For prevention of engine rotation
49 SE01 310 Centering tool, clutch disc 	For installation of clutch disc	49 L012 0A0 Installer set, valve seal & valve guide 	For installation of valve seal
49 L012 001 Installer (Part of 49 L012 0A0) 	For installation of valve seal	49 L012 002 Body (Part of 49 L012 0A0) 	For installation of valve seal
49 L012 005 Spacer (Part of 49 L012 0A0) 	For installation of valve seal	49 0636 100A Arm, valve spring lifter 	For removal and installation of valve
49 B012 006 Pivot, valve spring lifter 	For removal and installation of valve		

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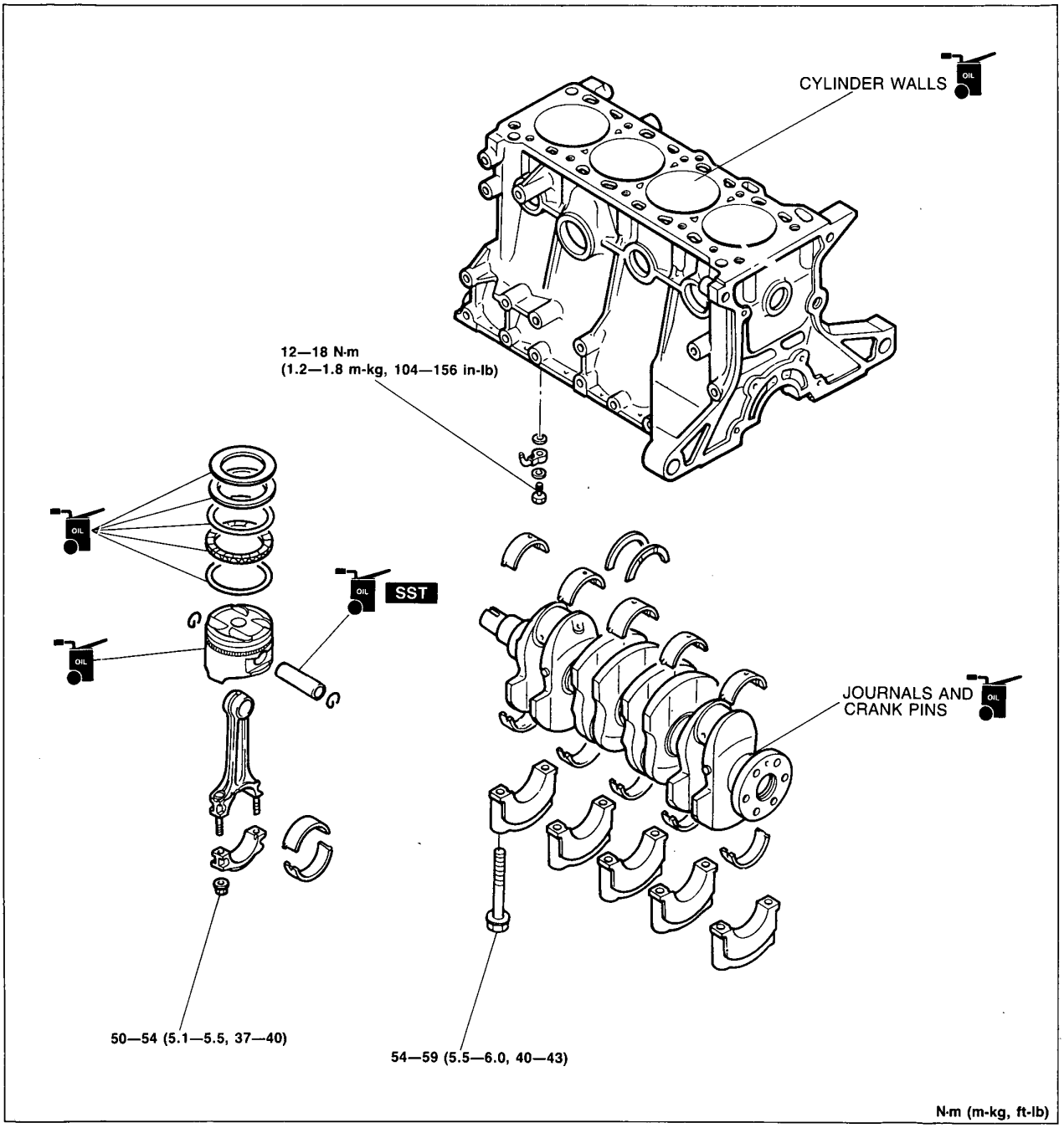
1. Clean all parts before reinstallation.
2. Apply new engine oil to all sliding and rotating parts.
3. Replace plain bearings if they are peeling, burned, or otherwise damaged.
4. Tighten all bolts and nuts to the specified torques.

Caution
- **Do not reuse gaskets or oil seals.**

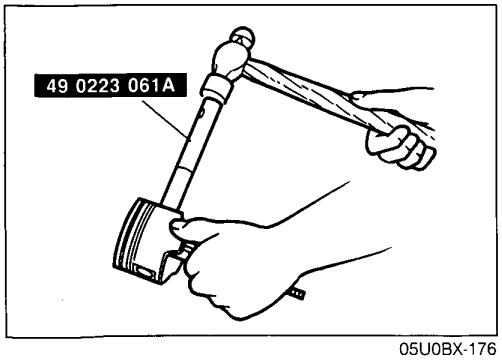
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CYLINDER BLOCK (INTERNAL PARTS)
Torque Specifications



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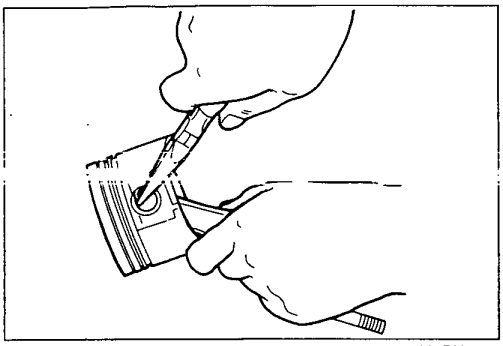


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Connecting Rod

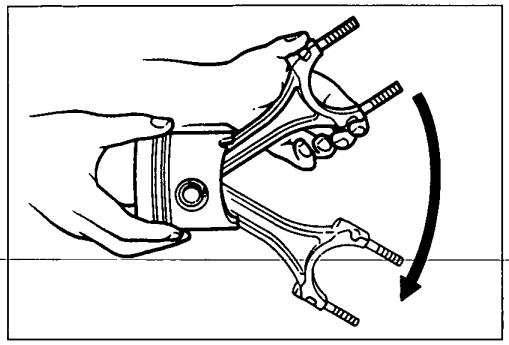
1. Install one piston pin clip into the clip groove in the piston.
2. Assemble the piston and the connecting rod in the direction from which they were disassembled.
3. Apply clean engine oil to the piston pin.
4. Install the piston pin from the side opposite the clip.
5. Tap the piston pin in with the **SST** until the pin contacts the clip.
   If the pin cannot be installed easily, replace the connecting rod.

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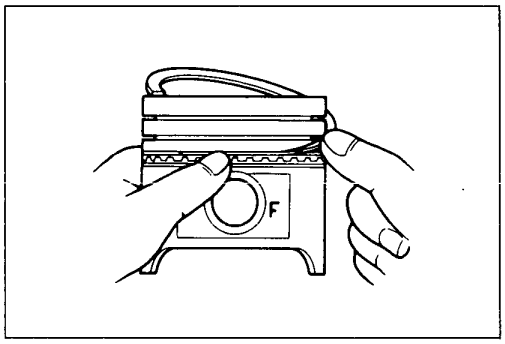
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6. Install the second clip into the clip groove in the piston.



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7. Check the oscillation torque of the connecting rod. If the large end does not drop by its own weight, replace the piston and/or piston pin.



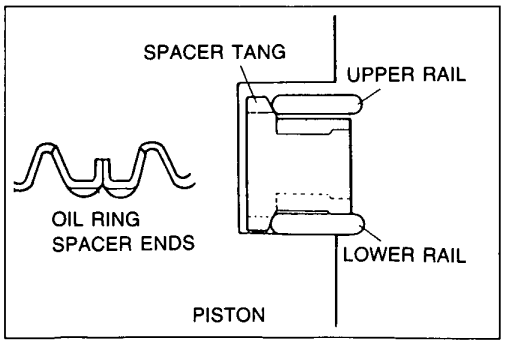
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Piston Ring

1. Install the three-piece oil rings on the pistons.
   (1) Apply clean engine oil to the oil ring spacer and rails.
   (2) Install the oil ring spacer with the ends upward.

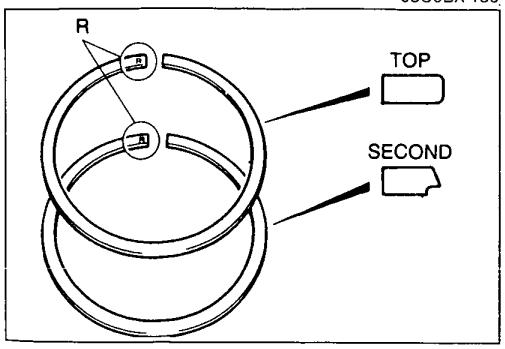
Note
- **The upper rail and lower rail are the same.**
- **The rails may be installed with either face upward.**

   (3) Install the upper rail and lower rail.



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2. Verify that both rails are expanded by the spacer tangs as shown in the figure by making certain the rails turn smoothly in both directions.

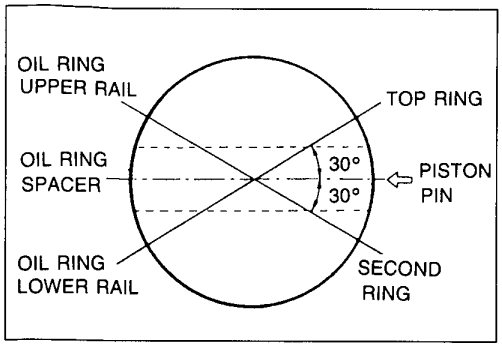


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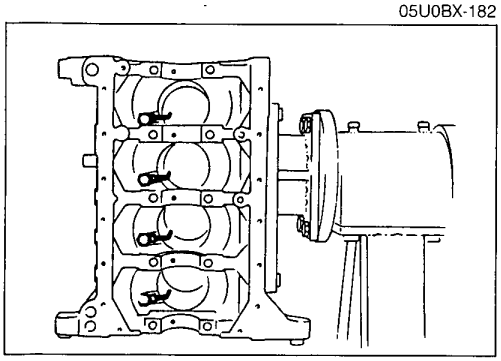
Caution
- **The rings must be installed with the R marks upward.**
- **The second ring must be installed with the scraper face downward.**

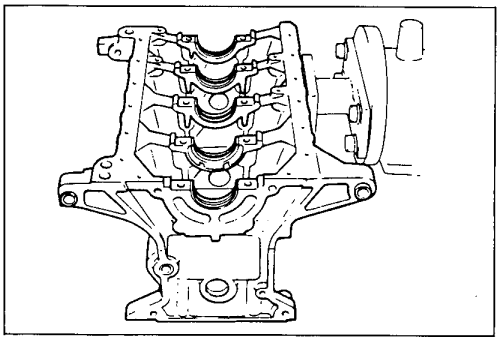
3. Apply clean engine oil to the top and second piston rings.
4. Install the second ring to the piston; then install the top ring. Use a piston ring expander (commercially available).

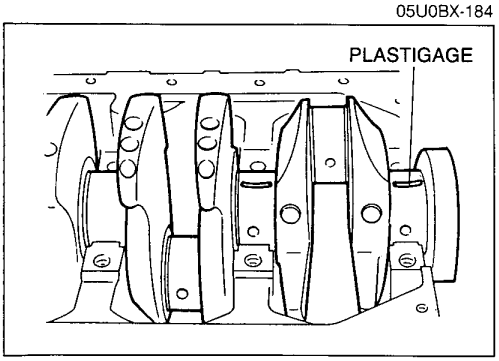
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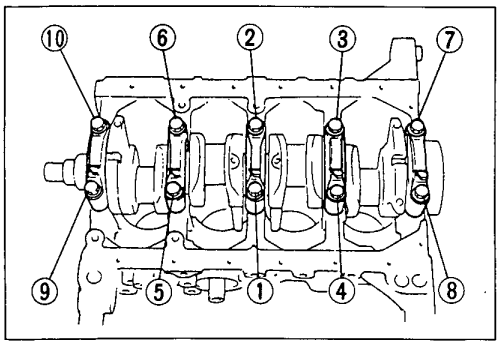
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5. Position the end gaps of the rings as shown in the figure.

Oil Jet

1. Install the oil jets.

Tightening torque:
12—18 N·m (1.2—1.8 m-kg, 104—156 in-lb)

Crankshaft

1. Before installing the crankshaft, inspect the main bearing oil clearances as follows.

Oil clearance inspection

(1) Remove all foreign material and oil from the journals and bearings.

Caution
- **Install the grooved upper main bearings in the cylinder block.**
- **Install the thrust bearings with the oil groove facing the crankshaft.**

(2) Install the upper main bearings and thrust bearings.
(3) Set the crankshaft in the cylinder block.

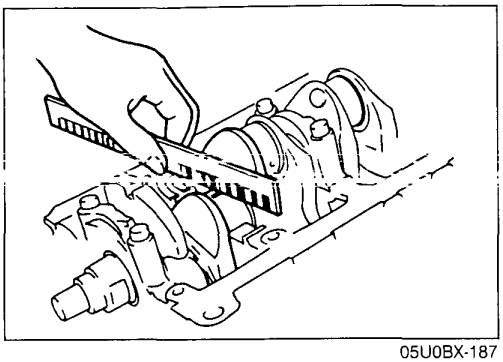
Caution
- **Do not rotate the crankshaft when measuring the oil clearances.**

(4) Position Plastigage atop the journals in the axial direction.

(5) Install the lower main bearings and the main bearing caps according to the cap number and ⇦ mark.
(6) Tighten the main bearing cap bolts in two or three steps in the order shown in the figure.

Tightening torque:
54—59 N·m (5.5—6.0 m-kg, 40—43 ft-lb)

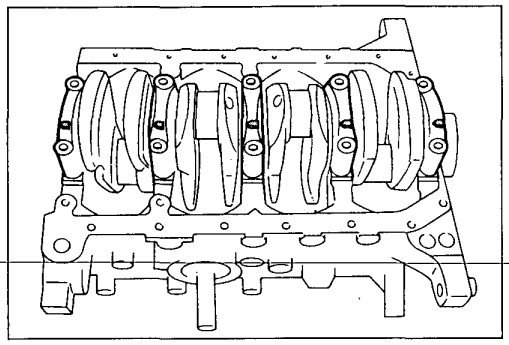
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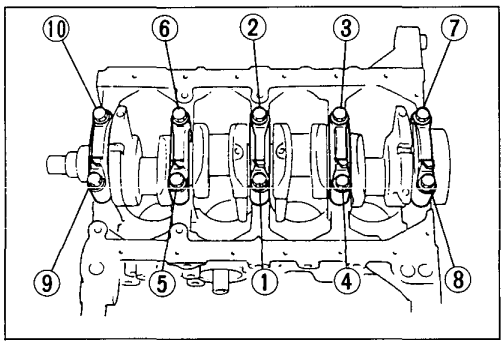
(7) Remove the main bearing caps, and measure the Plastigage at each journal at the widest point for the smallest clearance, and at the narrowest point for the largest clearance.
(8) If the oil clearance exceeds specification, grind the crankshaft and use undersize main bearings.
(Refer to page B–58.)

Oil clearance: 0.018—0.036mm (0.0007—0.0014 in)
Maximum: 0.10mm (0.004 in)



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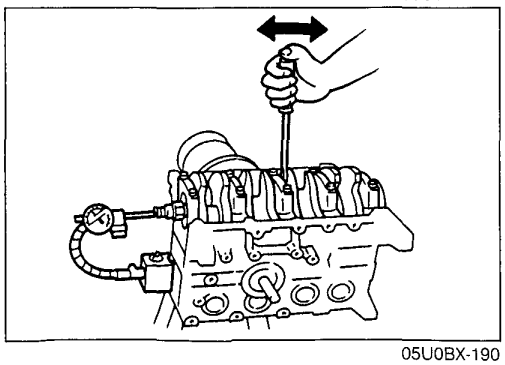
2. Apply a liberal amount of clean engine oil to the main bearings, thrust bearings and main journals.
3. Install the crankshaft and the main bearing caps according to the cap number and ⇦ mark.



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4. Tighten the main bearing cap bolts in two or three steps in the order shown in the figure.

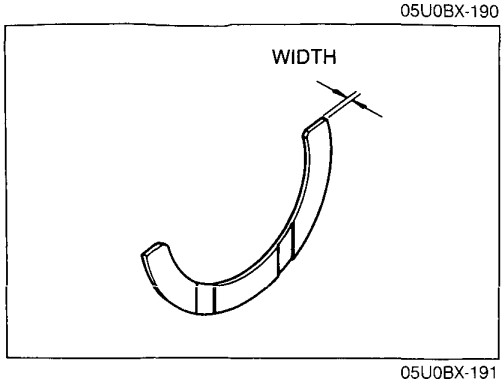
Tightening torque:
54—59 N·m (5.5—6.0 m-kg, 40—43 ft-lb)



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5. Measure the crankshaft end play.

End play : 0.080—0.282mm (0.0031—0.0111 in)
Maximum: 0.30mm (0.012 in)

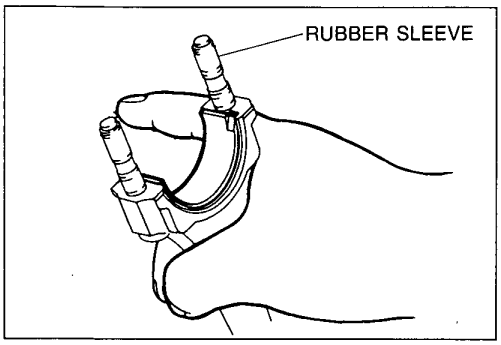


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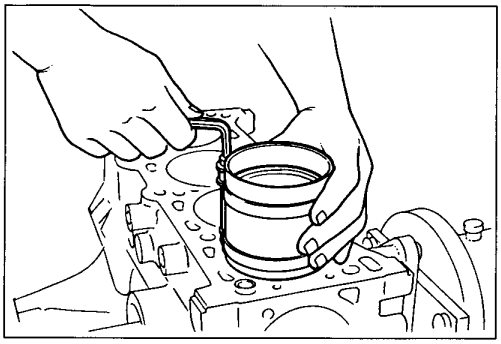
6. If the end play exceeds the maximum, grind the crankshaft and install an oversize thrust bearing or replace the crankshaft and thrust bearing.

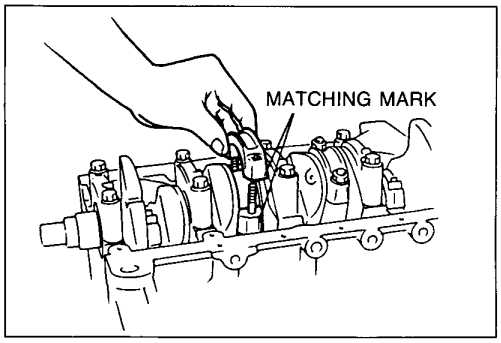
Thrust bearing width
Standard:
2.500—2.550mm (0.0984—0.1004 in)
0.25mm (0.010 in) oversize:
2.625—2.675mm (0.1033—0.1053 in)
0.50mm (0.020 in) oversize:
2.750—2.800mm (0.1083—0.1102 in)
0.75mm (0.030 in) oversize:
2.875—2.925mm (0.1132—0.1152 in)

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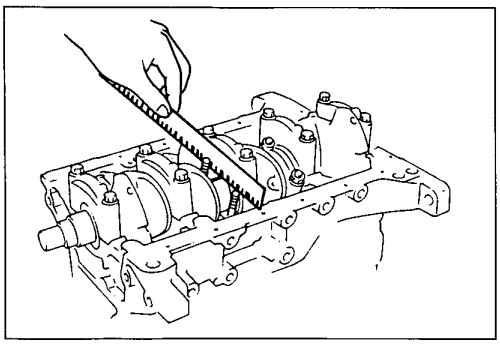


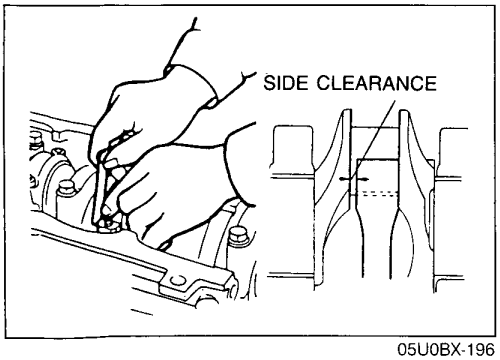
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Piston and Connecting Rod Assembly

Caution
- **Protect the connecting rod bolts with rubber sleeves to prevent damage to the crankpin journals.**

1. Apply a liberal amount of clean engine oil to the cylinder walls, pistons, and piston rings.
2. Check the piston rings for correct end gap alignment.
3. Insert each piston assembly into the cylinder block with the **F** mark facing the front of the engine. Use a piston ring compressor (commercially available).

Connecting Rod Cap

1. Measure the connecting rod bearing oil clearances using the same procedure as for the main bearing oil clearance.

Caution
- **Align the matching marks on the cap and the connecting rod when installing the connecting rod cap.**

Tightening torque:
50—54 N·m (5.1—5.5 m-kg, 37—40 ft-lb)

Oil clearance: 0.028—0.068mm (0.0011—0.0027 in)
Maximum: 0.10mm (0.004 in)

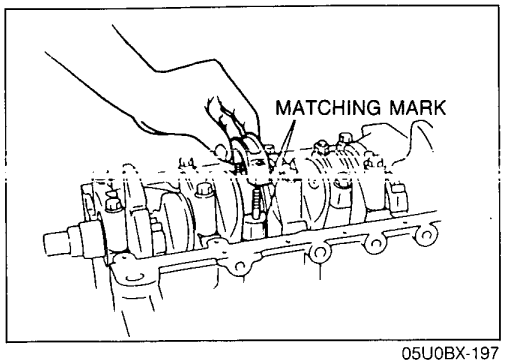
2. If the oil clearance exceeds the maximum, grind the crankshaft and use undersize bearings. (Refer to page B–58.)

3. Measure the connecting rod side clearances.

Side clearance: 0.110—0.262mm (0.0043—0.0103 in)
Maximum: 0.30mm (0.012 in)

4. If the clearance exceeds the maximum, replace the connecting rod and cap.

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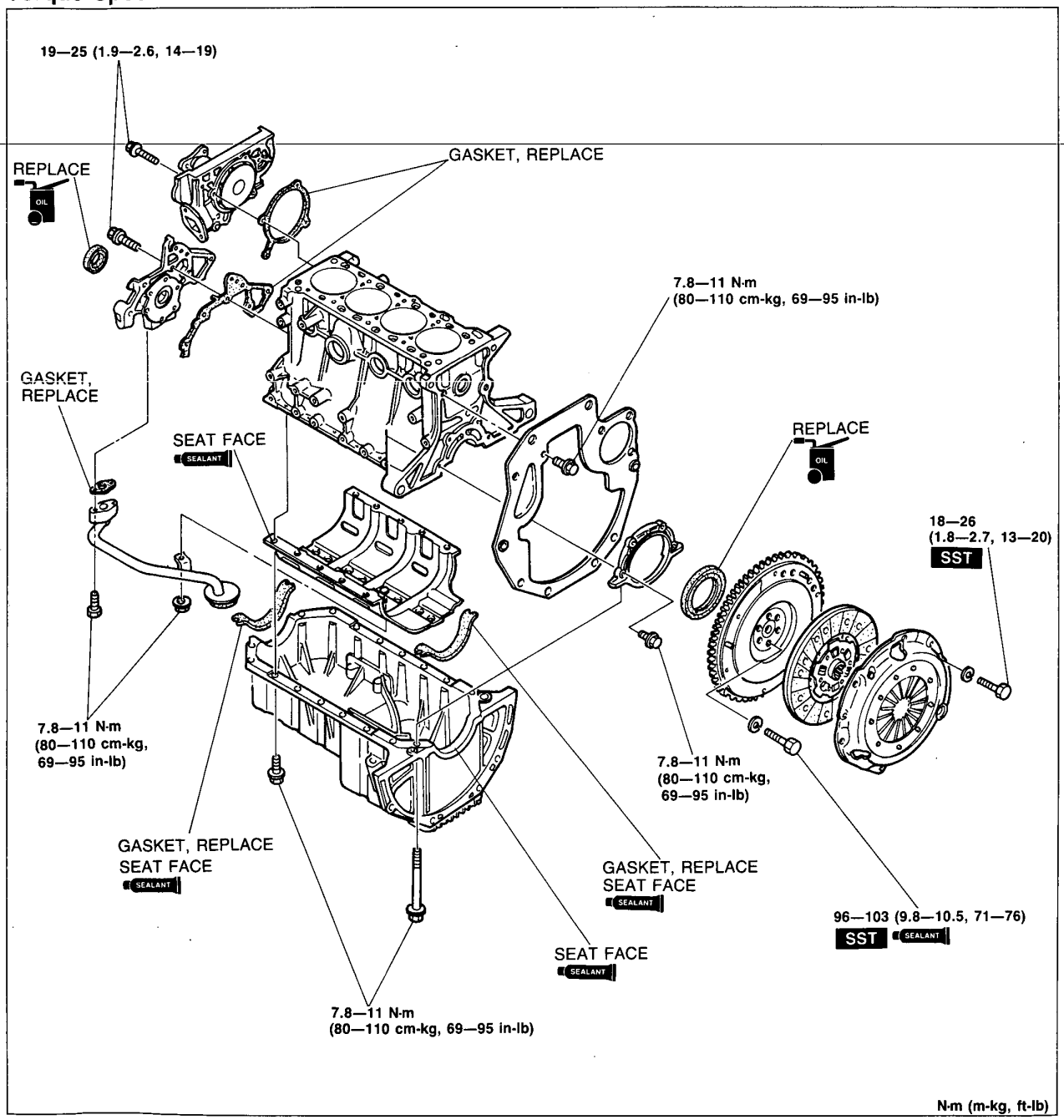


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5. Apply a liberal amount of clean engine oil to the crankpin journals and connecting rod bearings.
6. Install the connecting rod caps with the matching marks aligned.
7. Tighten the connecting rod cap nuts in two or three steps.

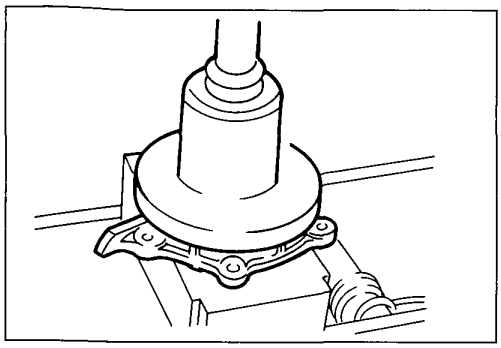
Tightening torque:
50—54 N·m (5.1—5.5 m-kg, 37—40 ft-lb)

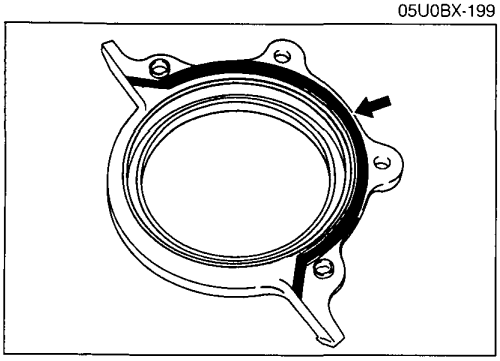
CYLINDER BLOCK (EXTERNAL PARTS)
Torque Specifications

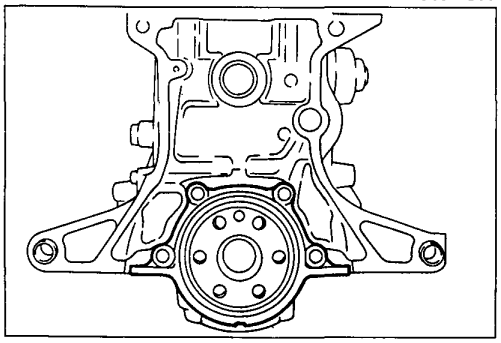


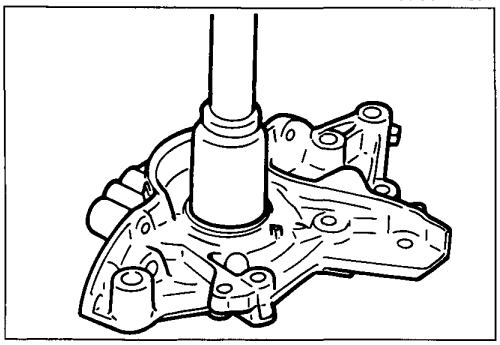
05U0BX-198

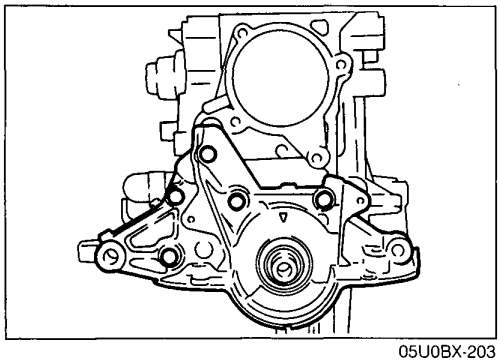
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05U0BX-199


05U0BX-200


05U0BX-201


05U0BX-202


05U0BX-203

Rear Cover

1. Apply a small amount of clean engine oil to the lip of a new oil seal.
2. Push the oil seal slightly in by hand.

Caution
- **The oil seal must be pressed in until it is flush with the edge of the rear cover.**

3. Press the oil seal in evenly with a suitable pipe.

Oil seal outer diameter: 100mm (3.94 in)

4. Apply silicone sealant to the shaded area shown in the figure.

5. Install the rear cover.

Tightening torque:
7.8—11 N·m (80—110 cm-kg, 69—95 in-lb)

Oil Pump

1. Apply a small amount of clean engine oil to the lip of a new oil seal.
2. Push the oil seal slightly in by hand.

Caution
- **The oil seal must be pressed in until it is flush with the edge of the oil pump body.**

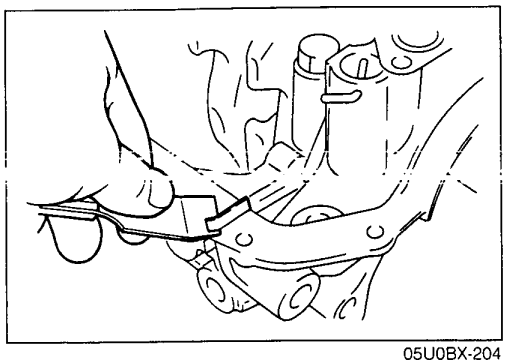
3. Press the oil seal in evenly with a suitable pipe.

Oil seal outer diameter: 44mm (1.73 in)

4. Install the oil pump and a new gasket.

Tightening torque:
19—25 N·m (1.9—2.6 m-kg, 14—19 ft-lb)

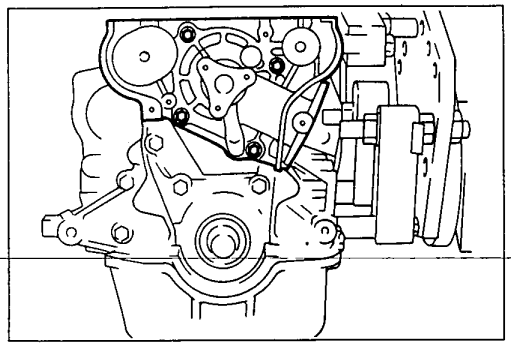
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05U0BX-204

Caution
- **Do not scratch the oil pump.**

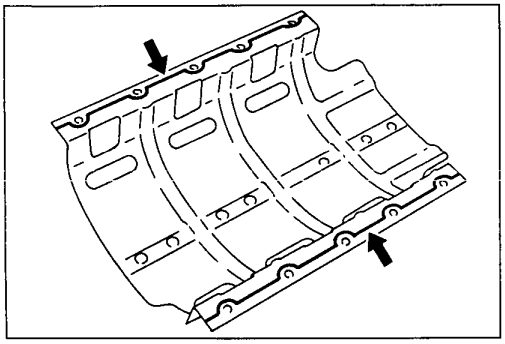
5. Cut away the portion of the gasket that projects from the body toward the oil pan side.



05U0BX-205

Water Pump
1. Remove all foreign material from the water pump mounting surface.
2. Install the water pump and a new gasket.

Tightening torque:
19—25 N·m (1.9—2.6 m-kg, 14—19 ft-lb)

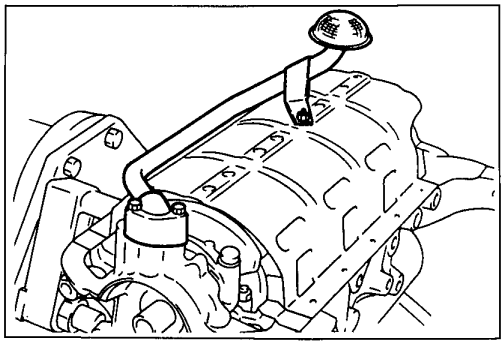


05U0BX-206

Oil Pan Baffle
1. Remove all foreign material from the contact surfaces.

Caution
- **The oil pan must be secured within 30 minutes after the sealant is applied to the baffle.**

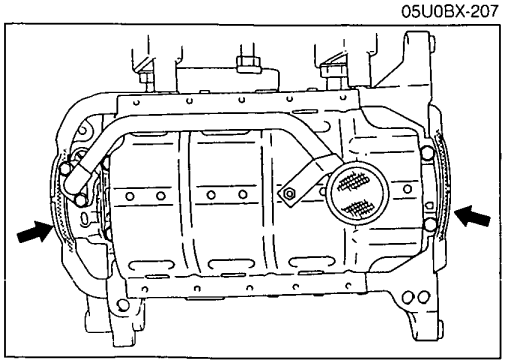
2. Apply a continuous bead of silicone sealant to the baffle along the inside of the bolt holes.
3. Install the baffle.



05U0BX-207

Oil Strainer
1. Install the oil strainer and a new gasket.

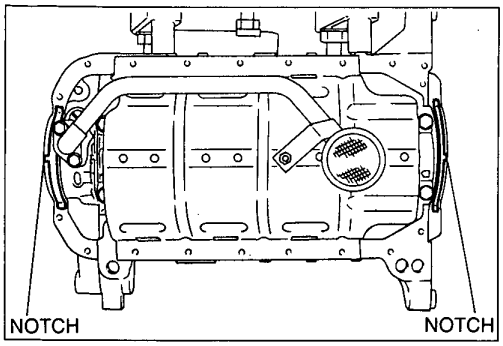
Tightening torque:
7.8—11 N·m (80—110 cm-kg, 69—95 in-lb)



05U0BX-208

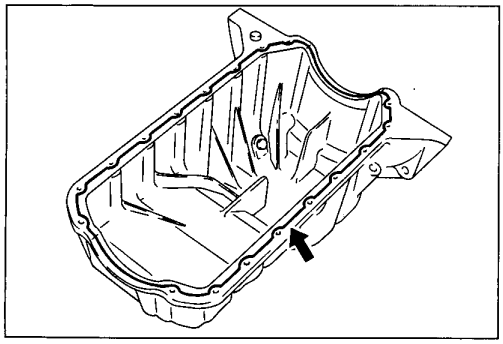
Oil Pan
1. Remove all foreign material from the contact surfaces.
2. Apply silicone sealant to the shaded areas shown in the figure.

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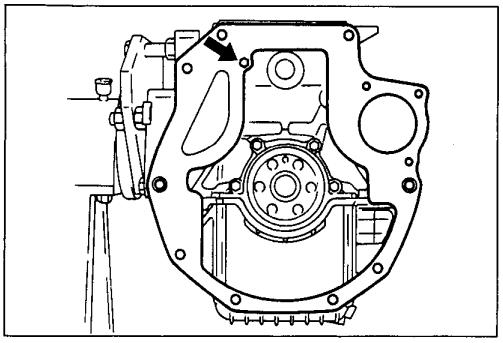
05U0BX-209

3. Install new gaskets onto the oil pump body and the rear cover with the projections in the notches shown in the figure.


05U0BX-210

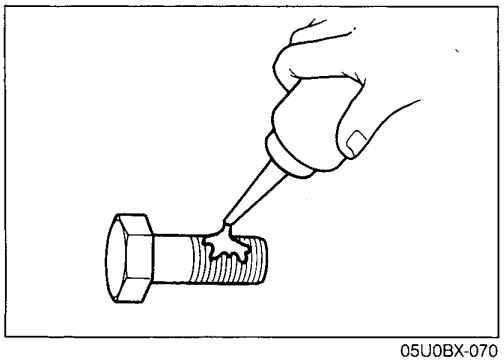
4. Apply a continuous bead of silicone sealant to the oil pan along the inside of the bolt holes and overlap the ends.
5. Install the oil pan.

Tightening torque:
7.8—11 N·m (80—110 cm-kg, 69—95 in-lb)


05U0BX-211

End Plate
1. Install the end plate.

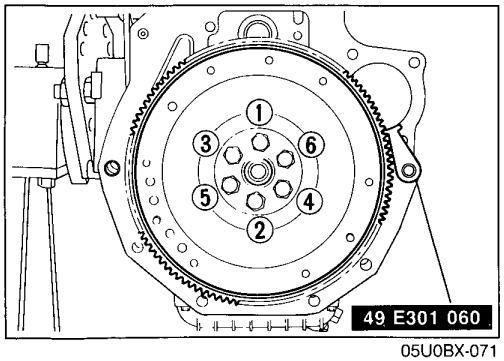
Tightening torque:
7.8—11 N·m (80—110 cm-kg, 69—95 in-lb)


05U0BX-070

Flywheel
1. Remove the sealant from the flywheel bolt holes in the crankshaft and from the flywheel bolts.

Caution
- **If all the previous sealant cannot be removed from a bolt, replace the bolt.**
- **Do not apply sealant if a new bolt is used.**

2. Set the flywheel onto the crankshaft.
3. Apply sealant to the flywheel bolts and install them.

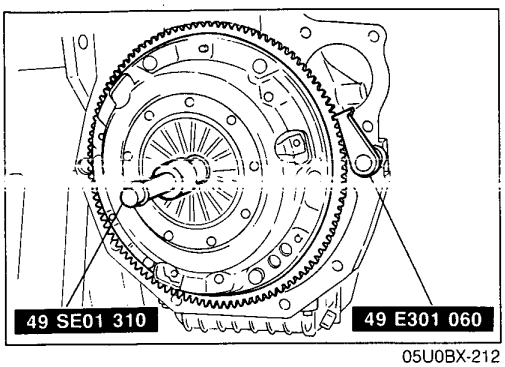


05U0BX-071

4. Hold the flywheel with the **SST**.
5. Tighten the bolts in two or three steps in the order shown.

Tightening torque:
96—103 N·m (9.8—10.5 m-kg, 71—76 ft-lb)

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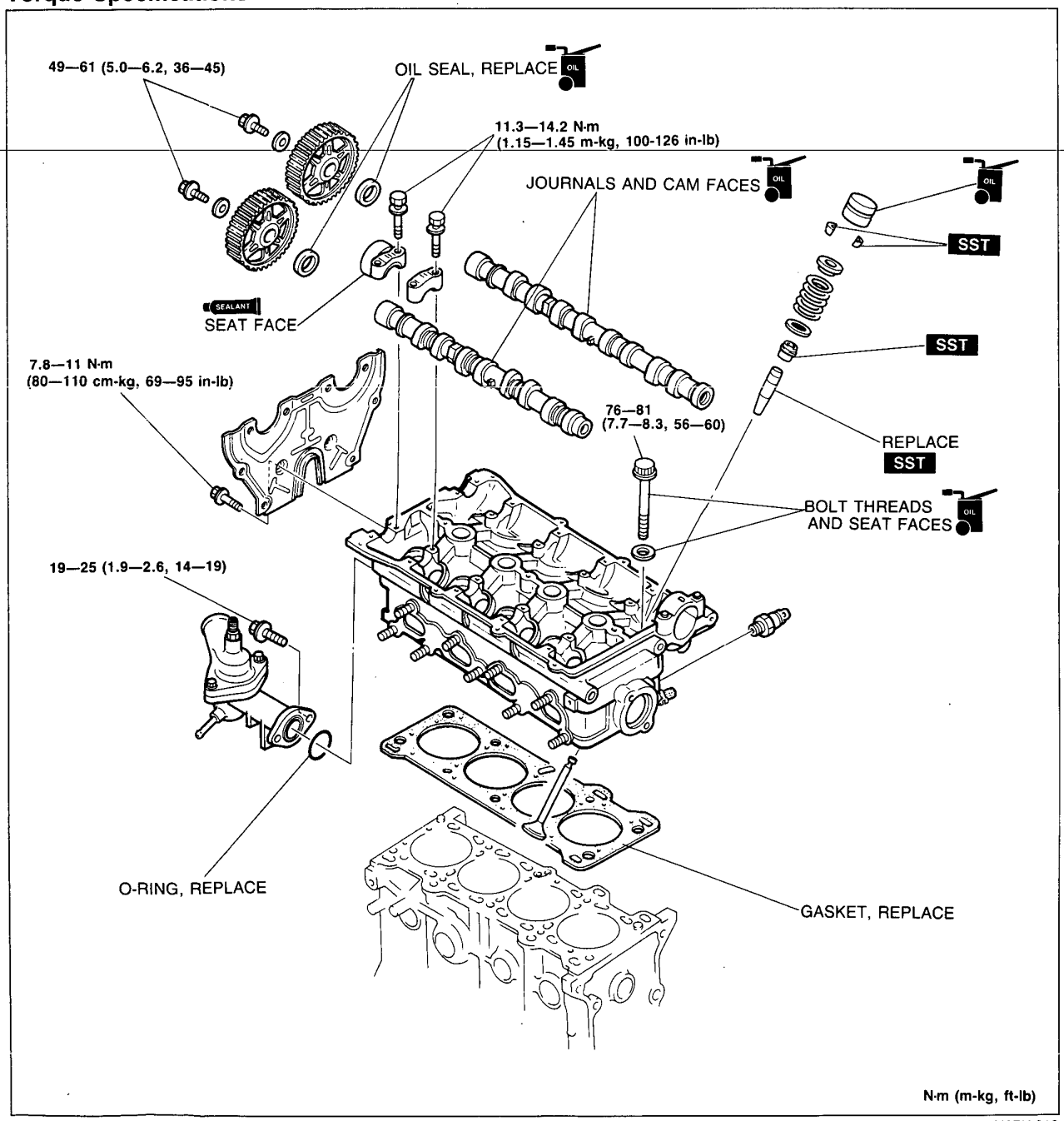
05U0BX-212

Clutch Disc and Clutch Cover

1. Install the clutch disc and clutch cover using the **SST**. (Refer to page H–14.)

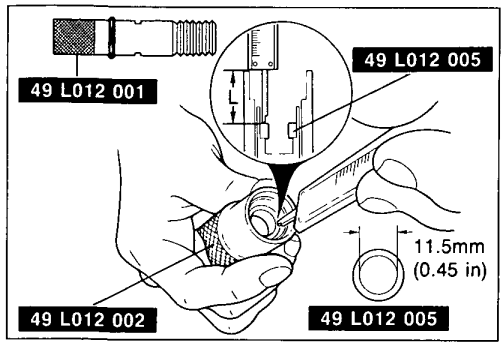
Tightening torque:
18—26 N·m (1.8—2.7 m-kg, 13—20 ft-lb)

CYLINDER HEAD
Torque Specifications



05U0BX-213

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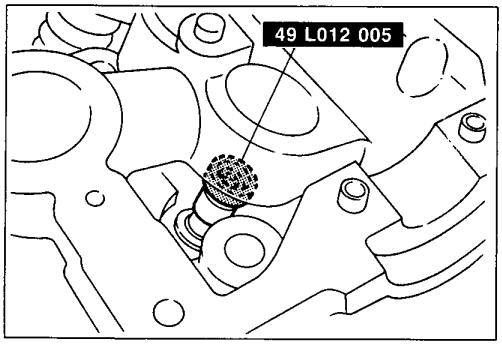


05U0BX-214

Valve Seal

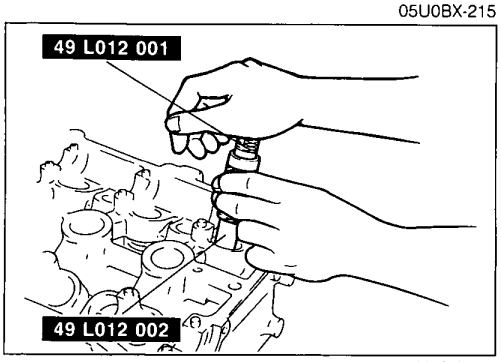
1. Assemble the **SST** so that depth **L** is as specified.

Depth L: 18.3—18.5mm (0.720—0.728 in)



05U0BX-215

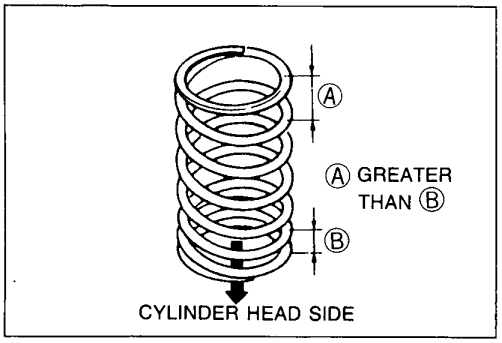
2. Slide the valve seal onto the valve guide.
3. Set the **SST** against the valve seal.



05U0BX-216

Caution
- **Do not use a hammer.**

4. Press the valve seal on until the **SST** contacts the cylinder head.



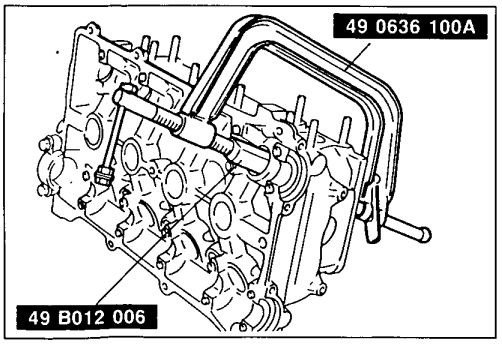
05U0BX-217

Valve and Valve Spring

1. Install the lower spring seat.
2. Install the valve.

Caution
- **Install the spring with the closer pitch toward the cylinder head.**

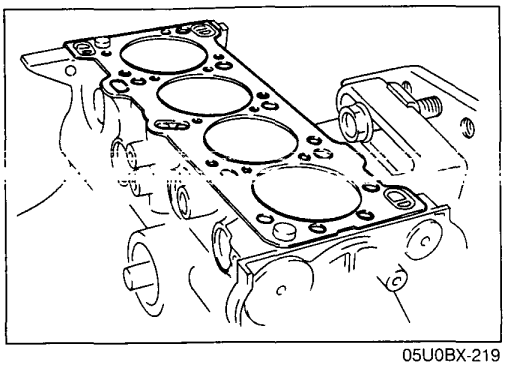
3. Install the valve spring and the upper spring seat.



05U0BX-218

4. Compress the valve spring with the **SST**, and install the valve keepers.
5. Remove the **SST**.
6. Tap the end of the valve stem lightly two or three times with a plastic hammer to verify that the keepers are all fully seated.

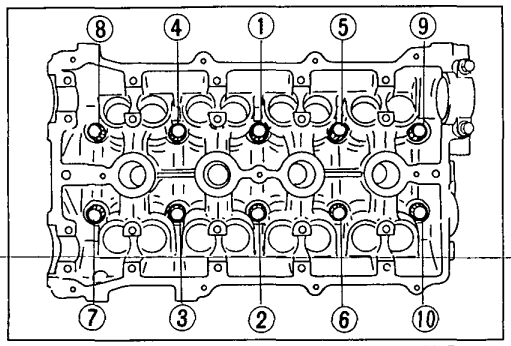
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05U0BX-219

Cylinder Head Gasket

1. Remove all foreign material from the top of the cylinder block.
2. Place the new cylinder head gasket in position.

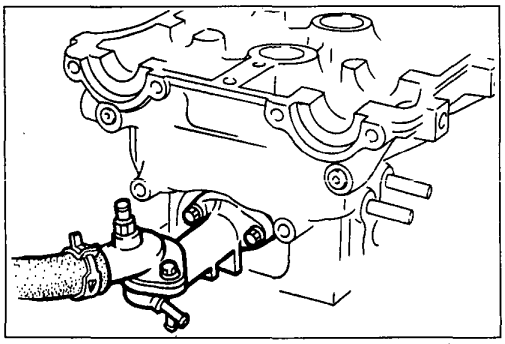


05U0BX-220

Cylinder Head

1. Install the cylinder head.
2. Apply clean engine oil to the bolt threads and seat faces.
3. Tighten the cylinder head bolts in two or three steps in the order shown.

Tightening torque:
76—81 N·m (7.7—8.3 m-kg, 56—60 ft-lb)

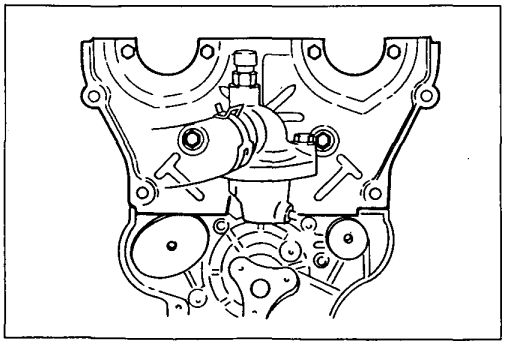


05U0BX-221

Thermostat Housing

1. Remove all foreign material from the thermostat housing mounting surface.
2. Install a new O-ring and the thermostat housing.

Tightening torque:
19—25 N·m (1.9—2.6 m-kg, 14—19 ft-lb)

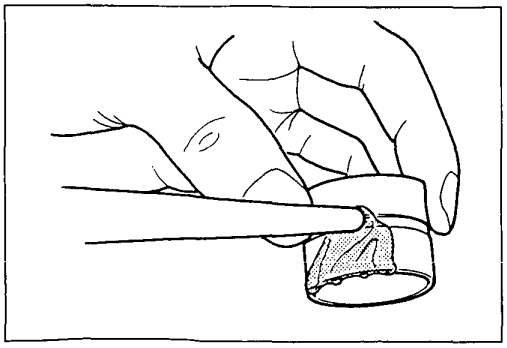


05U0BX-222

Seal Plate

1. Install the seal plate on the cylinder head.

Tightening torque:
7.8—11 N·m (80—110 cm-kg, 69—95 in-lb)

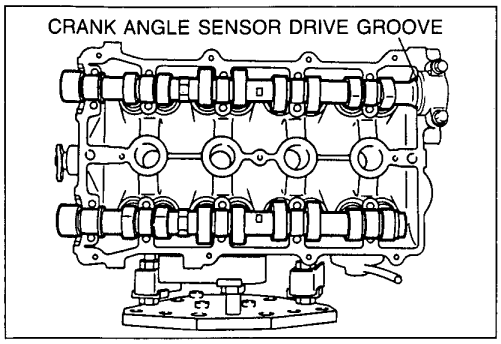


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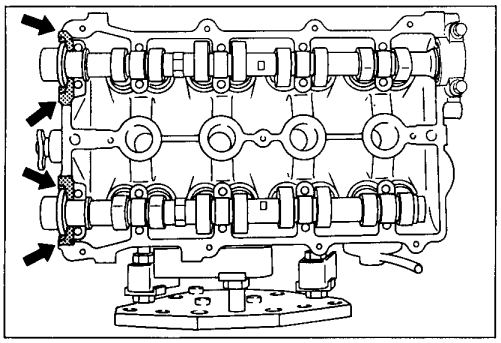
HLA

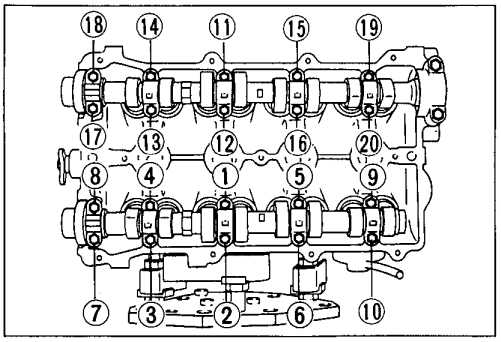
1. Apply clean engine oil to the friction surfaces.
2. If the HLA are being reused, install them in the position from which they were removed.
3. Verify that the HLA move smoothly in their bores.

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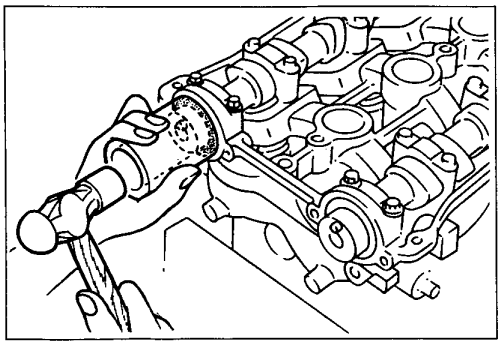


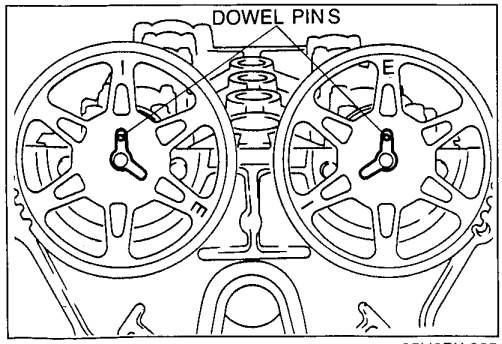
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05U0BX-054



05U0BX-055


05U0BX-056



05U0BX-225

Camshaft

Note
- **The intake camshaft is grooved for the crank angle sensor drive.**

1. Apply clean engine oil to the camshaft journals and bearings.
2. Install the camshaft in position.

Caution
- **Do not allow any sealant on the camshaft journal surfaces.**

3. Apply silicone sealant to the shaded areas shown in the figure.
4. Install the camshaft caps according to the cap number and arrow mark.

5. Install the camshaft cap bolts, and tighten them in two or three steps in the order shown.

Tightening torque:
11.3—14.2 N·m (1.15—1.45 m-kg, 100—126 in-lb)

6. Apply a small amount of clean engine oil to the lip of a new camshaft oil seal.
7. Push the oil seal slightly in by hand.

Caution
- **The oil seal must be tapped in until it is flush with the edge of the camshaft cap.**

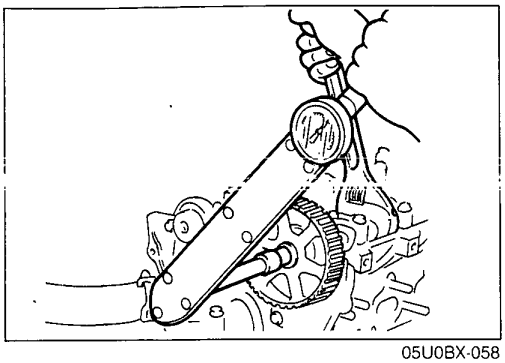
8. Tap the oil seal in evenly with a suitable pipe and a hammer.

Oil seal outer diameter: 48mm (1.89 in)

Camshaft Pulley

1. Turn the camshafts until the camshaft dowel pins face straight up.
2. Install the camshaft pulleys with the I mark (intake side) or the E mark (exhaust side) straight up.

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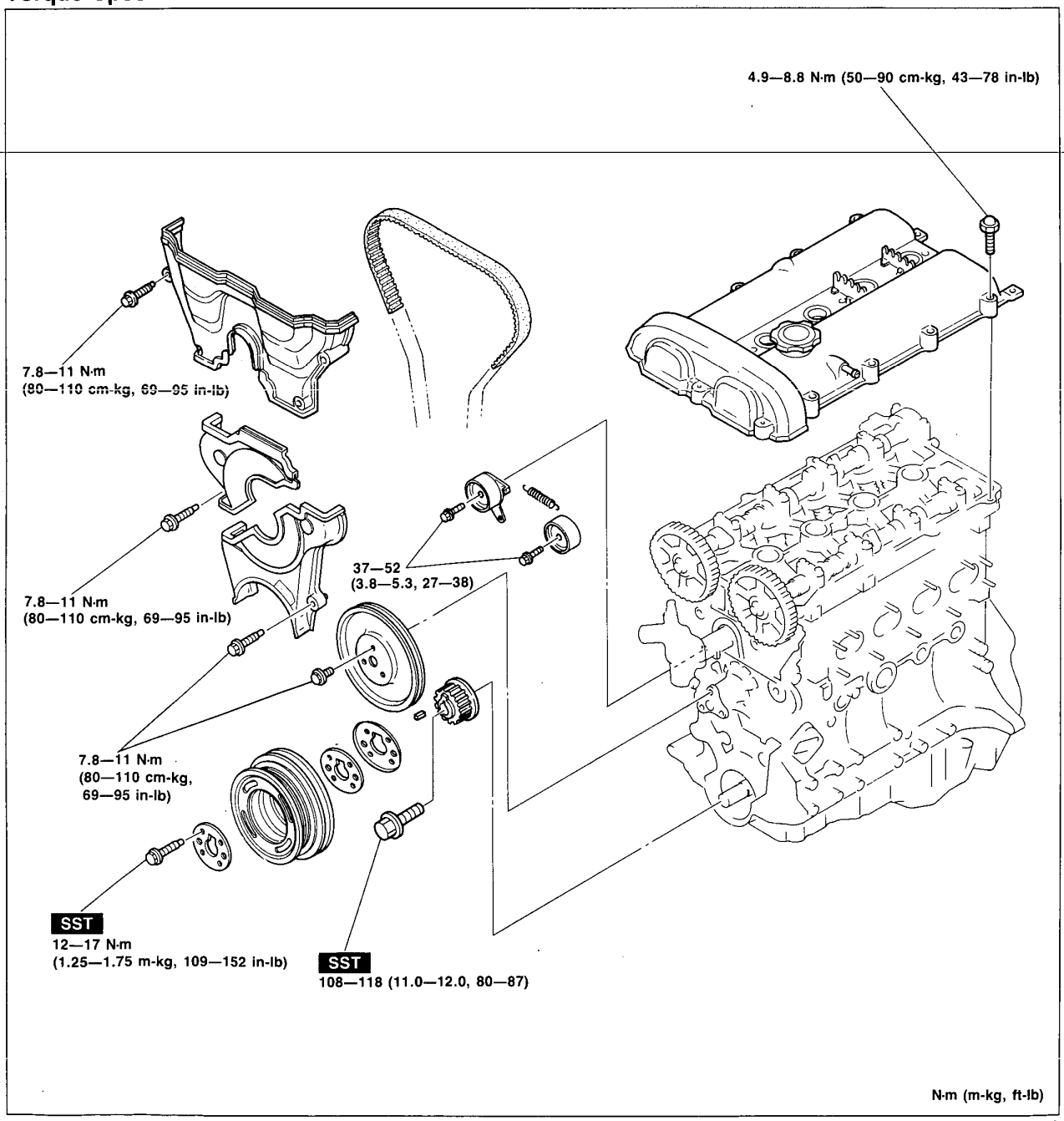


05U0BX-058

3. Install the camshaft pulley lock bolts.
4. Hold the camshaft with a wrench.
5. Tighten the camshaft pulley lock bolt.

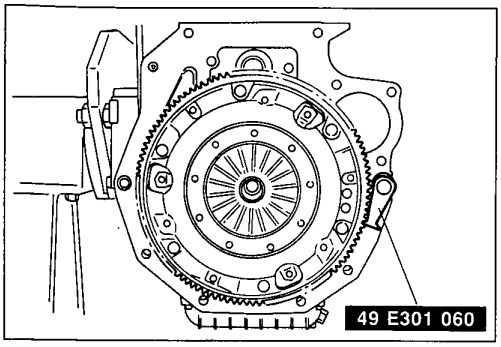
Tightening torque:
49—61 N·m (5.0—6.2 m-kg, 36—45 ft-lb)

TIMING BELT
Torque Specifications



05U0BX-226

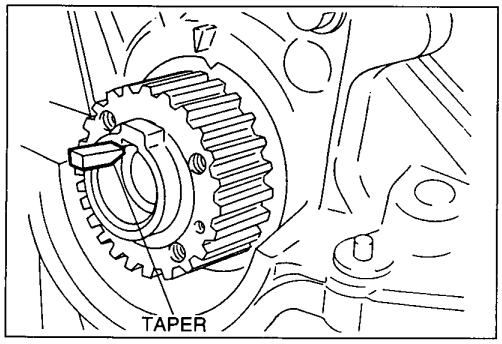
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05U0BX-227

Timing Belt Pulley

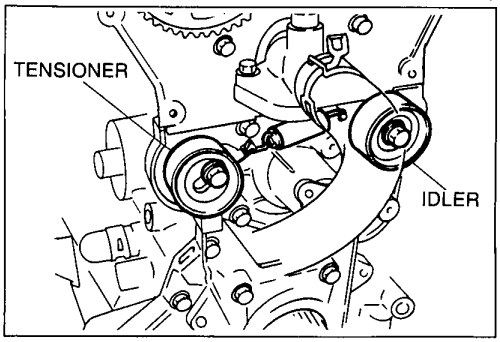
1. Reverse the direction of the **SST** on the flywheel.



05U0BX-228

2. Install the timing belt pulley.
3. Install the pulley Woodruff key with the tapered side toward the oil pump body.
4. Install the pulley lock bolt.
5. Tighten the pulley lock bolt.

Tightening torque:
108—118 N·m (11.0—12.0 m-kg, 80—87 ft-lb)



05U0BX-229

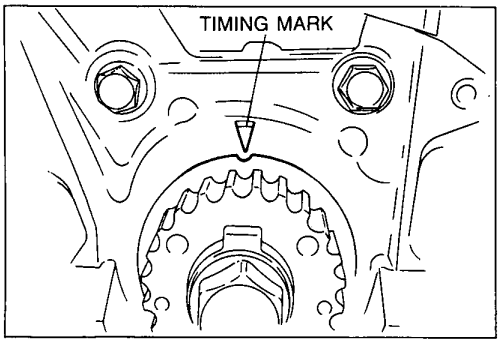
Idler

1. Install the idler.

Tightening torque:
37—52 N·m (3.8—5.3 m-kg, 27—38 ft-lb)

Tensioner and Tensioner Spring

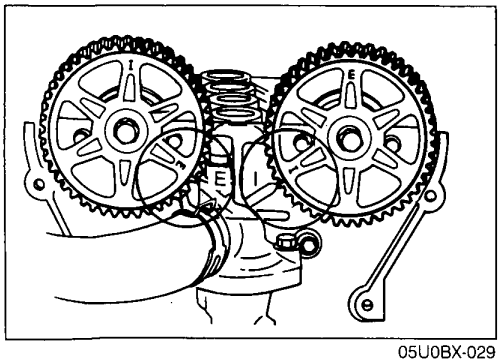
1. Install the tensioner and the tensioner spring.
2. Temporarily secure the tensioner with the spring fully extended.



05U0BX-230

Timing Belt

1. Turn the crankshaft and align the timing belt pulley mark with the timing mark.

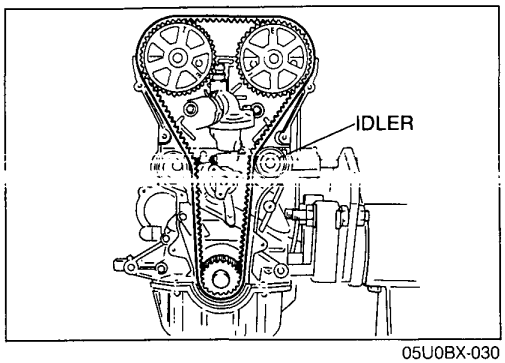


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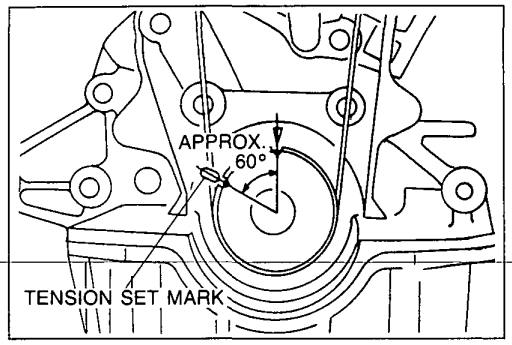
2. Verify that the camshaft pulley marks are aligned with the seal plate marks.

Caution
- **For intake side, align the E mark.**
- **For exhaust side, align the I mark.**

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05U0BX-030



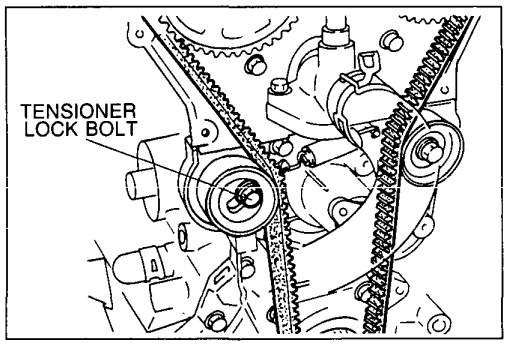
05U0BX-031

3. Install the timing belt so that there is no looseness at the idler side or between the two camshaft pulleys.

Caution
- **Do not turn the crankshaft counterclockwise.**

4. Turn the crankshaft two turns clockwise, and align the timing belt pulley mark with the timing mark.
5. Verify that the camshaft pulley marks are aligned with the seal plate marks.
   If not aligned, remove the timing belt and repeat from tensioner installation.

6. Turn the crankshaft 1 and 5/6 turn clockwise, and align the timing belt pulley mark with the tension set mark.

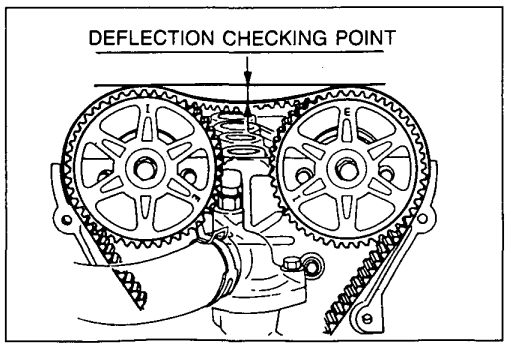


05U0BX-032

7. Loosen the tensioner lock bolt to apply tension to the timing belt.
8. Tighten the tensioner lock bolt.

Tightening torque:
37—52 N·m (3.8—5.3 m-kg, 27—38 ft-lb)

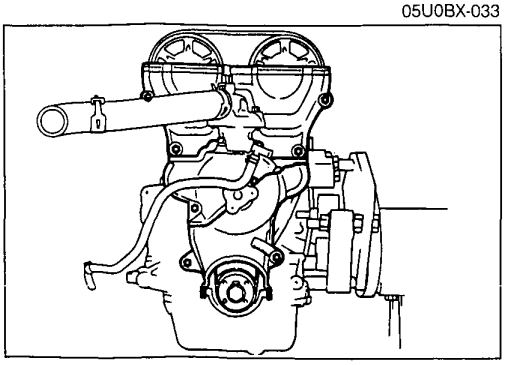
9. Turn the crankshaft 2 and 1/6 turns clockwise and verify that the timing marks are correctly aligned.



05U0BX-033

10. Measure the timing belt deflection by applying moderate pressure **(98 N, 10 kg, 22 lb)** midway between the two camshaft pulleys.
    If the deflection is not correct, repeat from Step 7 above.

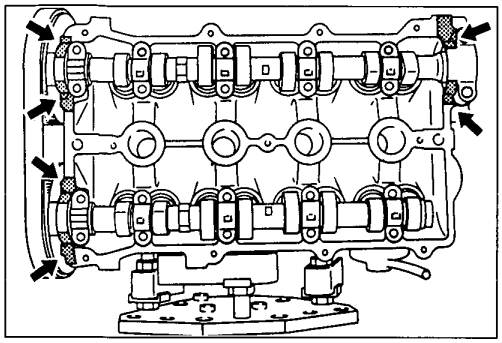
Deflection:
9.0—11.5mm (0.35—0.45 in) at 98 N (10 kg, 22 lb)


05U0BX-231

Timing Belt Cover
1. Install the lower, middle, and upper covers.

Tightening torque:
7.8—11 N·m (80—110 cm-kg, 69—95 in-lb)

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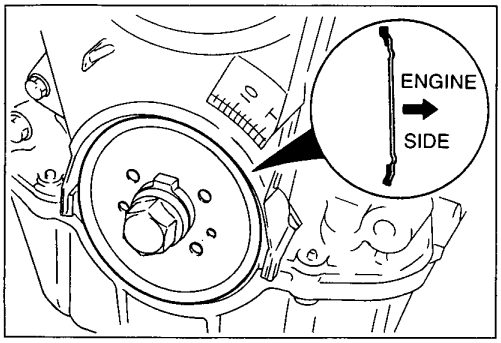


05U0BX-232

Cylinder Head Cover

1. Apply silicone sealant to the shaded areas shown in the figure.
2. Install the cylinder head cover.

Tightening torque:
4.9—8.8 N·m (50—90 cm-kg, 43—78 in-lb)

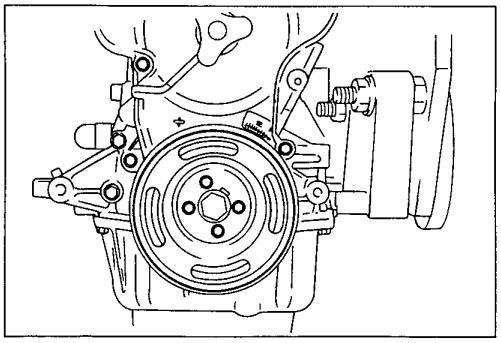


05U0BX-233

Crankshaft Pulley

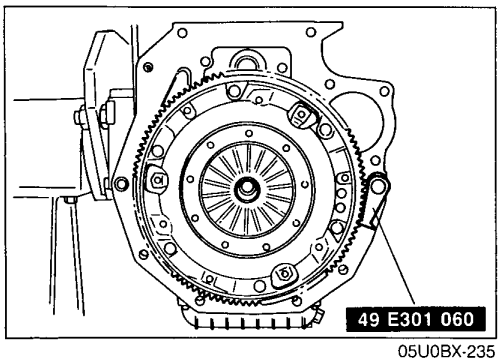
Caution
- **Make sure the timing belt inner guide plate is installed in the proper direction.**

1. Install the timing belt inner guide plate.



05U0BX-234

2. Install the timing belt outer guide plate.
3. Install the crankshaft pulley.
4. Install the plate.

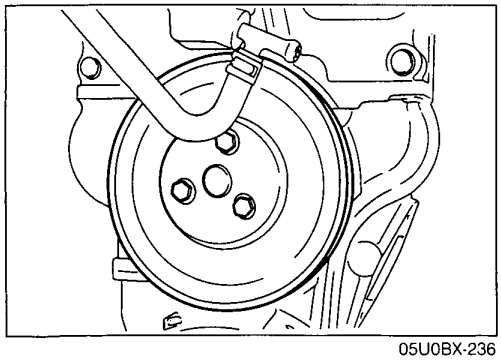


05U0BX-235

5. Tighten the lock bolts with the **SST**.

Tightening torque:
12—17 N·m (1.25—1.75 m-kg, 109—152 in-lb)

6. Remove the **SST**.



05U0BX-236

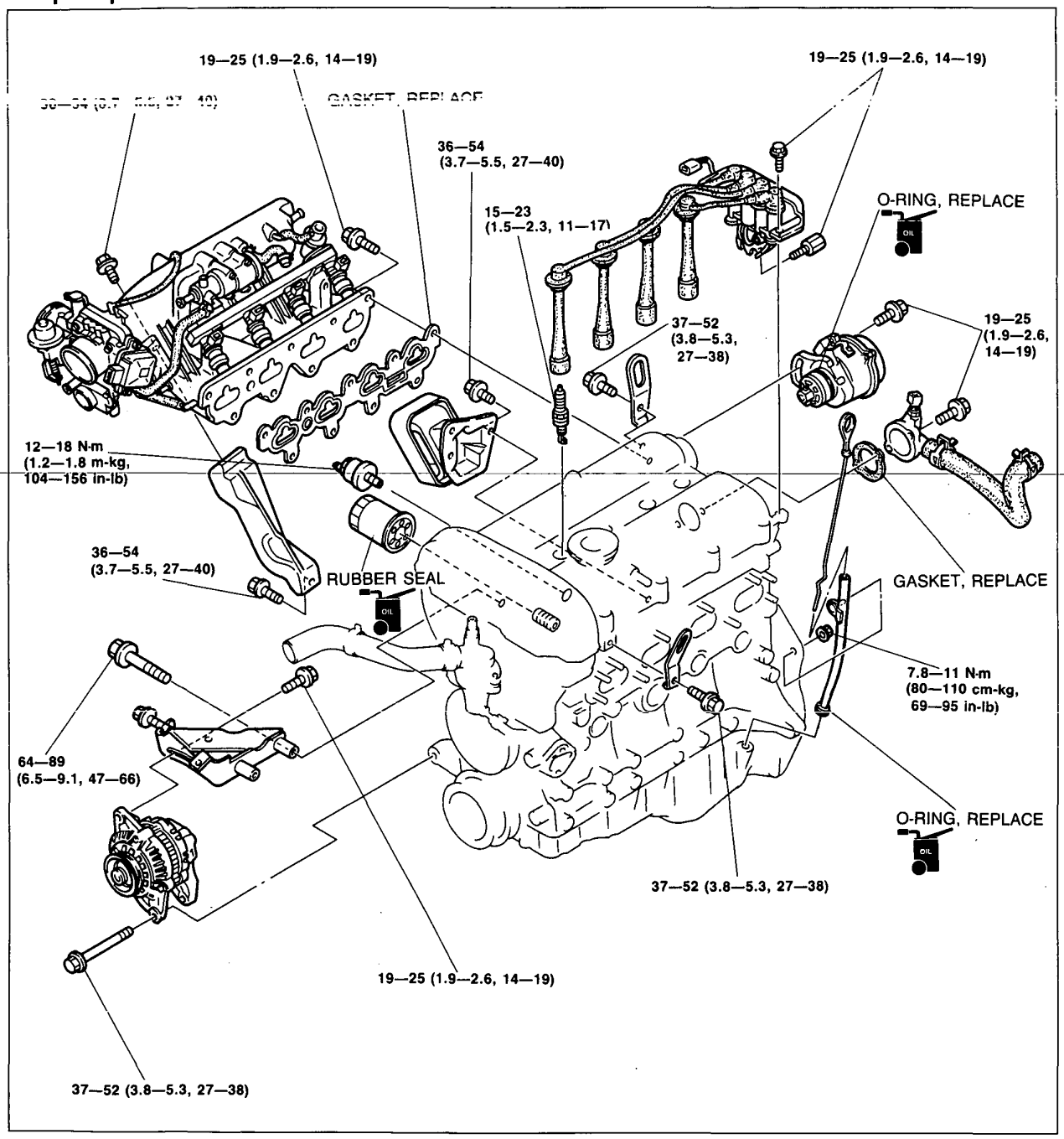
Water Pump Pulley

1. Install the water pump pulley.

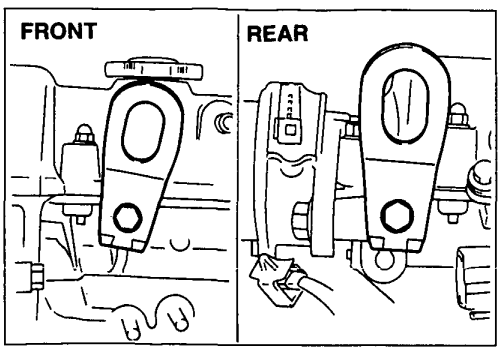
Tightening torque:
7.8—11 N·m (80—110 cm-kg, 69—95 in-lb)

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AUXILIARY PARTS
Torque Specifications



05U0BX-237



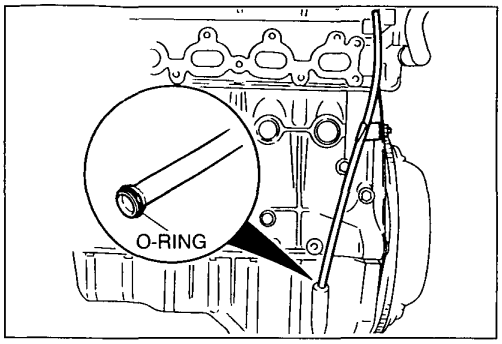
05U0BX-238

Engine Hanger

1. Install the front and rear engine hangers.

Tightening torque:
37—52 N·m (3.8—5.3 m-kg, 27—38 ft-lb)

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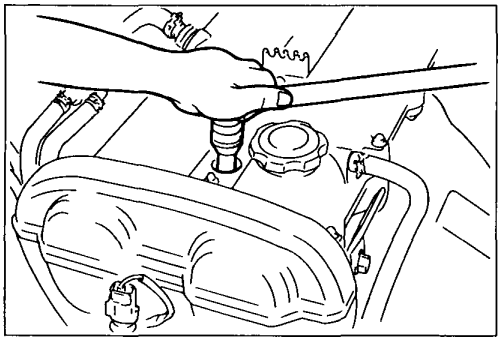


05U0BX-239

Oil Level Gauge Pipe
1. Apply a small amount of clean engine oil to the new O-ring.
2. Push the level gauge pipe into the oil pan.
3. Tighten the level gauge pipe bracket nut.

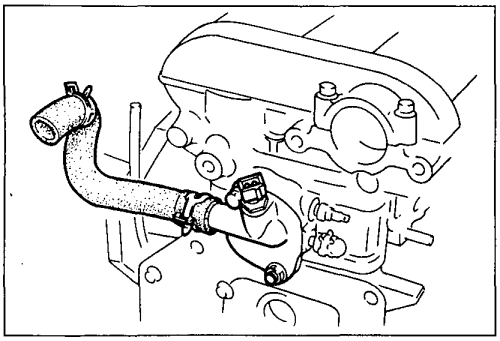
Tightening torque:
7.8—11 N·m (80—110 cm-kg, 69—95 in-lb)

4. Install the level gauge.


05U0BX-240

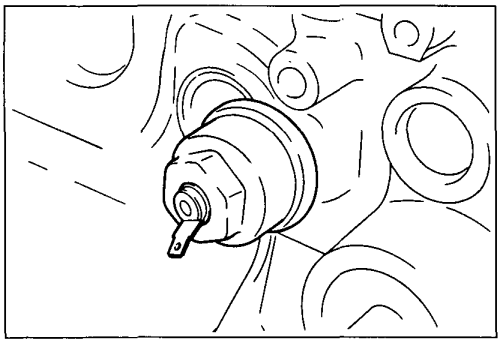
Spark Plug
1. Apply antiseize compound or molybdenum-based lubricant to the spark plug threads.
2. Install the spark plugs.

Tightening torque:
15—23 N·m (1.5—2.3 m-kg, 11—17 ft-lb)


05U0BX-241

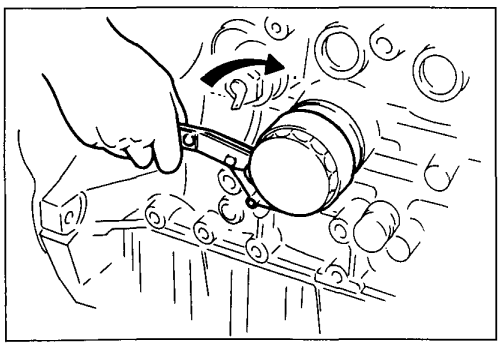
Water Outlet Pipe
1. Remove all foreign material from the water outlet pipe mounting surface.
2. Install a new gasket and the water outlet pipe.

Tightening torque:
19—25 N·m (1.9—2.6 m-kg, 14—19 ft-lb)


05U0BX-242

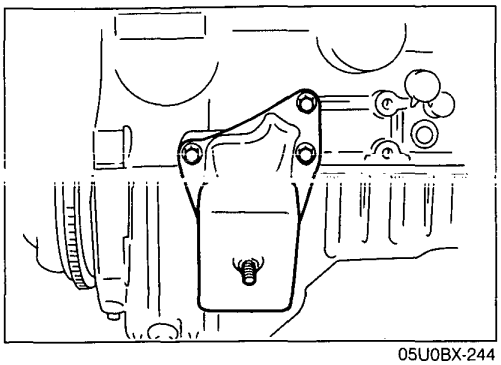
Oil Pressure Gauge Sender Unit
1. Install the oil pressure gauge sender unit.

Tightening torque:
12—18 N·m (1.2—1.8 m-kg, 104—156 in-lb)


05U0BX-243

Oil Filter
1. Remove all foreign material from the oil filter mounting surface.
2. Apply a small amount of clean engine oil to the rubber seal of the oil filter.
3. Install the oil filter and tighten it by hand until the rubber seal contacts the base.
4. Tighten the filter 1 and 1/6 turn with a filter wrench.

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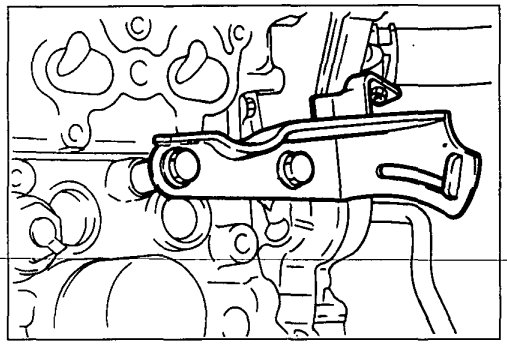


05U0BX-244

Right Engine Mount

1. Install the right engine mount.

Tightening torque:
36—54 N·m (3.7—5.5 m-kg, 27—40 ft-lb)

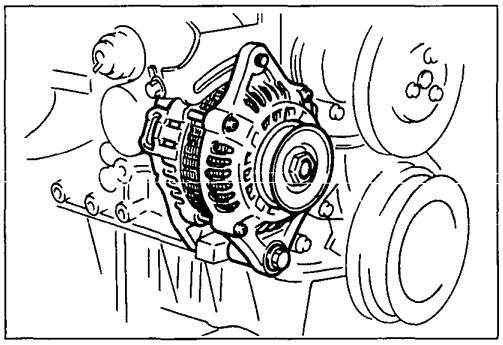


05U0BX-245

Alternator Bracket

1. Install the alternator bracket.

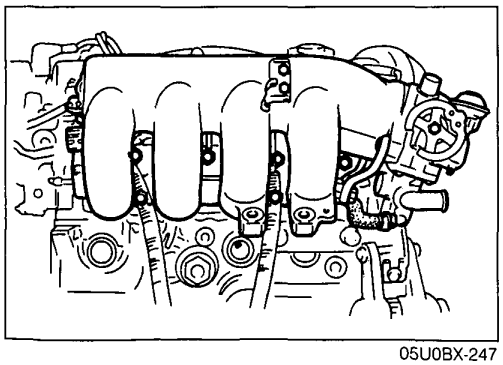
Tightening torque:
36—54 N·m (3.7—5.5 m-kg, 27—40 ft-lb)
64—89 N·m (6.5—9.1 m-kg, 47—66 ft-lb)



05U0BX-246

Alternator

1. Install the alternator and loosely tighten the mounting bolts.

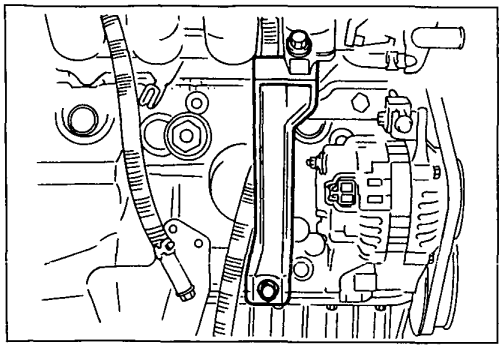


05U0BX-247

Intake Manifold Assembly

1. Remove all foreign material from the intake manifold contact surface.
2. Install a new gasket and the intake manifold assembly.

Tightening torque:
19—25 N·m (1.9—2.6 m-kg, 14—19 ft-lb)



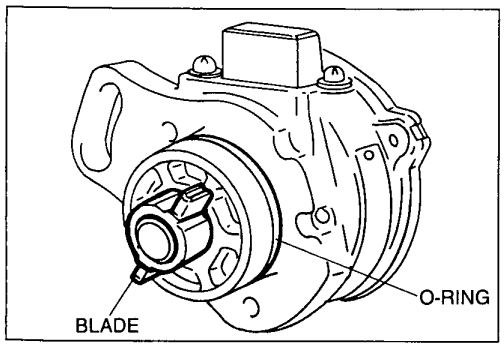
05U0BX-248

Manifold Bracket

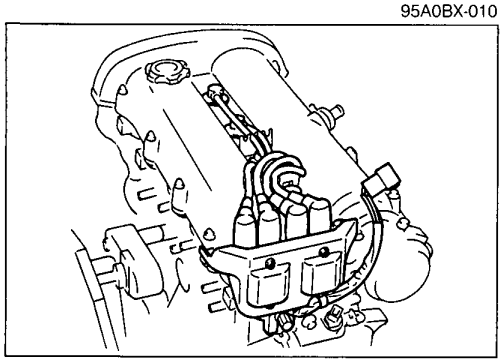
1. Install the manifold bracket.

Tightening torque:
36—54 N·m (3.7—5.5 m-kg, 27—40 ft-lb)

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95A0BX-010



05U0BX-250

Crank Angle Sensor

1. Apply clean engine oil to a new O-ring and the blade.
2. Install the crank angle sensor and loosely tighten the installation bolt.

Ignition Coil and High-tension Lead

1. Install the ignition coil.

Tightening torque:
19—25 N·m (1.9—2.6 m-kg, 14—19 ft-lb)

2. Connect the high-tension leads.

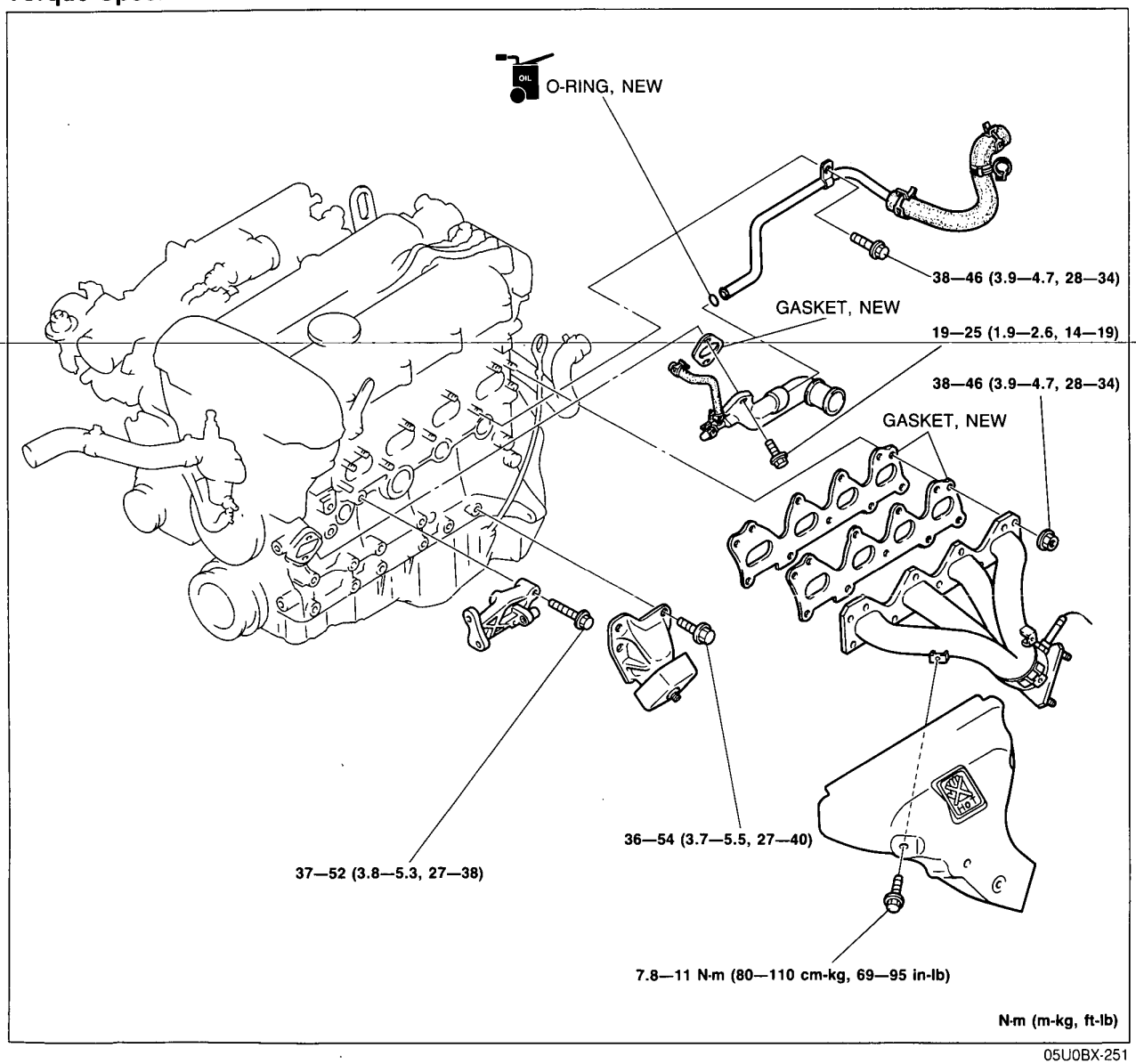
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ENGINE STAND DISMOUNTING

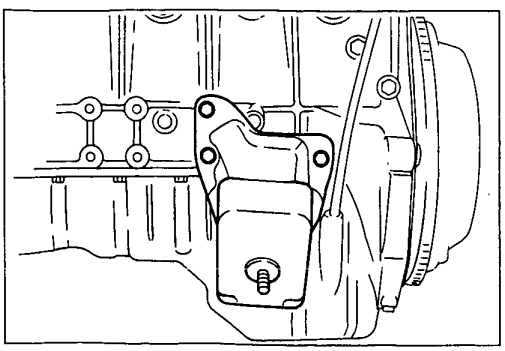
PROCEDURE

1. Remove the engine from the **SST (engine stand)**.
2. Remove the **SST (engine hanger)** from the engine.
3. Install the parts shown in the figure

Torque Specifications



05U0BX-251



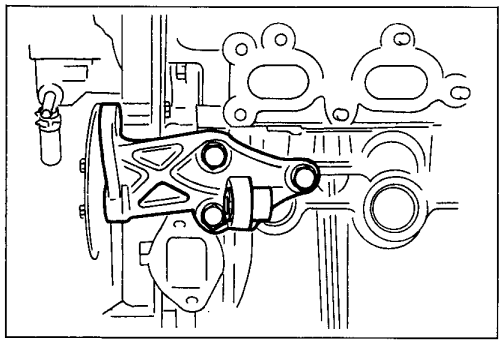
05U0BX-252

Left Engine Mount

1. Install the left engine mount.

Tightening torque:
36—54 N·m (3.7—5.5 m-kg, 27—40 ft-lb)

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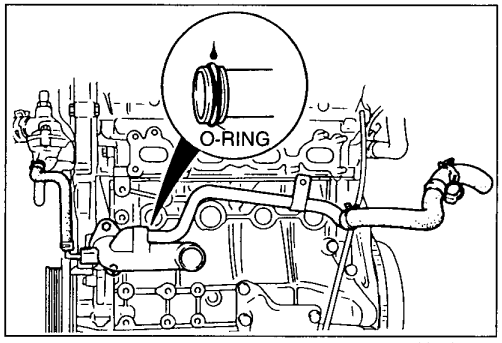


95E0BX-008

P/S Oil Pump Bracket

1. Install the P/S oil pump bracket.

Tightening torque:
37—52 N·m (3.8—5.3 m-kg, 27—38 ft-lb)



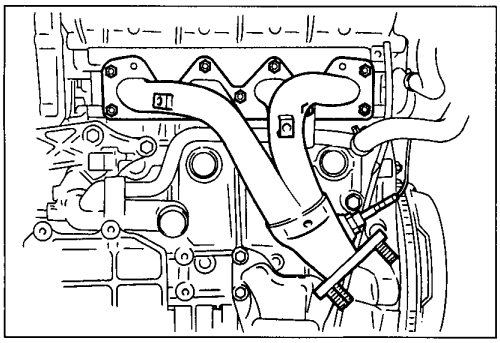
05U0BX-254

Water Inlet Pipe and Bypass Pipe

1. Remove all foreign material from the water inlet pipe mounting surface.
2. Install a new gasket and the water inlet pipe.

Tightening torque:
19—25 N·m (1.9—2.6 m-kg, 14—19 ft-lb)

3. Apply a small amount of engine coolant to the new O-ring.
4. Install the water bypass pipe.

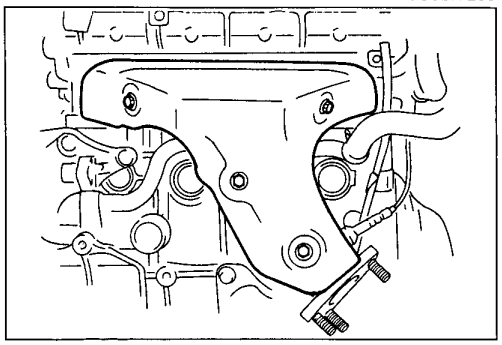


05U0BX-256

Exhaust Manifold

1. Remove all foreign material from the exhaust manifold contact surface.
2. Install a new gasket and the exhaust manifold.

Tightening torque:
38—46 N·m (3.9—4.7 m-kg, 28—34 ft-lb)



05U0BX-257

Exhaust Manifold Insulator

1. Install the exhaust manifold insulator.

Tightening torque:
7.8—11 N·m (80—110 cm-kg, 69—95 in-lb)

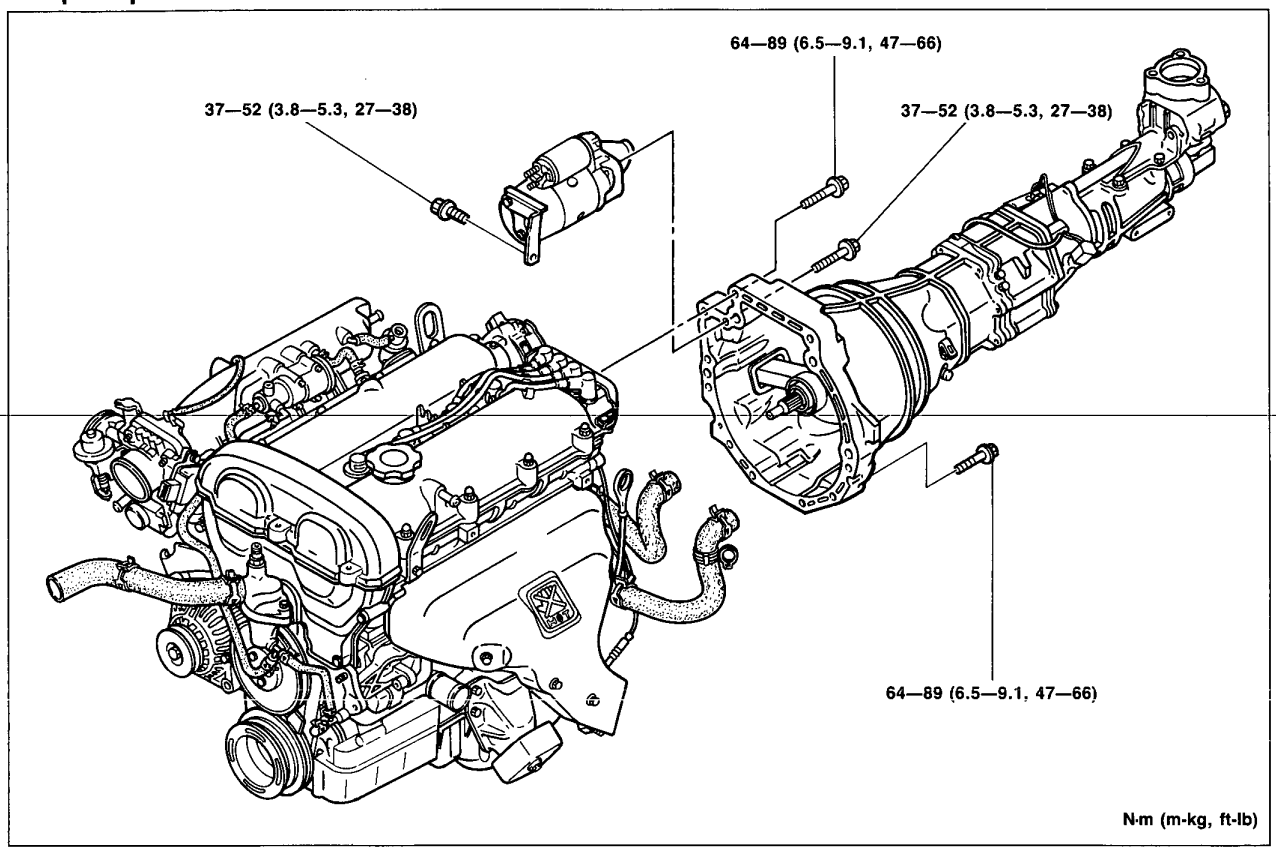
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INSTALLATION

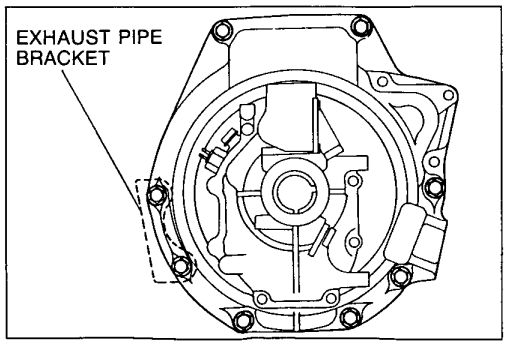
PROCEDURE

1. Tighten all bolts and nuts to the specified torques.

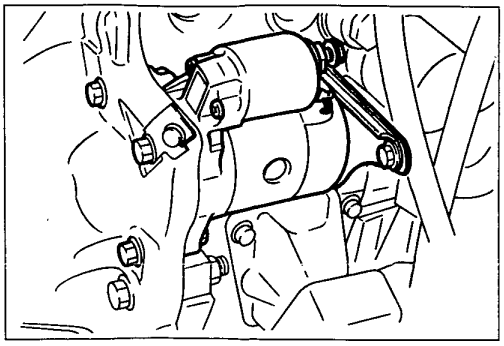
Step 1
Torque Specifications



05U0BX-258



05U0BX-259



05U0BX-260

Transmission

1. Join the engine and transmission.
2. Install the transmission mounting bolts.

Caution
- **Install the exhaust pipe bracket as shown.**

3. Tighten the bolts.

Tightening torque:
64—89 N·m (6.5—9.1 m-kg, 47—66 ft-lb)

Starter

1. Install the starter to the transmission housing.

Tightening torque:
37—52 N·m (3.8—5.3 m-kg, 27—38 ft-lb)

2. Install the starter bracket bolt.

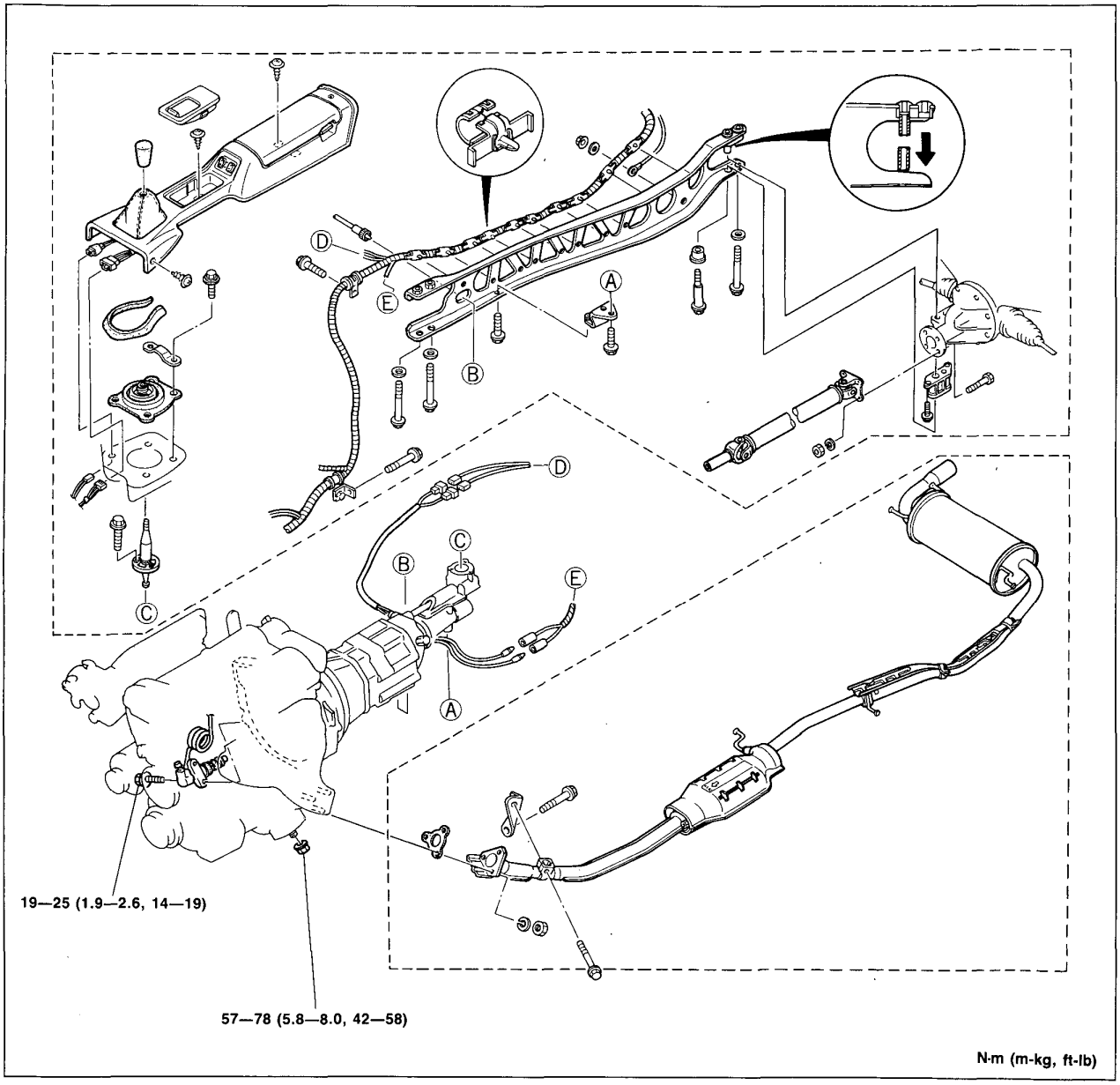
Tightening torque:
37—52 N·m (3.8—5.3 m-kg, 27—38 ft-lb)

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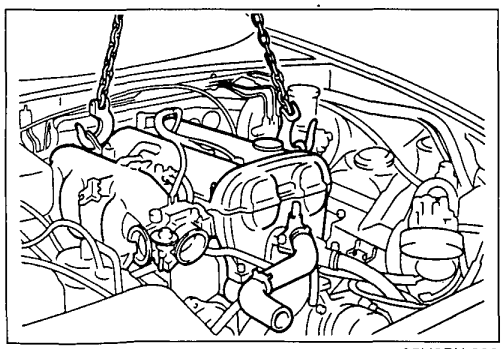
Step 2

Warning
- **Be sure the vehicle is securely supported on safety stands.**

Torque Specifications



05U0BX-261



05U0BX-262

Engine and transmission assembly

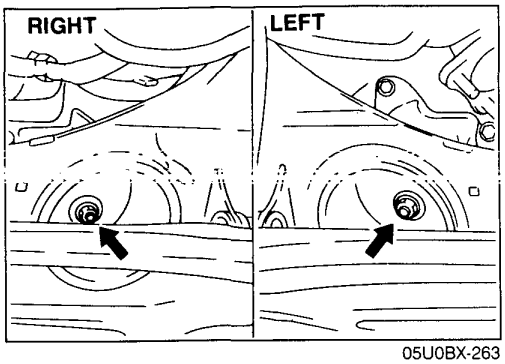
1. Suspend the engine and transmission assembly.

Caution
- **Do not damage any components in the engine compartment.**

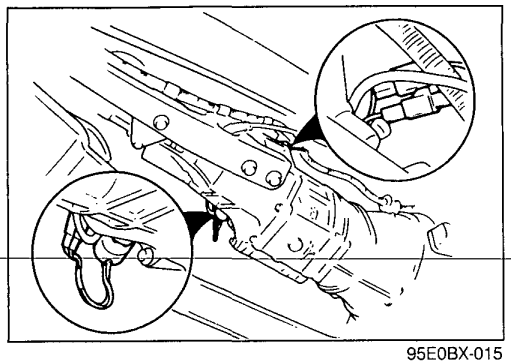
2. Install the engine with the transmission tilting downward.
3. Align the engine mounts with the crossmember mounting holes.
4. Support the transmission with a transmission jack.
5. Install the engine mount nuts and loosely tighten them.

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INSTALLATION



05U0BX-263



95E0BX-015

Power plant frame
1. Install the power plant frame. (Refer to page J–45.)

Engine mount nut
1. Tighten the engine mount nuts.

Tightening torque:
57—78 N·m (5.8—8.0 m-kg, 42—58 ft-lb)

Propeller shaft, speedometer cable, and shift knob
1. Install the propeller shaft, speedometer cable, and shift knob. (Refer to page J–45.)

Transmission harness
1. Connect the transmission harness.

Clutch release cylinder
1. Install the clutch release cylinder.

Tightening torque:
19—25 N·m (1.9—2.6 m-kg, 14—19 ft-lb)

Exhaust pipe
1. Install the exhaust pipe assembly. (Refer to page F–112.)

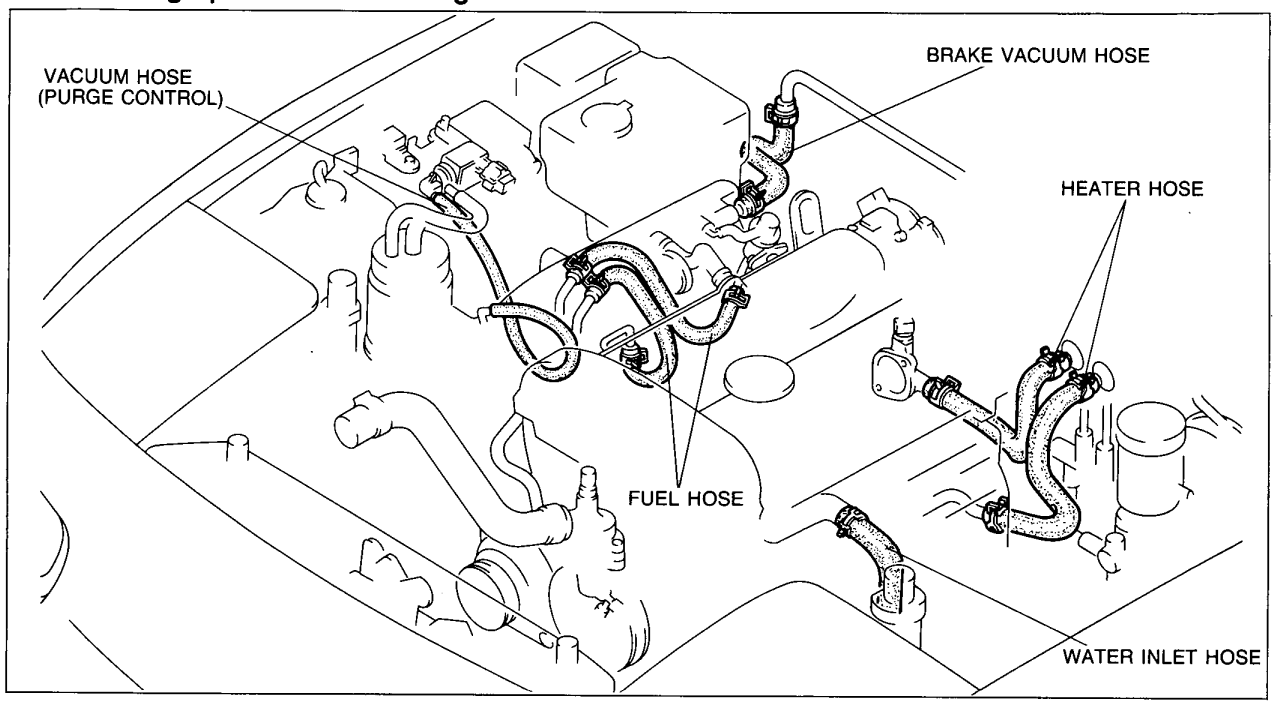
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Step 3

1. Connect the hoses shown in the figure.

Caution

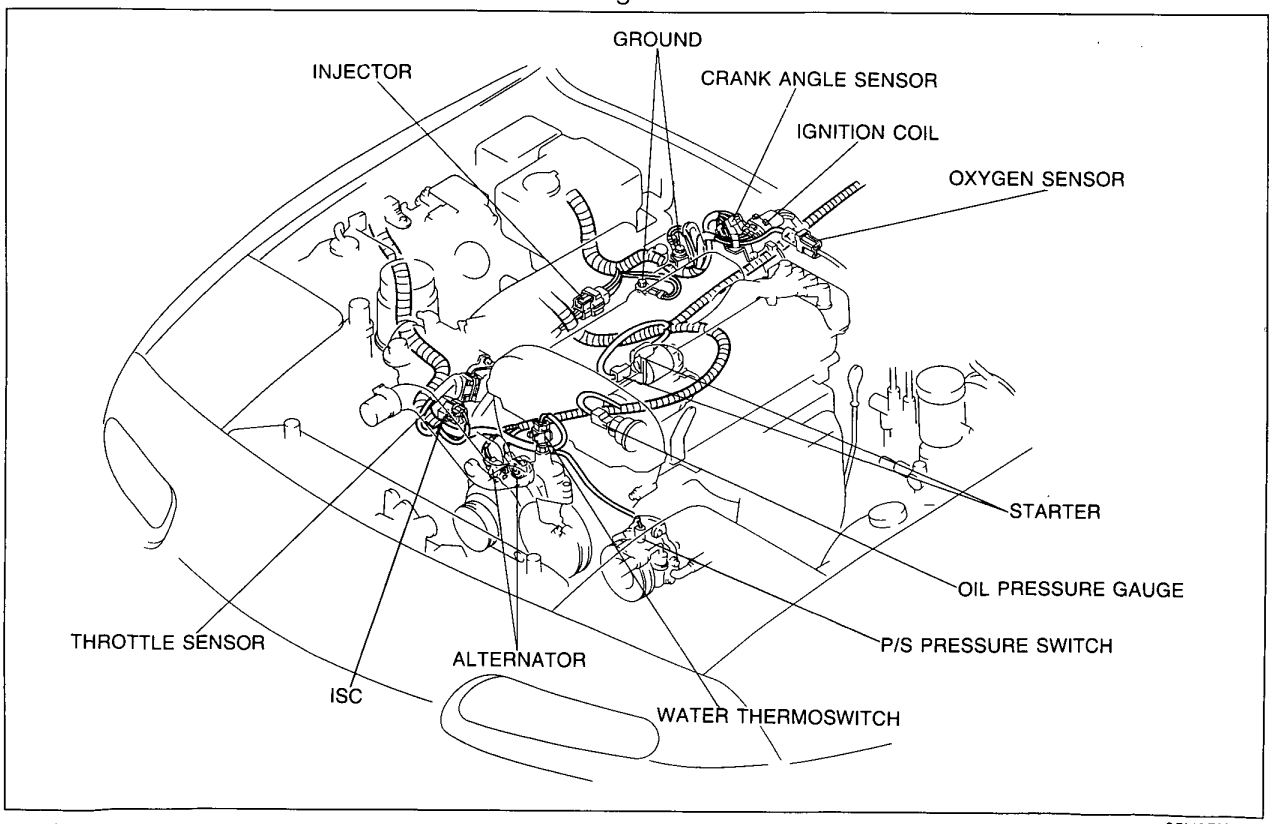
- **Position the hose clamp in the original location on the hose, and squeeze the clamp lightly with large pliers to ensure a good fit.**



05U0BX-267

Step 4

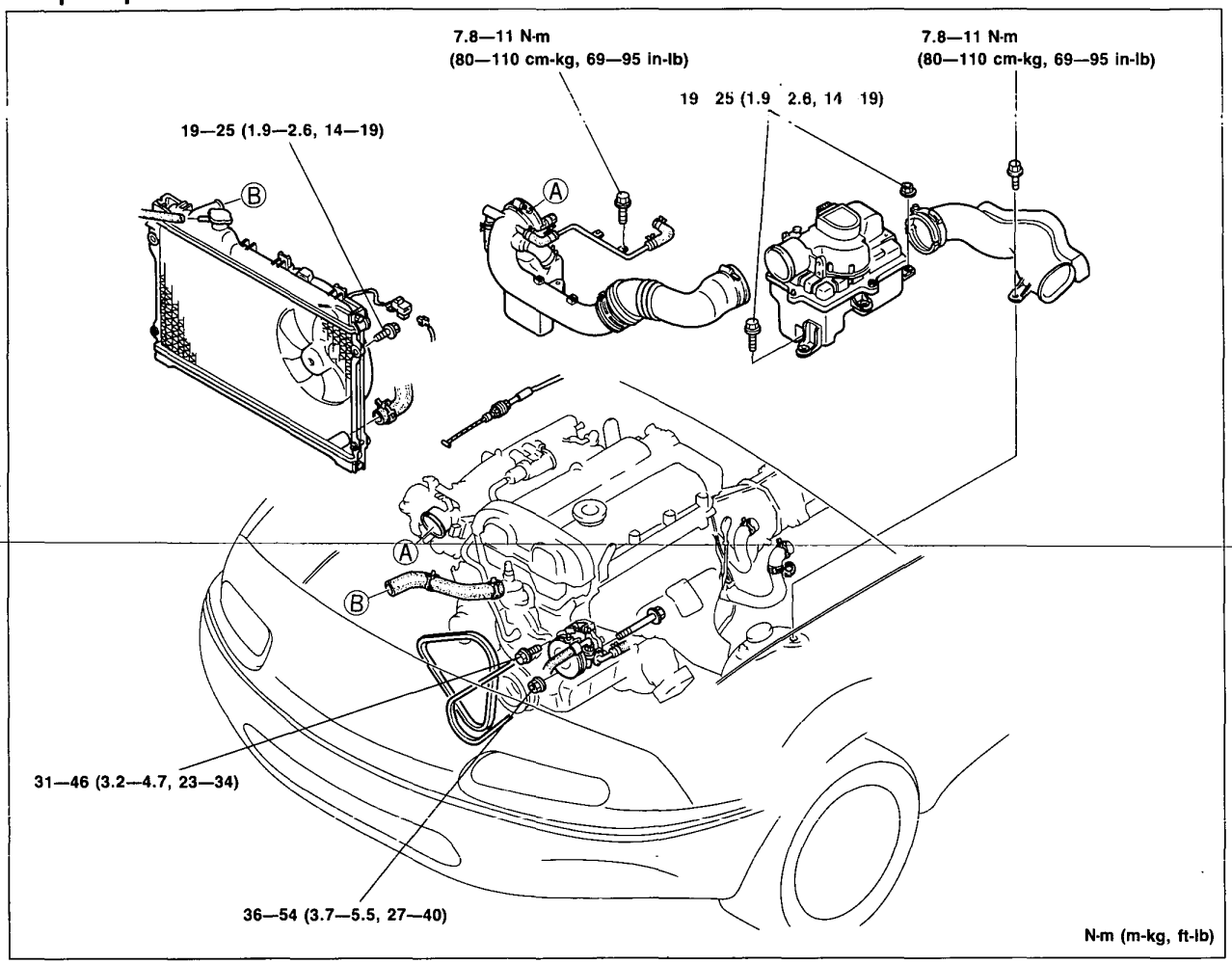
1. Connect the harness connectors shown in the figure.



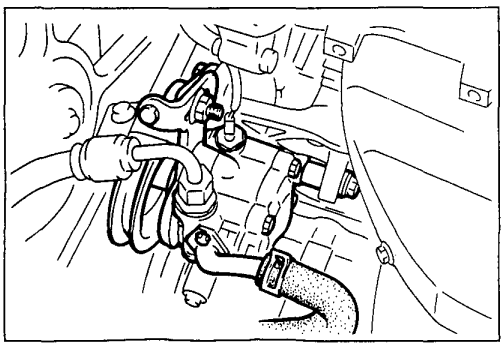
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Step 5
Torque Specifications



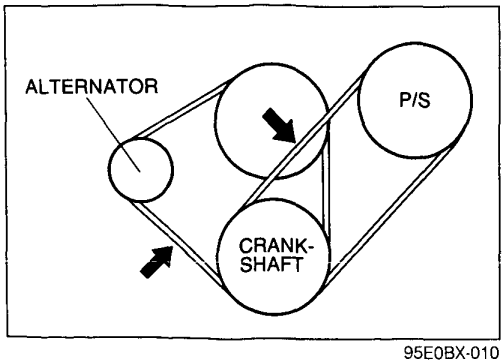
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05U0BX-271

P/S oil pump

1. Install the P/S oil pump and loosely tighten the mounting bolts.

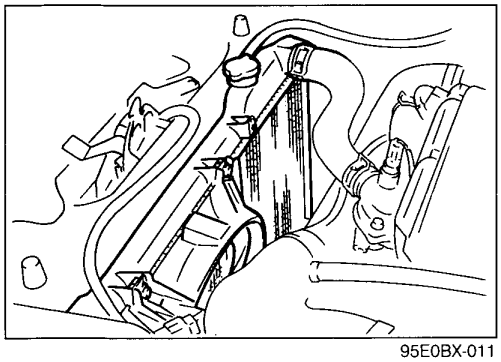


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Drive belt

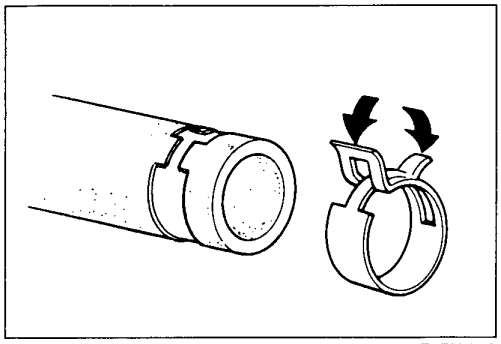
1. Install the alternator drive belt.
2. Install the P/S drive belt.
3. Adjust the drive belt deflections, and tighten the alternator and P/S mounting bolts and nuts. (Refer to page B–6.)

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95E0BX-011

Radiator and cooling fan assembly
1. Install the radiator and cooling fan assembly.

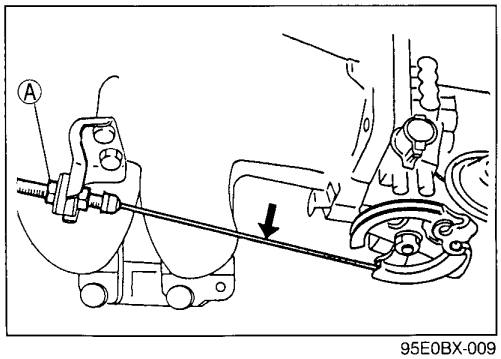
Tightening torque:
19—25 N·m (1.9—2.6 m-kg, 14—19 ft-lb)


95E0BX-016

2. Connect the upper and lower radiator hoses.

Caution
- **Position the hose clamp in the original location on the hose, and squeeze the clamp lightly with large pliers to ensure a good fit.**

3. Connect the coolant reservoir hose.
4. Connect the cooling fan connector.



95E0BX-009

Accelerator cable
1. Install the accelerator cable.
2. Adjust the cable deflection by turning nut A.

Deflection: 1—3mm (0.04—0.12 in)

Air cleaner assembly
1. Install the air cleaner assembly.

Tightening torque:
19—25 N·m (1.9—2.6 m-kg, 14—19 ft-lb)

Steps After Installation
1. Install the under cover.
2. If the engine oil was drained, fill with the specified amount and type of engine oil. (Refer to page D–5.)
3. Fill the radiator with the specified amount and type of engine coolant. (Refer to page E–5.)
4. If the transmission oil was drained, fill with the specified amount and type of transmission oil. (Refer to page J–8.)
5. Connect the negative battery cable.
6. Start the engine and check the following.
   (1) Engine oil, transmission oil, and engine coolant leakage.
   (2) Ignition timing, idle speed. (Refer to page B–8.)
   (3) Operation of emission control system.
7. Perform a road test.
8. Recheck the engine oil and engine coolant levels.

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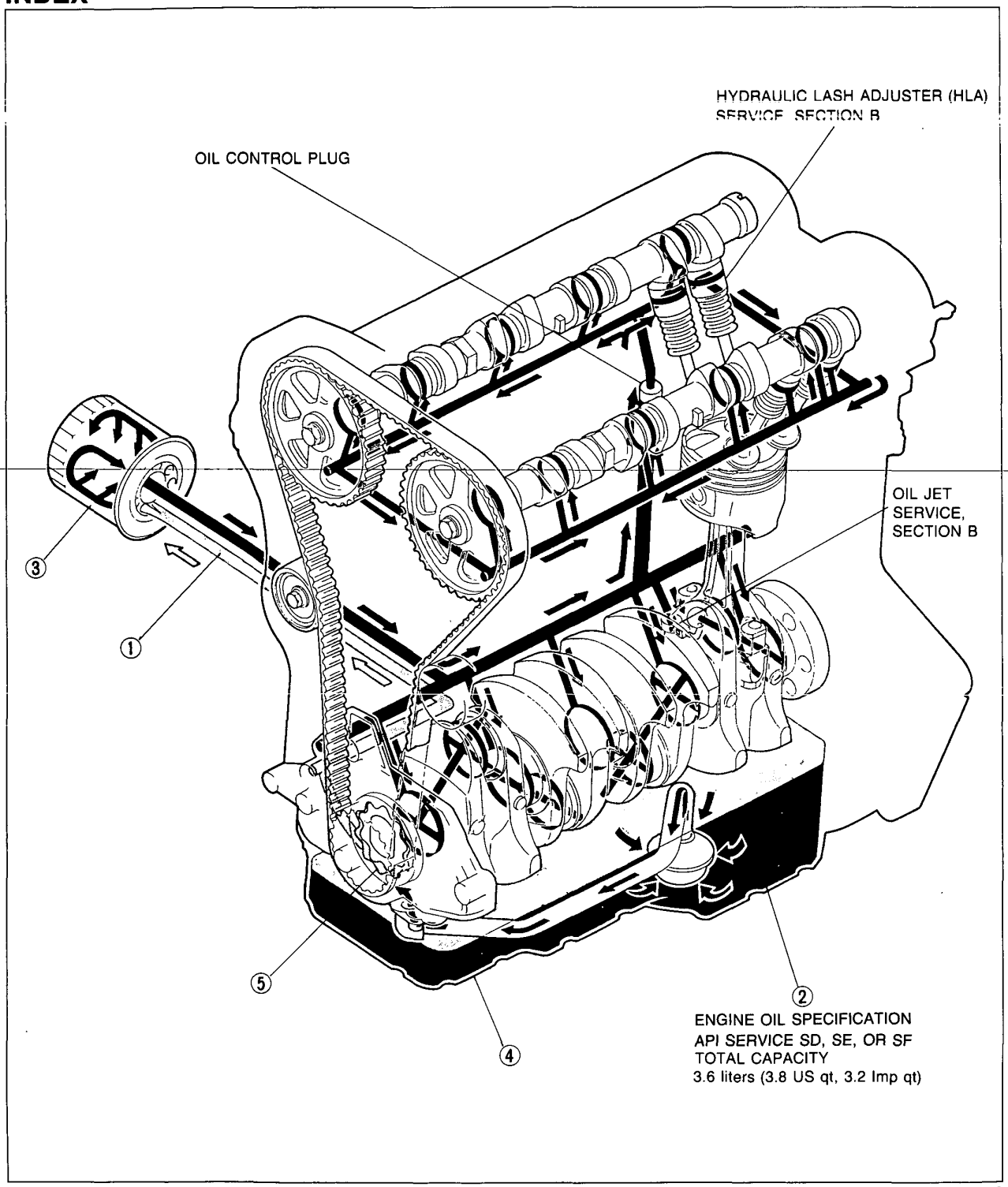
LUBRICATION SYSTEM

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SPECIFICATIONS ..... **D– 3**
TROUBLESHOOTING GUIDE ..... **D– 3**
OIL PRESSURE ..... **D– 4**
PREPARATION ..... **D– 4**
INSPECTION ..... **D– 4**
ENGINE OIL ..... **D– 5**
INSPECTION ..... **D– 5**
REPLACEMENT ..... **D– 5**
OIL FILTER ..... **D– 5**
REPLACEMENT ..... **D– 5**
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2. Engine oil
Inspection ..... page D– 5
Replacement ..... page D– 5
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4. Oil pan
Removal / Inspection / Installation ..... page D– 6
5. Oil pump
Removal / Installation ..... page D– 9
Disassembly / Inspection / Assembly ..... page D–11

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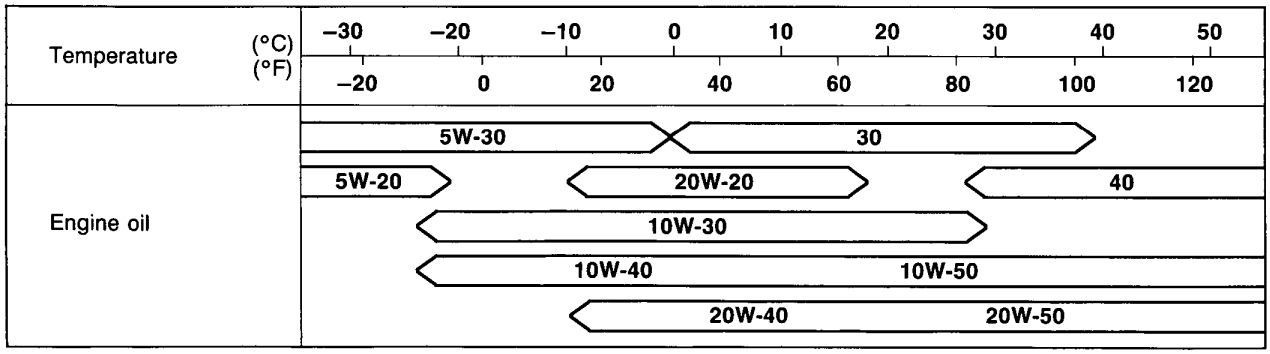
OUTLINE

SPECIFICATIONS

Item \ Engine		B6 DOHC
Lubrication system		Force-fed type
Oil pump	Type	Trochoid gear
	Relief pressure kPa (kg/cm², psi)	343—441 (3.5—4.5, 50—64)
Oil filter	Type	Full-flow, paper element
	Relief pressure differential kPa (kg/cm², psi)	78—118 (0.8—1.2, 11—17)
Oil capacity	Total (dry engine) liters (US qt, Imp qt)	3.6 (3.8, 3.2)
	Oil pan liters (US qt, Imp qt)	3.2 (3.4, 2.8)
	Oil filter liter (US qt, Imp qt)	0.17 (0.18, 0.15)
Engine oil		API service SD, SE, or SF

95A0DX-003

Recommended SAE Viscosity



Anticipated ambient temperature range before succeeding oil change, °C (°F).

05U0DX-004

TROUBLESHOOTING GUIDE

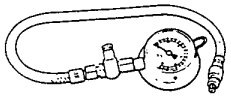
Problem	Possible Cause	Remedy	Page
Engine hard starting	Improper engine oil Insufficient engine oil	Replace Add oil	D–5 D–5
Excessive oil consumption	Oil working up or down Oil leakage	Refer to Section B Repair	 —
Oil pressure drop	Insufficient oil Oil leakage Worn and/or damaged oil pump gear Worn plunger (inside oil pump) or weak spring Clogged oil strainer Excessive main bearing or connecting rod bearing clearance	Add oil Repair Replace Replace Clean Refer to Section B	D–5 — D–11, 12 D–11, 12 —
Oil pressure gauge (meter) does not operate	Oil pressure drop Malfunction of oil pressure gauge Malfunction of electrical system	As described above Refer to Section T Refer to Section T	—

05U0DX-005

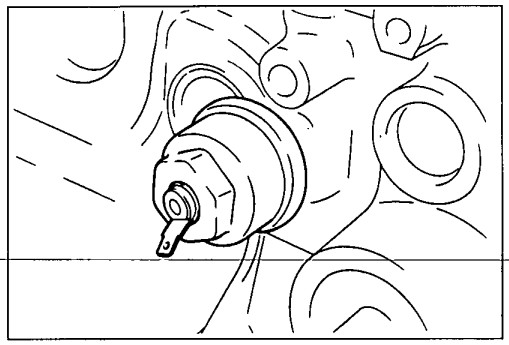
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OIL PRESSURE

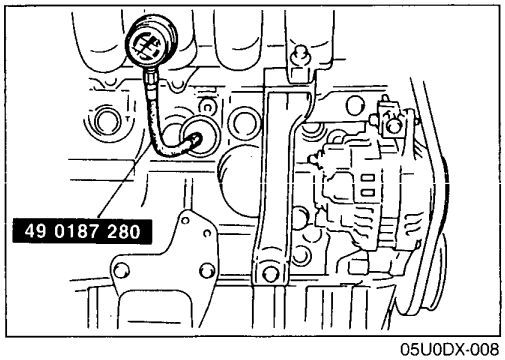
PREPARATION
SST

[illegible] Gauge, oil pressure		For inspection of oil pressure

05U0DX-006



05U0DX-007



05U0DX-008

INSPECTION

1. Remove the oil pressure gauge sender unit.
2. Screw the **SST** into the oil pressure gauge sender unit installation hole.
3. Warm up the engine to normal operating temperature.
4. Run the engine at 1,000 rpm and 3,000 rpm, and note the gauge reading.

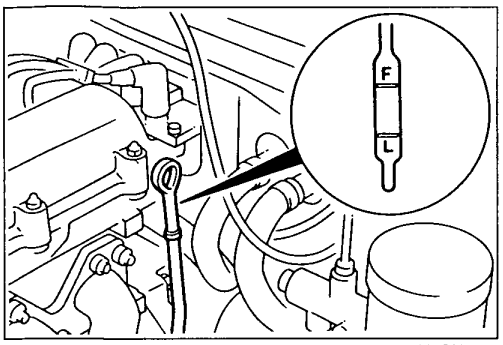
   Oil pressure:
   196—294 kPa (2.0—3.0 kg/cm^2, 28—43 psi)-1,000 rpm
   294—392 kPa (3.0—4.0 kg/cm^2, 43—57 psi)-3,000 rpm

5. If the pressure is not as specified, check for the cause and repair. (Refer to Troubleshooting Guide.)
6. Remove the **SST** and install the oil pressure gauge sender unit.

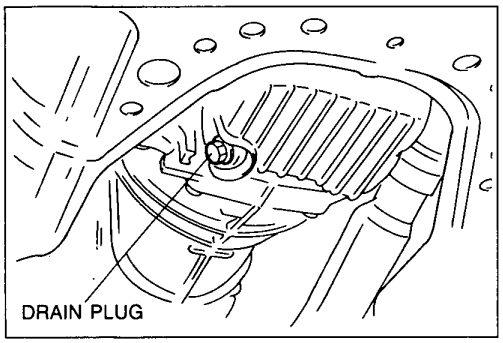
   Tightening torque:
   12—18 N·m (1.2—1.8 m-kg, 104—156 in-lb)

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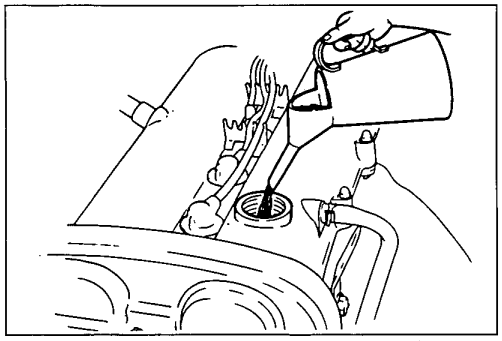
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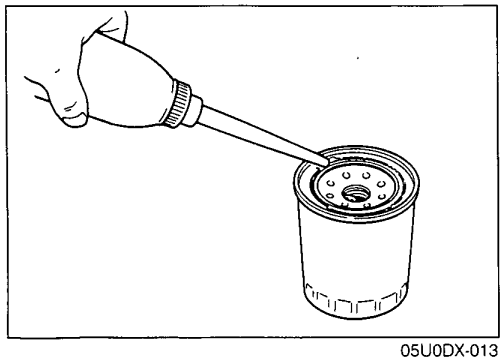


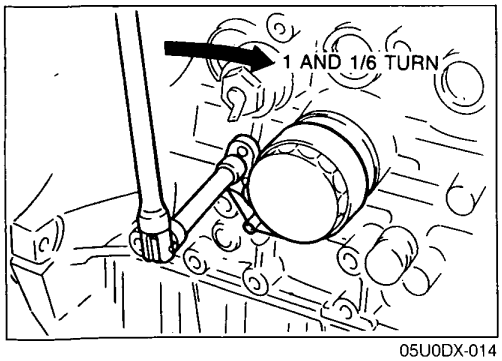
05U0DX-036



05U0DX-011


05U0DX-012


05U0DX-013



05U0DX-014

ENGINE OIL

INSPECTION

1. Be sure the vehicle is on level ground.
2. Warm up the engine to normal operating temperature and stop it.
3. Wait for five minutes.
4. Remove the oil level gauge and check the oil level and condition.
5. Add or replace oil as necessary.

Note
- **The distance between the L and F marks on the level gauge represents 0.8 liter (0.85 US qt, 0.70 Imp qt).**

REPLACEMENT

Warning
- **Be careful when draining; the oil is hot.**

1. Warm up the engine to normal operating temperature and stop it.
2. Remove the oil filler cap and the oil pan drain plug.
3. Drain the oil into a suitable container.
4. Install a new gasket and the drain plug.

Tightening torque:
29—41 N·m (3.0—4.2 m-kg, 22—30 ft-lb)

5. Refill the engine with the specified type and amount of engine oil.
6. Refit the oil filler cap.

Oil pan capacity: 3.2 liters (3.4 US qt, 2.8 Imp qt)

7. Run the engine and check for leaks.
8. Check the oil level and add oil if necessary.

OIL FILTER

REPLACEMENT

1. Remove the oil filter with a suitable wrench.
2. Use a clean rag to wipe off the mounting surface on the engine.
3. Apply a small amount of clean engine oil to the rubber seal of the new filter.

4. Install the oil filter and tighten it by hand until the rubber seal contacts the base.
5. Tighten the filter 1 and 1/6 turn with a filter wrench.
6. Start the engine and check for leaks.
7. Check the oil level and add oil if necessary.

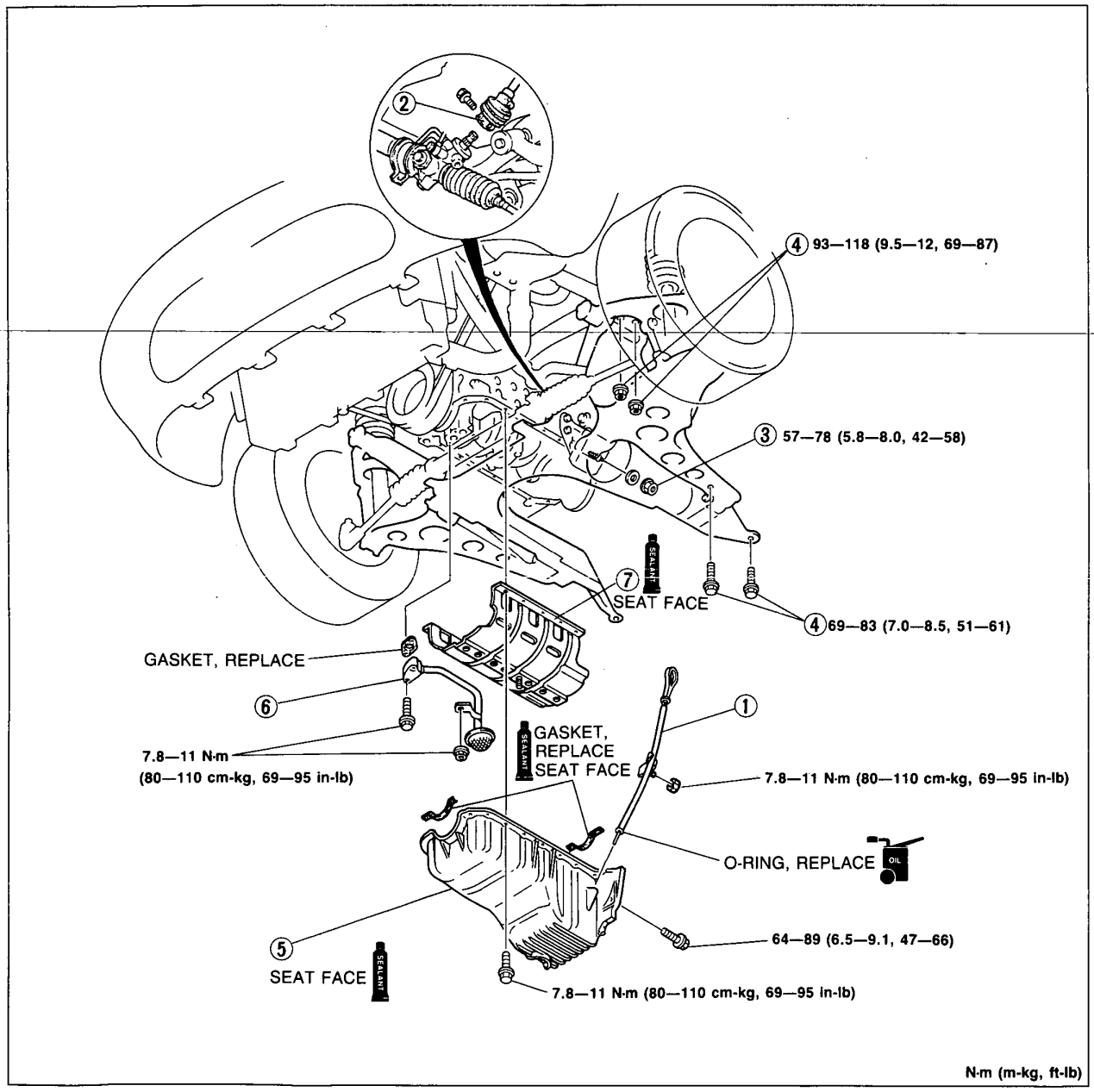
Oil filter capacity: 0.17 liter (0.18 US qt, 0.15 Imp qt)

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OIL PAN

REMOVAL / INSPECTION / INSTALLATION

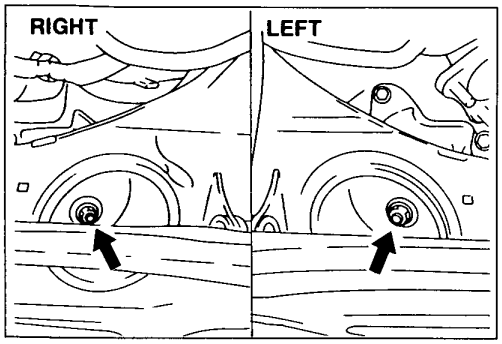
1. Disconnect the negative battery cable.
2. Drain the engine oil.
3. Remove the under cover.
4. Remove in the order shown in the figure, referring to **Removal Note**.
5. Install in the reverse order of removal, referring to **Installation Note**.



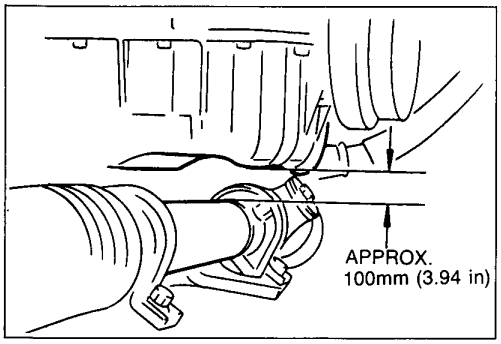
95A0DX-001

1. Oil level gauge and pipe
2. Intermediate shaft
3. Engine mount nut
   Removal Note ..... page D– 7
4. Crossmember installation bolt and nut
   Removal Note ..... page D– 7
5. Oil pan
   Removal Note ..... page D– 7
   Inspect for cracks, deformation, and damage
   Installation Note..... page D– 8
6. Oil strainer
7. Oil pan baffle
   Removal Note ..... page D– 7
   Installation Note..... page D– 7

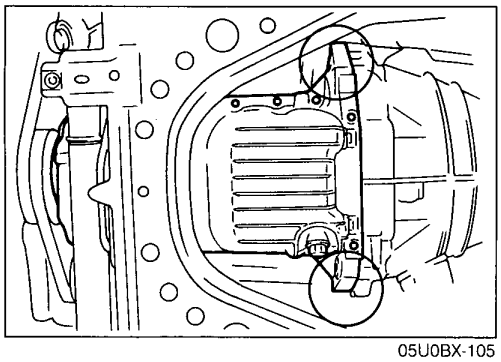
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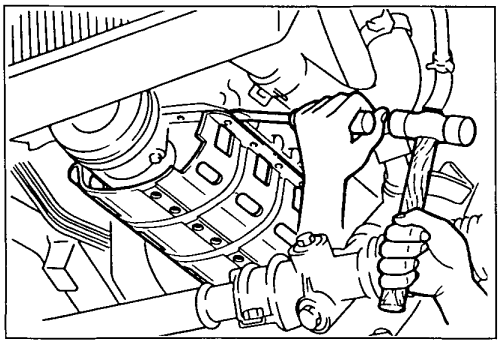


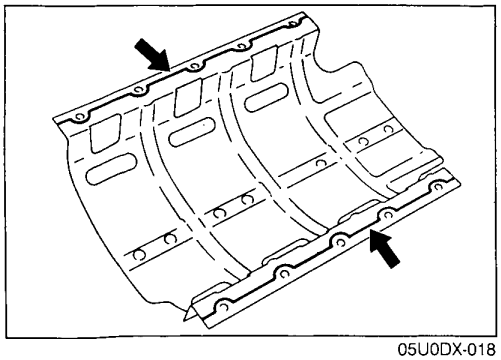
05U0DX-016



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05U0BX-105


05U0BX-106


05U0DX-018

Removal Note
Engine mount nut
1. Loosen the oil pan mounting bolts.
2. Remove the engine mount nuts.
3. Lift the engine slightly with a hoist.

Crossmember installation bolt and nut
1. Support the crossmember with a transmission jack.
2. Remove the crossmember installation bolts and nuts.

Caution
- **Do not damage the brake hoses and P/S hoses when lowering the crossmember.**

Note
- **Lower the crossmember after separating the steering intermediate shaft from the pinion shaft.**

3. Lower the crossmember until the clearance between the oil pan and the steering gear housing exceeds **approx. 100mm (3.94 in)**.

Oil pan
1. Remove the oil pan mounting bolts.

Caution
- **Do not force a prying tool between the cylinder block and the oil pan, which may damage the contact surfaces.**
- **Do not damage or scratch the contact surfaces when removing the old sealant.**

2. Insert a screwdriver or a suitable tool only at the points shown in the figure.
3. Remove the oil pan.

Oil pan baffle

Caution
- **Do not bend the baffle when prying it loose.**

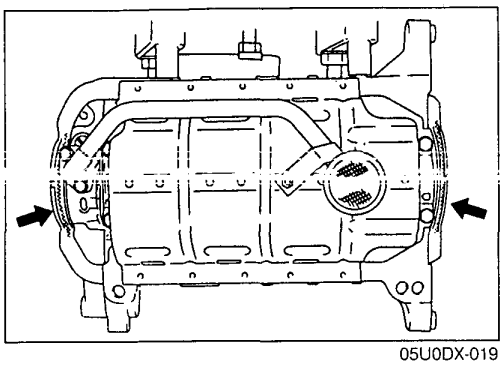
1. Insert a screwdriver or other suitable tool between the cylinder block and the baffle to separate them.
2. Remove the baffle.

Installation Note
Oil pan baffle
1. Remove all foreign material from the contact surfaces.

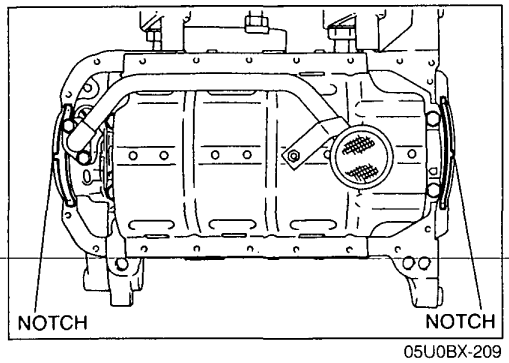
Caution
- **The oil pan must be secured within 30 minutes after the sealant is applied to the baffle.**

2. Apply a continuous bead of silicone sealant to the baffle along the inside of the bolt holes.
3. Install the baffle.

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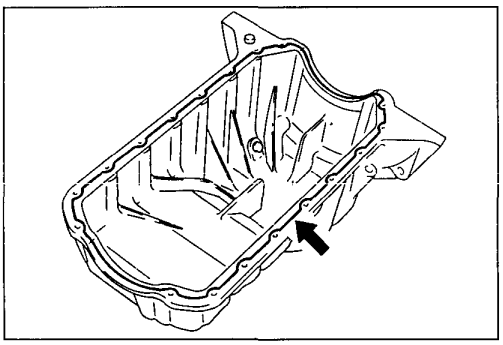

05U0DX-019

Oil pan
1. Remove all foreign material from the contact surfaces.
2. Apply silicone sealant to the shaded areas shown in the figure.

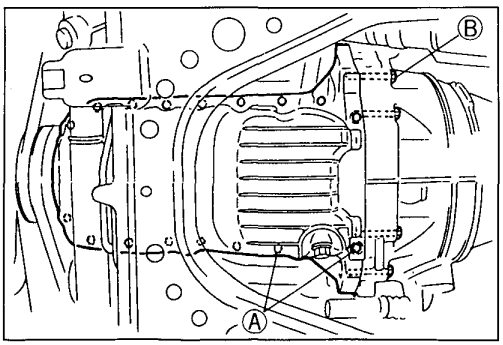


05U0BX-209

3. Install new gaskets onto the oil pump body and the rear cover with the projections in the notches shown in the figure.


05U0DX-020

4. Apply a continuous bead of silicone sealant to the oil pan along the inside of the bolt holes and overlap the ends.



05U0DX-021

5. Install the oil pan.

Tightening torque:
Ⓐ 7.8—11 N·m (80—110 cm-kg, 69—95 in-lb)
Ⓑ 64—89 N·m (6.5—9.1 m-kg, 47—66 ft-lb)

Steps After Installation
1. Install the under cover.
2. Fill with the specified amount and type of engine oil. (Refer to page D–5.)
3. Connect the negative battery cable.
4. Start the engine and check for leaks.
5. Check the oil level and add oil if necessary.

05U0DX-022

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OIL PUMP

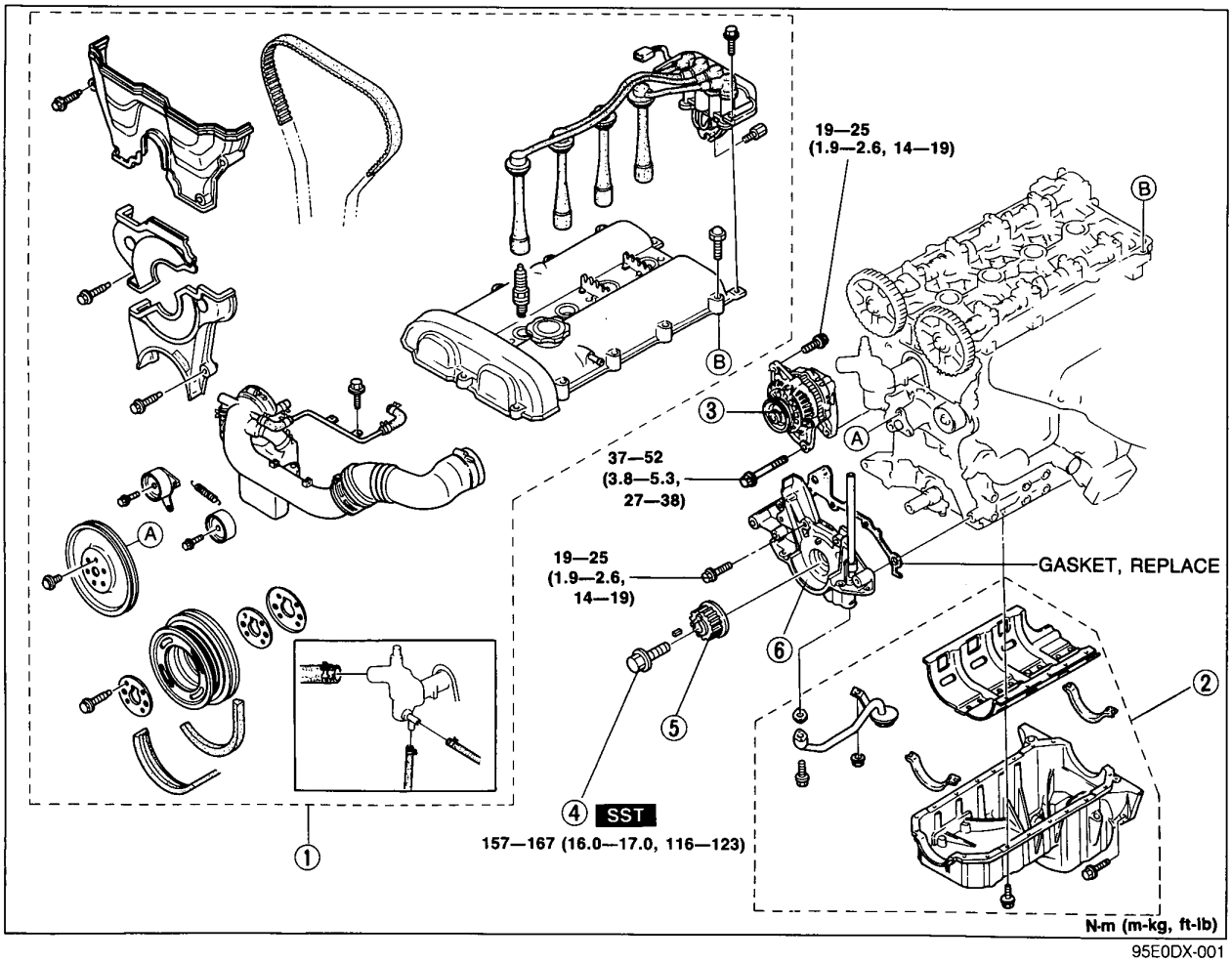
PREPARATION
SST

49 S120 710 Holder, coupling flange	For removal and installation of timing belt pulley	49 B011 102 Lock tool, crankshaft	For removal and installation of timing belt pulley

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REMOVAL / INSTALLATION

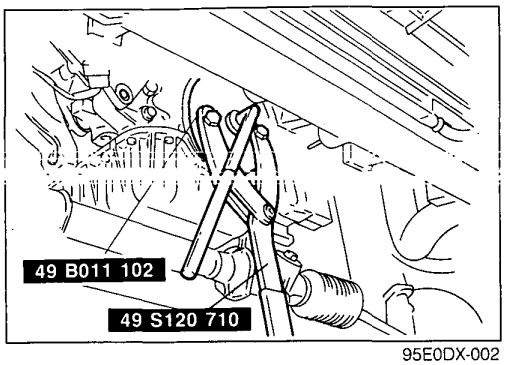
1. Disconnect the negative battery cable.
2. Drain the engine oil.
3. Remove in the order shown in the figure, referring to **Removal Note**.
4. Install in the reverse order of removal, referring to **Installation Note**.



95E0DX-001

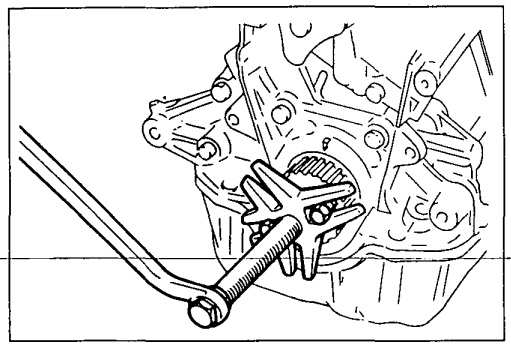
1. Timing belt
   Service ..... page B–12
2. Oil pan
   Removal / Installation ..... page D– 6
3. Alternator
4. Pulley lock bolt
   Removal Note ..... page D–10
   Installation Note ..... page D–10
5. Timing belt pulley
   Removal Note ..... page D–10
   Installation Note ..... page D–10
6. Oil pump
   Disassembly / Inspection / Assembly ..... page D–11

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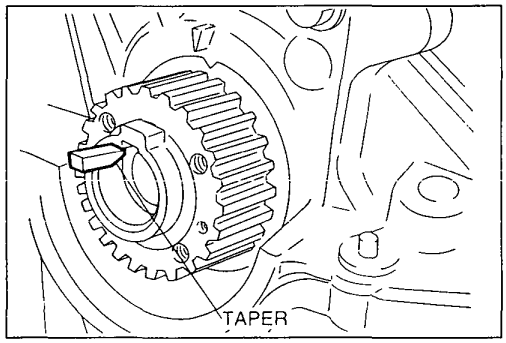
Removal Note
Pulley lock bolt
1. Hold the timing belt pulley with the **SST**.
2. Connect the **SST** and loosen the pulley lock bolt.
3. Remove the pulley lock bolt.


05U0BX-062

Timing belt pulley

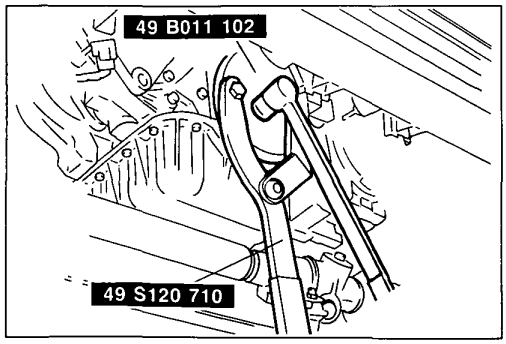
Note
- **If necessary, remove the pulley with a steering wheel puller (commercially available).**

1. Remove the timing belt pulley.
2. Remove the pulley Woodruff key.



05U0DX-027

Installation Note
Timing belt pulley
1. Install the timing belt pulley.
2. Install the pulley Woodruff key with the tapered side toward the oil pump body.



05U0DX-028

Pulley lock bolt
1. Install the pulley lock bolt.
2. Tighten the pulley lock bolt using the two **SST**.

Tightening torque:
108—118 N·m (11.0—12.0 m-kg, 80—87 ft-lb)

3. Remove the **SST**.

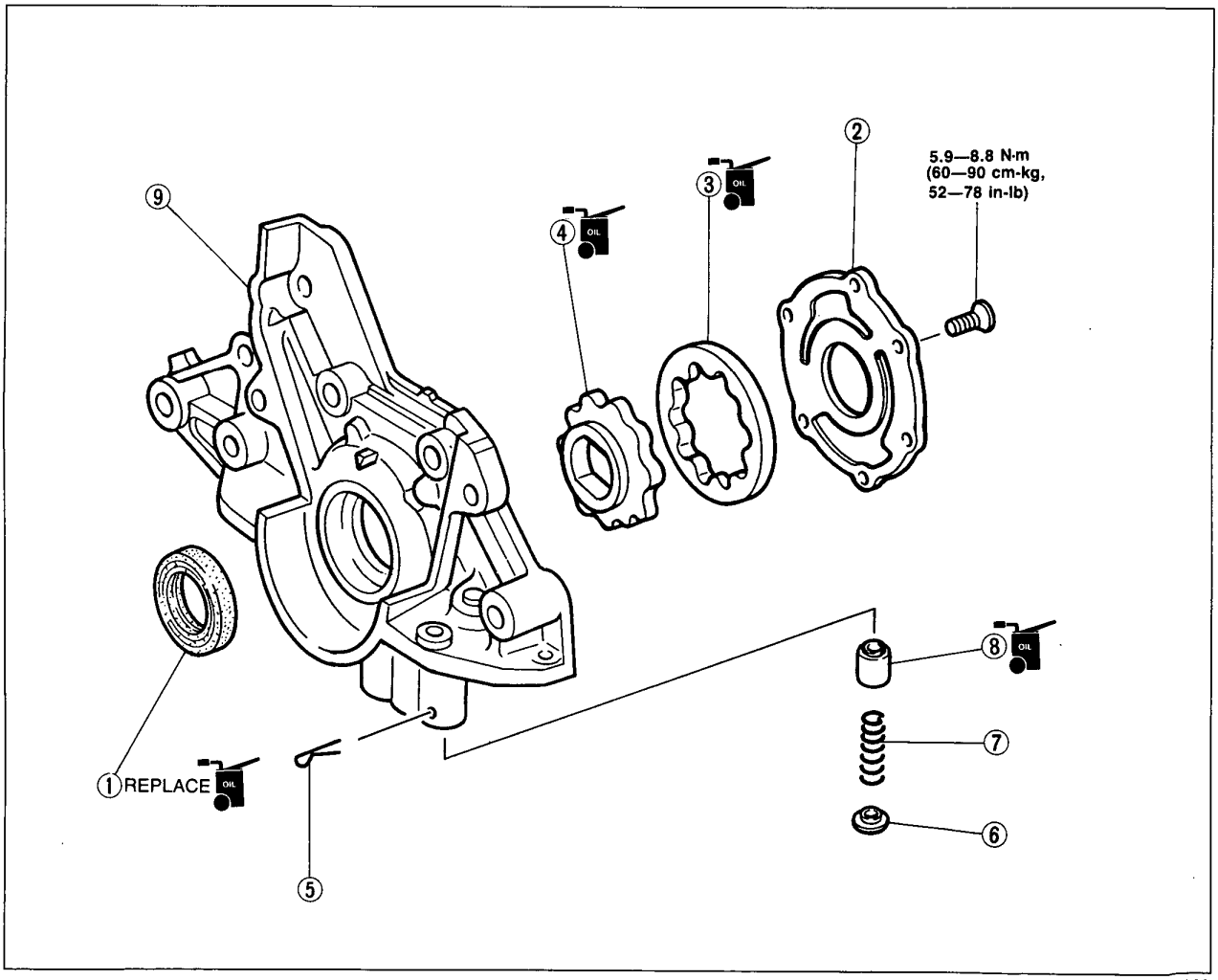
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Steps After Installation
1. Install the under cover.
2. Fill with the specified amount and type of engine oil. (Refer to page D–5.)
3. Connect the negative battery cable.
4. Start the engine and check for leaks.
5. Check the oil level and add oil if necessary.

05U0DX-022

DISASSEMBLY / INSPECTION / ASSEMBLY

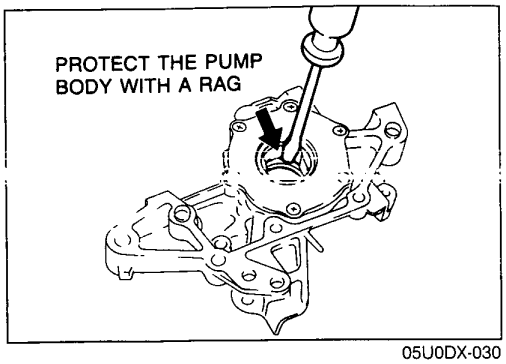
1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Assemble in the reverse order of disassembly, referring to **Assembly Note**.



05U0DX-029

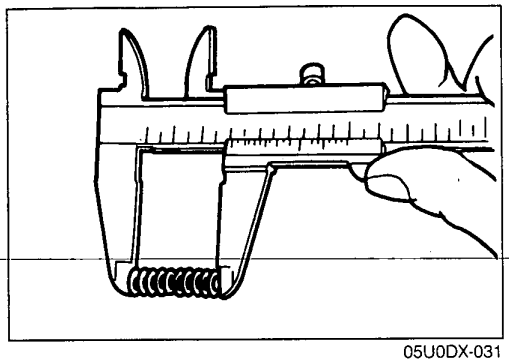
1. Oil seal
   Disassembly Note ..... page D–12
   Assembly Note..... page D–13
2. Pump cover
   Inspect for distortion or damage
3. Outer rotor
4. Inner rotor
5. Roll pin
6. Spring seat
7. Pressure spring
   Inspection..... page D–12
8. Control plunger
   Inspect for wear or damage
9. Pump body
   Inspect for distortion or damage

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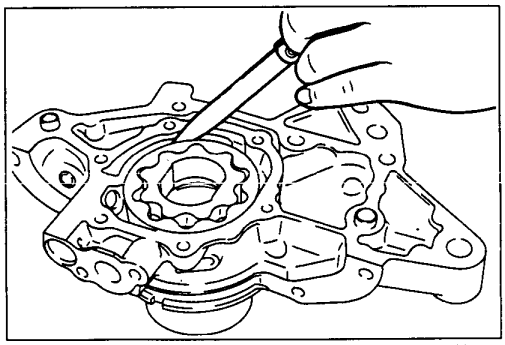
05U0DX-030

Disassembly Note
Oil seal
1. Remove the oil seal with a screwdriver protected with a rag.


05U0DX-031

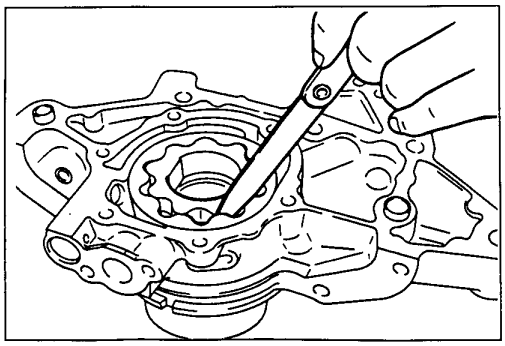
INSPECTION
Pressure Spring
1. Inspect the spring for weakness or breakage.
2. Measure the free length. Replace the spring if necessary.

Free length: 45.5mm (1.791 in)

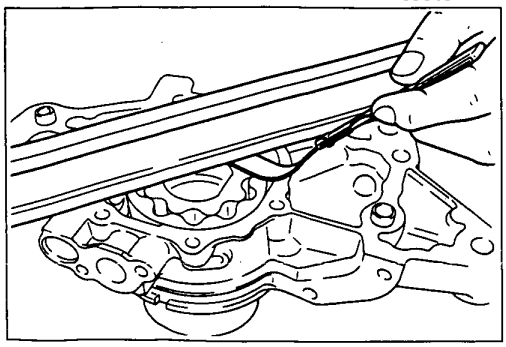

05U0DX-032

Rotor Clearance
1. Measure the following clearances. Replace the rotor if necessary.

Tooth tip clearance: 0.20mm (0.0079 in) max.

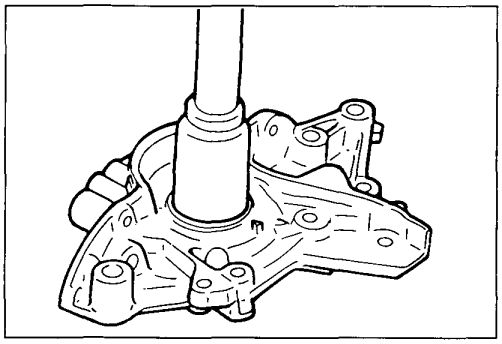

05U0DX-033

Outer rotor to pump body clearance: 0.22mm (0.0087 in) max.


05U0DX-034

Side clearance: 0.14mm (0.0055 in) max.

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05U0DX-035

Assembly Note
Oil seal

1. Apply a small amount of clean engine oil to the lip of a new oil seal.
2. Push the oil seal slightly in by hand.

Caution
- **The oil seal must be pressed in until it is flush with the edge of the oil pump body.**

3. Press the oil seal in evenly with a suitable pipe.

Oil seal outer diameter: 44mm (1.73 in)

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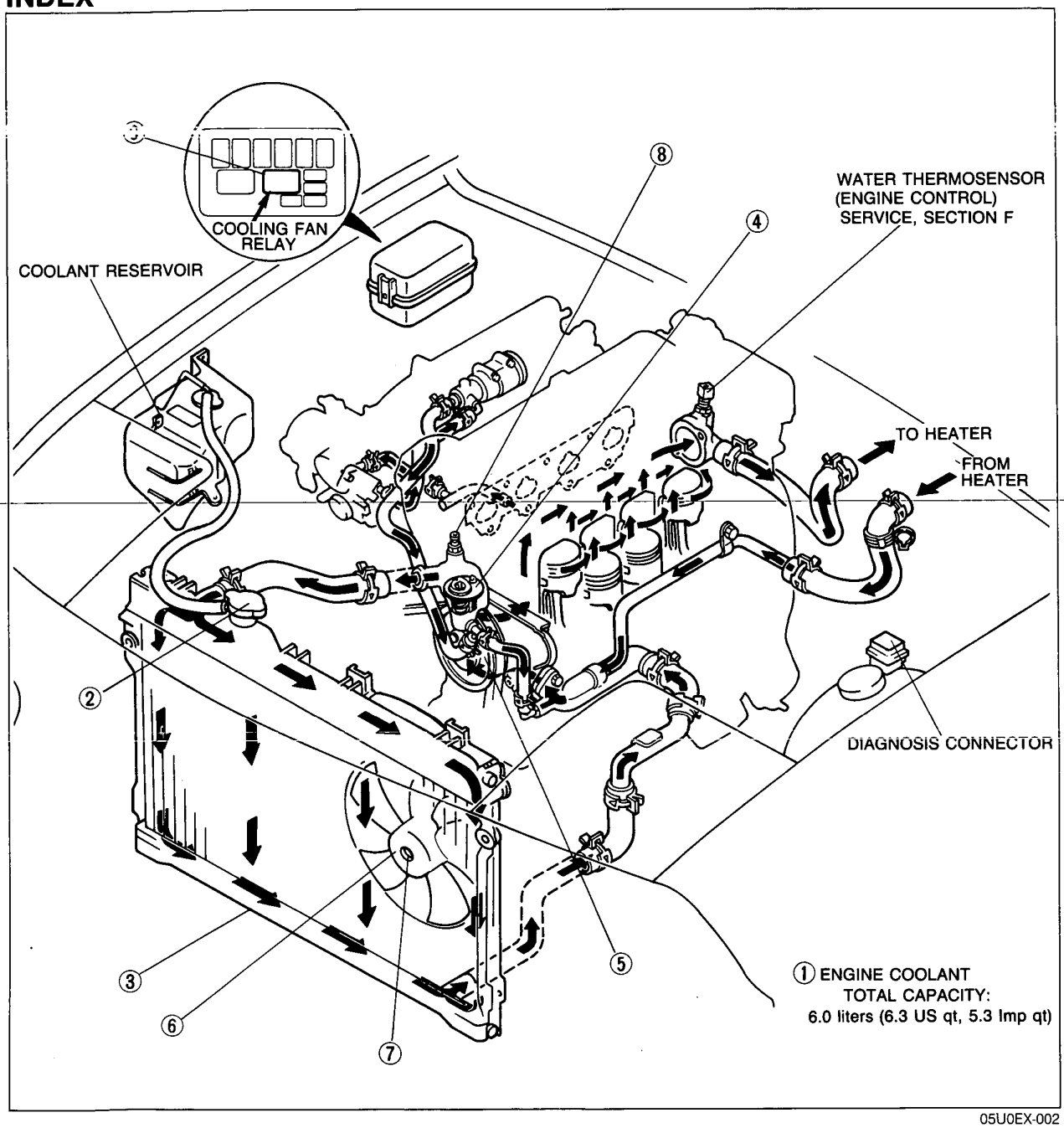
COOLING SYSTEM

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TROUBLESHOOTING GUIDE ..... **E– 3**
ENGINE COOLANT ..... **E– 4**
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REPLACEMENT ..... **E– 5**
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Removal / Inspection / Installation ..... page E– 8
5. Water pump
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6. Electric cooling fan system
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7. Fan motor
Inspection ..... page E–12
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8. Water thermoswitch
Removal / Inspection / Installation ..... page E–13
9. Fan relay
Inspection ..... page E–14

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OUTLINE

SPECIFICATIONS

Item \ Engine			B6 DOHC
Cooling system			Water-cooled, forced circulation
Coolant capacity		liters (US qt, Imp qt)	6.0 (6.3, 5.3)
Water pump	Type		Centrifugal
	Water seal		Unified mechanical seal
Thermostat	Type		Wax
	Opening temperature	°C (°F)	80.5—83.5 (177—182)
	Full-open temperature	°C (°F)	95 (203)
	Full-open lift	mm (in)	8.5 (0.33) min.
Radiator	Type		Corrugated fin
	Cap valve opening pressure	kPa (kg/cm^2, psi)	74—103 (0.75—1.05, 11—15)
Cooling fan	Type		Electric
	Blade	Outer diameter mm (in)	320 (12.6)
		Number	5
	Motor	Capacity W-V	70-12
		Current A	5.3—6.5

95A0EX-001

TROUBLESHOOTING GUIDE

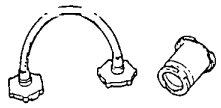
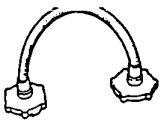
Problem	Possible Cause	Remedy	Page
Overheating	Coolant level insufficient	Add	E– 5
	Coolant leakage	Repair	—
	Radiator fins clogged	Clean	E– 7
	Radiator cap malfunction	Replace	E– 6
	Cooling fan malfunction	Replace	E–11
	Thermostat malfunction	Replace	E– 8
	Water passage clogged	Clean	E– 5
	Water pump malfunction	Replace	E– 9
Corrosion	Impurities in coolant	Replace	E– 5

05U0EX-004

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ENGINE COOLANT

PREPARATION
SST

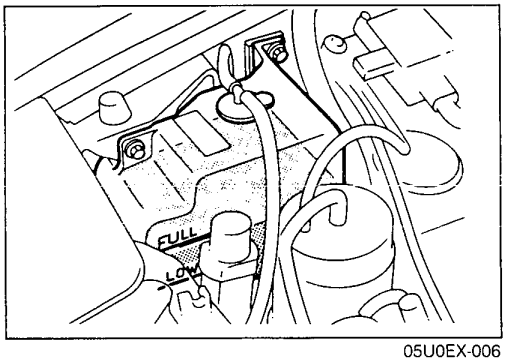
49 9200 145 Adapter set, radiator cap tester		For inspection of cooling system pressure	49 9200 146 Adapter A (Part of 49 9200 145)		For inspection of cooling system pressure

05U0EX-005

INSPECTION

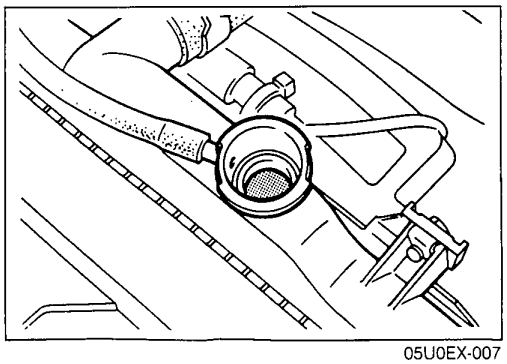
Warning
- **Never remove the radiator cap while the engine is hot.**
- **Wrap a thick cloth around the cap when removing it.**
- **When removing the radiator cap, loosen it slowly to the first stop until the pressure in the radiator is released, and then remove it.**

05U0EX-033



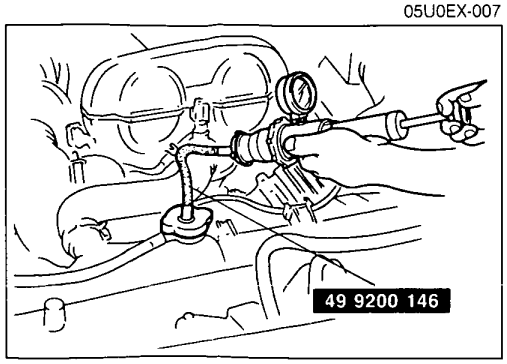
05U0EX-006

Coolant Level (Engine cold)
1. Verify that the coolant level is near the radiator filler neck.
2. Verify that the coolant level in the coolant reservoir is between the FULL and LOW marks. Add coolant if necessary.



05U0EX-007

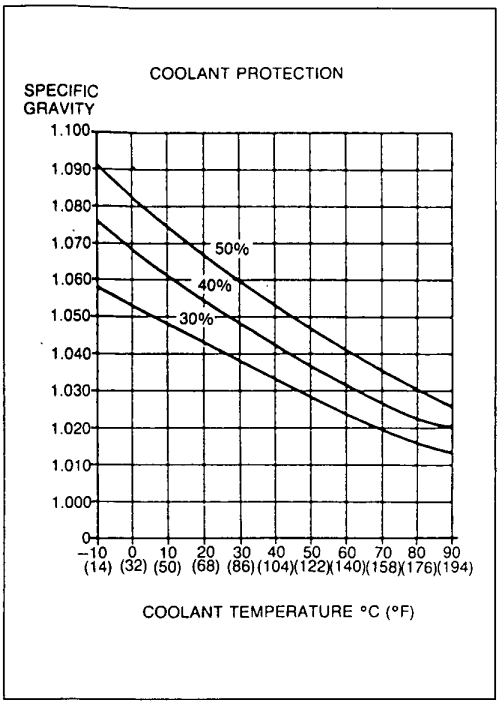
Coolant Quality
1. Verify that there is no buildup of rust or scale around the radiator cap or radiator filler neck.
2. Verify that coolant is free of oil.
   Replace the coolant if necessary.



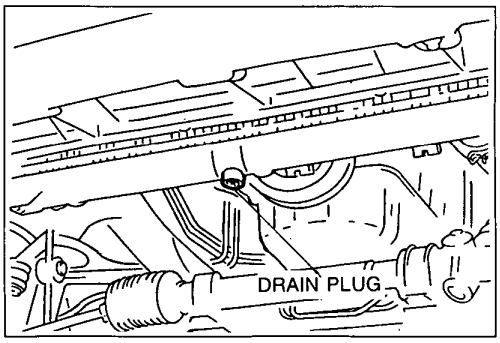
05U0EX-008

Coolant Leakage
1. Connect a radiator tester (commercially available) and the **SST** to the radiator filler neck.
2. Apply **103 kPa (1.05 kg/cm^2, 15 psi)** pressure to the system.
3. Verify that the pressure is held.
   If not, check for coolant leakage.

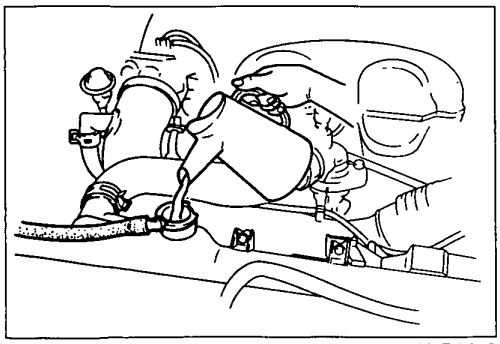
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05U0EX-009



05U0EX-011



05U0EX-012

Coolant Protection

Caution
- **Do not use alcohol- or methanol-based coolant.**
- **Use only soft (demineralized) water in the coolant mixture.**

1. Measure the coolant temperature and specific gravity with a thermometer and a hydrometer.
2. Determine the coolant protection by referring to the graph shown.
   If the coolant protection is not proper, add water or coolant.

Antifreeze solution mixture percentage

Coolant protection	Volume percentage		Gravity at 20°C (68°F)
	Water	Coolant	
Above −16°C (3°F)	65	35	1.054
Above −26°C (−15°F)	55	45	1.066
Above −40°C (−40°F)	45	55	1.078

05U0EX-010

REPLACEMENT

Warning
- **Never open the radiator cap while the engine is hot.**
- **Wrap a thick cloth around the cap when loosening.**
- **Use caution when draining hot coolant.**

Caution
- **Do not use alcohol- or methanol-based coolant.**
- **Use only soft (demineralized) water in the coolant mixture.**

1. Remove the radiator cap and loosen the drain plug.
2. Drain the coolant into a suitable container.
3. Flush the cooling system with water until all traces of color are gone, then let the system drain completely.
4. Install the drain plug.
5. Fill with the proper amount and mixture of ethylene glycol-based coolant by referring to the table above.

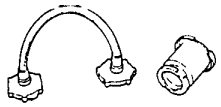
   Coolant capacity: 6.0 liters (6.3 US qt, 5.3 Imp qt)

6. Run the engine, with the radiator cap removed, until the upper radiator hose is hot.
7. With the engine idling, add coolant to the radiator until it reaches the bottom of the filler neck.
8. Install the radiator cap.

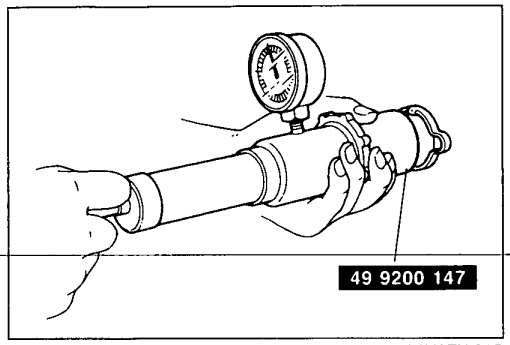
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RADIATOR CAP

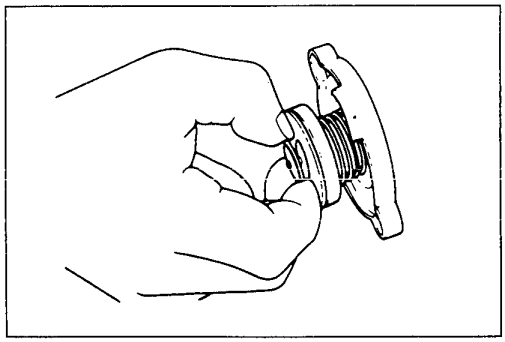
PREPARATION
SST

49 9200 145 Adapter set, radiator cap tester 	For inspection of radiator cap valve	49 9200 147 Adapter B (Part of 49 9200 145) 	For inspection of radiator cap valve

05U0EX-014



05U0EX-015



05U0EX-013

INSPECTION
Radiator Cap Valve

1. Remove foreign material (such as water residue) from between the radiator cap valve and the valve seat.
2. Attach the radiator cap to a radiator cap tester (commercially available) with the **SST**. Apply pressure gradually to **74—103 kPa (0.75—1.05 kg/cm^2, 11—15 psi)**.
3. Wait about **10 seconds**. Verify that the pressure has not decreased.

Negative Pressure Valve

1. Pull the negative pressure valve to open it. Verify that it closes completely when released.
2. Check for damage on the contact surfaces and for cracked or deformed seal packing.
3. Replace the radiator cap if necessary.

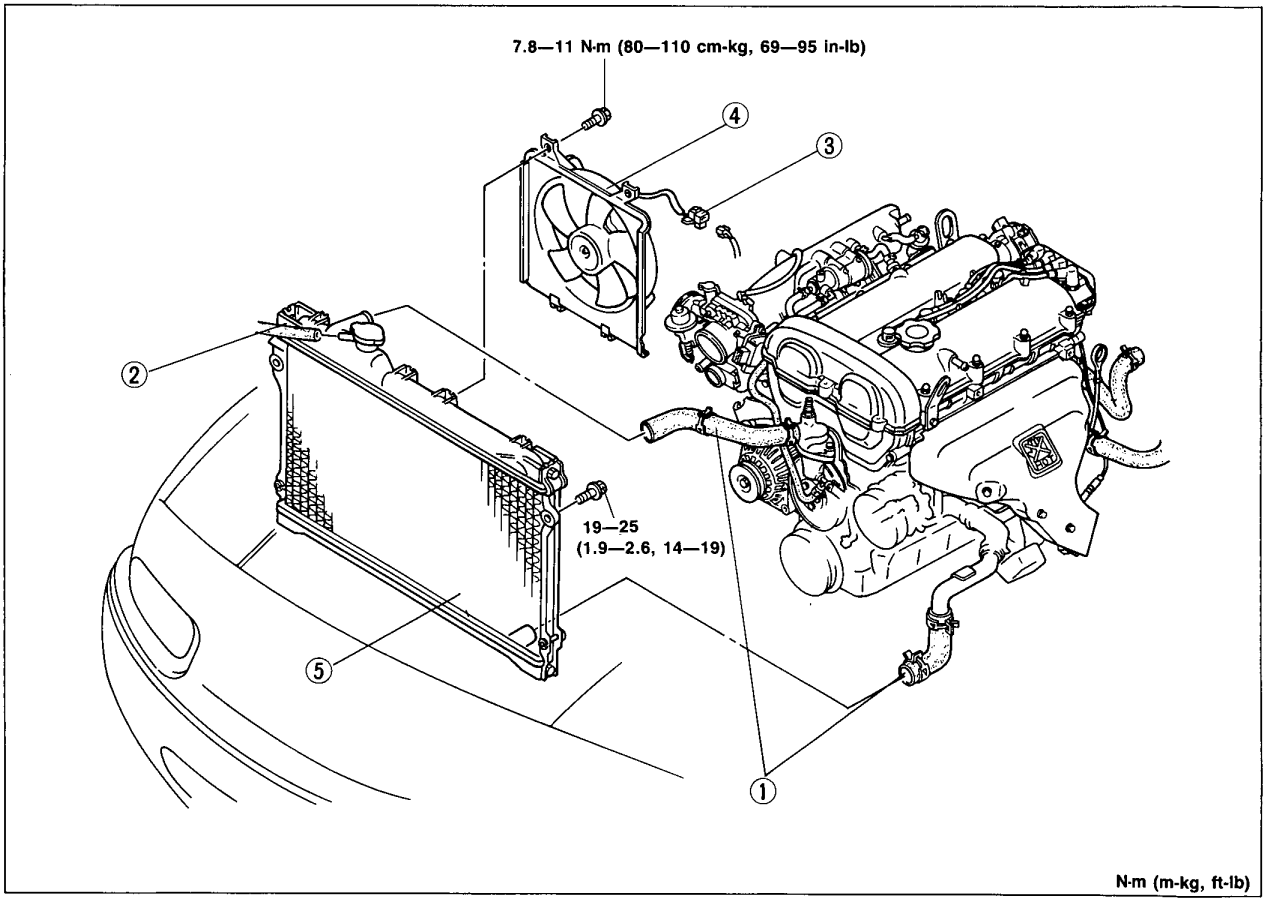
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RADIATOR

REMOVAL / INSPECTION / INSTALLATION

Caution
- **Position the hose clamp in the original location on the hose, and squeeze the clamp lightly with large pliers to ensure a good fit.**

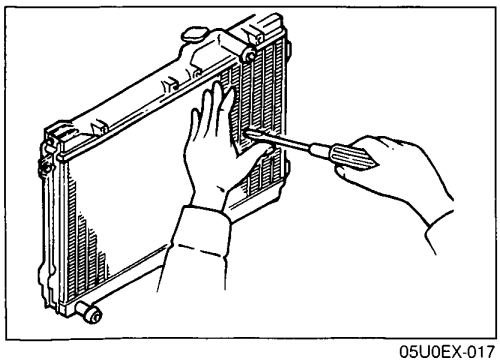
1. Disconnect the negative battery cable.
2. Drain the engine coolant.
3. Remove the under cover.
4. Remove in the order shown in the figure.
5. Install in the reverse order of removal.



95E0EX-001

1. Radiator hose
2. Coolant reservoir hose
3. Cooling fan connector
4. Cooling fan
5. Radiator

Inspection ..... page E–7



05U0EX-017

INSPECTION

Check for the following and repair or replace as necessary.
1. Cracks, damage, and water leakage.
2. Bent fins (repair with a screwdriver).
3. Distorted or bent radiator inlet.

Steps After Installation

1. Install the under cover.
2. Fill the radiator with the specified amount and type of engine coolant. (Refer to page E–5.)
3. Connect the negative battery cable.
4. Start the engine and check for leaks.

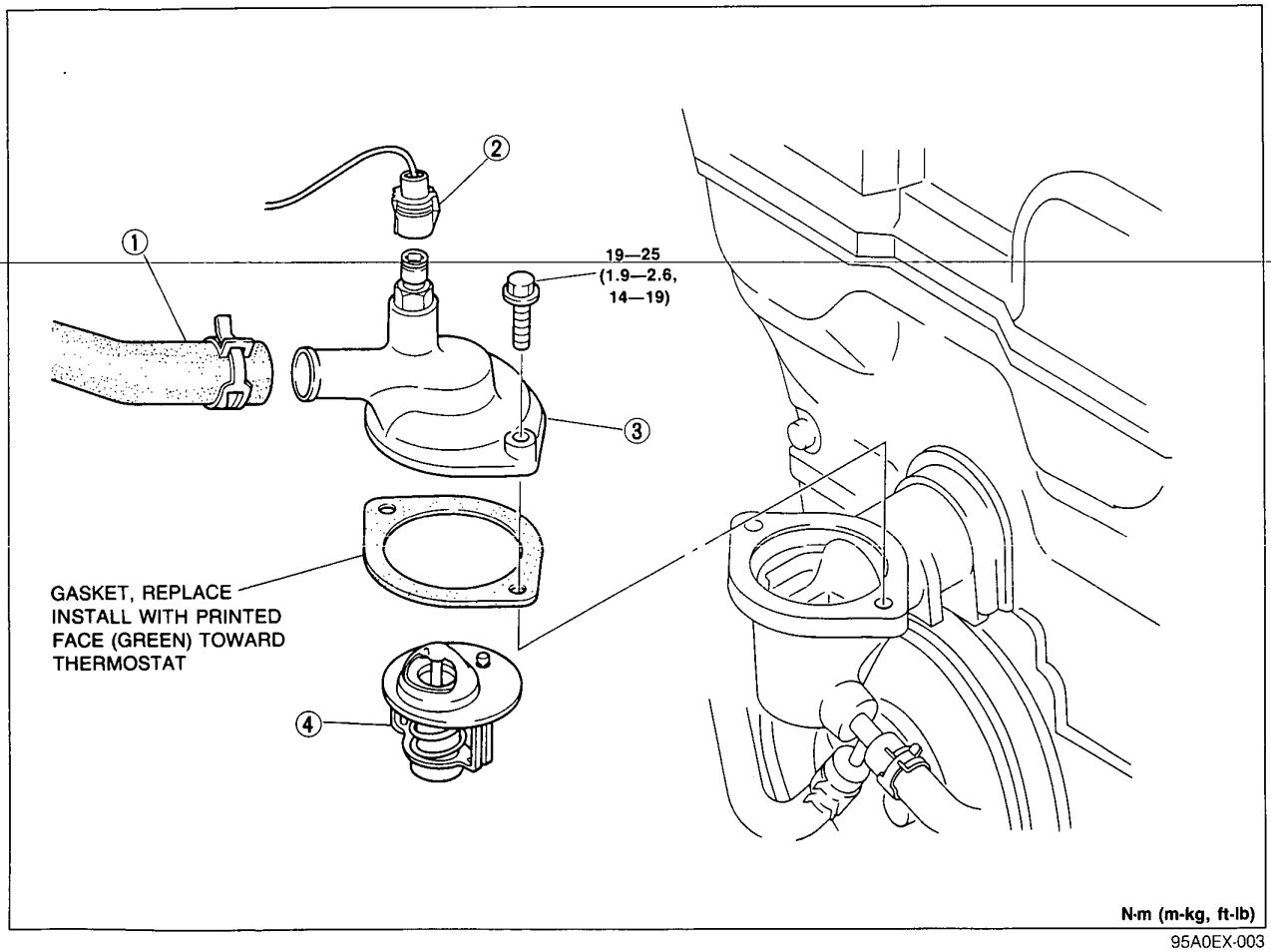
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THERMOSTAT

REMOVAL / INSPECTION / INSTALLATION

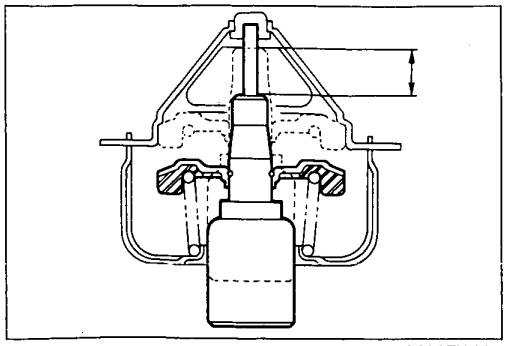
Caution
- **Position the hose clamp in the original location on the hose, and squeeze the clamp lightly with large pliers to ensure a good fit.**

1. Disconnect the negative battery cable.
2. Drain the engine coolant.
3. Remove in the order shown in the figure.
4. Install in the reverse order of removal.



95A0EX-003

1. Radiator hose upper
2. Water thermoswitch connector
3. Thermostat cover
4. Thermostat
   Inspection ..... page E–8



95A0EX-004

INSPECTION
1. Visually check that the thermostat valve is airtight.
2. Place the thermostat and a thermometer in water.
3. Heat the water and check the following:

Initial-opening temperature:
80.5—83.5°C (177—182°F)
Full-open temperature: 95°C (203°F)
Full-open lift: 8.5mm (0.33 in) min.

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Steps After Installation
1. Fill the radiator with the specified amount and type of engine coolant. (Refer to page E–5.)
2. Connect the negative battery cable.
3. Start the engine and check for leaks.

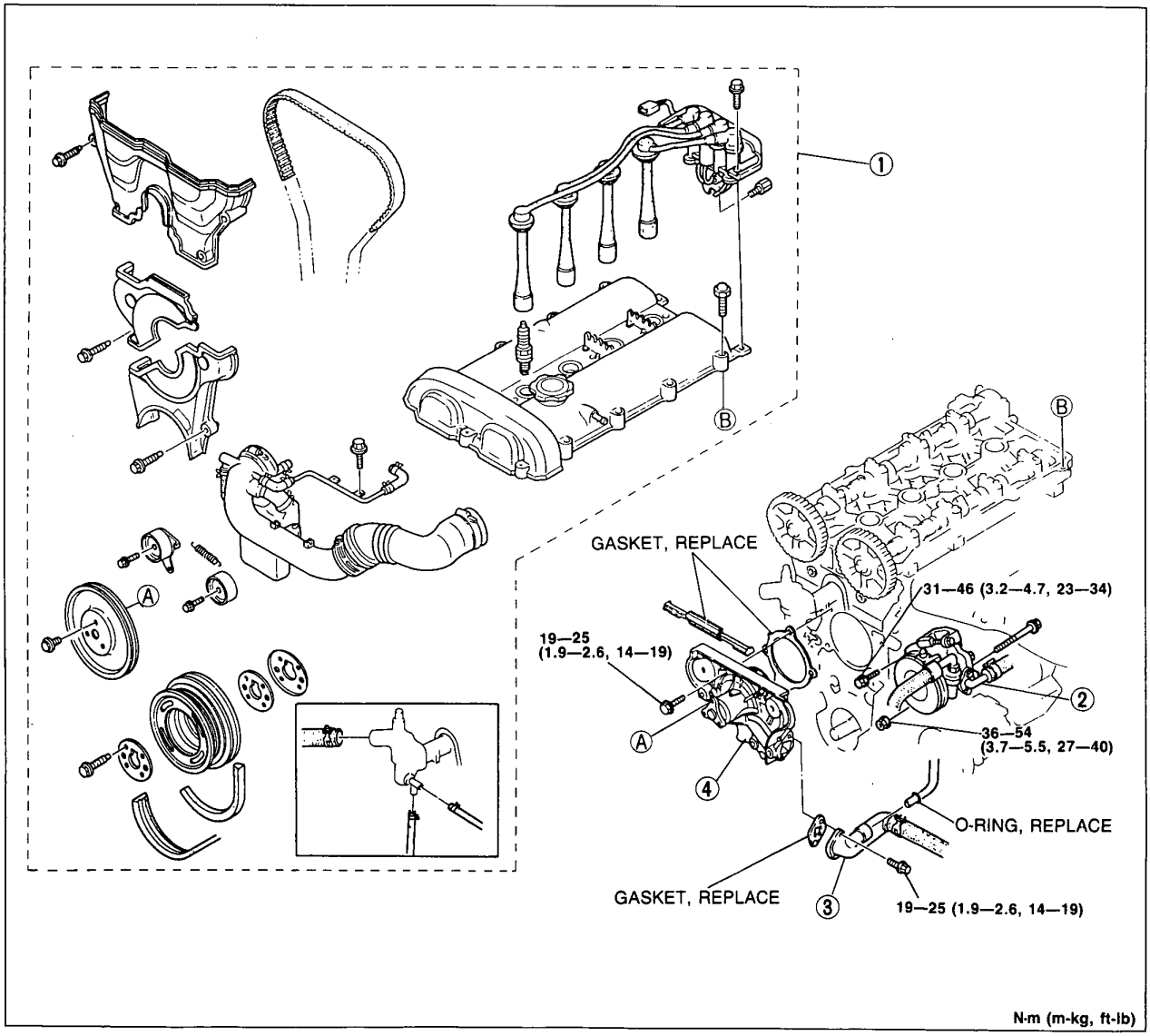
05U0EX-020

WATER PUMP

REMOVAL / INSTALLATION

Caution
- **Do not disassemble the water pump. If a problem is found, replace the pump as a unit.**

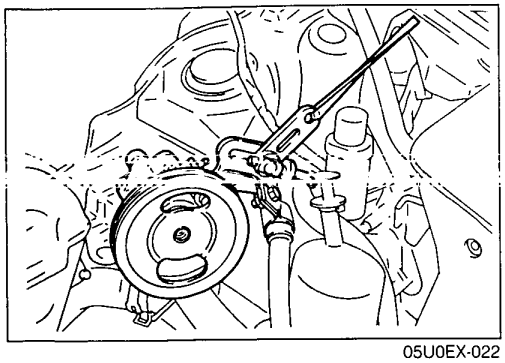
1. Disconnect the negative battery cable.
2. Drain the engine coolant.
3. Remove in the order shown in the figure, referring to **Removal Note**.
4. Install in the reverse order of removal.



95A0EX-005

1. Timing belt
   Service..... page B–12
2. P/S oil pump
   Removal Note..... page E–10
3. Water inlet pipe
4. Water pump
   Inspect for cracks, damaged mounting surface, bearing condition, and leakage

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05U0EX-022

Removal Note
P/S oil pump

Caution
- **Do not damage the hoses.**

1. Remove the P/S oil pump with the hoses still connected.
2. Position the pump away from the engine and affix it with wire.

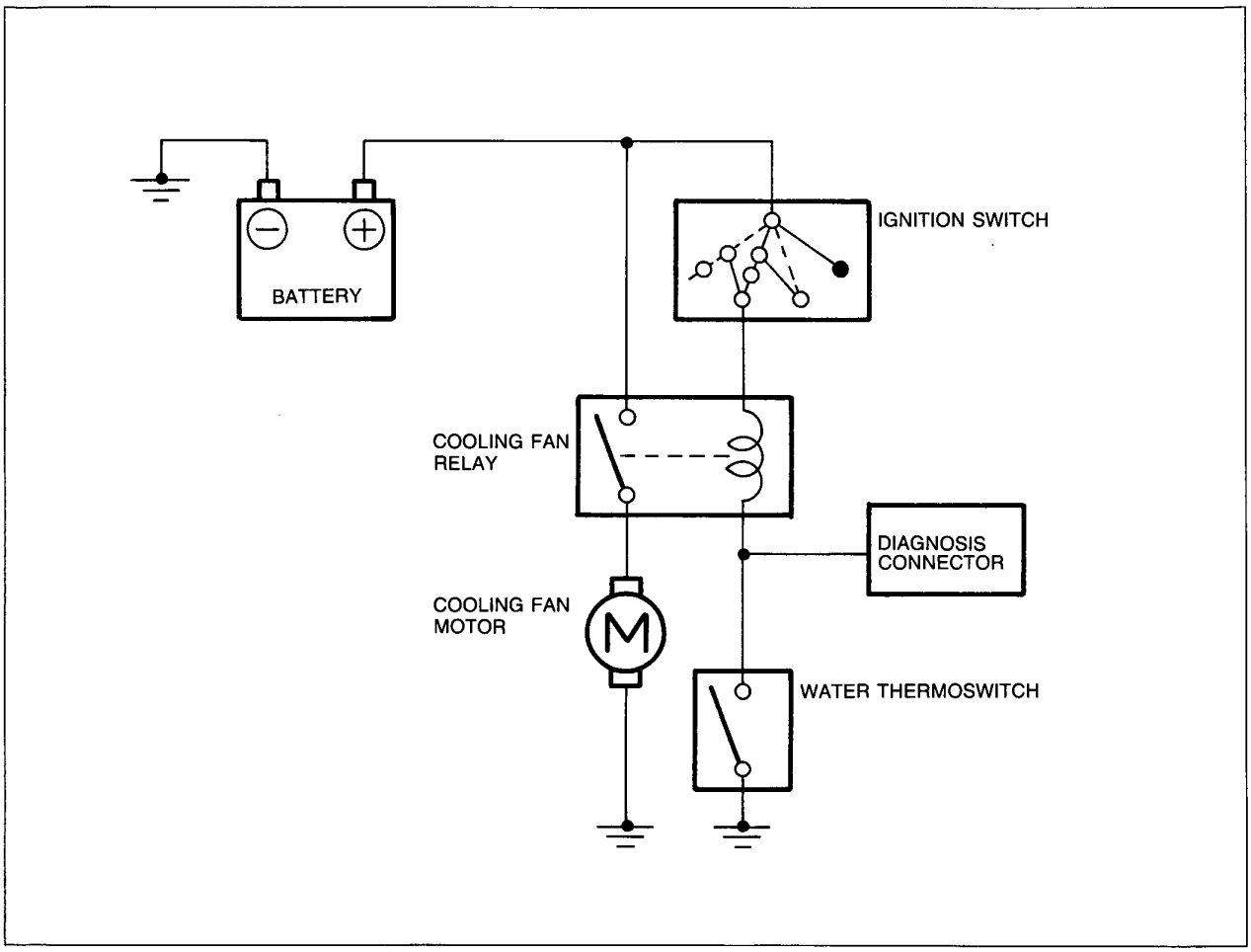
Steps After Installation
1. Fill the radiator with the specified amount and type of engine coolant. (Refer to page E–5.)
2. Connect the negative battery cable.
3. Start the engine and check for leaks.

05U0EX-020

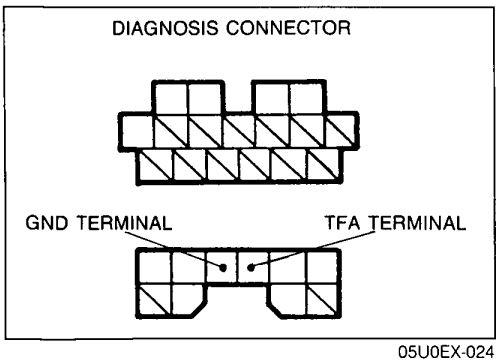
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ELECTRIC COOLING FAN SYSTEM

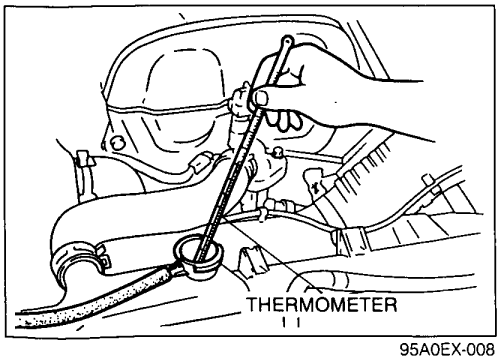
SYSTEM CIRCUIT



05U0EX-023



05U0EX-024

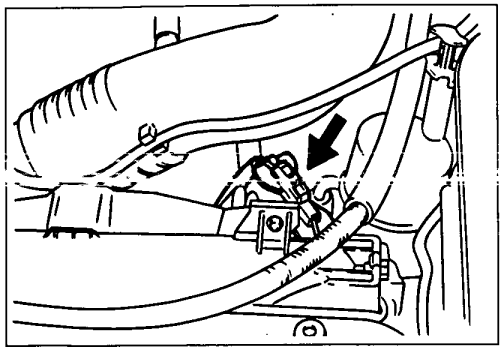


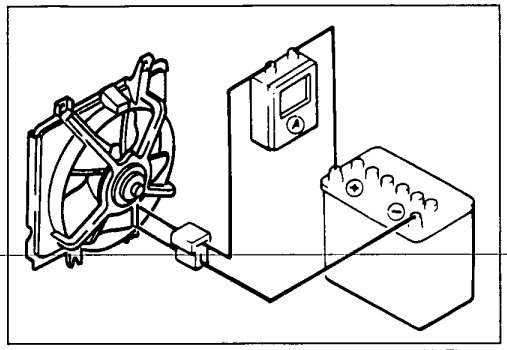
95A0EX-008

SYSTEM INSPECTION

1. Jump across the fan test (TFA) terminal and the ground (GND) terminal of the diagnosis connector.
2. Turn the ignition switch ON and verify that the fan operates. If the fan does not operate, inspect the cooling fan system components and wire harness.
3. Remove the radiator cap and place a thermometer in the radiator filler neck.
4. Start the engine.
5. Verify that the fan operates when the coolant temperature reaches **approx. 91°C (196°F)**.
   If the fan does not operate, check the water thermoswitch. (Refer to page E–13.)

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05U0EX-027

FAN MOTOR

INSPECTION

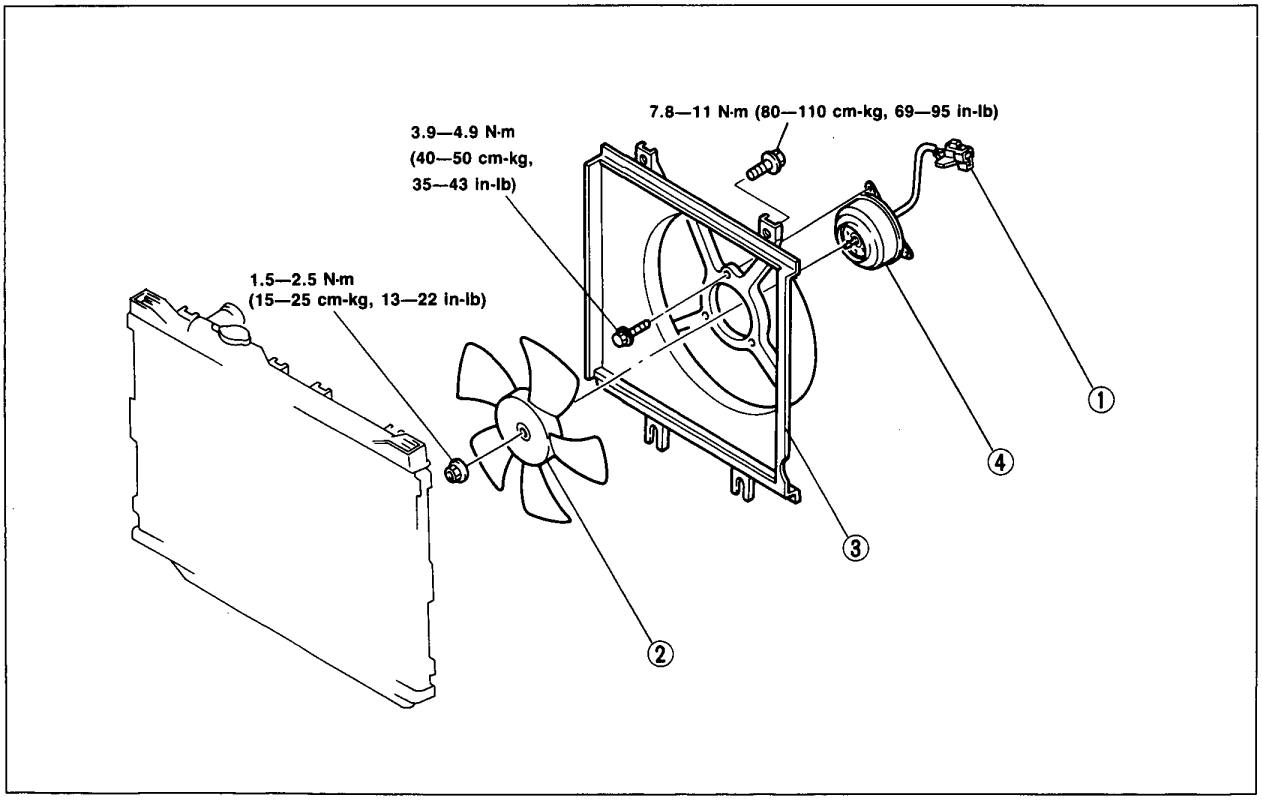
1. Check that the battery is fully charged.
2. Disconnect the fan motor connector.
3. Connect the battery and an ammeter to the fan motor connector.
4. Verify that current is as specified.

Current: 5.3—6.5A

5. If current is not within specification and/or the fan does not turn smoothly, replace the fan motor.

REPLACEMENT

1. Disconnect the negative battery cable.
2. Drain the engine coolant.
3. Remove in the order shown in the figure.
4. Install in the reverse order of removal.



95A0EX-006

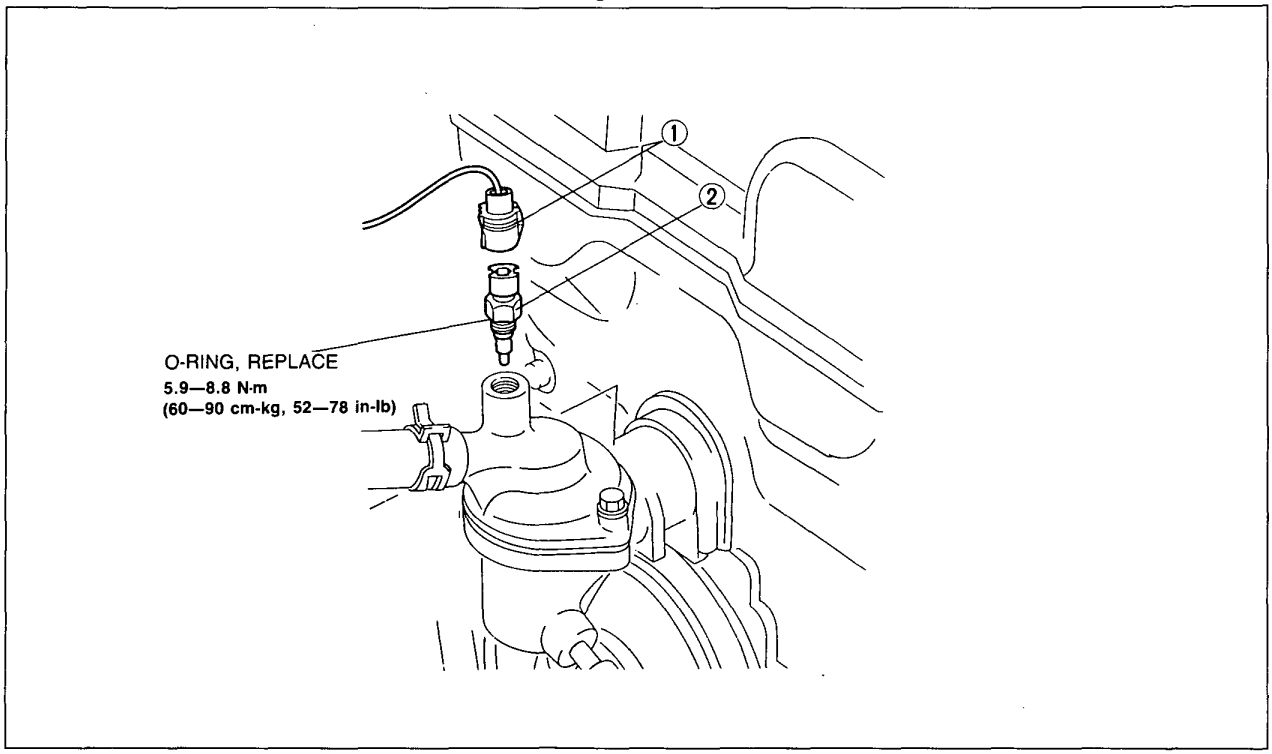
1. Cooling fan connector
2. Cooling fan
3. Radiator cowling
4. Fan motor

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WATER THERMOSWITCH

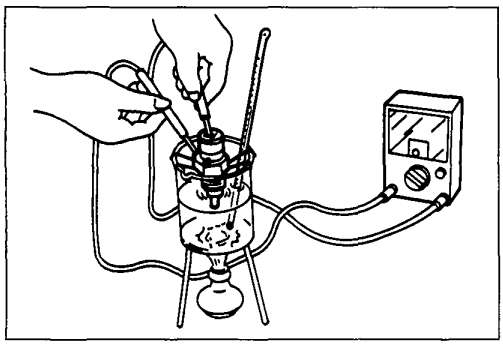
REMOVAL / INSPECTION / INSTALLATION

1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure.
3. Install in the reverse order of removal, referring to **Installation Note**.

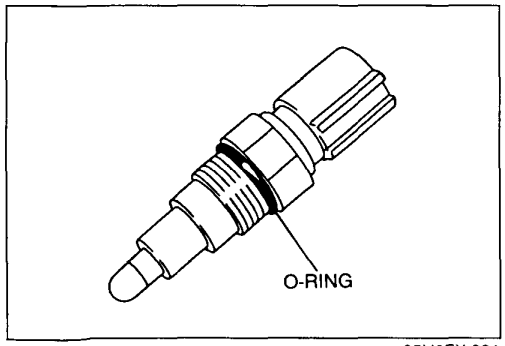


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1. Water thermoswitch connector
2. Water thermoswitch
   - Inspection ..... page E–13
   - Installation Note ..... page E–13



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05U0EX-031

INSPECTION

1. Place the switch and a thermometer in water.
2. Heat the water gradually and check continuity of the switch with an ohmmeter.

Coolant temperature °C (°F)	Continuity
More than 91 (196)	Yes
Less than 84 (183)	No

3. If not as specified, replace the water thermoswitch.

Installation Note
Water thermoswitch

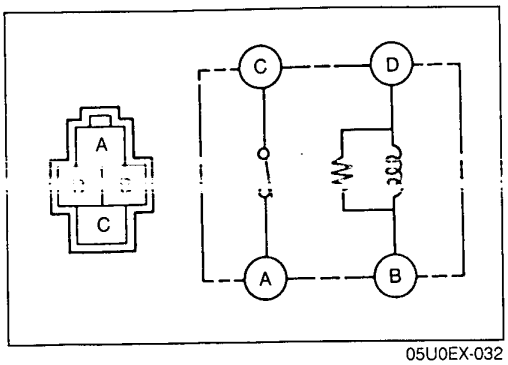
1. Apply a small amount of engine coolant to the new O-ring.

Caution
- **Do not use an impact wrench for installation.**

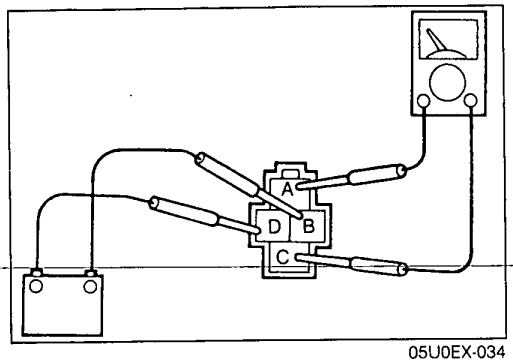
2. Install the water thermoswitch.

Tightening torque:
5.9—8.8 N·m (60—90 cm-kg, 52—78 in-lb)

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05U0EX-034

FAN RELAY

INSPECTION

1. Check continuity as shown with an ohmmeter.

Terminal	Continuity
A—C	No
B—D	Yes

2. Apply 12V between terminals B and D.
   Check for continuity between terminals A and C.
3. If not as specified, replace the fan relay.

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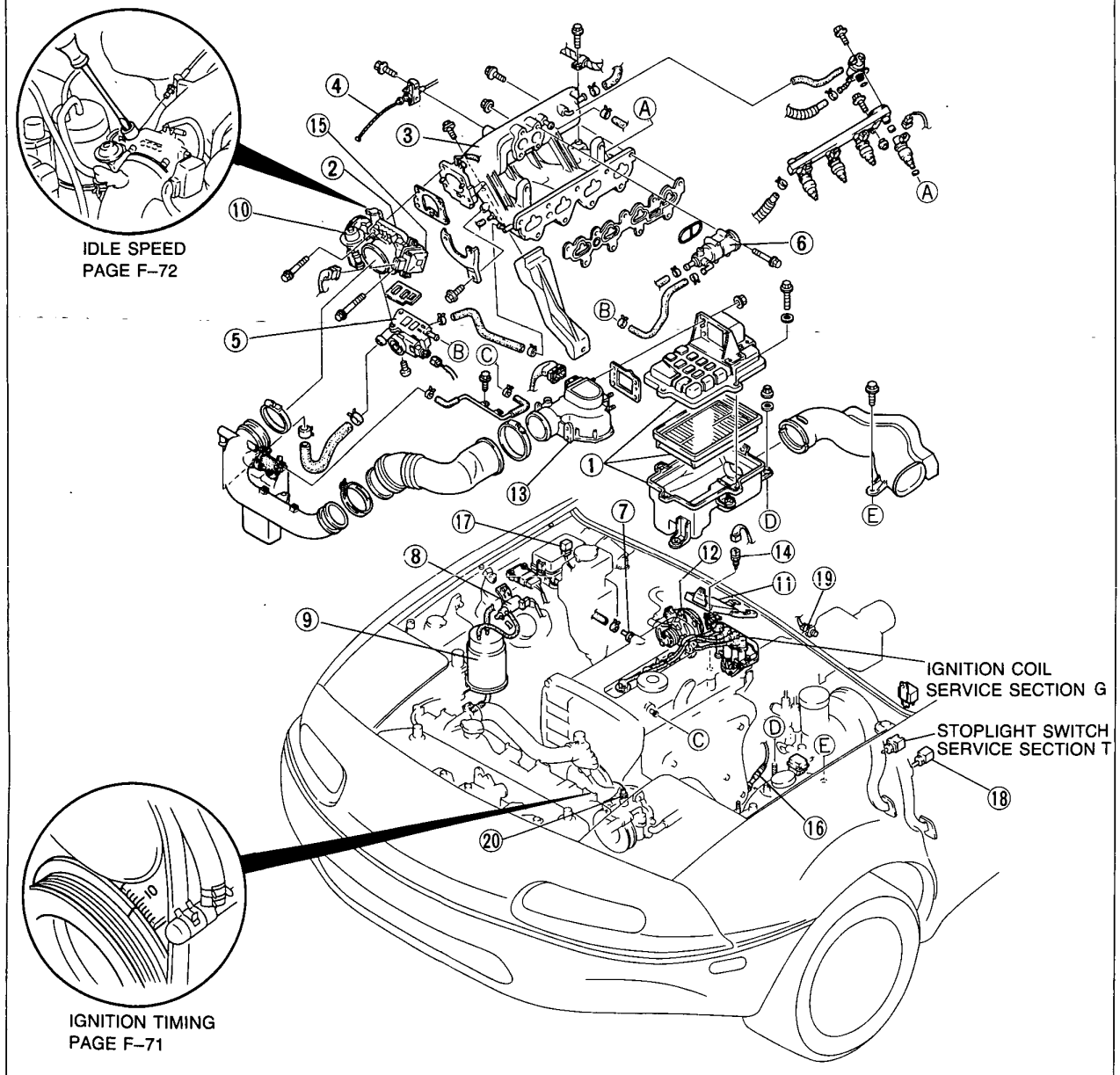
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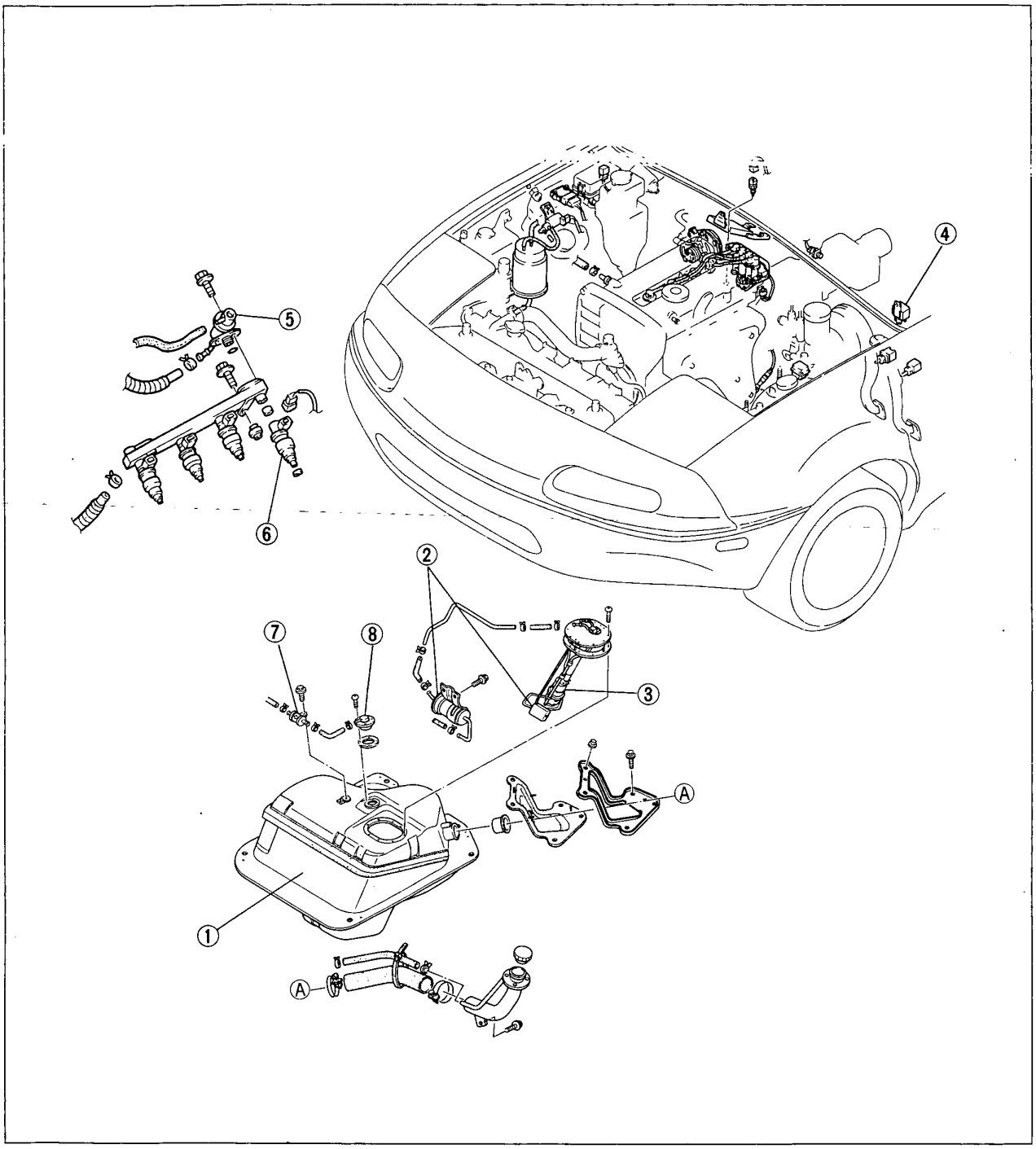
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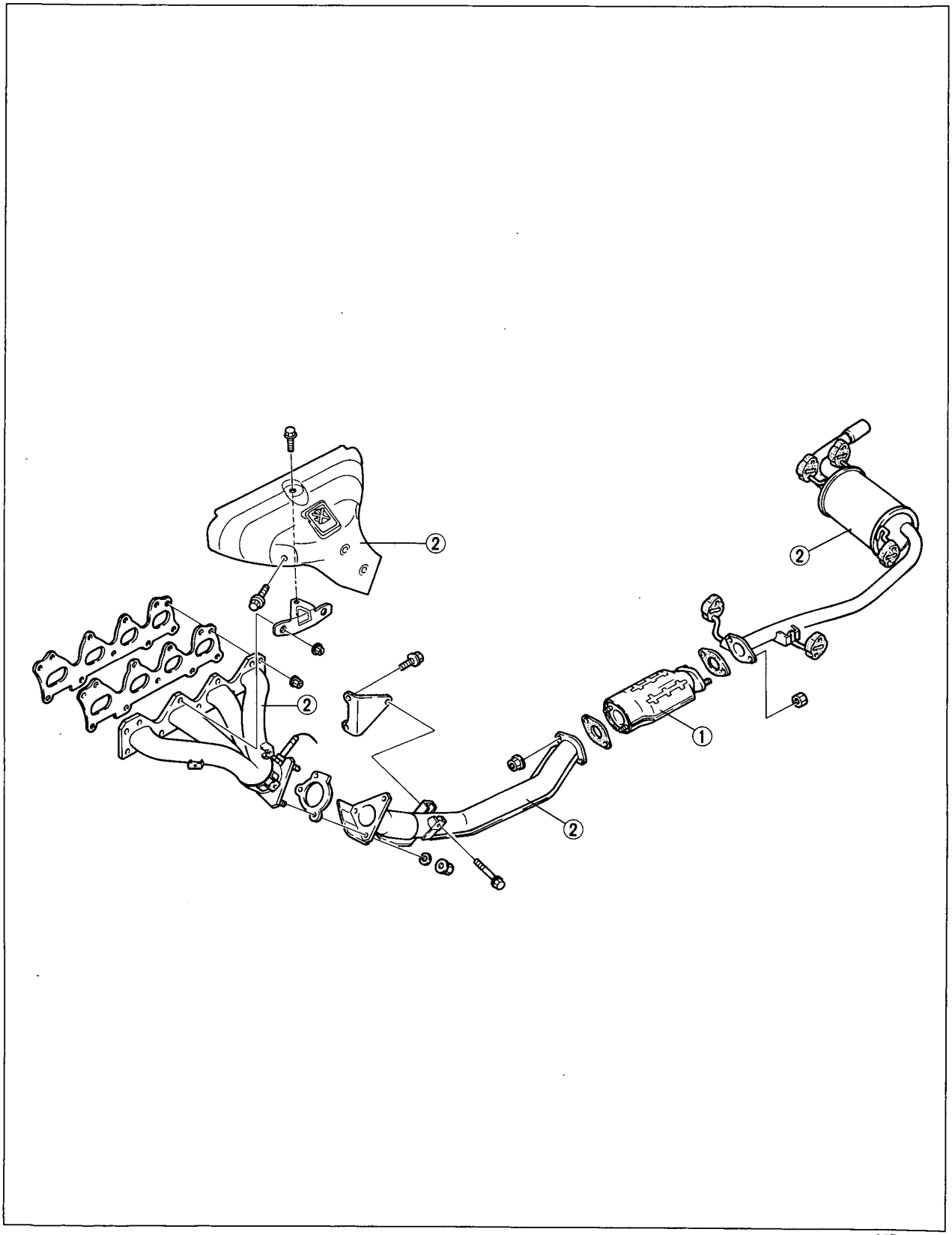
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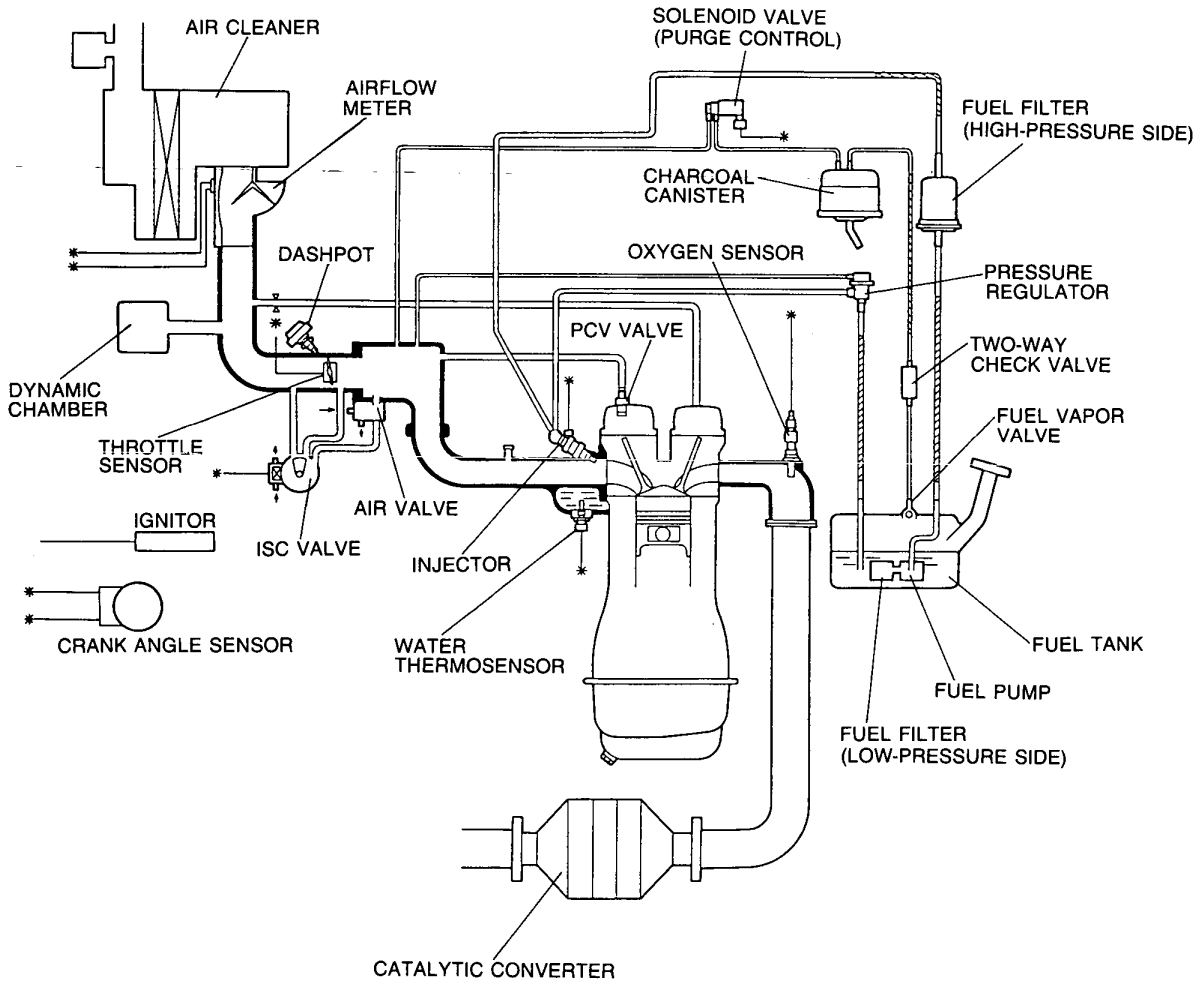
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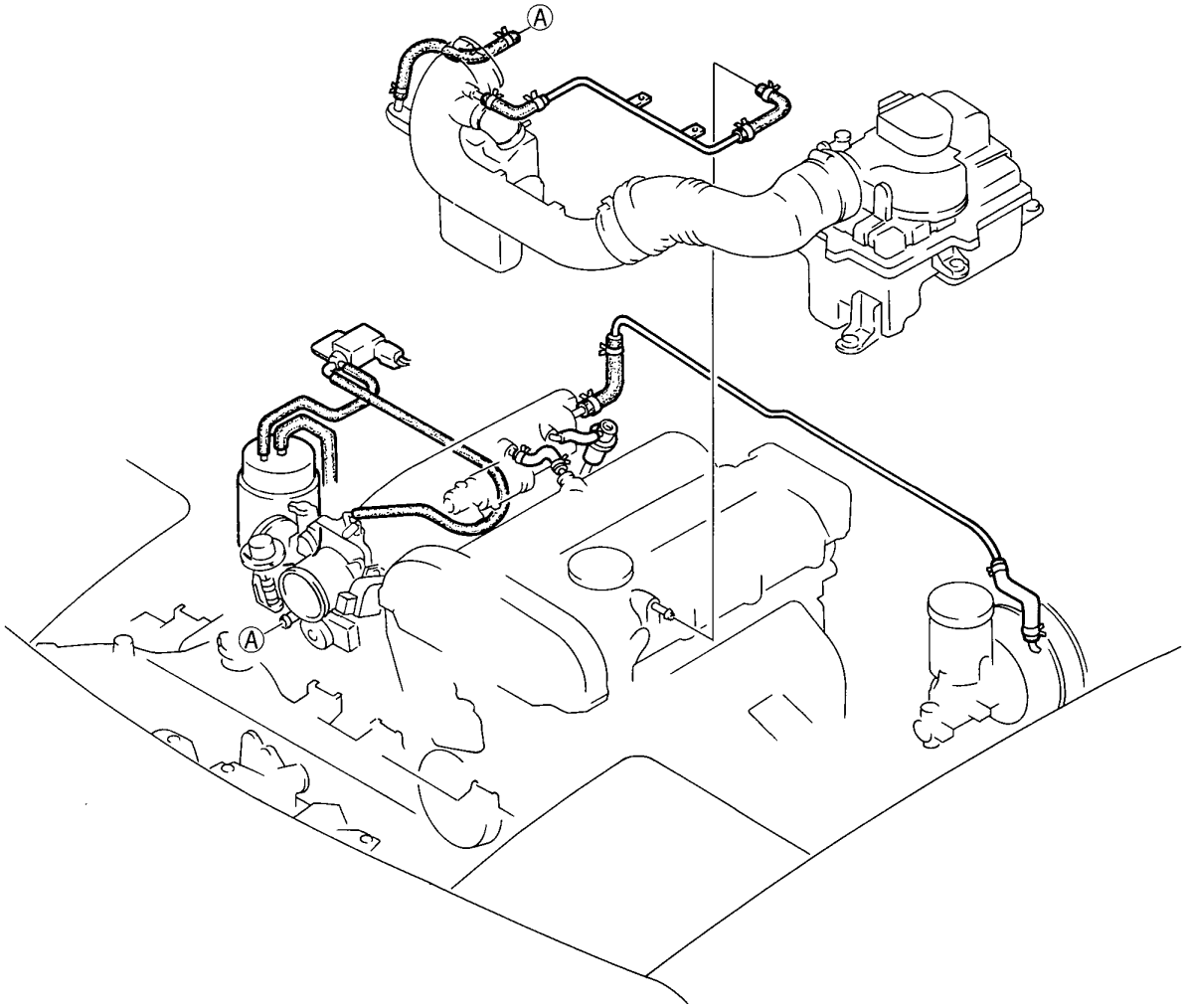
SYSTEM DIAGRAM



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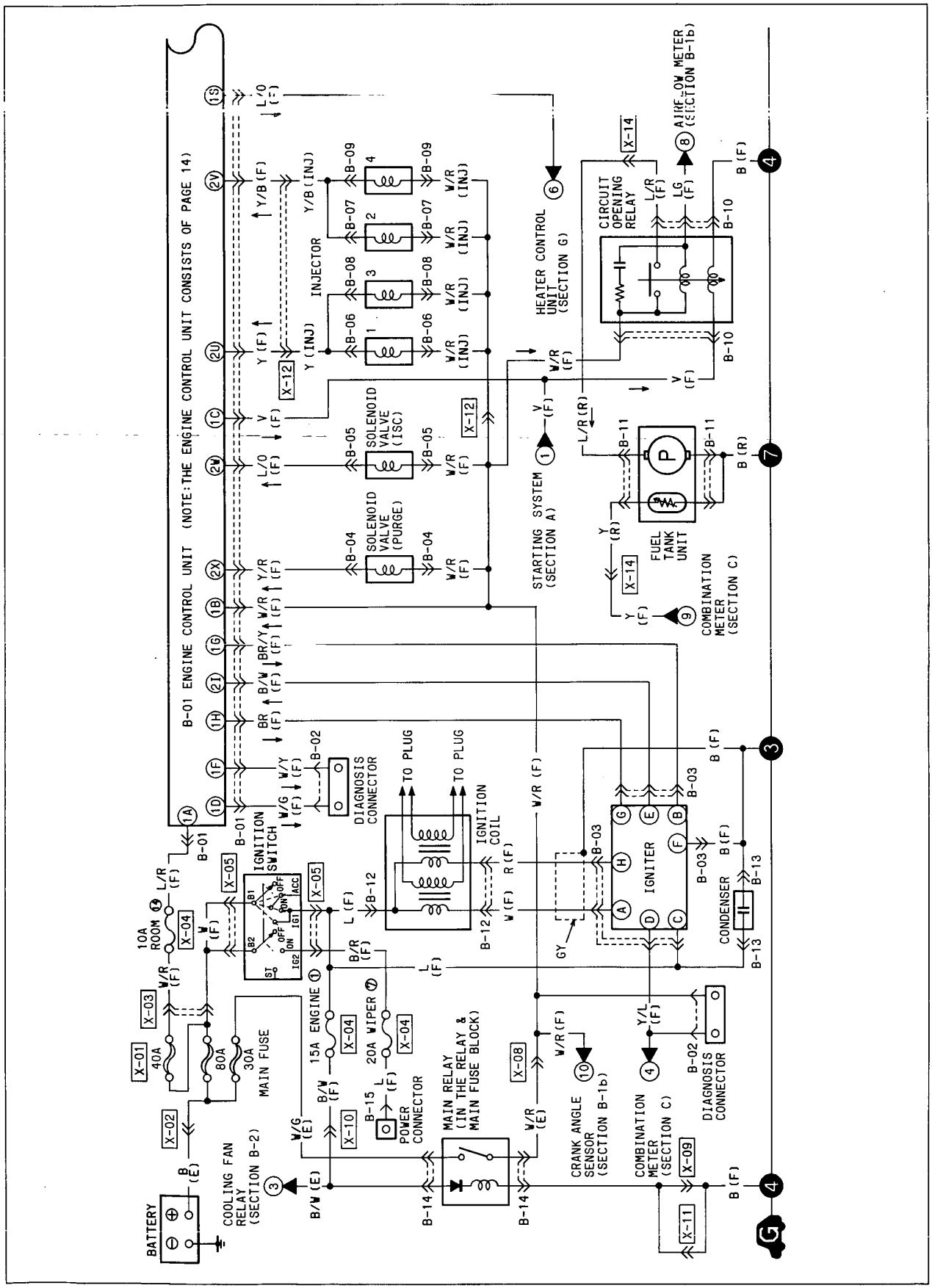
VACUUM HOSE ROUTING DIAGRAM



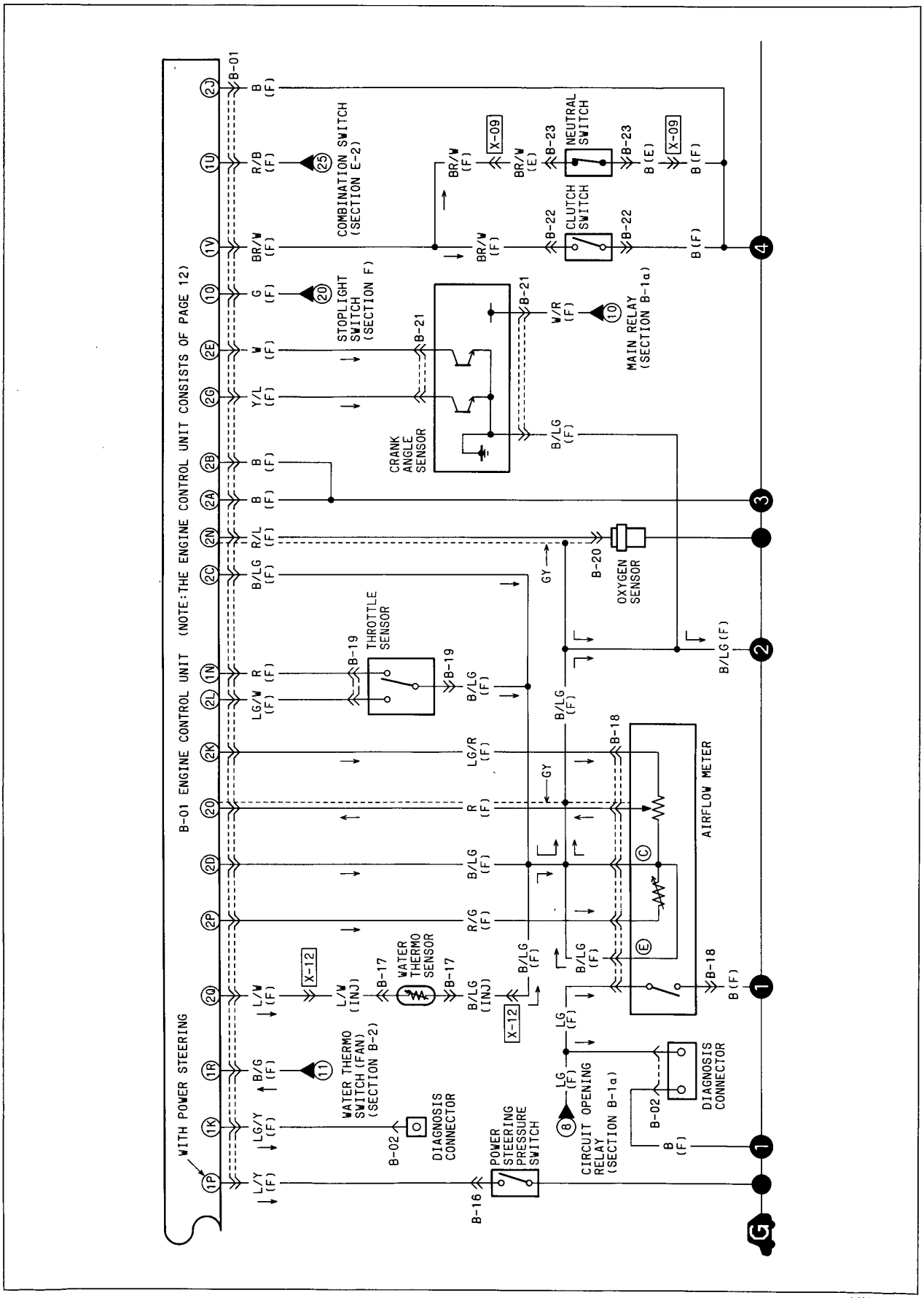
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WIRING DIAGRAM



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SPECIFICATIONS

Item			Specification
Idle speed		rpm	850 ± 50*
Ignition timing		BTDC	10° ± 1°*
Throttle body			
Type			Horizontal draft
Throat diameter		mm (in)	55 (2.2)
Fuel pump			
Type			Impeller (in-tank)
Output pressure		kPa (kg/cm², psi)	441—589 (4.5—6.0, 64—85)
Fuel filter			
Type	Low-pressure side		Nylon element
	High-pressure side		Paper element
Pressure regulator			
Type			Diaphragm
Regulating pressure		kPa (kg/cm², psi)	265—314 (2.7—3.2, 38—46)
Injector			
Type			High-ohmic
Type of drive			Voltage
Resistance		Ω	12—16 (at 20°C, 68°F)
ISC valve			
Solenoid resistance		Ω	11—13 (at 20°C, 68°F)
Air valve			
Opening temperature			Below 40°C (104°F)
Solenoid valve (Purge control)			
Solenoid resistance		Ω	23—27 (at 20°C, 68°F)
Crank angle sensor			
Type			Optical pickup
Airflow meter			
Resistance Ω	$E_2 \leftrightarrow V_S$	Fully closed	200—600
		Fully open	20—1,000
	$E_2 \leftrightarrow V_C$		200—400
	$E_2 \leftrightarrow THA_A$ (Intake air thermosensor)	−20°C (−4°F)	13,600—18,400
		20°C (68°F)	2,210—2,690
		60°C (140°F)	493—667
	$E_1 \leftrightarrow F_C$	Fully closed	∞
		Fully open	0
Water thermosensor			
Resistance		−20°C (−4°F)	14.6—17.8
	kΩ	20°C (68°F)	2.2—2.7
		80°C (179°F)	0.29—0.35
Circuit opening relay			
Resistance		STA—E_1	21—43
	Ω	B—Fc	109—226
		B—Fp	∞
Fuel tank			
Capacity		liters (US gal, Imp gal)	45 (11.9, 9.9)
Air cleaner			
Element type			Oil permeated
Accelerator cable			
Free play		mm (in)	1—3 (0.039—0.118)
Fuel			
Specification			Unleaded (RON 91 or higher)

*... TEN terminal in diagnosis connector grounded.

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COMPONENT DESCRIPTIONS

Component	Function	Remark
Air cleaner	Filters air entering throttle body	
Airflow meter	Detects amount of intake air; sends signal to engine control unit	• Intake air thermosensor and fuel pump switch included • Use Vref (5 volt) as power source
Air valve	When cold, supplies bypass air into dynamic chamber	• Engine speed increased to shorten warm-up period • Thermowax type
Atmospheric pressure sensor	Detects atmospheric pressure; sends signal to engine control unit	Built-in ECU
Catalytic converter	Reduces HC, CO, and NOx by chemical reaction	Monolith type
Charcoal canister	Stores gas tank fumes while engine stopped	
Circuit opening relay	Voltage for fuel pump while engine running	
Clutch switch (M/T)	Detects in-gear condition; sends signal to engine control unit	Switch OFF when clutch pedal released
Diagnosis connector	Concentrated service connector Concentrated terminals are: 1. EGI self-diagnosis terminal 2. Initial set terminal 3. Fuel pump check terminal 4. Cooling fan check terminal	25-pin (Black)
Crank angle sensor **G-signal** **Ne-signal**	 Detects No.1 cylinder TDC; sends signal to engine control unit Detects crank angle at 180° intervals; sends signal to control unit	
Dynamic chamber	Interconnects all cylinders	
Engine control unit (ECU)	**Detects the following:** 1. Air/fuel ratio (Oxygen concentration) 2. Atmospheric pressure 3. Braking signal 4. Cranking signal 5. E/L operation 6. Engine coolant temperature 7. Engine speed 8. In-gear condition 9. Intake air amount 10. Intake air temperature 11. No.1 piston TDC 12. P/S operation 13. Initial set signal 14. Throttle valve fully closed 15. Throttle valve opening amount **Controls operation of the following:** 1. Fail-safe function 2. Fuel injection system 3. Idle speed control 4. Ignition timing control system 5. Monitor function 6. Purge control system	 1. Oxygen sensor 2. Atmospheric pressure sensor 3. Stoplight switch 4. Ignition switch (START position) 5. Cooling fan relay Light and turn relay Blower motor switch 6. Water thermosensor 7. Crank angle sensor (Ne-signal) 8. Neutral and clutch switches 9. Airflow meter 10. Intake air thermosensor 11. Crank angle sensor (G-signal) 12. P/S pressure switch 13. Diagnosis connector 14. Throttle sensor (IDL signal) 15. Throttle sensor (POW signal) 1. Self-diagnosis checker 2. Injector 3. ISC valve 4. Igniter 5. Monitor lamp (Self-diagnosis checker) 6. Solenoid valve (Purge control)

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Fuel vapor valve	Prevents fuel from entering canister during vehicle roll over	
Fuel filter	Filters particles from fuel	
Fuel pump	Provides fuel to injectors	• Operates while engine running • Installed in fuel tank
Igniter	Receives spark signal from engine control unit and generates high voltage in ignition coil Detects high voltage ignition; sends substitute ignition signal to engine control unit	
Ignition switch (START position)	Sends engine cranking signal to engine control unit	
Injector	Injects fuel into intake port	• Controlled by signals from engine control unit • High-ohmic injector • Single port injector nozzle
Intake air thermosensor	Detects intake air temperature; sends signal to engine control unit	Installed in airflow meter
ISC valve	Controls bypass air amount	• Controlled by duty signal from engine control unit • Controls idle-up
Solenoid valve (Purge control)	Controls evaporative fumes from canister to intake manifold	• Controlled by duty signal from engine control unit
Main relay	Supplies electric current to injectors, engine control unit, etc.	
Neutral switch	Detects in-gear condition; sends signal to engine control unit	Switch ON when in neutral
Oxygen sensor	Detects oxygen concentration; sends signal to engine control unit	Zirconia ceramic and platinum coating
PCV valve	Controls blowby gas amount introduced into engine	
P/S pressure switch	Detects P/S operation; sends signal to engine control unit	P/S: ON when steering wheel turned
Pressure regulator	Adjusts fuel pressure supplied to injectors	
Resonance chamber	Improves mid range torque characteristics	
Stoplight switch	Detects braking operation (deceleration); sends signal to engine control unit	
Throttle body	Controls intake air quantity	Integrated throttle sensor, ISC valve, and dashpot
Throttle sensor IDL signal	Detects position of the throttle valve fully closed; sends signal to engine control unit	
Throttle sensor POW signal	Detects the throttle valve opening at a preset angle; sends signal to engine control unit	
Two-way check valve	Controls pressure in fuel tank	
Water thermosensor	Detects coolant temperature; sends signal to engine control unit	

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TROUBLESHOOTING GUIDE

RELATIONSHIP CHART

Input Devices \ Output Devices		Injector		ISC Valve	Solenoid Valve (Purge Control)	Igniter (Ignition Timing Control)
		Fuel Injection Amount	Fuel Injection Timing			
Test Terminal		×	×	○	×	○
Ignition Switch (Start Position)		○	○	○	○	○
P/S Pressure Switch		×	×	○	×	×
Cooling Fan Switch		×	×	○	×	×
Blower Control Switch		×	×	○	×	×
Headlight Switch		×	×	○	×	×
Stoplight Switch		○	×	×	×	×
Neutral and Clutch Switches		○	×	○	○	○
Throttle Sensor	Idle Terminal (IDL)	○	×	○	○	○
	Power Terminal (POW)	○	×	×	×	×
Atmospheric Pressure Sensor		○	×	○	×	×
IGF Signal		○	×	×	×	×
Oxygen Sensor		○	×	×	○	×
Water Thermosensor		○	×	○	○	○
Airflow Meter	Potentiometer	○	×	×	○	○
	Intake Air Thermosensor	○	×	○	×	×
Crank Angle Sensor	Ne-Signal	○	○	○	○	○
	G-Signal	×	○	×	×	○

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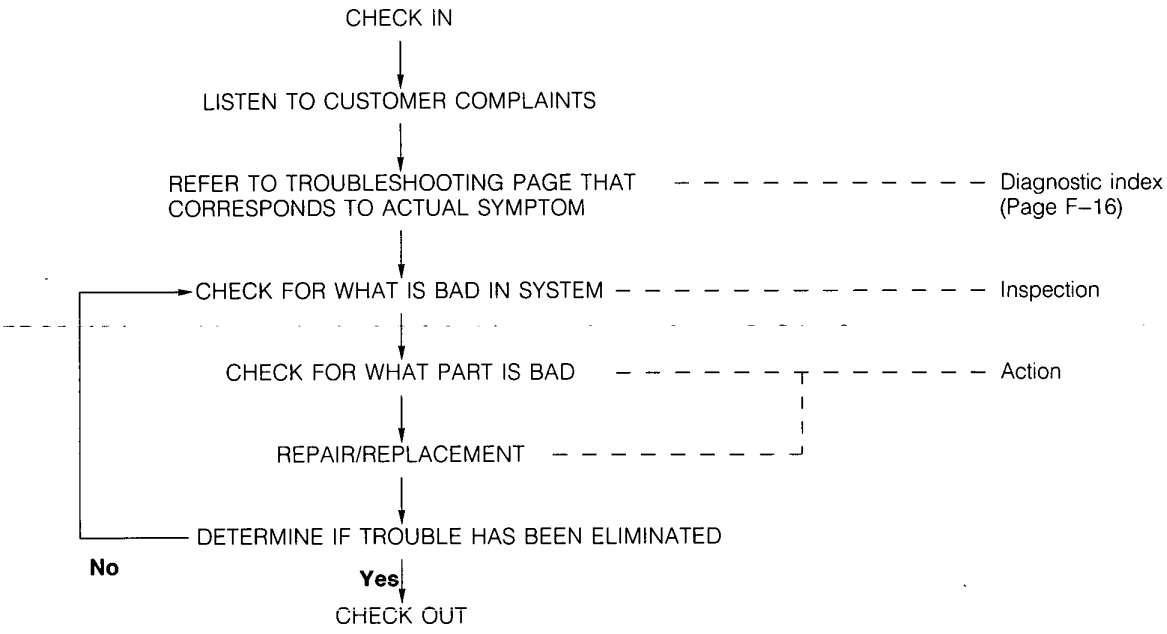
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USING THIS SECTION

Introduction

Most of the fuel and emission control system is electrically controlled, often making it difficult to diagnose problems in the system, especially intermittent problems. Before undertaking actual checks, take a few minutes to talk with a customer who approaches with a drivability complaint. The customer is often a good source of information on such problems, especially intermittent ones. Through talks with the customer, one can find out what the symptoms are and under what conditions they occur.

Work flow

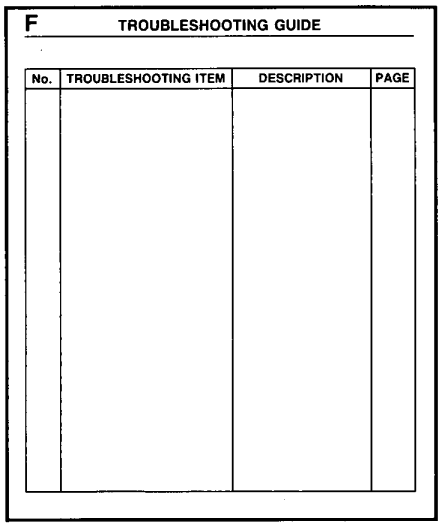


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Diagnostic index

DESCRIPTION:
Describes each troubleshooting item.

No.:
Each troubleshooting item is assigned a number.



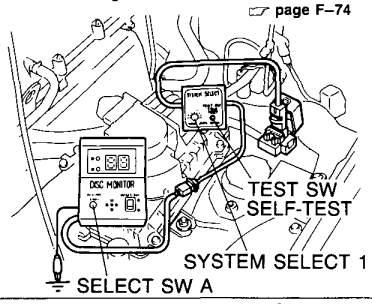
PAGE:
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TROUBLESHOOTING ITEM:
There are 31 troubleshooting items. Choose the item that most closely corresponds to the actual symptom.

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Troubleshooting chart

7	CRANKS NORMALLY BUT HARD TO START — AFTER WARM-UP		
DESCRIPTION	• Engine cranks at normal speed but requires excessive cranking time (more than 5 sec.) before starting after running and hot soaked • Battery in normal condition • Engine starts normally when cold		
[TROUBLESHOOTING HINTS] ① Air/Fuel mixture too rich • Fuel injection control malfunction • Injector fuel leakage ② Vapor lock • Fuel pressure not held in fuel line after engine stops • High RVP (winter) fuel used in warm weather			
STEP	INSPECTION		ACTION
1	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ page F–74  	Yes	Go to next step
		No	**Malfunction Code No. displayed** Check for cause (Refer to specified check sequence) ☞ page F–77 **"88" flashes** Check ECU terminal 1F voltage ☞ page F–124 **Voltage: Approx. 12V (Ignition switch ON)** ⇨ If OK, replace ECU ☞ page F–123 ⇨ If not OK, check wiring between ECU and Self-Diagnosis Checker ☞ page F–8
2	Check if ECU terminal voltages are OK (2D and 2Q) ☞ page F–125	Yes	Go to next step
		No	Check for cause (Refer to "Check Point for Each Terminal") ☞ page F–128
3	Run engine at [illegible] sure [illegible]	Yes	Go to next step
			[illegible] of pressure regulator and [illegible] sure is held after

05U0FX-015

DESCRIPTION:
Further describes the symptom. Confirm that the chart addresses the actual symptom before beginning troubleshooting.

TROUBLESHOOTING HINTS:
This describes the possible point of malfunction.

STEP:
This shows the order of troubleshooting. Proceed with troubleshooting as indicated.

INSPECTION:
This describes an inspection to quickly determine the malfunction of parts. If a detailed procedure is necessary to perform the INSPECTION, refer to the page shown by the "☞" mark.

ACTION:
This recommends the appropriate action to take as a result (Yes/No) of the INSPECTION. How to perform the action is described on the reference page shown by the "☞" mark.

05U0FX-016

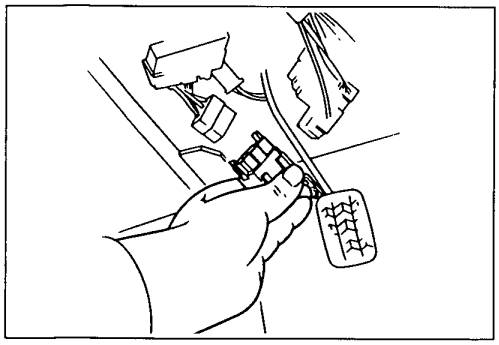
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DIAGNOSTIC INDEX

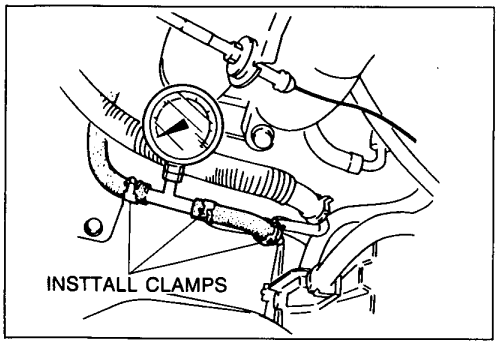
No.	TROUBLESHOOTING ITEM	DESCRIPTION	PAGE
1	Will not crank or cranks slowly	Refer to Engine Electrical System	G– 4
2	Cranks normally but will not start (No combustion)	Engine cranks at normal speed but shows no sign of "firing"	F–18
3	Cranks normally but will not start (Partial combustion) — When engine is cold	Engine cranks at normal speed but shows partial combustion and will not continue to run	F–20
4	Cranks normally but will not start (Partial combustion) — After warm-up	Engine cranks at normal speed but shows partial combustion and will not continue to run after running and hot soaked	F–22
5	Cranks normally but hard to start — Always	Engine cranks at normal speed but requires excessive cranking time (more than 5 sec.) before starting	F–24
6	Cranks normally but hard to start — When engine is cold	Same condition as No.5 when engine is cold Restarts OK after warm-up	F–26
7	Cranks normally but hard to start — After warm-up	Same condition as No.5 after running and hot soaked Starts normally when cold	F–27
8	Rough idle — Always	Engine vibrates excessively at idle in every condition	F–28
9	Low idle speed/Rough idle — Before warm-up	Engine speed low or engine vibrates excessively at idle during warm-up	F–30
10	Low idle speed/Rough idle — After warm-up	Engine runs normally at idle during warm-up but vibrates excessively after warm-up	F–32
11	High idle speed — After warm-up	Engine idle excessive for operation mode	F–34
12	Low idle speed — When P/S, or E/L ON	Engine speed decreases at idle when P/S, or E/L is ON	F–36
13	Rough idle just after starting	Engine starts normally but vibrates excessively only just after starting	F–37
14	Idle moves up and down	Engine speed up and down periodically at idle	F–38
15	Engine stalls at idle — Always	Engine starts normally but vibrates excessively and stalls at idle in every condition	F–40
16	Engine stalls at idle — Before warm-up	Engine starts normally but vibrates excessively and stalls at idle before warm-up	F–42
17	Engine stalls at idle — After warm-up	Engine runs normally at idle during warm-up but becomes rough and stalls after warm-up	F–43
18	Engine stalls during start-up	Engine unexpectedly stops running while starting	F–44
19	Engine stalls on deceleration	Engine unexpectedly stops running while decelerating or after deceleration	F–46
20	Engine stalls at idle — When P/S, or E/L ON	Engine unexpectedly stops running at idle when P/S, or E/L is ON	F–48
21	Engine stalls suddenly (Intermittent)	Engine intermittently stops running	F–49
22	Hesitates/Stumbles on acceleration	Flat spot occurs just after accelerator is depressed or mild jerking occurs during acceleration	F–50
23	Surges while cruising	Unexpected, usually repetitive change in engine speed	F–52
24	Lack of power	Performance poor under load Maximum speed reduced	F–54
25	Poor acceleration	Performance poor while accelerating	F–58
26	Runs rough on deceleration/Backfire	Engine runs rough while decelerating and abnormal combustion in exhaust system	F–62
27	Knocking	Abnormal combustion accompanied by audible "pinging" noise	F–64
28	Fuel odor	Gasoline odor in cabin	F–66
29	Exhaust sulfur smell	Exhaust gas smells abnormal (rotten egg smell)	F–67
30	High oil consumption	Oil consumption excessive	F–67
31	Poor fuel economy	Fuel economy unsatisfactory	F–68

95E0FX-008

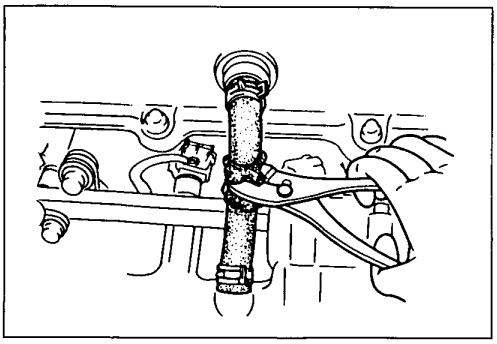
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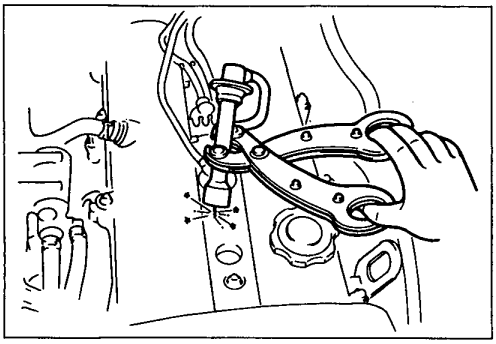
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05U0FX-235



05U0FX-018



05U0FX-236

PRECAUTION

Fuel Pressure Release and Servicing Fuel System

Fuel in the fuel system remains under high pressure even when the engine is not running.

a) Before disconnecting any fuel line, release the fuel pressure from the fuel system to reduce the possibility of injury or fire.
   1. Start the engine.
   2. Disconnect the circuit opening relay connector.
   3. After the engine stalls, turn off the ignition switch.
   4. Reconnect the circuit opening relay connector.

b) Use a rag as protection from fuel spray when disconnecting the hoses.
   Plug the hoses after removal.

c) When inspecting the fuel system, use a suitable fuel pressure gauge.

Caution

- **Install hose clamps when securing the fuel pressure gauge to the fuel pipe and the fuel main hose to prevent fuel leakage.**

Pinching Hose

When pinching an air hose or fuel hose with pliers, wrap the hose with a rag to prevent damage.

Checking ignition spark

When checking ignition spark condition, hold the high-tension lead with insulated pliers.

Note

- **If a timing light is used to check for spark, some lights do not light at Nos. 2 and 4 cylinders even if the ignition system is normal.**

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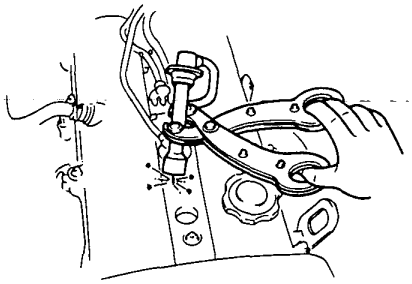
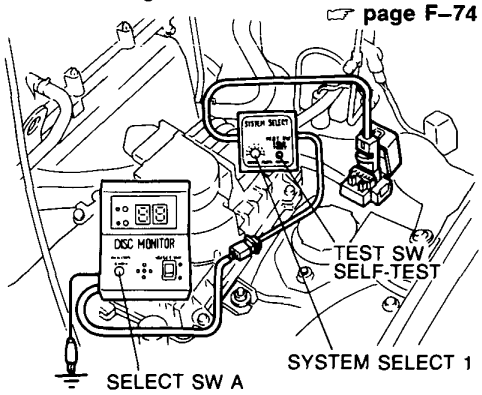
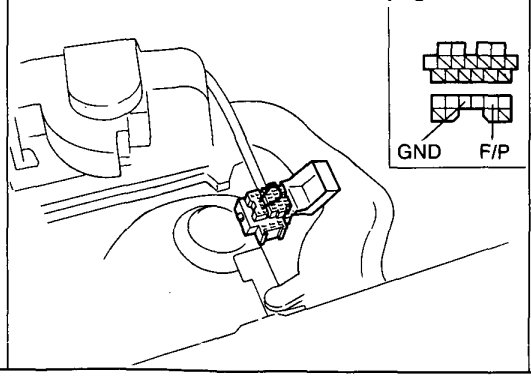
SYMPTOM TROUBLESHOOTING

2	CRANKS NORMALLY BUT WILL NOT START (NO COMBUSTION)
DESCRIPTION	• Engine cranks at normal speed but shows no sign of "firing" • Battery in normal condition • Throttle valve not held fully open while cranking • Fuel in tank

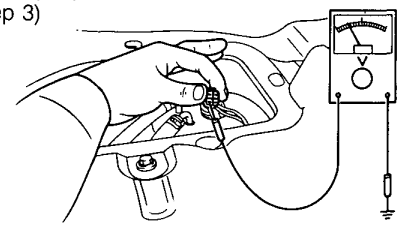
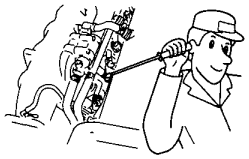
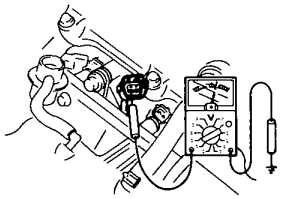
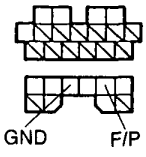
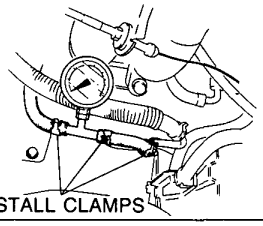
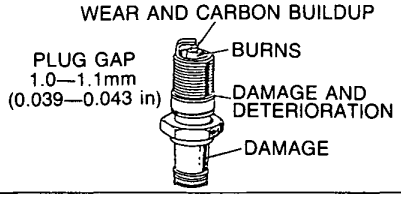
[TROUBLESHOOTING HINTS]
Because of no combustion, possibly no fuel is injected to engine or no ignition at all cylinders
① No spark
- Ignition control malfunction
- Ignition system component malfunction

② No fuel injection
- Fuel pump does not operate
- Injector does not operate

③ Low fuel line pressure
④ Low engine compression

STEP	INSPECTION		ACTION
1	Check if strong blue spark is visible at disconnected high-tension lead while cranking engine 	Yes	Go to Step 3
		No	Go to Step 2
2	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ **page F–74** 	Yes	Check ignition system (Refer to Troubleshooting "Misfire") ☞ **page G–18**
		No	**Malfunction Code No. displayed** Check for cause (Refer to specified check sequence) ☞ **page F–77** **"88" flashes** Check ECU terminal 1F voltage ☞ **page F–124** **Voltage: Approx. 12V (Ignition switch ON)** ⇨ If OK, replace ECU ☞ **page F–123** ⇨ If not OK, check wiring between ECU and Self-Diagnosis Checker ☞ **page F–8**
3	Connect diagnosis connector terminals F/P and GND with jumper wire and check for fuel pump operating sound with ignition switch ON ☞ **page F–104** 	Yes	Check if engine starts in this condition ⇨ If starts, check circuit opening relay ☞ **page F–107** ⇨ If does not start, go to Step 5
		No	Go to Step 4

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STEP	INSPECTION		ACTION
4	Check if approx. 12V exists at fuel pump connector (L/R) wire with jumper wire connected (Step 3) 	Yes	Check continuity of fuel pump ☞ **page F–104**
		No	Check circuit opening relay ☞ **page F–107**
5	Check for injector operating sound while cranking engine 	Yes	Go to Step 7
		No	Go to Step 6
6	Check if approx. 12V exists at injector connector (W/R) wire with ignition switch ON 	Yes	Check ECU terminals 2A, 2U and 2V voltages ☞ **page F–125**
		No	Check for open circuit in wiring between main relay and injector ☞ **page F–8**
7	Connect diagnosis connector terminals F/P and GND with jumper wire and check for correct fuel line pressure with ignition switch ON ☞ **page F–100** **Fuel Line pressure: 265—314 kPa (2.7—3.2 kg/cm², 38—46 psi)**  	Yes	Go to next step
		No	**Low pressure** Check fuel line pressure while pinching fuel return hose ⇨ If fuel line pressure quickly increases, check pressure regulator ☞ **page F–108** ⇨ If fuel line pressure gradually increases, check for clogging between fuel pump and pressure regulator If not clogged, check fuel pump maximum pressure ☞ **page F–105**
8	Check for correct engine compression ☞ **page B–10** **Engine compression: 1,324—932 kPa (13.5—9.5 kg/cm², 192—135 psi) - 300 rpm**	Yes	Go to next step
		No	Check engine condition ☞ **page B–10** • Worn piston, piston rings or cylinder wall • Defective cylinder head gasket • Distorted cylinder head • Improper valve seating • Valve sticking in guide
9	Check if spark plugs are OK 	Yes	Go to next step
		No	Repair, clean, or replace ☞ **page G–20**
10	Try known good ECU and check if condition improves ☞ **page F–123**		

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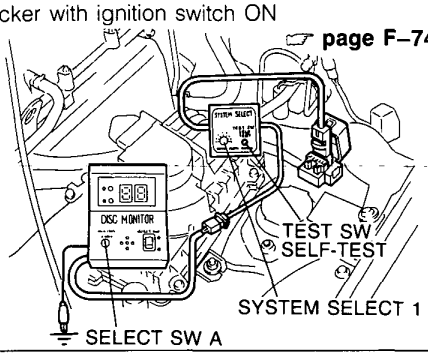
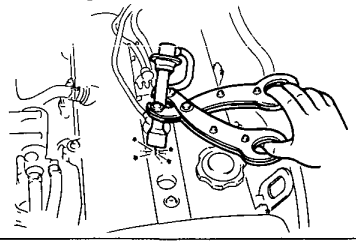
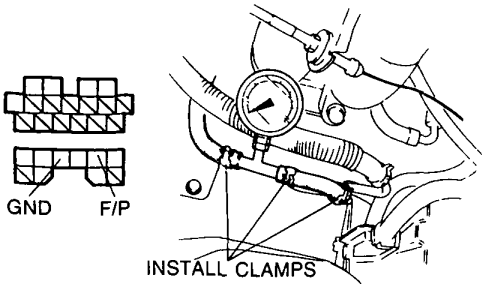
3	CRANKS NORMALLY BUT WILL NOT START (PARTIAL COMBUSTION) — WHEN ENGINE IS COLD
DESCRIPTION	• Engine cranks at normal speed but shows partial combustion and will not continue to run • Battery in normal condition • Fuel in tank

[TROUBLESHOOTING HINTS]

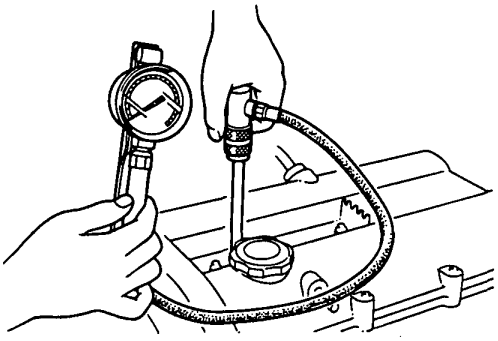
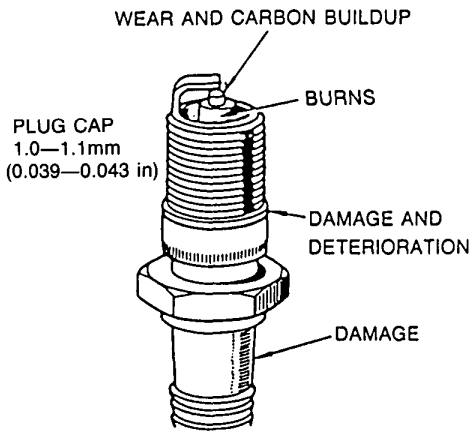
① Air/Fuel mixture too rich
- Air cleaner element clogged
- Airflow meter stuck

② Air/Fuel mixture too lean
- Fuel injection control malfunction (Correction for coolant temperature)
- Low fuel line pressure
- Air leakage of intake air system

③ Low engine compression

STEP	INSPECTION		ACTION
1	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ **page F–74** 	Yes	Go to next step
		No	**Malfunction Code No. displayed** Check for cause (Refer to specified check sequence) ☞ **page F–77**
			"88" flashes Check ECU terminal 1F voltage ☞ **page F–124** **Voltage: Approx. 12V (Ignition switch ON)** ⇨ If OK, replace ECU ☞ **page F–123** ⇨ If not OK, check wiring between ECU and Self-Diagnosis Checker ☞ **page F–8**
2	Check if strong blue spark is visible at each disconnected high-tension lead while cranking engine 	Yes	Go to next step
		No	Check ignition system (Refer to Troubleshooting "Misfire") ☞ **page G–18**
3	Connect diagnosis connector terminal F/P and GND with jumper wire and check for correct fuel line pressure with ignition switch ON ☞ **page F–100** **Fuel line pressure: 265—314 kPa (2.7—3.2 kg/cm², 38—46 psi)** 	Yes	Go to next step
		No	**Low pressure** Check fuel line pressure while pinching fuel return hose ⇨ If fuel line pressure quickly increases, check pressure regulator ☞ **page F–108** ⇨ If fuel line pressure gradually increases, check for clogging between fuel pump and pressure regulator If not clogged, check fuel pump maximum pressure ☞ **page F–105**
			High pressure Check if fuel return hose is clogged or restricted ⇨ If OK, replace pressure regulator ☞ **page F–109** ⇨ If not OK, repair or replace
4	Check if ECU terminal voltages are OK (2D, 2O and 2Q) ☞ **page F–126**	Yes	Go to next step
		No	Check for cause (Refer to "Check Point for Each Terminal") ☞ **page F–126**

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STEP	INSPECTION		ACTION
5	Check for air leakage of intake air system ☞ **page F–90**	Yes	Repair or replace
		No	Go to nest step
6	Check if airflow meter vane moves smoothly	Yes	Go to nest step
		No	Repair or replace ☞ **page F–89**
7	Check for correct engine compression ☞ **page B–10** **Engine compression: 1,324—932 kPa (13.5—9.5 kg/cm², 192—135 psi) - 300 rpm** 	Yes	Go to next step
		No	Check engine condition ☞ **page B–10** • Worn piston, piston rings or cylinder wall • Defective cylinder head gasket • Distorted cylinder head • Improper valve seating • Valve sticking in guide
8	Check if spark plugs are OK 	Yes	Go to next step
		No	Repair, clean, or replace ☞ **page G–20**
9	Try known good ECU and check if condition improves ☞ **page F–123**		

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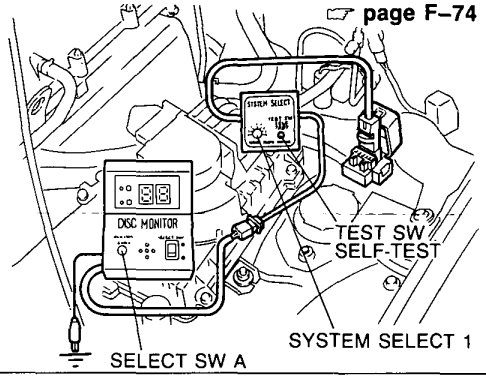
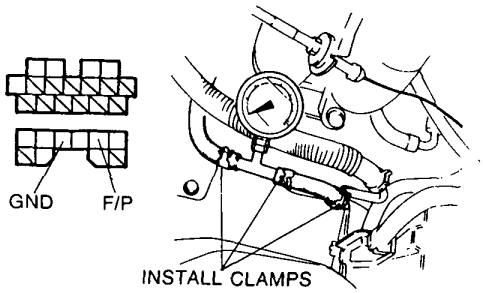
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4	CRANKS NORMALLY BUT WILL NOT START (PARTIAL COMBUSTION) — AFTER WARM-UP
DESCRIPTION	• Engine cranks at normal speed but shows partial combustion and will not continue to run after running and hot soaked • Battery in normal condition • Engine starts normally when cold

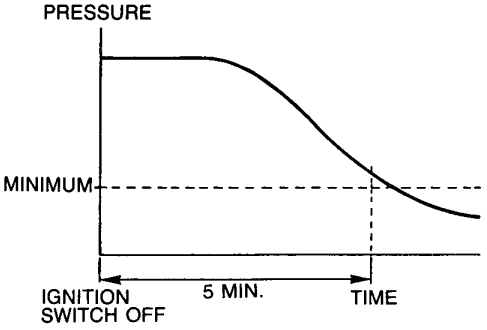
[TROUBLESHOOTING HINTS]

① Air/Fuel mixture too rich
- Fuel injection control malfunction (Correction for coolant temperature)
- Injector fuel leakage

② Vapor lock
- Fuel pressure not held in fuel line after engine stops
- High RVP (winter) fuel used in warm weather

STEP	INSPECTION		ACTION
1	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ **page F–74**  	Yes	Go to next step
		No	**Malfunction Code No. displayed** Check for cause (Refer to specified check sequence) ☞ **page F–77** **"88" flashes** Check ECU terminal 1F voltage ☞ **page F–124** **Voltage: Approx. 12V (Ignition switch ON)** ⇨ If OK, replace ECU ☞ **page F–123** ⇨ If not OK, check wiring between ECU and Self-Diagnosis Checker ☞ **page F–8**
2	Check if ECU terminal voltages are OK (2D and 2Q) ☞ **page F–126**	Yes	Go to next step
		No	Check for cause (Refer to "Check Point for Each Terminal") ☞ **page F–128**
3	Connect diagnosis connector terminals F/P and GND with jumper wire and check for correct fuel line pressure with ignition switch ON ☞ **page F–100** **Fuel line pressure:** **265—314 kPa (2.7—3.2 kg/cm², 38—46 psi)**  	Yes	Go to next step
		No	**Low pressure** Check fuel line pressure while pinching fuel return hose ⇨ If fuel line pressure quickly increases, check pressure regulator ☞ **page F–108** ⇨ If fuel line pressure gradually increases, check fuel line and filter for clogging If not clogged, check fuel pump maximum pressure ☞ **page F–105** **High pressure** Check if fuel return hose is clogged or restricted ⇨ If OK, replace pressure regulator ☞ **page F–109** ⇨ If not OK, repair or replace hose

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STEP	INSPECTION		ACTION
4	With condition of step 3, check if fuel line pressure is held after ignition switch is turned OFF ☞ **page F–99** **Fuel line pressure: More than 147 kPa (1.5 kg/cm², 21 psi) for 5 min.**  	Yes	Go to Step 6
		No	Go to Step 5
5	Check if fuel line pressure is held after ignition switch is turned OFF and blocking outlet of pressure regulator ☞ **page F–108** **Fuel line pressure: More than 147 kPa (1.5 kg/cm², 21 psi) for 5 min.**	Yes	Replace pressure regulator ☞ **page F–109**
		No	Check fuel pump hold pressure ☞ **page F–104** ⇨ If OK, check injector for fuel leakage ☞ **page F–110** ⇨ If not OK, replace fuel pump ☞ **page F–105**
6	Try known good ECU and check if condition improves ☞ **page F–123**	Yes	Replace ECU
		No	Change fuel to another brand

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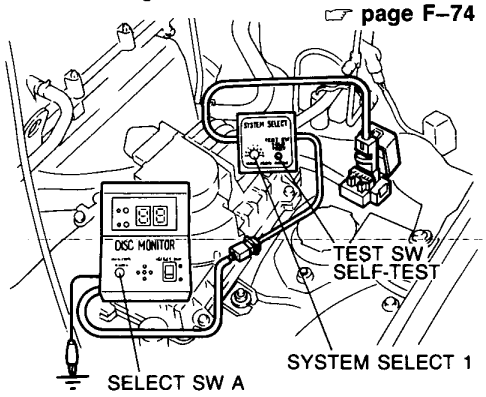
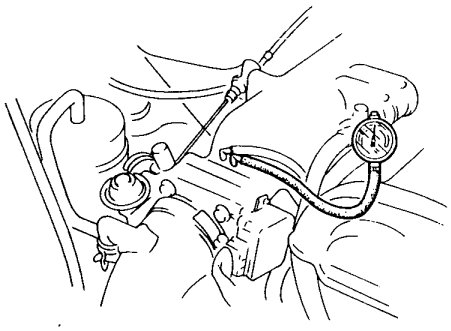
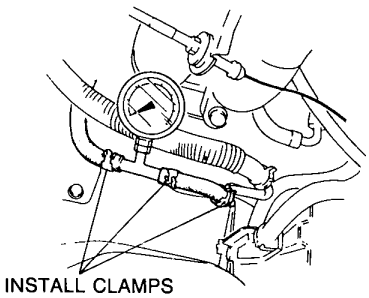
5	CRANKS NORMALLY BUT HARD TO START — ALWAYS
DESCRIPTION	• Engine cranks at normal speed but requires excessive cranking time (more than 5 sec.) before starting • Battery in normal condition

[TROUBLESHOOTING HINTS]

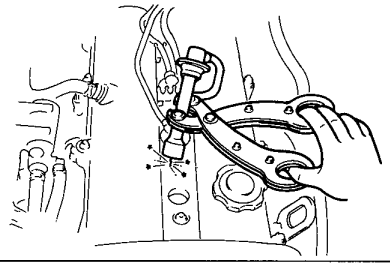
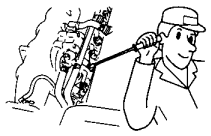
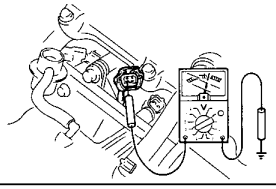
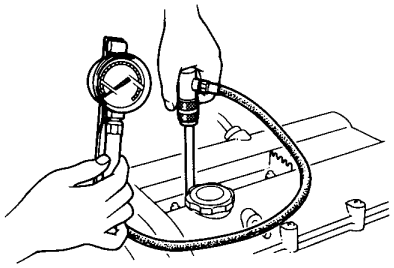
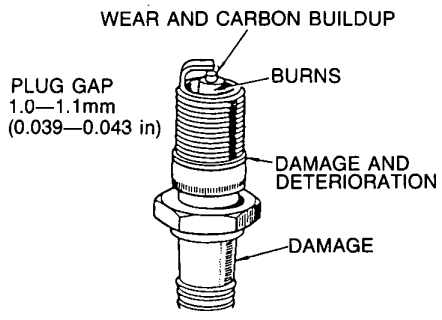
① Air/Fuel mixture too lean
- Fuel injection control malfunction (Correction for coolant temperature)
- Low fuel line pressure
- Air leakage

② Air/Fuel mixture too rich
- Air cleaner element clogged
- Airflow meter stuck

③ Poor ignition spark

STEP	INSPECTION		ACTION
1	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ **page F–74**  	Yes	Go to next step
		No	**Malfunction Code No. displayed** Check for cause (Refer to specified check sequence) ☞ **page F–77**
			"88" flashes Check ECU terminal 1F voltage ☞ **page F–124** **Voltage: Approx. 12V (Ignition switch ON)** ⇨ If OK, replace ECU ☞ **page F–123** ⇨ If not OK, check wiring between ECU and Self-Diagnosis Checker ☞ **page F–8**
2	Check for correct intake manifold vacuum at idle **Vacuum: More than 450 mmHg (17.7 inHg)** 	Yes	Go to next step
		No	Check for air leakage of intake air system components ☞ **page F–90**
3	Check if air cleaner element is clean ☞ **page F–71**	Yes	Go to next step
		No	Replace air cleaner element ☞ **page F–89**
4	Check for correct fuel line pressure at idle ☞ **page F–100** **Fuel line pressure: 265—314 kPa (2.7—3.2 kg/cm², 38—46 psi) (Vacuum hose to pressure regulator disconnected)**  	Yes	Go to next step
		No	**Low pressure** Check fuel line pressure while pinching fuel return hose ⇨ If fuel line pressure quickly increases, check pressure regulator ☞ **page F–108** ⇨ If fuel line pressure gradually increases, check for clogging between fuel pump and pressure regulator If not clogged, check fuel pump maximum pressure ☞ **page F–105**

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STEP	INSPECTION		ACTION
5	Check if ECU terminal voltages are OK (2D, 2O and 2Q) ☞ **page F–125**	Yes	Go to next step
		No	Check for cause (Refer to "Check Point for Each Terminal") ☞ **page F–128**
6	Check if strong blue spark is visible at each disconnected high-tension lead while cranking engine 	Yes	Go to next step
		No	Check ignition system (Refer to Troubleshooting "Misfire") ☞ **page G–18**
7	Check for injector operating sound at each injector at idle 	Yes	Go to Step 9
		No	Go to Step 8
8	Check if approx. 12V exists at injector connector (W/R) wire with ignition switch ON 	Yes	Check if injector resistance is OK ☞ **page F–109** **Resistance: Approx. 14Ω** ⇨ If OK, check wiring between injector and ECU ☞ **page F–8** ⇨ If not OK, replace injector ☞ **page F–109**
		No	Check wiring between main relay and injector ☞ **page F–8**
9	Check for correct engine compression ☞ **page B–10** **Engine compression: 1,324—932 kPa (13.5—9.5 kg/cm², 192—135 psi) - 300 rpm** 	Yes	Go to next step
		No	Check engine condition ☞ **page B–10** • Worn piston, piston rings or cylinder wall • Defective cylinder head gasket • Distorted cylinder head • Improper valve seating • Valve sticking in guide
10	Check if spark plugs are OK 	Yes	Go to next step
		No	Repair, clean, or replace ☞ **page G–20**
11	Try known good ECU and check if condition improves ☞ **page F–123**		

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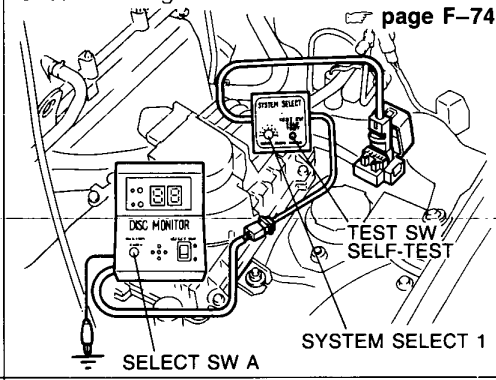
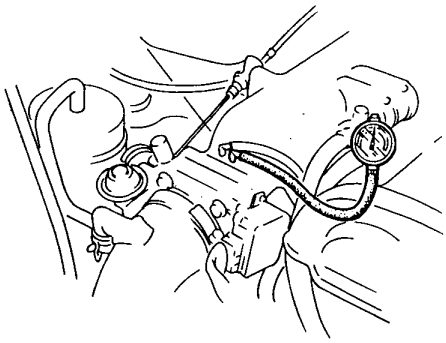
6	CRANKS NORMALLY BUT HARD TO START — WHEN ENGINE IS COLD
DESCRIPTION	• Engine cranks at normal speed but requires excessive cranking time before starting • Battery in normal condition • Restarts OK after warm-up

[TROUBLESHOOTING HINTS]

① Air/Fuel mixture too rich
- Airflow meter stuck
- Air cleaner element clogged
- Idle speed control malfunction

② Air/Fuel mixture too lean
- Fuel injection control malfunction (Correction for coolant temperature)

③ Poor atomization of fuel
- Low RVP (summer) fuel used in cold weather

STEP	INSPECTION		ACTION
1	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ **page F–74** 	Yes	Go to next step
		No	**Malfunction Code No. displayed** Check for cause (Refer to specified check sequence) ☞ **page F–77**
			"88" flashes Check ECU terminal 1F voltage ☞ **page F–124** **Voltage: Approx. 12V (Ignition switch ON)** ⇨ If OK, replace ECU ☞ **page F–123** ⇨ If not OK, check wiring between ECU and Self-Diagnosis Checker ☞ **page F–8**
2	Check if ECU terminal voltages are OK (1C, 2D, 2O and 2Q) ☞ **page F–124**	Yes	Go to next step
		No	Check for cause (Refer to "Check Point for Each Terminal") ☞ **page F–127**
3	Check if engine starts easily when depressing accelerator while cranking	Yes	Check if ISC valve is OK ☞ **page F–96** ⇨ If OK, check air valve ☞ **page F–96** ⇨ If not OK, replace ISC valve ☞ **page F–96**
		No	Go to next step
4	Check for correct intake manifold vacuum at idle **Vacuum: More than 450 mmHg (17.7 inHg)** 	Yes	Go to next step
		No	Check for air leakage of intake air system components ☞ **page F–90**
5	Check if air cleanerr element is clean ☞ **page F–71**	Yes	Go to next step
		No	Replace air cleaner element ☞ **page F–89**
6	Try known good ECU and check if condition improves ☞ **page F–123**	Yes	Replace ECU
		No	Change fuel to another brand

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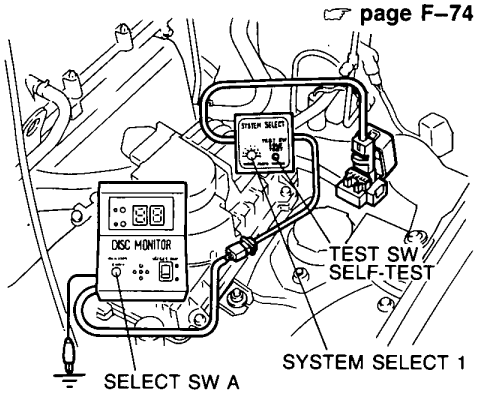
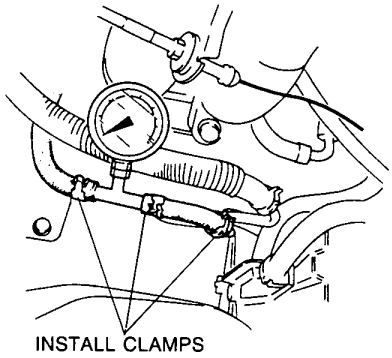
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7	CRANKS NORMALLY BUT HARD TO START — AFTER WARM-UP
DESCRIPTION	• Engine cranks at normal speed but requires excessive cranking time (more than 5 sec.) before starting after running and hot soaked • Battery in normal condition • Engine starts normally when cold

[TROUBLESHOOTING HINTS]

① Air/Fuel mixture too rich
- Fuel injection control malfunction
- Injector fuel leakage

② Vapor lock
- Fuel pressure not held in fuel line after engine stops
- High RVP (winter) fuel used in warm weather

STEP	INSPECTION		ACTION
1	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ **page F–74**  	Yes	Go to next step
		No	**Malfunction Code No. displayed** Check for cause (Refer to specified check sequence) ☞ **page F–77** **"88" flashes** Check ECU terminal 1F voltage ☞ **page F–124** **Voltage: Approx. 12V (Ignition switch ON)** ⇨ If OK, replace ECU ☞ **page F–123** ⇨ If not OK, check wiring between ECU and Self-Diagnosis Checker ☞ **page F–8**
2	Check if ECU terminal voltages are OK (2D and 2Q) ☞ **page F–125**	Yes	Go to next step
		No	Check for cause (Refer to "Check Point for Each Terminal") ☞ **page F–128**
3	Run engine at idle and check if fuel line pressure is held after ignition switch turned OFF ☞ **page F–99** **Fuel line pressure: More than 147 kPa (1.5 kg/cm², 21 psi) for 5 min.**  	Yes	Go to next step
		No	Block outlet of pressure regulator and check if fuel line pressure is held after ignition switch turned OFF ☞ **page F–108** ⇨ If OK, replace pressure regulator ☞ **page F–109** ⇨ If not OK, check fuel pump hold pressure ☞ **page F–104** If fuel pump is OK, check injector for fuel leakage ☞ **page F–110**
4	Try known good ECU and check if condition improves ☞ **page F–123**	Yes	Replace ECU
		No	Change fuel to another brand

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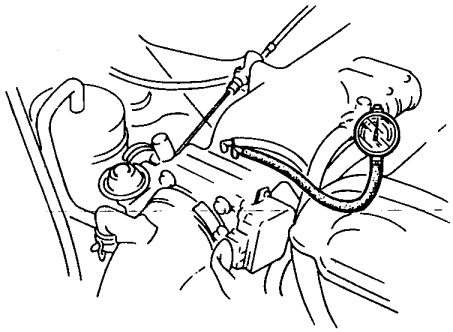
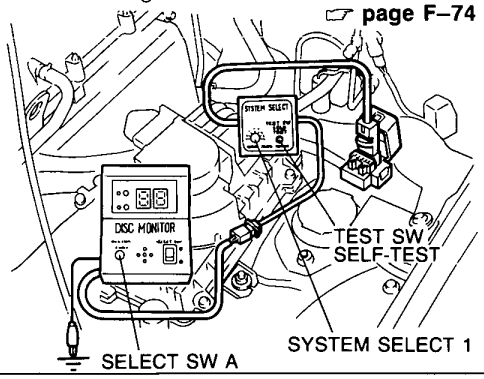
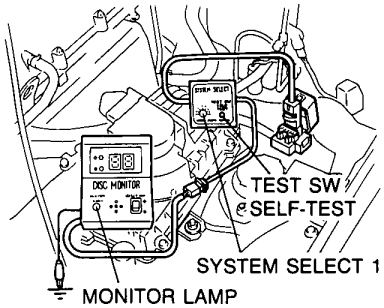
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8	ROUGH IDLE — ALWAYS
DESCRIPTION	• Engine vibrates excessively at idle in every condition

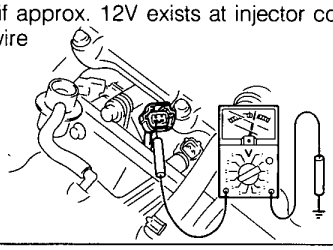
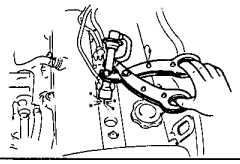
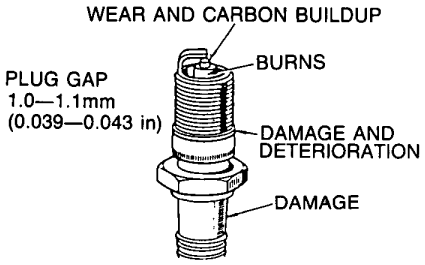
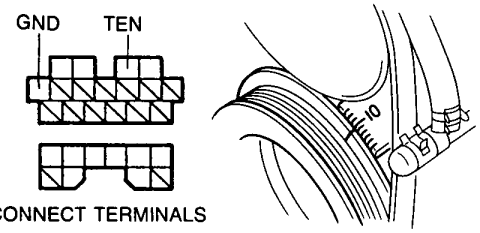
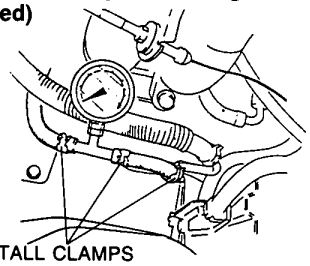
[TROUBLESHOOTING HINTS]

① Air/fuel mixture too lean
- Air leakage
- Fuel injection control malfunction
- Low fuel line pressure

② One or more injectors not operating or clogged
③ One or more spark plugs not sparking
④ Injection timing misadjustment
⑤ Low engine compression

STEP	INSPECTION		ACTION
1	Check for correct intake manifold vacuum at idle **Vacuum: More than 450 mmHg (17.7 inHg)** 	Yes	Go to next step
		No	Check for air leakage of intake air system components ☞ **page F–90**
2	Check if air cleaner element is clean ☞ **page F–71**	Yes	Go to next step
		No	Replace air cleaner element ☞ **page F–89**
3	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ **page F–74** 	Yes	Go to next step
		No	**Malfunction Code No. displayed** Check for cause (Refer to specified check sequence) ☞ **page F–77** **"88" flashes** Check ECU terminal 1F voltage ☞ **page F–124** **Voltage: Approx. 12V (Ignition switch ON)** ⇨ If OK, replace ECU ☞ **page F–123** ⇨ If not OK, check wiring between ECU and Self-Diagnosis Checker ☞ **page F–8**
4	Check switches for correct operation with Self-Diagnosis Checker Monitor Lamp and ignition switch ON ☞ **page F–86** 	Yes	Go to next step
		No	**Lamp not ON/OFF with specified switch** Check for cause (Refer to specified check sequence) ☞ **page F–77** **Lamp always ON** Check wiring between ECU terminal 1D and Self-Diagnosis Checker ☞ **page F–8**
5	Check if ECU terminal voltages are OK (2D, 2O and 2Q) ☞ **page F–126**	Yes	Go to next step
		No	Check for cause (Refer to "Check Point for Each Terminal") ☞ **page F–128**

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STEP	INSPECTION		ACTION
6	Check for injector operating sound at idle with sound scope or screwdriver	Yes	Go to Step 8
		No	Go to Step 7
7	Check if approx. 12V exists at injector connector (W/R) wire 	Yes	Check if injector resistance is OK ☞ **page F–109** **Resistance: Approx. 14Ω** ⇨ If OK, check wiring between ECU and injector ☞ **page F–8** ⇨ If not OK, replace injector ☞ **page F–109**
		No	Check wiring between ECU and injector ☞ **page F–8**
8	Disconnect each high-tension lead at idle and check if engine speed decreases equally each time 	Yes	Disconnect each injector connector at idle and check if engine speed decreases equally each time ⇨ If OK, go to Step 10 ⇨ If not OK, check injector for fuel leakage ☞ **page F–110**
		No	Go to step 9
9	Check if spark plugs are OK 	Yes	Check for correct engine compression ☞ **page B–10** ⇨ If OK, replace injector ☞ **page F–109** ⇨ If not OK, check for cause (Refer to Section B) ☞ **page B–10**
		No	Repair, clear, or replace ☞ **page G–20**
10	Check for correct ignition timing at idle ☞ **page F–72** **Ignition timing: 10° ± 1° BTDC** 	Yes	Check for correct idle speed ☞ **page F–72** **Idle speed: 850 ± 50 rpm** ⇨ If OK, go to next step ⇨ If not OK, adjust idle speed ☞ **page F–72**
		No	Adjust ☞ **page F–72**
11	Check for correct fuel line pressure at idle ☞ **page F–100** **Fuel line pressure:** **265—314 kPa (2.7—3.2 kg/cm², 38—48 psi)** **(Vacuum hose to pressure regulator disconnected)** 	Yes	Go to next step
		No	**Low pressure** Check fuel line pressure while pinching fuel return hose ⇨ If fuel line pressure quickly increases, check pressure regulator ☞ **page F–108** ⇨ If fuel line pressure gradually increases, check for clogging between fuel pump and pressure regulator If not clogged, check fuel pump maximum pressure ☞ **page F–107**
12	Try known good ECU and check if condition improves ☞ **page F–123**		

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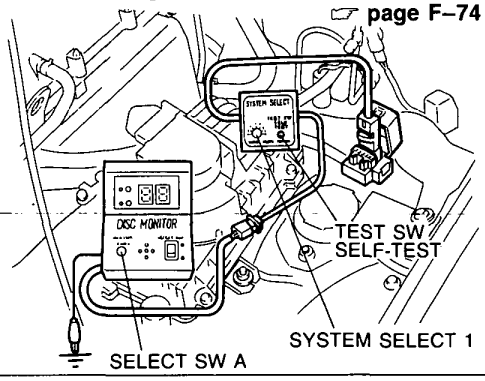
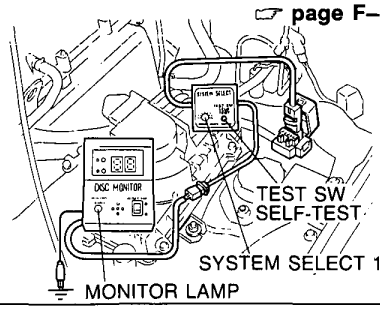
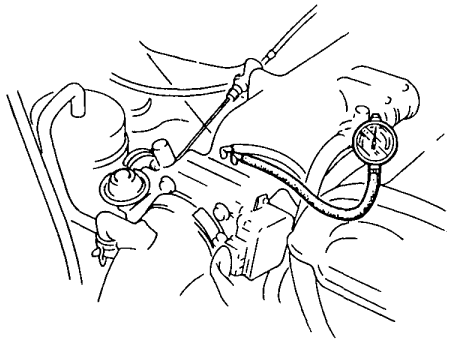
9	LOW IDLE SPEED/ROUGH IDLE — BEFORE WARM-UP
DESCRIPTION	• Engine speed low or engine vibrates excessively at idle during warm-up

[TROUBLESHOOTING HINTS]

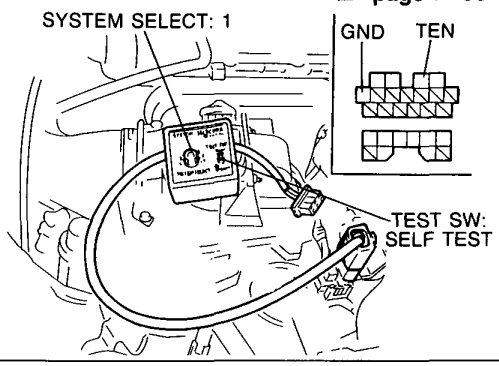
① Low intake air amount
- Airflow meter stuck
- Air cleaner element clogged
- Idle speed control
  - [Air valve
  - [Correction for coolant temperature]

② Low fuel injection amount
- Fuel injection control malfunction (Correction for coolant temperature)

③ Poor atomization of fuel
- Low RVP (summer) fuel used in cold weather

STEP	INSPECTION		ACTION
1	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ **page F–74** 	Yes	Go to next step
		No	**Malfunction Code No. displayed** Check for cause (Refer to specified check sequence) ☞ **page F–77**
			"88" flashes Check ECU terminal 1F voltage ☞ **page F–124** **Voltage: Approx. 12V (Ignition switch ON)** ⇨ If OK, replace ECU ☞ **page F–123** ⇨ If not OK, check wiring between ECU and Self-Diagnosis Checker ☞ **page F–8**
2	Check switches for correct operation with Self-Diagnosis Checker Monitor Lamp and ignition switch ON ☞ **page F–86** 	Yes	Go to next step
		No	**Lamp not ON/OFF with specified switch** Check for cause (Refer to specified check sequence) ☞ **page F–87**
			Lamp always ON Check wiring between ECU terminal 1D and Self-Diagnosis Checker ☞ **page F–8**
3	Check if ECU terminal voltages are OK (2D, 2O and 2Q) ☞ **page F–125**	Yes	Go to next step
		No	Check for cause (Refer to "Check Point for Each Terminal") ☞ **page F–128**
4	Check for correct intake manifold vacuum at idle **Vacuum: More than 450 mmHg (17.7 inHg)** 	Yes	Go to next step
		No	Check for air leakage of intake air system components ☞ **page F–90**
5	Check if air cleaner element is clean ☞ **page F–71**	Yes	Go next step
		No	Replace air cleaner element ☞ **page F–89**

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STEP	INSPECTION		ACTION
6	Connect System Selector to diagnosis connector and set it to position 1 and SELF TEST when engine is cold Check if engine speed decreases as engine warms up ☞ **page F–95**  	Yes	Go to next step
		No	Check air valve ☞ **page F–96**
7	With condition of Step 5 check for correct ignition timing at idle after warm-up ☞ **page F–71** **Ignition timing: 10° ± 1° BTDC**	Yes	Go to next step
		No	Adjust ☞ **page F–71**
8	Try known good ECU and check if condition improves ☞ **page F–123**	Yes	Replace ECU ☞ **page F–123**
		No	Change fuel to another brand

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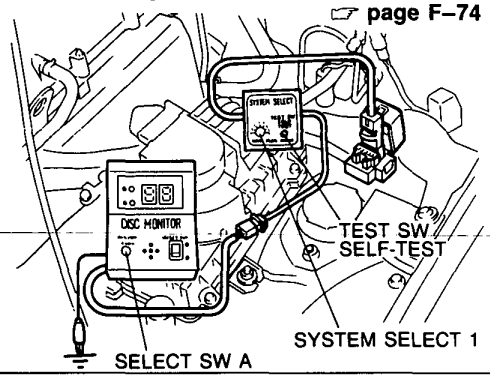
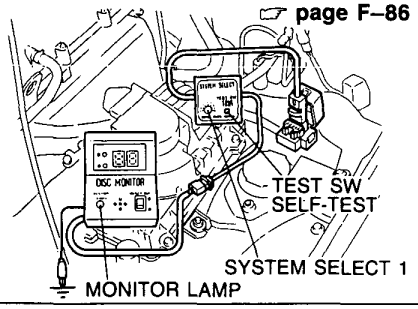
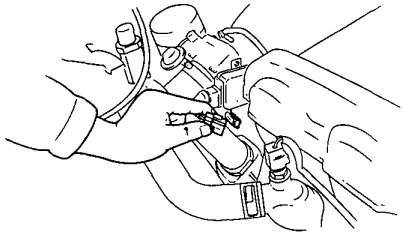
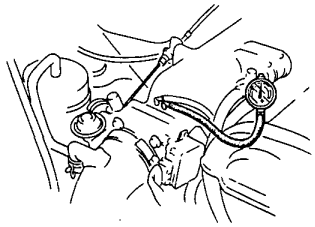
10	LOW IDLE SPEED/ROUGH IDLE — AFTER WARM-UP
DESCRIPTION	• Engine runs normally at idle during warm-up but vibrates excessively after warm-up

[TROUBLESHOOTING HINTS]

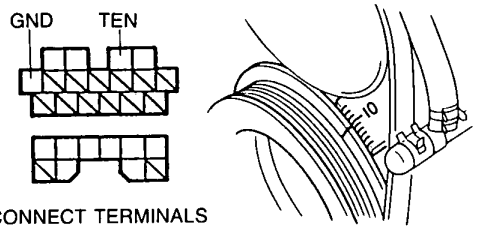
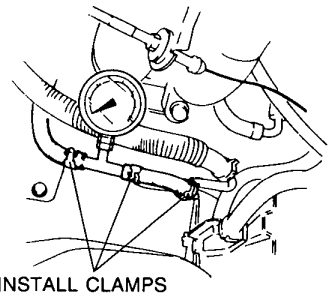
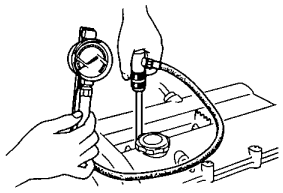
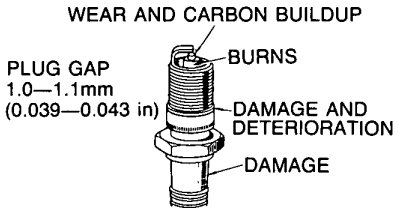
① Idle speed control malfunction
② Air/Fuel mixture too lean
- Air leakage of intake air system
- Low fuel line pressure

③ Air/Fuel mixture too rich
- Fuel injection control malfunction (Correction for coolant temperature)

④ Poor ignition spark
⑤ Low engine compression

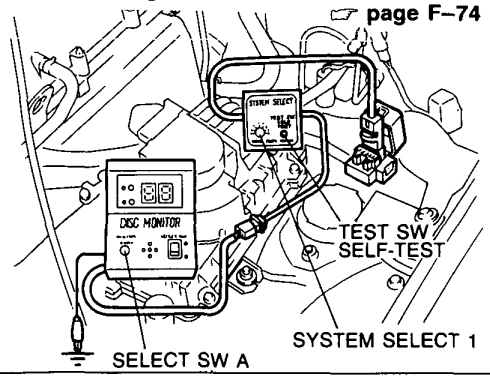
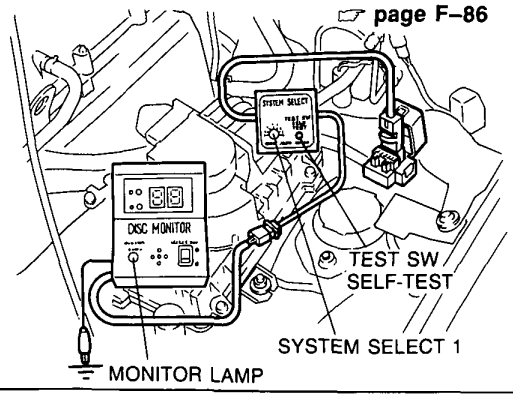
STEP	INSPECTION		ACTION
1	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ page F–74 	Yes	Go to next step
		No	**Malfunction Code No. displayed** Check for cause (Refer to specified check sequence) ☞ page F–77
			"88" flashes Check ECU terminal 1F voltage ☞ page F–124 **Voltage: Approx. 12V (Ignition switch ON)** ⇨ If OK, replace ECU ☞ page F–123 ⇨ If not OK, check wiring between ECU and Self-Diagnosis Checker ☞ page F–8
2	Check switches for correct operation with Self-Diagnosis Checker Monitor Lamp and ignition switch ON ☞ page F–86 	Yes	Go to next step
		No	**Lamp not ON/OFF with specified switch** Check for cause (Refer to specified check sequence) ☞ page F–87
			Lamp always ON Check wiring between ECU terminal 1D and Self-Diagnosis Checker ☞ page F–8
3	Disconnect ISC valve connector at idle and check if "clicking" is heard from ISC valve 	Yes	Go to next step
		No	Replace ISC valve ☞ page F–96
4	Check for correct intake manifold vacuum at idle **Vacuum: More than 450 mmHg (17.7 inHg)** 	Yes	Go to next step
		No	**Low vacuum** Check for air leakage of intake air system components ☞ page F–90

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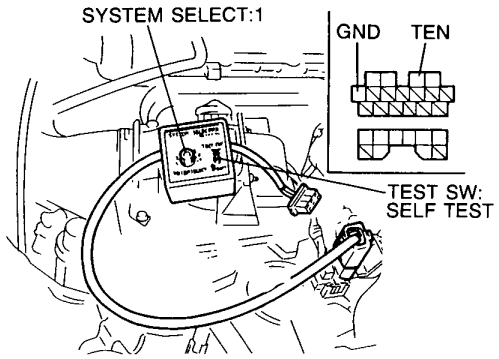
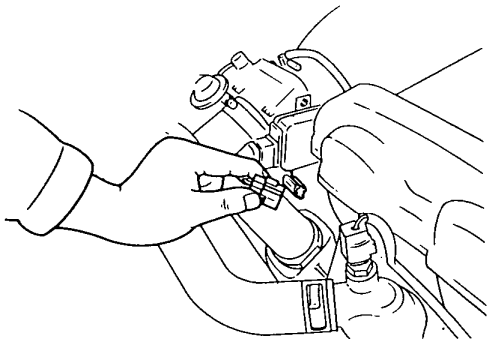
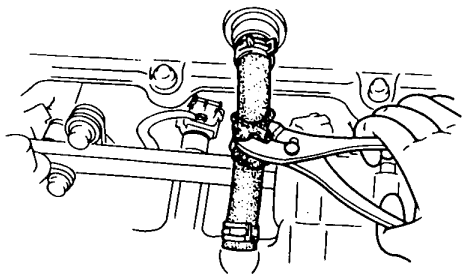
STEP	INSPECTION		ACTION
5	Check if ECU terminal voltages are OK (2D, 2O and 2Q) ☞ **page F–124**	Yes	Go to next step
		No	Check for cause (Refer to "Check Point for Each Terminal") ☞ **page F–128**
6	Check for correct ignition timing at idle ☞ **page F–71** **Ignition timing: 10° ± 1° BTDC** 	Yes	Check for correct idle speed ☞ **page F–72** **Idle speed: 850 ± 50 rpm** ⇨ If OK, go to next step ⇨ If not OK, adjust idle speed ☞ **page F–72**
		No	Adjust ☞ **page F–71**
7	Check for correct fuel line pressure at idle ☞ **page F–100** **Fuel line pressure: 265—314 kPa (2.7—3.2 kg/cm², 38—46 psi) (Vacuum hose to pressure regulator disconnected)** 	Yes	Go to next step
		No	**Low pressure** Check fuel line pressure while pinching fuel return hose ⇨ If fuel line pressure quickly increases, check pressure regulator ☞ **page F–108** ⇨ If fuel line pressure gradually increases, check for clogging between fuel pump and pressure regulator If not clogged, check fuel pump maximum pressure ☞ **page F–105**
8	Check if strong blue spark is visible at each disconnected high-tension lead while cranking engine	Yes	Go to next step
		No	Check ignition system (Refer to Troubleshooting "Misfire") ☞ **page G–18**
9	Check for correct engine compression ☞ **page B–10** **Engine compression: 1,324—932 kPa (13.5—9.5 kg/cm², 192—135) - 300 rpm** 	Yes	Go to next step
		No	Check engine condition ☞ **page B–10** • Worn piston, piston rings or cylinder wall • Defective cylinder head gasket • Distorted cylinder head • Improper valve seating • Valve sticking in guide
10	Check if spark plugs are OK 	Yes	Go to next step
		No	Repair, clear, or replace ☞ **page G–20**
11	Try known good ECU and check if condition improves ☞ **page F–123**		

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11	HIGH IDLE SPEED — AFTER WARM-UP		
[TROUBLESHOOTING HINTS] Excessive intake air supplied to engine ① Throttle valve not fully closed ② Idle speed control malfunction • Air valve not closing • ISC valve stuck • Incorrect coolant temperature signal			
STEP	**INSPECTION**		**ACTION**
1	Check if throttle valve is fully closed when accelerator released	Yes	Go to Step 3
		No	Check if throttle linkage is correctly installed and operates freely ☞ **page F–93** ⇨ If OK, go to Step 2 ⇨ If not OK, clean, adjust or replace linkage ☞ **page F–93**
2	Check if dashpot is correctly adjusted ☞ **page F–118** **Dashpot set speed: 2,500 ± 150 rpm**	Yes	Check if throttle valve is contaminated ⇨ If contaminated, clean throttle body ☞ **page F–91** ⇨ If not contaminated, replace throttle body ☞ **page F–91**
		No	Adjust ☞ **page F–118**
3	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ **page F–74** 	Yes	Go to next step
		No	**Malfunction Code No. displayed** Check for cause (Refer to specified check sequence) ☞ **page F–77** **"88" flashes** Check ECU terminal 1F voltage ☞ **page F–124** **Voltage: Approx. 12V (Ignition switch ON)** ⇨ If OK, replace ECU ☞ **page F–123** ⇨ If not OK, check wiring between ECU and Self-Diagnosis Checker ☞ **page F–8**
4	Check switches for correct operation with Self-Diagnosis Checker Monitor Lamp and ignition switch ON ☞ **page F–86** 	Yes	Go to next step
		No	**Lamp not ON/OFF with specified switch** Check for cause (Refer to specified check sequence) ☞ **page F–87** **Lamp always ON** Check wiring between ECU terminal 1D and Self-Diagnosis Checker ☞ **page F–8**

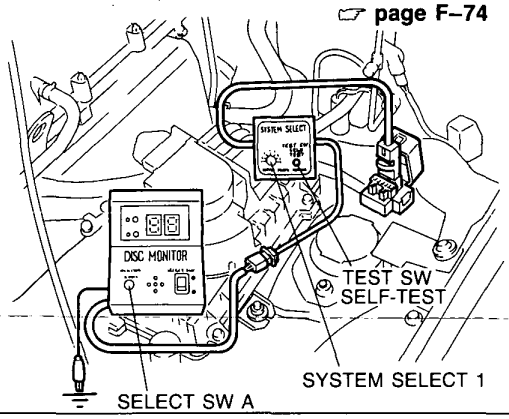
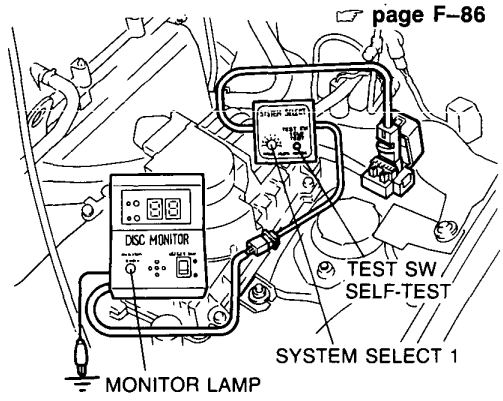
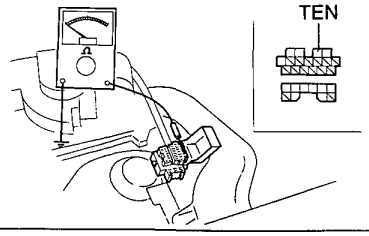
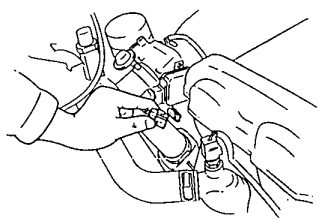
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STEP	INSPECTION		ACTION
5	Connect System Selector to diagnosis connector and set it to position 1 and SELF TEST when engine is cold Check if engine speed decreases as engine warms up 	Yes	Go to next step
		No	Check air valve ☞ **page F–96**
6	Disconnect ISC valve connector at idle and check if "clicking" is heard from ISC valve 	Yes	Go to next step
		No	Check ISC valve ☞ **page F–96**
7	Pinch PCV hose with pliers and check if engine speed decreases 	Yes	Check PCV valve ☞ **page F–114**
		No	Go to next step
8	Check if ECU terminal voltages are OK (2D, 2O and 2Q) ☞ **page F–125**	Yes	Try known good ECU ☞ **page F–123**
		No	Check for cause (Refer to "Check Point for Each Terminal") ☞ **page F–128**

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12	LOW IDLE SPEED — WHEN P/S, OR E/L ON
DESCRIPTION	• Engine speed decreases at idle when P/S, or E/L ON • P/S, headlights, blower fan and electric cooling fan operate normally
[TROUBLESHOOTING HINTS]	• Idle speed control malfunction • ISC valve stuck • Engine speed feedback control malfunction

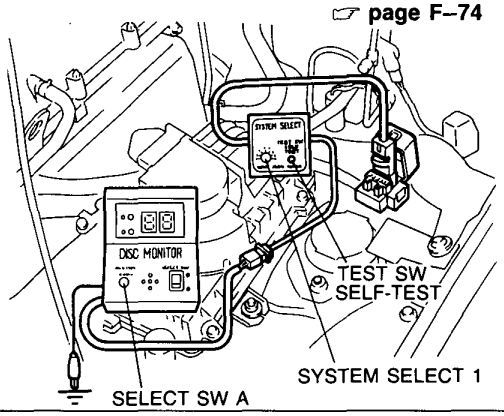
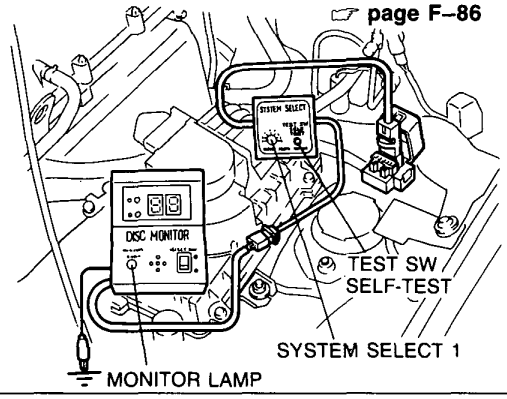
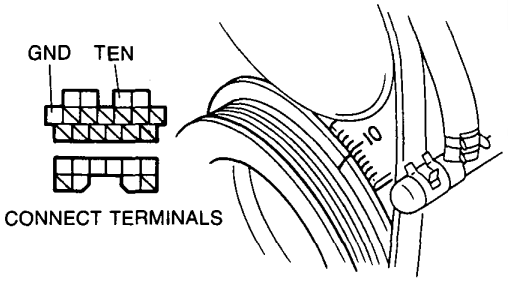
STEP	INSPECTION		ACTION
1	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ page F–74 	Yes	Go to next step
		No	**Malfunction Code No. displayed** Check for cause (Refer to specified check sequence) ☞ page F–77
			"88" flashes Check ECU terminal 1F voltage ☞ page F–124 **Voltage: Approx. 12V (Ignition switch ON)** ⇨ If OK, replace ECU ☞ page F–123 ⇨ If not OK, check wiring between ECU and Self-Diagnosis Checker ☞ page F–8
2	Check switches for correct operation with Self-Diagnosis Checker Monitor Lamp and ignition switch ON ☞ page F–86 	Yes	Go to next step
		No	**Lamp not ON/OFF with specified switch** Check for cause (Refer to specified check sequence) ☞ page F–87
			Lamp always ON Check wiring between ECU terminal 1D and Self-Diagnosis Checker ☞ page F–8
3	Check if continuity exists between diagnosis connector terminal TEN and ground 	Yes	Check for short circuit in wiring between diagnosis connector terminal TEN and ground ☞ page F–8
		No	Go to next step
4	Disconnect ISC valve connector at idle and check if "clicking" is heard from ISC valve 	Yes	Try known good ECU ☞ page F–123
		No	Replace ISC valve ☞ page F–96

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13	ROUGH IDLE JUST AFTER STARTING
DESCRIPTION	• Engine starts normally but vibrates excessively just after starting

[TROUBLESHOOTING HINTS]
① Fuel injection control and idle speed control malfunction
• Start signal not input to ECU
② Idle speed misadjustment
③ Ignition timing misadjustment

STEP	INSPECTION		ACTION
1	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ page F–74 	Yes	Go to next step
		No	**Malfunction Code No. displayed** Check for cause (Refer to specified check sequence) ☞ page F–77
			"88" flashes Check ECU terminal 1F voltage ☞ page F–124 **Voltage: Approx. 12V (Ignition switch ON)** ⇨ If OK, replace ECU ☞ page F–123 ⇨ If not OK, check wiring between ECU and Self-Diagnosis Checker ☞ page F–8
2	Check switches for correct operation with Self-Diagnosis Checker Monitor Lamp and ignition switch ON ☞ page F–86 	Yes	Go to next step
		No	**Lamp not ON/OFF with specified switch** Check for cause (Refer to specified check sequence) ☞ page F–87
			Lamp always ON Check wiring between ECU terminal 1D and Self-Diagnosis Checker ☞ page F–8
3	Check if ECU terminal 1C voltage is OK ☞ page F–124 **Voltage: Approx. 10V (While cranking)**	Yes	Go to next step
		No	Check for cause (Refer to "Check Point for Each Terminal") ☞ page F–127
4	Check for correct ignition timing at idle ☞ page F–71 **Ignition timing: 10° ± 1° BTDC** 	Yes	Check for correct idle speed ☞ page F–72 **Idle speed: 850 ± 50 rpm** ⇨ If OK, go to next step ⇨ If not OK, adjust idle speed ☞ page F–72
		No	Adjust ☞ page F–71
5	Try known good ECU and check if condition improves ☞ page F–123		

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14	IDLE MOVES UP AND DOWN
DESCRIPTION	• Engine speed up and down periodically at idle

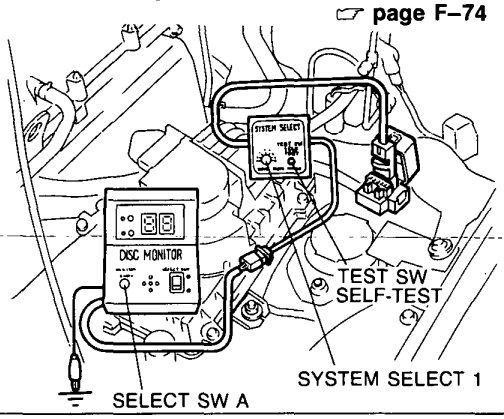
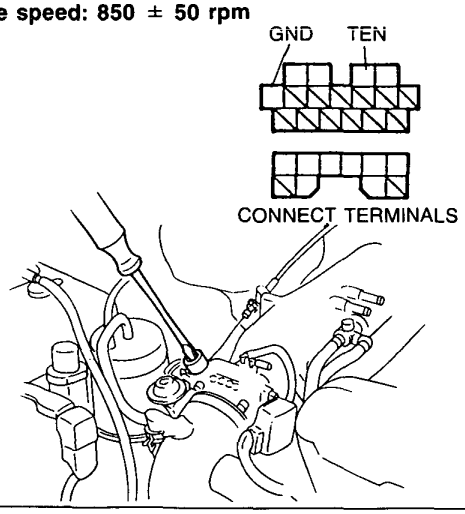
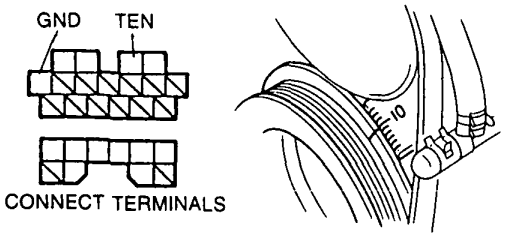
[TROUBLESHOOTING HINTS]

① Fuel cut occurs at idle
- Air valve not closing after warm-up and idle speed reaches to fuel cut speed

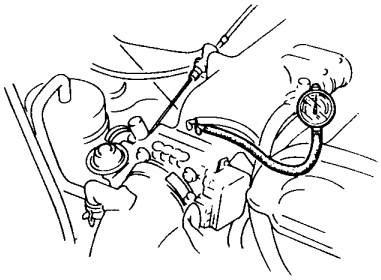
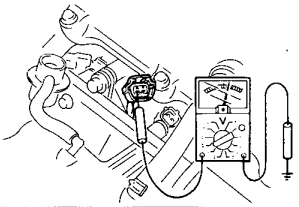
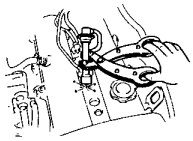
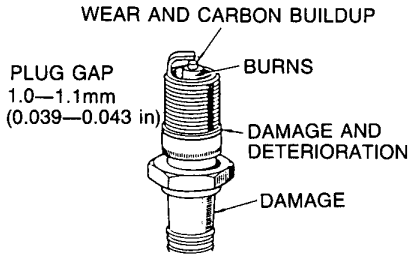
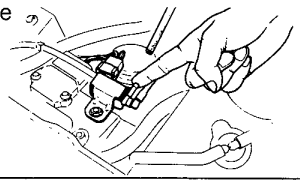
② Fuel injection amount fluctuating
- Bad contact point inside airflow meter

③ Air leakage at intake air system
④ Poor ignition spark
⑤ Air/Fuel mixture too rich
- Evaporative emission control system malfunction

⑥ Low engine compression

STEP	INSPECTION		ACTION
1	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ **page F–74**  	Yes	Go to next step
		No	**Malfunction Code No. displayed** Check for cause (Refer to specified check sequence) ☞ **page F–77**
			"88" flashes Check ECU terminal 1F voltage ☞ **page F–124** **Voltage: Approx. 12V (Ignition switch ON)** ⇨ If OK, replace ECU ☞ **page F–123** ⇨ If not OK, check wiring between ECU and Self-Diagnosis Checker ☞ **page F–8**
2	Check for correct idle speed ☞ **page F–72** **Idle speed: 850 ± 50 rpm**  	Yes	Go to next step
		No	Check if idle speed can be adjusted by turning air adjust screw ⇨ If OK, adjust idle speed ⇨ If not OK, check air valve ☞ **page F–96**
3	Check for correct ignition timing at idle ☞ **page F–71** **Ignition timing 10° ± 1° BTDC**  	Yes	Go to next step
		No	Adjust ☞ **page F–71**

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STEP	INSPECTION		ACTION
4	Check for correct intake manifold vacuum at idle **Intake manifold vacuum:** **More than 450 mmHg (17.7 inHg)** 	Yes	Go to next step
		No	**Low vacuum** Check for air leakage of intake air system ☞ **page F–90**
5	Check for injector operating sound at idle with sound scope or screwdriver	Yes	Go to Step 7
		No	Go to Step 6
6	Check if approx. 12V exists at injector connector (W/R) wire 	Yes	Check if injector resistance is OK ☞ **page F–109** **Resistance: Approx. 14Ω** ⇨ If OK, check wiring between ECU and injector ☞ **page F–8** ⇨ If not OK, replace injector ☞ **page F–109**
		No	Check wiring between ECU and injector ☞ **page F–8**
7	Disconnect each high-tension lead at idle and check if engine speed decreases equally each time 	Yes	Disconnect each injector connector at idle and check if engine speed decreases equally each time ⇨ If OK, go to Step 9 ⇨ If not OK, check injector for fuel leakage ☞ **page F–110**
		No	Go to Step 8
8	Check if spark plugs are OK 	Yes	Check for correct engine compression ☞ **page B–10** ⇨ If OK, replace injector ☞ **page F–109** ⇨ If not OK, check for cause (Refer to Section B) ☞ **page B–10**
		No	Repair, clear, or replace ☞ **page G–20**
9	Check if ECU terminal voltages are OK (2D, 2Q and 2X) ☞ **page F–124**	Yes	Go to next step
		No	Check for cause (Refer to "Check Point for Each Terminal") ☞ **page F–128**
10	Check if vacuum is felt at solenoid valve (purge control) at idle 	Yes	Check solenoid valve ☞ **page F–116**
		No	Go to next step
11	Try known good ECU and check if condition improves ☞ **page F–123**		

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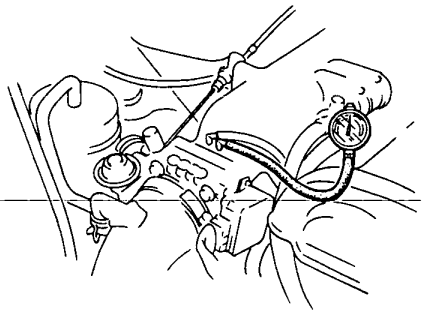
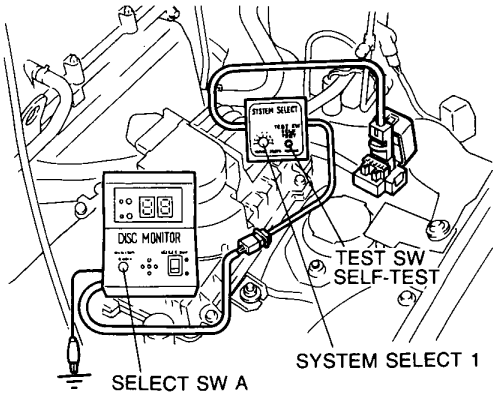
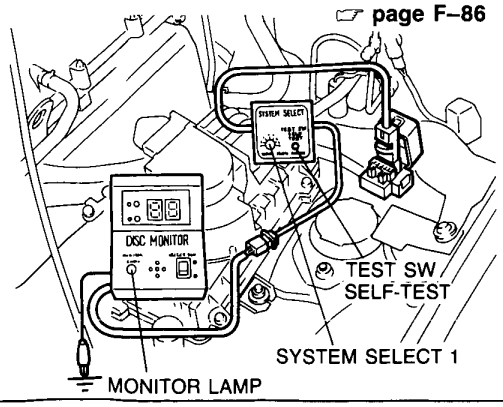
15	ENGINE STALLS AT IDLE — ALWAYS
DESCRIPTION	• Engine starts normally but vibrates excessively and stalls at idle in every condition

[TROUBLESHOOTING HINTS]

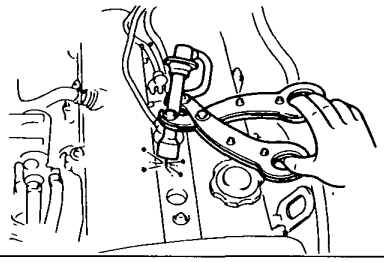
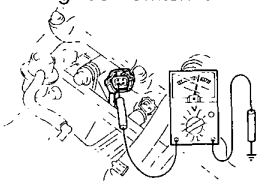
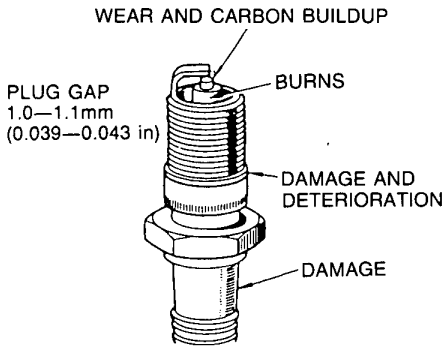
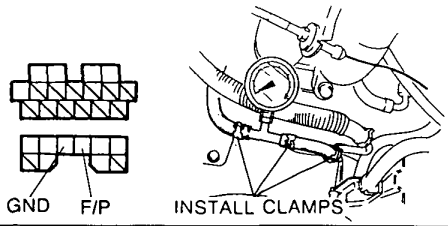
① Incorrect idle speed
- Idle speed misadjustment
- Idle speed control malfunction

② Air/Fuel mixture too rich or lean
- Injector clogged or inoperative
- Low fuel line pressure
- Low intake air amount or air leakage

③ Poor ignition spark

STEP	INSPECTION		ACTION
1	Check for correct intake manifold vacuum at idle **Vacuum: More than 450 mmHg (17.7 inHg)** 	Yes	Go to next step
		No	Check for air leakage of intake air system components ☞ **page F–90**
2	Check if air cleaner element is clean ☞ **page F–71**	Yes	Go to next step
		No	Replace air cleaner element ☞ **page F–89**
3	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ **page F–74** 	Yes	Go to next step
		No	**Malfunction Code No. displayed** Check for cause (Refer to specified check sequence) ☞ **page F–77**
			"88" flashes Check ECU terminal 1F voltage ☞ **page F–124** **Voltage: Approx. 12V (Ignition switch ON)** ⇨ If OK, replace ECU ☞ **page F–123** ⇨ If not OK, check wiring between ECU and Self-Diagnosis Checker ☞ **page F–8**
4	Check switches for correct operation with Self-Diagnosis Checker Monitor Lamp and ignition switch ON ☞ **page F–86** 	Yes	Go to next step
		No	**Lamp not ON/OFF with specified switch** Check for cause (Refer to specified check sequence) ☞ **page F–87**
			Lamp always ON Check wiring between ECU terminal 1D and Self-Diagnosis Checker ☞ **page F–8**

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STEP	INSPECTION		ACTION
5	Check if ECU terminal voltages are OK (2D, 2O and 2Q) ☞ **page F–125**	Yes	Go to next step
		No	Check for cause (Refer to "Check Point for Each Terminal") ☞ **page F–128**
6	Check if strong blue spark is visible at each disconnected high-tension lead while cranking engine 	Yes	Go to next step
		No	Check ignition system (Refer to Troubleshooting "Misfire") ☞ **page G–18**
7	Check for injector operating sound at each injector at idle	Yes	Go to Step 9
		No	Go to Step 8
8	Check if approx. 12V exists at injector connector (W/R) wire with ignition switch ON 	Yes	Check if injector resistance is OK ☞ **page F–109** **Resistance: Approx. 14Ω** ⇨ If OK, check wiring between injector and ECU ⇨ If not OK, replace injector ☞ **page F–109**
		No	Check wiring between main relay and injector ☞ **page F–8**
9	Check if spark plugs are OK 	Yes	Go to next step
		No	Repair or replace ☞ **page G–20**
10	Connect diagnosis connector terminals F/P and GND with jumper wire and check for correct fuel line pressure with ignition switch ON ☞ **page F–100** **Fuel line pressure: 265—314 kPa (2.7—3.2 kg/cm², 38—46 psi)** 	Yes	Go to next step
		No	**Low pressure** Check fuel line pressure while pinching fuel return hose ⇨ If fuel line pressure quickly increases, check pressure regulator ☞ **page F–108** ⇨ If fuel line pressure gradually increases, check for clogging between fuel pump to pressure regulator If not clogged, check for fuel pump maximum pressure ☞ **page F–105**
11	Try known good ECU and check if condition improves ☞ **page F–123**		

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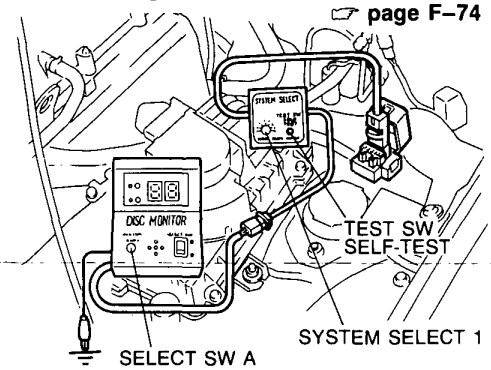
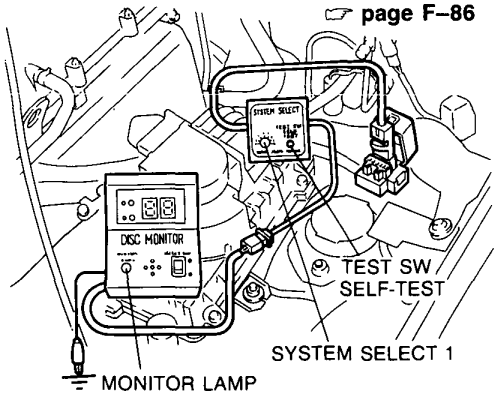
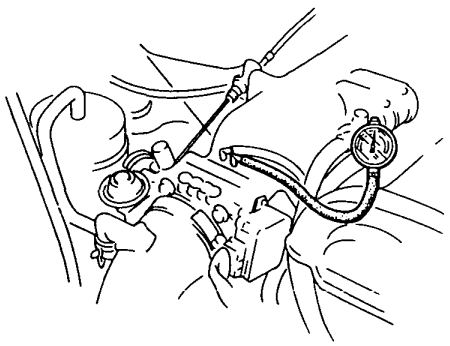
16	ENGINE STALLS AT IDLE — BEFORE WARM-UP
DESCRIPTION	• Engine starts normally but vibrates excessively and stalls at idle before warm-up

[TROUBLESHOOTING HINTS]

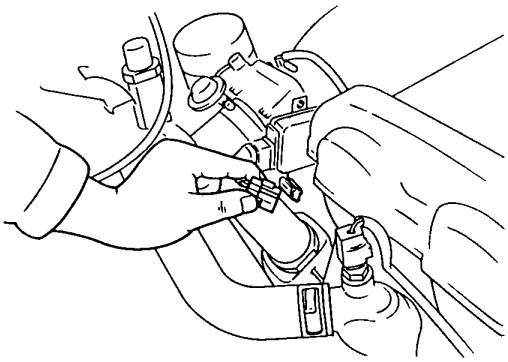
① Low intake air volume
- Idle speed control malfunction
- Air cleaner element clogged
- Airflow meter stuck

② Air/Fuel mixture too lean
- Air leakage of intake air system

③ Poor atomization of fuel
- Low RVP (summer) fuel used in cold weather

STEP	INSPECTION		ACTION
1	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ page F–74 	No	Go to next step
		No	**Malfunction Code No. displayed** *Check for cause (Refer to specified check sequence)* ☞ page F–77
			"88" flashes Check ECU terminal 1F voltage ☞ page F–124 **Voltage: Approx. 12V (Ignition switch ON)**
			⇨ If OK, replace ECU ☞ page F–123 ⇨ If not OK, check wiring between ECU and Self-Diagnosis Checker ☞ page F–8
2	Check switches for correct operation with Self-Diagnosis Checker Monitor Lamp with ignition switch ON ☞ page F–86 	Yes	Go to next step
		No	**Lamp not ON/OFF with specified switch** Check for cause (Refer to specified check sequence) ☞ page F–87
			Lamp always ON Check wiring between ECU terminal 1D and Self-Diagnosis Checker ☞ page F–8
3	Check if ECU terminal voltages are OK (2D, 2O and 2Q) ☞ page F–125	Yes	Go to next step
		No	Check for cause (Refer to "Check Point for Each Terminal") ☞ page F–128
4	Check for correct intake manifold vacuum at idle **Vacuum: More than 450 mmHg (17.7 inHg)** 	Yes	Go to next step
		No	Check for air leakage of intake air system components ☞ page F–90

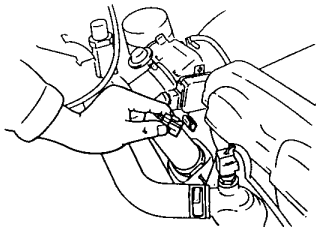
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STEP	INSPECTION		ACTION
5	Check if air cleaner element is clean ☞ **page F–71**	Yes	Go to next step
		No	Replace air cleaner element ☞ **page F–89**
6	Disconnect ISC valve connector when engine is cold and note idle speed Check if engine speed decreases after warm-up 	Yes	Go to next step
		No	Check air valve ☞ **page F–96**
7	Try known good ECU and check if condition improves ☞ **page F–123**	Yes	Replace ECU ☞ **page F–123**
		No	Change fuel to another brand

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17	ENGINE STALLS AT IDLE — AFTER WARM-UP
DESCRIPTION	• Engine runs normally at idle during warm-up but becomes rough and stalls after warm-up

[TROUBLESHOOTING HINTS]
① Air/Fuel mixture too lean
• Air leakage of intake air system
② Low intake air amount
• Idle speed control malfunction

STEP	INSPECTION		ACTION
1	Check if air is leaked from intake air system component ☞ **page F–90**	Yes	Repair or replace ☞ **page F–90**
		No	Go to next step
2	Disconnect ISC valve connector at idle and check if "clicking" is heard from ISC Valve 	Yes	Go to next step
		No	Replace ISC valve ☞ **page F–96**
3	Go to troubleshooting No.10 "LOW IDLE SPEED/ROUGH IDLE-AFTER WARM-UP" ☞ **page F–32**		

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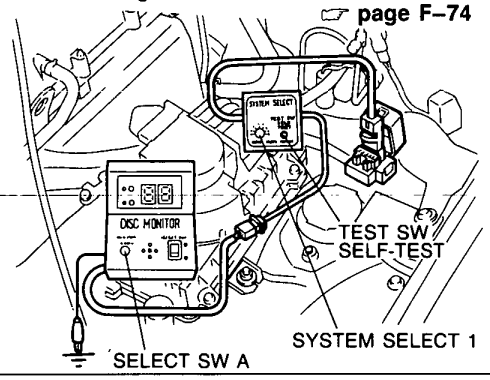
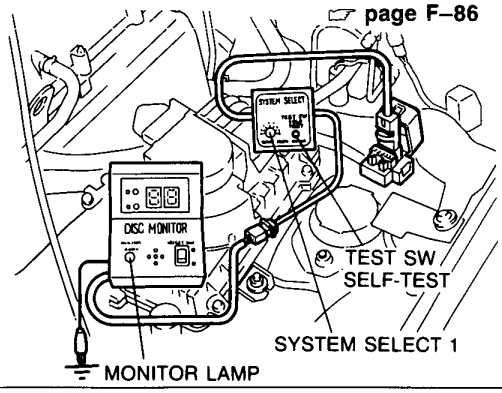
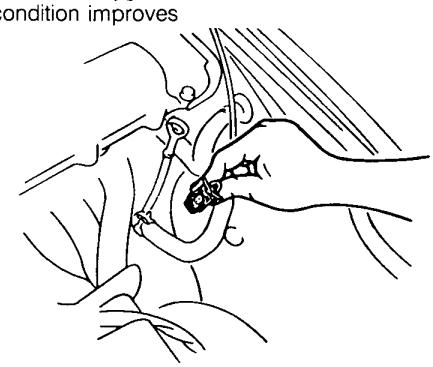
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18	ENGINE STALLS DURING START-UP
DESCRIPTION	• Engine unexpectedly stops running while starting

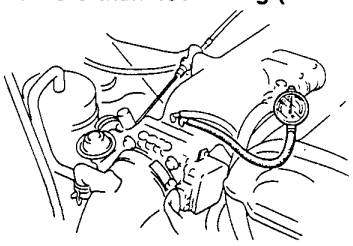
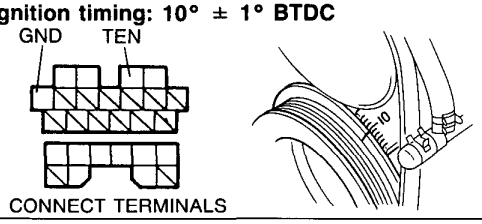
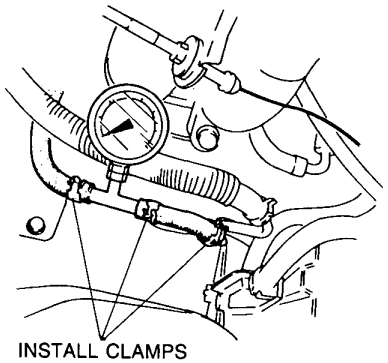
[TROUBLESHOOTING HINTS]

① Engine stalls when depressing accelerator
- Air/Fuel mixture too rich or too lean
- Incorrect ignition timing
- Weak ignition

② Lack of engine torque for start up
- Air/Fuel mixture too rich or too lean
- Low intake air amount
- Low engine compression

STEP	INSPECTION		ACTION
1	Check if brakes are dragging ☞ **page P–29**	Yes	Repair ☞ **page P–29**
		No	Go to next step
2	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ **page F–74** 	No	**Malfunction Code No. displayed** Check for cause (Refer to specified check sequence) ☞ **page F–74**
			"88" flashes Check ECU terminal 1F voltage ☞ **page F–124**
			Voltage: Approx. 12V (Ignition switch ON) ⇨ If OK, replace ECU ☞ **page F–123** ⇨ If not OK, check wiring between ECU and Self-Diagnosis Checker ☞ **page F–8**
3	Check switches for correct operation with Self-Diagnosis Checker Monitor Lamp and ignition switch ON ☞ **page F–86** 	Yes	Go to next step
		No	**Lamp not ON/OFF with specified switch** Check for cause (Refer to specified check sequence) ☞ **page F–87**
			Lamp always ON Check wiring between ECU terminal 1D and Self-Diagnosis Checker ☞ **page F–8**
4	Disconnect oxygen sensor connector and check if condition improves 	Yes	Check oxygen sensor ☞ **page F–134**
		No	Go to next step
5	Check if ECU terminal voltages are OK ☞ **page F–124**	Yes	Go to next step
		No	Check for cause (Refer to "Check Point for Each Terminal") ☞ **page F–127**

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STEP	INSPECTION		ACTION
6	Check if throttle linkage is correctly installed and operates freely	Yes	Go to next step
		No	Correct, clean, or replace as required any binding or damaged linkage and adjust cable deflection at throttle body ☞ **page F–93**
7	Check for correct intake manifold vacuum at idle **Vacuum: More than 450 mmHg (17.7 inHg)** 	Yes	Go to next step
		No	Check for air leakage of intake air system components ☞ **page F–90**
8	Check if air cleaner element is clean ☞ **page F–71**	Yes	Go to next step
		No	Replace air cleaner element ☞ **page F–89**
9	Check for correct ignition timing at idle ☞ **page F–72** **Ignition timing: 10° ± 1° BTDC** 	Yes	Check if ignition timing advances when accelerating ⇨ If advances, go to next step ⇨ If no advance, replace ECU ☞ **page F–123**
		No	Adjust ☞ **page F–72**
10	Check for correct fuel line pressure at idle ☞ **page F–100** **Fuel line pressure: 265—314 kPa (2.7—3.2 kg/cm², 38—46 psi) (Vacuum hose to pressure regulator disconnected)** 	Yes	Check if fuel line pressure decreases when accelerating quickly ⇨ If decreases, check fuel pump maximum pressure ☞ **page F–105** If OK, check fuel line and filter for clogging ⇨ If no decrease, go to next step
		No	**Low pressure** Check for fuel line pressure while pinching fuel return hose ⇨ If fuel line pressure quickly increases, check pressure regulator ☞ **page F–108** ⇨ If fuel line pressure gradually increases, check for clogging between fuel pump and pressure regulator If not clogged, check fuel pump maximum pressure ☞ **page F–105**
			High pressure Check if fuel return line is clogged ⇨ If OK, replace pressure regulator ☞ **page F–109** ⇨ If not OK, replace
11	Check for correct engine compression ☞ **page B–10** **Engine compression: 1,324—932 kPa (13.5—9.5 kg/cm², 192—135 psi) - 300 rpm**	Yes	Go to next step
		No	Check engine condition ☞ **page B–10** • Worn piston, piston rings or cylinder wall • Defective cylinder head gasket • Distorted cylinder head • Improper valve seating • Valve sticking in guide
12	Try known good ECU and check if condition improves ☞ **page F–123**		

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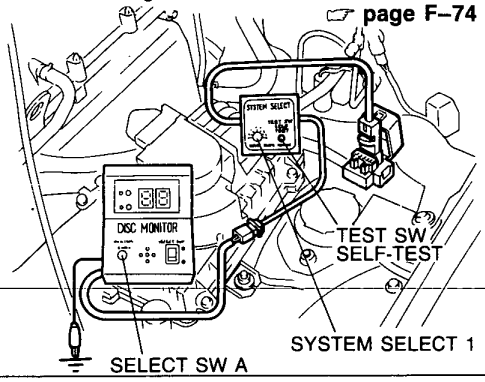
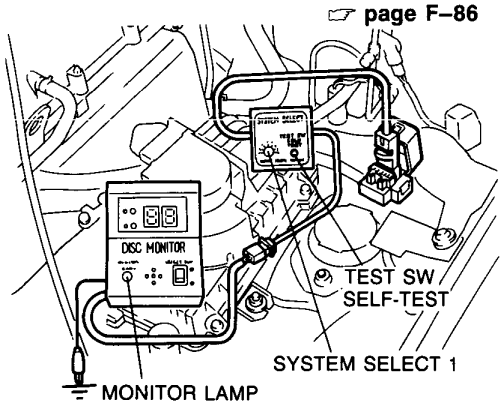
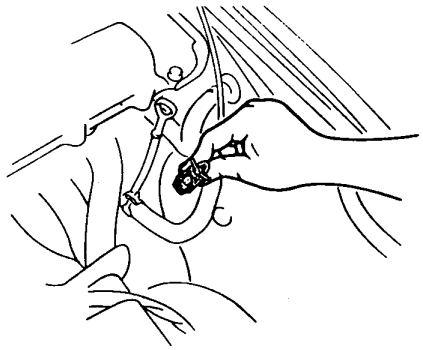
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19	ENGINE STALLS ON DECELERATION
DESCRIPTION	• Engine unexpectedly stops running while decelerating or after deceleration

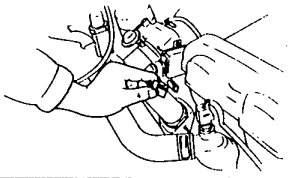
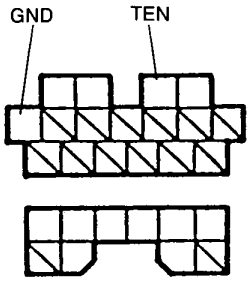
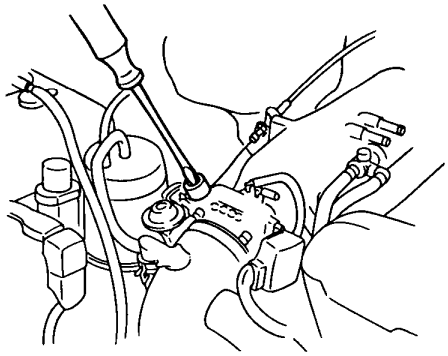
[TROUBLESHOOTING HINTS]

Engine speed drops too much when releasing accelerator

① Idle speed control malfunction
② Fuel cut control malfunction
③ Engine feedback control malfunction
④ Idle speed misadjustment

STEP	INSPECTION		ACTION
1	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ **page F–74** 	Yes	Go to next step
		No	**Malfunction Code No. displayed** Check for cause (Refer to specified check sequence) ☞ **page F–77**
			"88" flashes Check ECU terminal 1F voltage ☞ **page F–124** **Voltage: Approx. 12V (Ignition switch ON)** ⇨ If OK, replace ECU ☞ **page F–123** ⇨ If not OK, check wiring between ECU and Self-Diagnosis Checker ☞ **page F–8**
2	Check switches for correct operation with Self-Diagnosis Checker Monitor Lamp and ignition switch ON ☞ **page F–86** 	Yes	Go to next step
		No	**Lamp not ON/OFF with specified switch** Check for cause (Refer to specified check sequence) ☞ **page F–87**
			Lamp always ON Check wiring between ECU terminal 1D and Self-Diagnosis Checker ☞ **page F–8**
3	Disconnect oxygen sensor connector and check if condition improves 	Yes	Check oxygen sensor ☞ **page F–134**
		No	Go to next step
4	Check if ECU terminal voltages are OK (2D, 2O, 2U, 2V and 2Q) ☞ **page F–125**	Yes	Go to next step
		No	Check for cause (Refer to "Check Point for Each Terminal") ☞ **page F–128**

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STEP	INSPECTION		ACTION
5	Disconnect ISC valve connector at idle and check if "clicking" is heard from ISC valve 	Yes	Go to next step
		No	Replace ISC valve ☞ **page F–96**
6	Check for correct idle speed ☞ **page F–72** **Idlle speed: 850 ± 50 rpm**  CONNECT TERMINALS 	Yes	Go to next step
		No	Adjust ☞ **page F–72**
7	Try known good ECU and check if condition improves ☞ **page F–123**		

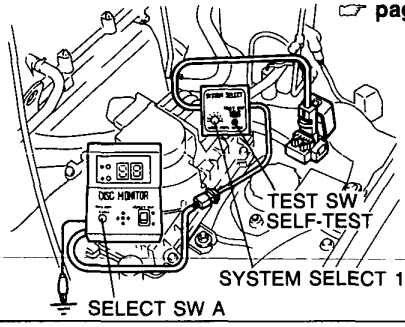
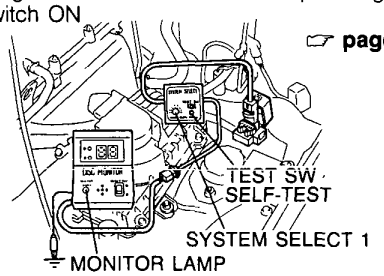
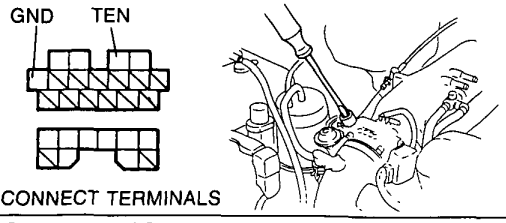
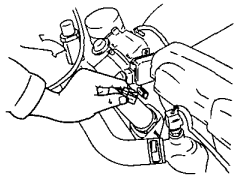
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20	ENGINE STALLS AT IDLE — WHEN P/S, OR E/L ON
DESCRIPTION	• Engine unexpectedly stops running at idle when P/S, or E/L ON • P/S, headlight, blower fan and electric cooling fan OK

[TROUBLESHOOTING HINTS]

① Idle speed control malfunction
- No input signal from switch
- Idle speed misadjustment
- ISC valve stuck

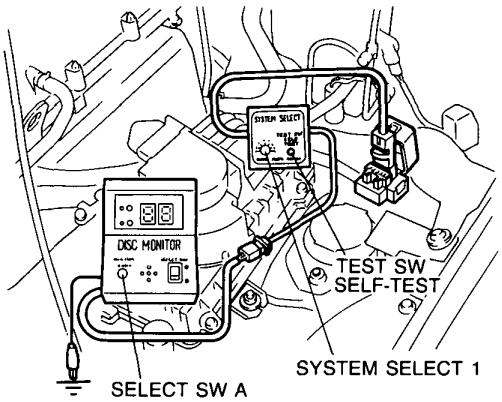
STEP	INSPECTION		ACTION
1	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ **page F–74**  	Yes	Go to next step
		No	**Malfunction Code No. displayed** Check for cause (Refer to specified check sequence) ☞ **page F–77** **"88" flashes** Check ECU terminal 1F voltage ☞ **page F–124** **Voltage: Approx. 12V (Ignition switch ON)** ⇨ If OK, replace ECU ☞ **page F–123** ⇨ If not OK, check wiring between ECU and Self-Diagnosis Checker ☞ **page F–8**
2	Check switches for correct operation with Self-Diagnosis Checker Monitor Lamp and ignition switch ON ☞ **page F–86**  	Yes	Go to next step
		No	**Lamp not ON/OFF with specified switch** Check for cause (Refer to specified check sequence) ☞ **page F–86** **Lamp always ON** Check wiring between ECU terminal 1D and Self-Diagnosis Checker ☞ **page F–8**
3	Check if ECU terminal voltages are OK (1G, 1P, 1U, 2D, 2Q and 2W) ☞ **page F–124**	Yes	Go to next step
		No	Check for cause (Refer to "Check Point for Each Terminal") ☞ **page F–127**
4	Check for correct idle speed ☞ **page F–75** **Idle speed: 850 ± 50 rpm**  	Yes	Go to next step
		No	Adjust ☞ **page F–72**
5	Disconnect ISC valve connector at idle and check if "clicking" is heard from ISC valve 	Yes	Go to next step
		No	Replace ISC valve ☞ **page F–96**
6	Try known good ECU and check if condition improves ☞ **page F–123**		

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21	ENGINE STALLS SUDDENLY (INTERMITTENT)
DESCRIPTION	• Engine intermittently stops running • Before stalling, engine condition OK

[TROUBLESHOOTING HINTS]
① Intermittently no spark or no fuel injection
• Poor connection in wiring harness

STEP	INSPECTION		ACTION
1	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ **page F–74**  	Yes	Go to next step
		No	**Malfunction Code No. displayed** Check for cause (Refer to specified check sequence) ☞ **page F–77** **Note** **When checking wiring harness and connectors, tap, move, and wiggle suspect sensor and/or harness to recreate problem**
			"88" flashes Check ECU terminal 1F voltage ☞ **page F–124** **Voltage: Approx. 12V (Ignition switch ON)** ⇨ If OK, replace ECU ☞ **page F–123** ⇨ If not OK, check wiring between ECU and Self-Diagnosis Checker ☞ **page F–8**
2	Check if ECU terminal voltages are OK (1B, 2A, 2B and 2C) ☞ **page F–124** **Note** **When checking voltages, tap, move, and wiggle harness and connector**	Yes	Go to Troubleshooting No.2 "CRANKS NORMALLY BUT WILL NOT START (NO COMBUSTION)" ☞ **page F–79**
		No	Check for cause (Refer to "Check Point for Each Terminal) ☞ **page F–127**

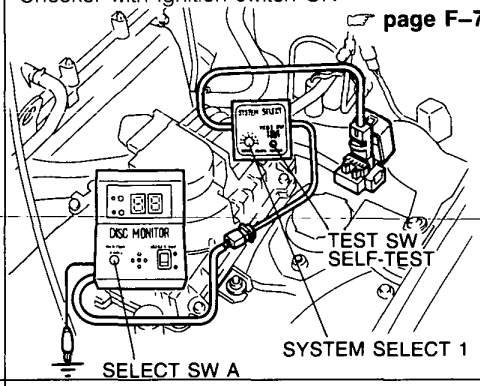
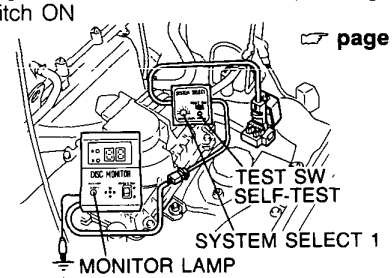
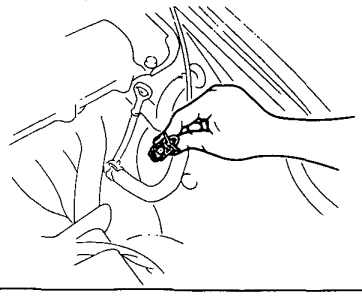
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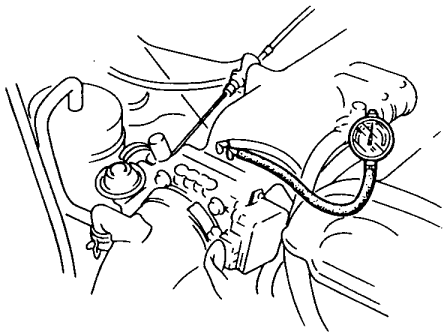
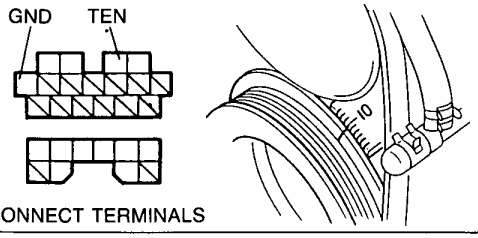
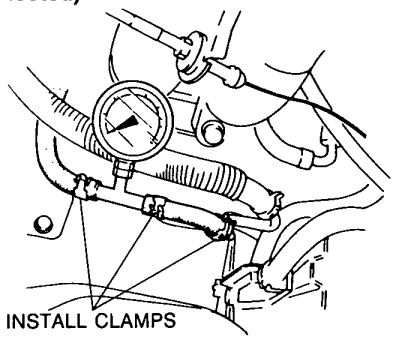
22	HESITATES/STUMBLES ON ACCELERATION
DESCRIPTION	• Flat spot occurs just after accelerator depressed or mild jerking occurs during acceleration

[TROUBLESHOOTING HINTS]

① Air-fuel mixture leaning when depressing accelerator
- Fuel injection control malfunction (Correction for accelerating condition)
- Air leakage of intake air system
- Fuel line pressure low
- Spark advance control malfunction

STEP	INSPECTION		ACTION
1	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ **page F–74** 	Yes	Go to next step
		No	**Malfunction Code No. displayed** Check for cause (Refer to specified check sequence) ☞ **page F–77**
			"88" flashes Check ECU terminal 1F voltage ☞ **page F–124** **Voltage: Approx. 12V (Ignition switch ON)** ⇨ If OK, replace ECU ☞ **page F–123** ⇨ If not OK, check wiring between ECU and Self-Diagnosis Checker ☞ **page F–8**
2	Check switches for correct operation with Self-Diagnosis Checker Monitor Lamp and ignition switch ON ☞ **page F–86** 	Yes	Go to next step
		No	**Lamp not ON/OFF with specified switch** Check for cause (Refer to specified check sequence) ☞ **page F–87**
			Lamp always ON Check wiring between ECU terminal 1D and Self-Diagnosis Checker ☞ **page F–8**
3	Disconnect oxygen sensor connector and check if condition improves 	Yes	Check oxygen sensor ☞ **page F–134**
		No	Go to next step
4	Check if ECU terminal voltages are OK ☞ **page F–124**	Yes	Go to next step
		No	Check for cause (Refer to "Check Point for Each Terminal") ☞ **page F–127**
5	Check if throttle linkage is correctly installed and operates freely	Yes	Go to next step
		No	Correct, clean, or replace as required any binding or damaged linkage and adjust cable deflection at throttle body ☞ **page F–93**

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STEP	INSPECTION		ACTION
6	Check if air duct and air hoses are correctly installed ☞ **page F–72**	Yes	Go to next step
		No	Repair ☞ **page F–89**
7	Check for correct intake manifold vacuum at idle **Vacuum: More than 450 mmHg (17.7 inHg)** 	Yes	Go to next step
		No	Check for air leakage of intake air system components ☞ **page F–90**
8	Check if air cleaner element is clean ☞ **page F–71**	Yes	Go to next step
		No	Replace air cleaner element ☞ **page F–89**
9	Check for correct ignition timing at idle ☞ **page F–71** **Ignition timing: 10° ± 1° BTDC** 	Yes	Check if ignition timing advances when accelerating ⇨ If advances, go to next step ⇨ If no advance, replace ECU ☞ **page F–123**
		No	Adjust ☞ **page F–71**
10	Check for correct fuel line pressure at idle ☞ **page F–100** **Fuel line pressure: 265—314 kPa (2.7—3.2 kg/cm², 38—46 psi) (Vacuum hose to pressure regulator disconnected)** 	Yes	Check if fuel line pressure decreases when accelerating quickly ⇨ If decreases, check fuel line and filter for clogging ⇨ If no decrease, go to next step
		No	**Low pressure** Check for fuel line pressure while pinching fuel return hose ⇨ If fuel line pressure quickly increases, check pressure regulator ☞ **page F–108** ⇨ If fuel line pressure gradually increases, check for clogging between fuel pump and pressure regulator If not clogged, check fuel pump maximum pressure ☞ **page F–107**
11	Check if exhaust system is restricted ☞ **page F–112**	Yes	Repair or replace ☞ **page F–112**
		No	Go to next step
12	Try known good ECU and check if condition improves ☞ **page F–123**		

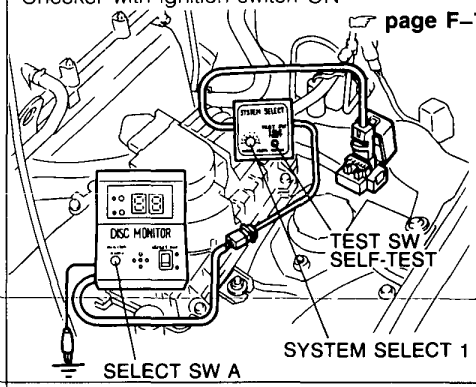
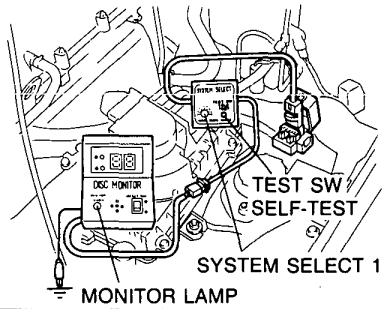
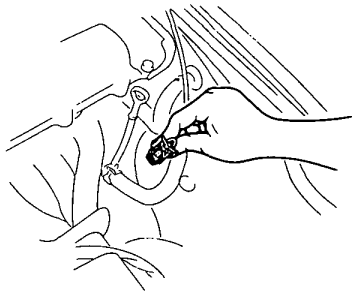
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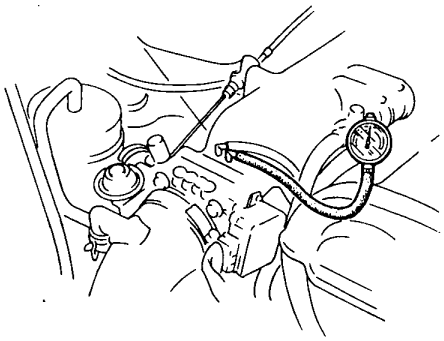
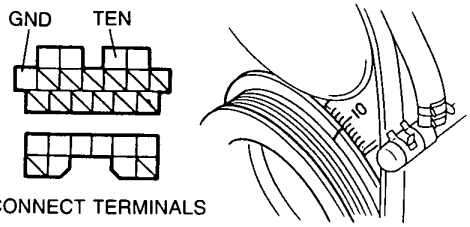
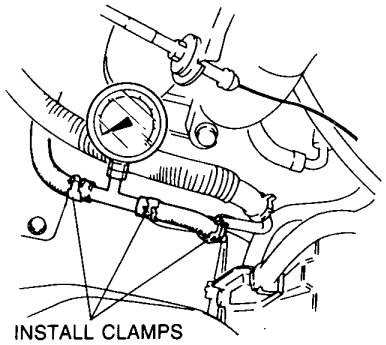
23	SURGES WHILE CRUISING
DESCRIPTION	• Unexpected change in engine speed which is usually repetitive

[TROUBLESHOOTING HINTS]

- Fuel injection control malfunction
- Air leakage of intake air system
- Fuel line pressure low
- Evaporative emission control malfunction
- Spark advance control malfunction

STEP	INSPECTION		ACTION
1	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ **page F–74** 	Yes	Go to next step
		No	**Malfunction Code No. displayed** Check for cause (Refer to specified check sequence) ☞ **page F–77**
			"88" flashes Check ECU terminal 1F voltage ☞ **page F–124** **Voltage: Approx. 12V (Ignition switch ON)** ⇨ If OK, replace ECU ☞ **page F–123** ⇨ If not OK, check wiring between ECU and Self-Diagnosis Checker ☞ **page F–8**
2	Check switches for correct operation with Self-Diagnosis Checker Monitor Lamp and ignition switch ON ☞ **page F–86** 	Yes	Go to next step
		No	**Lamp not ON/OFF with specified switch** Check for cause (Refer to specified check sequence) ☞ **page F–87**
			Lamp always ON Check wiring between ECU terminal 1D and Self-Diagnosis Checker ☞ **page F–8**
3	Disconnect oxygen sensor connector and check if condition improves 	Yes	Check oxygen sensor ☞ **page F–134**
		No	Go to next step
4	Check if ECU terminal voltages are OK ☞ **page F–124**	Yes	Go to next step
		No	Check for cause (Refer to "Check Point for Each Terminal") ☞ **page F–127**
5	Check if throttle linkage is correctly installed and operates freely	Yes	Go to next step
		No	Correct, clean, or replace as required any binding or damaged linkage, and adjust cable deflection at throttle body ☞ **page F–93**

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STEP	INSPECTION		ACTION
6	Check for correct intake manifold vacuum **Vacuum: More than 450 mmHg (17.7 inHg)** 	Yes	Go to next step
		No	Check for air leakage of intake air system components ☞ **page F–90**
7	Check if air cleaner element is clean ☞ **page F–71**	Yes	Go to next step
		No	Replace air cleaner element ☞ **page F–89**
8	Check for correct ignition timing at idle ☞ **page F–71** **Ignition timing: 10° ± 1° BTDC** 	Yes	Check if ignition timing advances when accelerating ⇨ If advances, go to next step ⇨ If no advance, replace ECU ☞ **page F–124**
		No	Adjust ☞ **page F–71**
9	Check for correct fuel line pressure at idle ☞ **page F–100** **Fuel line pressure:** **265—314 kPa (2.7—3.2 kg/cm², 38—46 psi)** **(Vacuum hose to pressure regulator disconnected)** 	Yes	Check if fuel line pressure decreases when accelerating quickly ⇨ If decreases, check fuel line and filter for clogging ⇨ If no decrease, go to next step
		No	**Low pressure** Check for fuel line pressure while pinching fuel return hose ⇨ If fuel line pressure quickly increases, check pressure regulator ☞ **page F–108** ⇨ If fuel line pressure gradually increases, check for clogging between fuel pump and pressure regulator If not clogged, check fuel pump maximum pressure ☞ **page F–105**
10	Check if exhaust system is restricted ☞ **page F–114**	Yes	Repair or replace ☞ **page F–112**
		No	Go to next step
11	Try known good ECU and check if condition improves ☞ **page F–125**		

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24	LACK OF POWER
DESCRIPTION	• Performance poor under load • Reduced maximum speed

[TROUBLESHOOTING HINTS]

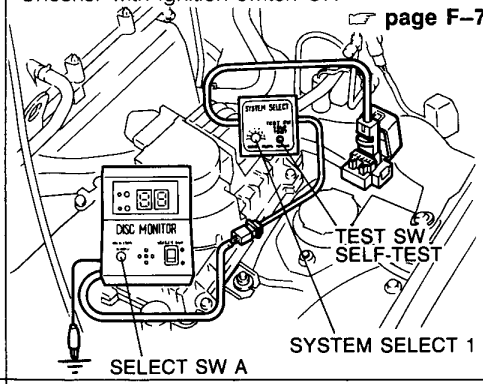
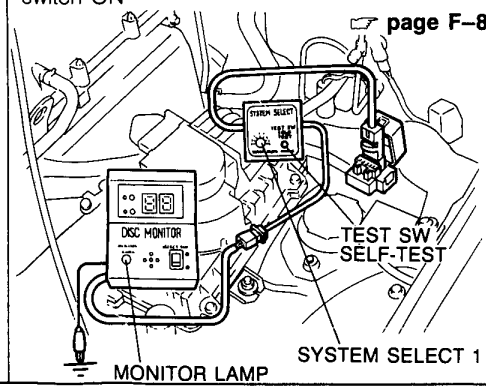
① Factors other than engine malfunction
- Clutch slipping
- Brake dragging
- Low tire pressure
- Unrecommended tire size
- Overloaded

② Low intake air amount
- Throttle valve not open fully
- Clogged intake air system

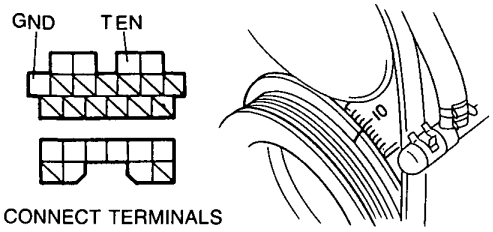
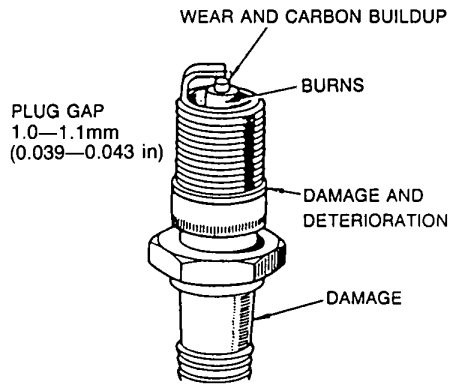
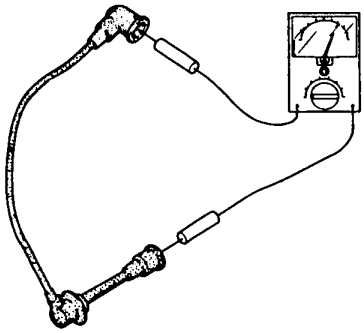
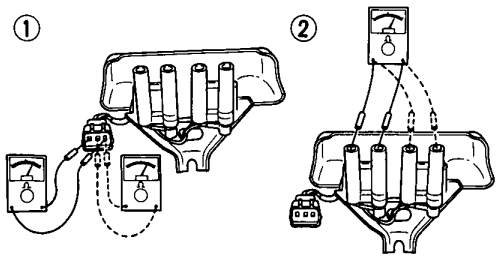
② Air/Fuel mixture too lean or too rich
- Fuel line pressure low or high
- Insufficient fuel injection

④ Poor ignition

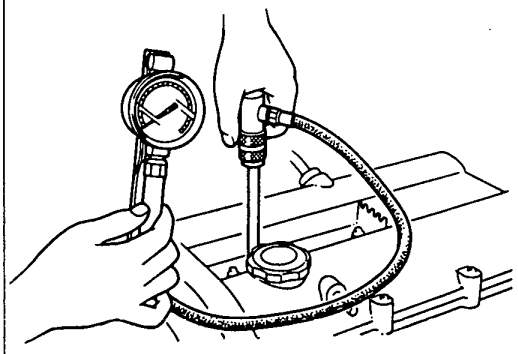
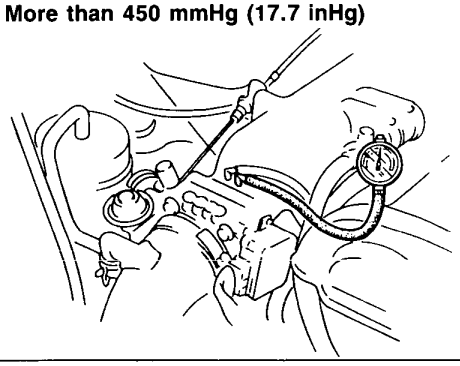
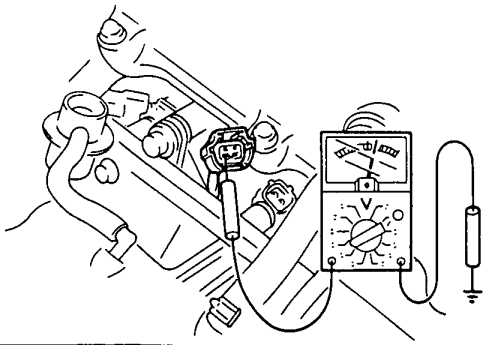
⑤ Low engine compression

STEP	INSPECTION		ACTION
1	Check factors other than engine • Clutch slipping ☞ **page H–3** • Brake dragging ☞ **page P–27** • Low tire pressure ☞ **page Q–3** • Unrecommended tire size ☞ **page Q–2**	Yes	Go to next step
		No	Repair
2	Check if throttle valve fully opens when depressing accelerator fully	Yes	Go to next step
		No	Check if accelerator cable is correctly installed ☞ **page F–93** ⇨ If OK, check throttle body ☞ **page F–92** ⇨ If not OK, install accelerator cable correctly ☞ **page F–93**
3	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ **page F–74** 	Yes	Go to next step
		No	**Malfunction Code No. displayed** Check for cause (Refer to specified check sequence) ☞ **page F–81** **"88" flashes** Check ECU terminal 1F voltage ☞ **page F–124** **Voltage: Approx. 12V (Ignition switch ON)** ⇨ If OK, replace ECU ☞ **page F–123** ⇨ If not OK, check wiring between ECU and Self-Diagnosis Checker ☞ **page F–8**
4	Check switches for correct operation with Self-Diagnosis Checker Monitor Lamp and ignition switch ON ☞ **page F–86** 	Yes	Go to next step
		No	**Lamp not ON/OFF with specified switch** Check for cause (Refer to specified check sequence) ☞ **page F–87** **Lamp always ON** Check wiring between ECU terminal 1D and Self-Diagnosis Checker ☞ **page F–8**

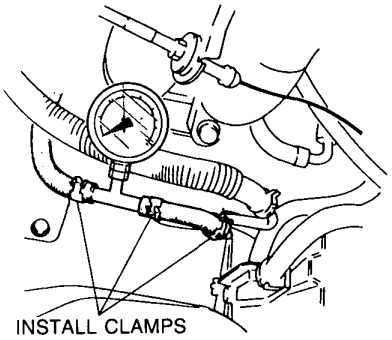
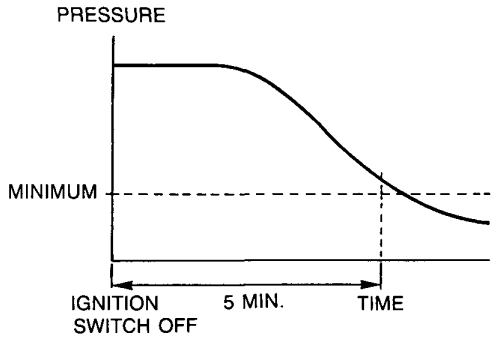
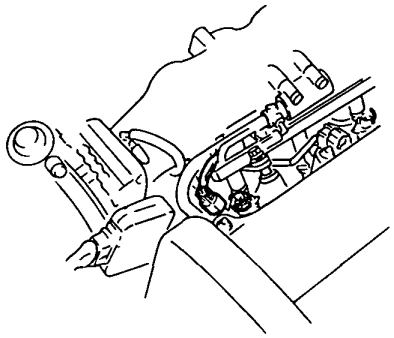
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STEP	INSPECTION		ACTION
5	Check for correct ignition timing at idle ☞ page F–71 **Ignition timing: 10° ± 1° BTDC** 	Yes	Check if ignition timing advances when accelerating ⇨ If advances, go to next step ⇨ If no advance, check ECU terminal voltages ☞ page F–124
		No	Adjust ☞ page F–71
6	Check if spark plugs are OK 	Yes	Go to next step
		No	Repair, clean, or replace ☞ page G–20
7	Check if resistance of high-tension leads are OK **Resistance: 16 kΩ per 1m (3.28 ft)** 	Yes	Go to next step
		No	Replace ☞ page G–22
8	Check if resistance of ignition coil is OK ☞ page G–21 **Resistance (at 20°C [68°F]):** **① Primary coil..... 0.78—0.94Ω** **② Secondary coil.... 11.2—15.2 kΩ** 	Yes	Go to next step
		No	Replace ☞ page G–21

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STEP	INSPECTION		ACTION
9	Check for correct engine compression ☞ **page B–10** **Engine compression: 1,324—932 kPa (13.5 — 9.5 kg/cm², 192 — 135 psi) – 300 rpm** 	Yes	Go to next step
		No	Check engine condition ☞ **page B–10** • Worn piston, piston rings or cylinder wall • Defective cylinder head gasket • Distorted cylinder head • Improper valve seating • Valve sticking in guide
10	Check for correct intake manifold vacuum at idle	Yes	Go to next step
	Intake manifold vacuum: **More than 450 mmHg (17.7 inHg)** 	No	Check for air leakage of intake air system components ☞ **page F–90**
11	Check if air cleaner element is clean ☞ **page F–71**	Yes	Go to next step
		No	Replace air cleaner element ☞ **page F–89**
12	Check for injector operating sound at idle	Yes	Go to Step 14
		No	Go to Step 13
13	Check if approx. 12V exists at injector connector (W/R) wire with ignition switch ON 	Yes	Check if injector resistance is OK ☞ **page F–96** **Resistance: Approx. 14Ω** ⇨ If OK, check wiring between ECU and injector ☞ **page F–8** ⇨ If not OK, check injector for fuel leakage ☞ **page F–110**
		No	Check wiring between ECU and injector ☞ **page F–8**
14	Check if ECU terminal voltages are OK (2D, 2O and 2Q) ☞ **page F–125**	Yes	Go to next step
		No	Check for cause (Refer to "Check Point for Each Terminal") ☞ **page F–128**

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STEP	INSPECTION		ACTION
15	Check for correct fuel line pressure at idle ☞ **page F–100** **Fuel line pressure: 265—314 kPa (2.7—3.2 kg/cm², 38—46 psi) (Vacuum hose to pressure regulator disconnected)**  	Yes	Check if fuel line pressure decreases when accelerating quickly ⇨ If decreases, check fuel pump maximum pressure ☞ **page F–105** If OK, check fuel line and filter for clogging ⇨ If no decreases, go to next step
		No	**Low pressure** Check for fuel line pressure while pinching fuel return hose ⇨ If fuel line pressure quickly increases, check pressure regulator ☞ **page F–108** ⇨ If fuel line pressure gradually increases, check for clogging between fuel pump and pressure regulator ☞ **page F–109** If not clogged, check fuel pump maximum pressure ☞ **page F–105**
16	Run engine several minutes at idle and check if fuel line pressure is held after ignition switch turned OFF ☞ **page F–99** **Fuel line pressure: More than 147 kPa (1.5 kg/cm², 21 psi) for 5 min.**  	Yes	**High pressure** Check if vacuum hose to pressure regulator is damaged or poorly connected ⇨ If OK, replace pressure regulator ☞ **page F–109** ⇨ If not OK, repair or replace hose
		No	Check injector for fuel leakage ☞ **page F–110**
17	Disconnect each injector connector at idle and check if engine speed decreases equally each time 	Yes	Go to next step
		No	Replace injector ☞ **page F–109**
18	Try known good ECU and check if condition improves ☞ **page F–123**		

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25	POOR ACCELERATION
DESCRIPTION	• Performance poor while accelerating

[TROUBLESHOOTING HINTS]

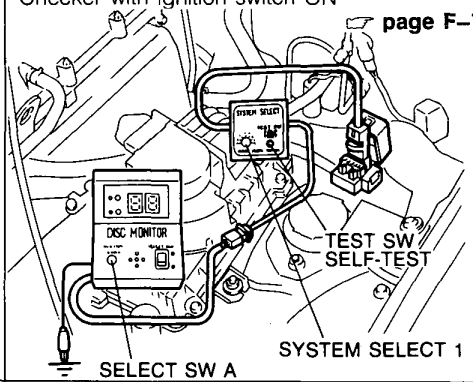
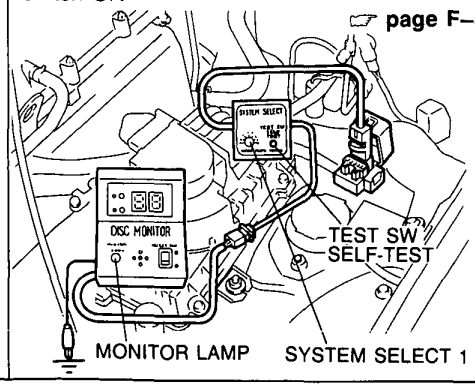
① Factors other than engine malfunction
- Clutch slipping
- Brake dragging
- Low tire pressure
- Unrecommended tire size
- Overloaded

② Low intake air amount
- Throttle valve not open fully
- Clogged intake air system

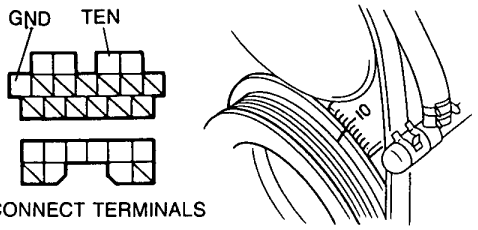
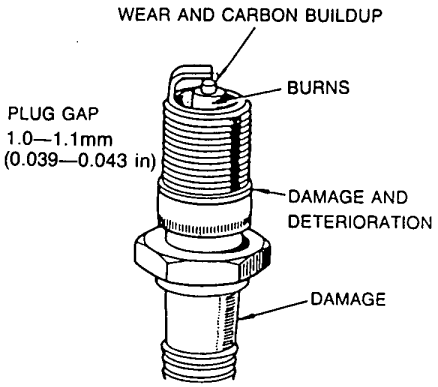
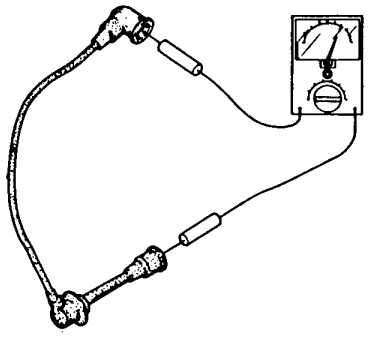
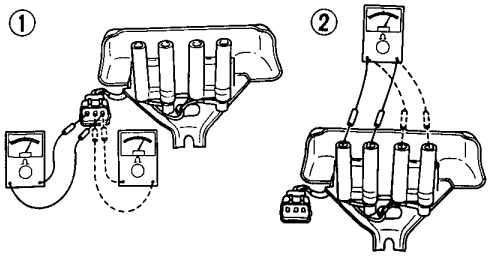
④ Air/Fuel mixture too lean or too rich
- Fuel line pressure low or high
- Insufficient fuel injection

④ Poor ignition

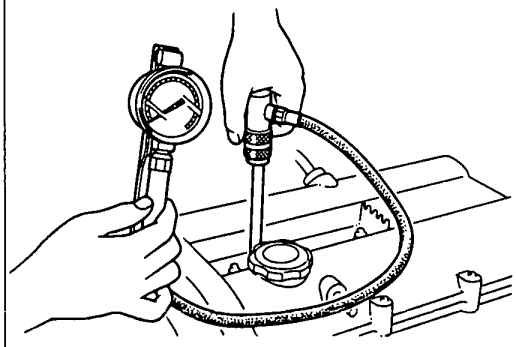
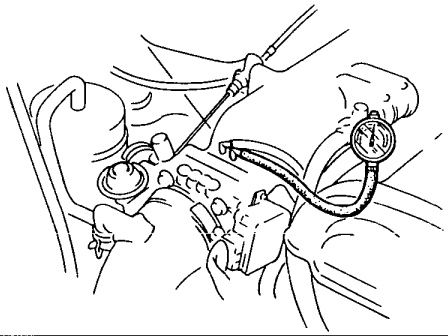
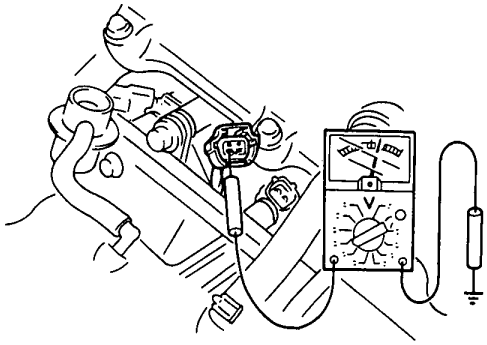
⑤ Low engine compression

STEP	INSPECTION		ACTION
1	Check factors other than engine • Clutch slipping ☞ **page H–3** • Brake dragging ☞ **page P–27** • Low tire pressure ☞ **page Q–3** • Unrecommended tire size ☞ **page Q–2**	Yes	Go to next step
		No	Repair
2	Check if throttle valve fully opens when depressing accelerator fully	Yes	Go to next step
		No	Check if accelerator cable is correctly installed ☞ **page F–93** ⇨ If OK, check throttle body ☞ **page F–91** ⇨ If not OK, install accelerator cable correctly ☞ **page F–93**
3	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ **page F–74** 	Yes	Go to next step
		No	**Malfunction Code No. displayed** Check for cause (Refer to specified check sequence) ☞ **page F–77** **"88" flashes** Check ECU terminal 1F voltage ☞ **page F–124** **Voltage: Approx. 12V (Ignition switch ON)** ⇨ If OK, replace ECU ☞ **page F–123** ⇨ If not OK, check wiring between ECU and Self-Diagnosis Checker ☞ **page F–8**
4	Check switches for correct operation with Self-Diagnosis Checker Monitor Lamp and ignition switch ON ☞ **page F–86** 	Yes	Go to next step
		No	**Lamp not ON/OFF with specified switch** Check for cause (Refer to specified check sequence) ☞ **page F–87** **Lamp always ON** Check wiring between ECU terminal 1D and Self-Diagnosis Checker ☞ **page F–8**

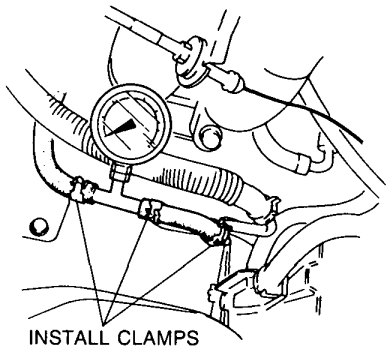
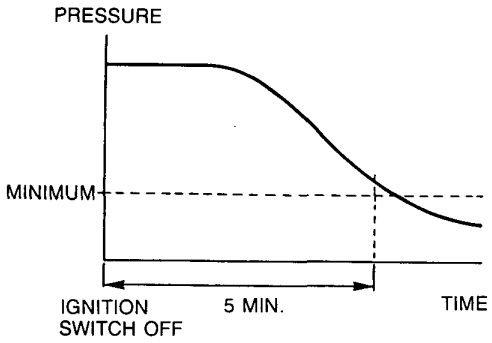
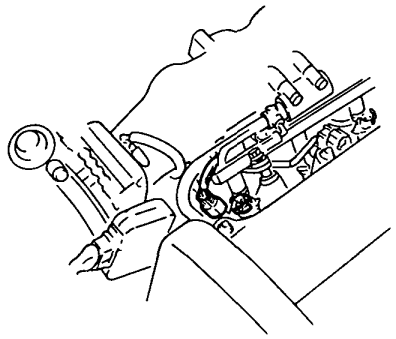
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STEP	INSPECTION		ACTION
5	Check for correct ignition timing at idle ☞ page F–71 **Ignition timing: 10° ± 1° BTDC** 	Yes	Check if ignition timing advances when accelerating ⇨ If advances, go to next step ⇨ If no advance, check ECU terminal voltages ☞ page F–123
		No	Adjust ☞ page F–71
6	Check if spark plugs are OK 	Yes	Go to next step
		No	Repair, clean, or replace ☞ page G–20
7	Check if resistance of high-tension leads are OK **Resistance: 16 kΩ per 1m (3.28 ft)** 	Yes	Go to next step
		No	Replace ☞ page G–22
8	Check if resistance of ignition coil is OK ☞ page G–21 **Resistance (at 20°C [68°F]):** **① Primary coil..... 0.78—0.94Ω** **② Secondary coil.... 11.2—15.2 kΩ** 	Yes	Go to next step
		No	Replace ☞ page G–21

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STEP	INSPECTION		ACTION
9	Check for correct engine compression ☞ **page B–10** **Engine compression: 1,324—932 kPa (13.5 — 9.5 kg/cm², 192 — 135 psi) 300 rpm** 	Yes	Go to next step
		No	Check engine condition ☞ **page B–10** • Worn piston, piston rings or cylinder wall • Defective cylinder head gasket • Distorted cylinder head • Improper valve seating • Valve sticking in guide
10	Check for correct intake manifold vacuum at idle	Yes	Go to next step
	Intake manifold vacuum: **More than 450 mmHg (17.7 inHg)** 	No	Check for air leakage of intake air system components ☞ **page F–90**
11	Check if air cleaner element is clean ☞ **page F–71**	Yes	Go to next step
		No	Replace air cleaner element ☞ **page F–89**
12	Check for injector operating sound at idle	Yes	Go to Step 14
		No	Go to Step 13
13	Check if approx. 12V exists at injector connector (W/R) wire with ignition switch ON 	Yes	Check if injector resistance is OK ☞ **page F–109** **Resistance: Approx. 14Ω** ⇨ If OK, check wiring between ECU and injector ☞ **page F–8** ⇨ If not OK, check injector for fuel leakage ☞ **page F–110**
		No	Check wiring between ECU and injector ☞ **page F–8**
14	Check if ECU terminal voltages are OK (2D, 2O and 2Q) ☞ **page F–125**	Yes	Go to next step
		No	Check for cause (Refer to "Check Point for Each Terminal") ☞ **page F–128**

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STEP	INSPECTION		ACTION
15	Check for correct fuel line pressure at idle ☞ **page F–100** **Fuel line pressure:** **265—314 kPa (2.7—3.2 kg/cm², 38—46 psi)** **(Vacuum hose to pressure regulator disconnected)**  	Yes	Check if fuel line pressure decreases when accelerating quickly ⇨ If decreases, check fuel pump maximum pressure ☞ **page F–105** If OK, check fuel line and filter for clogging ⇨ If no decreases, go to next step
		No	**Low pressure** Check for fuel line pressure while pinching fuel return hose ⇨ If fuel line pressure quickly increases, check pressure regulator ☞ **page F–108** ⇨ If fuel line pressure gradually increases, check for clogging between fuel pump and pressure regulator If no clogged, check fuel pump maximum pressure ☞ **page F–105**
16	Run engine several minutes at idle and check if fuel line pressure is held after ignition switch turned OFF ☞ **page F–99** **Fuel line pressure: More than 147 kPa (1.5 kg/cm², 21 psi) for 5 min.**  	Yes	**High pressure** Check if vacuum hose to pressure regulator is damaged or poorly connected ⇨ If OK, replace pressure regulator ☞ **page F–109** ⇨ If not OK, repair or replace hose
		No	Check injector for fuel leakage ☞ **page F–110**
17	Disconnect each injector connector at idle and check if engine speed decreases equally each time 	Yes	Go to next step
		No	Replace injector ☞ **page F–109**
18	Try known good ECU and check if condition improves ☞ **page F–123**		

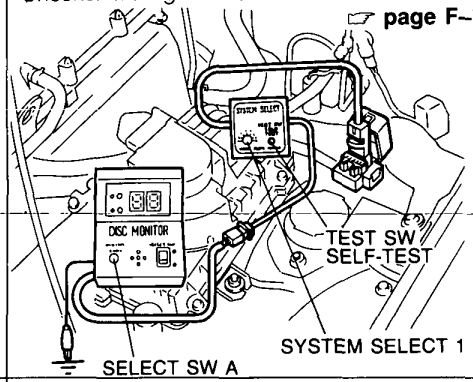
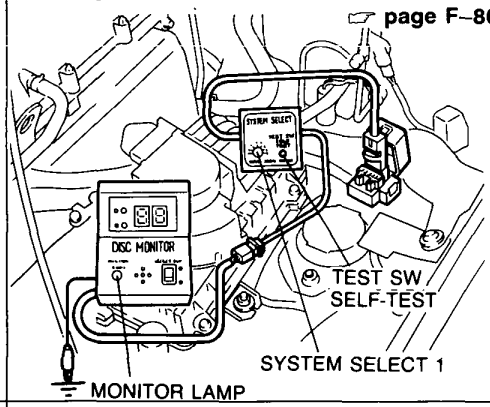
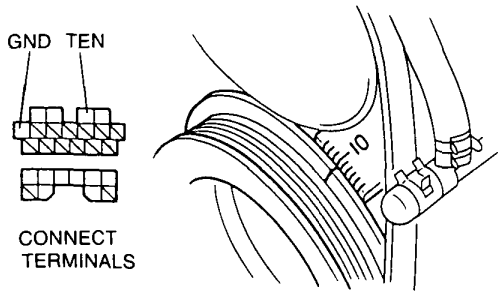
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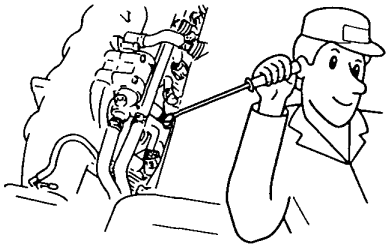
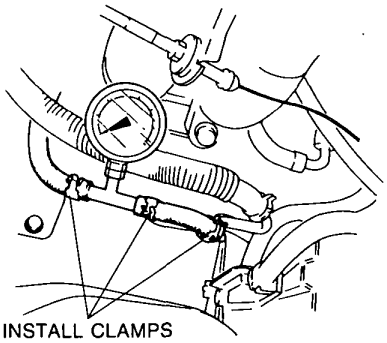
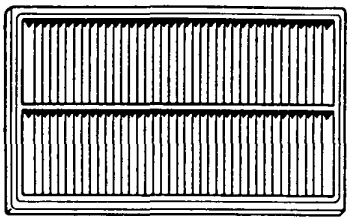
26	RUNS ROUGH ON DECELERATION/BACKFIRE
DESCRIPTION	• Engine runs rough while decelerating and abnormal combustion occurs in exhaust system

[TROUBLESHOOTING HINTS]

① Air/Fuel mixture too rich
- Air cleaner element clogged
- Fuel injection control malfunction (Fuel cut control)
- Injector fuel leakage
- Ignition timing misadjustment

STEP	INSPECTION		ACTION
1	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ **page F–74**  	Yes	Go to next step
		No	**Malfunction Code No. displayed** Check for cause (Refer to specified check sequence) ☞ **page F–77** **"88" flashes** Check ECU terminal 1F voltage ☞ **page F–124** **Voltage: Approx. 12V (Ignition switch ON)** ⇨ If OK, replace ECU ☞ **page F–123** ⇨ If not OK, check wiring between ECU and Self-Diagnosis Checker ☞ **page F–8**
2	Check switches for correct operation with Self-Diagnosis Checker Monitor Lamp with ignition switch ON ☞ **page F–86**  	Yes	Go to next step
		No	**Lamp not ON/OFF with specified switch** Check for cause (Refer to specified check sequence) ☞ **page F–87** **Lamp always ON** Check wiring between ECU terminal 1D and Self-Diagnosis Checker ☞ **page F–8**
3	Check for correct ignition timing at idle ☞ **page F–71** **Ignition timing: 10° ± 1° BTDC**  	Yes	Go to next step
		No	Adjust ☞ **page F–71**

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STEP	INSPECTION		ACTION
4	Check if fuel cut operation is OK during deceleration **Fuel cut: Above 1,900 rpm after warm-up** 	Yes	Go to next step
		No	Try known good ECU ☞ **page F–123**
5	Run engine several minutes at idle and check if fuel line pressure is held after ignition switch turned OFF ☞ **page F–99** **Fuel line pressure: More than 147 kPa (1.5 kg/cm^2, 21 psi) for 5 min.**  INSTALL CLAMPS	Yes	Go to next step
		No	Check injector for fuel leakage ☞ **page F–112**
6	Check if air cleaner element is clean ☞ **page F–71** 	Yes	Go to next step
		No	Replace ☞ **page F–71**
7	Try known good ECU and check if condition improves ☞ **page F–123**		

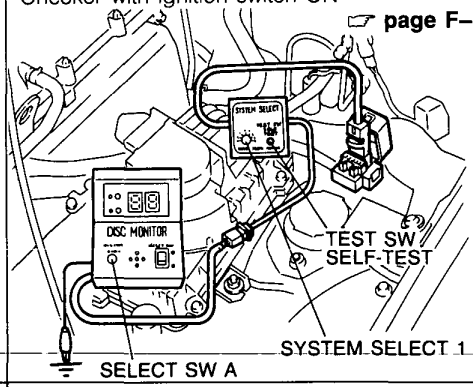
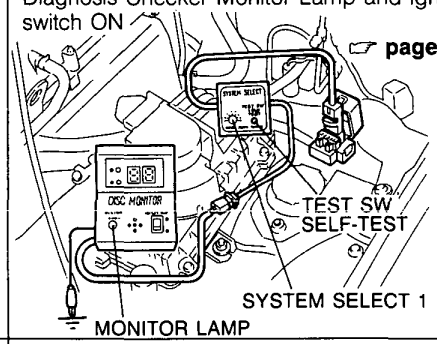
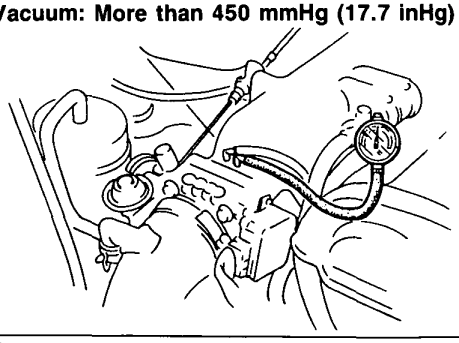
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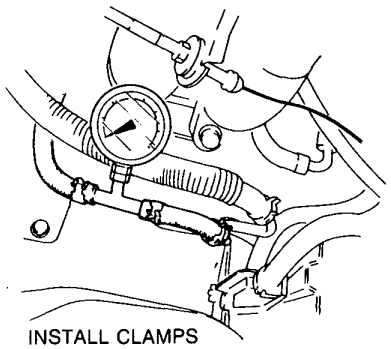
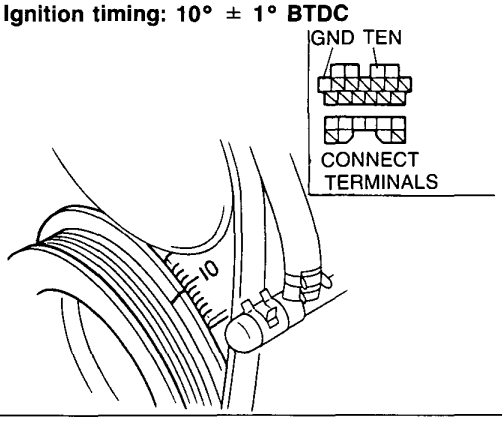
27 KNOCKING

[TROUBLESHOOTING HINTS]
① Air/Fuel mixture too lean
- Fuel injection amount incorrect
- Fuel line pressure decreases while accelerating

② Incorrect ignition timing (too advance)
③ Overheating
④ Carbon deposits in engine

STEP	INSPECTION		ACTION
1	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ page F–74 	Yes	Go to next step
		No	**Malfunction Code No. displayed** Check for cause (Refer to specified check sequence) ☞ page F–77
			"88" flashes Check ECU terminal 1F voltage ☞ page F–124 **Voltage: Approx. 12V (Ignition switch ON)** ⇨ If OK, replace ECU ☞ page F–123 ⇨ If not OK, check wiring between ECU and Self-Diagnosis Checker ☞ page F–8
2	Check switches for correct operation with Self-Diagnosis Checker Monitor Lamp and ignition switch ON ☞ page F–86 	Yes	Go to next step
		No	**Lamp not ON/OFF with specified switch** Check for cause (Refer to specified check sequence) ☞ page F–87
			Lamp always ON Check wiring between ECU terminal 1D and Self-Diagnosis Checker ☞ page F–8
3	Check if ECU terminal voltages are OK (2D, 2O and 2Q) ☞ page F–125	Yes	Go to next step
		No	Check for cause (Refer to "Check Point for Each Terminal") ☞ page F–124
4	Check for correct intake manifold vacuum at idle **Vacuum: More than 450 mmHg (17.7 inHg)** 	Yes	Go to next step
		No	Check for air leakage of intake air system components ☞ page F–90
5	Check if air cleaner element is clean ☞ page F–71	Yes	Go to next step
		No	Replace air cleaner element ☞ page F–89
6	Check for correct engine compression ☞ page B–10 **Engine compression: 1,324—932 kPa (13.5—9.5 kg/cm², 192—135 psi) - 300 rpm**	Yes	Go to next step
		No	**High compression** Check engine condition ☞ page B–10 • Carbon deposits

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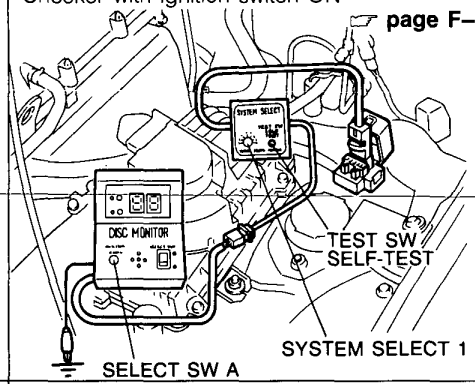
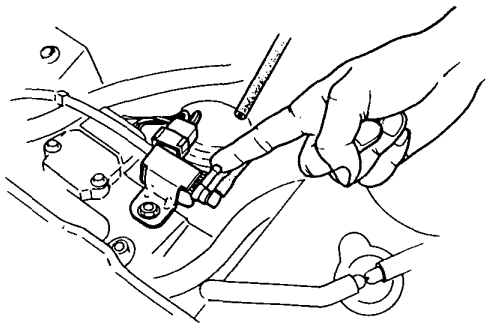
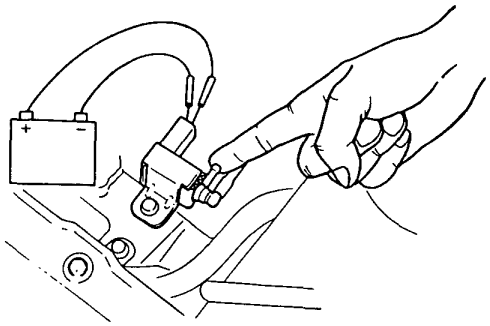
STEP	INSPECTION		ACTION
7	Check for correct fuel line pressure at idle ☞ **page F–100** **Fuel line pressure:** **265—314 kPa (2.7—3.2 kg/cm², 38—46 psi)** **(Vacuum hose to pressure regulator disconnected)**  INSTALL CLAMPS	Yes	Check if fuel line pressure decreases when accelerating quickly ⇨ If decreases, check for clogging between fuel pump and pressure regulator ⇨ If no decrease, go to next step
		No	**Low pressure** Check for fuel line pressure while pinching fuel return hose ⇨ If fuel line pressure quickly increases, check pressure regulator ☞ **page F–108** ⇨ If fuel line pressure gradually increases, check for clogging between fuel pump and pressure regulator If not clogged, check fuel pump maximum pressure ☞ **page F–105**
8	Check for correct ignition timing at idle ☞ **page F–71** **Ignition timing: 10° ± 1° BTDC**  	Yes	Check if ignition timing advances when accelerating ⇨ If advances, go to next step ⇨ If no advance, replace ECU ☞ **page F–123**
		No	Adjust ☞ **page F–71**
9	Check if cooling system is OK ☞ **page E–3**	Yes	Go to next step
		No	Repair or replace • Thermostat ☞ **page E–8** • Electric cooling fan ☞ **page B–11** • Radiator ☞ **page E–7**
10	Try known good ECU and check if condition improves ☞ **page F–124**	Yes	Replace ECU
		No	Change fuel to another brand or use higher octane fuel

95E0FX-034

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28	FUEL ODOR
DESCRIPTION	• Gasoline odor in cabin

[TROUBLESHOOTING HINTS]
① Poor connection or damaged fuel system or evaporative emission control system
② Charcoal canister overflow due to evaporative emission control system malfunction

STEP	INSPECTION		ACTION
1	Check if fuel leak or damage are visible at fuel system and evaporative emission control system	Yes	Repair or replace ☞ **page F–97**
		No	Go to next step
2	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ **page F–74** 	Yes	Go to next step
		No	**Malfunction Code No. displayed** Check for cause (Refer to specified check sequence) ☞ **page F–77** **"88" flashes** Check ECU terminal 1F voltage ☞ **page F–124** **Voltage: Approx. 12V (Ignition switch ON)** ⇨ If OK, replace ECU ☞ **page F–123** ⇨ If not OK, check wiring between ECU and Self-Diagnosis Checker ☞ **page F–8**
3	Check if vacuum is felt at solenoid valve (purge control) with engine running and throttle valve opened (Neutral switch connector disconnected) 	Yes	Go to Step 5
		No	Check for solenoid valve operating sound in this condition ⇨ If OK, check vacuum hoses for clogging ☞ **page F–6** ⇨ If not OK, go to next step
4	Apply 12V and ground to solenoid valve (purge control) and check if air flows through valve 	Yes	Check ECU terminal 2X voltage ☞ **page F–126**
		No	Replace solenoid valve ☞ **page F–116**
5	Try known good ECU ☞ **page F–123**		

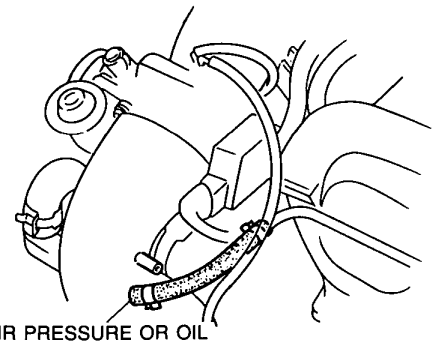
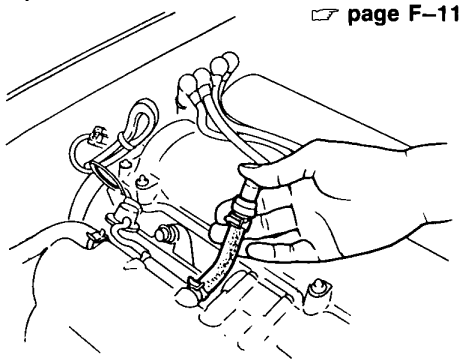
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29	EXHAUST SULFER SMELL
DESCRIPTION	• Exhaust gas smells abnormal (Rotten egg smell)
[TROUBLESHOOTING HINTS] High sulfer content fuel used	

STEP	INSPECTION	ACTION
1	Change fuel to another brand	

05U0FX-046

30	HIGH OIL CONSUMPTION		
[TROUBLESHOOTING HINTS] ① PCV system malfunction ② Engine malfunction (Oil working up, working down, or leakage)			
STEP	INSPECTION		ACTION
1	Check if PCV hose, ventilation hose or their attaching nipples are separated, damaged, clogged, or restricted ☞ **page F–114**	Yes	Repair or replace ☞ **page F–114**
		No	Go to next step
2	Check if air pressure or oil is present at ventilation hose  AIR PRESSURE OR OIL	Yes	Go to next step
		No	Check engine condition ☞ **page B–3** • Oil leakage • Worn valve seal • Worn valve stem • Worn valve guide
3	Check if vacuum is felt at PCV valve at idle ☞ **page F–114** 	Yes	Check engine condition ☞ **page B–3** • Worn piston ring groove • Stuck piston ring • Worn piston or cylinder
		No	Replace PCV valve ☞ **page F–114**

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31 POOR FUEL ECONOMY

[TROUBLESHOOTING HINTS]
While fuel consumption is drastically increased during city driving, short-run operation, stop and go driving, extended winter warm-up periods, etc., as opposed to "trip" mileage, an attempt should be made to determine these factors when confronted with "poor mileage" conditions. However, since the operator is not always at fault, the following is offered.

① Operator depressing accelerator more than usual due to low engine power
- Poor ignition
- Low intake air amount
- Electric spark advance control malfunction
- Clutch slipping
- Exhaust component restricted

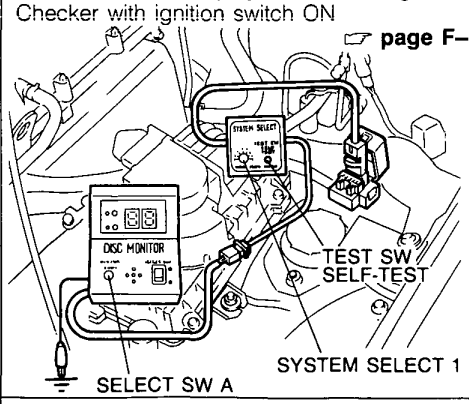
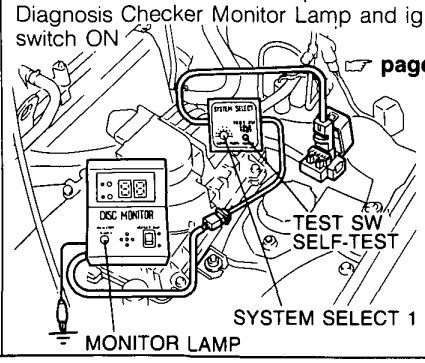
② Air/Fuel mixture too rich
- High fuel line pressure

③ Alcohol blended fuel used

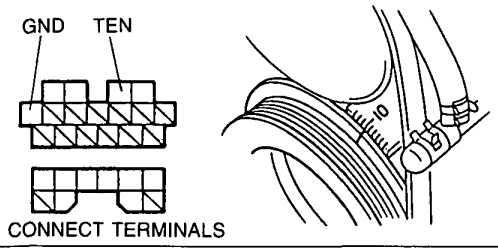
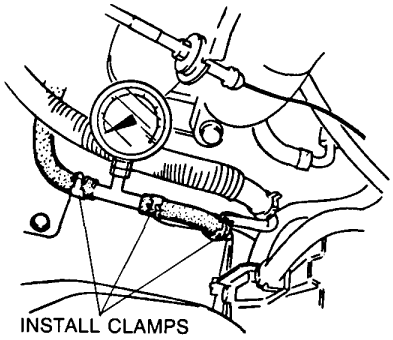
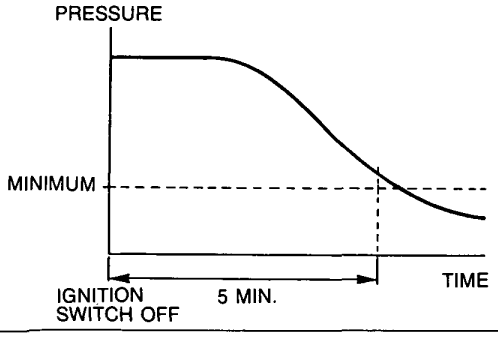
④ High vehicle load
- Low tire pressure
- Unrecommended tire used
- Brake dragging

⑤ Fuel cut control malfunction

⑥ High idle speed
(Refer to page F–36)

STEP	INSPECTION		ACTION
1	Check factors other than engine • Low tire pressure ☞ **page Q–3** • Unrecommended tire used ☞ **page Q–2** • Clutch slipping ☞ **page H–3** • Brake dragging ☞ **page P–27** • Exhaust component resticted ☞ **page F–112**	Yes	Go to next step
		No	Repair
2	Check if air hoses are connected correctly ☞ **page F–90**	Yes	Go to next step
		No	Repair ☞ **page F–90**
3	Check if air cleaner element is clean ☞ **page F–71**	Yes	Go to next step
		No	Replace ☞ **page F–71**
4	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ **page F–74** 	Yes	Go to next step
		No	**Malfunction Code No. displayed** Check for cause (Refer to specified check sequence) ☞ **page F–77** **"88" flashes** Check ECU terminal 1F voltage ☞ **page F–124** **Voltage: Approx. 12V (Ignition switch ON)** ⇨ If OK, replace ECU ☞ **page F–123** ⇨ If not OK, check wiring between ECU and Self-Diagnosis Checker ☞ **page F–8**
5	Check switches for correct operation with Self-Diagnosis Checker Monitor Lamp and ignition switch ON ☞ **page F–86** 	Yes	Go to next step
		No	**Lamp not ON/OFF with specified switch** Check for cause (Refer to specified check sequence) ☞ **page F–87** **Lamp always ON** Check wiring between ECU terminal 1F and Self-Diagnosis Checker ☞ **page F–8**

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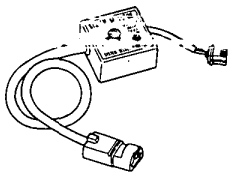
STEP	INSPECTION		ACTION
6	Check if ECU terminal voltages are OK (2D, 2N, 2O, 2P, 2Q, 2U and 2V) ☞ page F–125	Yes	Go to next step
		No	Check for cause (Refer to "Check Point for Each Terminal") ☞ page F–128
7	Check if fuel cut operation is OK during deceleration **Fuel cut: Above 2,200 rpm after warm-up**	Yes	Go to next step
		No	Try known good ECU ☞ page F–123
8	Check for correct ignition timing at idle ☞ page F–71 **Ignition timing: 10° ± 1° BTDC** 	Yes	Go to next step
		No	Adjust ☞ page F–71
9	Check for correct fuel line pressure at idle ☞ page F–108 **Fuel line pressure: 216—265 kPa (2.2—2.7 kg/cm², 31—38 psi)** 	Yes	Go to next step
		No	**High pressure** Check if vacuum hose to pressure regulator is damaged or poorly connected ⇨ If OK, replace pressure regulator ☞ page F–109 ⇨ If not OK, repair or replace hose
10	Run engine several minutes at idle and check if fuel line pressure is held after ignition switch turned OFF ☞ page F–99 **Fuel line pressure: More than 147 kPa (1.5 kg/cm², 21 psi) for 5 min.** 	Yes	Go to next step
		No	Check injector for fuel leakage ☞ page F–110
11	Change fuel to another brand		

95E0FX-037

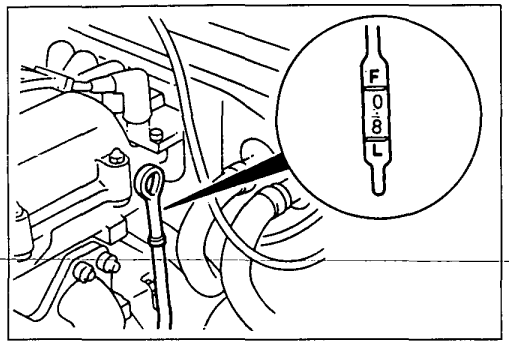
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ENGINE TUNE-UP

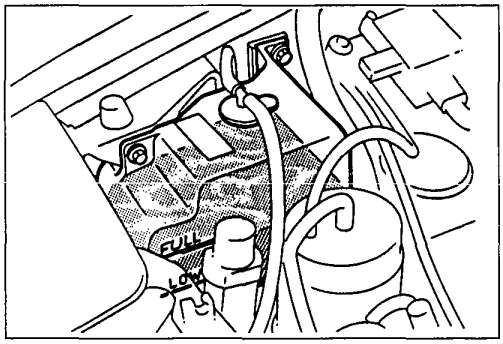
PREPARATION
SST

System Selector 	For inspection of ignition timing and idle speed

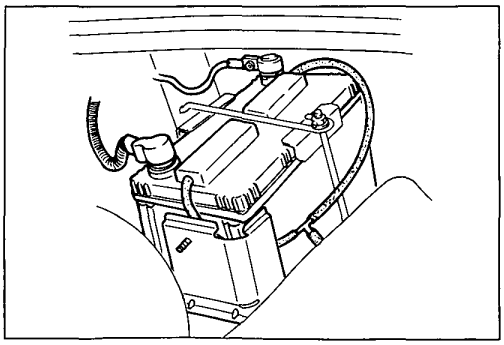
05U0FX-052



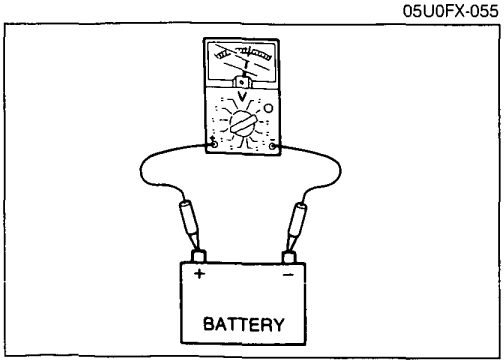
05U0FX-053



05U0FX-054



05U0FX-055



05U0FX-056

BASIC INSPECTION
Engine Oil

1. Be sure the vehicle is on level ground.
2. Warm up the engine to normal operating temperature and stop it.
3. Wait for five minutes.
4. Remove the oil level gauge and check the oil level and condition.
5. Add or replace oil if necessary.

Note
- **The distance between the L and F marks on the level gauge represents 0.8 liter (0.85 US qt, 0.70 Imp qt).**

Coolant Level (Cold engine)

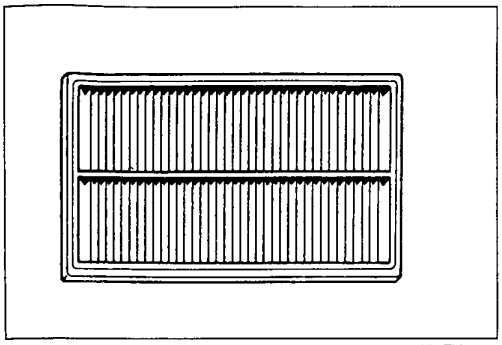
Warning
- **Never remove the radiator cap while the radiator and engine are hot.**
- **Wrap a thick cloth around the cap while carefully removing it.**

1. Verify that the coolant level is at the bottom of the radiator filler neck.
2. Verify that the level in the coolant reservoir is between the FULL and LOW marks. Add coolant if necessary.

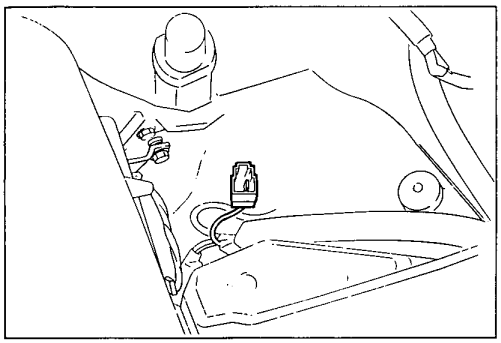
Battery

1. Check for loose or corroded terminals and connections.
2. Clean and tighten the connections as necessary.
3. Measure the battery voltage. If the voltage is **12.6V or less**, recharge the battery. (Refer to Section G.)

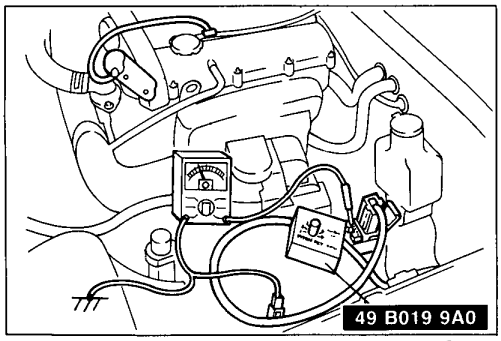
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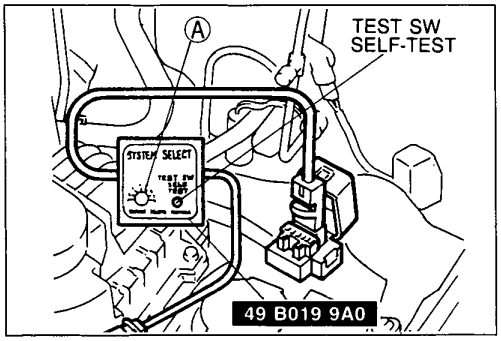
05U0FX-057



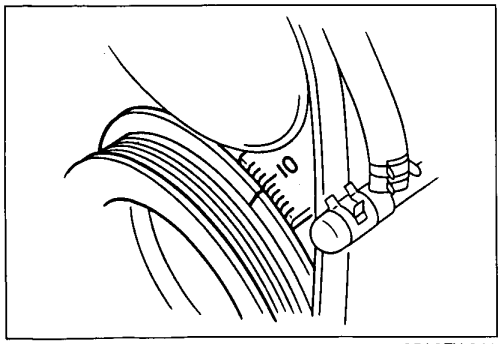
05U0FX-058



05U0FX-059



95E0FX-038



95A0FX-041

Air Cleaner Element

Caution
- **Do not clean the air cleaner element with compressed air.**

Visually check the air cleaner element for excessive dirt, damage, or oil. Replace if necessary.

ADJUSTMENT

Preparation

1. Check the condition of the engine (spark plugs, leaks in hoses, etc.).
2. Make sure all accessories are OFF.
3. Warm up the engine to normal operating temperature.

Note
- **When using an externally powered timing light and/or tachometer connect it to the power connector (Blue: 1-pin).**

Warning
- **Do not ground the power connector terminal (Blue: 1-pin); the wiper 20A fuse will be burned.**

4. Connect a timing light and tachometer to the diagnosis connector terminal IG–.

Ignition Timing

Caution
- **Be extremely careful when making connections to the diagnosis connector as a mistaken connection will cause a malfunction.**

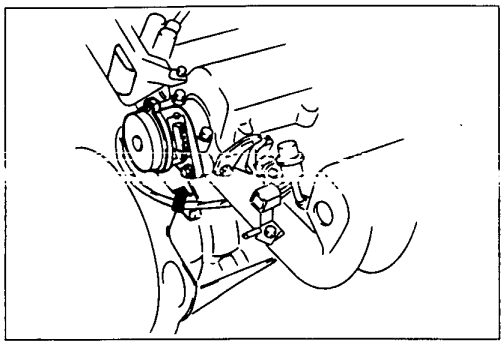
1. Connect the **SST** to the diagnosis connector.
2. Set switch Ⓐ to position 1.
3. Set TEST SW to SELF-TEST.
4. Check the idle speed, and set it to specification if necessary. (Refer to page F–72.)

Idle speed: 850 ± 50 rpm

5. Verify that the timing mark (Yellow) on the crankshaft pulley and the timing belt cover are aligned.

Ignition timing: 10° ± 1° BTDC (at idle)

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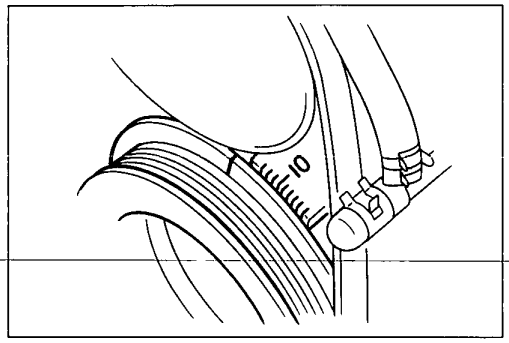


95A0FX-042

6. If the marks are not aligned, loosen the crank angle sensor lock bolt, and turn the crank angle sensor to make the adjustment.
7. Tighten the crank angle sensor lock bolt to the specified torque.

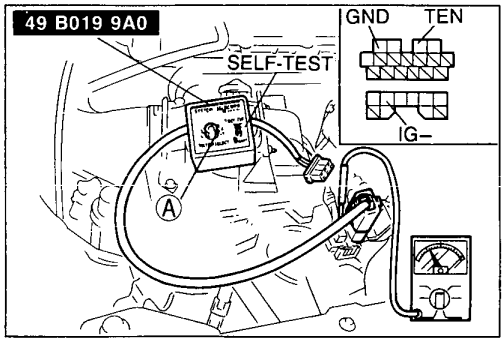
Tightening torque:
19—25 N·m (1.9—2.6 m-kg, 14—19 ft-lb)

8. After adjusting the ignition timing, disconnect the **SST** or jumper wire from the diagnosis connector.



95A0FX-043

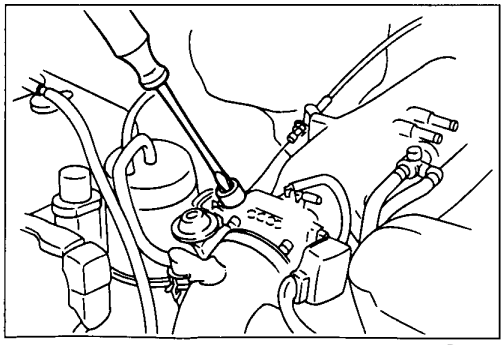
9. Increase the engine speed and verify that the ignition timing advances.



95A0FX-044

Idle Speed

1. Connect the **SST** to the diagnosis connector.
2. Set switch Ⓐ to position 1.
3. Set TEST SW to SELF-TEST.



95A0FX-045

4. Verify that the idle speed is within specification.

Idle speed: 850 ± 50 rpm

5. If the idle speed is not within specification, remove the blind cap from the air adjusting screw and adjust it.
6. After adjusting the idle speed, install the blind cap and disconnect the **SST** or jumper wire from the diagnosis connector.

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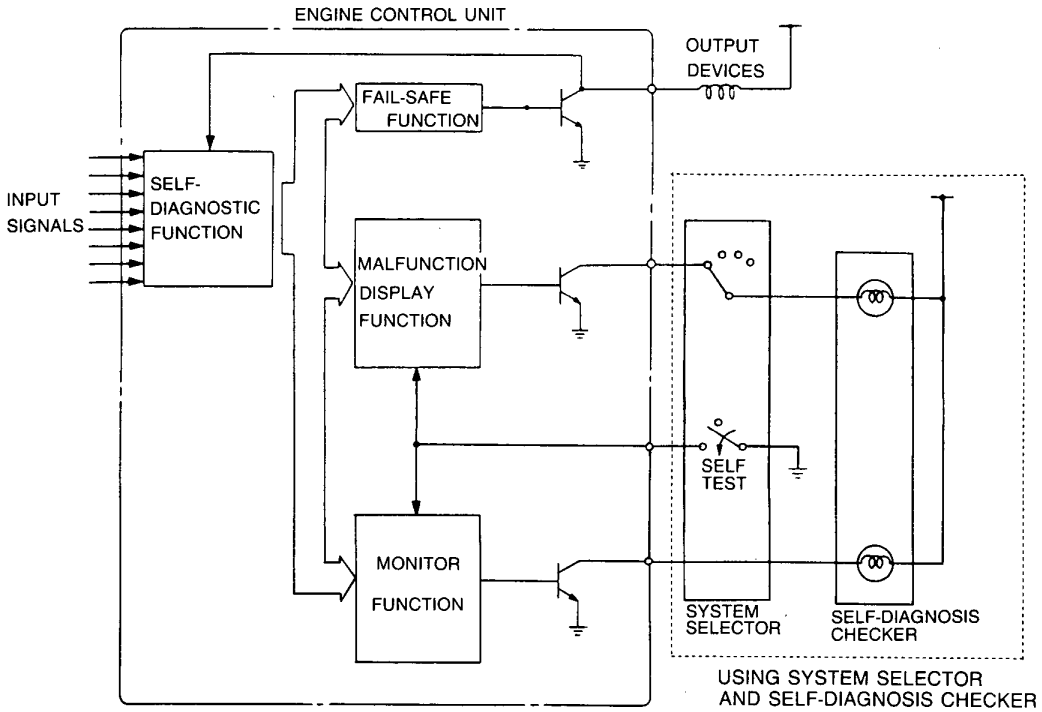
SELF-DIAGNOSIS FUNCTION

DESCRIPTION

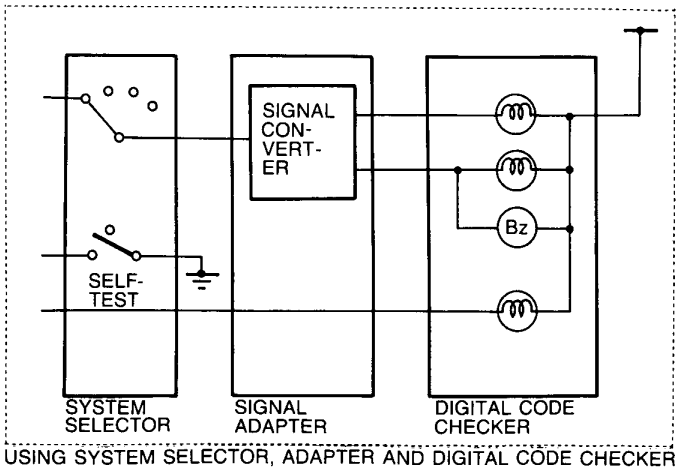
When troubles occur in the main input devices or output devices, check for the cause using the **SST**. Failures of each input and output device are indicated and retrieved from the engine control unit as malfunction code numbers.

Note

- **The engine control unit constantly checks for malfunction of the input devices.**
- **But, the engine control unit checks for malfunction of output devices only in a 3 second period after the ignition switch is turned ON and the diagnosis connector terminal (TEN) is grounded.**



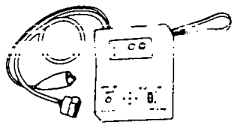
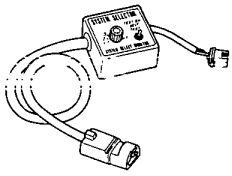
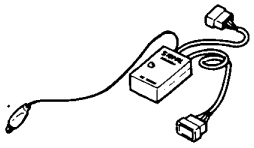
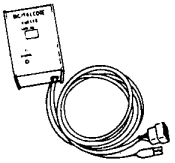
USING SYSTEM SELECTOR AND SELF-DIAGNOSIS CHECKER



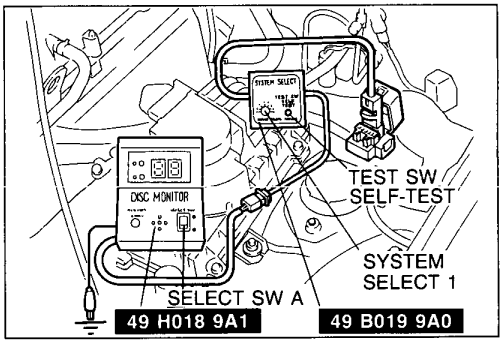
USING SYSTEM SELECTOR, ADAPTER AND DIGITAL CODE CHECKER

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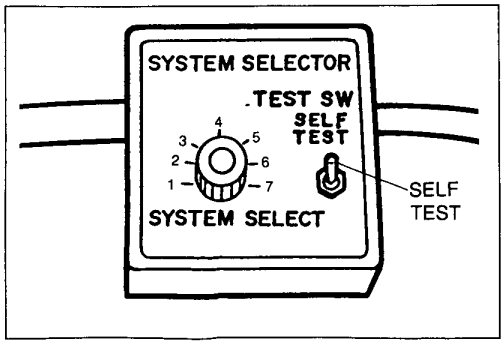
PREPARATION
SST

49 H018 9A1 Rear Diagnosis Checker 	For diagnosis	49 B019 9A0 System Selector 	For diagnosis
49 9200 180 Signal adapter 	For diagnosis	49 G018 9A0 Digital code checker 	For diagnosis

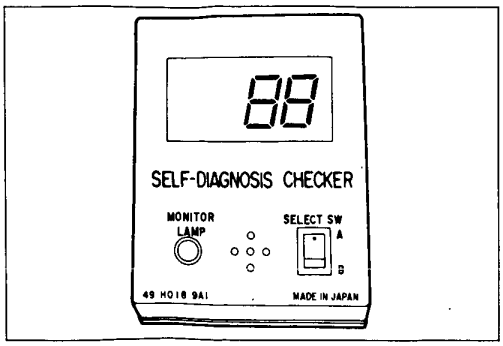
95A0FX-046



95A0FX-047



05U0FX-069



95E0FX-039

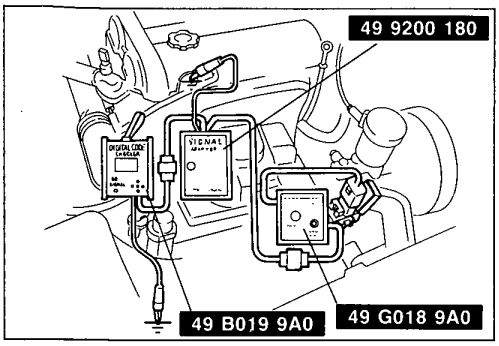
MALFUNCTION CODE NUMBER
Inspection procedure
Using self-diagnosis checker

1. Connect the **SSTs** to the diagnosis connector and a ground.
2. Set the select switch to position A.
3. Set the System Selector to position 1 and SELF TEST as shown.
4. Turn the ignition switch ON.
5. Verify that **88** flashes on the digital display and that the buzzer sounds for **3 sec.** after turning the ignition switch ON.
6. If **88** does not flash, check the main relay, (Refer to page F–135.) power supply circuit, and check connector wiring.
7. If **88** flashes and the buzzer continues for more than **20 sec.**, check for a short circuit between the engine control unit terminal 1F and the diagnosis connector. Replace the engine control unit if necessary and perform Steps 3 and 4 again.
8. Note any code numbers and check for the causes by referring to the check sequences shown on pages F–78 to F–84. Repair as necessary.

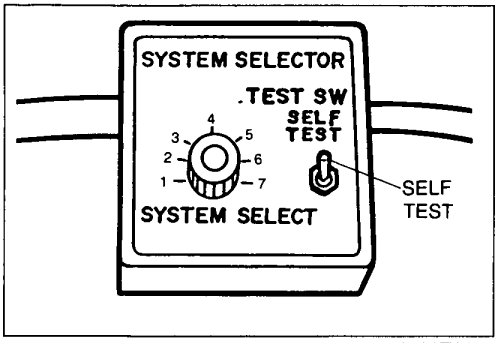
Note

- **Cancel the code numbers by performing the after-repair procedure following repairs. (Refer to page F–85.)**

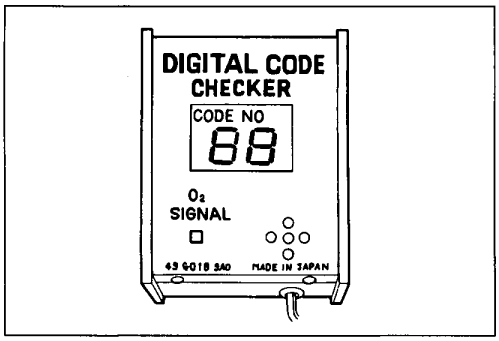
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95A0FX-049



95A0FX-050



95E0FX-040

Using digital code checker and signal adapter

1. Connect the **SSTs** to the diagnosis connector and ground.
2. Set the system selector to position 1 and SELF TEST as shown.
3. Turn the ignition switch ON.
4. Verify that **88** flashes on the digital display for **3 sec.** after turning the ignition switch ON.
5. If **88** does not flash, check the main relay, (Refer to page F–135.) power supply circuit, and check connector wiring.
6. If **88** flashes continues for more than **20 sec.**, check for a short circuit between the engine control unit terminal 1F and the diagnosis connector.
   Replace the engine control unit if necessary and perform Steps 2 and 3 again.
7. Note any code numbers and check for the causes by referring to the check sequences shown on pages F–78 to F–84. Repair as necessary.

Note

- **Cancel the code numbers by performing the adter-repair procedure following repairs. (Refer to page F–85.)**

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Principle of Code Cycle

Malfunction codes are determined as shown below.

1. Code cycle break

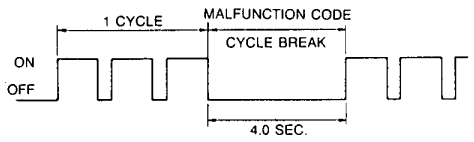
Using self-diagnosis checker

The time between malfunction code cycles is 4.0 seconds.

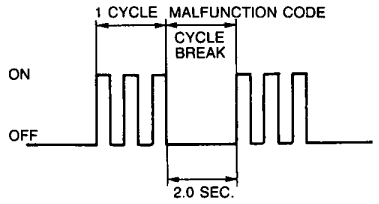
Using digital code checker with signal adapter

The time between malfunction code cycles is 2.0 seconds.

SELF-DIAGNOSIS CHECKER



DIGTAL CODE CHECKER WITH SIGNAL ADAPTER



95A0FX-052

2. Second digit of malfunction code (ones position)

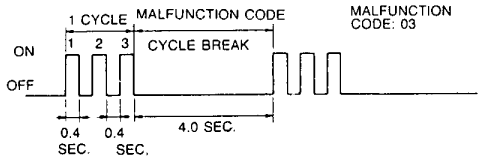
Using self-diagnosis checker

The digit in the ones position of the malfunction code represents the number of times the checker buzzer sounds 0.4 second during one cycle.

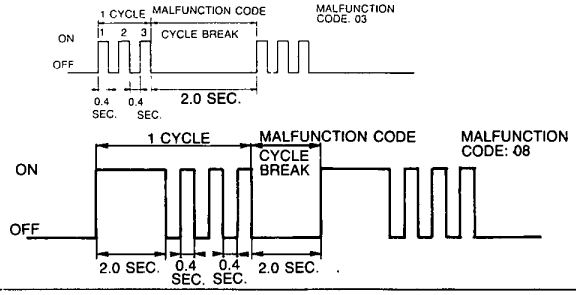
Using digital code checker with signal adapter

The digit in the ones position of the malfunction code represents the number of times the checker buzzer sounds 0.4 second (No.1—4) or 2.0 seconds plus 0.4 second (No.5—9) during one cycle.

SELF-DIAGNOSIS CHECKER



DIGTAL CODE CHECKER WITH SIGNAL ADAPTER



95A0FX-053

3. First digit of malfunction code (tens position)

Using self-diagnosis checker

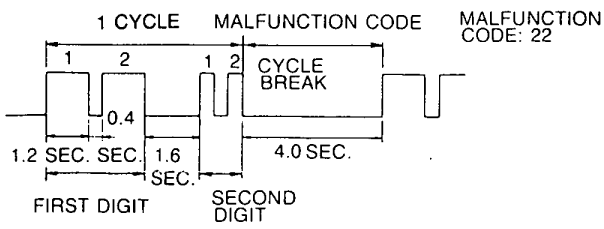
The digit in the tens position of the malfunction code represents the number of times the checker buzzer sounds 1.2 seconds during one cycle.

The buzzer remains off for 1.6 seconds between the long and short pulses.

Using digital code checker with signal adapter

The checker does not sound.

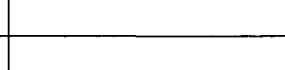
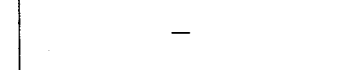
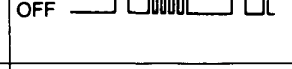
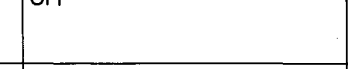
SELF-DIAGNOSIS CHECKER



95A0FX-054

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Code Numbers

Malfunction display			Sensor or subsystem	Self-diagnosis	Fail-safe
Code No.	Pattern of output signal				
	Self-Diagnosis Checker	Digital Code Checker and Signal Adapter			
01			Ignition pulse	No IGf signal	—
02			Ne-signal	No Ne-signal	—
03			G-signal	No G-signal	Cancels 2-group injection and electronic spark distribution
08			Airflow meter	Open or short circuit	Basic fuel injection amount fixed as for two driving modes (1) Idle switch: ON (2) Idle switch: OFF
09			Water thermosensor	Open or short circuit	Maintains constant 20°C (68°F) command for EGI 80°C (176°F) command for ISC
10		—	Intake air thermosensor (Airflow meter)	Open or short circuit	Maintains constant 20°C (68°F) command
14			Atmospheric pressure sensor (Engine control unit)	Open or short circuit	Maintains constant command of sea level pressure
15			Oxygen sensor	Sensor output continues less than 0.55V 120 sec. after engine exceeds 1,500 rpm	Cancels engine feedback operation
17			Feedback system	Sensor output continues unchanged max 80 sec. after engine exceeds 1,500 rpm	Cancels engine feedback operation
26			Solenoid valve (Purge control)	Open or short circuit	—
34			Solenoid valve (Idle speed control)		—

95A0FX-111

Caution

- **If there is more than one failure present, the lowest number malfunction code is displayed first, the subsequent malfunction codes appear in order.**
- **After repairing all failures, turn the ignition switch OFF, disconnect the negative battery cable, and depress the brake pedal for 5 seconds to erase the malfunction code memory of the engine control unit.**
- **The buzzer sounds only for the ones position when using the Digital Code Checker. To judge the correct malfunction code number, refer to the digital display.**

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Troubleshooting

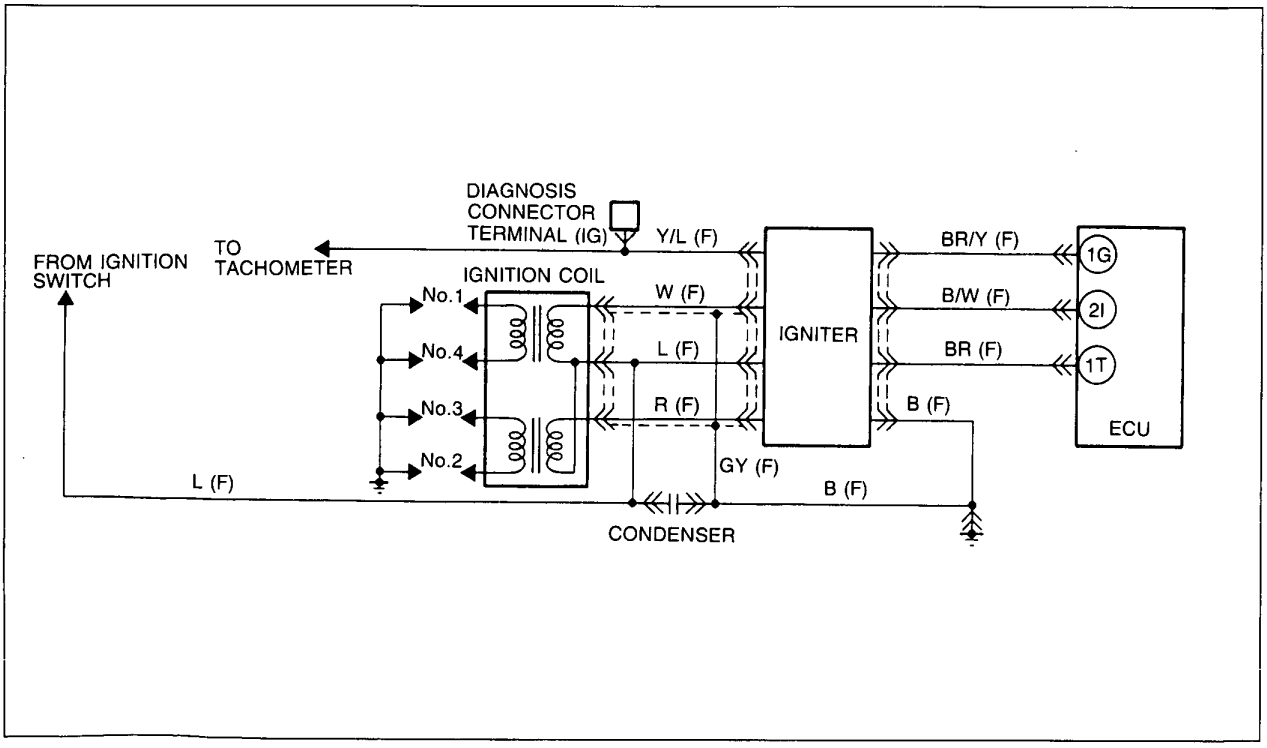
If a malfunction code number is shown on the **SST**, check for the cause by using the chart related to the code number shown.

CODE No.01 IGf-SIGNAL

STEP	INSPECTION		ACTION
1	Are there any poor connections at ignition coil connectors and igniter connectors?	Yes	Repair or replace connector
		No	Go to next step
2	Does tachometer operates?	Yes	Go to next step
		No	Check for open circuit in wiring from igniter to ECU terminal 2I
3	Is resistance of ignition coil OK? Resistance: Primary 0.78—0.94Ω Secondary 11.2—15.2 kΩ	Yes	Go to next step
		No	Replace ignition coil (Refer to page G–21)
4	Is there continuity between ignition coil and igniter? Ignition coil: A (W), B (Y) Igniter: A (W), H (Y)	Yes	Go to next step
		No	Check for open circuit in wiring from ignition coil to igniter
5	Is ignition coil terminal wire (L) voltage OK? (Refer to page G–21)	Yes	Go to next step
		No	Check for open circuit in wiring from ignition coil to ignition switch
6	Is igniter terminal-wire (L) voltage OK? (Refer to page G–22)	Yes	Go to next step
		No	Check for open circuit in wiring from igniter to ignition switch
7	Is there continuity between igniter and ground?	Yes	Go to next step
		No	Check for open circuit in wiring from igniter to ground
8	Check igniter (Refer to page G–22)	Yes	Replace ECU (Refer to page F–123)
		No	Replace igniter (Refer to page G–22)

95E0FX-041

Circuit Diagram



05U0FX-077

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CODE No.02 Ne-SIGNAL

STEP	INSPECTION		ACTION
1	Are there any poor connections in crank angle sensor circuit?	Yes	Repair or replace connector
		No	Go to next step
2	Is Code No.03 present at same time?	Yes	Go to next step
		No	Go to Step 5
3	Is there continuity between crank angle sensor terminal-wire (B/LG) and ground?	Yes	Go to next step
		No	Check for open circuit in wiring from crank agnle sensor to ground
4	Is there battery voltage at crank angle sensor terminal-wire (W/R)?	Yes	Go to next step
		No	Check for open circuit in wiring from crank angle sensor to main relay
5	Is there continuity between crank angle sensor and ECU?	Yes	Go to next step
	Crank angle sensor: C (W) — ECU: 2E	No	Check for open circuit in wiring from crank angle sensor to ECU
6	Is there approx. 5V at ECU terminal 2E? (With crank angle sensor connector disconnected)	Yes	Go to next step
		No	Replace ECU (Refer to page F–123)
7	Is there approx. 5V at crank angle sensor terminal-wire (W)? (At harness-side connector with connector disconnected)	Yes	Replace crank angle sensor (Refer to page F–130)
		No	Check for short circuit in wiring from crank angle sensor to ECU

95E0FX-042

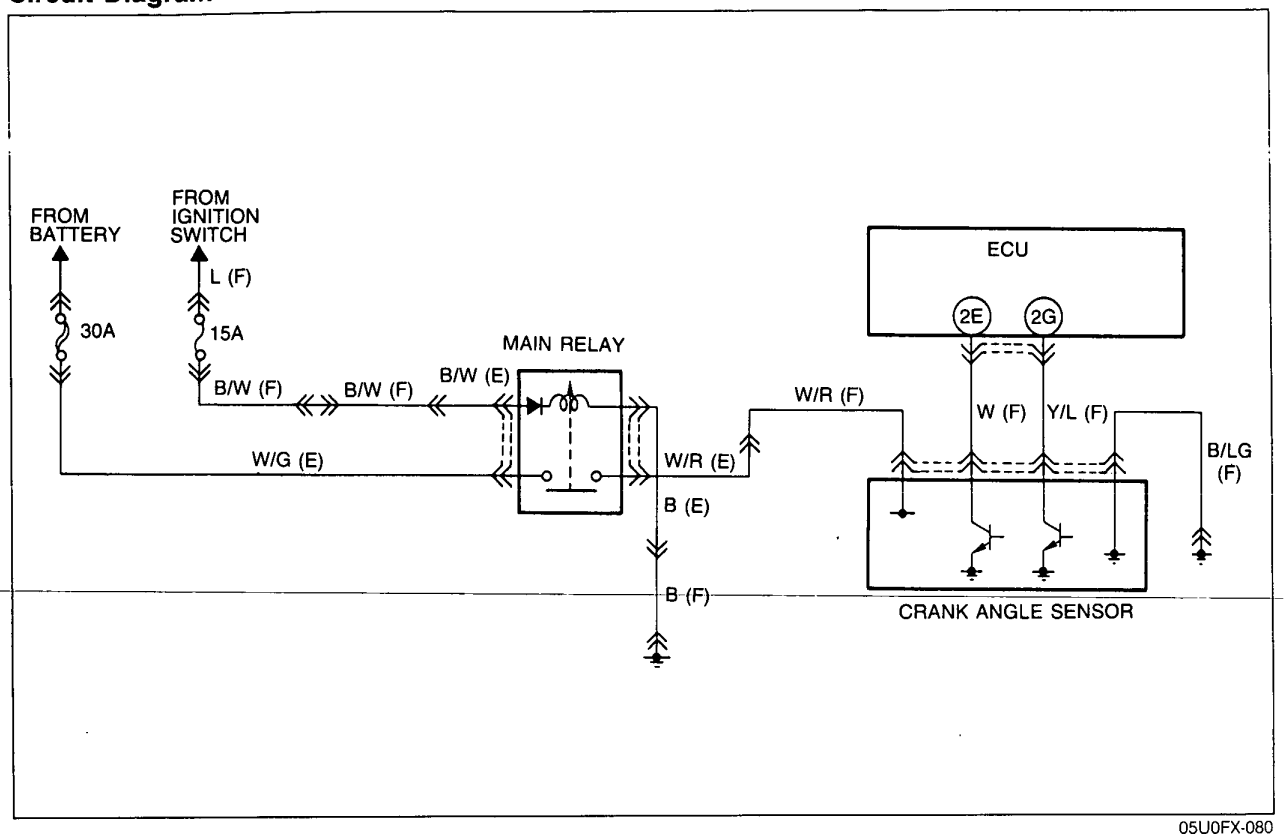
CODE No.03 G-SIGNAL

STEP	INSPECTION		ACTION
1	Are there any poor connections in crank angle sensor circuit?	Yes	Repair or replace connector
		No	Go to next step
2	Is Code No.02 also present?	Yes	Go to next step
		No	Go to Step 5
3	Is there continuity between crank angle sensor terminal-wire (B/LG) and ground?	Yes	Go to next step
		No	Check for open circuit in wiring from crank angle sensor to ground
4	Is there battery voltage at crank angle sensor terminal-wire (W/R)?	Yes	Go to next step
		No	Check for open circuit in wiring from crank angle sensor to main relay
5	Is there continuity between crank angle sensor and ECU?	Yes	Go to next step
	Crank angle sensor: D (Y/L) — ECU: 2G	No	Check for open circuit in wiring from crank angle sensor to ECU
6	Is there approx. 5V at ECU terminal 2E? (With crank angle sensor connector disconnected)	Yes	Go to next step
		No	Replace ECU (Refer to page F–123)
7	Is there approx. 5V at crank angle sensor terminal-wire (Y/L)? (At harness-side connector with connector disconnected)	Yes	Replace crank angle sensor (Refer to page F–130)
		No	Check for short circuit in wiring from crank angle sensor to ECU

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Circuit Diagram



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CODE No.08 AIRFLOW METER

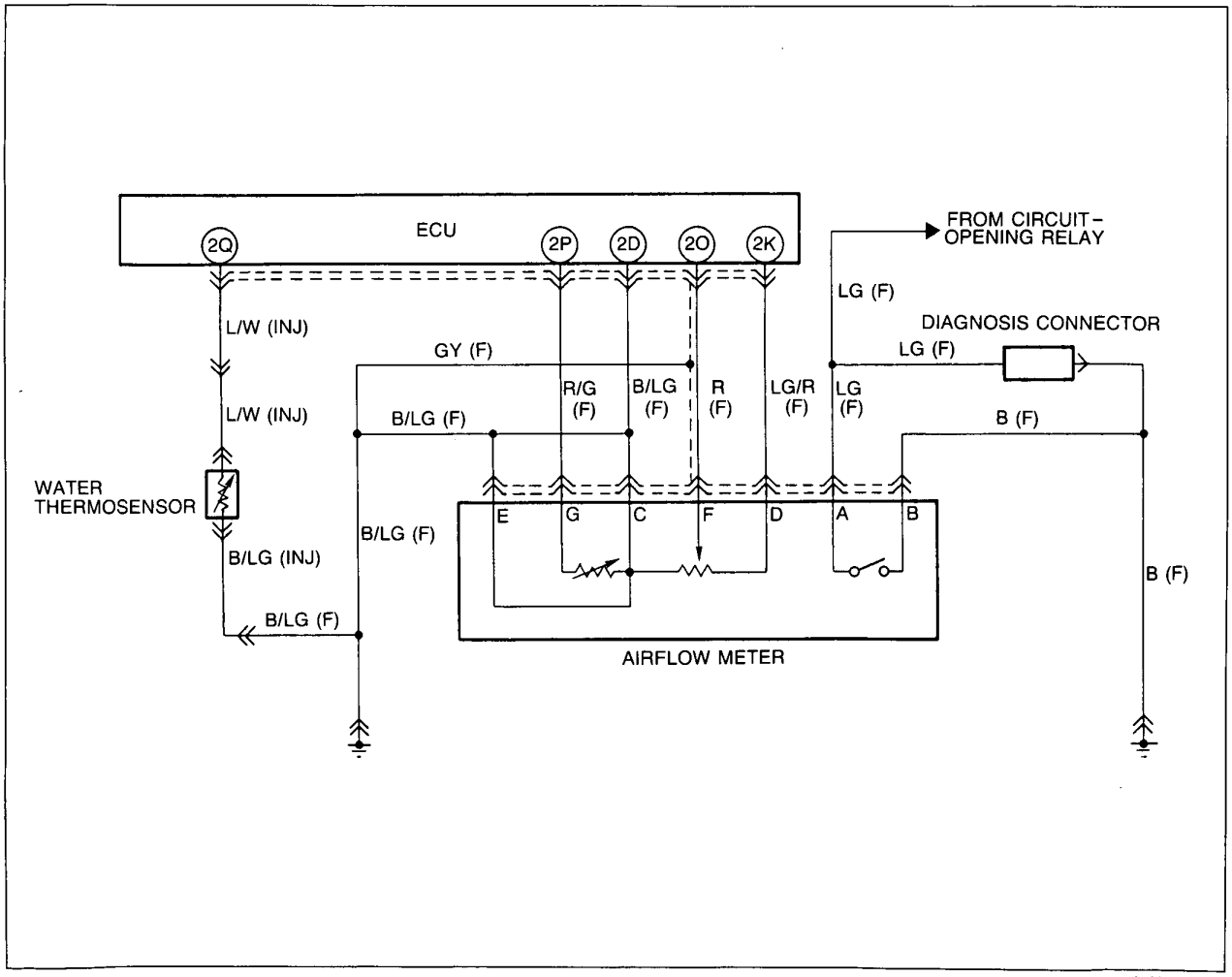
STEP	INSPECTION		ACTION
1	Are there any poor connections in airflow meter circuit?	Yes	Repair or replace connector
		No	Go to next step
2	Is Code No.10 present at same time?	Yes	Check for open circuit in wiring from airflow meter terminal-wire (B/LG) to ground
		No	Go to next step
3	Is resistance of airflow meter OK?	Yes	Go to next step
		No	Replace airflow meter (Refer to page F–131)
4	Is there continuity between airflow meter connector and ECU?	Yes	Go to next step
		No	Check for open circuit in wiring from airflow meter to ECU
5	Are ECU terminals 2D and 2K voltages OK? (Refer to page F–125)	Yes	Replace ECU (Refer to page F–123)
		No	Check for short circuit in wiring from airflow meter to ECU

Airflow meter	Fully closed Ω	Fully open Ω
D (LG/R)—F (R)	200—600	20—1,000
D (LG/R)—C (B/LG)	200—400	

Airflow meter	ECU
D (LG/R)	2K
F (R)	2O

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Circuit Diagram



05U0FX-082

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CODE No.09 WATER THERMOSENSOR

STEP	INSPECTION		ACTION
1	Are there any poor connections in water thermosensor circuit?	Yes	Repair or replace connector
		No	Go to next step
2	Is there continuity between water thermosensor and ECU?	Yes	Go to next step
	Water thermosensor — ECU: A (L/W) — 2Q; B (B/LG) — 2D	No	Check for open circuit in wiring from water thermosensor to ECU
3	Is resistance of water thermosensor OK?	Yes	Go to next step
	Coolant temp. / Resistance: −20°C (−4°F) — 14.6—17.8 kΩ; 20°C (68°F) — 2.2—2.7 kΩ; 80°C (176°F) — 290—350Ω	No	Replace water thermosensor (Refer to page F–132)
4	Is same Code No. present after performing after-repair procedure? (Refer to page F–85)	Yes	Go to next step
		No	Water thermosensor and circuit OK
5	Are ECU terminals 2Q and 2D voltages OK? (Refer to page F–125)	Yes	Replace ECU (Refer to page F–123)
		No	Check for short circuit in wiring from water thermosensor to ECU

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CODE No.10 INTAKE AIR THERMOSENSOR (IN AIRFLOW METER)

STEP	INSPECTION		ACTION
1	Are there any poor connections in intake air thermosensor circuit?	Yes	Repair or replace connector
		No	Go to next step
2	Is there continuity between intake air thermosensor (in airflow meter) and ECU?	Yes	Go to next step
	Intake air thermosensor — ECU: C (B/LG) — 2D; G (R/G) — 2P	No	Check for open circuit in wiring from intake air thermosensor (in airflow meter) to ECU
3	Is resistance of intake air thermosensor (in airflow meter) OK?	Yes	Go to next step
	Terminal / Temperature / Resistance: C (B/RG) —G (R/G) — −20°C (−4°F) 13.6—18.4 kΩ; 20°C (68°F) 2.21—2.69 kΩ; 60°C (140°F) 493—667Ω	No	Replace airflow meter (Refer to page F–131)
4	Is same Code No. present after performing after-repair procedure? (Refer to page F–85)	Yes	Go to next step
		No	Intake air thermosensor and circuit OK
5	Are engine control unit terminals 2P and 2D voltages OK? (Refer to page F–125)	Yes	Replace ECU (Refer to page F–123)
		No	Check for short circuit in wiring from intake air thermosensor to ECU

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CODE No.14 ATMOSPHERIC PRESSURE SENSOR

Replace ECU (Refer to page F–123)

95E0FX-047

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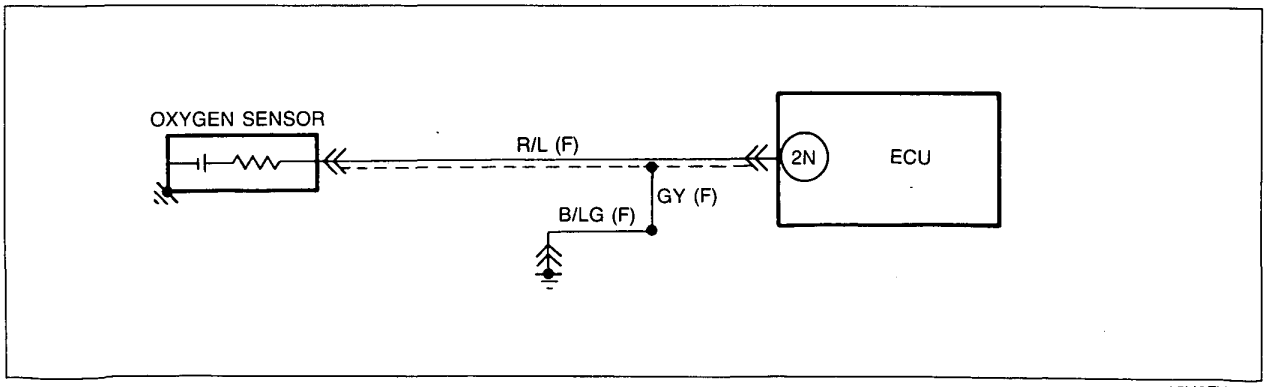
CODE No.15 OXYGEN SENSOR			
Note **• If Code Nos.15 and 17 are both present, first perform the checking procedure for Code No.17**			
STEP	**INSPECTION**		**ACTION**
1	Are there any poor connections in oxygen sensor circuit?	Yes	Repair or replace connector
		No	Go to next step
2	Is oxygen sensor output voltage OK? (Refer to page F–134)	Yes	Go to next step
		No	Replace oxygen sensor (Refer to page F–134)
3	Is there continuity between oxygen sensor and ECU terminal 2N?	Yes	Go to next step
		No	Check for open circuit in wiring from oxygen sensor to ECU
4	Is ECU terminal 2N voltage OK?	Yes	Go to next step
		No	Check for short circuit in wiring from oxygen sensor to ECU
5	Is sensitivity of oxygen sensor OK? (Refer to page F–134)	Yes	Replace ECU (Refer to page F–123)
		No	Replace oxygen sensor (Refer to page F–134)

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CODE No.17 FEEDBACK SYSTEM			
STEP	**INSPECTION**		**ACTION**
1	Warm up engine and run it at 2,500—3,000 rpm for 3 min.		
2	Does monitor lamp of Self-Diagnosis Checker illuminate at idle?	Yes	Go to next step
		No	Check for air leak in vacuum hoses or emission components Check for contaminated oxygen sensor Check for insufficient fuel injection
3	Are spark plugs clean?	Yes	Go to next step
		No	Clean or replace spark plugs
4	Is oxygen sensor voltage OK? (Refer to page F–134)	Yes	Go to next step
		No	Replace oxygen sensor (Refer to page F–134)
5	Is same Code No. present after performing after-repair procedure? (Refer to page F–85)	Yes	Go to next step
		No	Check for short circuit in wiring from oxygen sensor to ECU terminal 2N
6	Is there continuity between oxygen sensor and ECU terminal 2N?	Yes	Go to next step
		No	Check for open circuit in wiring from oxygen sensor to ECU
7	Is ECU terminal 2N voltage OK? (Refer to page F–123)	Yes	Replace ECU (Refer to page F–123)
		No	Check for short circuit in wiring from oxygen sensor to ECU

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Circuit Diagram



05U0FX-088

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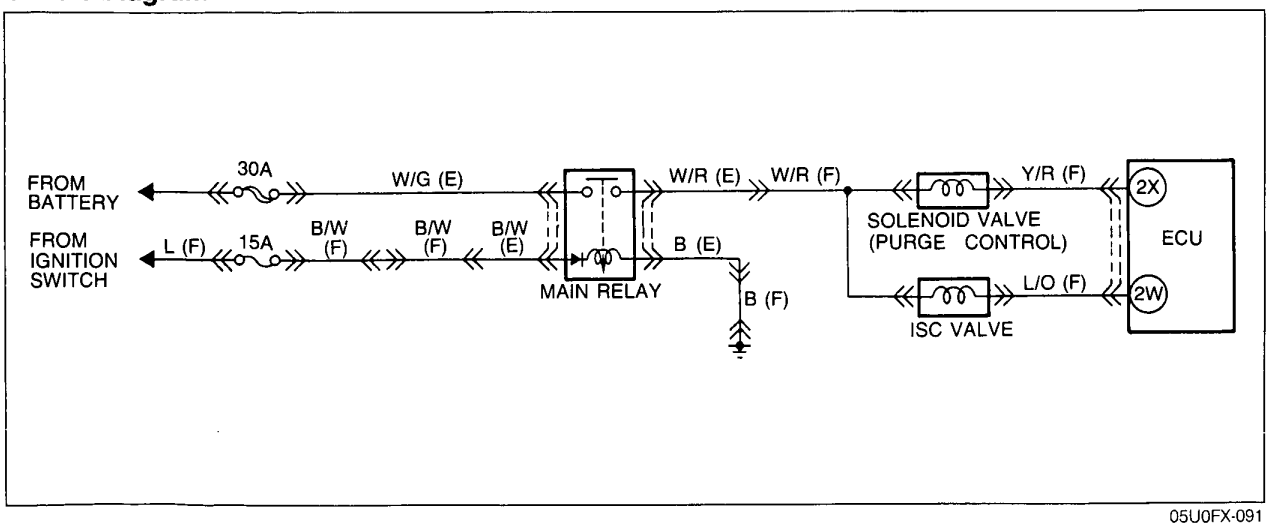
CODE No.26 SOLENOID VALVE (PURGE CONTROL)			
STEP	INSPECTION		ACTION
1	Are there any poor connections in solenoid valve circuit?	Yes	Repair or replace connector
		No	Go to next step
2	Is resistance of solenoid valve OK? **Resistance: 25 ± 2Ω**	Yes	Go to next step
		No	Replace solenoid valve (Refer to page F–116)
3	Is there battery voltage at terminal wire (W/R) of solenoid valve circuit?	Yes	Go to next step
		No	Check for open circuit in wiring from solenoid valve to main relay
4	Is there continuity between solenoid valve and ECU? Solenoid valve: B (Y/R) — ECU: 2X	Yes	Go to next step
		No	Check for open circuit in wiring from solenoid valve to ECU
5	Is ECU terminal (2X) voltage OK? (Refer to page F–126)	Yes	Replace ECU (Refer to page F–123)
		No	Check for short circuit in wiring from solenoid valve to ECU

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CODE No.34 ISC VALVE			
STEP	INSPECTION		ACTION
1	Are there any poor connections in ISC valve circuit?	Yes	Repair or replace connector
		No	Go to next step
2	Is resistance of ISC valve OK? **Resistance: 12 ± 1Ω**	Yes	Go to next step
		No	Replace ISC valve (Refer to page F–96)
3	Is there battery voltage at terminal-wire (W/R) of ISC valve circuit?	Yes	Go to next step
		No	Check for open circuit in wiring from ISC valve to main relay
4	Is there continuity between ISC valve and ECU? ISC valve: B (L/O) — ECU: 2W	Yes	Go to next step
		No	Check for open circuit in wiring from ISC valve to ECU
5	Is ECU terminal 2W voltage OK? (Refer to page F–126)	Yes	Replace ECU (Refer to page F–123)
		No	Check for short circuit in wiring from ISC valve to ECU

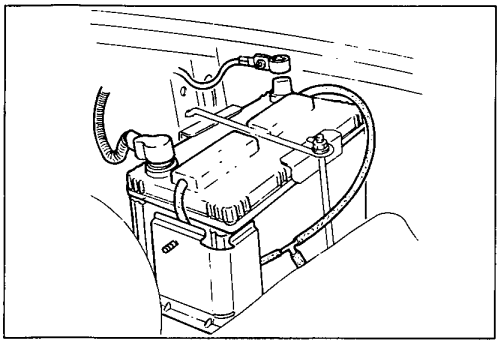
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Circuit Diagram

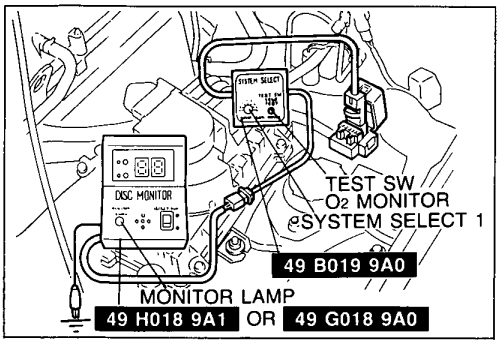


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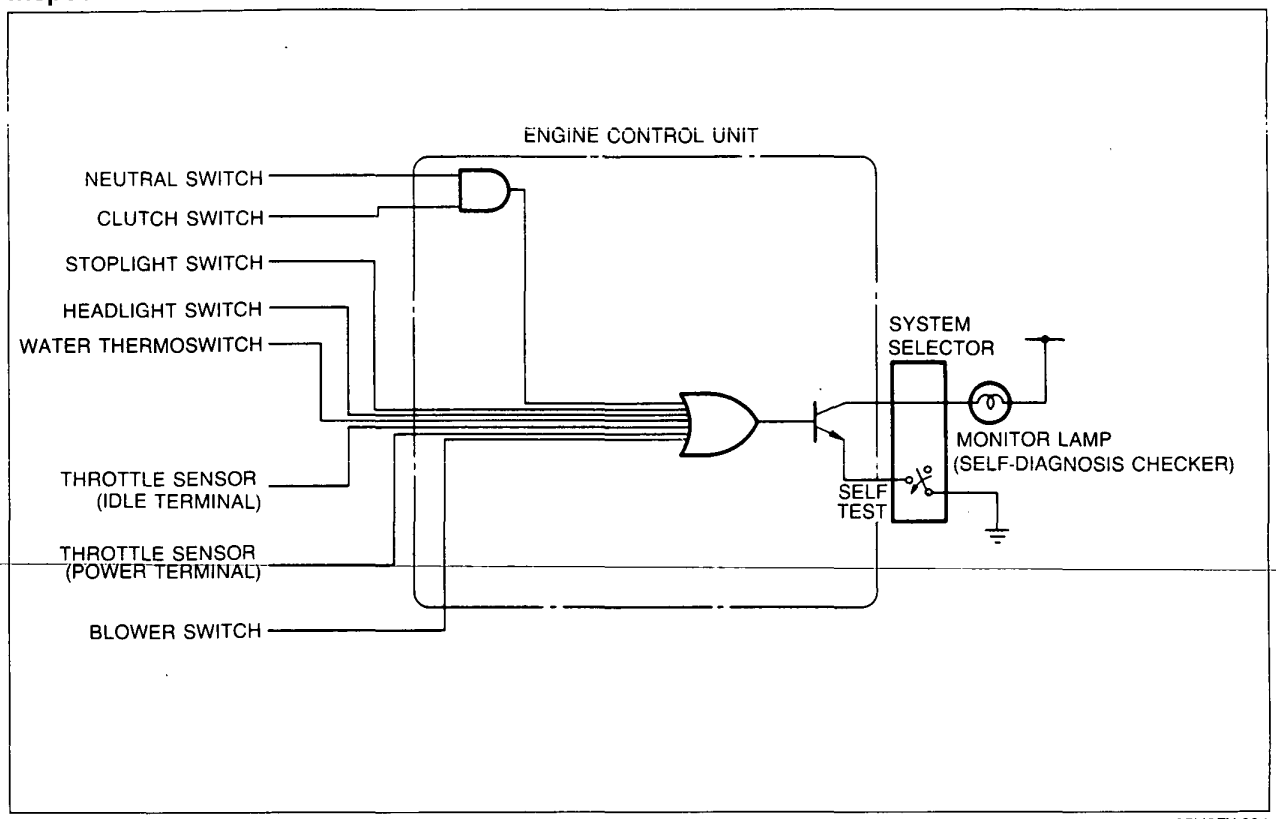
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After-repair Procedure

1. Cancel the memory of malfunctions by disconnecting the negative battery cable and depressing the brake pedal for **at least five seconds**. Reconnect the negative battery cable.
2. Connect the **SSTs** to the diagnosis connector as shown.
3. Turn the ignition switch ON, but do not start the engine for **six seconds**.
4. Start and warm up the engine, then run it at **2,000 rpm for three minutes**.
5. Verify that no code numbers are displayed.

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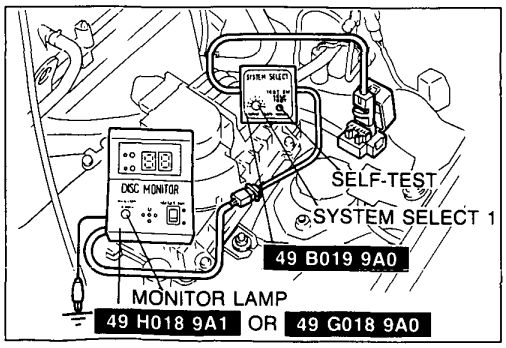
SWITCH MONITOR FUNCTION
Inspection Procedure



05U0FX-094

Switch	Self-Diagnosis Checker (Monitor lamp)		Remark
	Light ON	Light OFF	
Clutch switch	Pedal released	Pedal depressed	In gear
Neutral switch	In gear	Neutral	Clutch pedal released
Idle terminal	Pedal depressed (not fully)	Pedal released	—
Pow. terminal	Pedal depressed (not fully)	Pedal fully depressed	—
Stoplight switch	Pedal depressed	Pedal released	—
Headlight switch	ON	OFF	—
Blower switch	ON	OFF	Blower motor position: "medium" "high" or "super high" position
Water thermoswitch	Fan operating	Fan not operating	

95E0FX-052



05U0FX-096

1. Connect the **SSTs** to the diagnosis connector as shown.
2. Turn the ignition switch ON. Check if the monitor lamp illuminates when each switch is made to function as described below.

Caution
- **If either of the switches remain activated, the monitor lamp will be illuminated.**
- **Do not start the engine.**

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Procedure

Set conditions to deactivate each switch
- All accessories OFF
- Transmission in neutral
- All pedals released

Verify that monitor lamp does not illuminate

NO → Check each switch and related wire harness
- Clutch and Neutral switch :Refer to page F–135
- Idle switch :Refer to page F–132
- Pow switch :Refer to page F–132
- Stoplight switch :Refer to Section T
- Headlight switch :Refer to Section T
- Blower switch :Refer to Section T
- Water thermoswitch :Refer to Section E

YES ↓

Check each switch as described

95E0FX-053

Neutral and Clutch switches

Shift transmission into gear
Verify that monitor lamp illuminates with clutch pedal released

NO → PC:
- Neutral or clutch switch malfunction (Refer to F–135)
- Open circuit in related wire harness
- Engine control terminal 1V malfunction (Refer to page F–125)

YES ↓

Depress clutch pedal
Verify that monitor lamp does not illuminate
Return transmission to neutral

NO → PC:
- Clutch switch malfunction (Refer to page F–135)

95E0FX-054

Idle terminal

Depress accelerator pedal (less than full) and verify that monitor lamp illuminates

NO → PC:
- Idle terminal malfunction (Refer to page F–132)
- Short circuit in wire harness from idle switch to engine control unit
- Engine control unit terminal 1N malfunction (Refer to page F–124)

YES ↓

Idle terminal OK
Release accelerator pedal

95E0FX-055

Pow terminal

Depress accelerator pedal (less than full) and verify that monitor lamp illuminates

NO → PC:
- Pow terminal malfunction (Refer to page F–124)
- Short circuit in wire harness from Pow terminal to engine control unit
- Engine control unit terminal 2L malfunction (Refer to page F–125)

YES ↓

Pow terminal OK
Release accelerator pedal

95E0FX-056

Stoplight switch

Depress brake pedal and verify that monitor lamp illuminates

NO → PC:
- Stoplight switch malfunction (Refer to Section T)
- Open circuit in wire harness from stoplight switch to engine control unit
- Engine control unit terminal 1O malfunction (Refer to page F–124)

YES ↓

Stoplight switch OK
Release brake pedal

95E0FX-057

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Headlight switch

Turn ON headlight switch
Verify that monitor lamp illuminates

NO → PC: • Headlight switch malfunction (Refer to Section T)
• Open circuit in wire harness from headlight switch to engine control unit
• Engine control unit terminal 1U malfunction (Refer to page F–125)

YES ↓

Headlight switch OK
Turn OFF headlight switch

95E0FX-058

Blower switch

Turn blower switch to "medium" position
Verify that monitor lamp illuminates

NO → PC: • Blower switch malfunction (Refer to Section T)
• Open circuit in wire harness from blower switch to engine control unit
• Engine control unit terminal 1S malfunction (Refer to page F–125)

YES ↓

Blower switch OK
Turn OFF blower switch

95E0FX-059

Water thermoswitch circuit (not included in switch inspection)

Warning
- **The cooling fan operates when the diagnosis connector terminals TFA and GND are connected a jumper wire. Use caution.**

Connect diagnosis connector terminals TFA and GND with a jumper wire
Verify that monitor lamp illuminates

NO → PC: • Relay malfunction (Refer to Section E)
• Open circuit in wire harness from water thermoswitch to engine control unit
• Engine control unit terminal 1R malfunction

YES ↓

Water thermoswitch circuit is OK
Disconnect a jumper wire

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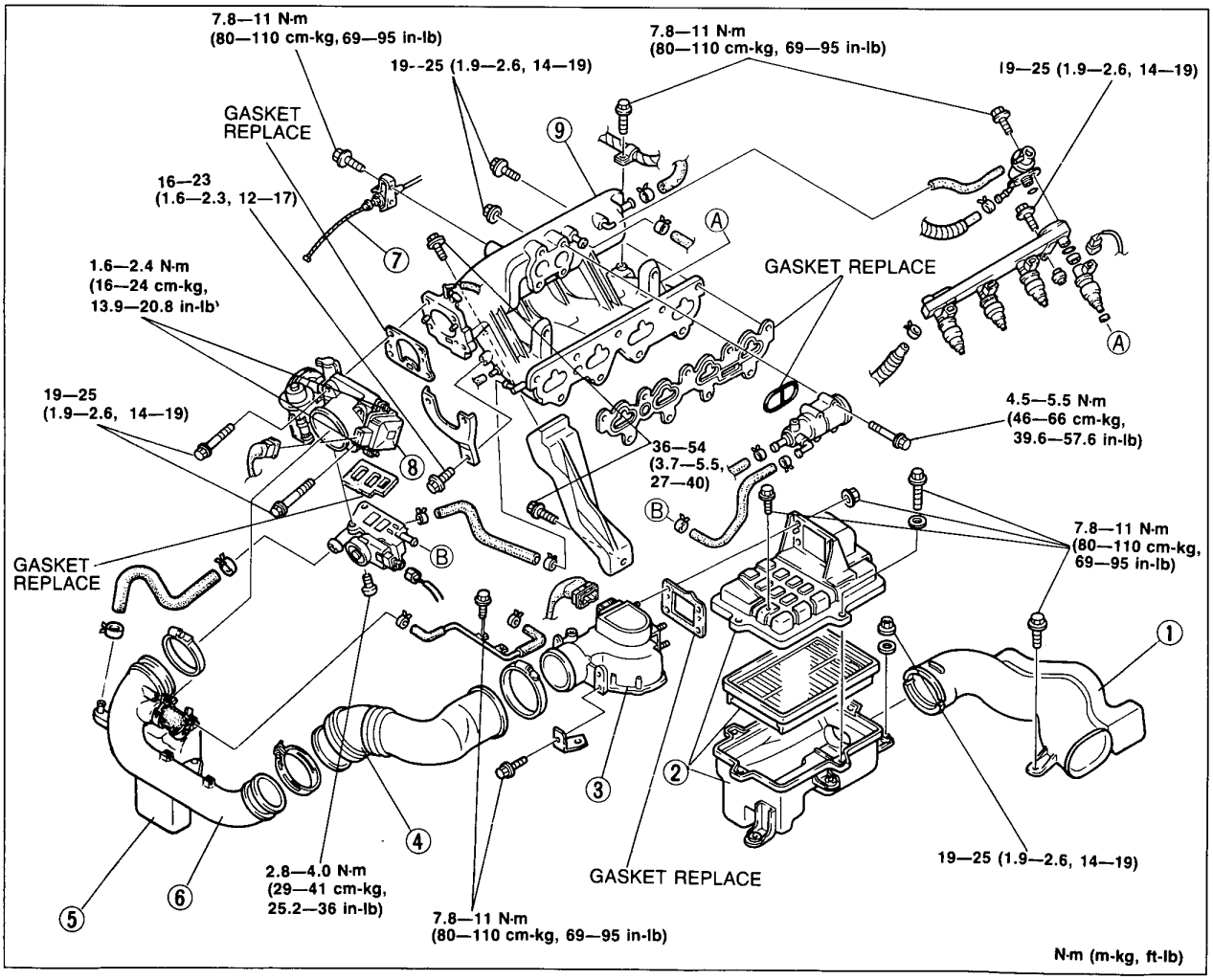
INTAKE AIR SYSTEM

COMPONENTS
Removal / Inspection / Installation

Warning
- **Before removing the intake manifold, release the fuel pressure from the fuel system to reduce the possibility of injury or fire. (Refer to page F–98.)**

Note
- **Before disconnecting the water hoses, drain the engine coolant.**
- **Use new gaskets during reassembly.**

1. Remove in the order shown in the figure.
2. Check the components for damage and repair or replace as necessary.
3. Install in the reverse order of removal.



95E0FX-060

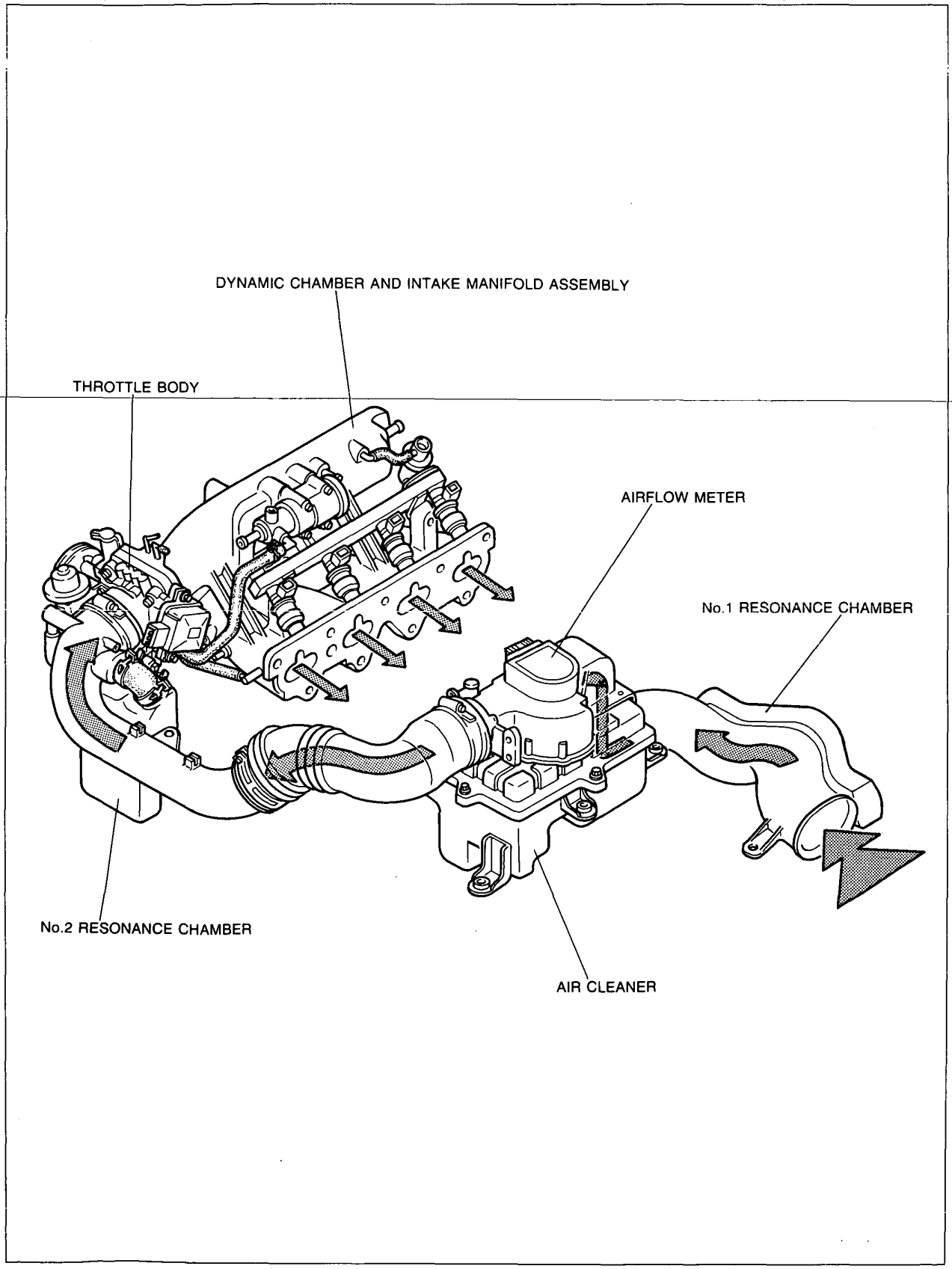
1. Air duct
2. Air cleaner
   Inspection ..... page F–70
3. Airflow meter
   Inspection / Replacement..... page F–89
4. Air hose
5. Resonance chamber
6. Air pipe
7. Accelerator pedal/cable
   Inspection / Replacement..... page F–93
8. Throttle body
   Removal / Inspection / Installation ..... page F–91
9. Intake manifold
   Removal / Installation ..... page F–92

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SYSTEM OPERATION

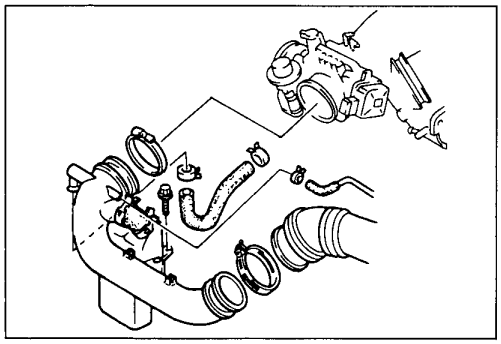
Inspection of Air Leakage

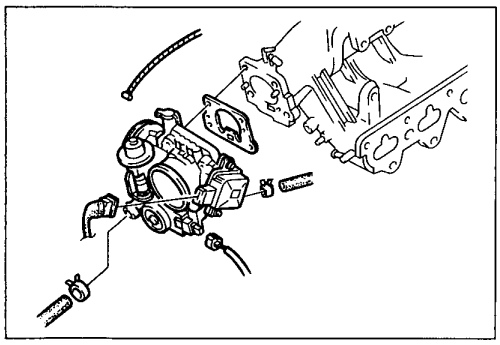
Check for possible air leakage at the points shown and repair or replace as necessary.

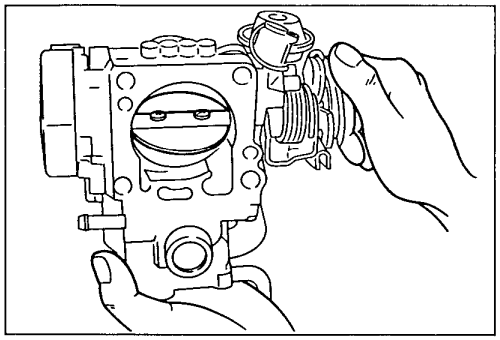


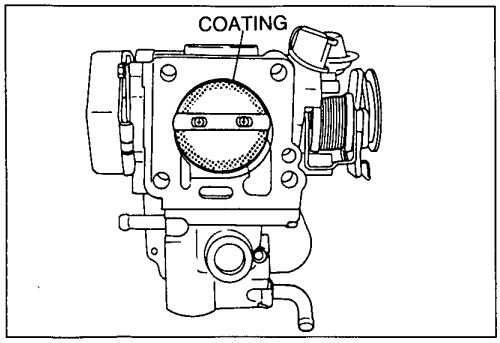
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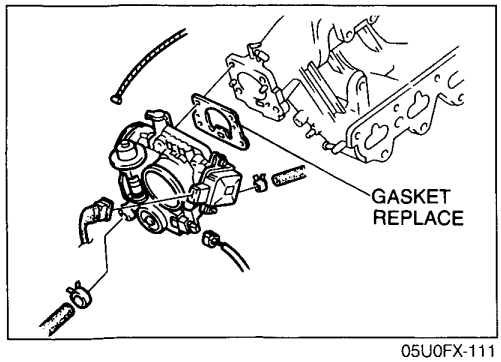

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05U0FX-108


05U0FX-109



05U0FX-110



05U0FX-111

THROTTLE BODY

Removal

1. Remove the negative battery terminal.
2. Remove the air pipe.
3. Remove the accelerator cable from the throttle lever.

Note
- **Before disconnecting the water hoses, drain the engine coolant.**

4. Disconnect the water hoses.
5. Disconnect the connectors for the ISC valve and the throttle sensor.
6. Remove the throttle body.

Inspection

1. Verify that the throttle valve is fully closed.
2. Verify that the throttle valve moves smoothly when the throttle lever is moved from fully closed to fully open.
3. Replace the throttle body if necessary.

Caution
- **Do not remove the thin seal coating from the throttle valve or bore.**

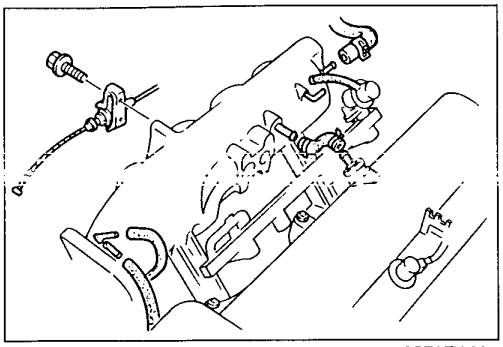
Installation

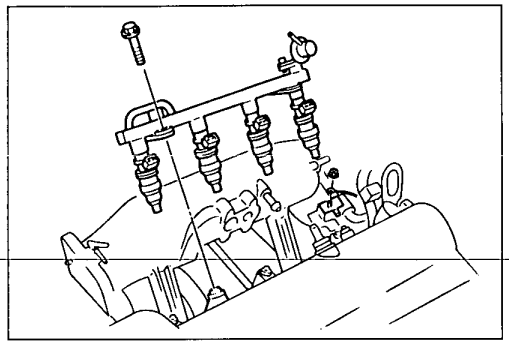
Install in the reverse order of removal.

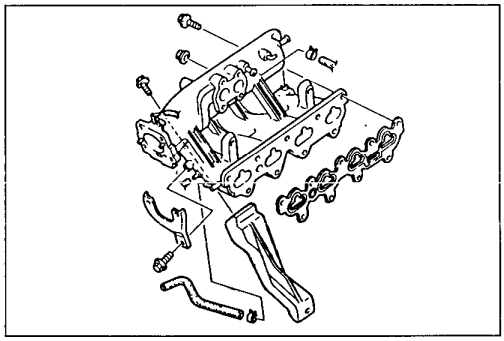
Note
- **Use a new mounting gasket.**

Tightening torque:
19—25 N·m (1.9—2.6 m-kg, 14—19 ft-lb)

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95E0FX-091


05U0FX-113


95A0FX-115

INTAKE MANIFOLD
Removal

Warning
- **Before removal, release the fuel pressure from the fuel system to reduce the possibility of injury or fire. (Refer to page F–99.)**

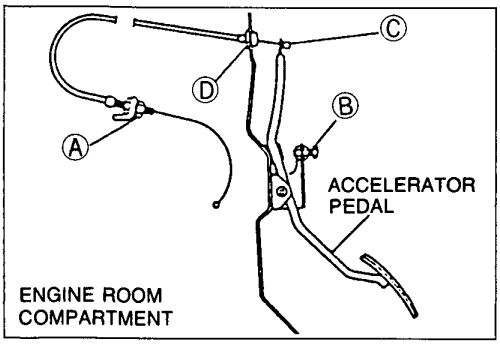
1. Remove the throttle body. (Refer to page F–91.)
2. Remove the air valve
3. Disconnect the vacuum hoses.
4. Remove the accelerator cable.
5. Disconnect the fuel hoses.
6. Disconnect the connectors from the injectors.
7. Remove the delivery pipe and injectors.
8. Remove the injector harness.
9. Remove the intake manifold bracket.
10. Remove the intake manifold.

Installation
Install in the reverse order of removal.

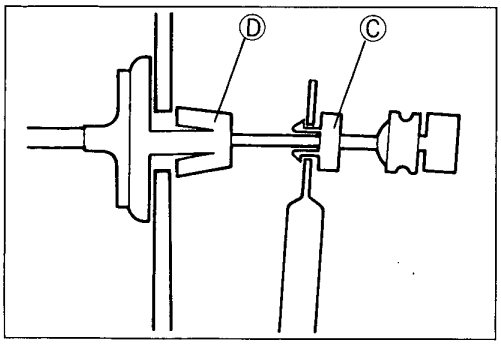
Note
- **Use a new mounting gasket.**

Tightening torque:
Intake manifold and delivery pipe
19—25 N·m (1.9—2.6 m-kg, 14—19 ft-lb)
Injector harness and bracket
7.8—11 N·m (80—110 cm-kg, 69—95 in-lb)

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05U0FX-115



05U0FX-116

ACCELERATOR PEDAL AND CABLE

Accelerator Cable

Inspection

1. Check deflection of the cable. If deflection exceeds **1—3mm (0.039—0.118 in)**, adjust it by turning nut A.
2. Depress the accelerator pedal to the floor and verify that the throttle valve opens fully. Adjust with bolt B if necessary.

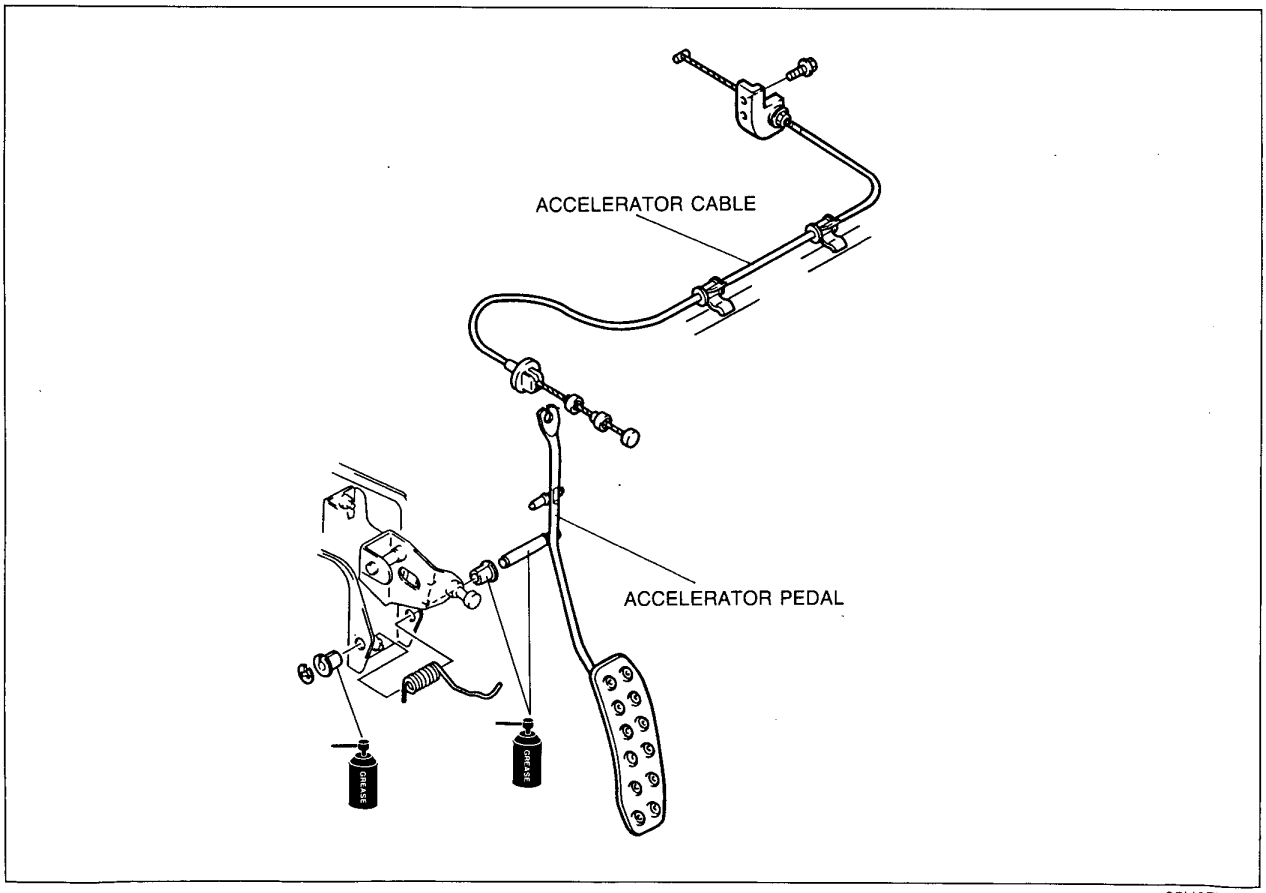
Replacement

1. Remove the accelerator cable from the throttle lever.
2. Loosen the throttle adjustment nuts and remove the cable from the bracket.
3. Compress the tabs of stay C and remove the accelerator cable from the pedal arm.
4. Compress the tabs of stay D and push the cable through the firewall.
5. Remove the accelerator cable.
6. Install in the reverse order of removal.
7. Adjust deflection of the cable after installation. (Refer to above.)

Accelerator Pedal

Replacement

1. Disconnect the accelerator cable.
2. Remove the accelerator pedal as shown in the figure.
3. Install in the reverse order of removal.

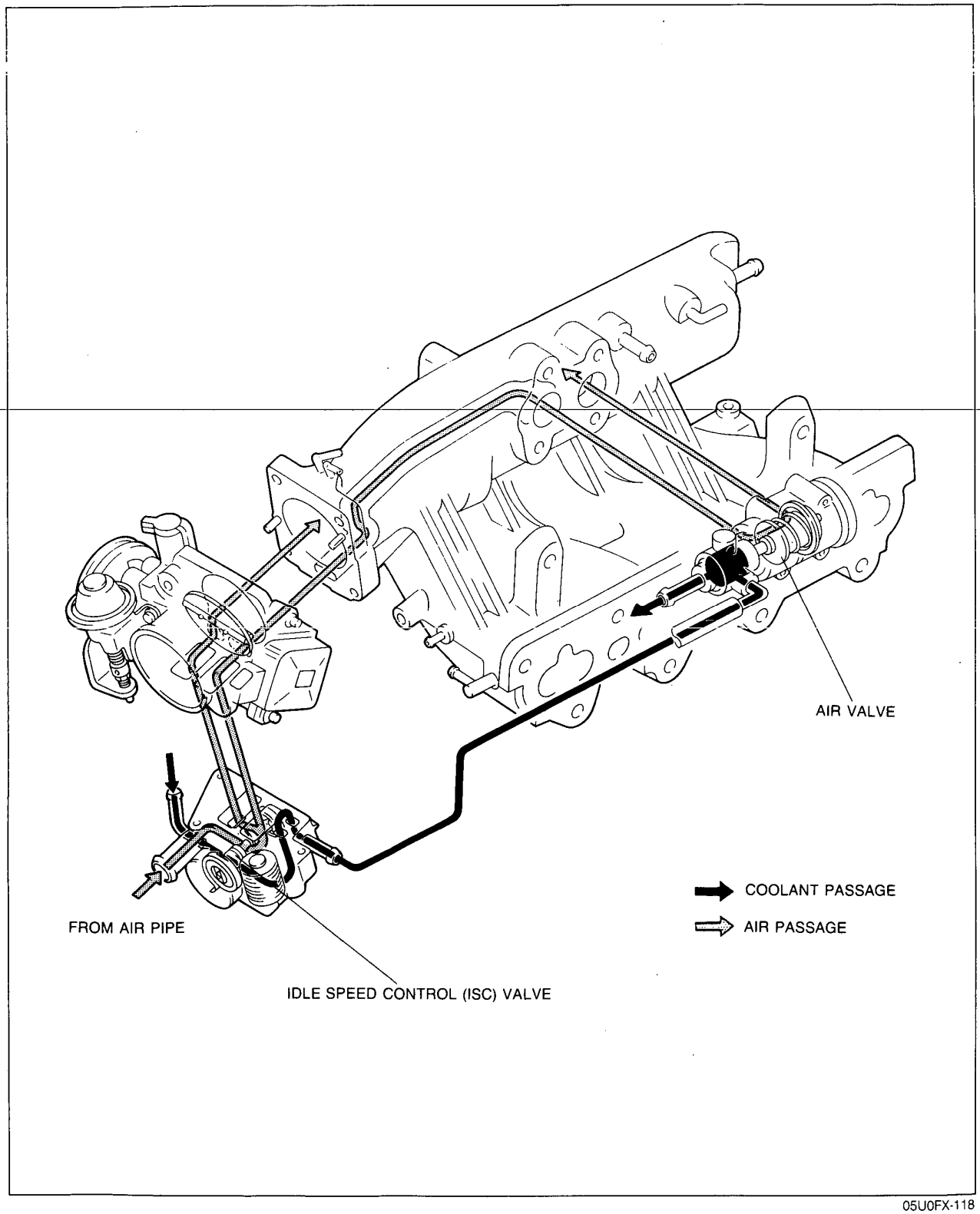


05U0FX-117

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IDLE SPEED CONTROL (ISC) SYSTEM

DESCRIPTION

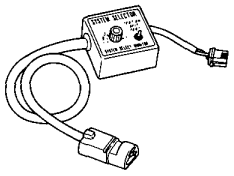


05U0FX-118

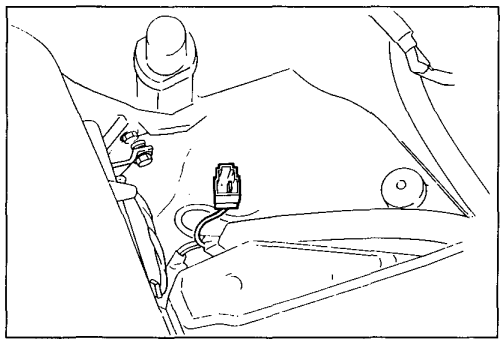
To improve idle smoothness, the ISC system controls the intake air amount by regulating amount of the by-pass air that passes through the throttle valve. This system consists of the air valve that functions only when the engine is cold, the ISC valve that works throughout the entire engine speed range, and the control system.

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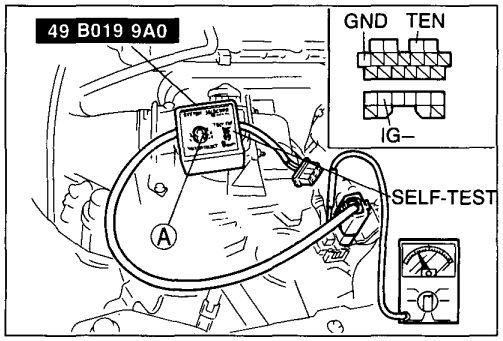
PREPARATION
SST

49 B019 9A0 System Selector		For inspection of air valve

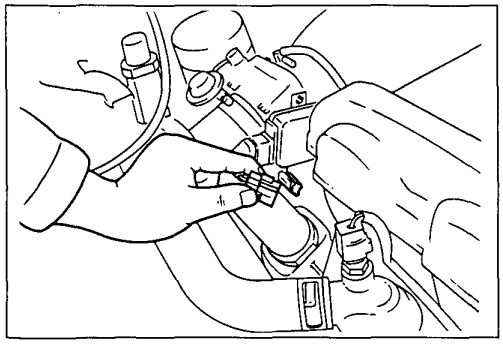
05U0FX-119



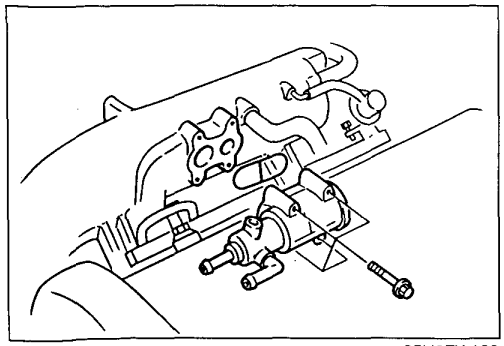
05U0FX-120



95A0FX-077



95A0FX-078



05U0FX-123

SYSTEM OPERATION
Air Valve
—Perform this inspection when the engine is cold. (Engine coolant temperature below 20°C [68°F].)

Note
- **When using an externally powered tachometer connect it to the power connector (Blue: 1-pin).**

Warning
- **Do not ground the power connector terminal (Blue: 1-pin); the wiper 20A fuse will be burned.**

1. Connect a tachometer to the diagnosis connector terminal IG–.

Caution
- **Be extremely careful when making connections to the diagnosis connector as a mistaken connection will cause a malfunction.**

2. Connect the **SST** to the diagnosis connector.
3. Set switch Ⓐ to position 1.
4. Set TEST SW to SELF-TEST.
5. Verify that the engine speed gradually decreases as the engine warms up.
6. Remove the **SST** or the jumper wire.

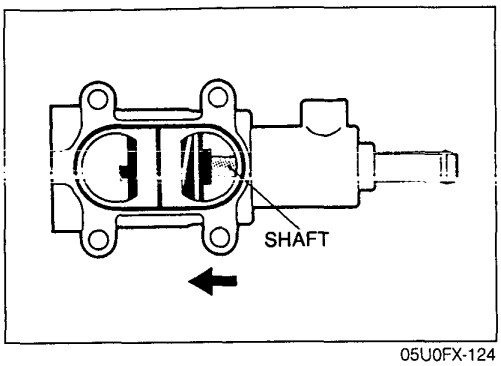
ISC Valve
1. Warm up the engine to the normal operating temperautre and run it at idle.
2. Disconnect the ISC valve connector (Black: 2-pin) and verify that the valve clicks and the engine speed increases to **approx. 1,200 rpm**.
3. Reconnect the ISC valve connector.

AIR VALVE
Removal

Note
- **Before disconnecting the water hoses, drain the engine coolant.**

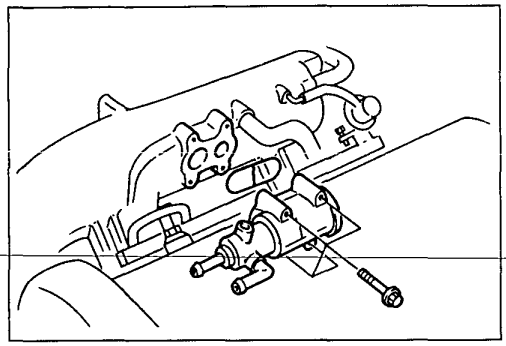
1. Disconnect the water hoses.
2. Remove the air valve from the intake manifold.

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05U0FX-124

Inspection
1. Cool the air valve to **0°C (32°F)**.
2. Mark the shaft.
3. Warm the air valve with a hot air gun and verify that the shaft moves in the direction of arrow.
4. Replace the air valve if necessary.

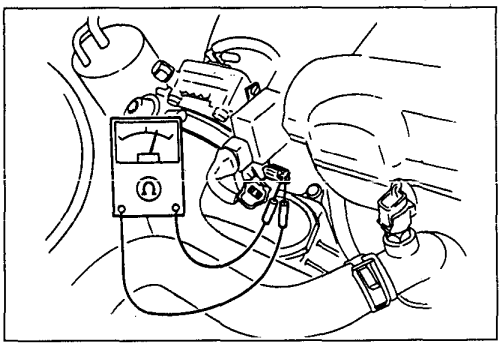

05U0FX-125

Installation

Note
- **Install a new gasket.**

Install in the reverse order of removal.

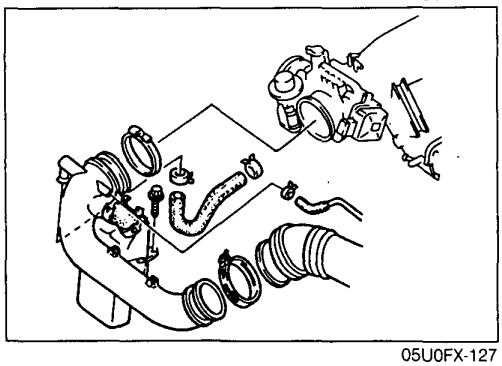
Tightening torque:
4.9—7.8 N·m (50—80 cm-kg, 43—69 in-lb)


05U0FX-126

ISC VALVE
Inspection
1. Disconnect the ISC valve connector.
2. Connect an ohmmeter between the terminals of the ISC valve and measure the resistance.

Resistance (at 20°C [68°F]): 12 ± 1Ω

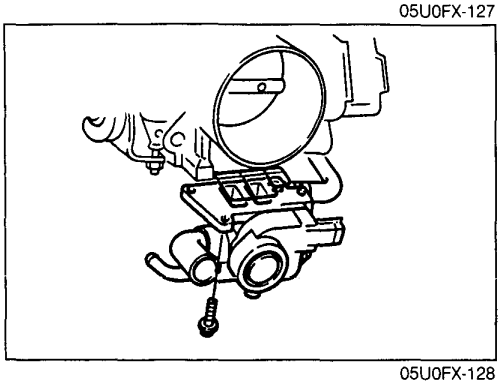
3. If not as specified, replace the ISC valve.


05U0FX-127

Replacement
1. Disconnect the ISC valve connector.
2. Remove the air pipe.

Note
- **Before disconnecting the water hose, drain the engine coolant.**

3. Disconnect the water hose and the air hose.


05U0FX-128

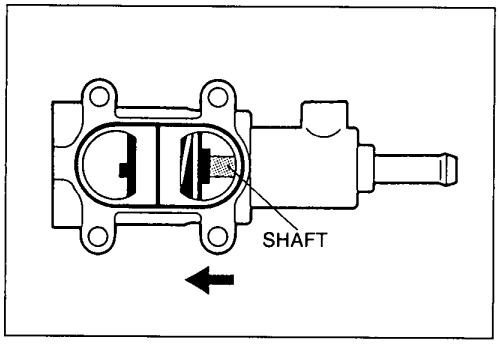
4. Remove the ISC valve.

Note
- **Install a new gasket.**

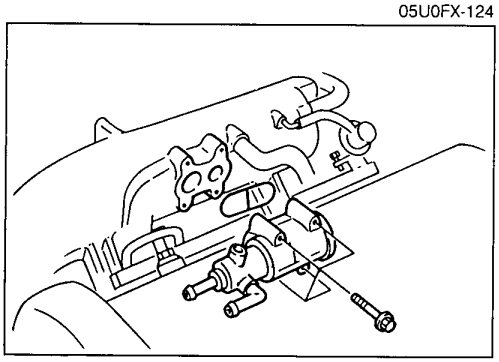
5. Install in the reverse order of removal.

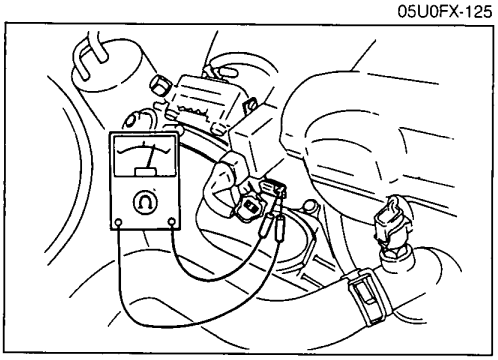
Tightening torque:
2.8—4.0 N·m (29—41 cm-kg, 25—35 in-lb)

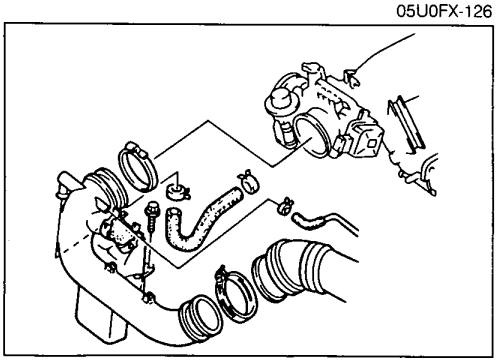
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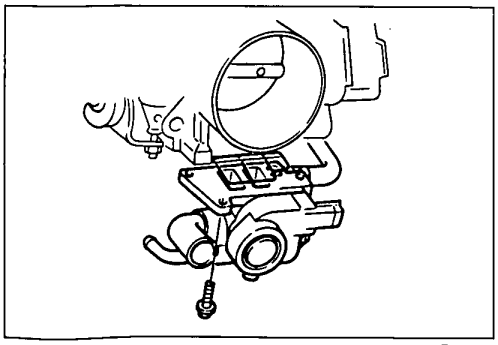


05U0FX-124


05U0FX-125


05U0FX-126


05U0FX-127


05U0FX-128

Inspection
1. Cool the air valve to **0°C (32°F)**.
2. Mark the shaft.
3. Warm the air valve with a hot air gun and verify that the shaft moves in the direction of arrow.
4. Replace the air valve if necessary.

Installation

Note
- **Install a new gasket.**

Install in the reverse order of removal.

Tightening torque:
4.9—7.8 N·m (50—80 cm-kg, 43—69 in-lb)

ISC VALVE
Inspection
1. Disconnect the ISC valve connector.
2. Connect an ohmmeter between the terminals of the ISC valve and measure the resistance.

Resistance (at 20°C [68°F]): 12 ± 1Ω

3. If not as specified, replace the ISC valve.

Replacement
1. Disconnect the ISC valve connector.
2. Remove the air pipe.

Note
- **Before disconnecting the water hose, drain the engine coolant.**

3. Disconnect the water hose and the air hose.

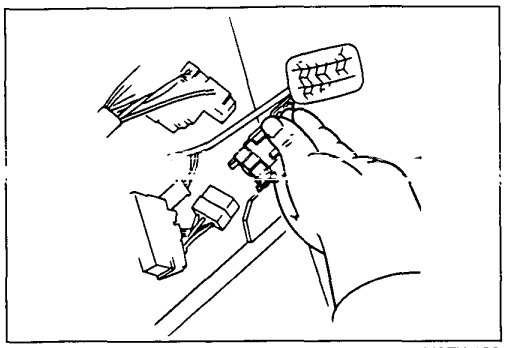
4. Remove the ISC valve.

Note
- **Install a new gasket.**

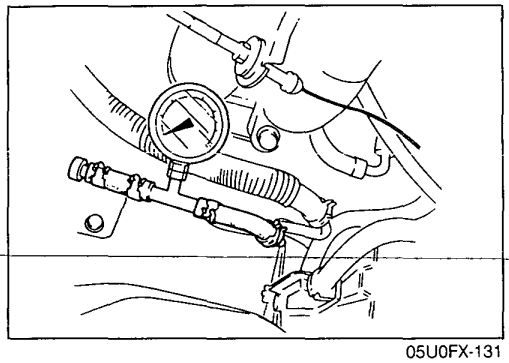
5. Install in the reverse order of removal.

Tightening torque:
2.8—4.0 N·m (29—41 cm-kg, 25—35 in-lb)

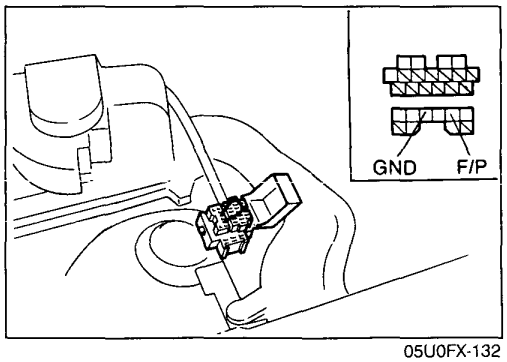
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05U0FX-131



05U0FX-132

PRECAUTION

Fuel Pressure Release and Servicing Fuel System

Fuel in the fuel system remains under high pressure even when the engine is not running.

a) Before disconnecting any fuel line, release the fuel pressure from the fuel system to reduce the possibility of injury or fire.
   1. Start the engine.
   2. Disconnect the circuit opening relay connector.
   3. After the engine stalls, turn off the ignition switch.
   4. Reconnect the circuit opening relay connector.

b) Use a rag as protection from fuel spray when disconnecting the hoses.
c) Plug the hoses after removal.
d) When inspecting the fuel system, use a suitable fuel pressure gauge.

Caution

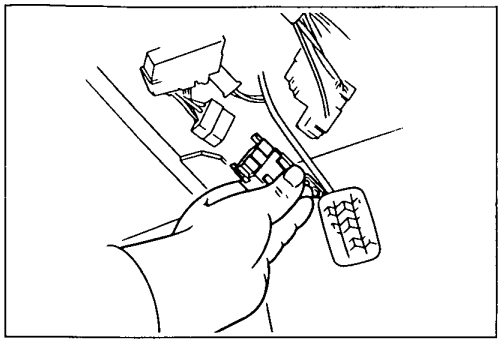
- **Install hose clamps when securing the fuel pressure gauge to the fuel pipe and the fuel main hose to prevent fuel leakage.**

Priming Fuel System

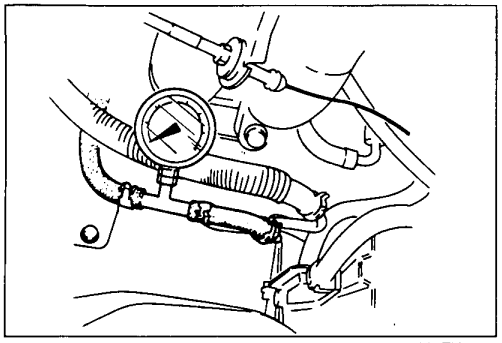
After releasing the fuel system pressure for repairs or inspection, the system must be primed to avoid excessive cranking when first starting the engine. Follow the steps below.

1. Connect diagnosis connector terminals F/P and GND with a jumper wire.
2. Turn the ignition switch ON for **approx. 10 sec.** and check for fuel leaks.
3. Turn the ignition switch OFF and remove the jumper wire.

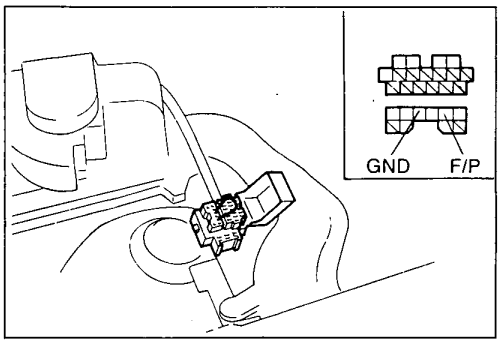
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95E0FX-063



05U0FX-134



95E0FX-064

SYSTEM OPERATION
Fuel Pressure Hold Inspection

Warning
- **Before performing the following operation, release the fuel pressure from the fuel system to reduce the possibility of injury or fire. (Refer to page F–98.)**

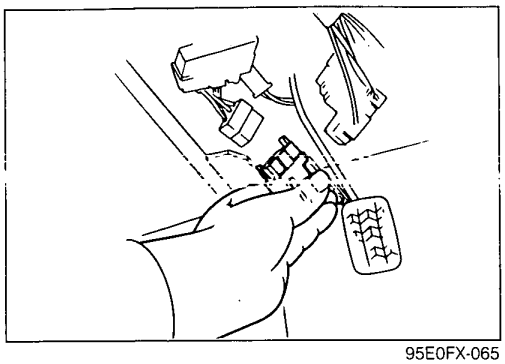
1. Disconnect the negative battery terminal.
2. Install a fuel pressure gauge between the fuel pipe and the fuel main hose. (Install clamps as shown.)
3. Connect the negative battery terminal.

4. Connect diagnosis connector terminals F/P and GND with a jumper wire.
5. Turn the ignition switch ON for **10 sec.** to operate the fuel pump.
6. Turn the ignition switch OFF and disconnect the jumper wire.
7. Observe the fuel pressure **after 5 min.**

Fuel pressure:
More than 147 kPa (1.5 kg/cm^2, 21 psi)

8. If not as specified, perform the following inspections.
   - Fuel pump hold pressure (Refer to page F–104.)
   - Pressure regulator hold pressure (Refer to page F–108.)
   - Injector fuel leakage. (Refer to page F–110.)

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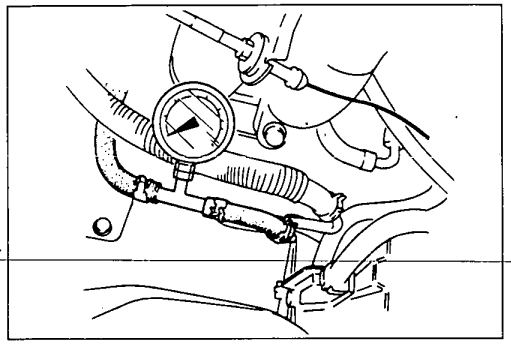


95E0FX-065

Fuel Line Pressure Inspection

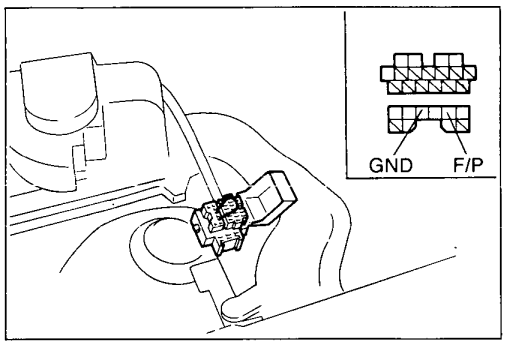
Warning

- **Before performing the following operation, release the fuel pressure from the fuel system to reduce the possibility of injury or fire. (Refer to page F-98.)**



05U0FX-137

1. Disconnect the negative battery terminal.
2. Install a fuel pressure gauge between the fuel pipe and the fuel main hose. (Install clamps as shown.)
3. Connect the negative battery terminal.



95E0FX-066

4. Connect diagnosis connector terminals F/P and GND with a jumper wire.
5. Turn the ignition switch ON.
6. Measure the fuel line pressure.

Fuel line pressure:
265—314 kPa (2.7—3.2 kg/cm^2, 38—46 psi)

Pressure low — Check fuel pump maximum pressure. (Refer to page F-105.) If as specified, fuel line or fuel filter might be clogged or restricted.

Pressure high — Replace the pressure regulator. (Refer to page F-108.)

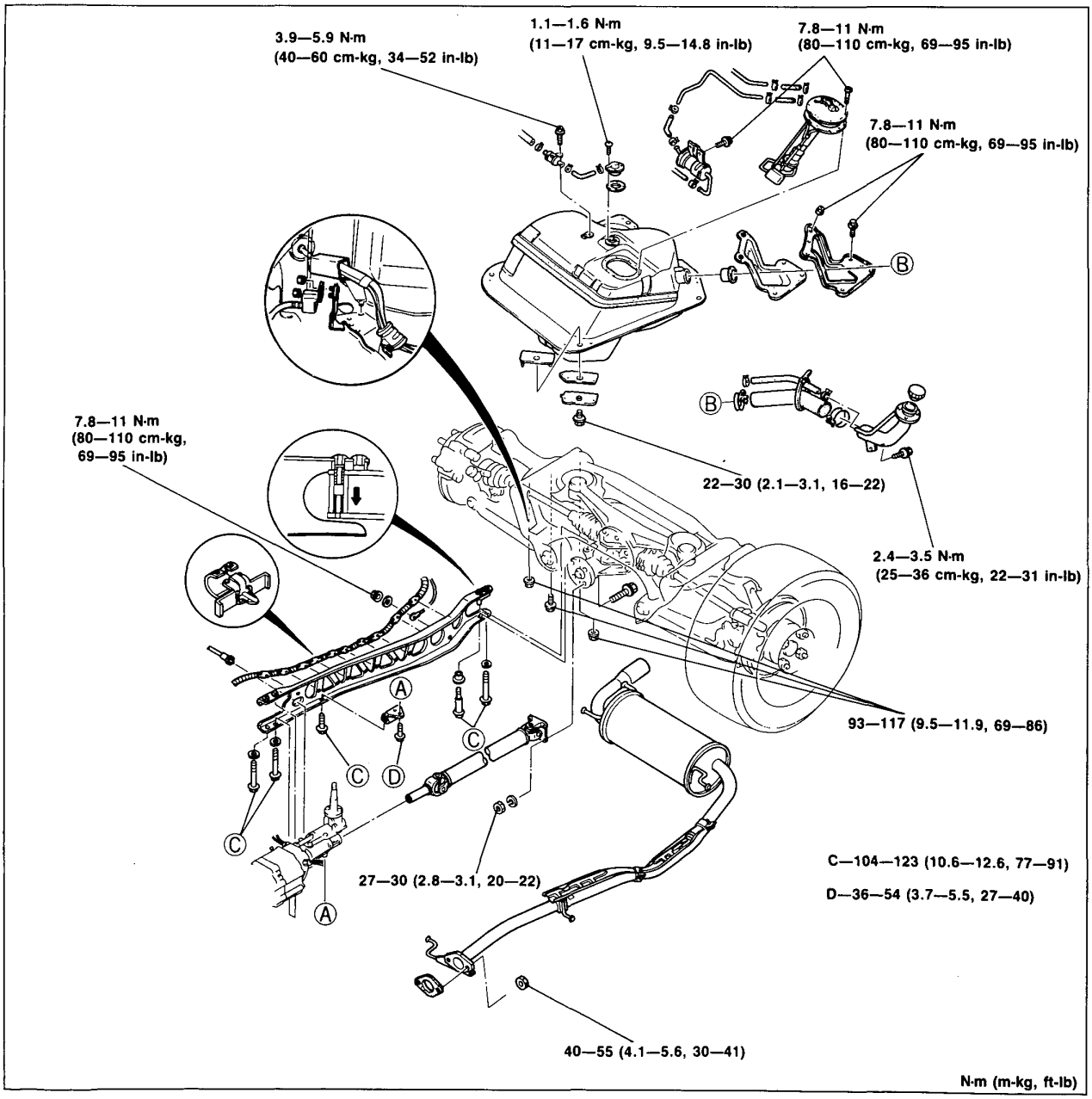
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FUEL TANK
Removal / Inspection / Installation

Warning
- **Before performing the following operation, release the fuel pressure from the fuel system to reduce the possibility of injury or fire. (Refer to page F–98.)**
- **When removing the fuel tank, keep sparks, cigarettes, and open flames away from the tank.**
- **Before repairing the fuel tank, clean it thoroughly with steam to remove all explosive gas.**

Note
- **Drain the fuel from the fuel tank before removing the tank.**

1. Disconnect the negative battery terminal.
2. Remove the main silenser. (Refer to page F–112.)
3. Remove the power plant frame. (Refer to page J–11.)
4. Remove in the order shown in the figure, referring to **Removal Note**.
5. Install in the reverse order of removal, referring to **Installation Note**.

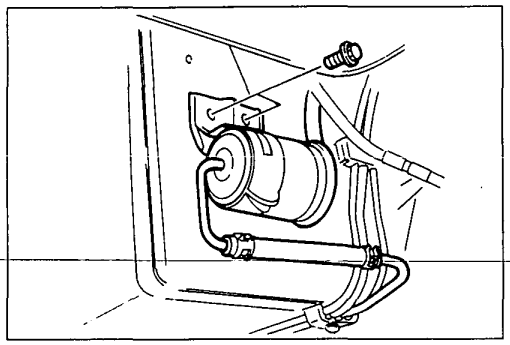


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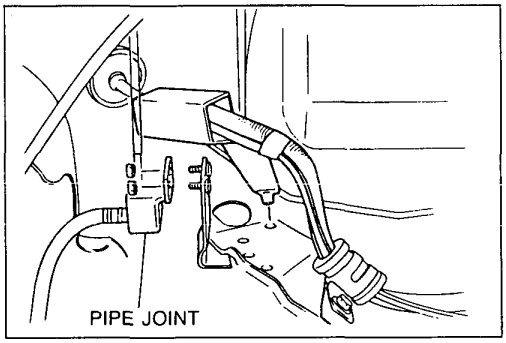
1. Fuel filler hoses
2. Fuel hoses
3. Evaporative hoses
4. Fuel pump connector
5. Fuel filter bolts
   Removal Note ..... page F–102
6. Brake pipe joint
   Removal Note ..... page F–102
7. Battery cable
   Removal Note ..... page F–102
8. Rear crossmember assembly
   Removal Note ..... page F–102
9. Fuel tank unit
10. Tow-way check valve
11. Fuel vapor valve
12. Fuel tank

95E0FX-068



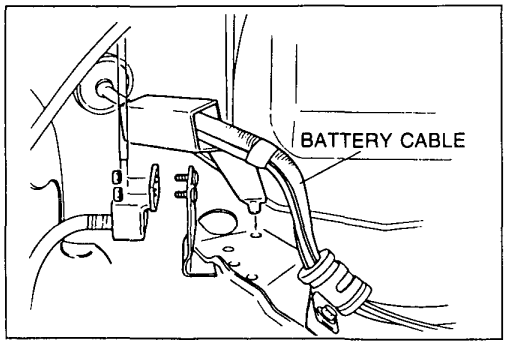
05U0FX-229

Removal note
Fuel filter bolts
1. Remove the fuel filter cover.
2. Remove the fuel filter bolts.
3. Remove the fuel filter with the fuel hoses still connected.



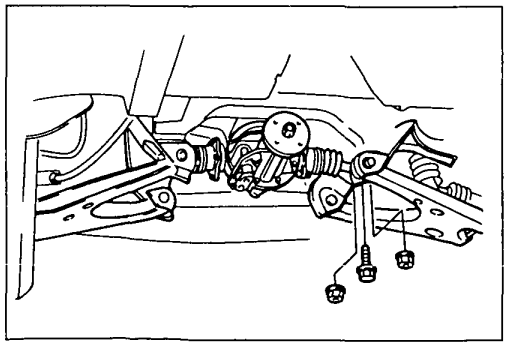
05U0FX-230

Brake pipe joint
1. Remove the brake pipe joint nuts.
2. Remove the brake pipe joint with the brake pipe and brake hose still connected.



05U0FX-231

Battery cable
1. Remove the battery cable clamp as shown in the figure.



05U0FX-232

Rear crossmember assembly
1. Support the rear crossmember assembly with a transmission jack.
2. Remove the rear crossmember mounting bolts and nuts.

Caution
- **Do not damage the brake hose, brake pipe, or fuel hoses.**

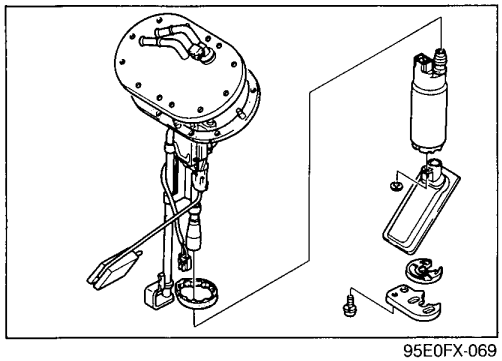
3. Lower the rear crossmember assembly.

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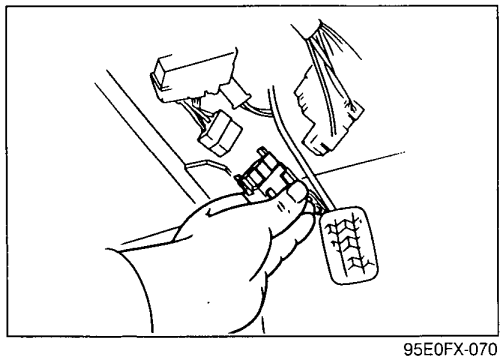
Installation note
Fuel hoses and fuel filler hoses
- Push the ends of the main fuel hose, fuel return hose, and evaporation hose onto the fuel tank fittings **at least 25mm (1.0 in)**.
- Push the fuel filler hose onto the fuel tank pipe and filler pipe **at least 35mm (1.4 in)**.

Power plant frame
- Install the power plant frame referring to the installation procedure on page J–46.

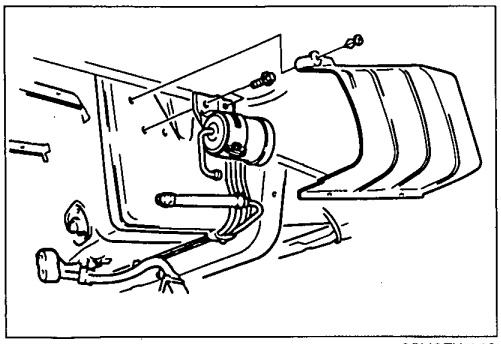
05U0FX-140



95E0FX-069



95E0FX-070



05U0FX-143

FUEL FILTER
Replacement
Low-pressure side (In-tank filter)
(Refer to page F–106.)

High-pressure side
The fuel filter must be replaced at the intervals outlined in the maintenance schedule.

Warning
- **Before performing the following operation, release the fuel pressure from the fuel system to reduce the possibility of injury or fire. (Refer to page F–98.)**
- **When replacing fuel system components, keep sparks, cigarettes, and open flames away from the fuel.**

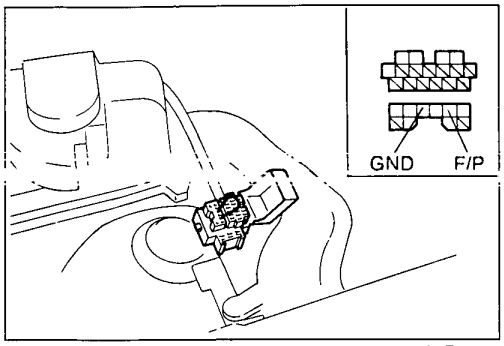
1. Raise the rear of the vehicle and support it with safety stands.
2. Remove the fuel filter protector.
3. Disconnect the fuel hoses from the fuel filter.
4. Remove the fuel filter and bracket.

Note
- **When installing the filter, push the fuel hoses fully onto the fuel filter.**

5. Install in the reverse order of removal.

Tightening torque:
7.8—11 N·m (80—110 cm-kg, 69—95 in-lb)

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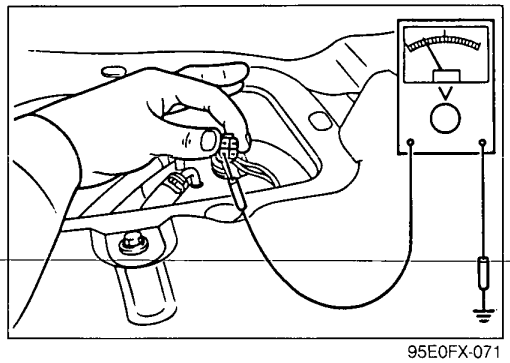
95A0FX-088

FUEL PUMP

Inspection

Fuel pump operation

1. Connect the diagnosis connector terminals F/P and GND with a jumper wire.
2. Remove the fuel filler cap.
3. Turn the ignition switch ON.
4. Listen for operational sound of the fuel pump at the filler inlet.
5. Install the fuel filler cap.

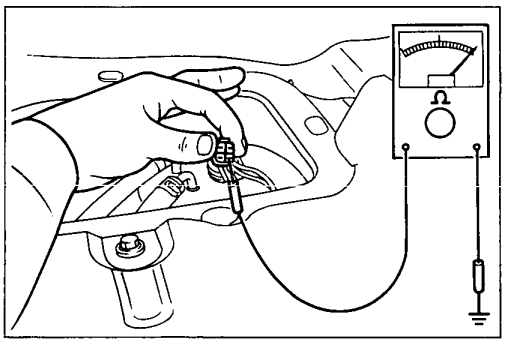


95E0FX-071

6. If no sound was heard, measure the voltage between the fuel pump connector wire to ground.

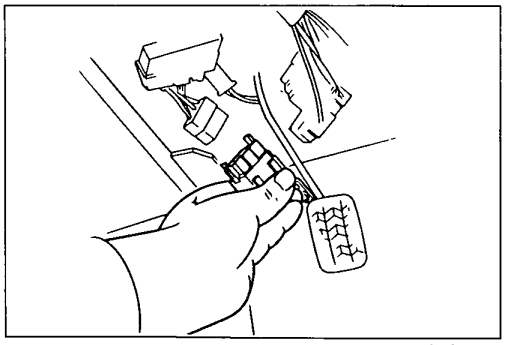
Voltage: 12V

7. If not correct, check the circuit opening relay and its circuits. (Refer to page F–106.)



05U0FX-146

8. If the voltage is normal, check for continuity between fuel pump connector (B) and a ground.
9. If there is continuity, replace the fuel pump.
10. If no continuity, repair the ground circuit.

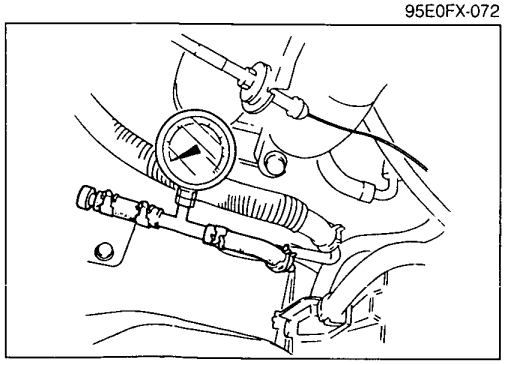

95E0FX-072

Hold pressure

Perform this inspection if the fuel pressure hold inspection is not as specified. (Refer to page F–99.)

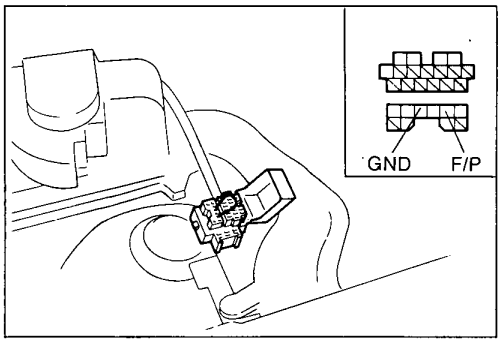
Warning

- **Before performing the following operation, release the fuel pressure from the fuel system to reduce the possibility of injury or fire. (Refer to page F–98.)**


05U0FX-148

1. Disconnect the negative battery terminal.
2. Connect a fuel pressure gauge to the fuel main pipe and plug the outlet of the fuel pressure gauge as shown. (Install clamps as shown.)
3. Connect the negative battery terminal.

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05U0FX-149

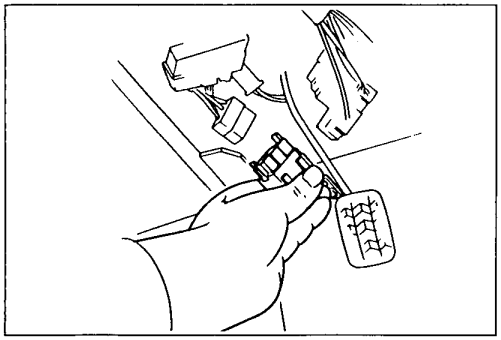
4. Connect diagnosis connector terminals F/P and GND with a jumper wire.
5. Turn the ignition switch ON **for 10 sec.** to operate the fuel pump.
6. Turn the ignition switch OFF and disconnect the jumper wire.
7. Observe the fuel pressure **after 5 min.**.

Fuel pressure:
More than 343 kPa (3.5 kg/cm^2, 50 psi)

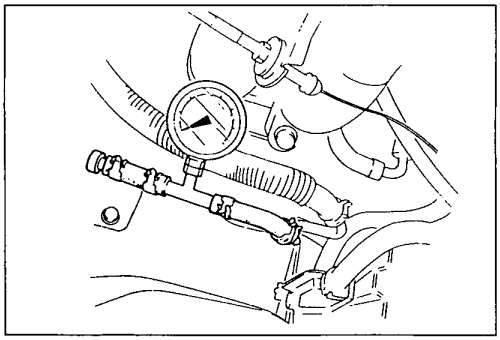
8. If not as specified, replace the fuel pump.

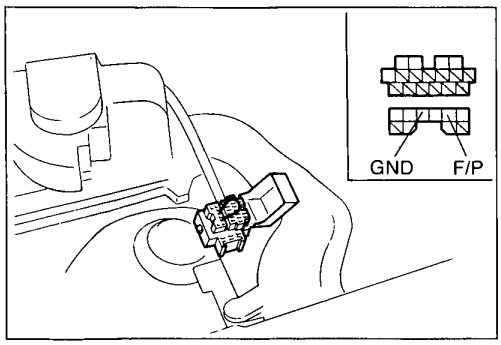
Fuel pump maximum pressure

Warning
- **Before performing the following operation, relase the fuel pressure from the fuel system to reduce the possibility of injury or fire. (Refer to page F–98.)**


95E0FX-073

1. Disconnect the negative battery terminal.
2. Connect a fuel pressure gauge to the fuel main pipe and plug the outlet of the fuel pressure gauge as shown. (Install clamps as shown.)
3. Connect the negative battery terminal.


05U0FX-151



05U0FX-152

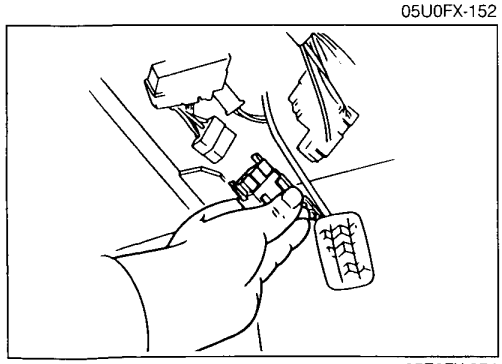
4. Connect diagnosis connector terminals F/P and GND with a jumper wire.
5. Turn the ignition switch ON to operate the fuel pump.
6. Measure the pump maximum pressure.

Fuel pump maximum pressure:
441—589 kPa (4.6—6.0 kg/cm^2, 64—85 psi)

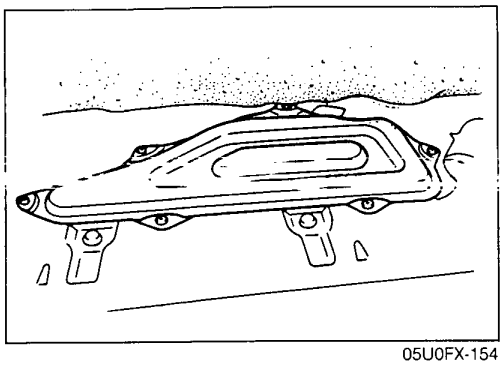
7. Turn the ignition switch OFF and disconnect the jumper wire.
8. If not as specified, replace the fuel pump.

Replacement

Warning
- **Before performing the following procedures, release the fuel pressure from the fuel system to reduce the possibility of injury or fire. (Refer to page F–98.)**
- **When replacing the fuel system parts, keep sparks, cigarettes, and open flames away from the fuel.**

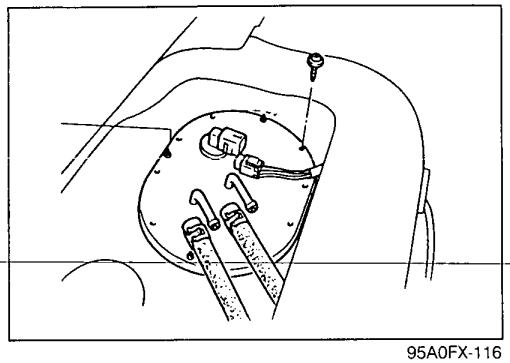

95E0FX-074

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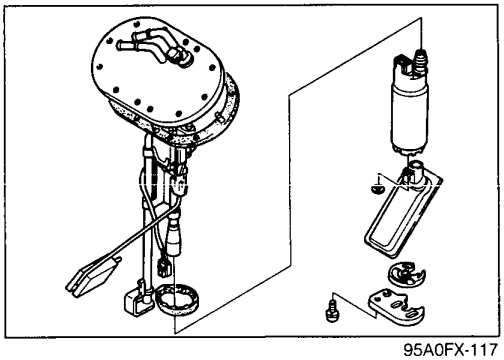
05U0FX-154

1. Remove the rear package trim.
2. Remove the service hole cover.



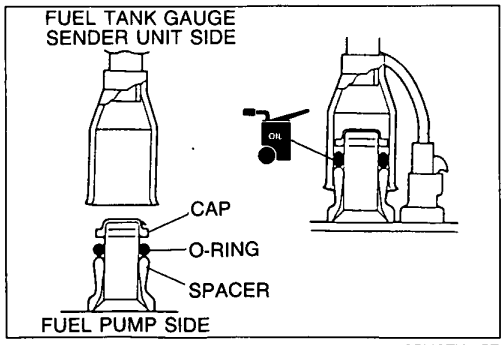
95A0FX-116

3. Remove the fuel pump cover.
4. Disconnect the fuel pump connector.
5. Disconnect the fuel hoses.
6. Remove the fuel pump and fuel tank gauge sender unit assembly.



95A0FX-117

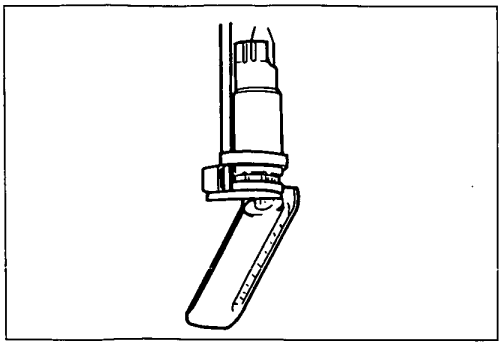
7. Remove the fuel pump.
8. Install in the reverse order of removal, referring to **Installation Note**.



05U0FX-157

Installation note
O-ring set

1. Use a new O-ring set. (O-ring, cap, and spacer)
2. Apply oil or fuel to the O-ring set before installing.
3. To confirm sealing of the O-ring, after assembling the fuel pump and fuel tank gauge sender unit, blow air through the fuel main pipe and verify that no air flows.
   If air flows, the check ball may be stuck. Shake the fuel pump 2 or 3 times and recheck.

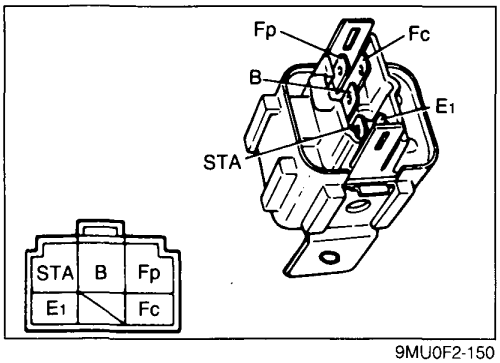


05U0FX-233

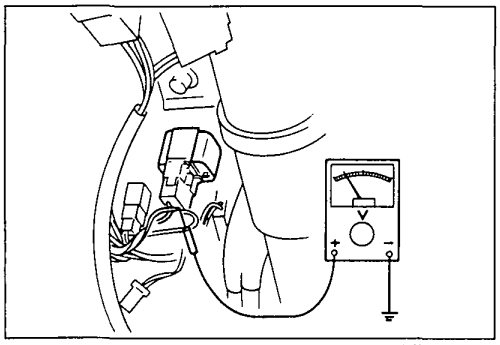
Fuel pump

1. After installing the fuel pump to the bracket, pull down the fuel pump down so that it is tight against the bracket.

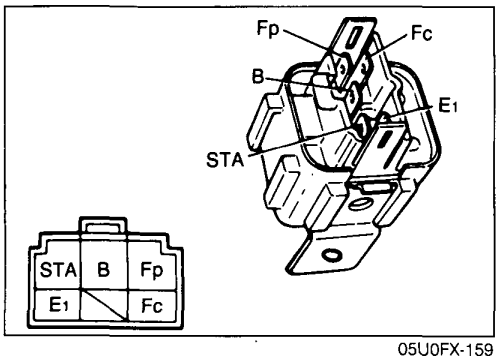
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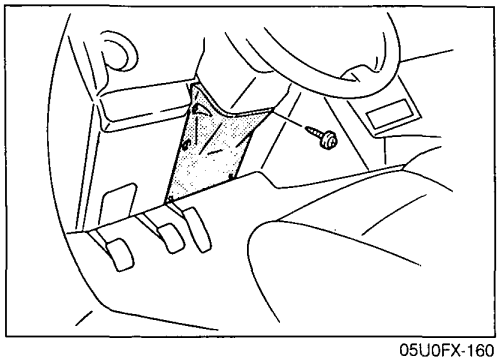
9MU0F2-150

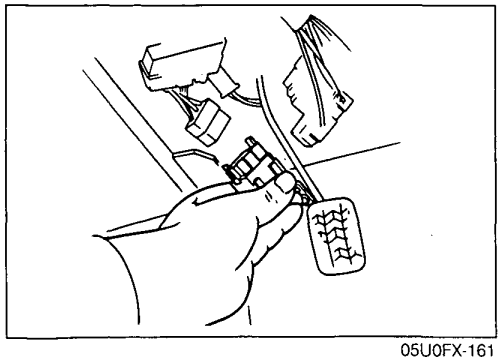


05U0FX-158



05U0FX-159


05U0FX-160


05U0FX-161

CIRCUIT OPENING RELAY

Inspection

Switching operation

Apply 12V and a ground to the terminals below and check the circuit opening relay operation as described.

12V	Grounded	Correct result
STA	E1	B-Fp: Continuity
B	Fc	Fp: Battery voltage

If not as specified, replace the circuit opening relay.

Relay circuit

Measure voltage between the terminals and a ground with a voltmeter.

Condition \ Terminal	Fp	Fc	B	STA	E1
Ignition switch: ON	0V	12V	12V	0V	0V
Ignition switch: START	12V	0V	12V	12V	0V
At idle	12V	0V	12V	0V	0V

If not as specified, check the related wiring harness.

Resistance

Measure resistance between the terminals with an ohmmeter.

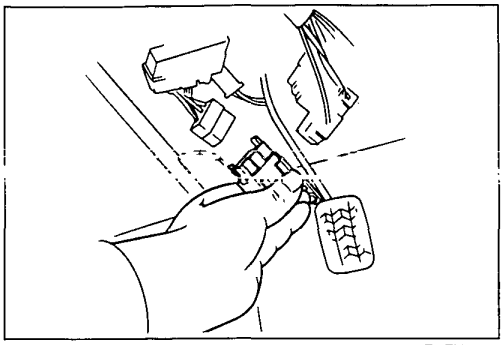
Between terminals	Resistance (Ω)
STA-E1	21—43
B-Fc	109—226
B-Fp	∞

If not as specified, replace the circuit opening relay.

Replacement

1. Remove the undercover.
2. Remove the circuit opening relay.
3. Install in the reverse order of removal.

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95E0FX-075

PRESSURE REGULATOR

Inspection

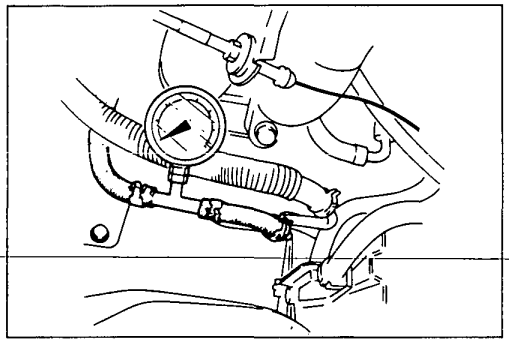
Fuel line pressure

Warning

- **Before performing the following operation, relase the fuel pressure from the fuel system to reduce the possibility of injury or fire. (Refer to page F–98.)**

1. Disconnect the negative battery terminal.
2. Connect a fuel pressure gauge between the fuel main pipe and the fuel main hose. (Install clamps as shown.)
3. Connect the negative battery terminal.
4. Start the engine and run it at idle.
5. Measure the fuel line pressure.

Fuel line pressure:
216—265 kPa (2.2—2.7 kg/cm^2, 31—38 psi)

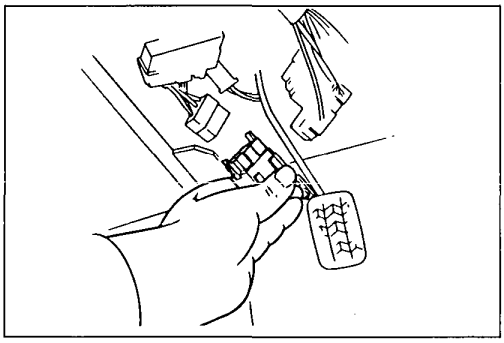

05U0FX-163

Hold pressure

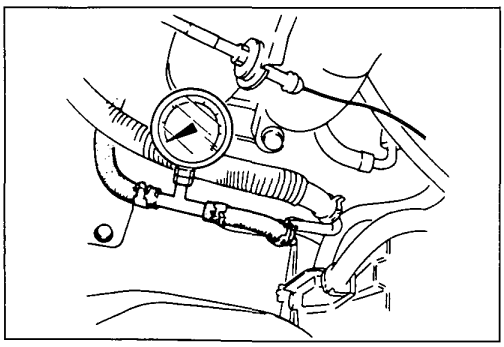
Perform this inspection if the fuel pressure hold inspection is not as specified. (Refer to page F–99.)

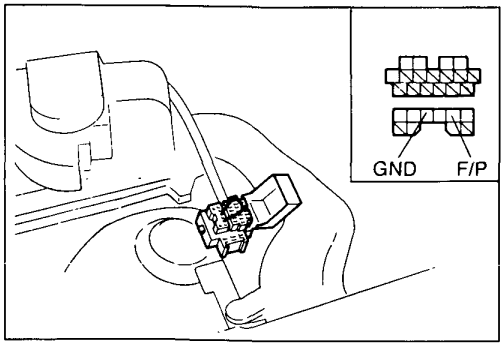
Warning

- **Before performing the following operation, relase the fuel pressure from the fuel system to reduce the possibility of injury or fire. (Refer to page F–98.)**


95E0FX-076

1. Disconnect the negative battery terminal.
2. Install a fuel pressure gauge between the fuel pipe and the fuel main hose. (Install clamps as shown.)
3. Connect the negative battery terminal.


05U0FX-165



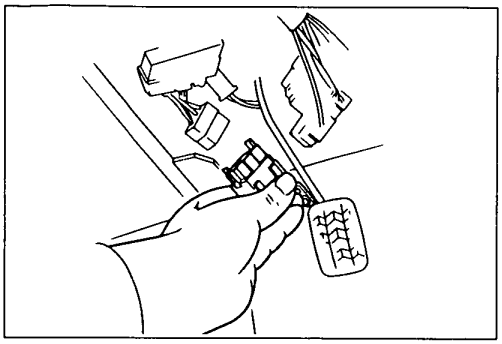
05U0FX-166

4. Connect diagnosis connector terminals F/P and GND with a jumper wire.
5. Turn the ignition switch ON **for 10 sec.** to operate the fuel pump.
6. Turn the ignition switch OFF and disconnect the jumper wire.
7. Block the outlet of the pressure regulator.
8. Observe the fuel pressure **for 5 min.**.

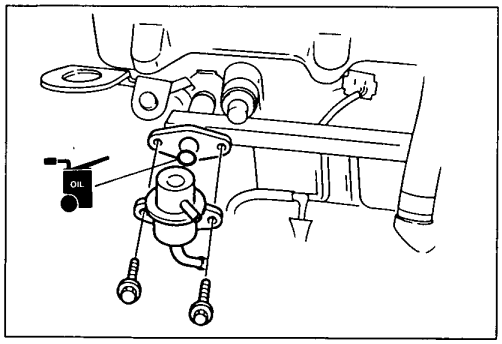
Fuel pressure:
More than 147 kPa (1.5 kg/cm^2, 21 psi)

9. If pressure is as specified, replace the pressure regulator.

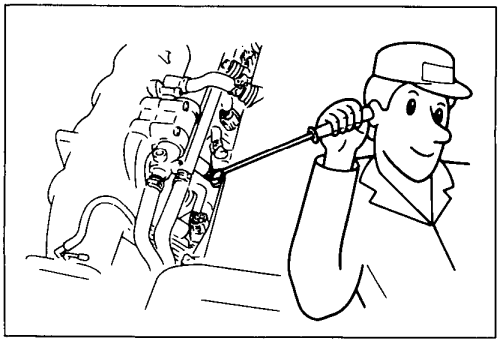
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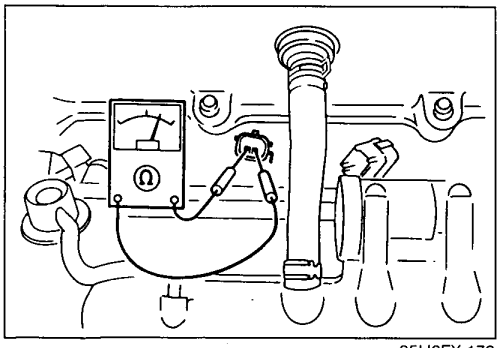
95E0FX-077



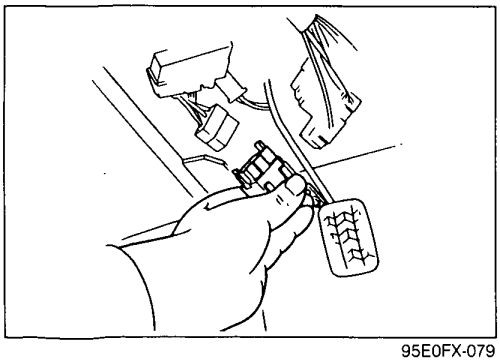
05U0FX-168



95E0FX-078



05U0FX-170



95E0FX-079

Replacement

Warning
- **Before performing the following operation, release the fuel pressure from the fuel system to reduce the possibility of injury or fire. (Refer to page F–98.)**
- **When replacing fuel system components, keep sparks, cigarettes, and open flames away from the fuel.**

1. Disconnect the vacuum hose.
2. Disconnect the fuel return hose.
3. Remove the pressure regulator.

Tightening torque:
7.8—11 N·m (80—110 cm-kg, 69—95 in-lb)

4. Use new O-ring.
5. Install in the reverse order of removal.

INJECTOR

Inspection

Operation check

1. Warm up the engine and run it at idle.
2. Listen for operational sound of the injector with a screwdriver or a sound scope.
3. If no sound is heard, measure injector resistance.
4. If the injector resistance is OK, check wiring to the injector and engine control unit terminals 2A, 2U, and 2V voltages. (Refer to page F–126.)

Injector resistance

1. Disconnect the injector harness.
2. Measure resistance of the injector with an ohmmeter.

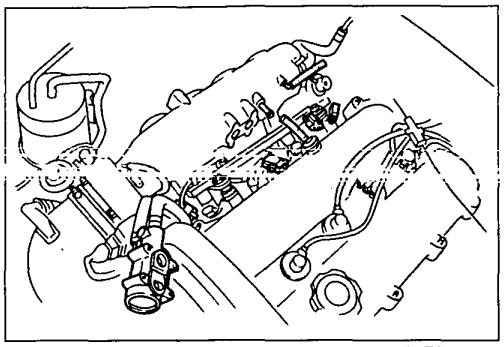
Resistance: 12—16Ω

3. If not as specified, replace the injector.

Removal

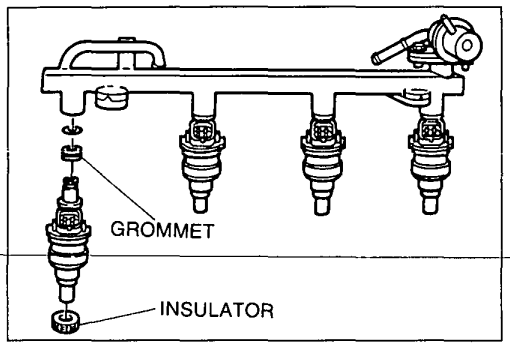
Warning
- **Before performing the following operation, release the fuel pressure from the fuel system to reduce the possibility of injury or fire. (Refer to page F–98.)**
- **When servicing the fuel system parts, keep sparks, cigarettes, and open flames away from the fuel.**

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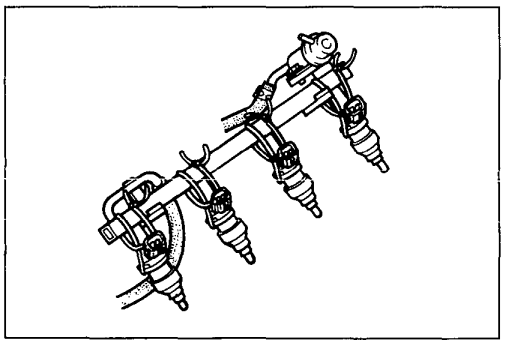
95E0FX-080

1. Disconnect the negative battery terminal.
2. Remove the air valve. (Refer to page F–95.)
3. Remove the PCV hose.
4. Disconnect the vacuum hose.
5. Disconnect the injector connectors.



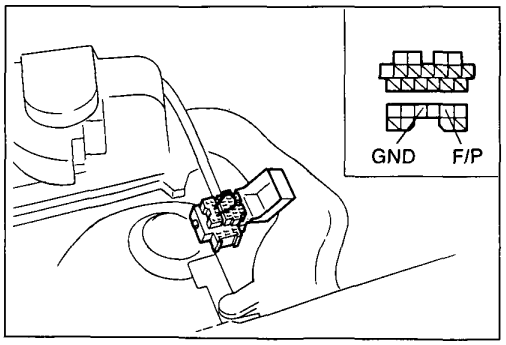
05U0FX-173

6. Remove the delivery pipe and the pressure regulator.
7. Remove the grommets, injectors, and insulators.



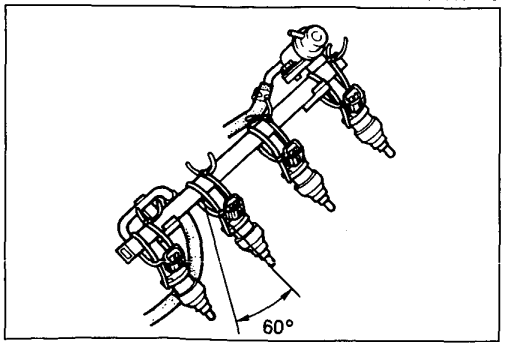
05U0FX-174

Inspection
Fuel leakage test
1. Remove the air valve.
2. Firmly affix the injectors to the delivery pipe with wire.
3. Disconnect the injector connectors.
4. Remove the delivery pipe and injectors together with the fuel hoses connected.



05U0FX-175

5. Connect diagnosis connector terminals (F/P) and (GND) with a jumper wire.



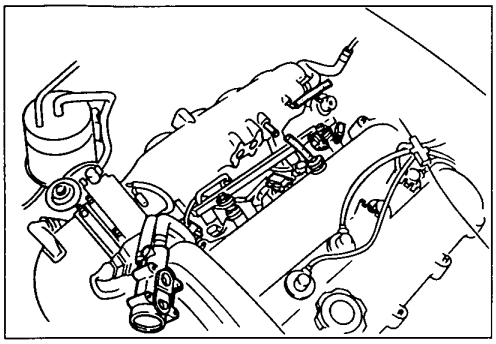
05U0FX-176

6. Turn the ignition switch ON.
7. Tilt the injectors **approx. 60 degrees** and verify that no fuel leaks from the injector nozzles.
8. If fuel leaks from an injector, replace it.

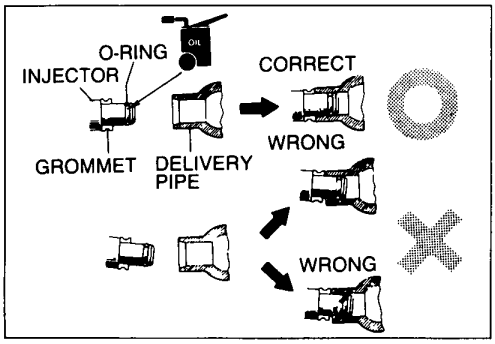
Note
- **After 1 minute a drop of fuel from the injector is acceptable.**

9. Turn the ignition switch OFF and remove the jumper wire.

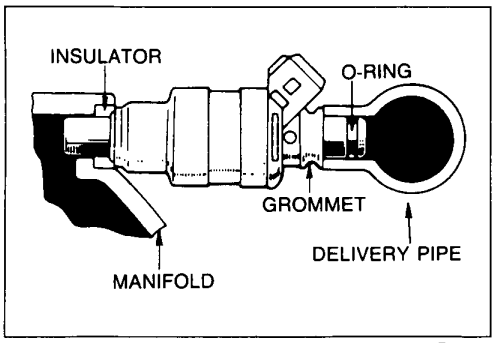
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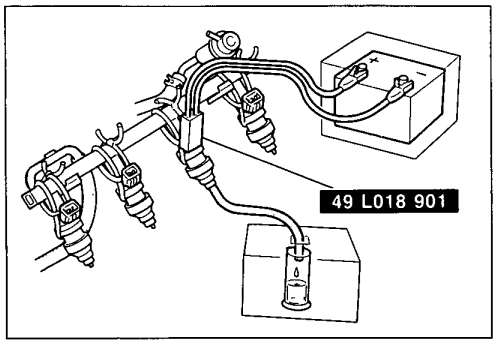
9MU0F2-172



05U0FX-177



05U0FX-238



95E0FX-150

Installation

Install in the reverse order of removal, referring to **Installation Note**.

Tightening torque:
Delivery pipe
19—25 N·m (1.9—2.6 m-kg, 14—19 ft-lb)

Installation note

1. Use new injector O-rings.
2. Apply a small amount of clean engine oil to the O-rings before installing.
3. Use new injector insulators.
4. Install the injectors and new injector insulators.

Volume test

Warning
- **Be extremely careful when working with fuel. Always work away from sparks or open flames.**

1. Perform the steps 1 to 4 of the fuel leakage test. (Refer to page F–110.)
2. Connect the **SST** to the battery and injector.
3. Check the injection volume with a graduated container.

Injection volume:
Approx. 50—64 cc (3.05—3.90 cu in)/15 sec.

4. If not as specified, replace the injector.

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EXHAUST SYSTEM

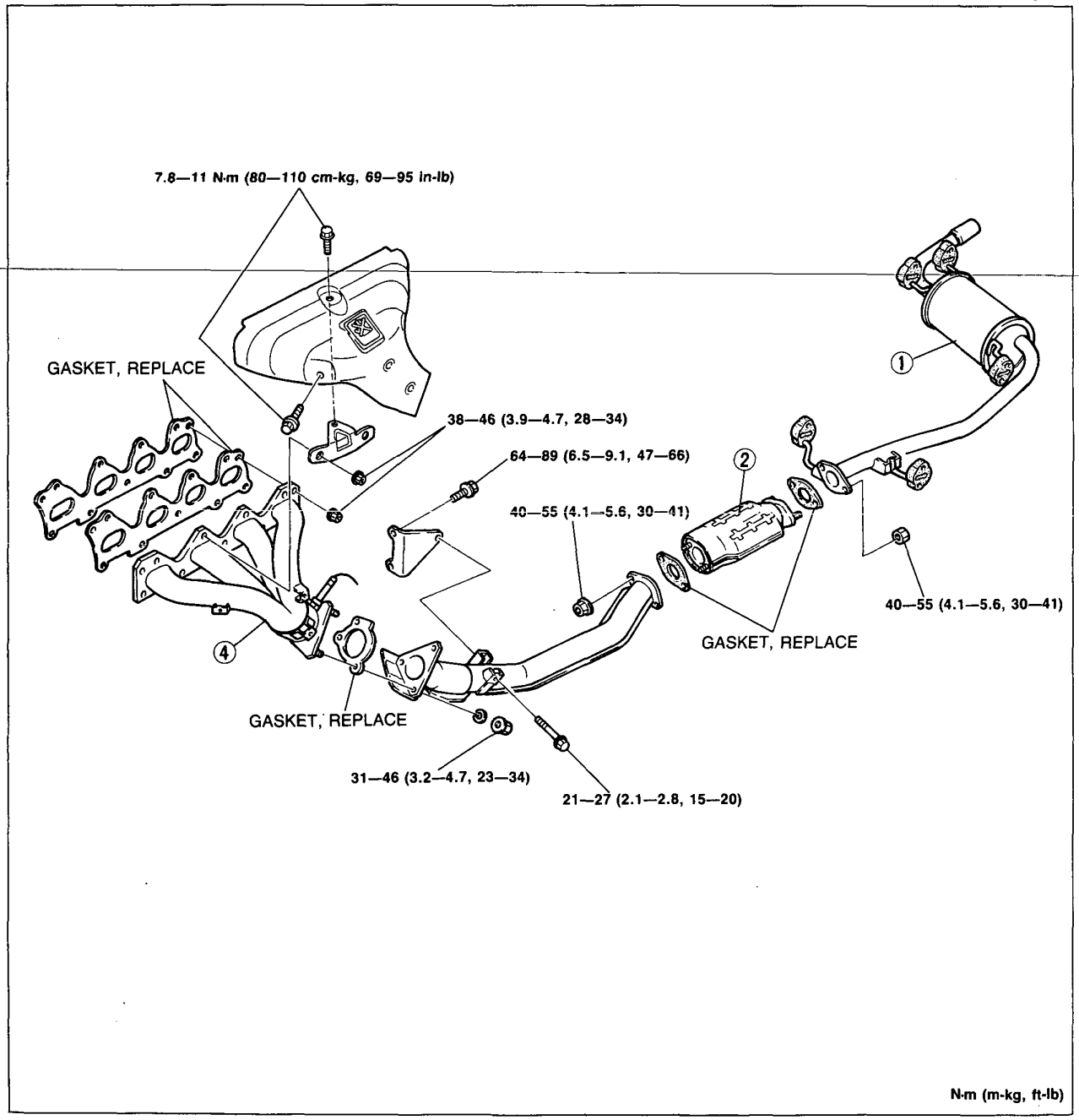
COMPONENTS

Removal / Inspection / Installation

1. Remove in the sequence shown in the figure.
2. Check all components for damage, deterioration, and restriction and repair or replace as necessary.
3. Install in the reverse order of removal.

Note

- **When installing the exhaust system components, tighten all fasteners to the specified torque.**



95E0FX-081

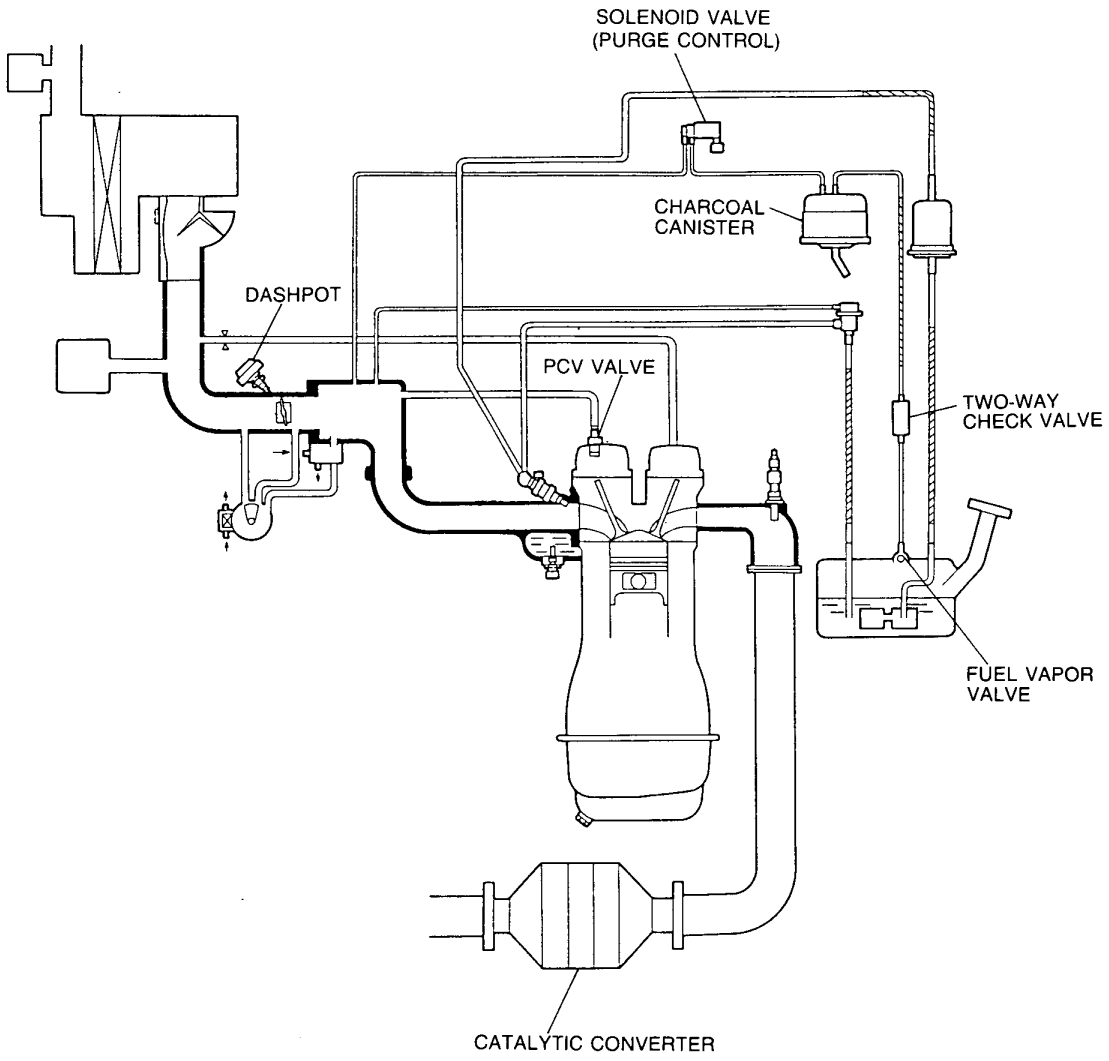
1. Main silencer
   Inspect for deterioration and restriction
2. Catalytic converter
   Inspect ..... page F–119
3. Front exhaust pipe
   Inspect for deterioration and restriction
4. Exhaust manifold
   Inspect for damage

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OUTLINE OF EMISSION CONTROL SYSTEM

STRUCTURAL VIEW

The following systems are employed to reduce CO, HC, and NOx emissions.
1. Positive crankcase ventilation (PCV) system.
2. Evaporative emission control system.
3. Catalytic converter.
4. Deceleration control system.



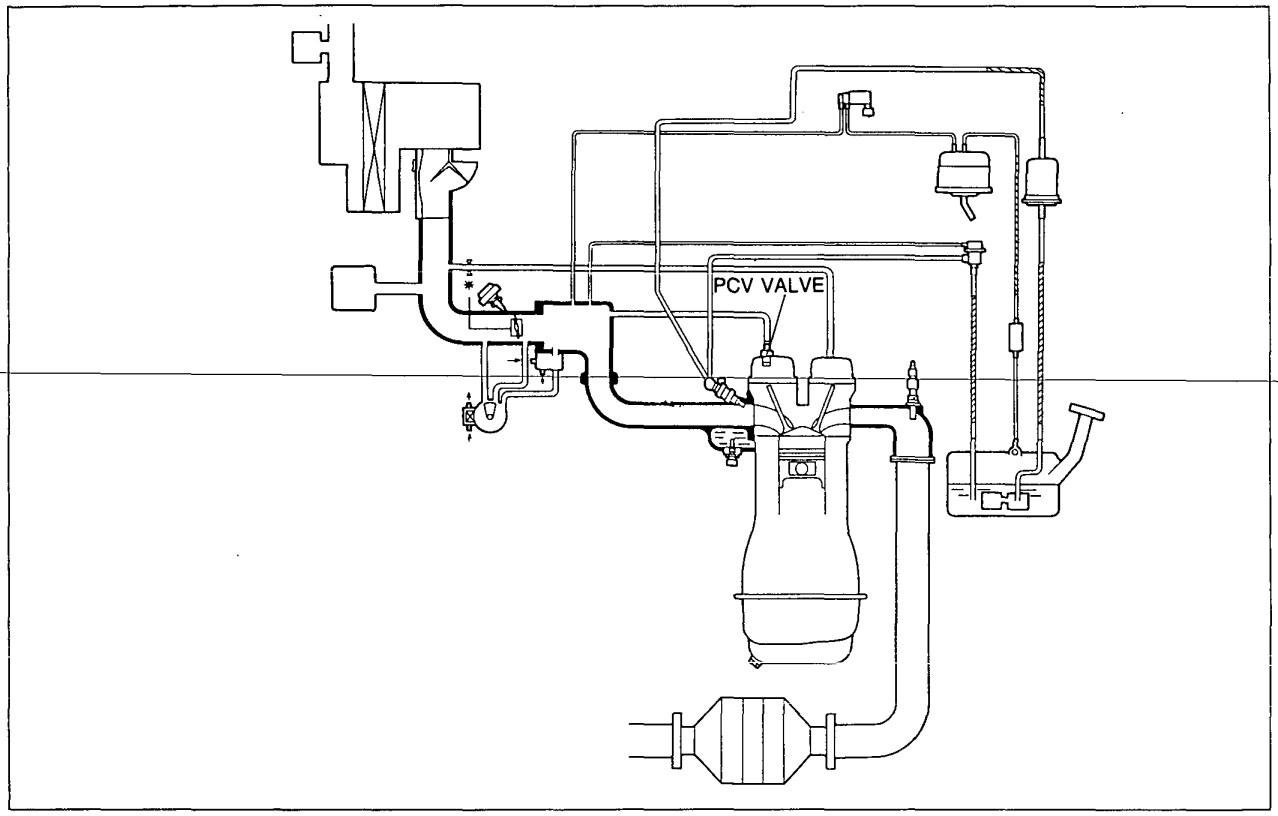
05UQFX-179

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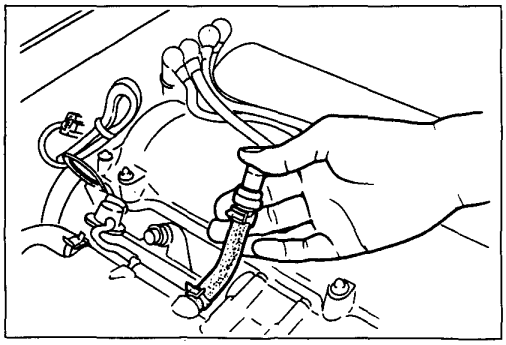
POSITIVE CRANKCASE VENTILATION (PCV) SYSTEM

DESCRIPTION

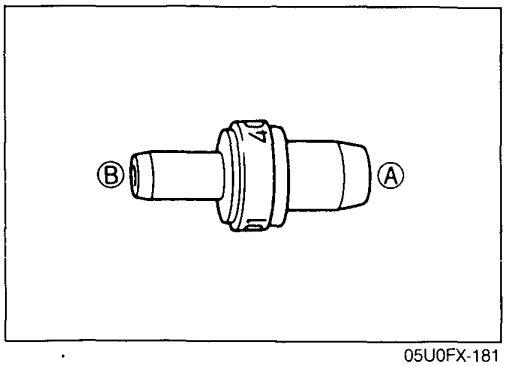
The PCV valve is operated by the intake manifold vacuum.
When the engine is running at idle the PCV valve is opened slightly and a small amount of blowby gas is drawn into the dynamic chamber to be burned.
At higher engine speeds the PCV valve is opened further, allowing a larger amount of blowby gas to be drawn into the dynamic chamber.



9MU0F2-182



05U0FX-180



05U0FX-181

PCV VALVE

Inspection

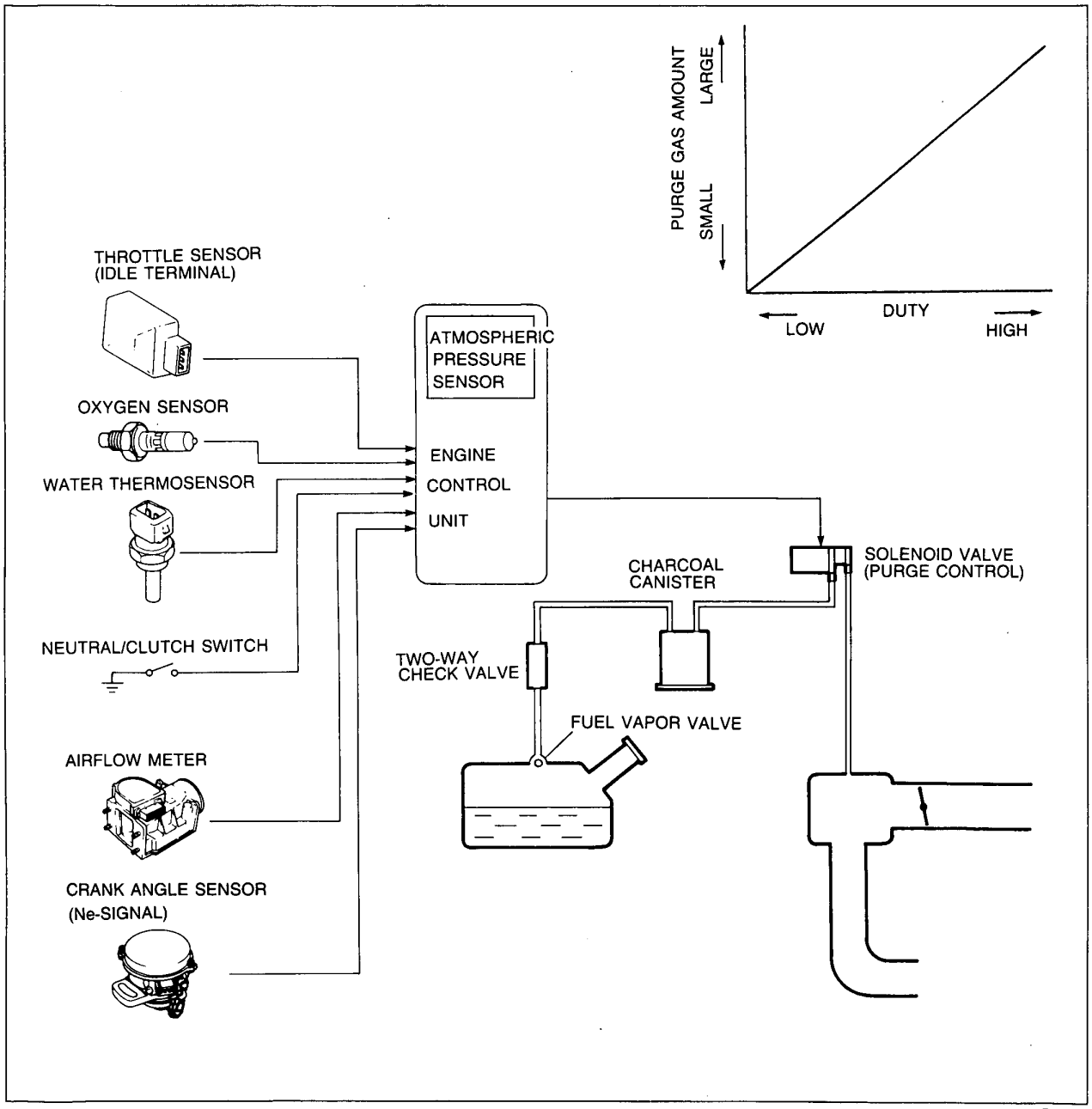
1. Warm up the engine to the normal operating temperature and run it at idle.
2. Disconnect the PCV valve together with the ventilation hose from the cylinder head cover.
3. Block the PCV valve opening.
4. Verify that vacuum is felt.
5. Remove the PCV valve.
6. Blow through the valve from port A and verify that air comes out of port B.
7. Blow through the valve from port B and verify that no air comes out of port A.
8. Replace the PCV valve if necessary.

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EVAPORATIVE EMISSION CONTROL SYSTEM

DESCRIPTION

The evaporative emission control system consists of the fuel vapor valve, the two-way check valve, the charcoal canister, the solenoid valve (purge control), the engine control unit, and the input devices. The amount of evaporative fumes introduced into the engine and burned is controlled by the solenoid valve in relation to the engine's operating conditions. To maintain the best engine performance, the solenoid valve is controlled by the engine control unit.



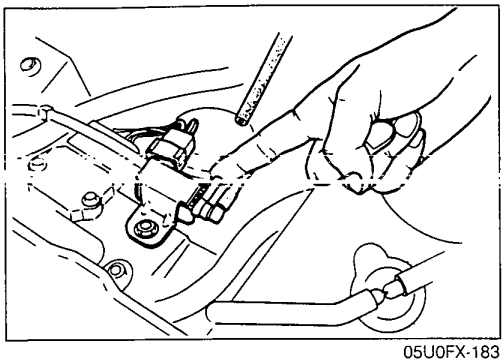
05U0FX-182

Operation

The solenoid valve (purge control) is controlled by duty signals from the engine control unit to perform purging of the charcoal canister. Purging is done when these conditions are met:

(1) After warm-up.
(2) Driving in gear.
(3) Accelerator pedal depressed (idle switch OFF).
(4) Oxygen sensor functioning normally.

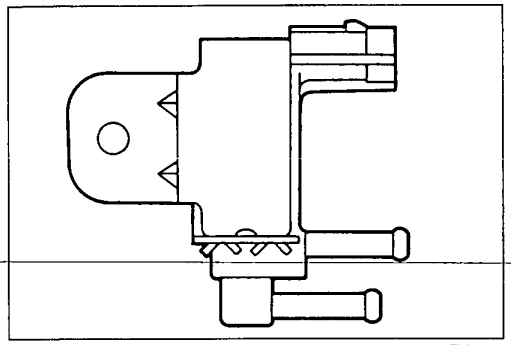
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05U0FX-183

SOLENOID VALVE (PURGE CONTROL)

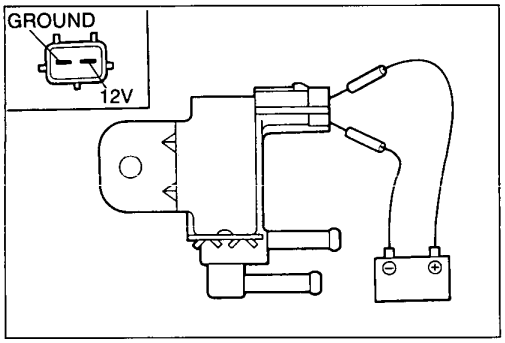
On-vehicle Inspection

1. Warm up the engine to normal operating temperature.
2. Run the engine at idle.
3. Disconnect the vacuum hose from the solenoid valve and verify that no vacuum is felt at the solenoid valve.
4. If not as specified, check the solenoid valve.


05U0FX-184

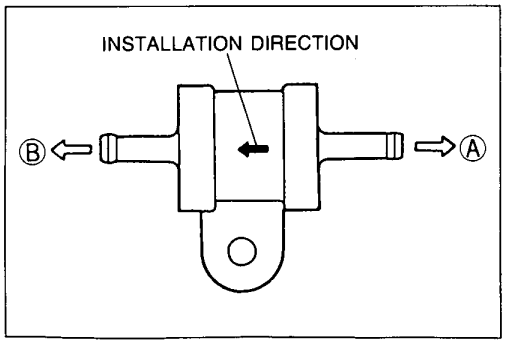
Inspection

1. Disconnect the vacuum hoses from the solenoid valve.
2. Verify that no air flows through the valve.



05U0FX-185

3. Disconnect the solenoid valve connector and connect **12V** and a ground to the terminals of the solenoid valve.
4. Verify that the air flows through the valve.
5. If not as specified, replace the solenoid valve.



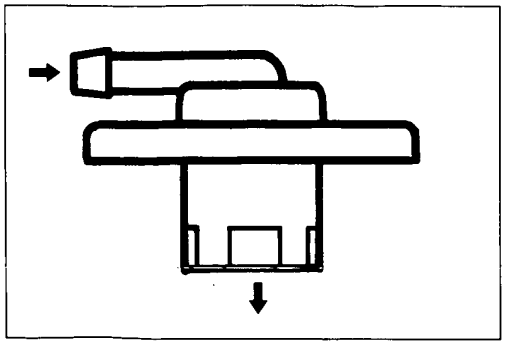
05U0FX-186

TWO-WAY CHECK VALVE

Inspection

1. Remove the valve.
2. Check the operation of the valve with a vacuum pump.

Apply approx. 37 mmHg (1.46 inHg) vacuum at port A	Airflow
Apply approx. 44 mmHg (1.73 inHg) vacuum at port B	Airflow

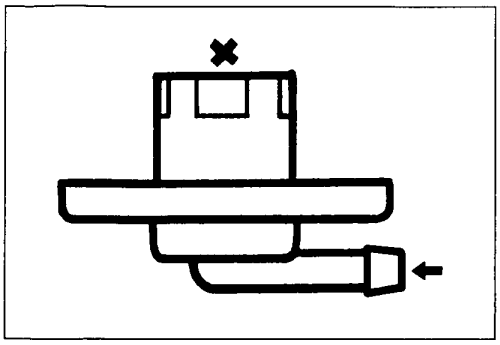

05U0FX-187

FUEL VAPOR VALVE

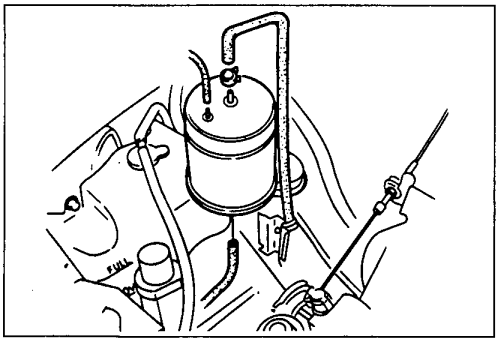
Inspection

1. Remove the valve.
2. Blow through the valve and verify that air flows in the direction shown.

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05U0FX-188



05U0FX-189

3. Turn the valve over and blow through the valve. Verify that no air flows.
4. Replace the valve if necessary.

CHARCOAL CANISTER

Inspection

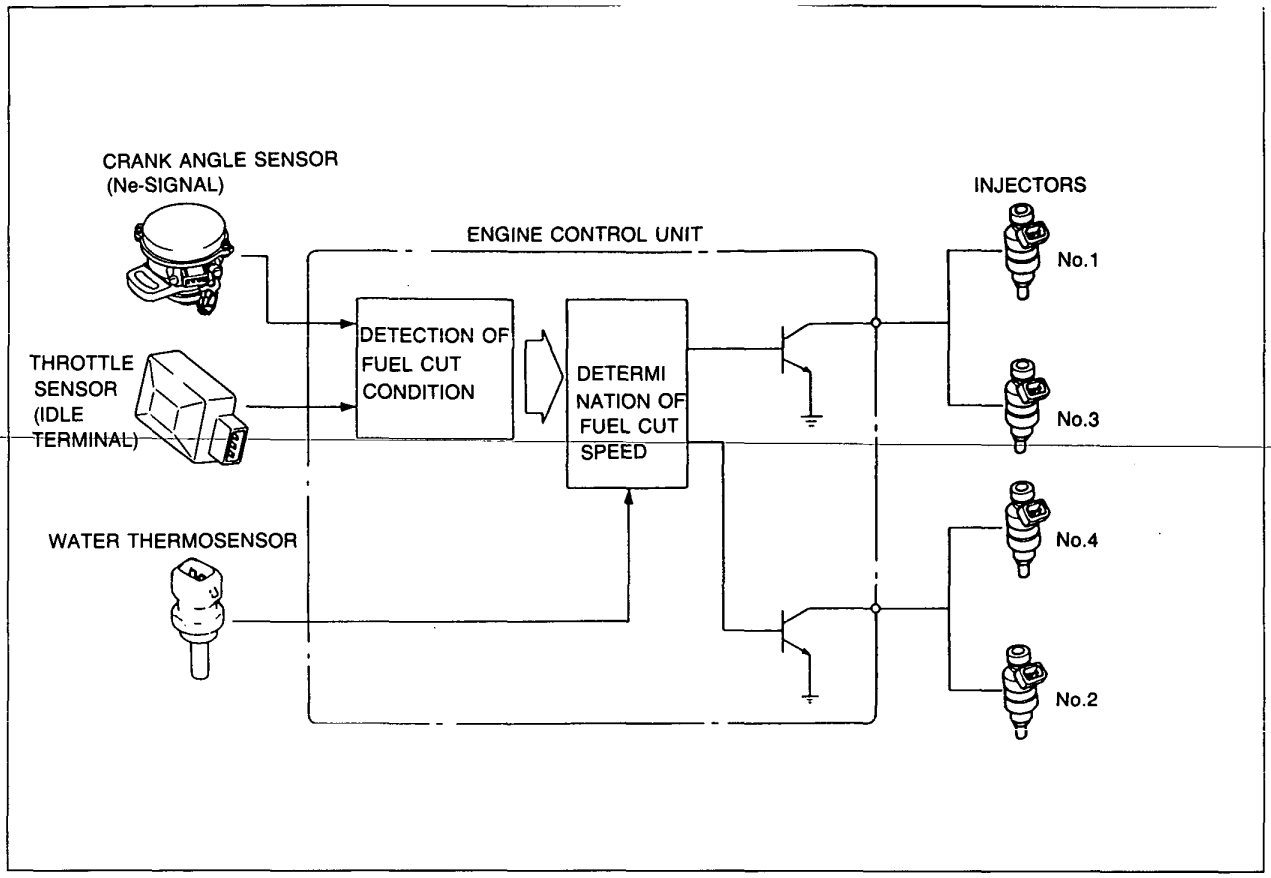
Visually check for damage and replace the charcoal canister if necessary.

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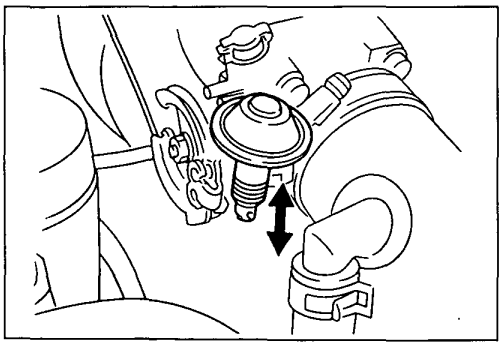
DECELERATION CONTROL SYSTEM

DESCRIPTION

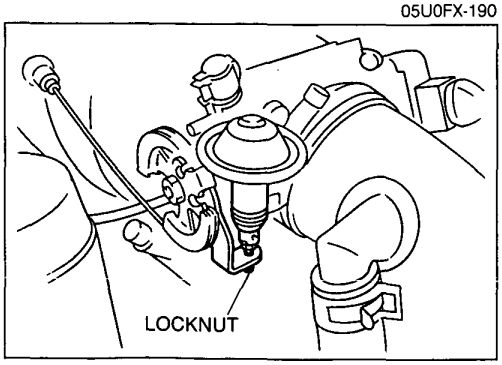
The deceleration control system consists of the fuel cut operation and the dashpot.
1. Dashpot: To prevent the throttle valves from suddenly closing.
2. Fuel cut: To improve the fuel economy and to prevent engine bucking during deceleration.



05U0FX-239



05U0FX-190



05U0FX-191

DASHPOT

Inspection

1. Open the throttle valve fully. Push the dashpot rod with a finger and verify that it goes into the dashpot slowly.
2. Release the rod and check that it comes out quickly.
3. Replace the dashpot if necessary.
4. Warm up the engine and run it at idle.
5. Connect a tachometer to the engine, and increase the engine speed to **4,000 rpm**.
6. Slowly decrease the engine speed and check that the lever touches the dashpot rod as specified.

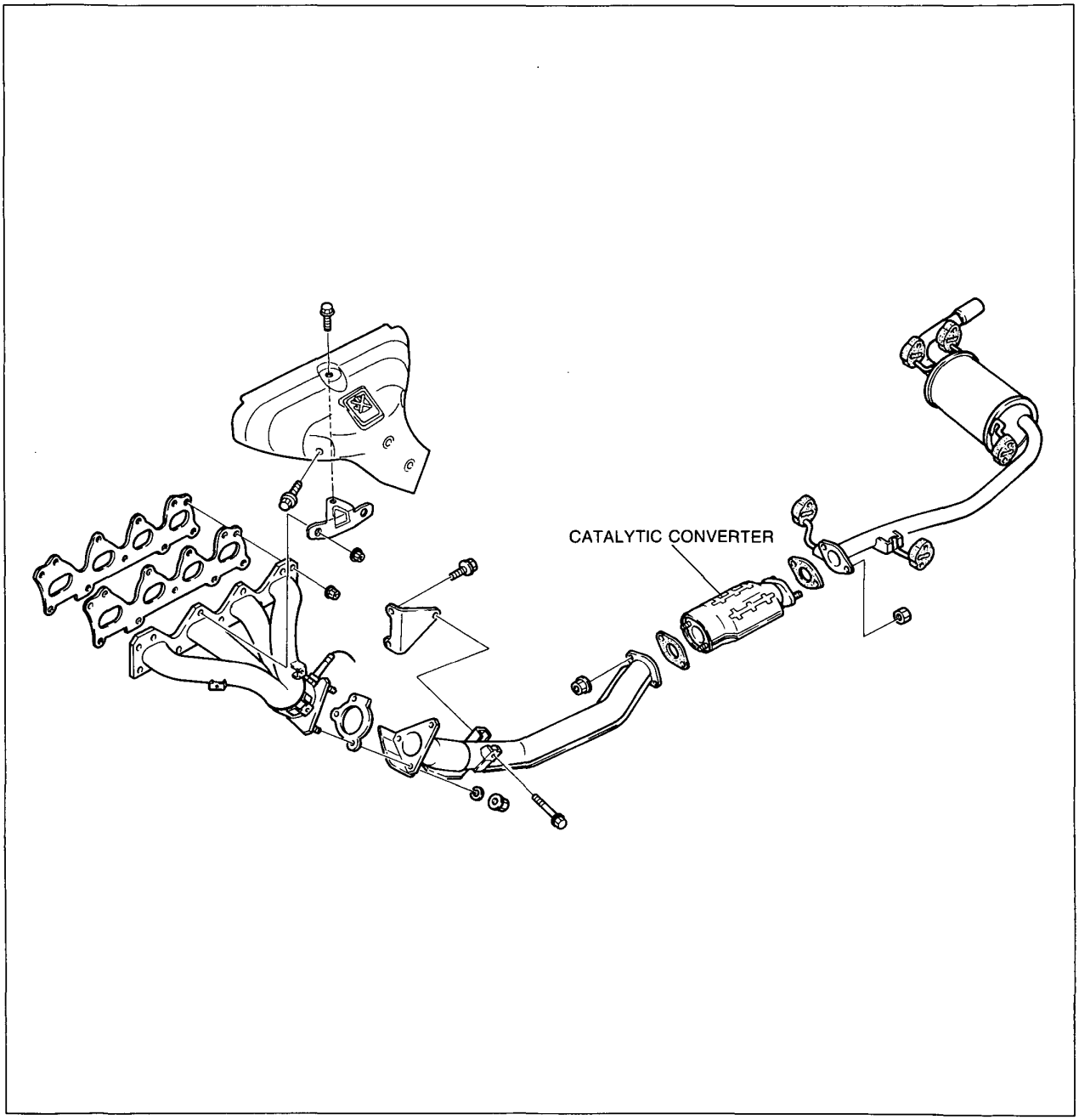
   Specification: 2,500 ± 150 rpm

7. If not as specified, loosen the locknut and turn the adjusting screw to adjust.

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CATALYTIC CONVERTER SYSTEM

DESCRIPTION



95E0FX-082

CATALYTIC CONVERTER

Inspection

Check the catalytic converter for deterioration or restriction. Check for damage to the insulation covers welded to the catalytic converter. Replace the catalytic converter if necessary.

Note

- **If the insulation cover touches the catalytic converter housing, excessive heat at the floor of the vehicle will occur.**

Replacement

Refer to page F–112.

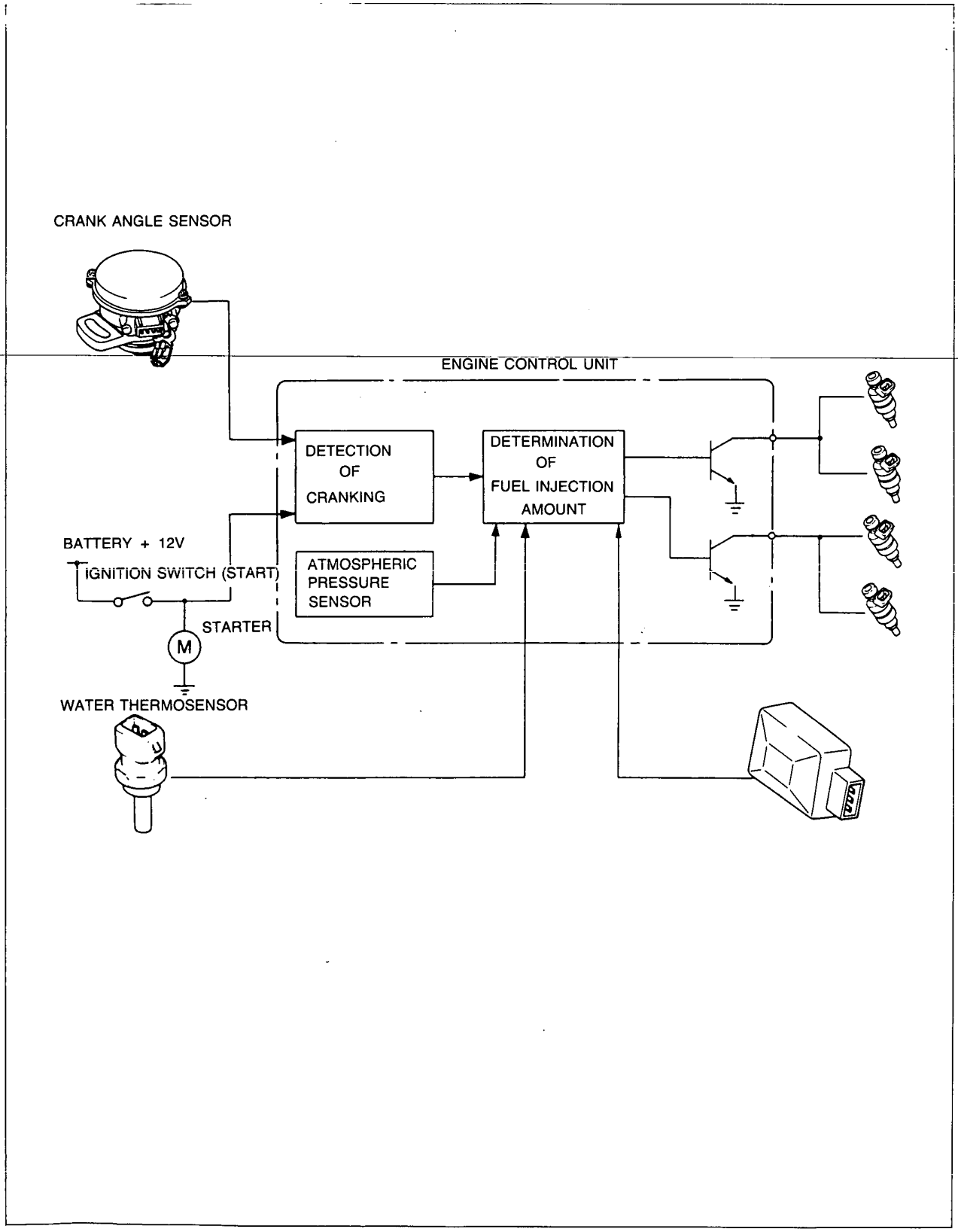
95A0FX-099

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DECHOKE CONTROL SYSTEM

DESCRIPTION

To clean out excess fuel in cylinders, as in the case of engine flooding, when the engine is cold, no fuel will be injected when the accelerator is held fully depressed while cranking the engine.

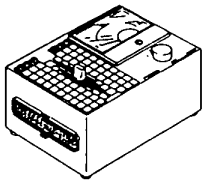
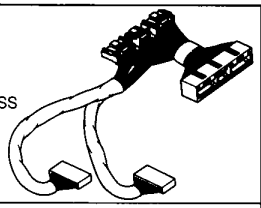
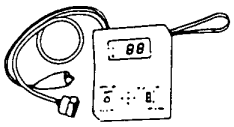
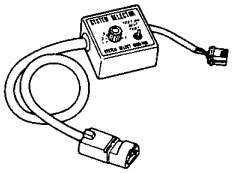
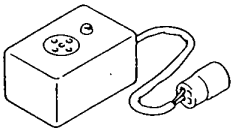
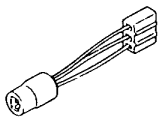
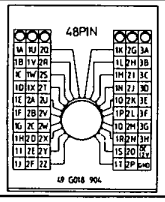


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CONTROL SYSTEM

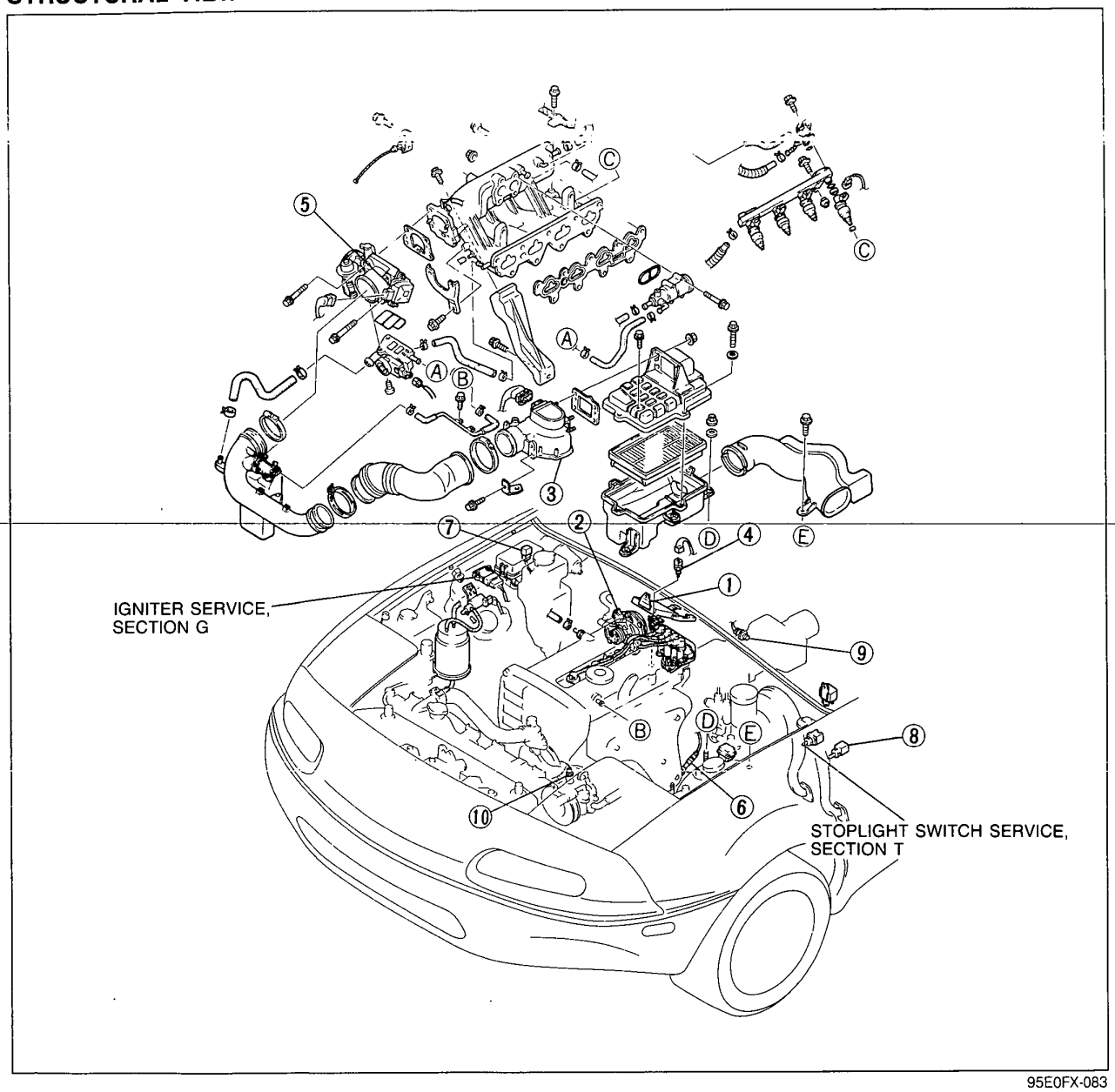
PREPARATION
SST

49 9200 162 Engine Signal Monitor 	For inspection of engine control unit	49 G018 903 Adapter harness 	For inspection of engine control unit
49 H018 9A1 Self-Diagnosis Checker 	For inspection of oxygen sensor	49 B019 9A0 System Selector 	For inspection of oxygen sensor
49 9200 165 Throttle Sensor Checker 	For inspection of oxygen sensor	49 9200 166 Adapter harness 	For inspection of oxygen sensor
49 G018 904 Sheet 	For inspection of engine control unit		

95A0FX-101

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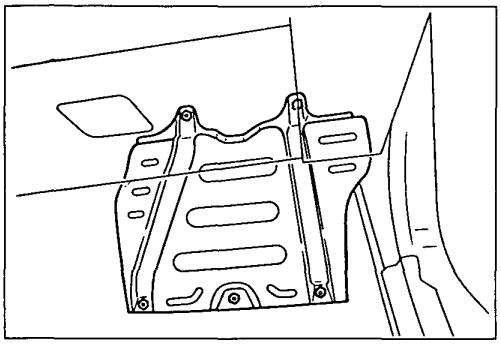
STRUCTURAL VIEW



95E0FX-083

1. Engine control unit
   Inspection ..... page F–123
2. Crank angle sensor
   Removal ..... page F–130
   Inspection ..... page F–130
   Installation ..... page F–130
3. Airflow meter
   Inspection ..... page F–131
4. Water thermosensor
   Removal ..... page F–132
   Inspection ..... page F–132
   Installation ..... page F–132
5. Throttle sensor
   Inspection ..... page F–132
   Adjustment ..... page F–133
   Replacement ..... page F–133
6. Oxygen sensor
   Inspection ..... page F–134
   Replacement ..... page F–135
7. Main relay (Fuel injector relay)
   Inspection ..... page F–135
8. Clutch switch
   Inspection ..... page F–135
   Replacement ..... page F–135
9. Neutral switch
   Inspection ..... page F–136
   Replacement ..... page F–136
10. Power steering pressure switch
   Inspection ..... page F–136
   Replacement ..... page F–136

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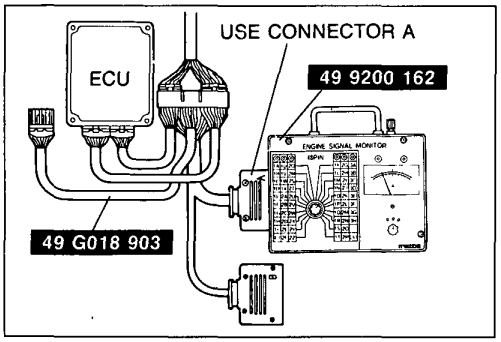


9MU0F2-207

ENGINE CONTROL UNIT

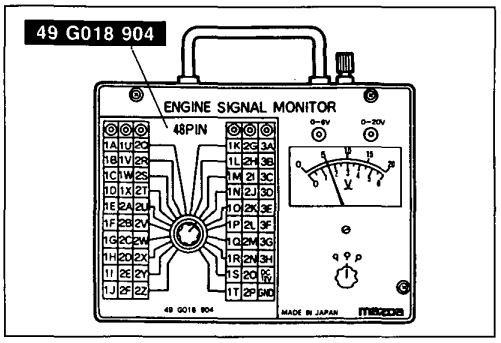
Inspection

1. Lift up the floormat in front of the passenger's seat.
2. Remove the protector cover.



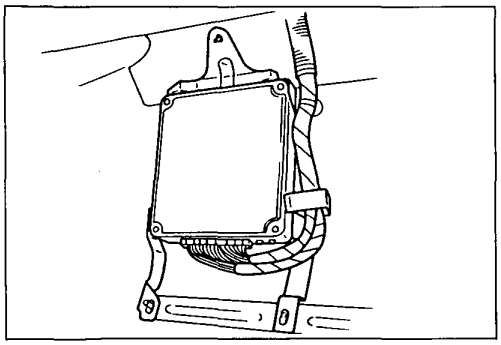
05U0FX-199

3. Connect the **Engine Signal Monitor** between the engine control unit and the wiring harness using the **Adapter** as shown.



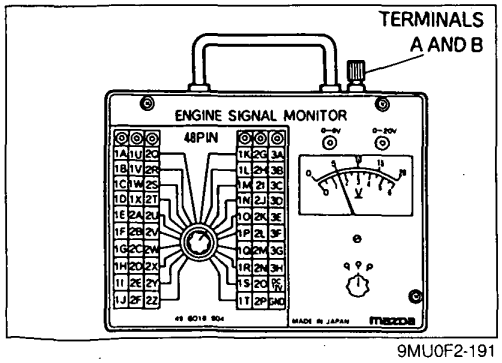
95E0FX-084

4. Place the **SST (Sheet)** on the **SST**.
5. Measure the voltage at each terminal.
   (Refer to pages F–124 to F–126.)



95E0FX-085

6. If any engine control unit terminal voltage is incorrect, check the input or output device and related wiring.
   If they are normal, replace the engine control unit.
   (Refer to pages F–127 to F–129.)



9MU0F2-191

Caution

- **Never apply voltage to SST terminals A and B.**

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Terminal	Input	Output	Connection to	Test condition	Voltage	Remark
1A	—	—	Battery	Constant	Approx. 12V	For backup
1B	○		Main relay	Ignition switch OFF	Approx. 0V	
				Ignition switch ON	Approx. 12V	
1C	○		Ignition switch (Start position)	While cranking	Approx. 12V	
				Ignition switch ON	Approx. 0V	
1D		○	Self-Diagnosis Checker (Monitor lamp)	Test switch at "SELF-TEST" Lamp illuminated for 3 sec. after ignition switch OFF→ON	Approx. 5V	With Self-Diagnosis Checker and System Selector
				Lamp not illuminated after 3 sec.	Approx. 12V	
				Test switch at "O_2 MONITOR" at idle Monitor lamp illuminated	Approx. 5V	
				Test switch at "O_2 MONITOR" at idle Monitor lamp not illuminated	Approx. 12V	
1E	—	—	—	—	—	—
1F		○	Self-Diagnosis Checker (Code number)	Buzzer sound for 3 sec. after ignition switch OFF→ON	Below 2.5V	• With Self-Diagnosis Checker and System Selector • With System Selector test switch at "SELF-TEST"
				Buzzer not sounded after 3 sec.	Approx. 12V	
				Buzzer sounded	Below 2.5V	
				Buzzer not sounded	Approx. 12V	
1G		○	Igniter	Ignition switch ON	Approx. 0V	
				Idle	Approx. 0.2V	
1H		○	Igniter	Ignition switch ON	Approx. 0V	
				Idle	Approx. 0.2V	
1I	—	—	—	—	—	—
1J	—	—	—	—	—	—
1K	○		Diagnosis connector	System Selector test switch at "O_2 MONITOR"	Approx. 12V	
				System Selector test switch at "SELF-TEST"	Approx. 0V	
1L	—	—	—	—	—	—
1M	—	—	—	—	—	—
1N	○		Throttle sensor (Idle point)	Accelerator pedal released	Approx. 0V	Ignition switch ON
				Accelerator pedal depressed	Approx. 12V	
1O	○		Stoplight switch	Brake pedal released	0V	
				Brake pedal depressed	Approx. 12V	
1P	○		P/S pressure switch	Ignition switch ON	Approx. 12V	
				P/S ON (at idle)	0V	
				P/S OFF (at idle)	Approx. 12V	
1Q	—	—	—	—	—	—

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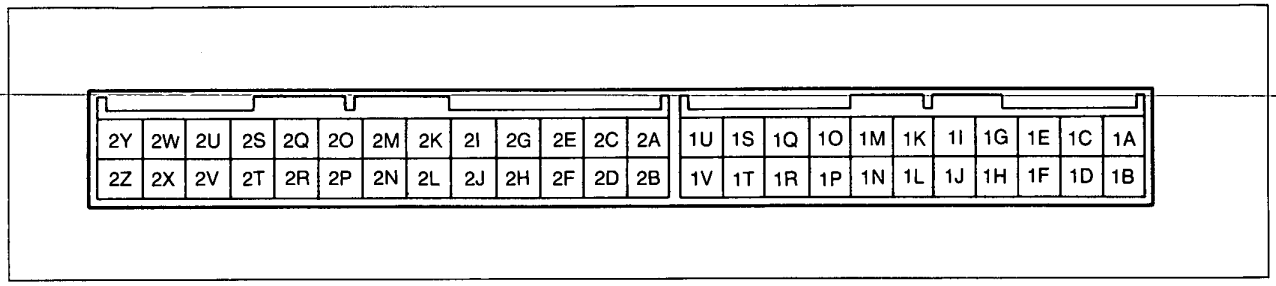
Terminal	Input	Output	Connection to	Test condition	Voltage	Remark
1R	O		Fan switch	Fan operating (Engine coolant temperature over 91°C (196°F) or diagnosis connector terminal TFA grounded)	Approx. 0V	
				Fan not operating (Idle)	Approx. 12V	
1S	O		Blower control switch	Blower control switch at mid, high or super high position	Approx. 0V	Ignition switch ON
				Blower control switch OFF or low	Approx. 12V	
1T	—	—	—	—	—	
1U	O		Headlight switch	Headlights ON (Tail, parking, low beam/ high beam)	Approx. 12V	
				Headlights OFF	0V	
1V	O		Neutral or clutch switch	Neutral position or clutch pedal depressed	Approx. 0V	
				Other conditions	Approx. 12V	
2A	—	—	Ground (Injector)	Constant	0V	
2B	—	—	Ground (Output)	Constant	0V	
2C	—	—	Ground (CPU)	Constant	0V	
2D	—	—	Ground (Input)	Constant	0V	
2E	O		Crank angle sensor (Ne-signal)	Ignition switch ON	Approx. 0V or 5V	
				Idle	Approx. 2V	
2F	—	—	—	—	—	—
2G	O		Crank angle sensor (G-sgnal)	Ignition switch ON	Approx. 0V or 5V	
				Idle	Approx. 1.5V	
2H	—	—	—	—	—	—
2I	O		Igniter	Ignition switch ON	Below 0.5V	
				Idle	Approx. 1V	
2J	O		Ground	Constant	0V	
2K		O	Airflow meter	Constant	4.5—5.5V	
2L	O		Throttle sensor (Power terminal)	Accelerator pedal released	Approx. 5V	
				Accelerator pedal fully depressed	Approx. 0V	
2M	—	—	—	—	—	—
2N	O		Oxygen sensor	Ignition switch ON	0V	
				Idle (Cold engine)	0V	
				Idle (After warm-up)	0—1V	
				Increase engine speed (After warm-up)	0.5—1V	
				Deceleration	0—0.4V	
2O	O		Airflow meter	Ignition switch ON	Approx. 3.8V	
				Idle	Approx. 3.3V	
2P	O		Airflow sensor (Intake air thermosensor)	At 20°C (68°F)	Approx. 2.5V	
2Q	O		Water thermosensor	Engine coolant temperature 20°C (68°F)	Approx. 2.5V	
				After warm up	Approx. 0.4V	
2R	—	—	—	—	—	—

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Terminal	Input	Output	Connection to	Test condition	Voltage	Remark
2S	—	—	—	—	—	—
2T	—	—	—	—	—	—
2U		O	Injector (Nos.1, 3) (Nos.2, 4)	Ignition switch ON	Approx. 12V	* Engine Signal Monitor: Green and red lights flash
				Idle	Approx. 12V*	
2V		O		Deceleration from 3,000 rpm to 1,900 rpm (After warm up)	Approx. 12V	
2W		O	ISC valve	Ignition switch ON	Approx. 7V	
				Idle	Approx. 9V	
2X		O	Solenoid valve (Purge control)	Ignition switch ON	Approx. 12V	
				Idle	Approx. 12V	
2Y	—	—	—	—	—	—
2Z	—	—	—	—	—	—

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Terminal location



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Check Point for Each Terminal

Terminal	Connection to	Abnormal voltage	Possible cause
1A	Battery	Always approx. 0V (Battery OK)	• ROOM 10A fuse burned • Open circuit in wiring from ROOM 10A fuse to ECU terminal 1A
1B	Main relay	Always approx. 0V	• Main relay malfunction (Refer to page F–135) • Open circuit in wiring from main relay to ECU terminal 1B
1C	Ignition switch (Start position)	Always approx. 0V (Starter turns)	• Open circuit in wiring from starter interlock switch to ECU terminal 1C
1D	Self-Diagnosis Checker (Monitor lamp)	Always approx. 0V	• Main relay malfunction (Refer to page F–135) • Open circuit in wiring from main relay to diagnosis connector terminal +B • Open or short circuit in wiring from diagnosis connector terminal MEN to ECU terminal 1D
		Always approx. 12V	• Poor connection at ECU connector • ECU malfunction
		Always approx. 5V	• ECU malfunction
1F	Self-Diagnosis Checker (Code No.)	Always below 2.5V (No display on Self-Diagnosis Checker)	• Main relay malfunction (Refer to page F–135) • Open circuit in wiring from main relay to diagnosis connector terminal +B
		Always below 2.5V ("88" is displayed and buzzer sounds continuously)	• Open or short circuit in wiring from diagnosis connector terminal FEN to ECU terminal 1F
		Always approx. 12V	• Poor connection at ECU connector • ECU malfunction
1G 1H	Igniter	Always approx. 0V	Refer to Code No.01 troubleshooting (Refer to page F–78)
1K	Diagnosis connector (Terminal TEN)	Always approx. 0V	• Short circuit in wiring from ECU terminal 1K to diagnosis connector terminal TEN
		Always approx. 12V	• Open circuit in wiring from ECU terminal 1K to diagnosis connector terminal TEN • Open circuit in wiring from diagnosis connector terminal GND to ground
1N	Throttle sensor (Idle terminal)	Always approx. 0V	• Throttle sensor misadjustment (Refer to page F–132) • Short circuit in wiring from ECU terminal 1N to throttle sensor • ECU malfunction
		Always approx. 12V	• Throttle sensor misadjustment (Refer to page F–132) • Open circuit in wiring from ECU terminal 1N to throttle sensor • Open circuit in wiring from throttle sensor to ground
1O	Stoplight switch	Always approx. 0V (Stoplights OK)	• Open circuit in wiring from stoplight switch to ECU terminal 1O

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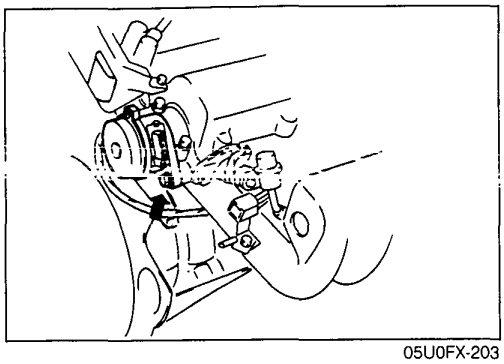
Terminal	Connection to	Abnormal voltage	Possible cause
1P	P/S pressure switch	Always approx. 0V	• P/S pressure switch malfunction (Refer to page F–136) • Short circuit in wiring from ECU terminal 1P to P/S pressure switch • ECU malfunction
		Always approx. 12V	• P/S pressure switch malfunction (Refer to page F–136) • Open circuit in wiring from ECU terminal 1P to P/S pressure switch • Open circuit in wiring from P/S pressure switch to ground
1R	Fan switch	Always approx. 0V (Cooling fan OK)	• Open or short circuit in wiring from electric cooling fan relay to ECU terminal 1R • ECU malfunction
1S	Blower control switch	Always approx. 0V (Blower fan OK)	• Short circuit in wiring from blower control switch to ECU terminal 1S • Poor connection at ECU connector • ECU malfunction
		Always approx. 12V (Blower fan OK)	• Open circuit in wiring from blower control switch to ECU terminal 1S
1U	Headlight switch	Always approx. 0V (Headlights OK)	• Open or short circuit in wiring from headlight relay to ECU terminal 1U
1V	Neutral switch Clutch switch	Always approx. 0V	• Neutral switch malfunction (Refer to page F–136) • Clutch switch malfunction (Refer to page F–135) • Short circuit in wiring from ECU terminal 1V to neutral or clutch switch • Poor connection at ECU connector • ECU malfunction • Open circuit in wiring from ECU terminal 1V to neutral and clutch switches
2A 2B 2C 2D	Ground	More than 0V	• Poor contact at ground terminal • Open circuit in wiring from ECU to ground
2E	Crank angle sensor (Ne-signal)	Always approx. 0V or approx. 5V	• Refer to Code No.02 troubleshooting (Refer to page F–79)
2G	Crank angle sensor (G-signal)	Always approx. 0V or approx. 5V	• Refer to Code No.03 troubleshooting (Refer to page F–79)
2I	Igniter	Always Approx. 0V	• Refer to Code No.01 troubleshooting (Refer to page F–78)
2J	Ground	Approx. 5V	• Open circuit in wiring from ECU terminal 2J to ground

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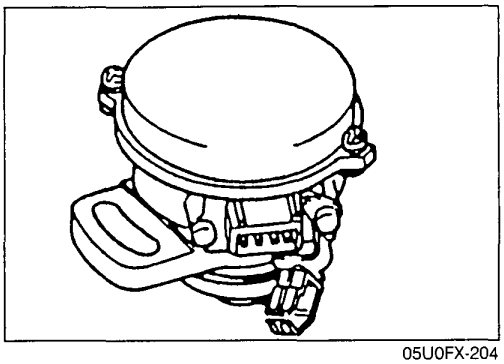
Terminal	Connection to	Abnormal voltage	Possible cause
2K	Airflow meter	Always approx. 0V	• Short circuit in wiring from ECU terminal 2K to airflow meter • Poor connection at ECU connector • ECU malfunction
		Below 4.5V or above 5.5V	• ECU malfunction
2L	Throttle sensor (Power terminal)	Always approx. 0V	• Throttle sensor malfunction (Refer to page F–132) • Short circuit in wiring from ECU terminal 2L to throttle sensor • Poor connection at ECU connector • ECU malfunction
		Always approx. 5V	• Throttle sensor misadjustment (Refer to page F–132) • Open circuit in wiring from ECU terminal 2L to throttle sensor • Open circuit in wiring from throttle sensor to ground
2N	Oxygen sensor	0V after warm-up	• Refer to Code No.15 troubleshooting (Refer to page F–83)
		Always approx. 1V after warm-up	• Refer to Code No.17 troubleshooting (Refer to page F–83)
2O	Airflow meter	Always approx. 0V or approx. 5V	• Refer to Code No.08 troubleshooting (Refer to page F–81)
2P	Airflow meter (Intake air thermosensor)	Always approx. 0V or approx. 5V	• Refer to Code No.10 troubleshooting (Refer to page F–82)
			• Intake air thermosensor malfunction (Refer to page F–131)
2Q	Water thermosensor	Always approx. 0V or approx. 5V	• Refer to Code No.09 troubleshooting (Refer to page F–82)
			• Water thermosensor malfunction (Refer to page F–132)
2U 2V	Injector	Always approx. 0V	• Main relay malfunction (Refer to page F–135) Open or short circuit in wiring from injector to ECU terminal 2U or 2V
		Always approx. 12V	• ECU malfnction
2W	ISC valve	Always approx. 0V or approx. 12V	• Refer to Code No.34 troubleshooting (Refer to page F–84)
			• ISC valve malfunction (Refer to page F–96)
2X	Solenoid valve (Purge control)	Always approx. 0V or approx. 12V	• Refer to Code No.26 troubleshooting (Refer to page F–84)
			• Solenoid valve (Purge control) malfunction (Refer to page F–116)

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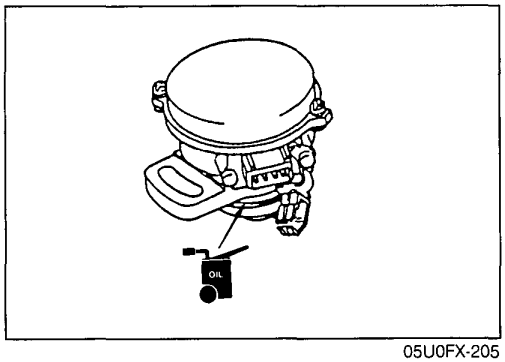
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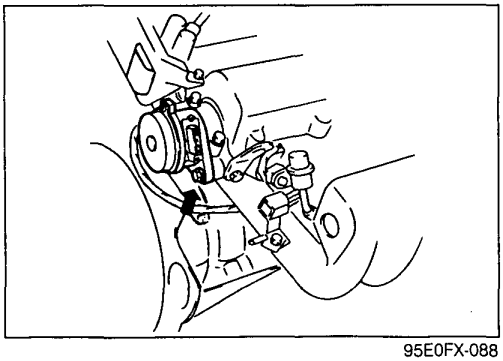
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CRANK ANGLE SENSOR

Removal

1. Disconnect the crank angle sensor connector
2. Remove the crank angle sensor.

Inspection

1. Visually check the crank angle sensor for damage.
2. Replace if necessary.

Installation

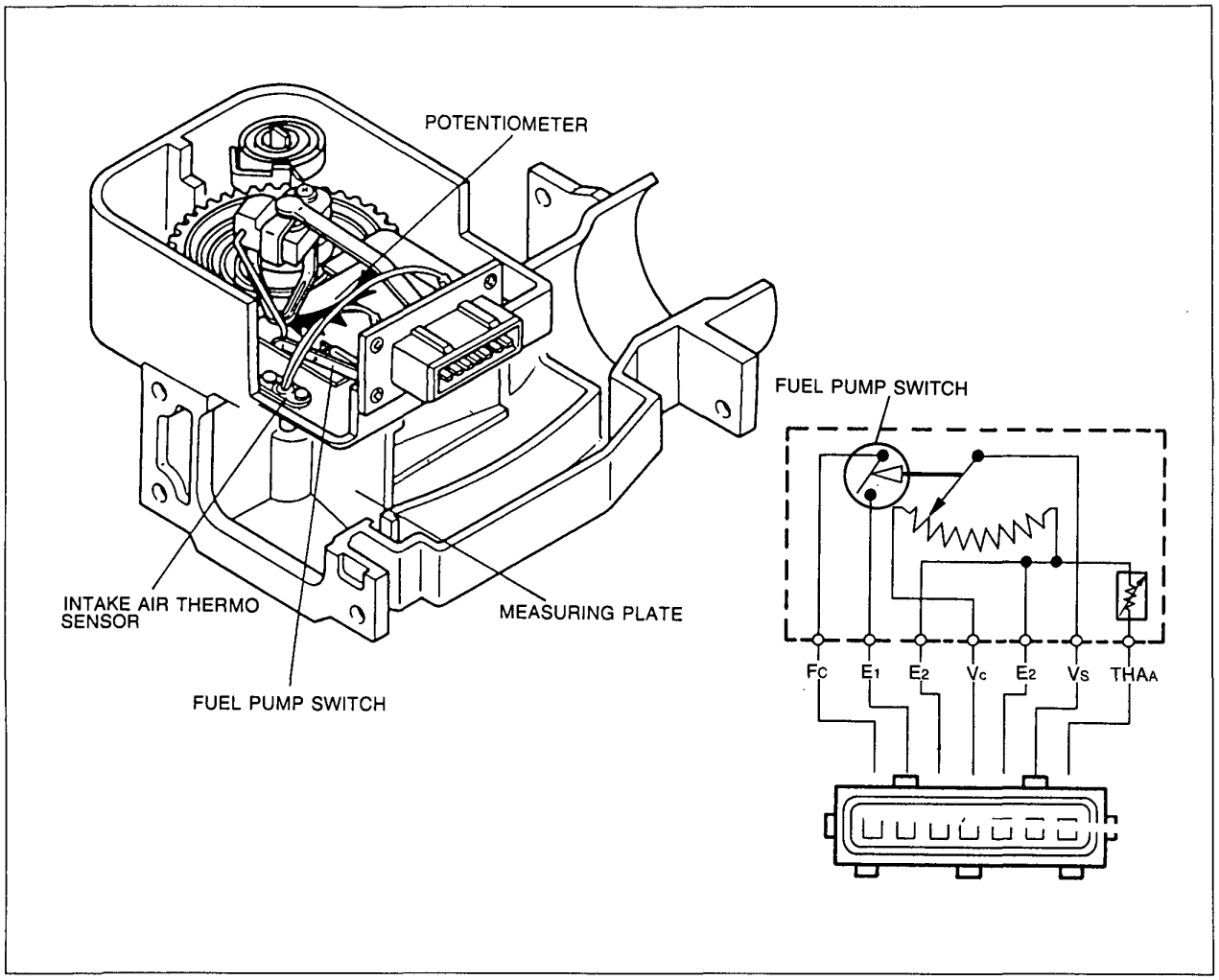
1. Apply grease to the new O-ring and the blade.
2. Install the crank angle sensor.

Tightening torque:
19—27 N·m (1.9—2.6 m-kg, 14—20 ft-lb)

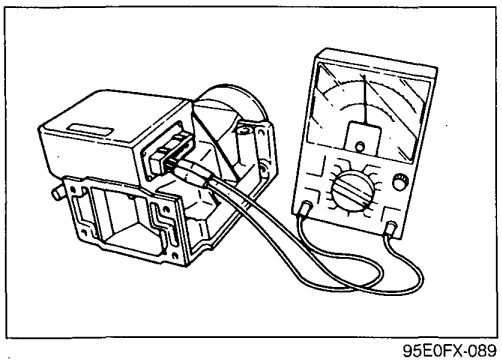
3. Connect the crank angle sensor connector.
4. Adjust the ignition timing. (Refer to page F–71.)

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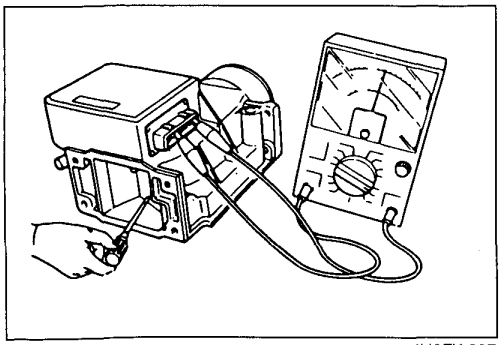
AIRFLOW METER



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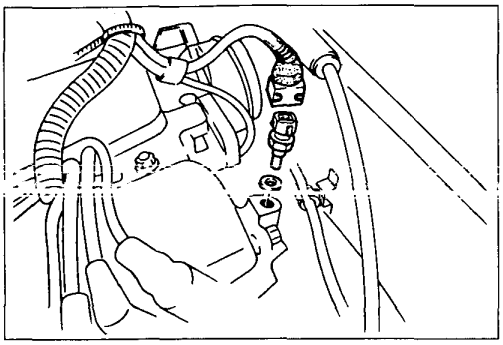
Inspection

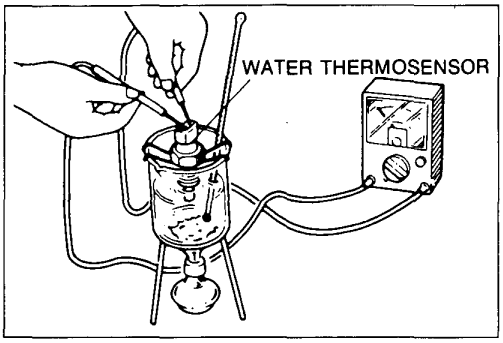
1. Remove the airflow meter. (Refer to page F–89.)
2. Check the airflow meter body for cracks.
3. Verify that the measuring plate moves smoothly.
4. Disconnect the connector from the airflow meter.
5. Move the measuring plate and check for resistance between the terminals with an ohmmeter.

Terminal	Resistance (Ω)	
	Fully closed	Fully open
E2↔Vs	200—600	20—1,000
E2↔Vc	200—400	
E2↔THAA (Intake air thermosensor)	−20°C (−4°F) 20°C (68°F) 60°C (140°F)	13,600—18,400 2,210— 2,690 493— 667
E1↔Fc	∞	0

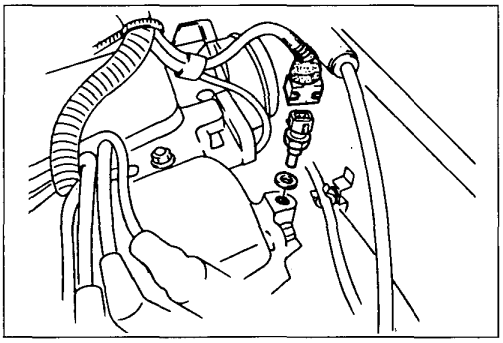
6. Connect the airflow meter connector after checking.

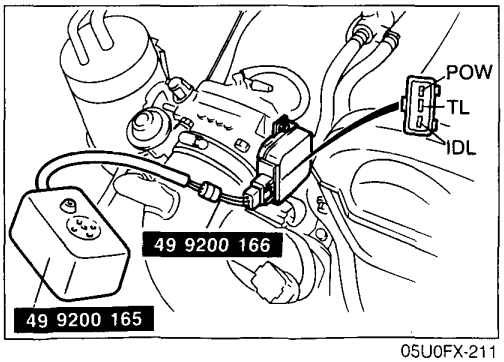
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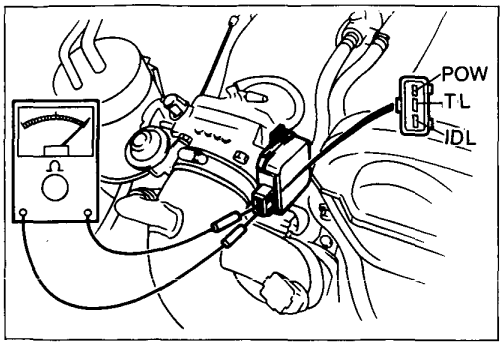


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WATER THERMOSENSOR

Removal

1. Remove the ignition coil assembly. (Refer to page G–21.)
2. Disconnect the water thermosensor connector.
3. Remove the water thermosensor.

Inspection

1. Place the sensor in water with a thermometer and heat the water gradually.
2. Measure resistance of the sensor with an ohmmeter.

Coolant	Resistance kΩ
–20°C (–4°F)	14.6 —17.8
20°C (68°F)	2.2 — 2.7
80°C (176°F)	0.29— 0.35

3. If not as specified, replace the water thermosensor.

Installation

1. Install the water thermosensor and a new washer.

Tightening torque:
25—29 N·m (2.5—3.0 m-kg, 18—22 ft-lb)

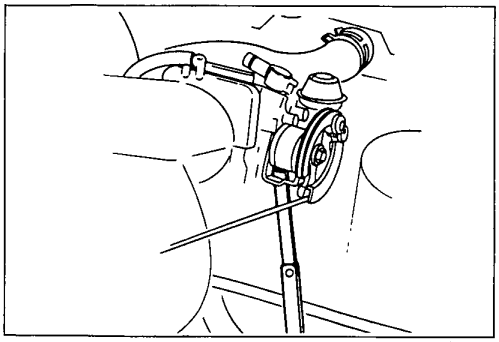
2. Connect the water thermosensor connector.
3. Install the ignition coil assembly. (Refer to page G–21.)

THROTTLE SENSOR

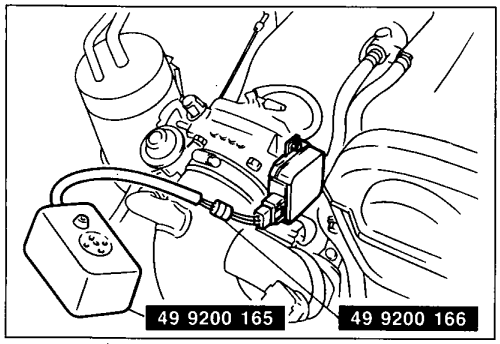
Inspection

1. Disconnect the connector from the throttle sensor.
2. Connect the **(SSTs)** or an ohmmeter to the throttle sensor.

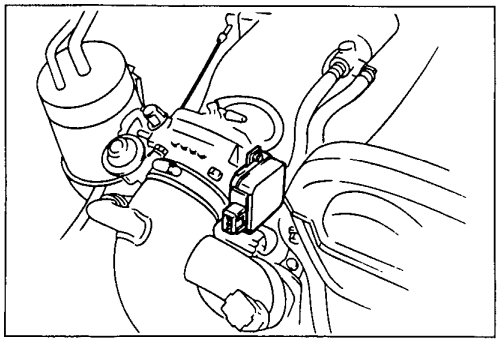
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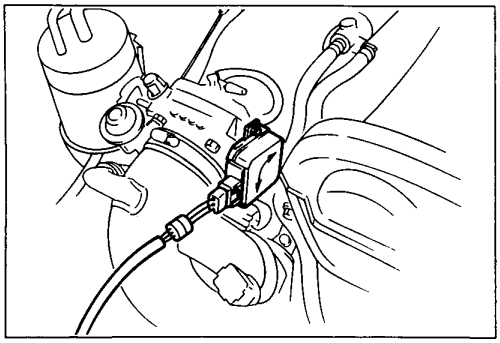
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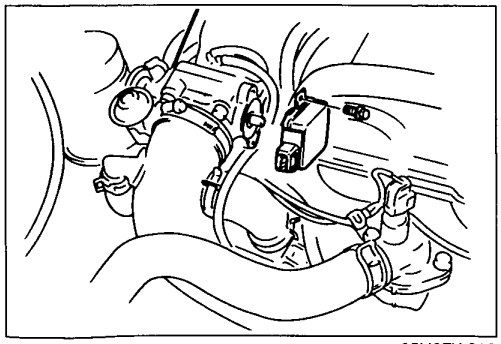
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05U0FX-215



05U0FX-216

3. Insert a feeler gauge between the throttle stop screw and the stop lever.
4. Note the operation of the buzzer or the continuity between terminals.

Feeler gauge	Buzzer	Continuity between terminals	
		IDL↔TL	POW↔TL
0.4mm (0.016 in)	Yes	Yes	No
0.7mm (0.027 in)	No	No	No
Wide-open throttle	Yes	No	Yes

Adjustment

1. Disconnect the connector from the throttle sensor and connect the **SSTs**.
2. Insert a **0.4mm (0.016 in)** feeler gauge between the throttle stop screw and the stop lever.
3. Loosen the two attaching screws.
4. Rotate the throttle sensor clockwise **approx. 30 degrees**, then rotate it back counterclockwise until the buzzer sounds.
5. Replace the feeler gauge with a **0.7mm (0.027 in)** gauge.
6. Verify that the buzzer does not sound.
7. If it sounds, repeat Steps 3 through 6.
8. Tighten the two attaching screws.

Note

- **Do not move the throttle sensor from the set position when tightening the screws.**

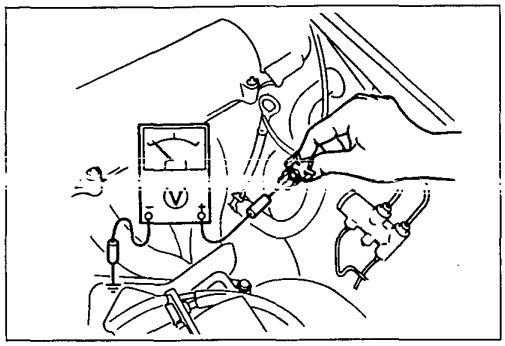
9. Open the throttle valve fully a few times.
10. Recheck the adjustment of the throttle sensor.

Replacement

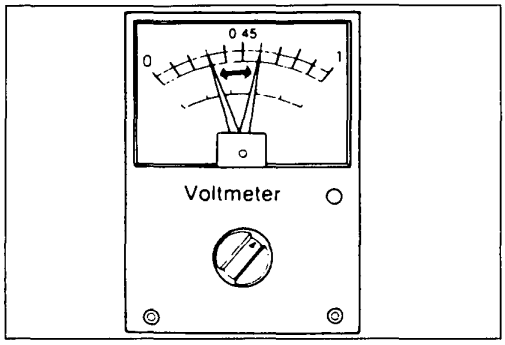
1. Disconnect the throttle sensor connector.
2. Remove the throttle sensor mounting screws.
3. Remove the throttle sensor.
4. Install in the reverse order of removal.

Tightening torque:
1.6—2.4 N·m (16—24 cm-kg, 13.9—20.8 in-lb)

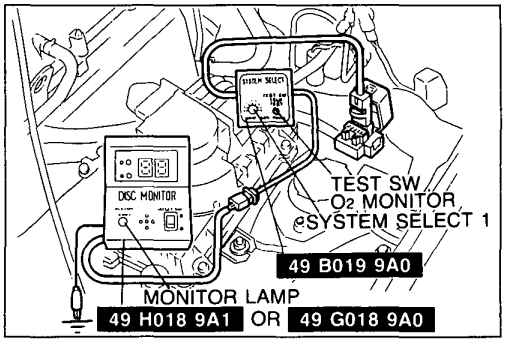
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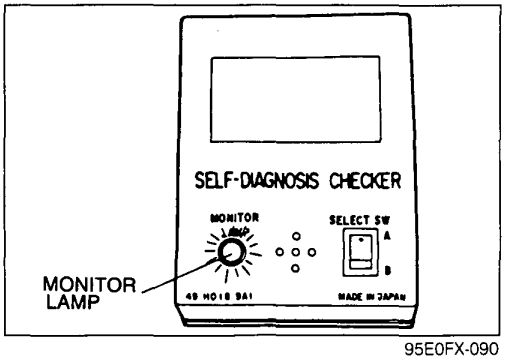
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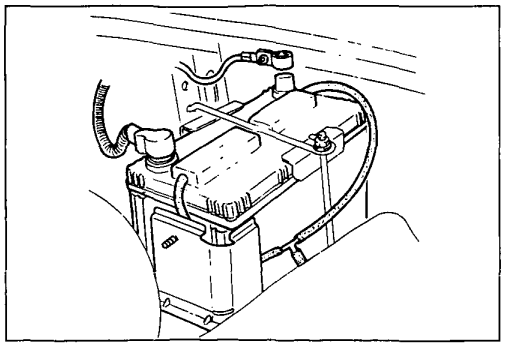
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95E0FX-090



05U0FX-221

OXYGEN SENSOR

Inspection of Terminal Voltage

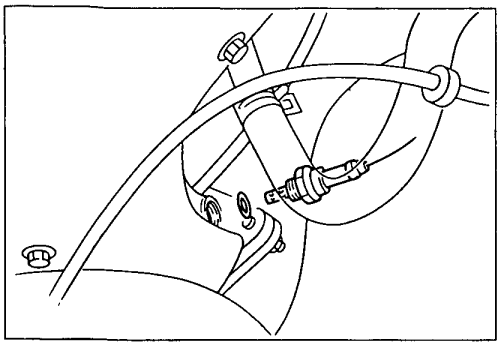
1. Warm up the engine and run it at idle.
2. Disconnect the oxygen sensor connector.
3. Connect a voltmeter between the oxygen sensor and a ground.
4. Run the engine **at 3,000 rpm** until the voltmeter indicates **approx. 0.55V**.
5. Increase and decrease the engine speed suddenly several times. Verify that when the speed is increased the meter reads **0.5V—1.0V**, and when the speed is decreased it reads **0V—0.4V**.
6. If not as specified, replace the oxygen sensor.

Inspection of Sensitivity

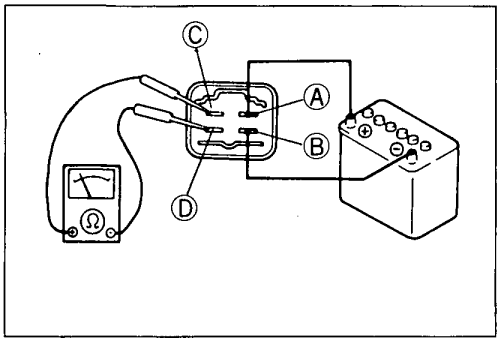
1. Warm up the engine to normal operating temperature.
2. Connect the **SST** to the diagnosis connector.
3. Set the **SST** as shown.
4. Increase the engine speed to **between 2,000 and 3,000 rpm**, and verify that the moniter lamp flashes for **10 sec.**. If not as specified, replace the oxygen sensor. (Refer to page F–135.)

   Monitor lamp: Flashes more than 8 times/10 seconds
5. Turn the ignition switch OFF.
6. Disconnect the negative battery terminal and depress the brake pedal for **at least 5 sec.** to eliminate the malfunction code that was created during inspection from the control unit memory.

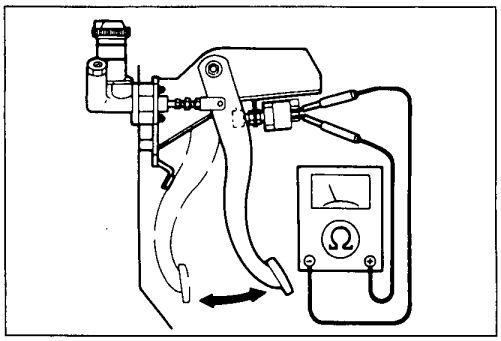
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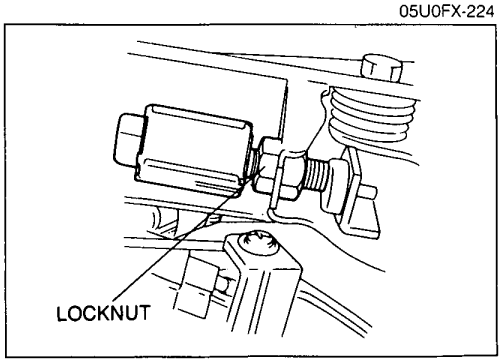
05U0FX-222



05U0FX-223



05U0FX-224



05U0FX-225

Replacement
1. Disconnect the oxygen sensor connector.
2. Remove the oxygen sensor.
3. Install in the reverse order of removal.

Tightening torque:
29—49 N·m (3—5 m-kg, 22—36 ft-lb)

MAIN RELAY (FUEL INJECTOR RELAY)

Inspection
1. Verify that the main relay clicks when turning the ignition switch OFF → ON.
2. Apply **12V** to terminal A and ground terminal B of the main relay.
3. Use an ohmmeter to check continuity of the terminals as shown.

Terminals	12V not applied	12V applied
C—D	No continuity	Continuity

4. If not as specified, replace the main relay.

CLUTCH SWITCH

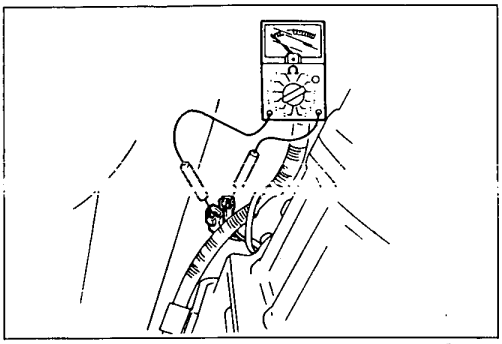
Inspection
1. Disconnect the clutch switch connector.
2. Connect an ohmmeter to the switch.
3. Check continuity of the switch.

Pedal	Continuity
Depressed	Yes
Released	No

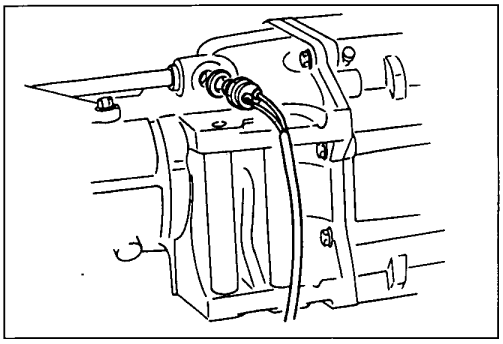
4. If not as specified, replace the clutch switch.

Replacement
1. Disconnect the clutch switch connector.
2. Loosen the locknut.
3. Remove the clutch switch.
4. Install in the reverse order of removal.
5. Adjust the pedal height. (Refer to page H–5.)

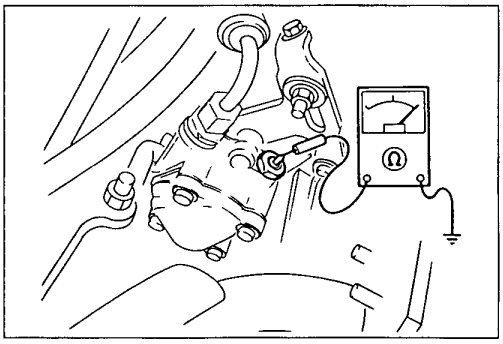
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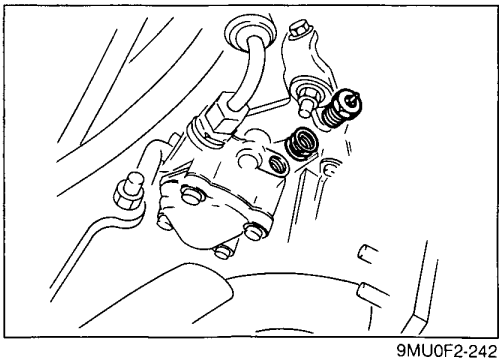
05U0FX-226



9MU0F2-240



05U0FX-227



9MU0F2-242

NEUTRAL SWITCH

Inspection

1. Disconnect the neutral switch connector.
2. Connect an ohmmeter to the switch.
3. Check continuity of the switch.

Transmission	Continuity
Neutral	Yes
Other ranges	No

4. If not as specified, replace the neutral switch.

Replacement

Replace the neutral switch as shown in the figure.

POWER STEERING PRESSURE SWITCH

Inspection

1. Disconnect the P/S pressure switch connector.
2. Connect an ohmmeter to the switch.
3. Start the engine and let it idle. Check continuity of the switch while turning the steering wheel.

P/S	Continuity
Turning	Yes
Not turning	No

4. If not as specified, replace the P/S pressure switch.

Replacement

Replace the P/S pressure switch as shown in the figure.

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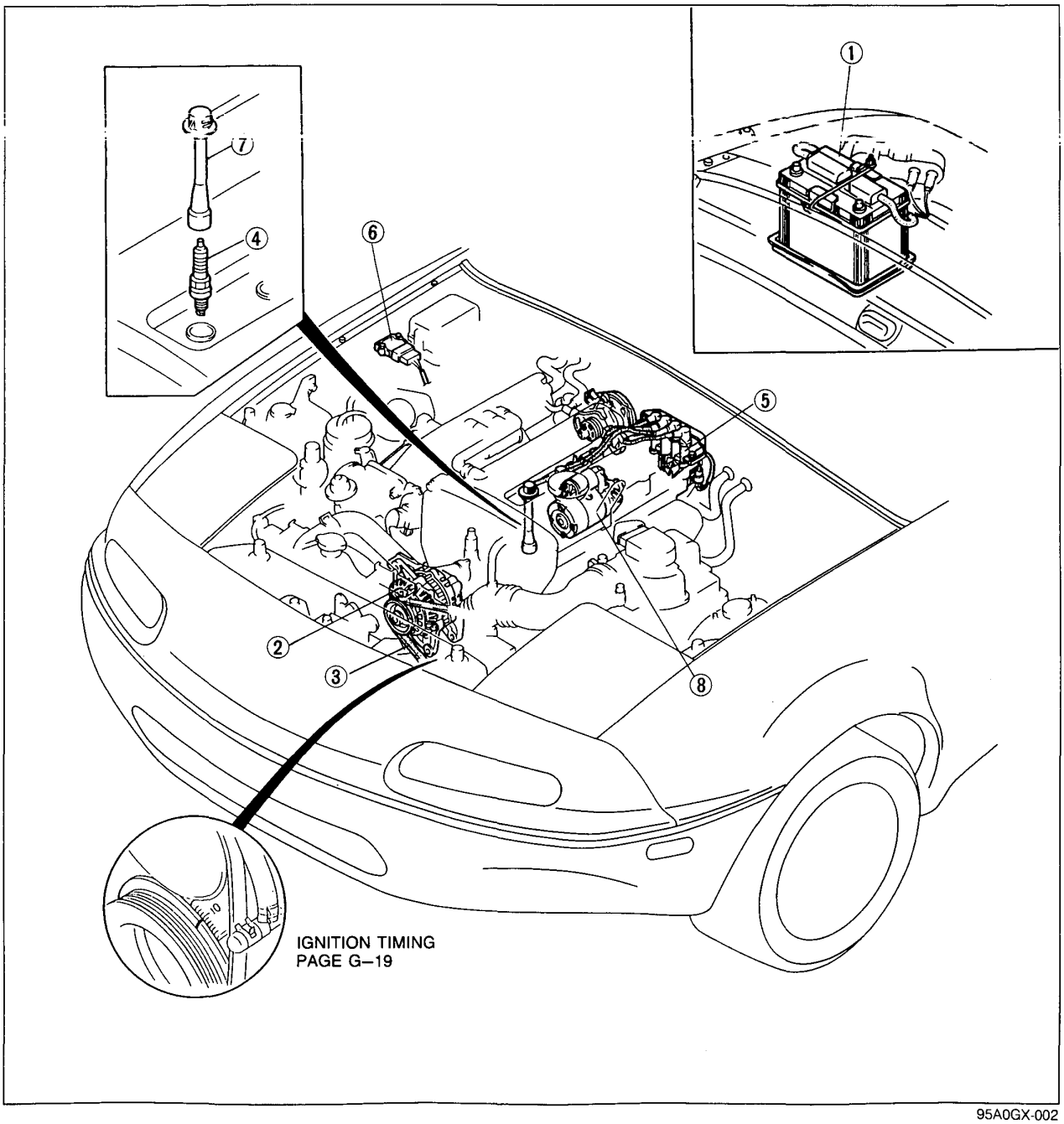
ENGINE ELECTRICAL SYSTEM

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OUTLINE

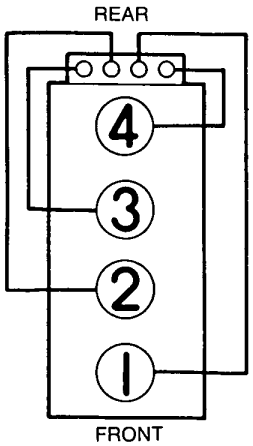
SPECIFICATIONS

Item			Engine B6 DOHC
Battery	Voltage	V	12, Negative ground
	Type and capacity	(5-hour rate)	S46A24L(S) (32 Ah) Maintenance-free
Dark current*1		mA	Max. 20.0
Alternator	Type		A.C.
	Output	V, A	12, 60
	Regulator type		Transistorized (built-in IC regulator)
	Regulated voltage		14.1—14.7
	Brush length mm (in)	Standard	21.5 (0.85)
		Minimum	8 (0.31)
	Drive belt tension mm (in)	New	8—9 (0.31—0.35)
		Used	9—10 (0.35—0.39)
Starter	Type		Conventional
	Output	V-kW	12-0.95
	Brush length mm (in)	Standard	17.0 (0.67)
		Minimum	11.5 (0.45)
Ignition system	Type		Electronic spark advance (ESA)
	Spark advance control		Engine control unit controls spark advance
Ignition timing		BTDC	10° ± 1° *2
Ignition coil	Type		Molded
	Primary coil winding	Ω	0.78—0.94
	Secondary coil winding	kΩ	11.2—15.2
Spark plug	Type		NGK : BKR5E-11, BKR6E-11, BKR7E-11 Nippon Denso : K16PR-U11, K20PR-U11, K22PR-U11
	Plug gap	mm (in)	1.0—1.1 (0.039—0.043)
	Firing order		1—3—4—2

95A0GX-010

*1 Dark current is the constant flow of current while the ignition switch is OFF (i.e. engine control unit, audio, etc.)
*2 TEN terminal in diagnosis connector grounded.

Cylinder Arrangement



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TROUBLESHOOTING GUIDE

Problem	Page
Will not crank	G–4
Cranks slowly	G–4
Discharged battery	G–5
Misfire	G–5

Will not crank

Will not crank

Check 1

Check if engine cranks with fully charged battery — **YES** → Check charging system (Refer to page G–7)

NO

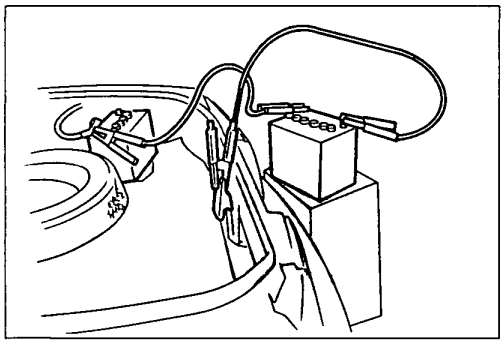
Check if click is heard from starter magnetic switch when ignition turned to START — **YES** → Check starting system (Refer to page G–23)

NO

Check ignition switch (Refer to Section T)

95A0GX-003

Check 1



Cranks slowly

Cranks slowly

Check 1

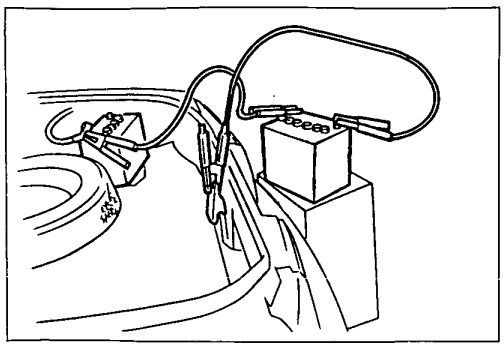
Check if engine cranks with fully charged battery — **YES** → Check charging system (Refer to page G–7)

NO

Check starting system (Refer to page G–23)

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Check 1



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Discharged battery

Discharged battery	→	Check charging system (Refer to page G–7)

05U0GX-006

Misfire

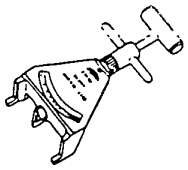
Misfire	→	Check ignition system (Refer to page G–18)

05U0GX-007

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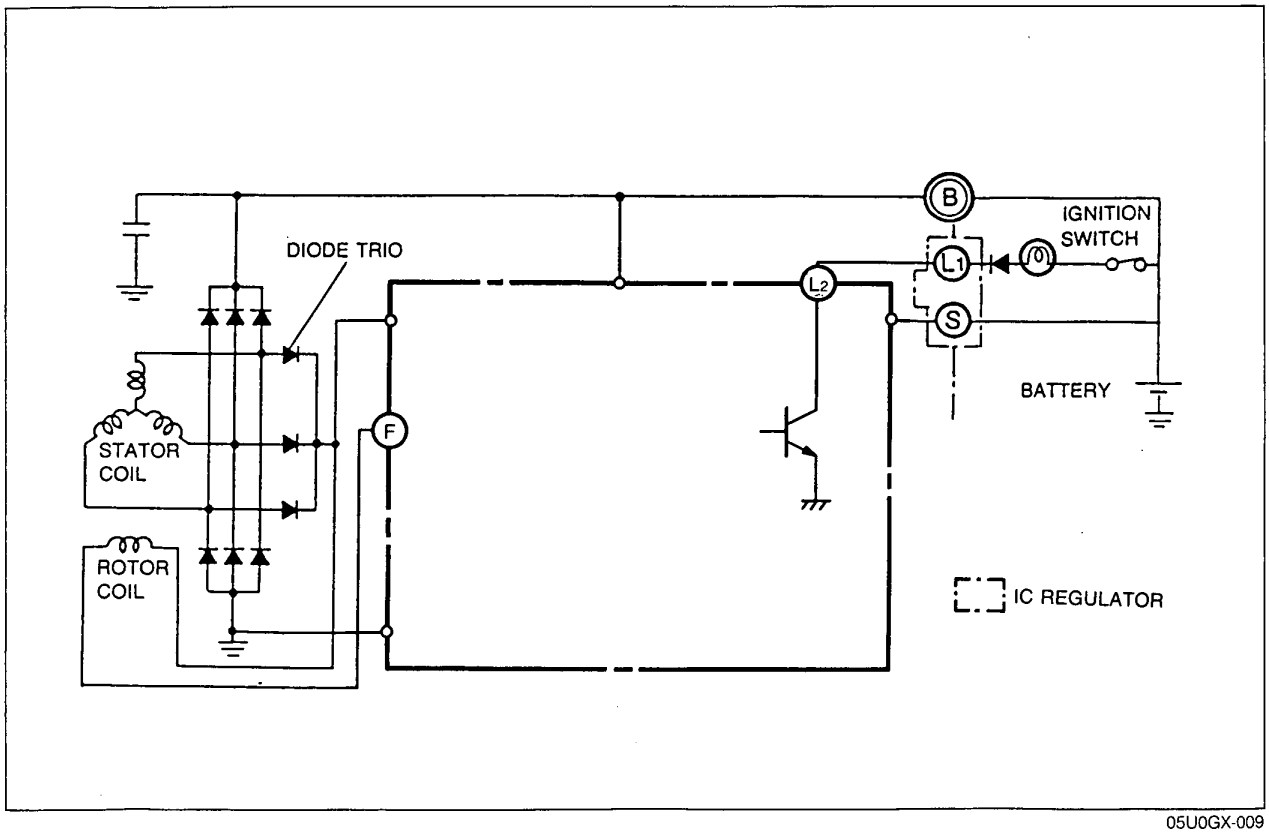
CHARGING SYSTEM

PREPARATION
SST

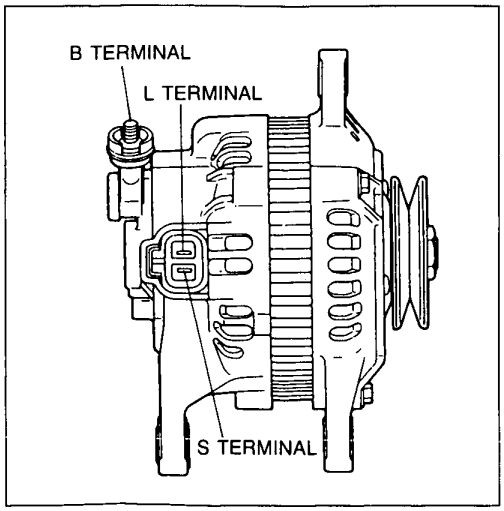
49 0200 020 V-ribbed belt tension gauge		For inspection of drive belt tension

05U0GX-008

CIRCUIT DIAGRAM



05U0GX-009



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TROUBLESHOOTING

Check 1

Check if battery voltage is above 12.6V
→ NO → Check battery (Refer to page G–8)

YES ↓

Check 2

1. Turn ignition switch ON
2. Check if voltage exists at each terminal of alternator

→ NO → Check wire harness (Refer to page G–6)

YES ↓

Check 3

1. Start engine
2. Check if alternator warning lamp goes off

→ NO → Check alternator (Refer to page G–12)

YES ↓

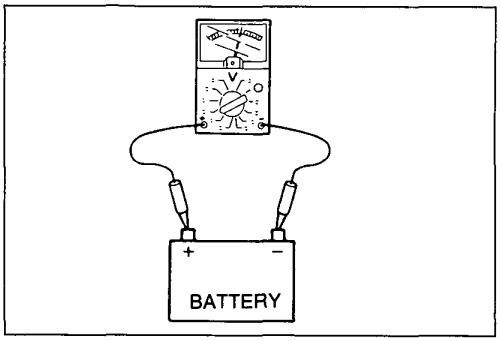
Check if drive belt tension is OK (Refer to page G–15)
→ NO → Adjust drive belt or replace (Refer to page G–15)

YES ↓

Check for dark current (Refer to page G–3)

05U0GX-010

Check 1

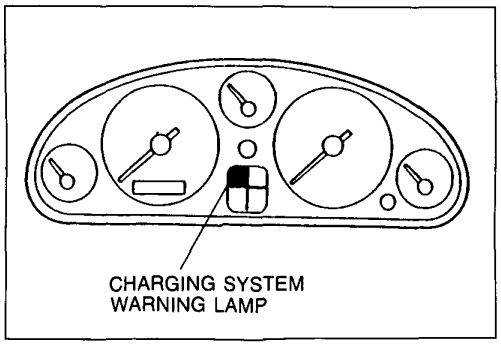


Check 2

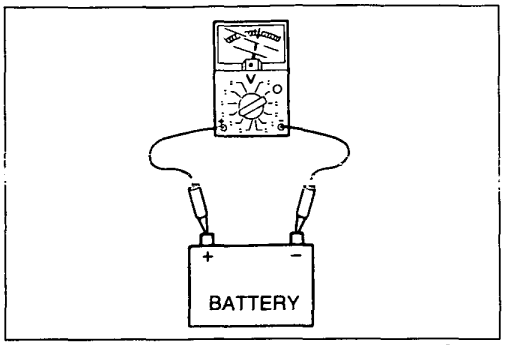
Terminal \ Ignition switch	OFF	ON	ON (Idle)
B	Approx. 12V	Approx. 12V	Approx. 14V
L	Approx. 0V	Approx. 1V	Approx. 14V
S	Approx. 12V	Approx. 12V	Approx. 14V

05U0GX-011

Check 3



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95A0GX-004

BATTERY
Inspection

Warning
- **The negative battery cable must be removed first and installed last.**

1. Disconnect the battery cables from the battery.
2. Connect a voltmeter to the battery.

VOLTAGE CHECK

Below 12.0V

Quick-charge (20A) for time specified in table below, and recheck voltage

Battery voltage	Charging time
Below 11.0V	75 min.
11.0—11.5V	50 min.
11.5—12.0V	30 min.

Below 12.0V → **Replace battery**

Above 12.0V

12.0—12.6V

Above 12.6V → **Battery OK**

Charge by referring to charging procedure, and recheck voltage after charging (Refer to page G–9)

Below 12.4V

Charge again by referring to charging procedure, and recheck voltage after charging (Refer to page G–9)

Below 12.4V → **Replace battery**

Above 12.4V → **Battery OK**

Above 12.4V → **Battery OK**

05U0GX-013

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Terminal and cable

1. Clean and tighten the battery terminals and cables.
2. Coat the terminals with grease.
3. Inspect for corroded or frayed battery cables.
4. Check the rubber protector on the positive terminal for proper coverage.

05U0GX-014

Recharging

Battery	Slow charge (A)	Quick charge (A)
S46A24L(S)	Under 3	Max. 20

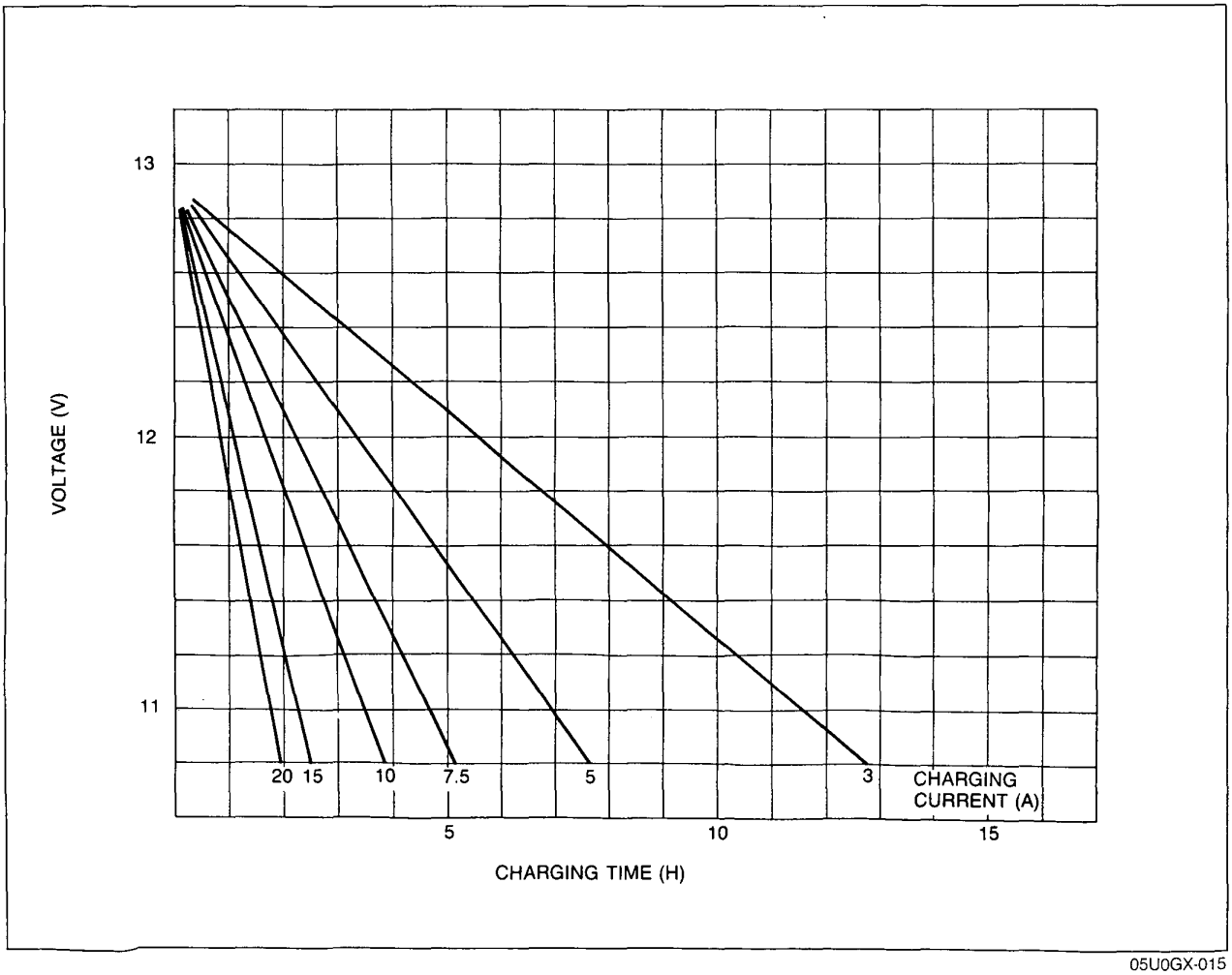
Warning

- **Before performing maintenance or recharging the battery, turn off all accessories and stop the engine.**
- **The negative battery cable must be removed first and installed last.**

Caution

- **Do not removed vent caps.**
  Follow carefully the instructions of the battery charger to prevent overcharging.

1. Remove the battery cover.
2. Disconnect the battery cables from the battery.
3. Measure and record the voltage between the battery terminals.
4. Decide the charging current and charging time by referring to the figure below.
5. Charge the battery.



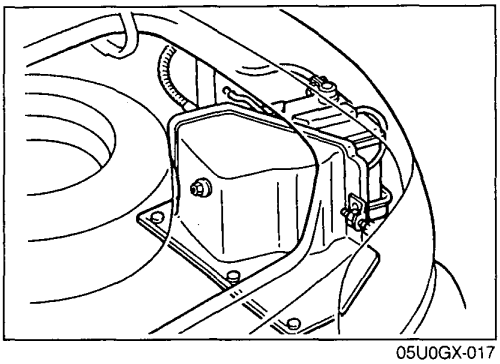
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Replacement

Note
- **The factory-installed battery in the MX-5 cannot be purchased over the counter. When replacing the battery, replace it with a Mazda genuine battery (with vent manifold) or equivalent and use a Mazda genuine battery tray, battery clamp, and clamp bolt or equivalent.**

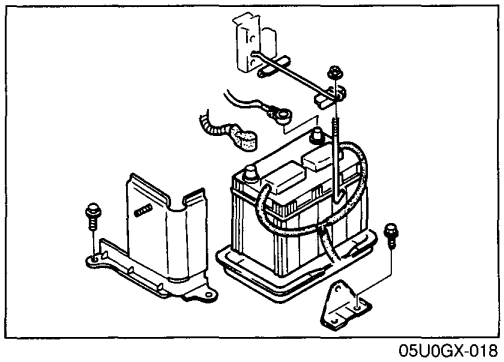
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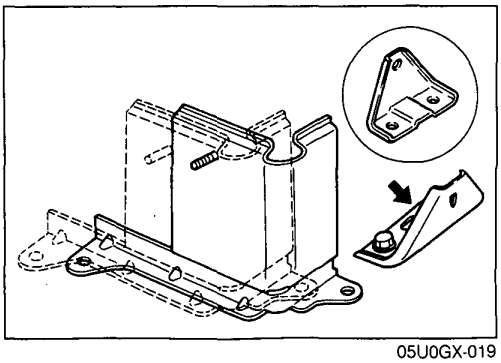
Battery replacement using the Mazda genuine battery tray, battery clamp, and clamp bolt is as follows.
1. Remove the battery cover.

Warning
- **The negative battery cable must be removed first and installed last.**



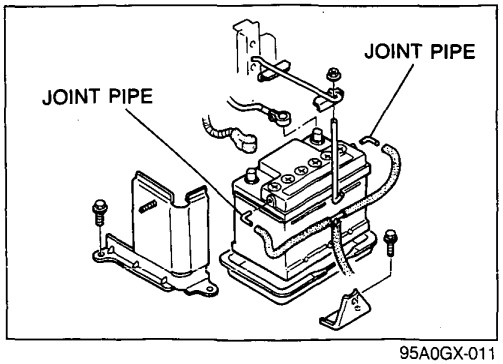
05U0GX-018

2. Disconnect the battery cables from the battery.
3. Remove the battery clamp.
4. Remove the battery.
5. Disconnect the battery vent hoses.
6. Remove the battery tray.
7. Remove the battery bracket.



05U0GX-019

8. Reverse the battery clamp bracket as shown.
9. Change the position of the battery bracket Ⓐ to Ⓑ as shown.



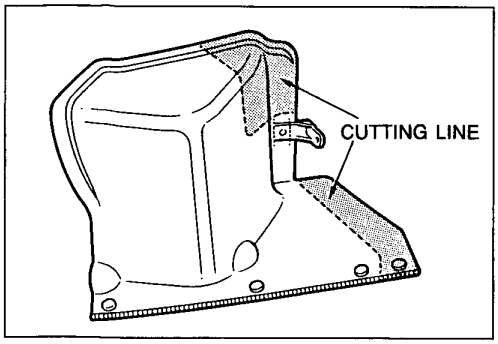
95A0GX-011

10. Insert the joint pipes into the new battery.

Warning
- **Install the battery vent hoses correctly to reduce the possibility of injury or fire.**

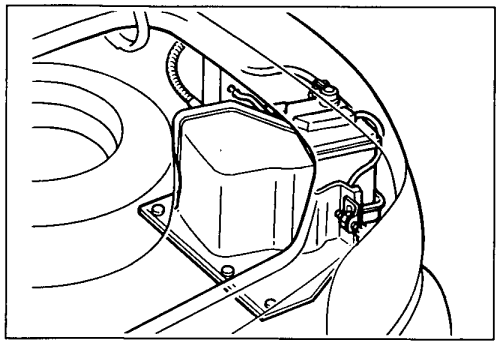
11. Connect the battery vent hoses to the joint pipes.
12. Install the new battery using the Mazda genuine battery tray, battery clamp, and clamp bolt.

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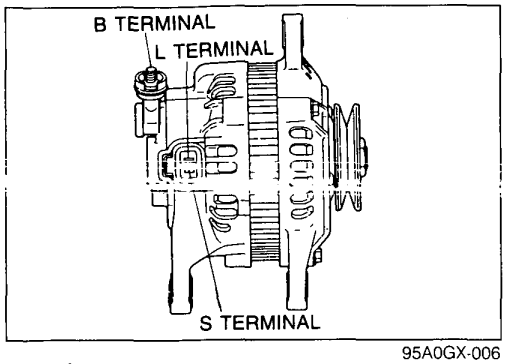
13. Trim off the shadded area of the battery cover as shown for proper fitting to new battery.



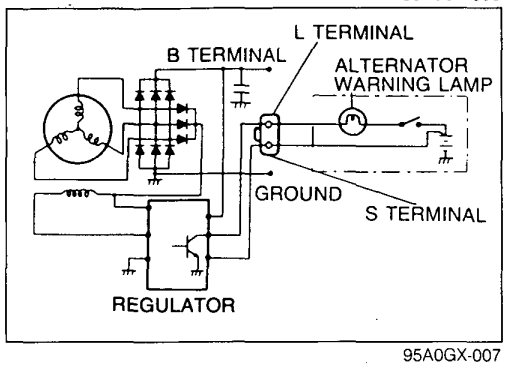
95A0GX-013

14. Install the battery cover as shown.

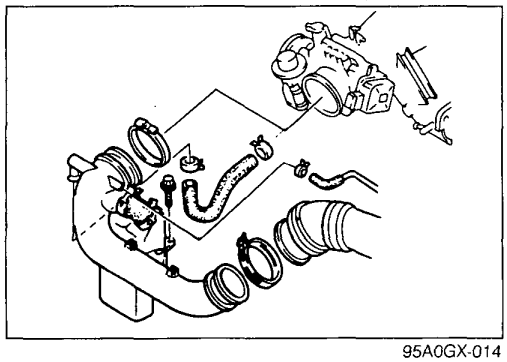
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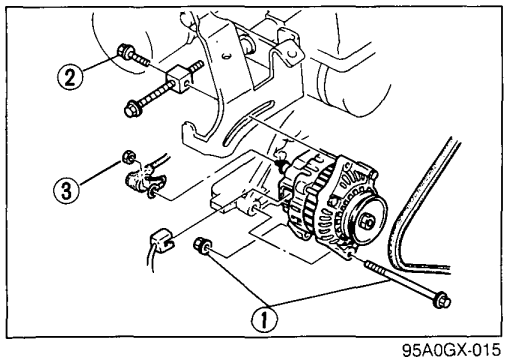


95A0GX-006



95A0GX-007


95A0GX-014



95A0GX-015

ALTERNATOR

Caution

- **Be sure the battery connections are not reversed because this will damage the rectifier.**
- **Do not use high-voltage testers such as a megger because they will damage the rectifier.**
- **Remember that battery voltage is always applied to the alternator B terminal.**
- **Do not ground the L terminal while the engine is running.**
- **Do not start the engine while the connector is disconnected from the L and S terminals.**

Self-Diagnosis System

The alternator has a self-diagnostic function to warn of problems in the charging system.
If any of the following problems arise, the alternator warning lamp illuminates.

1. S circuit open.
2. No voltage output.
3. Field circuit open.
4. B circuit open.
5. Voltage output too high.

Removal / Installation

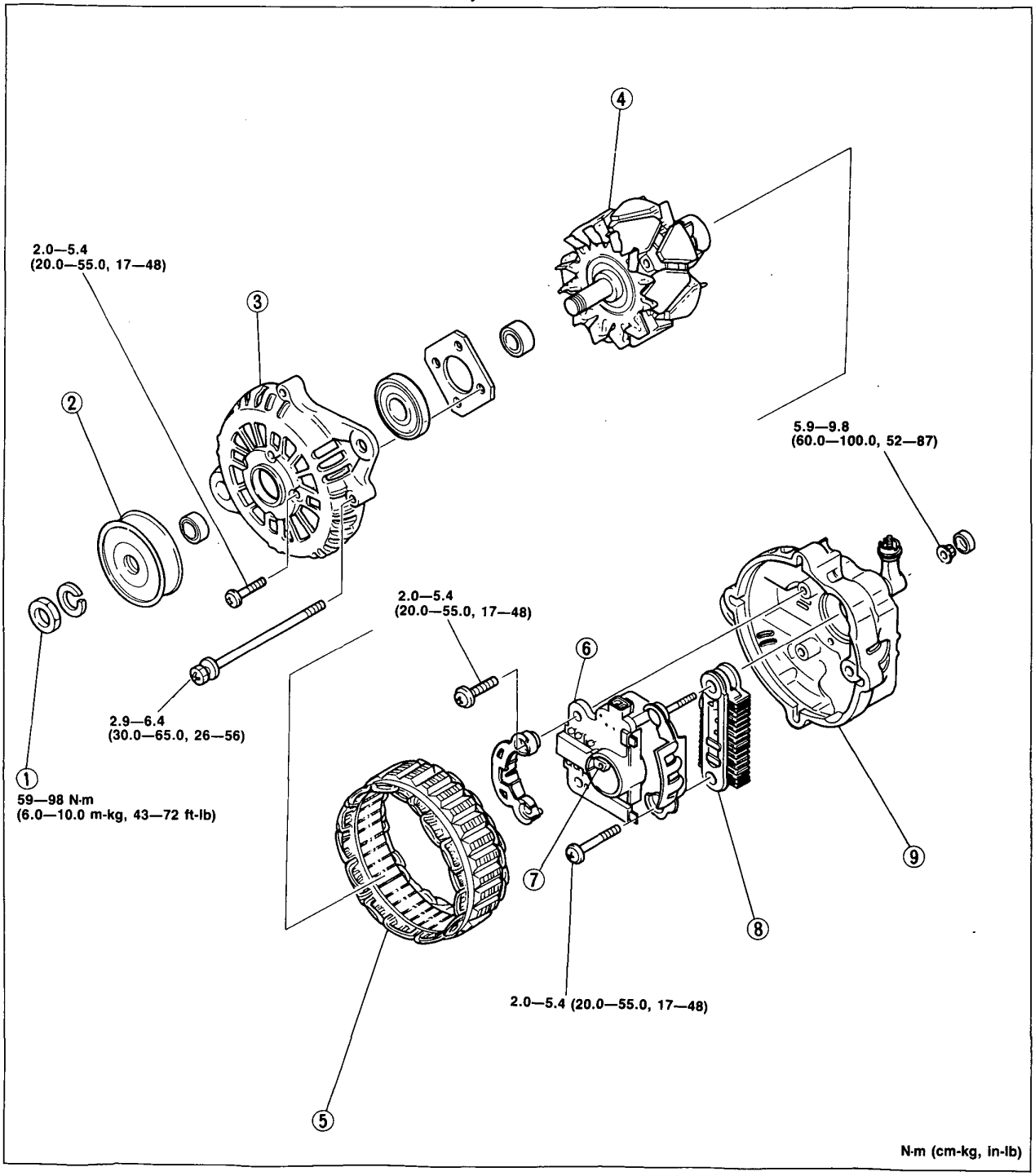
1. Disconnect the negative battery cable.
2. Disconnect the water thermoswitch connector.
3. Disconnect the ISC valve connector.
4. Remove the air pipe.
5. Disconnect the wire and connector from the alternator.
6. Remove the alternator bolts and nut.
7. Remove the alternator.
8. Install in the reverse order of removal.

Tightening torque:
Bolt, Nut (1)
37—52 N·m (3.8—5.3 m-kg, 27—38 ft-lb)
Bolt (2)
19—25 N·m (1.9—2.6 m-kg, 14—19 ft-lb)
Nut (3)
9.8—15 N·m (100—150 cm-kg, 87—130 in-lb)

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Disassembly / Assembly

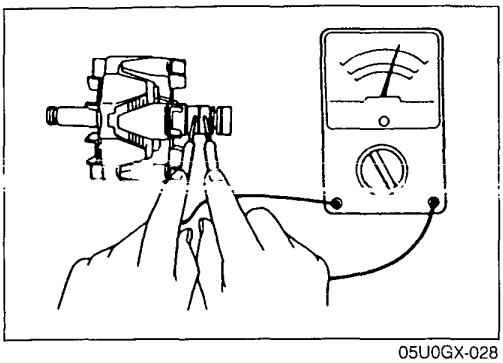
1. Disassemble in the order shown in the figure.
2. Assemble in the reverse order of disassembly.

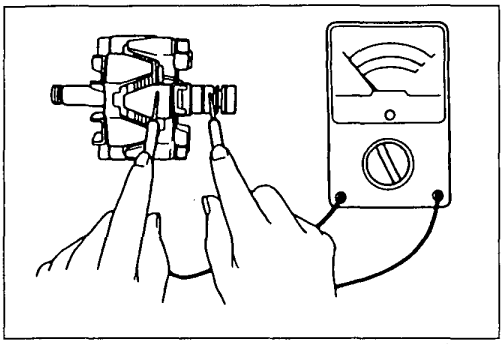


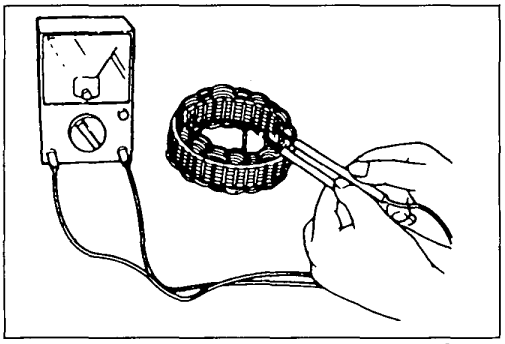
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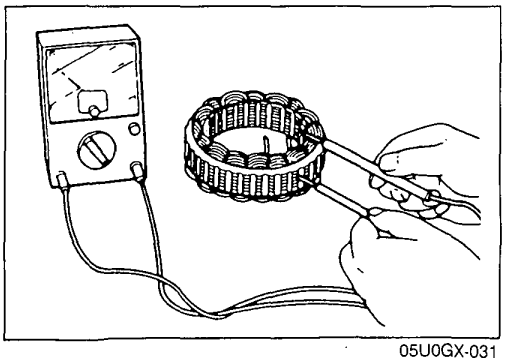
1. Pulley nut
2. Pulley
3. Front cover
4. Rotor
   Inspection..... page G–14
5. Stator
   Inspection..... page G–14
6. Brush holder assembly
   Inspection..... page G–15
7. Brush
   Inspection..... page G–14
8. Rectifier
   Inspection..... page G–15
9. Rear cover

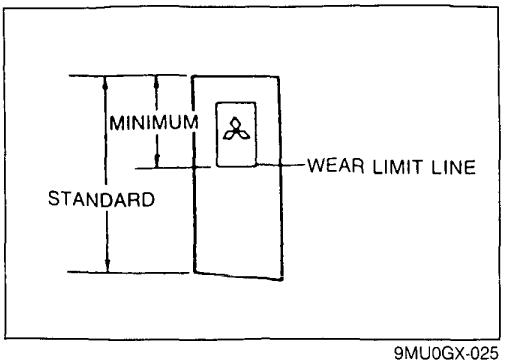
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05U0GX-030


05U0GX-031



9MU0GX-025

Inspection
Rotor
1. Winding damage
   (1) Check the resistance between the slip rings with an ohmmeter.

   Specification: 3.5 - 4.5Ω/20°C (68°F)

   (2) If it is not within specification, replace the rotor.

2. Ground of field coil
   (1) Check for continuity between each slip ring and the core with an ohmmeter.
   (2) Replace the rotor if there is continuity.
3. Slip ring surface
   If the slip ring surface is rough, use fine sandpaper to repair it.

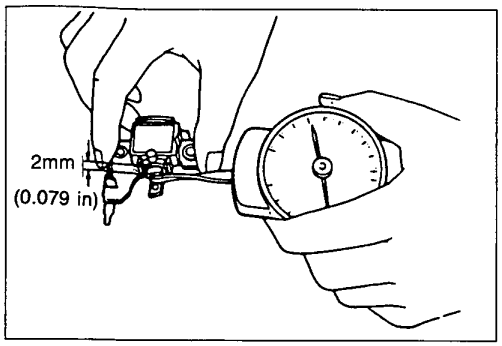
Stator
1. Wiring damage
   (1) Check for continuity between the stator coil leads with an ohmmeter.
   (2) Replace the stator if there is no continuity.

2. Ground of stator coil
   (1) Check for no continuity between the stator coil leads and the core with an ohmmeter.
   (2) Replace the stator if there is continuity.

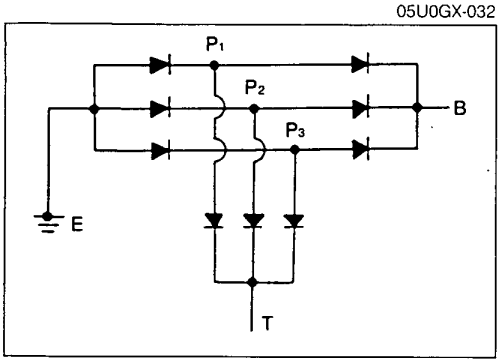
Brush
If the brushes are worn almost to or beyond the limit, replace them.

Standard: 21.5mm (0.846 in)
Minimum: 8.0mm (0.315 in)

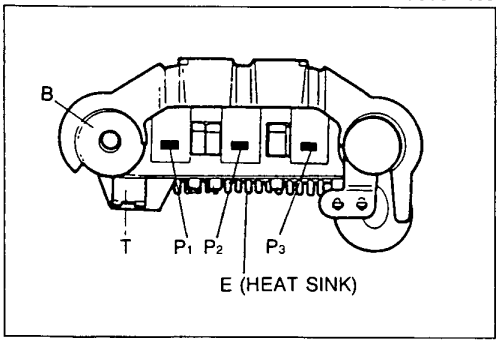
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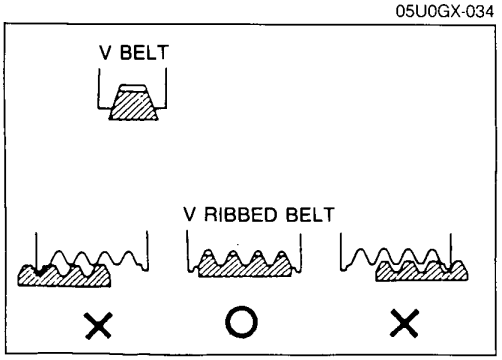
05U0GX-032



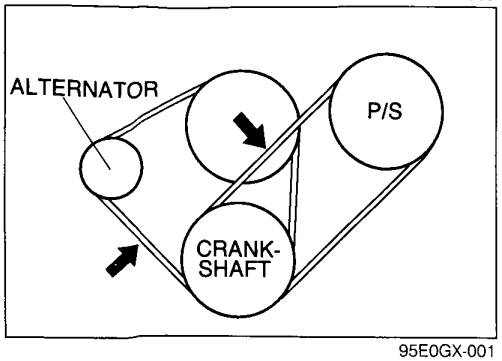
05U0GX-033



05U0GX-034



05U0BX-009



95E0GX-001

Brush Spring

1. Measure the force of the brush spring with a spring pressure gauge.
2. Replace the spring if necessary.

Standard force:
3.1—4.3 N (320—440 g, 11.3—15.5 oz)
Minimum: 1.6—2.4 N (160—240 g, 5.6—8.5 oz)

Note
- **Read the spring pressure gauge at a brush tip projection of 2mm (0.079 in).**

Rectifier

1. Check for continuity of the diodes with an ohmmeter.

Negative (Black)	Positive (Red)	Continuity
E	P1, P2, P3	Yes
B		No
T		No
P1, P2, P3	E	No
	B	Yes
	T	Yes

2. Replace the rectifier if necessary.

DRIVE BELT

Inspection

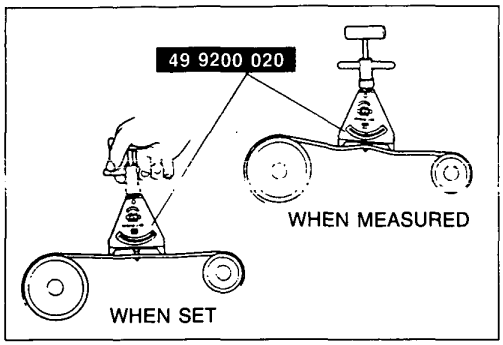
1. Remove the air intake pipe.
2. Check the drive belts for wear, cracks, or fraying. Replace if necessary.
3. Verify that the drive belts are correctly mounted on the pulleys.
4. Check the drive belt deflection by applying moderate pressure **(98 N, 10 kg, 22 lb)** midway between the pulleys as shown in the figure. Adjust if necessary.

Deflection

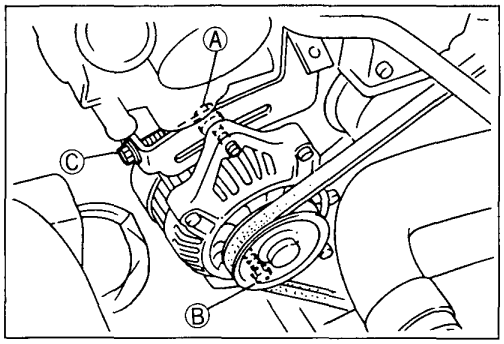
mm (in)

Drive belt	New	Used
Alternator	8.0—9.0 (0.31—0.35)	9.0—10.0 (0.35—0.39)
P/S	8.0—9.0 (0.31—0.35)	9.0—10.0 (0.35—0.39)

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05U0BX-013

5. Check the drive belt tension with a tension gauge.

Note
- **Belt tension can be measured between any pulleys.**

Tension

N (kg, lb)

Drive belt	New	Used
Alternator	491—589 (50—60, 110—132)	422—491 (43—50, 95—110)
P/S	491—589 (50—60, 110—132)	422—491 (43—50, 95—110)

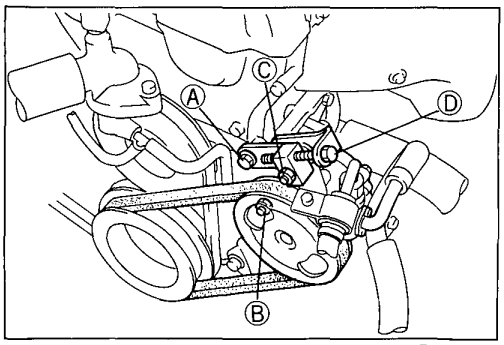
6. Install the air intake pipe.

Adjustment

Caution
- **If a new belt is used, adjust the belt deflection at the midpoint of new belt specification.**

(1) Alternator belt
If necessary, loosen the alternator bolts Ⓐ and Ⓑ and adjust the belt deflection by turning the adjusting bolt Ⓒ.

Tightening torque:
Ⓐ 19—25 N·m (1.9—2.6 m-kg, 14—19 ft-lb)
Ⓑ 37—52 N·m (3.8—5.3 m-kg, 27—38 ft-lb)



95E0GX-003

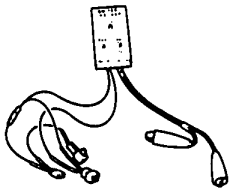
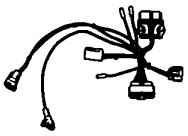
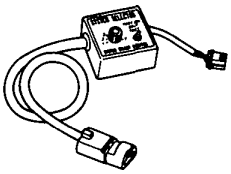
(2) P/S belt
If necessary, loosen the P/S oil pump bolt Ⓐ and nuts Ⓑ and Ⓒ and adjust the belt deflection by turning the adjusting bolt Ⓓ.

Tightening torque:
Ⓐ 31—46 N·m (3.2—4.7 m-kg, 23—34 ft-lb)
Ⓑ 36—54 N·m (3.7—5.5 m-kg, 27—40 ft-lb)
Ⓒ 19—25 N·m (1.9—2.6 m-kg, 14—19 ft-lb)

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IGNITION SYSTEM

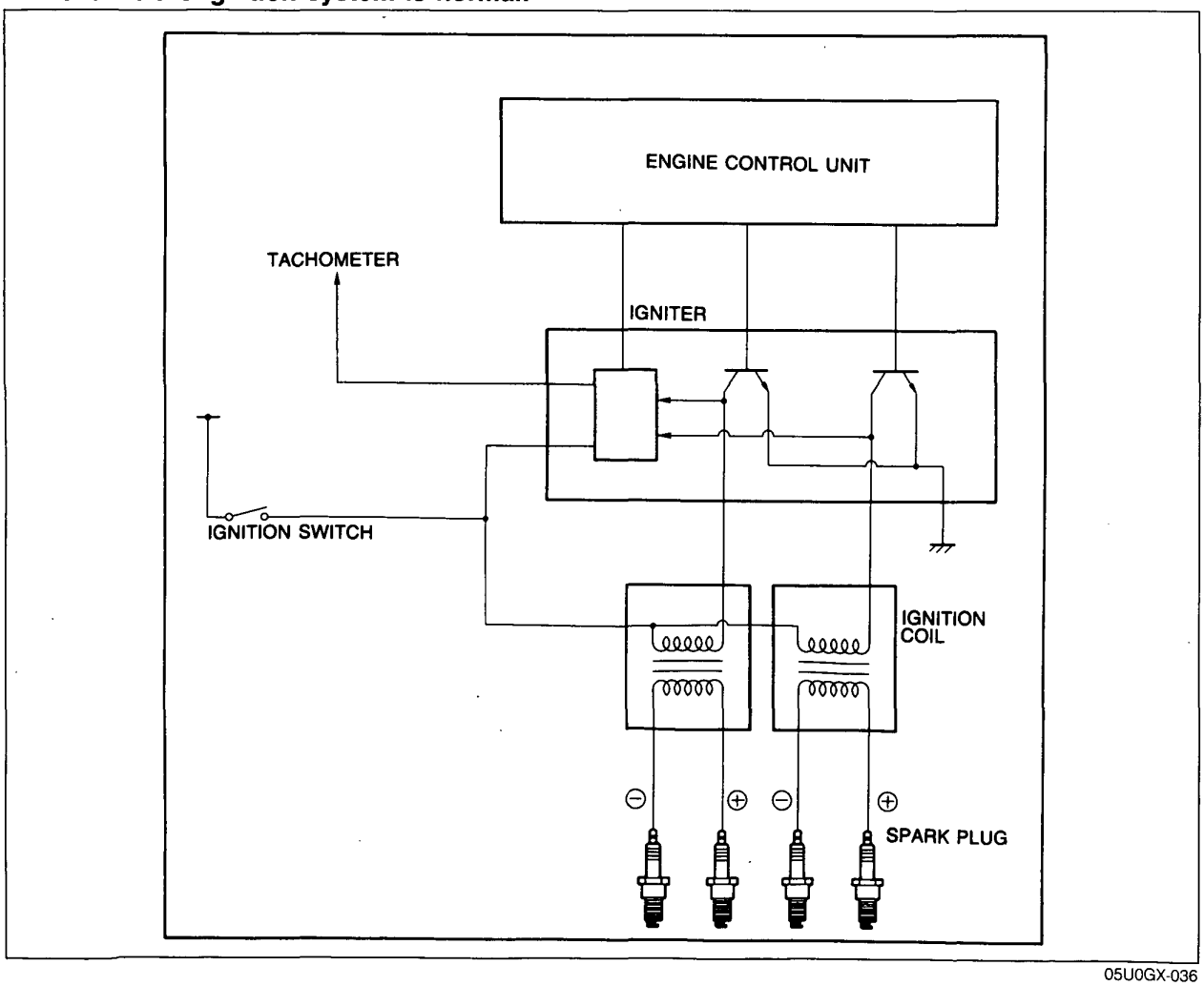
PREPARATION
SST

49 F018 002 Igniter checker 	For inspection of igniter	49 N018 001 Adapter harness 	For inspection of igniter
49 B019 9A0 System selector 	For inspection of ignition timing		

05U0GX-035

CIRCUIT DIAGRAM

Note
- **If a timing light is used to check for spark, some lights do not light at Nos. 2 and 4 cylinders even if the ignition system is normal.**



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TROUBLESHOOTING

Misfire

1. Turn ignition switch ON
2. Connect diagnosis connector terminals (TEN) and (GND) with a jumper wire
3. Check if MIL illuminates

YES → Refer to Section F (Refer to page F–80)

Check 1

NO

Check if resistance of secondary windings is OK (Refer to page G–21)

NO → Check ignition coil (Refer to page G–21)

Check 2

YES

Check if resistance of high-tension lead is OK (Refer to page G–22)

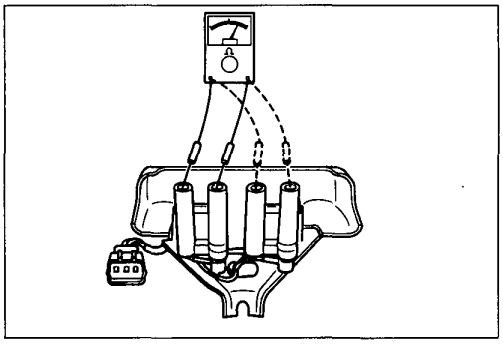
YES → Check spark plug (Refer to page G–20)

NO

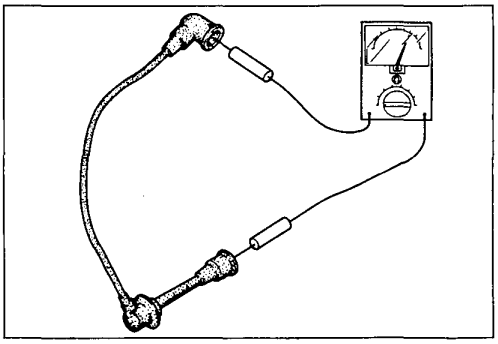
Check high-tesion lead (Refer to page G–22)

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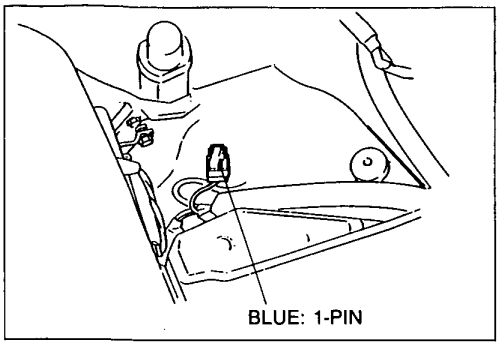
Check 1



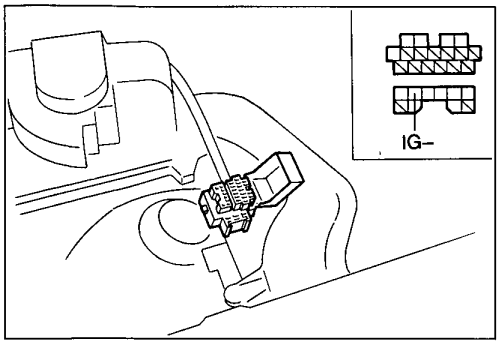
Check 2



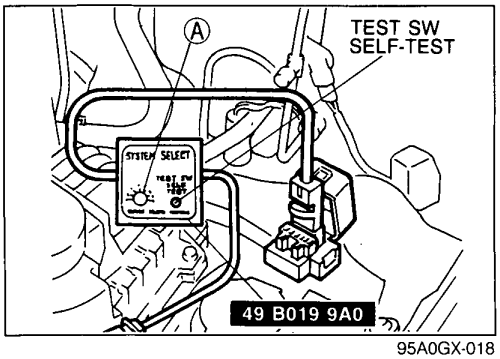
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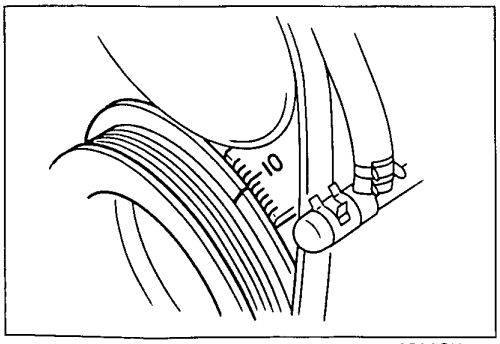
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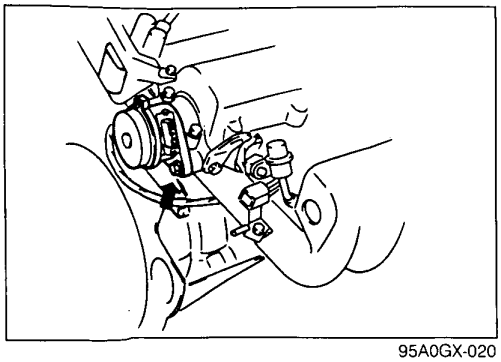
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95A0GX-018



95A0GX-019



95A0GX-020

IGNITION TIMING

1. Check the condition of the engine (spark plugs, leaks in hoses, etc.).
2. Verify that all accessories are OFF.
3. Warm up the engine to the normal operating temperature.

Note
- **When using an externally powered timing light and/or tachometer connect it to the power connector (Blue: 1-pin).**

Warning
- **Do not ground the power connector terminal (Blue: 1-pin); the wiper 20A fuse will be burned.**

4. Connect a timing light and tachometer to the diagnosis connector terminal (IG–).

Caution
- **Be extremely careful when making connections to the diagnosis connector as a mistaken connection will cause a malfunction.**

5. Connect the **SST** to the diagnosis connector.
6. Set switch Ⓐ to position 1.
7. Set TEST SW to SELF-TEST.
8. Check the idle speed, and set it to specification if necessary.

Idle speed: 850 ± 50 rpm

9. Check if the timing mark (Yellow) on the crankshaft pulley and the timing belt cover are aligned.

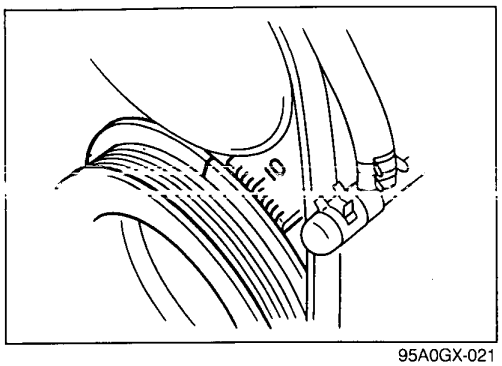
Ignition timing: 10° ± 1° BTDC (at idle)

10. If the marks are not aligned, loosen the crank angle sensor lock bolt, and turn the crank angle sensor to make the adjustment.
11. Tighten the crank angle sensor lock bolt to the specified torque.

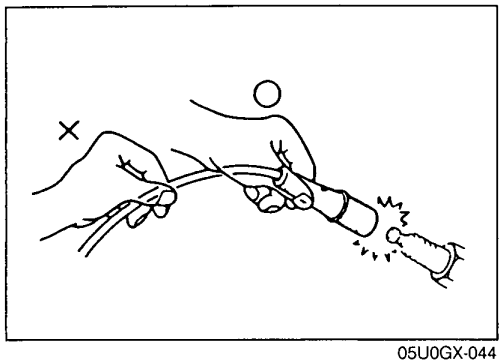
Tightening torque:
19—25 N·m (1.9—2.6 m-kg, 14—19 ft-lb)

12. After adjusting the ignition timing, disconnect the jumper wire or **SST** from the diagnosis connector.

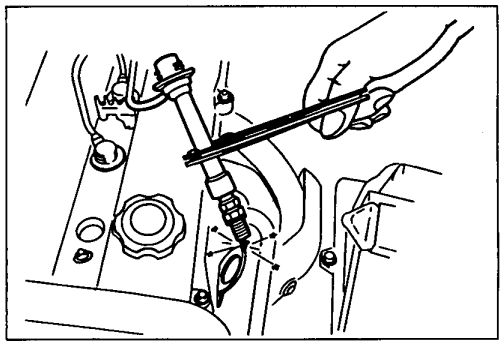
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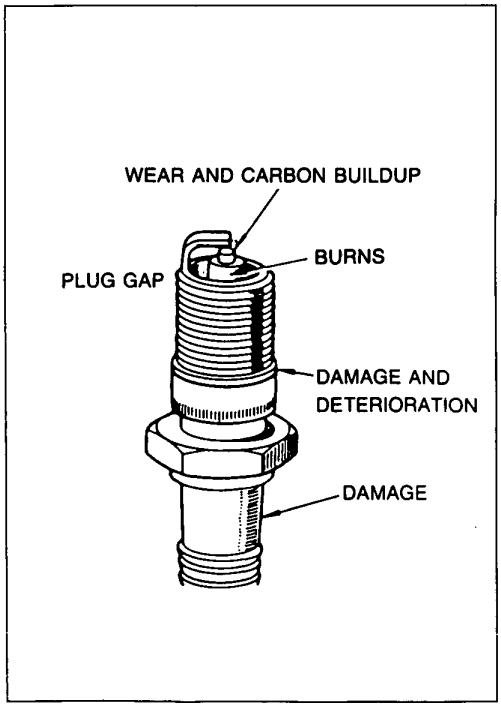
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05U0GX-044



05U0GX-045



05U0GX-046

13. Increase the engine speed and verify that the ignition timing advances.

SPARK PLUG

Removal / Installaion

Note the following points:

1. When the high-tension lead is to be pulled off, be sure to pull on the boot, not the wire.
2. Apply anti-seize compound or molybdenum-based lubricant to the spark plug threads before installing.
3. Tighten the spark plugs to the specified torque.

Tightening torque:
15—23 N·m (1.5—2.3 m-kg, 11—17 ft-lb)

Spark Test

1. Disconnect the high-tension lead from the spark plug.
2. Connect a new spark plug to the high-tension lead.
3. Hold with insulated pliers **approx. 5—10mm (0.20—0.39 in)** from a ground.
4. Crank the engine and verify that a strong blue spark is visible.

Note

- **If a timing light is used to check for spark, some lights do not light at Nos. 2 and 4 cylinders even if the ignition system is normal.**

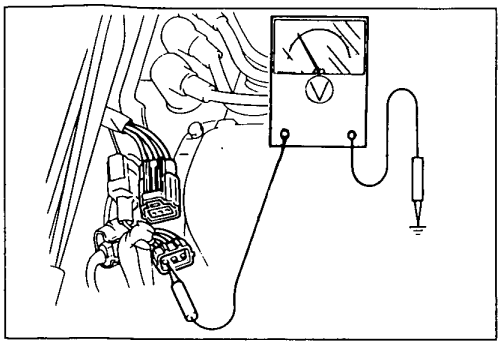
Inspection

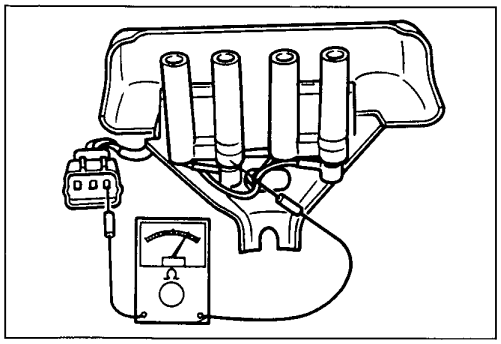
Check the following and replace the spark plugs as necessary.

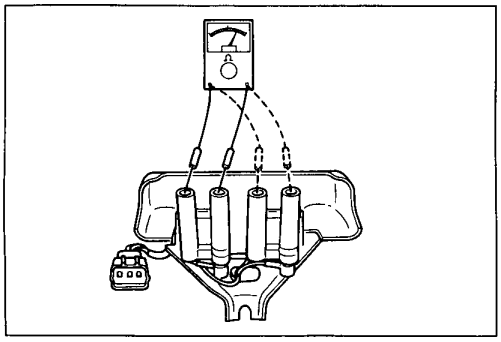
1. Damaged insulation.
2. Worn electrodes.
3. Carbon deposits.
   If cleaning is necessary, use a plug cleaner or a wire brush. Wipe upper insulator.
4. Damaged gasket.

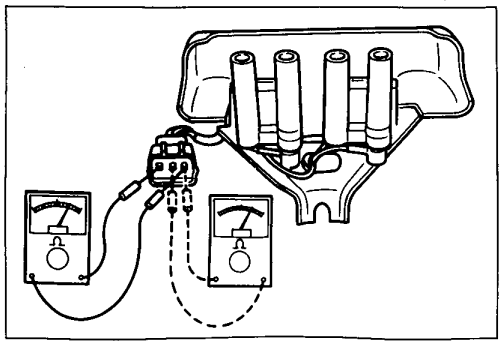
Plug gap: 1.0—1.1mm (0.039—0.043 in)

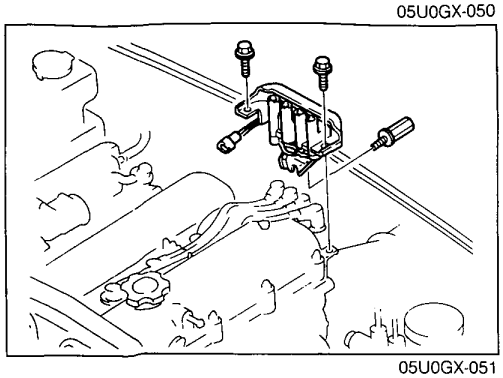
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05U0GX-051

IGNITION COIL

Inspection

1. Disconnect the ignition coil connector.
2. Check for voltage at the positive (+) terminal of the ignition coil connector with the ignition switch in the ON position.

   Voltage: Approx. 12V

3. If there is no voltage check the main fuse, ignition switch, and wire harness.

Primary coil winding

Measure resistance of the primary coil winding of each coil with an ohmmeter.
If not within specification, replace the coil.

Primary coil winding resistance (at 20°C [68°F]): 0.78—0.94Ω

Secondary coil winding

Measure resistance of the secondary coil winding of each coil with an ohmmeter.
If not within specification, replace the coil.

Secondary coil winding resistance (at 20°C [68°F]): 11.2—15.2 kΩ

Installation of Case

Use a **500V megger** tester to measure the insulation resistance between the primary terminal and the coil case.

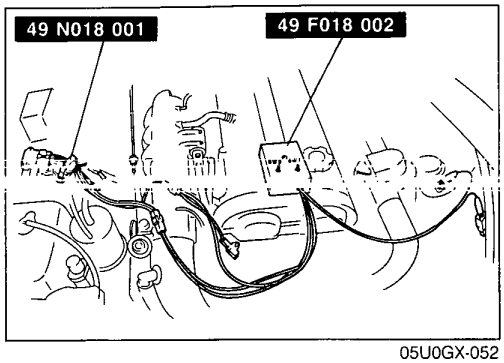
Resistance : 10 MΩ min.

Replacement

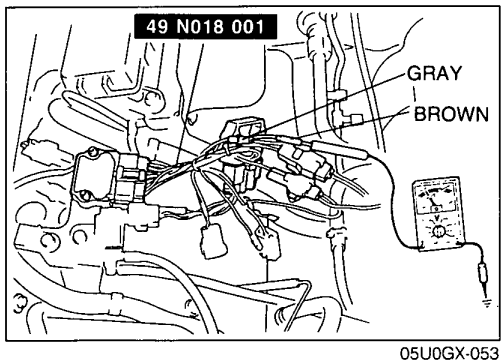
1. Disconnect the high tension-leads and ignition coil connector.
2. Remove the installaition bolts and the ignition coil.
3. Install in the reverse order of removal.

Tightening torque:
19—25 N·m (1.9—2.6 m-kg, 14—19 ft-lb)

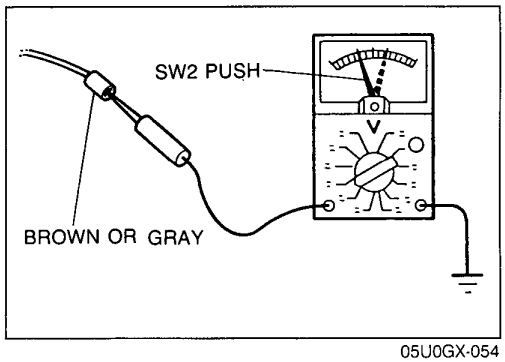
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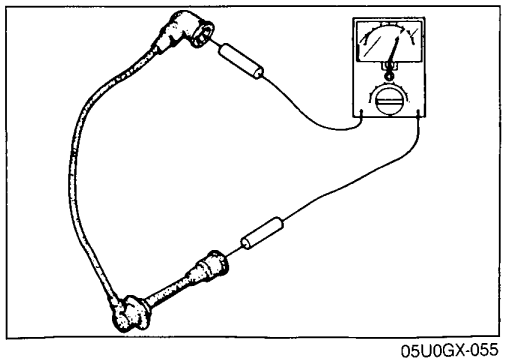
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05U0GX-054


05U0GX-055

IGNITER

Inspection

1. Disconnect the igniter connector.

Warning

- **Do not ground the power connector terminal (Blue: 1-pin), the wiper 20A fuse will be burned.**

2. Connect the **SST** between the igniter and igniter connector as shown.
3. Connect the **SST** to the power connector (Blue: 1-pin).
4. Connect a voltmeter between the **SST** (brown wire) and a ground.
5. Turn the ignition switch ON.
6. Verify that there is **approx. 12V** at the terminal. If not as specified, check related wiring.

Caution

- **Do not activate the SW2 switch for more than 1 sec.**

7. Push the **SW2** switch on the **SST** while observing the ohmmeter.
8. Verify that the voltmeter indicates **approx. 8V**.
9. If not as specified, replace the igniter.
10. Disconnect the voltmeter from the brown wire and connect it to the **SST** gray wire.
11. Repeat Steps 5 through 9.

HIGH-TENSION LEAD

Inspection

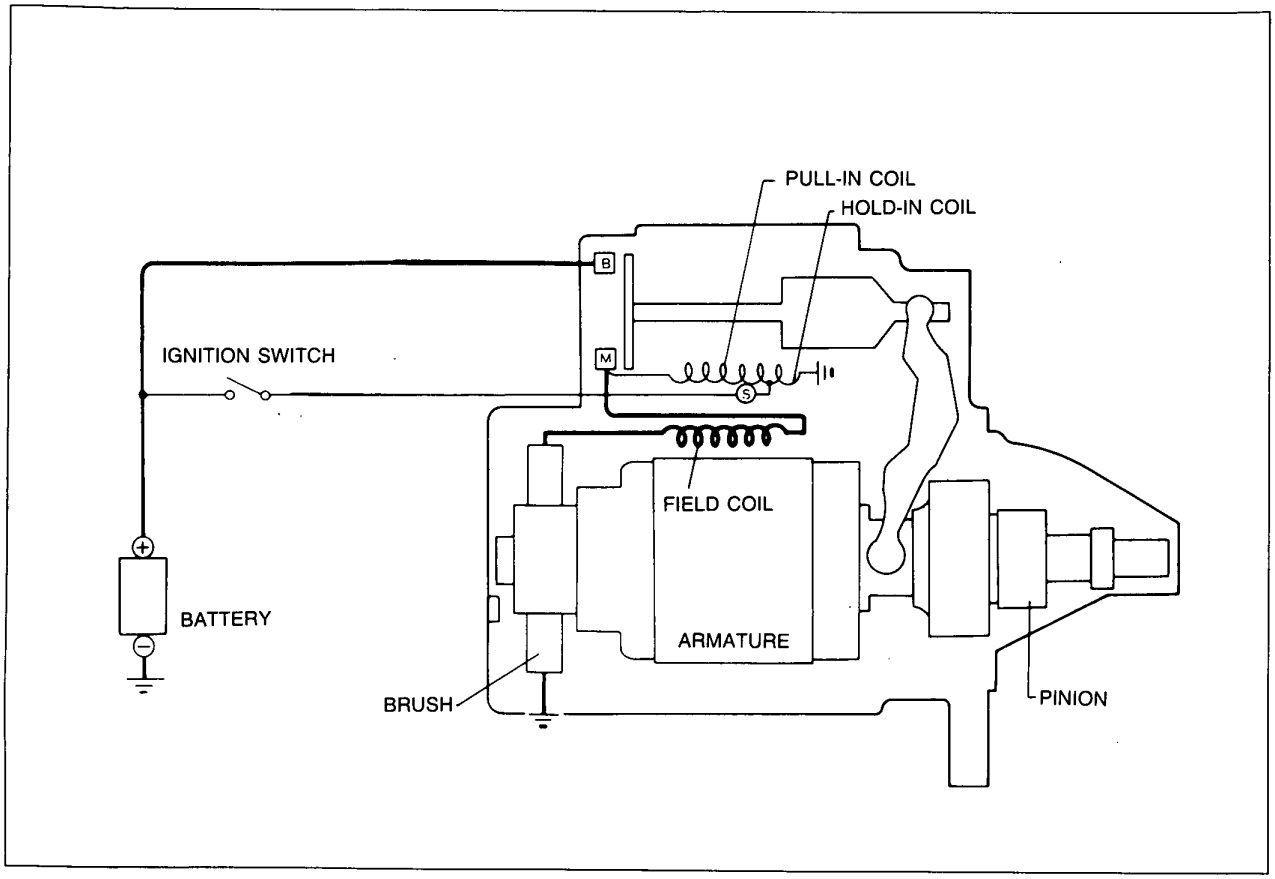
Use an ohmmeter to measure the resistance of each lead.

Resistance: 16 kΩ per 1 m (3.28 ft)

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STARTING SYSTEM

CIRCUIT DIAGRAM



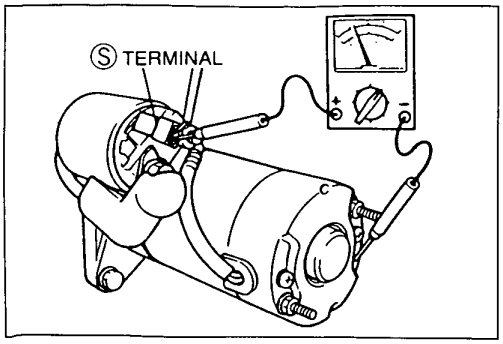
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TROUBLESHOOTING

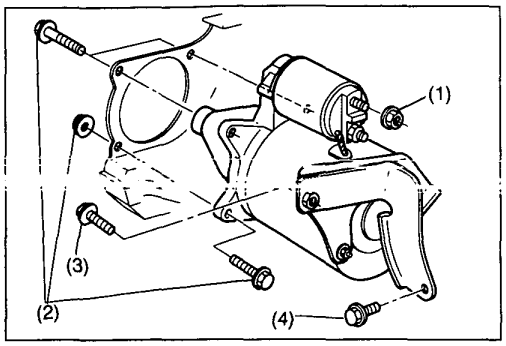
Magnetic switch only clicks when ignition switch at START	YES	Check starter motor (Refer to page G–25) Check wire harness
Check → **NO**		
1. Turn ignition switch to START position 2. Check if voltage between S terminal and ground is approx. 12V	YES	Check starter motor magnetic switch (Refer to page G–25)
NO		
Check wire harness		

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Check 1



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95A0GX-009

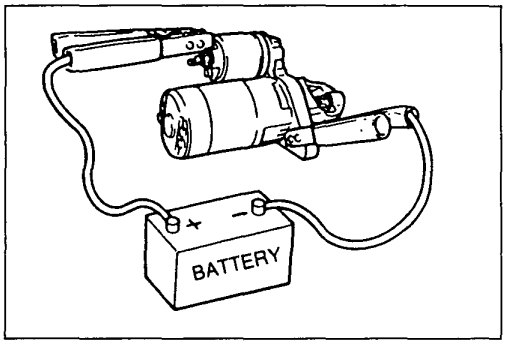
STARTER

Removal / Installation

1. Disconnect the negative battery cable.
2. Disconnect the wiring from the starter.
3. Remove the starter bracket.
4. Raise the front of the vehicle and support it with safety stands.
5. Remove the bolts and the starter.
6. Install in the reverse order of removal.

Tightening torque:

Nut (1)
10—12 N·m (105—120 cm-kg, 91—104 in-lb)
Bolt, Nut (2)
37—52 N·m (3.8—5.3 m-kg, 27—38 ft-lb)
Bolt (3) 16—23 N·m (1.6—2.3 m-kg, 5.0—7.2 ft-lb)
Bolt (4) 37—52 N·m (3.8—5.3 m-kg, 27—38 ft-lb)

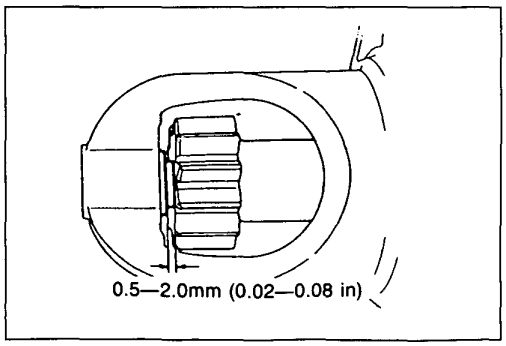


05U0GX-059

Performance Inspection

Pull-out test

Verify that the pinion is pulled out with 12V connected to the S terminal and the starter body grounded.



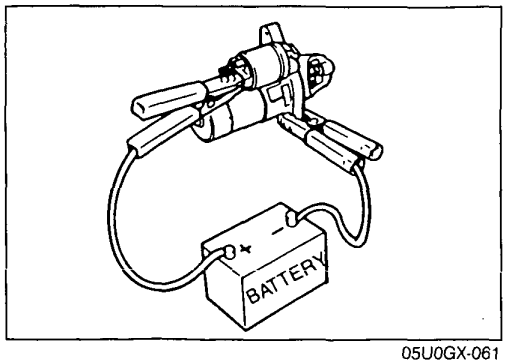
05U0GX-060

Pinion gap check

Measure the pinion gap while the pinion is pulled out.

Specification: 0.5—2.0mm (0.02—0.08 in)

Adjust the pinion gap with an adjustment washer (between drive housing front cover and magnetic switch) if it is not within specification.

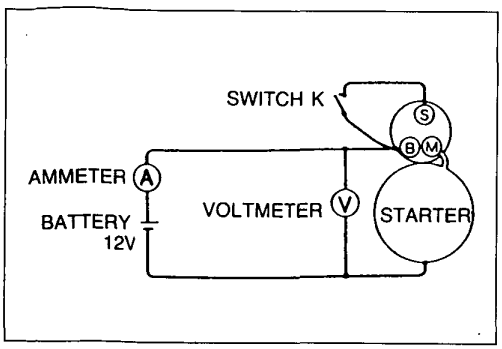


05U0GX-061

Return test

1. Disconnect the motor wire from the M terminal.
2. Connect 12V to the M terminal and ground to the body.
3. Pull out the overrunning clutch with a screwdriver. Verify that it returns to its original position when released.

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05U0GX-062

No-load test

1. After adjusting the pinion gap, form a test circuit with a voltmeter and an ammeter.

Note

- **Use heavy gauge wires and tighten each terminal fully.**

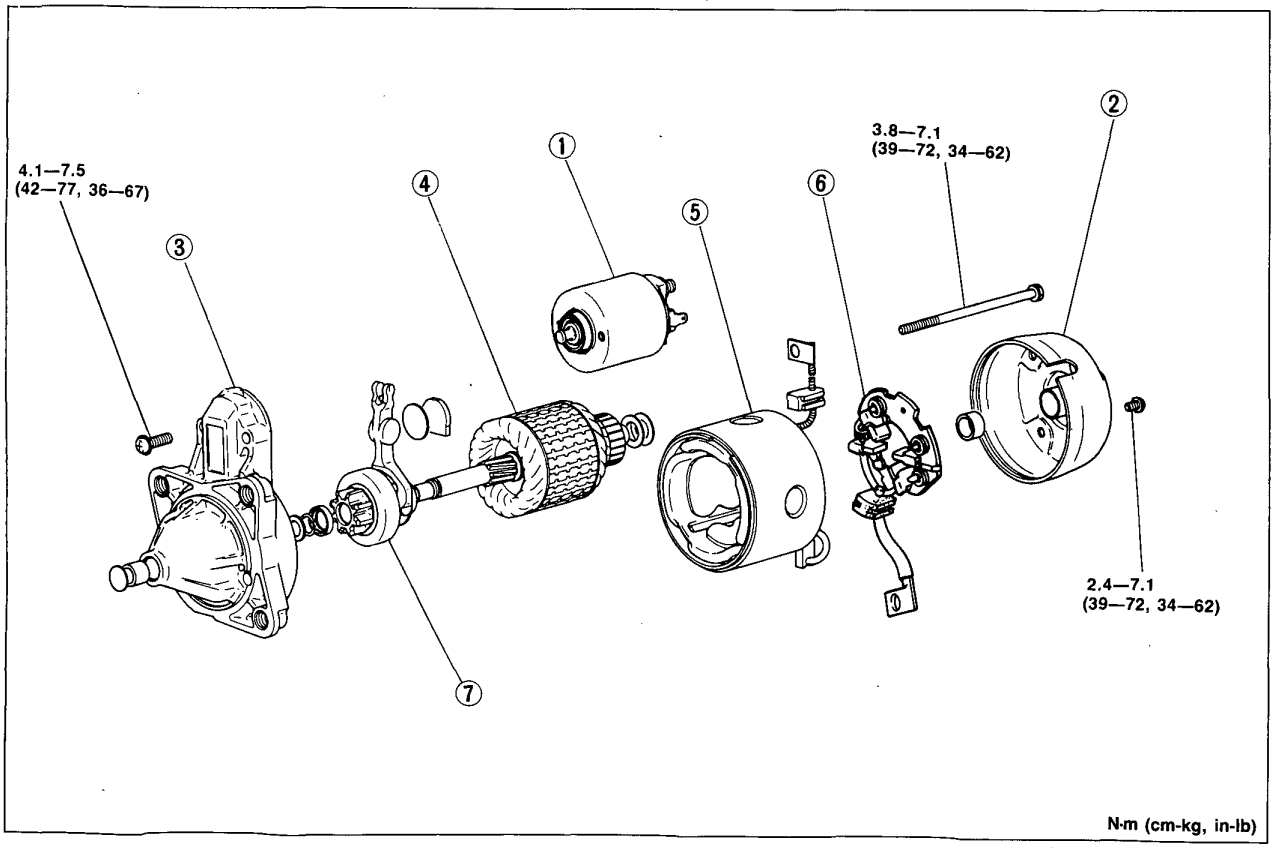
2. Close switch K to run the starter.
3. Check for the following:

Starter type	kW	0.95
Voltage	V	11.5
Current	A	Max. 60
Gear shaft speed	rpm	Min. 6,600

4. If not as specified, check for the cause by referring to Inspection.

Disassembly / Assembly

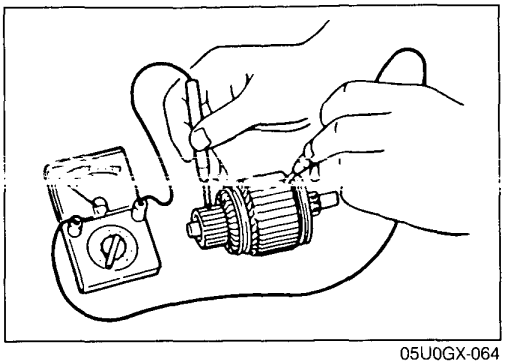
1. Disassemble in the order shown in the figure.
2. Inspect and repair or replace parts as necessary.
3. Assemble in the reverse order of diassembly.

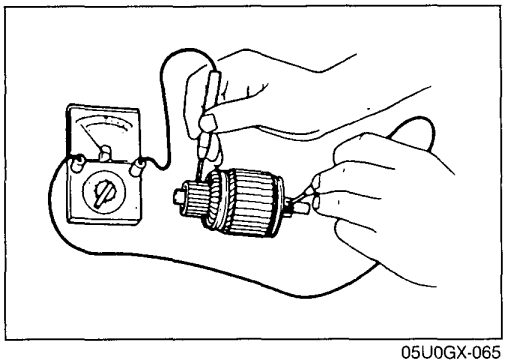


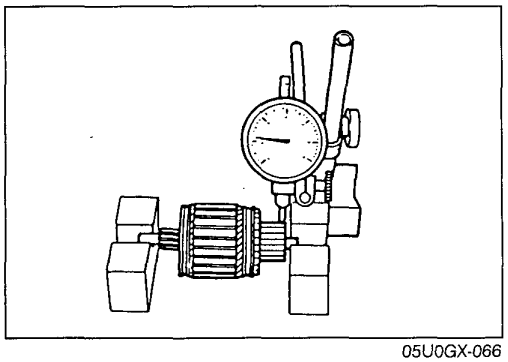
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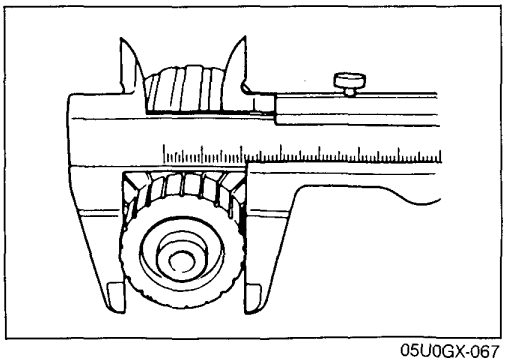
1. Magnetic switch
   Inspection..... page G–28
2. Rear housing
3. Front cover
4. Armature
   Inspection..... page G–27
5. Yoke assembly
   Inspection..... page G–28
6. Brush holder assembly
   Inspection..... page G–28
7. Drive pinion

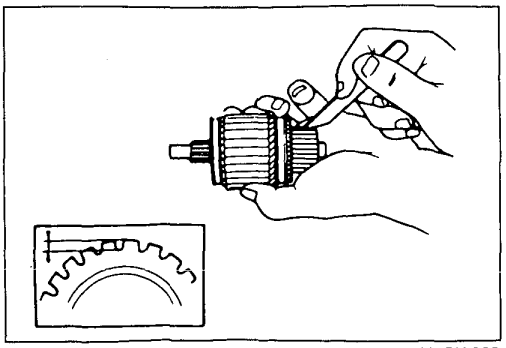
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05U0GX-066


05U0GX-067


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Inspection
Armature

1. Ground of armature coil
   Check for no continuity between the commutator and the core with an ohmmeter. Check the entire circum ferance of the commutator. Replace the armature if there is continuity.

2. Insulation of armature coil
   Check for no continuity between the commutator and the shaft with an ohmmeter. Check the entire circum ferance of the commutator. Replace the armature if there is continuity.

3. Runout of commutator
   (1) Place the armature on V blocks, and measure the runout with a dial gauge.
   (2) Repair with a lathe if the runout is small or replace the armature if necesary.

   Runout: 0.03mm (0.001 in)

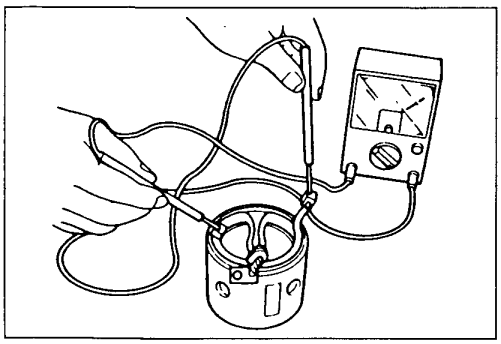
4. Outer diameter of commutator
   Replace the armature if the outer diameter of the commutator is at the grind limit or less.
5. Roughness of commutator surface
   If the commutator surface is dirty, wipe it with a cloth; if it is rough, repair it with a lathe or fine sandpaper.

   Grind limit: 30.8mm (1.21 in)

6. Segment groove depth
   If the depth of the molding between segments is at the depth limit or less, undercut the grooves to the standard depth.

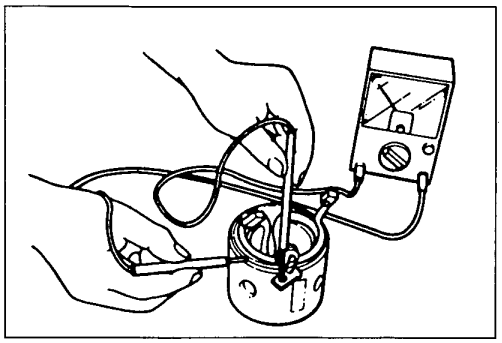
   Standard depth: 0.5—0.8mm (0.020—0.031 in)
   Depth limit: 0.2mm (0.008 in)

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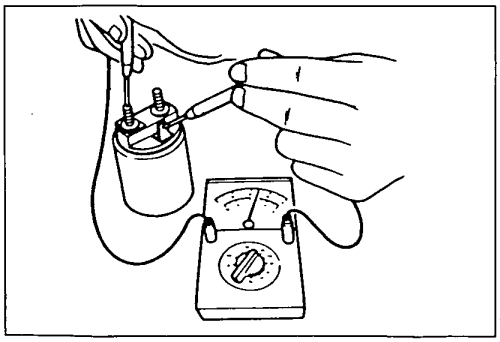

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Yoke assembly

1. Wiring damage of field coil
   (1) Check for continuity between the connector and the brushes with an ohmmeter.
   (2) Replace the yoke assembly if there is no continuity.

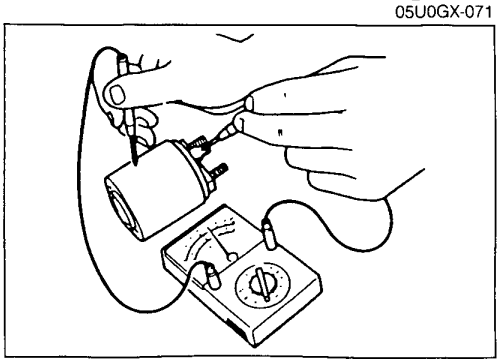

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2. Ground of field coil
   (1) Check for no continuity between the connector and the yoke with an ohmmeter.
   (2) Repair or replace the yoke assembly if there is continuity.
3. Installation of field coil
   Replace the yoke assembly if the field coil is loose.

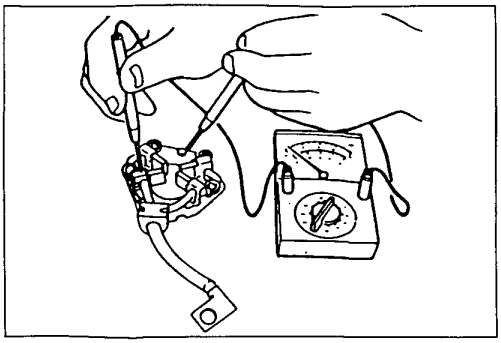

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Magnetic Switch

1. Wiring damage (S terminal — M terminal)
   Check for continuity between terminal S and terminal M with an ohmmeter. Replace the magnetic switch if there is no continuity.


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2. Wiring damage (S terminal — body)
   Check for continuity between terminal S and the body with an ohmmeter.
   Replace the magnetic switch if there is no continuity.

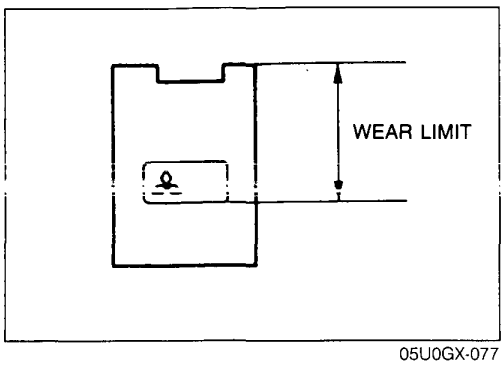

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Brush and Brush Holder

Insulation of brush holder

Check for no continuity between each insulated brush and the plate with an ohmmeter. Replace the brush holder if there is continuity.

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Brush

If the brushes are worn beyond the wear limit or if the wear is near the limit, replace the brushes.

Standard: 17mm (0.67 in)
Wear limit: 11.5mm (0.45 in)

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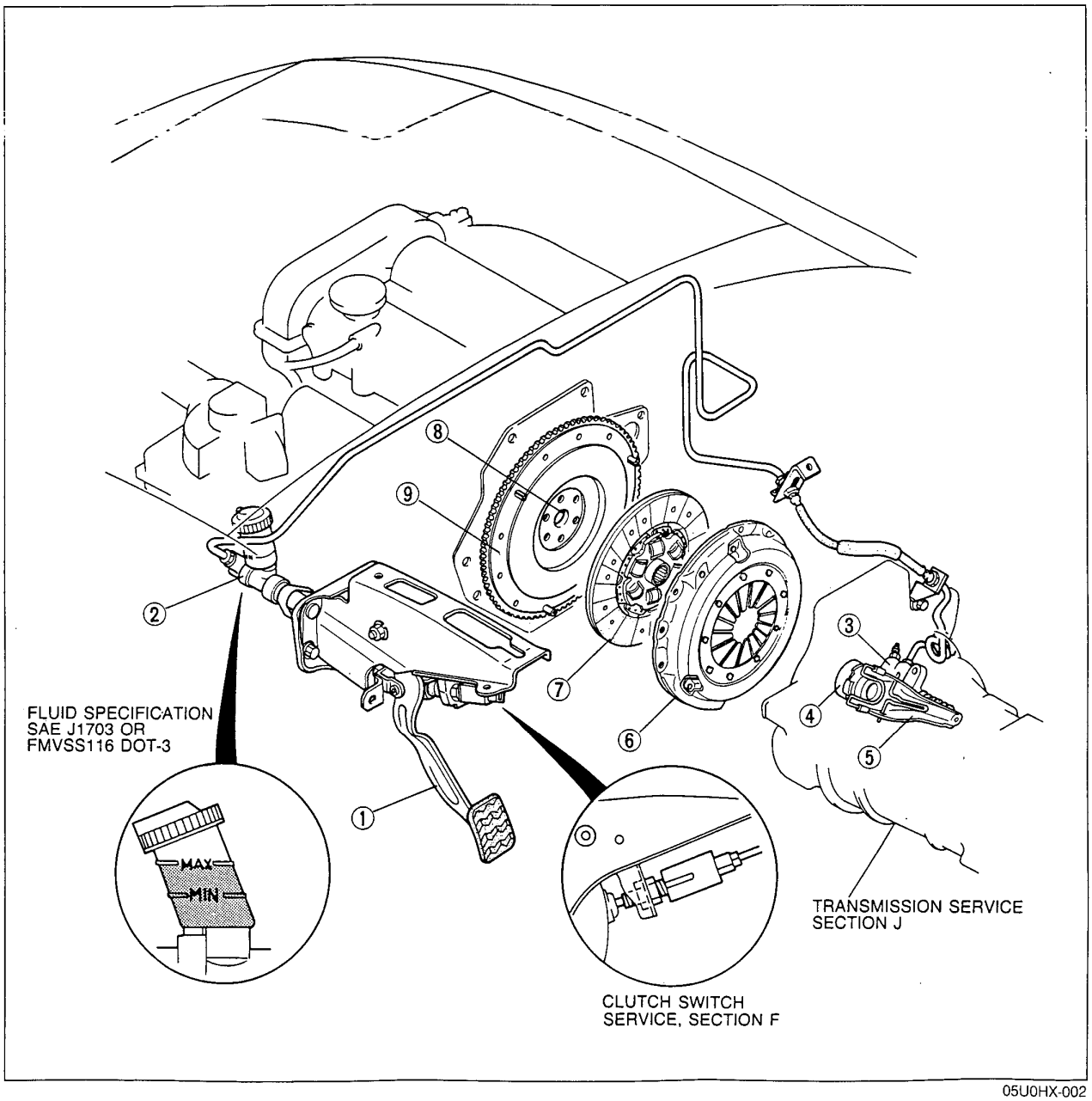
CLUTCH

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OUTLINE

SPECIFICATIONS

Item \ Engine/Transmission Model			B6 DOHC M5M-D
Clutch control			Hydraulic
Clutch cover	Type		Diaphragm spring
	Set load	N (kg, lb)	4,022 (410, 902)
Clutch disc	Outer diameter	mm (in)	200 (7.87)
	Inner diameter	mm (in)	130 (5.12)
	Thickness	Pressure plate side mm (in)	3.5 (0.14)
		Flywheel side mm (in)	3.5 (0.14)
Clutch pedal	Type		Suspended
	Pedal ratio		6.13
	Full stroke	mm (in)	120 (4.72)
	Height	mm (in)	175—185 (6.89—7.28)
Master cylinder inner diameter		mm (in)	15.87 (0.625)
Release cylinder inner diameter		mm (in)	19.05 (0.750)
Clutch fluid			SAE J1703 or FMVSS116 DOT-3

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TROUBLESHOOTING GUIDE

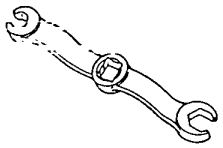
Problem	Possible Cause	Action	Page
Slipping	Clutch disc facing worn excessively	Replace	H–14
	Clutch disc facing surface hardened or oil on surface	Repair or replace	H–14
	Pressure plate damaged	Repair or replace	H–14
	Diaphragm spring damaged or weak	Replace	H–14
	Insufficient clutch pedal play	Adjust	H– 5
	Clutch pedal sticking	Repair or replace	H– 6
	Flywheel damaged	Repair or replace	H–14
Faulty disengagement	Excessive runout or damaged clutch disc	Replace	H–14
	Clutch disc splines rusted or worn	Remove rust or replace	H–14
	Oil on facing	Repair or replace	—
	Diaphragm spring weak	Replace	H–14
	Excessive clutch pedal play	Adjust	H– 5
	Insufficient clutch fluid	Add fluid	H– 2
	Leakage of clutch fluid	Locate and repair or replace	—
Clutch vibrates when accelerating	Oil on facing	Repair or replace	H–14
	Torsion rubbers weak	Replace	H–14
	Clutch disc facing hardened or damaged	Repair or replace	H–14
	Clutch disc facing rivets loose	Replace	H–14
	Pressure plate damaged or excessive runout	Replace	H–14
	Flywheel surface hardened or damaged	Repair or replace	H–14
	Loose or worn engine mount	Tighten or replace	—
Clutch pedal sticking	Pedal shaft not properly lubricated	Lubricate or replace	H– 6
Abnormal noise	Clutch release bearing damaged	Replace	H–14
	Poor lubrication of release bearing sleeve	Lubricate or replace	H–14
	Torsion rubbers weak	Replace	H–14
	Excessive crankshat end play	Repair	Refer to Section B
	Pilot bearing worn or damaged	Replace	H–14
	Worn pivot points of release fork	Repair or replace	H–14

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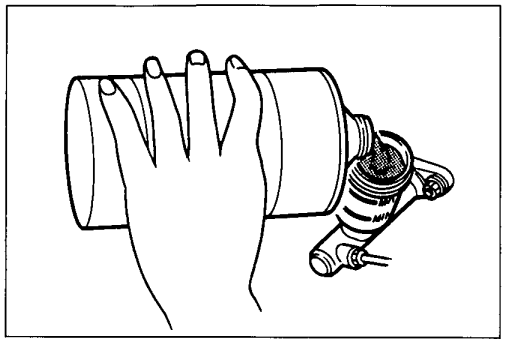
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CLUTCH FLUID

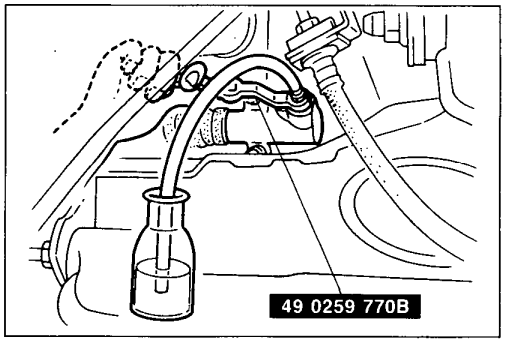
PREPARATION

49 0259 770B Wrench, flare nut 	For loosening and tightening bleeder screw

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REPLACEMENT

Note
- **The fluid in the reservoir must be maintained at the 3/4 level or higher during replacement.**

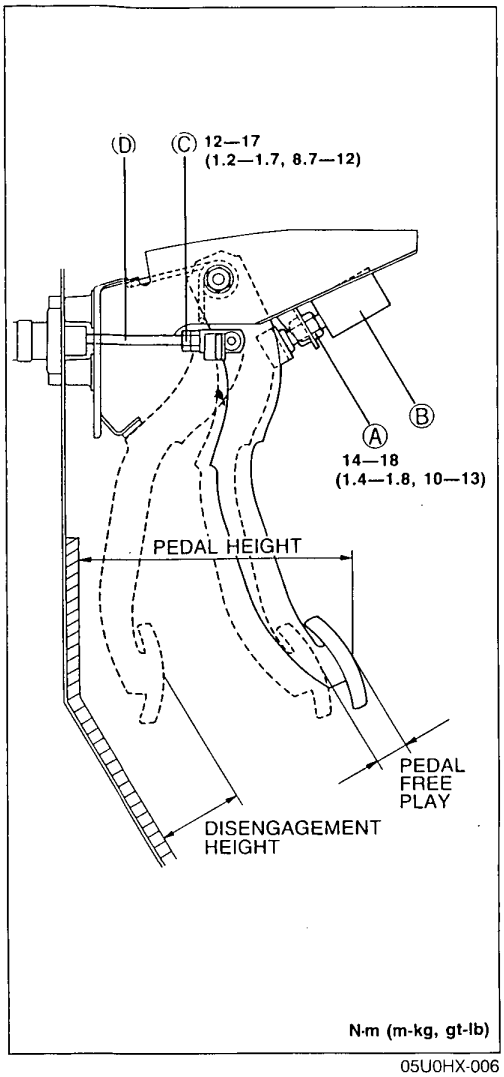
Caution
- **Be careful not to spill clutch fluid on a painted surface. If this should happen, wash it off immediately.**
- **Do not mix different brands of clutch fluid.**
- **Do not reuse the clutch fluid which was drained out.**

1. Draw the fluid from the reserve tank with a suction pump.
2. Remove the bleeder cap from the clutch release cylinder and attach a vinyl hose to the bleeder plug.
3. Place the other end of the vinyl hose in a container.
4. Slowly pump the clutch pedal several times.
5. With the clutch pedal depressed, loosen the bleeder screw with the **SST** to let fluid escape. Close the bleeder screw with the **SST**.
6. Repeat Steps 4 and 5 until only clean fluid is seen.
7. Tighten the bleeder screw.

Tightening torque:
5.9—8.8 N·m (60—90 cm-kg, 52—78 in-lb)

8. Add fluid to the MAX mark.
9. Check for correct clutch operation.

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05U0HX-006

CLUTCH PEDAL

ADJUSTMENT

Clutch Pedal Height

Inspection

Measure the distance from the upper surface of the pedal pad to the carpet.

Pedal height: 175—185mm (6.89—7.28 in)
(With carpet)

If necessary, adjust the pedal height.

Adjustment

1. Loosen locknut Ⓐ and turn clutch switch Ⓑ until the height is correct.
2. Tighten locknut Ⓐ.

Tightening torque:
14—18 N·m (1.4—1.8 m-kg, 10—13 ft-lb)

3. After adjustment, inspect the pedal free play.

Clutch Pedal Free Play

Inspection

Depress the clutch pedal by hand until clutch resistance is felt.

Pedal free play: 0.6—3.1mm (0.02—0.12 in)
Total pedal free play: 5—13mm (0.20—0.51 in)

If necessary, adjust the pedal free play.

Adjustment

1. Loosen locknut Ⓒ and turn push rod Ⓓ until pedal free play is correct.
2. Verify that the disengagement height as measured from the upper surface of the pedal to the carpet is correct when the pedal is fully depressed.

Minimum disengagement height: 68mm (2.68 in)
(With carpet)

3. Tighten locknut Ⓒ.

Tightening torque:
12—17 N·m (1.2—1.7 m-kg, 8.7—12 ft-lb)

4. After adjustment, inspect the pedal height.

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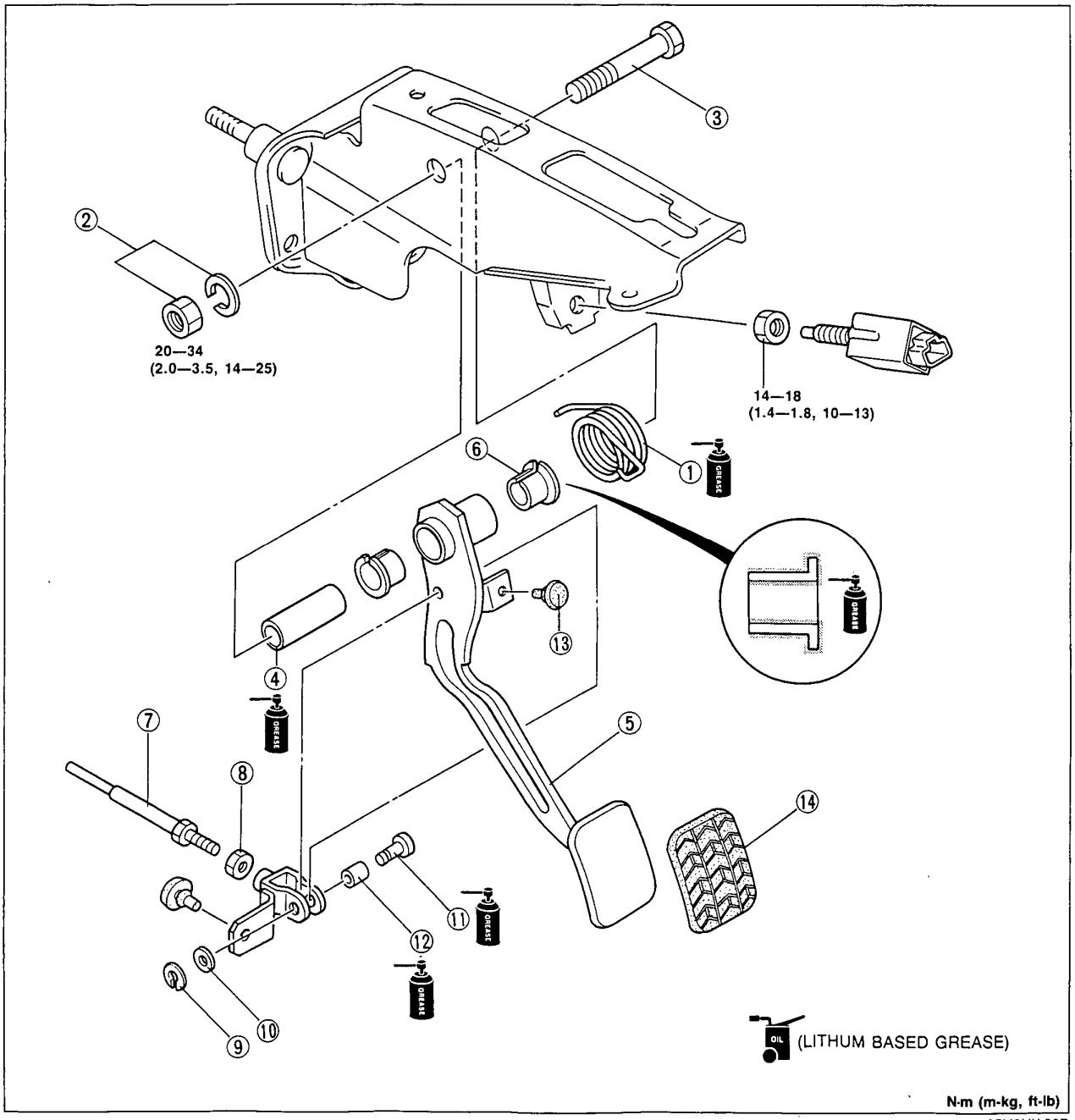
REMOVAL / INSPECTION / INSTALLATION

1. Remove in the order shown in the figure, referring to **Removal Note**.
2. Inspect all parts and repair or replace as necessary.

Note

- **Apply lithium based grease to the bushings and pin when installing.**

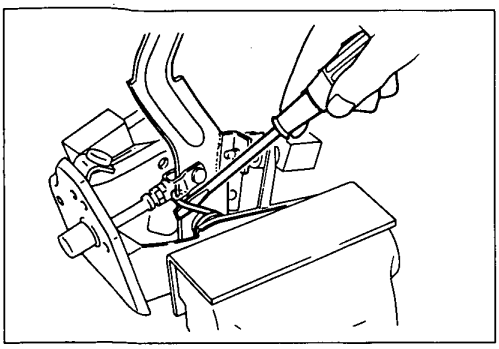
3. Install in the reverse order of removal, referring to **Installation Note**.



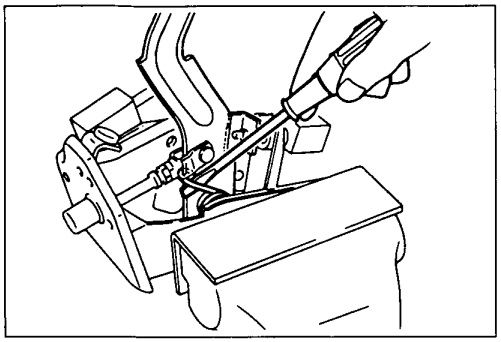
05U0HX-007

1. Spring
   Removal Note.... page H–7
   Installation Note. page H–7
2. Nut and lock washer
3. Bolt
4. Spacer
5. Clutch pedal
6. Bushings
7. Push rod
   Inspect for damage and bending
8. Nut
9. Clip
10. Wave washer
11. Pin
12. Spacer
13. Stop
14. Pedal pad

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05U0HX-008



05U0HX-009

Removal Note
Spring

Note
- **Use pads in the vise to prevent damaging the clutch master cylinder bracket.**

1. Place the clutch pedal assembly in the vise.
2. Pry the spring off the clutch pedal as shown in the figure.

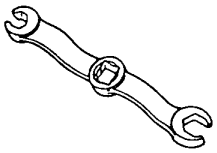
Installation Note
Spring

Note
- **Use pads in the vise to prevent damaging the clutch master cylinder bracket.**

1. Place the clutch pedal assembly in the vise.
2. Pry the spring on the clutch pedal as shown in the figure.
3. Adjust the clutch pedal height and free play after installation. (Refer to page H–5.)

CLUTCH MASTER CYLINDER

PREPARATION
SST

49 0259 770B Wrench, flare nut		For disconnecting and connecting clutch pipe

05U0HX-010

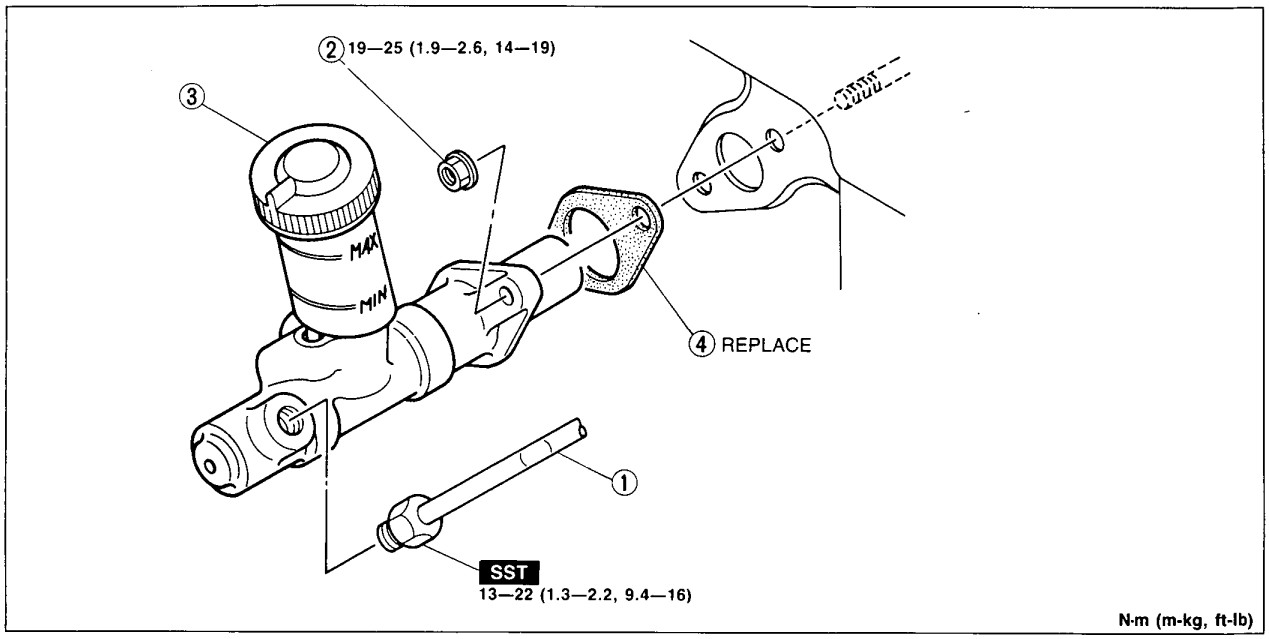
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CLUTCH MASTER CYLINDER

REMOVAL / INSTALLATION

Caution
- **Clutch fluid will damage painted surfaces. Be sure to use a container or rags to collect it. If fluid does get on a painted surface, wipe it off immediately with a rag.**

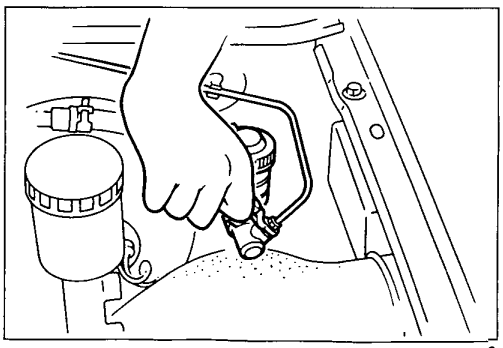
1. Remove in the order shown in the figure, referring to **Removal Note**.
2. Install in the reverse order of removal, referring to **Installation Note**.



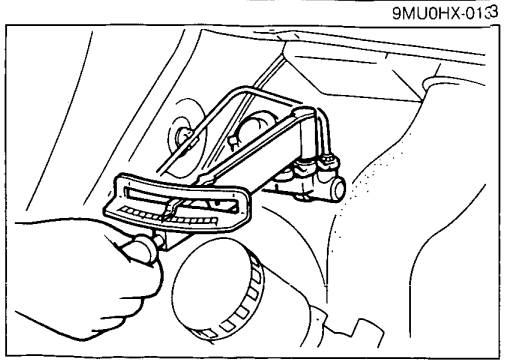
N·m (m-kg, ft-lb)

05U0HX-011

1. Clutch pipe
   Removal Note.. page H– 8
   Installation Note page H– 8
2. Nut
3. Clutch master cylinder
   Check for fluid leakage from cylinder bore
   Overhaul ..... page H–10
   Air bleeding .... page H– 9
4. Gasket



9MU0HX-013



05U0HX-012

Removal Note
Clutch pipe
Disconnect the clutch pipe with the **SST**.

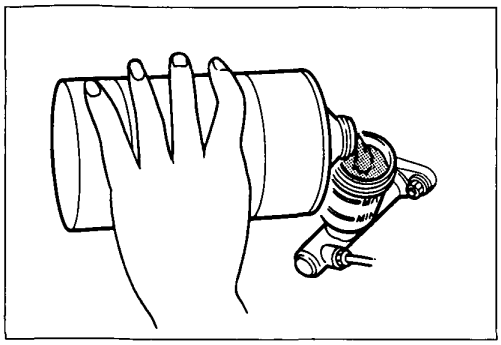
Installation Note
Clutch pipe
Tighten the clutch pipe with the **SST**.

Tightening torque:
13—22 N·m (1.3—2.2 m-kg, 9.4—16 ft-lb)

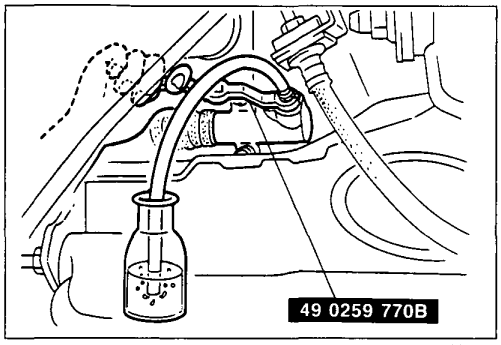
Air Bleeding
After installation, bleed the clutch system.
(Refer to page H–9.)

Inspection and Adjustment
Clutch pedal height and free play
(Refer to page H–5.)

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05U0HX-602



97U0HX-010

AIR BLEEDING

The clutch hydraulic system must be bled to remove air introduced whenever a hydraulic line is disconnected.

Note

- **The fluid in the reservoir must be maintained at the 3/4 level or higher during air bleeding.**

Caution

- **Clutch fluid will damage a painted surface. If fluid does get on a painted surface, wipe it off immediately.**
- **Do not mix different brands of clutch fluid.**
- **Do not reuse the clutch fluid which was drained out.**

1. Remove the bleeder cap from the clutch release cylinder and attach a vinyl hose to the bleeder plug.
2. Insert the other end of the vinyl hose in a clear container.
3. Slowly pump the clutch pedal several times.
4. While depressing the pedal, loosen the bleeder screw with the **SST** to let fluid and air escape.
   Close the bleeder screw with the **SST**.
5. Repeat Steps 3 and 4 until no air bubbles are seen in the fluid.
6. Tighten the bleeder screw.

Tightening torque:
5.9—8.8 N·m (60—90 cm-kg, 52—78 in-lb)

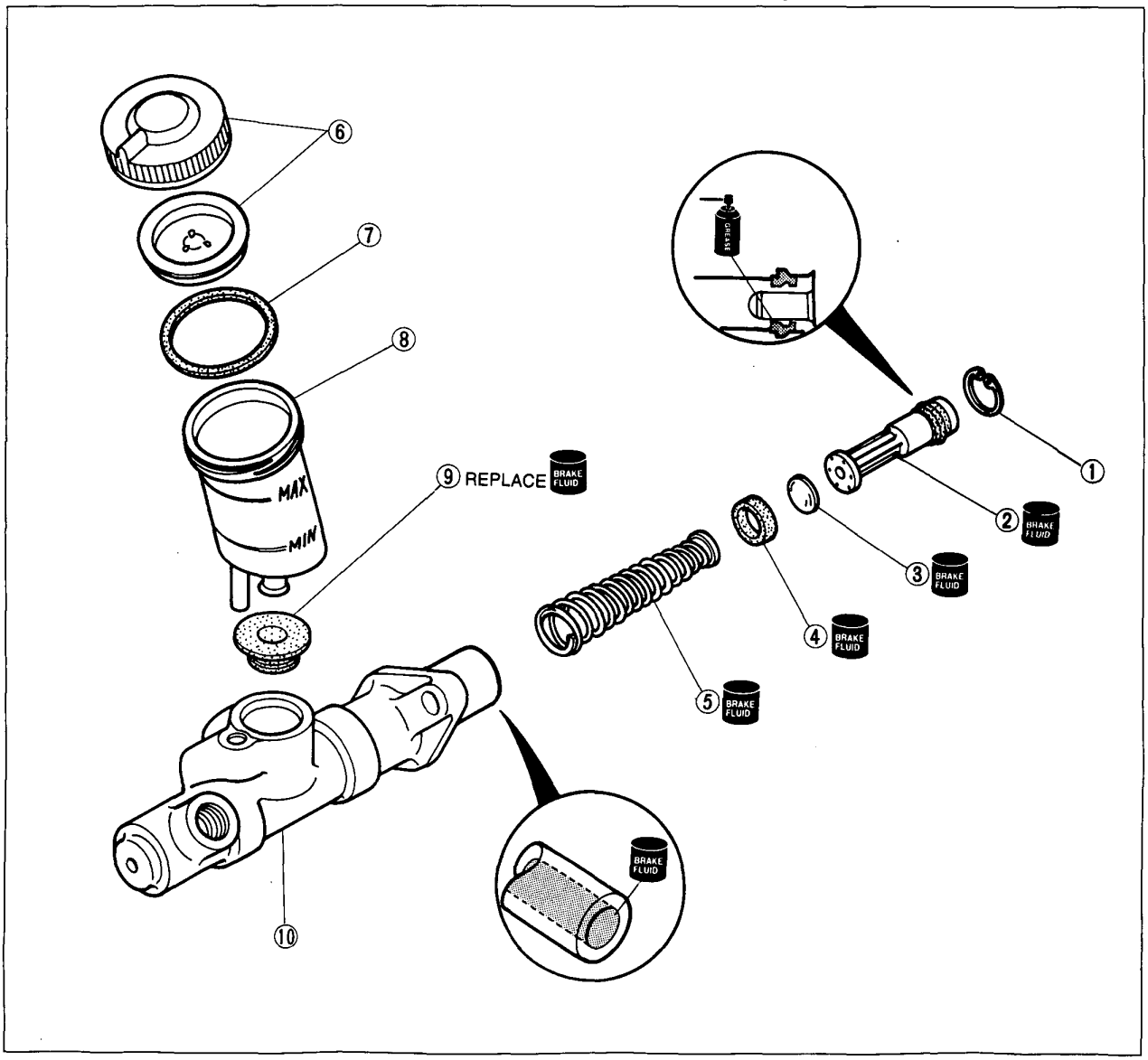
7. Check for correct clutch operation.
8. Verify that there is no fluid leakage.

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OVERHAUL

Caution
- **Clean the disassembled parts in solvent and blow through all ports and passages with compressed air.**

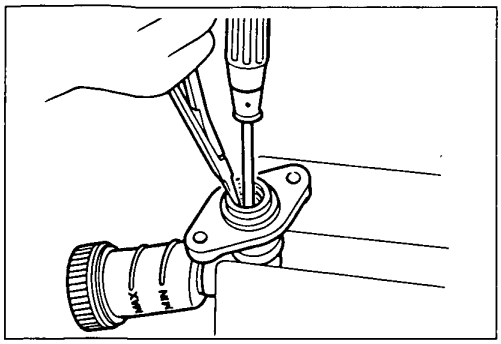
1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Inspect all parts and repair or replace as necessary.
3. Assemble in the reverse order of disassembly, referring to **Assembly Note**.



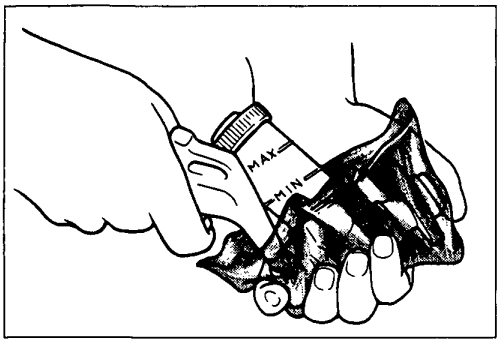
05U0HX-013

1. Snap ring
   Disassembly Note ..... page H–11
   Assembly Note ..... page H–11
2. Piston and secondary cup assembly
   Disassembly Note ..... page H–11
   Inspect for wear, scoring, and cracks
   Assembly Note ..... page H–11
3. Spacer
4. Primary cup
   Inspect for wear and cracks
5. Return spring
6. Cap
7. Packing
8. Reservoir
9. Bushing
10. Master cylinder body
    Inspect cylinder bore for scoring and corrosion

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9MU0HX-018



9MU0HX-019

Disassembly Note
Snap ring

Note
- **Do not damage the push rod contact surface of the piston.**

Press down on the piston and remove the snap ring with snap-ring pliers.

Piston and secondary cup assembly

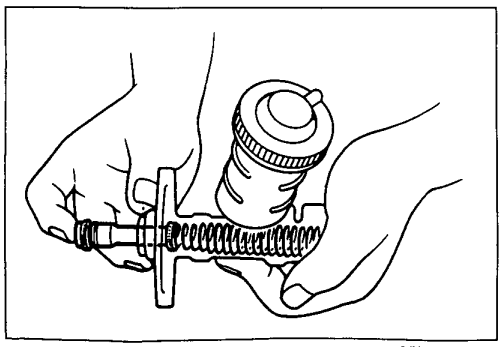
Caution
- **Hold a rag over the master cylinder to prevent the piston and secondary cup assembly from jumping out.**

Remove the piston and secondary cup assembly, spacer, and primary cup by applying compressed air through the clutch pipe installation hole.

Assembly Note

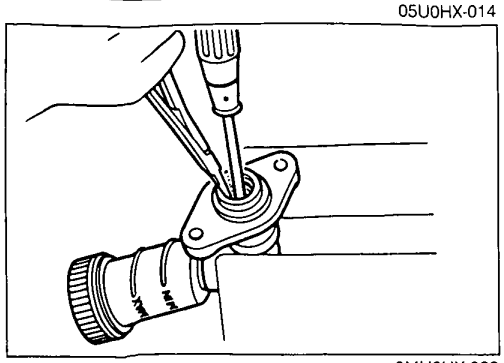
Caution
- **Before assembly, make sure all parts are completely clean.**
- **Do not mix different brands of clutch fluid.**
- **Do not reuse the clutch fluid which was drained out.**
- **Apply the specified clutch fluid to the piston and secondary cup assembly, spacer, primary cup, and cylinder bore before assembly.**
- **Replace parts with new ones whenever specified to do so.**

9MU0HX-021



05U0HX-014

Piston and secondary cup assembly
Install the spring, primary cup, spacer, and piston and secondary cup assembly, noting the proper direction of the parts. (Refer to page H–10.)



9MU0HX-023

Snap ring

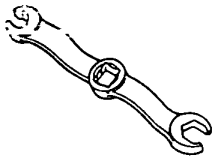
Note
- **Do not damage the push rod contact surface of the piston.**

While pressing the piston, install the snap ring.

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CLUTCH RELEASE CYLINDER

PREPARATION
SST

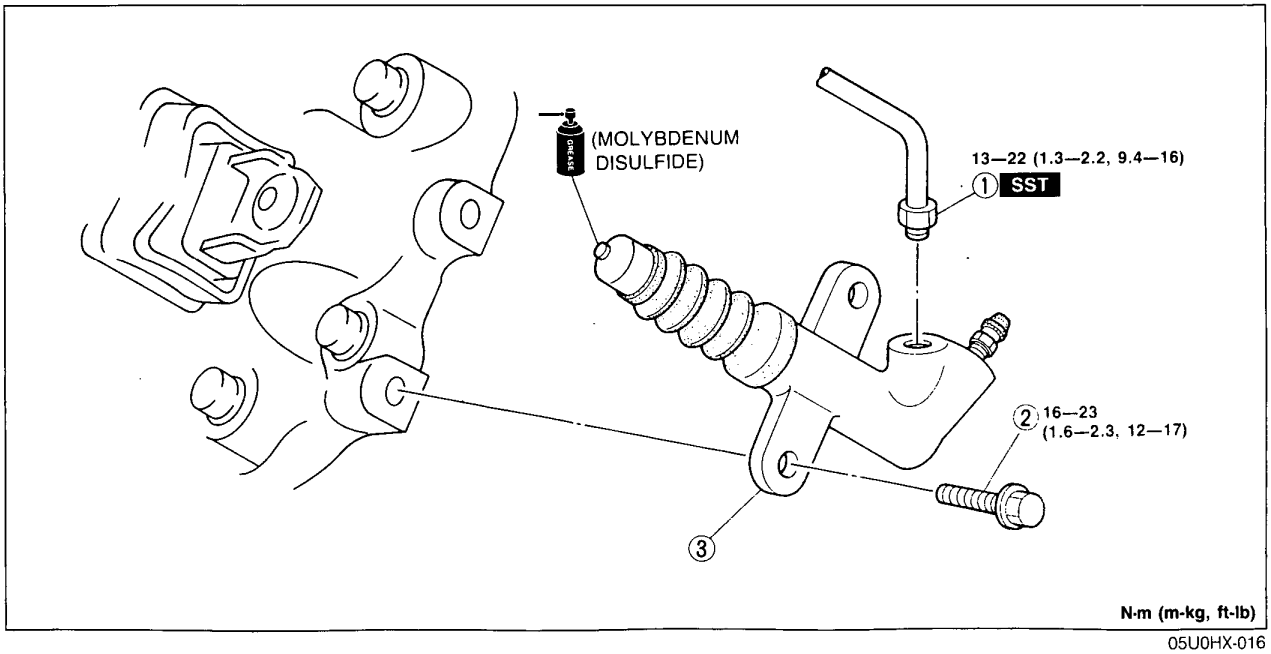
[illegible] Wrench, flare nut		For disconnecting and connecting clutch pipe

05U0HX-015

REMOVAL / INSTALLATION

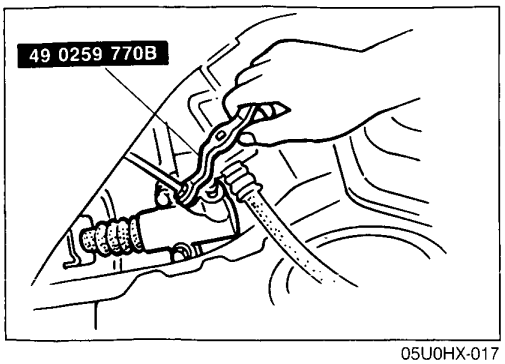
Caution
- **Clutch fluid will damage painted surfaces. Be sure to use a container or rags to collect it. If fluid does get on a painted surface, wipe it off immediately with a rag.**

1. Remove in the order shown in the figure, referring to **Removal Note**.
2. Install in the reverse order of removal, referring to **Installation Note**.



05U0HX-016

1. Clutch pipe
   Removal Note ..... page H–12
   Installation Note..... page H–13
2. Bolt
3. Clutch release cylinder
   Remove boot and check for fluid leakage
   Overhaul..... page H–13



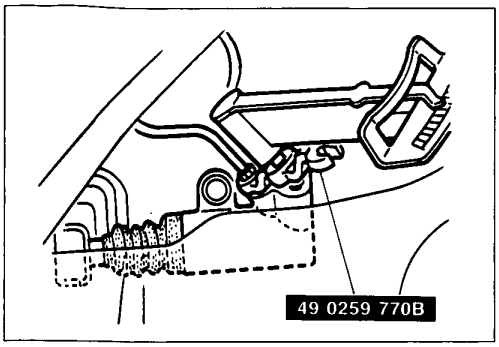
05U0HX-017

Removal Note
Clutch pipe

Caution
- **After disconnecting the clutch pipe, plug it to prevent fluid leakage.**

Disconnect the clutch pipe with the **SST**.

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05U0HX-018

Installation Note
Clutch pipe
Tighten the clutch pipe with the **SST**.

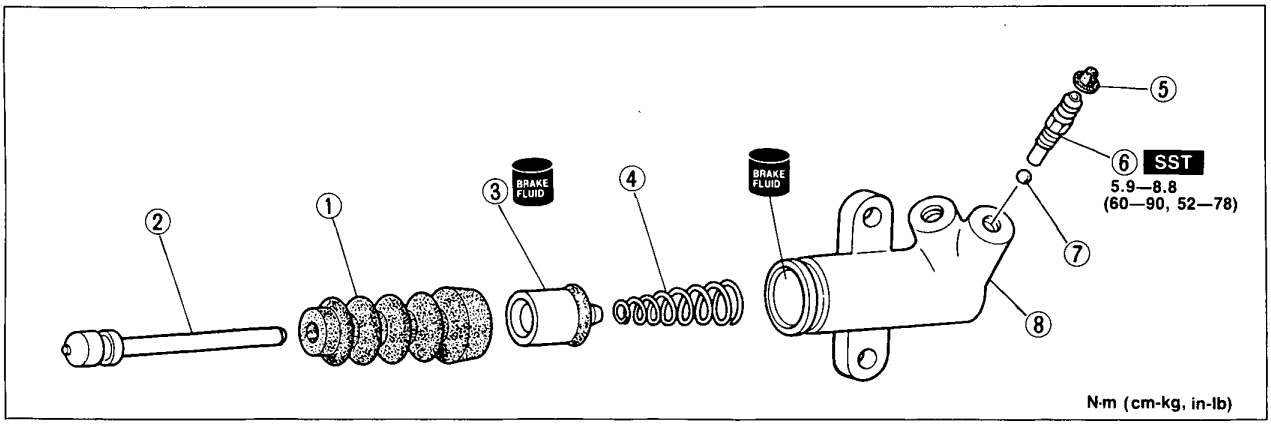
Tightening torque:
13—22 N·m (1.3—2.2 m-kg, 9.4—16 ft-lb)

Air Bleeding
After installation, bleed the clutch system.
(Refer to page H–9.)

OVERHAUL

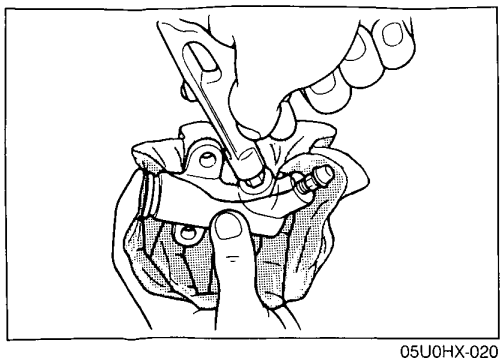
Caution
- **Clean the disassembled parts in solvent and blow through all ports and passages with compressed air.**
- **Before assembly, make sure all parts are completely clean.**
- **Apply the specified clutch fluid to the piston and cup assembly and cylinder bore before assembly.**

1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Inspect all parts and repair or replace as necessary.
3. Assemble in the reverse order of disassembly.



05U0HX-019

1. Boot
2. Push rod
3. Piston and cup assembly
   Disassembly Note..... page H–13
   Inspect for wear, scoring, and cracks
4. Spring
5. Bleeder cap
6. Bleeder screw
7. Steel ball
8. Release cylinder body
   Inspect cylinder bore for scoring and corrosion


05U0HX-020

Disassembly Note
Piston and cup assembly

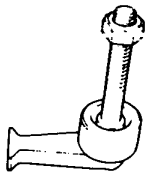
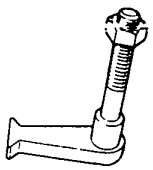
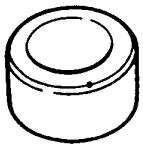
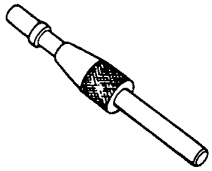
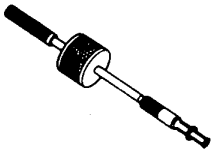
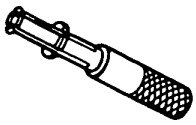
Caution
- **Hold a rag over the release cylinder to prevent the piston and cup assembly from jumping out.**

Remove the piston and cup assembly by applying compressed air through the clutch pipe installation hole.

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CLUTCH UNIT

PREPARATION
SST

[illegible] Brake, ring gear 	For holding ring gear	[illegible] Body (Part of 49 E301 060) 	For holding ring gear
49 E301 062 Collar (Part of 49 E301 060) 	For holding ring gear	49 SE01 310 Clutch disc centering tool 	For removal and installation of clutch disc
49 1285 071 Puller, bearing 	For removal of pilot bearing	49 1285 073 Chuck (Part of 49 1285 073) 	For removal of pilot bearing

05U0HX-021

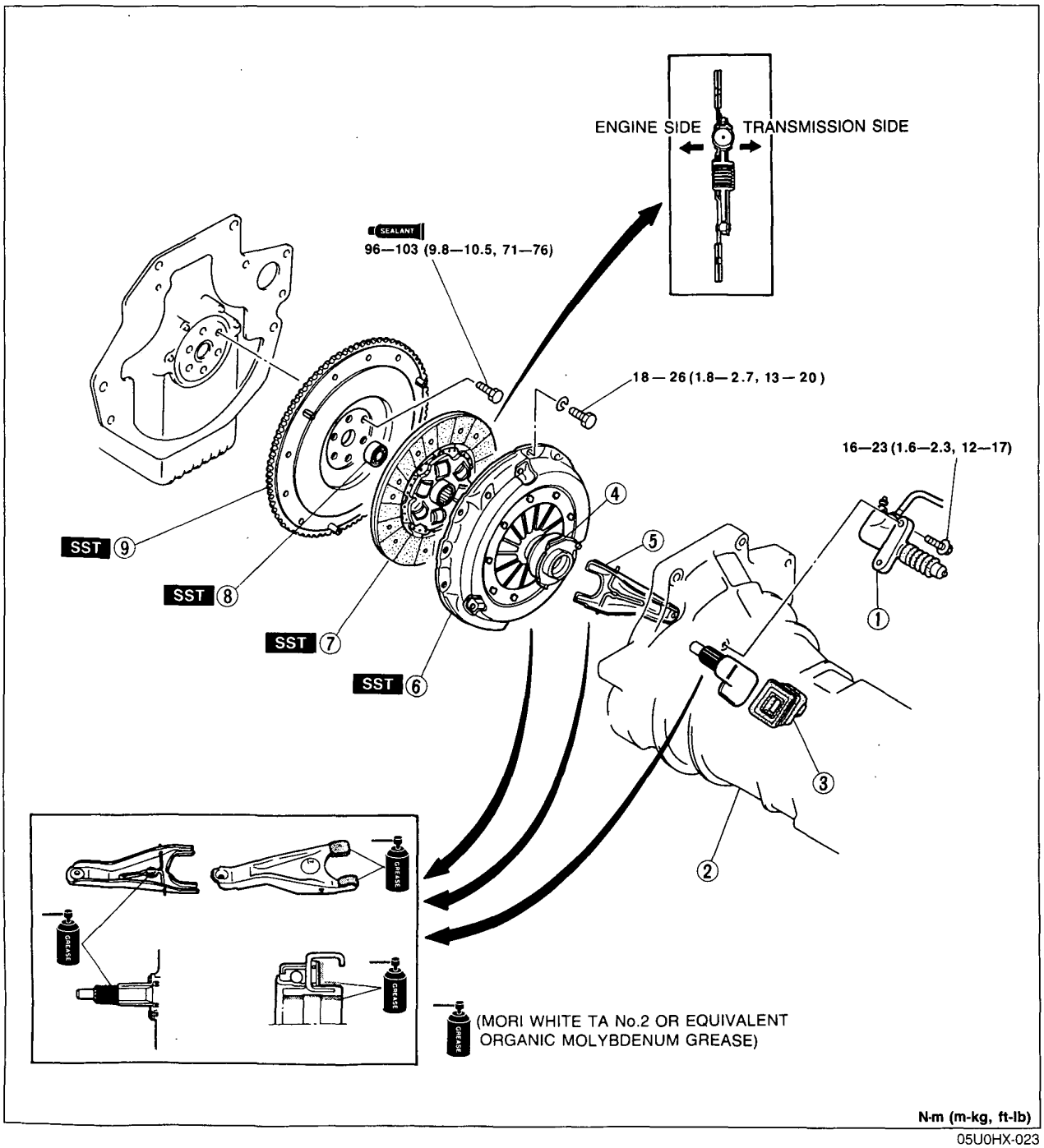
REMOVAL / INSTALLATION

Note
- **Remove the clutch release cylinder with the clutch pipe connected.**
- **Do not remove the pilot bearing if not necessary.**

1. Remove in the order shown in the figure, referring to **Removal Note**.
2. Install in the reverse order of removal, referring to **Installation Note**.

05U0HX-022

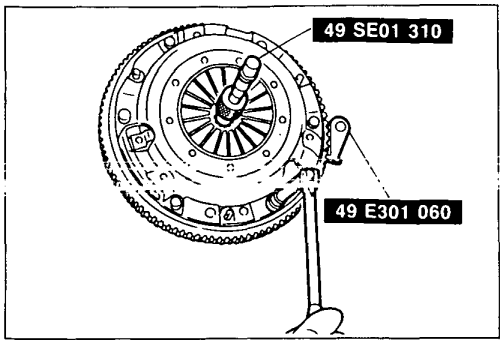
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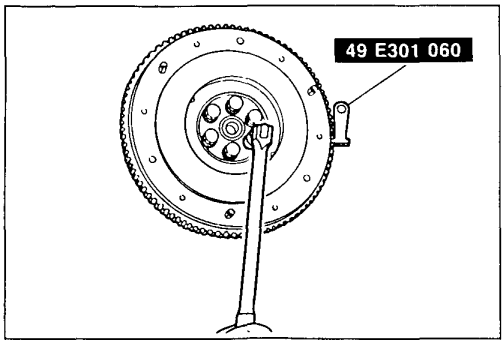
1. Clutch release cylinder
2. Transmission
   Service ..... Section J
3. Boot
4. Release bearing
   Inspection ..... page H–17
5. Release fork
6. Clutch cover
   Removal Note ..... page H–16
   Inspection ..... page H–17
   Installation Note ..... page H–17
7. Clutch disc
   Removal Note ..... page H–16
   Inspection ..... page H–17
   Installation Note ..... page H–17
8. Pilot bearing
   Inspection ..... page H–18
   Removal Note ..... page H–16
   Installation Note ..... page H–16
9. Flywheel
   Removal Note ..... page H–16
   Inspection ..... page H–18
   Installation Note ..... page H–16

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97U0HX-016

Removal Note
Clutch cover and disc
1. Install the **SST**.
2. Loosen each bolt one turn at a time in a crisscross pattern until spring tension is released. Then remove the clutch cover and disc.

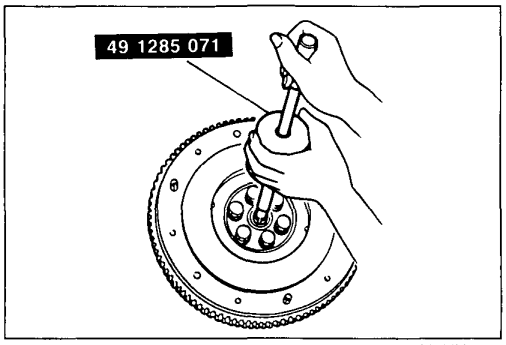


05U0HX-024

Flywheel

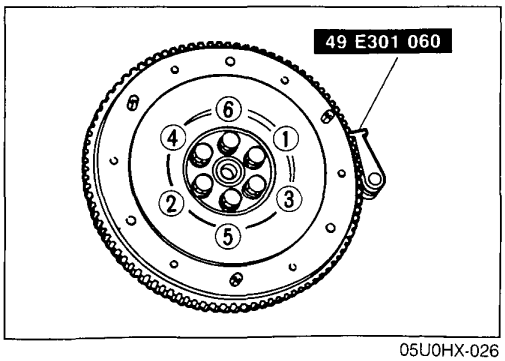
Note
- **After removing the flywheel, inspect for oil leakage past the crankshaft rear oil seal. If necessary, replace the oil seal. (Refer to Section B.)**

1. Hold the flywheel with the **SST**.
2. Remove the flywheel.



05U0HX-025

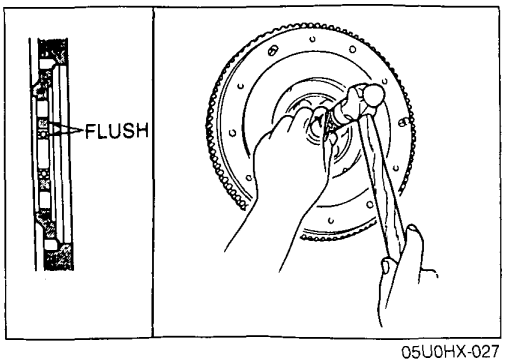
Pilot bearing
Remove the pilot bearing with the **SST**, if necessary.



05U0HX-026

Installation Note
Flywheel
1. Wipe the bolts clean, and apply sealant to the bolt threads.
2. Install the flywheel and **SST**.
3. Tighten the bolts in the pattern shown.

Tightening torque:
96—103 N·m (9.8—10.5 m-kg, 71—76 ft-lb)



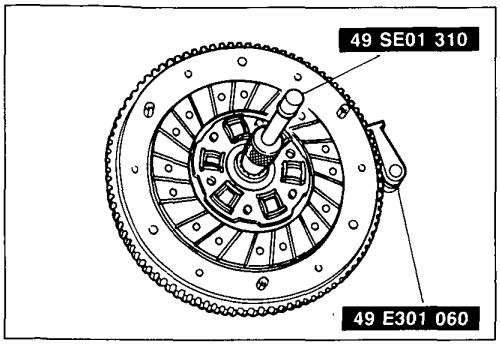
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Pilot bearing

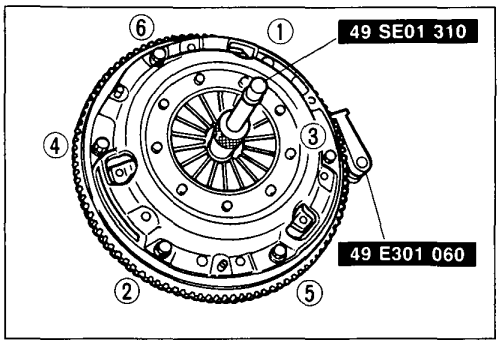
Note
- **Install the pilot bearing flush with the flywheel.**

Install the new bearing with a suitable pipe.

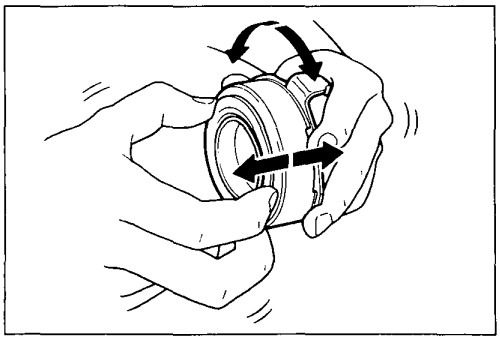
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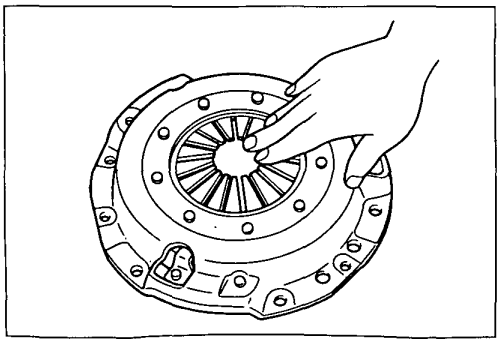


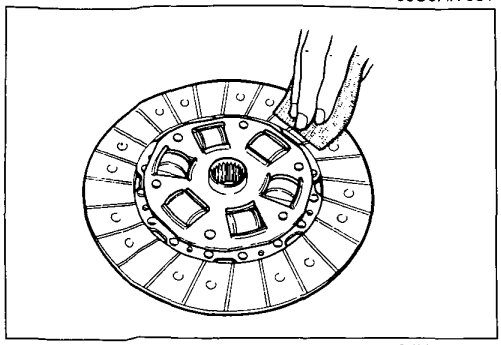
05U0HX-029



05U0HX-030


9MU0HX-040


05U0HX-031


05U0HX-032

Clutch disc

1. Clean the clutch disc splines and main drive gear splines, and apply Mori White TA No.2 or equivalent organic molybdeum grease.
2. Hold the clutch disc in position with the **SST**.

Clutch cover

1. Install the **SST**.
2. Align the dowel holes with the flywheel dowels.
3. Tighten the bolts evenly and gradually in the pattern shown.

Tightening torque:
18—26 N·m (1.8—2.7 m-kg, 13—20 ft-lb)

RELEASE BEARING

INSPECTION

Note
- **The clutch release bearing is a sealed bearing and must not be washed in solvent.**

Turn the bearing while applying force in the axial direction. If the bearing sticks or has excessive resistance, replace it.

CLUTCH COVER

INSPECTION

Note
- **Minor scoring or burning should be removed with emery paper.**

1. Inspect the contact surface of the clutch disc for scoring, cracks, and burning, repair or replace as necessary.
2. Inspect the contact surface of the clutch release bearing for wear and cracks.
3. If there is wear or cracks, replace the clutch cover.

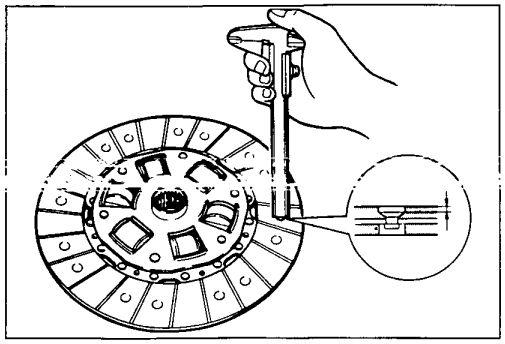
CLUTCH DISC

INSPECTION

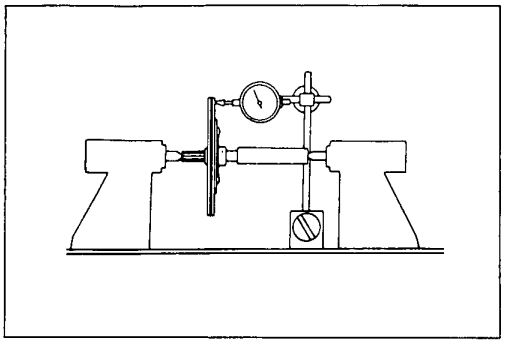
Note
- **Use sandpaper if the trouble is minor.**

1. Inspect the lining surface for burning and oil contamination. Replace the clutch disc if it is badly burned or oil soaked.
2. Inspect for loose facing rivets or torsion rubbers. Replace the clutch disc if any are loose.

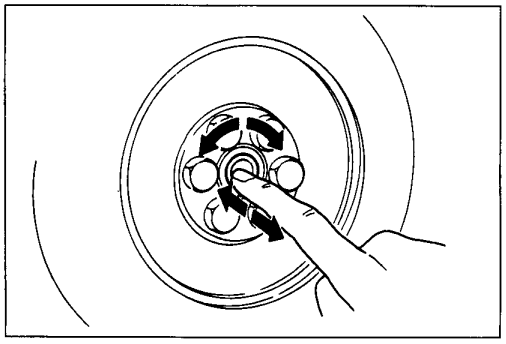
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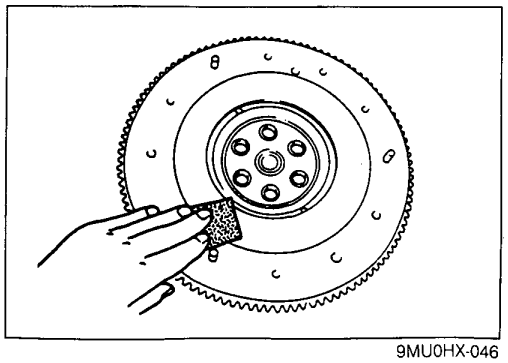
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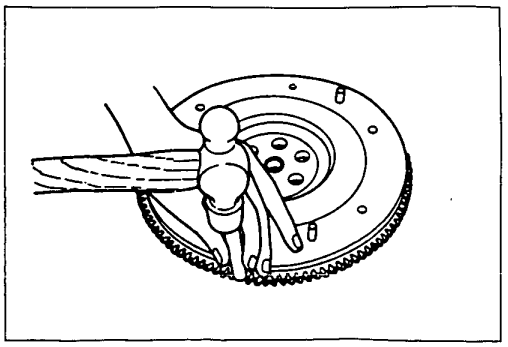
97U0HX-024



05U0HX-028



9MU0HX-046



9MU0HX-047

3. Measure the thickness of the lining at a rivet head on both sides with vernier calipers.
   Replace the clutch disc if less than minimum.

   Minimum thickness: 0.3mm (0.012 in)

4. Measure the clutch disc runout with a dial indicator.
   Replace the clutch disc if runout is excessive.

   Maximum runout: 0.7mm (0.028 in)

PILOT BEARING

INSPECTION

Turn the bearing while applying force in the axial direction. If the bearing sticks or has excessive resistance, replace it.

FLYWHEEL

INSPECTION

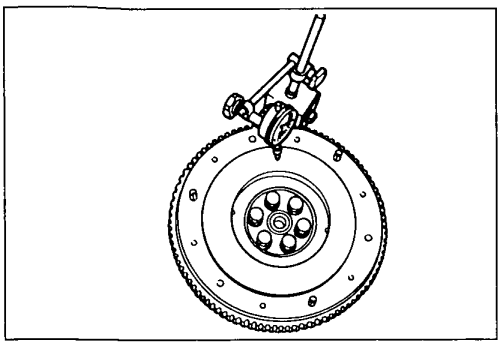
Note
- **Minor scoring or burning should be removed with emery paper.**

1. Inspect the contact surface of the clutch disc for scoring, cracks, or burning, repair or replace as necessary.

Note
- **The beveled side of the ring gear must face the engine side.**

2. Inspect the ring gear teeth for wear or damage. If necessary, replace the ring gear as follows:
   (1) Heat the ring gear with a blowtorch. Tap around the gear to remove it from the flywheel.
   (2) Heat the new ring gear to **250—300°C (480—570°F)**; then fit it onto the flywheel.

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9MU0HX-048

3. Measure the flywheel runout with a dial indicator. Replace the flywheel if runout is excessive.

Maximum runout: 0.2mm (0.008 in)

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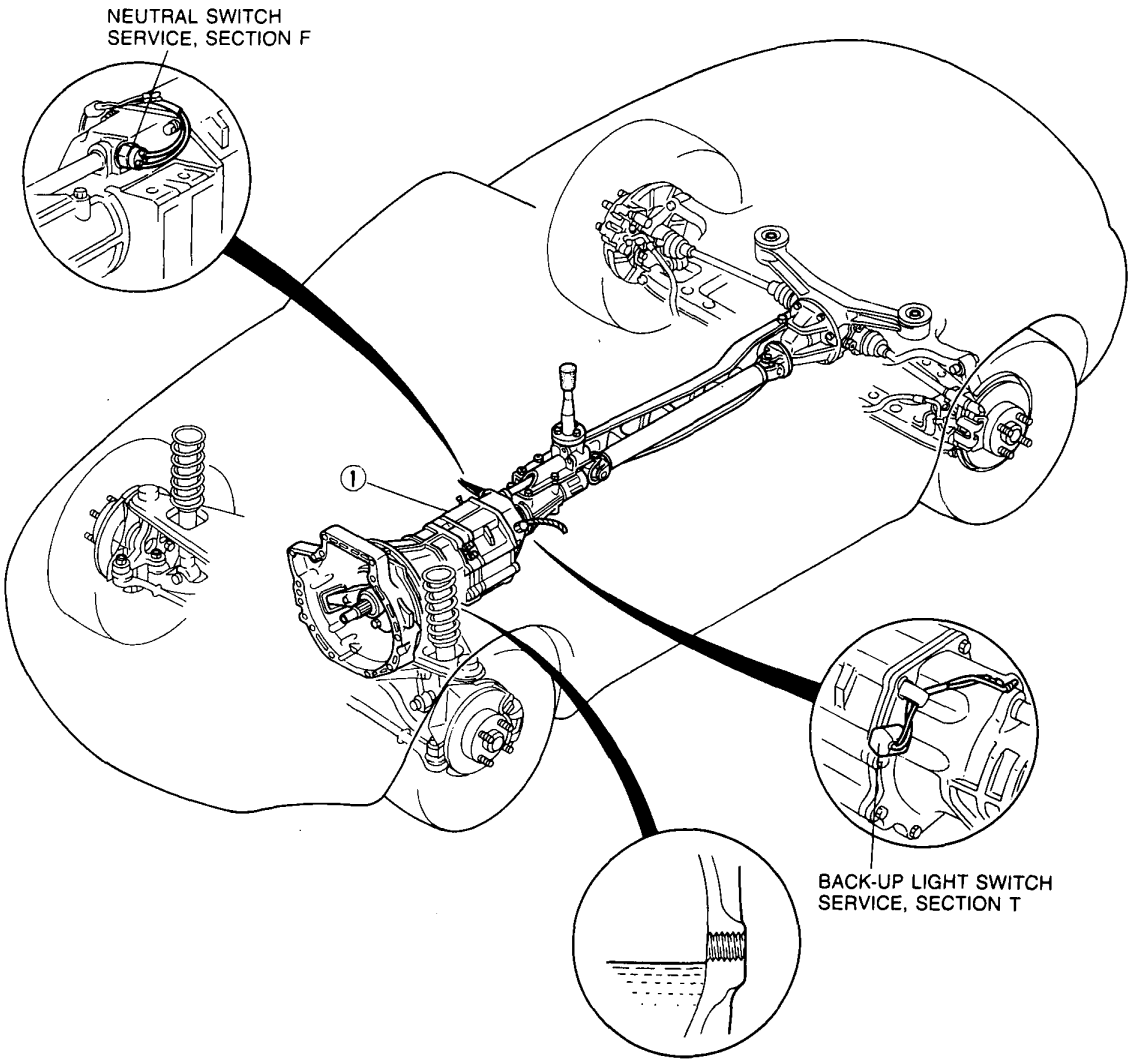
MANUAL TRANSMISSION

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POWERFLOW ..... **J– 6**
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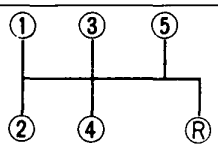
05U0JX-002

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OUTLINE

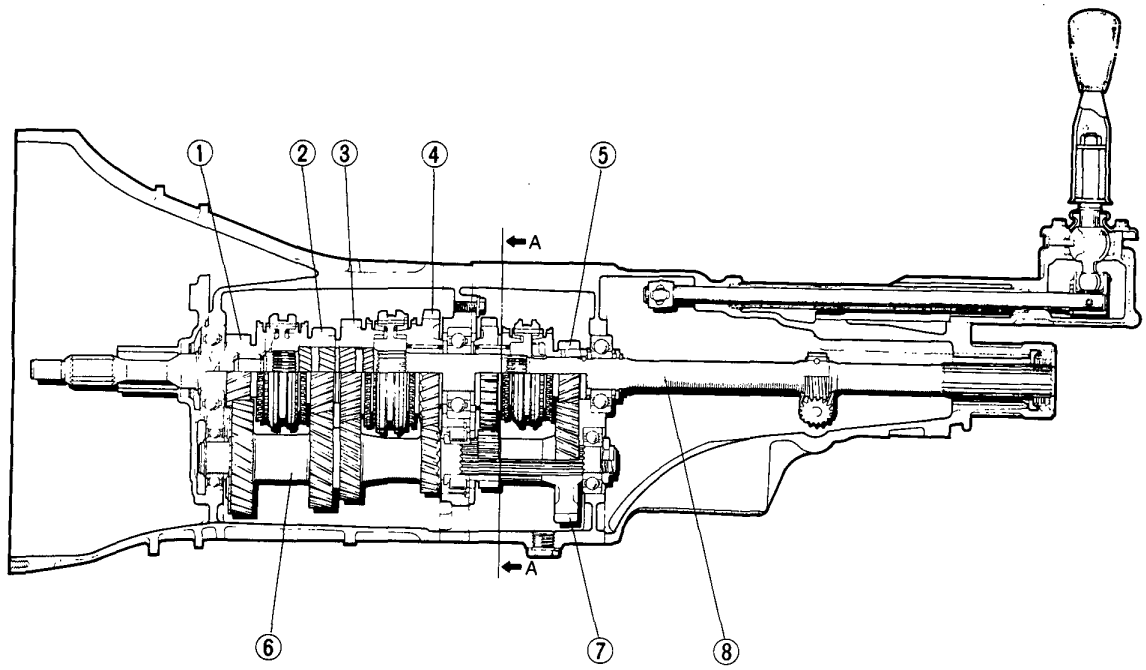
SPECIFICATIONS

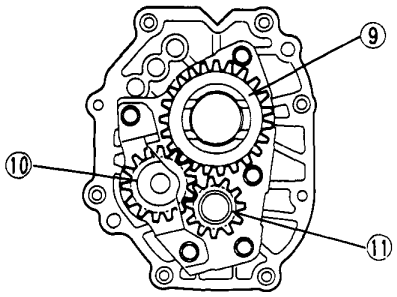
Item \ Transmission model			M-type
Synchronization mechanism			Forward: Synchromesh Reverse: Synchromesh
Shift type			5-speed, floor shift
Shift pattern			
Gear ratio	1st		3.136
	2nd		1.888
	3rd		1.330
	4th		1.000
	5th		0.814
	Reverse		3.758
Oil	Grade		API service GL-4 or GL-5
	Viscosity	All-season	SAE 75W-90
		Above 10°C (50°F)	SAE 80W-90
	Capacity	liters (US qts, Imp qts)	2.0 (2.1, 1.8)

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STRUCTURAL VIEW





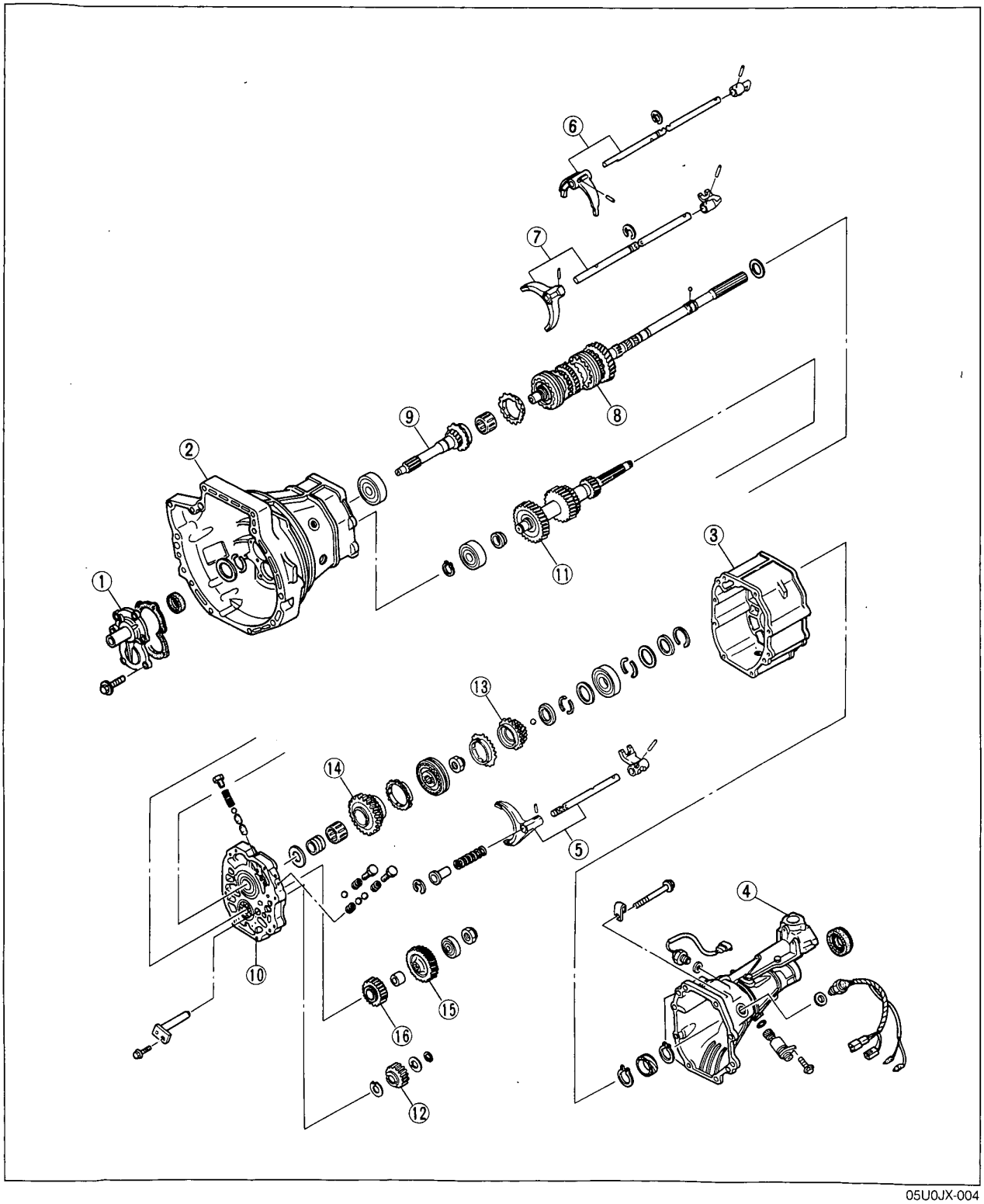
VIEW A—A

9MU0JX-004

1. Main drive gear (4th gear)
2. 3rd gear
3. 2nd gear
4. 1st gear
5. 5th gear
6. Countershaft
7. Counter 5th gear
8. Mainshaft
9. Reverse gear
10. Reverse idler gear
11. Counter reverse gear

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COMPONENTS

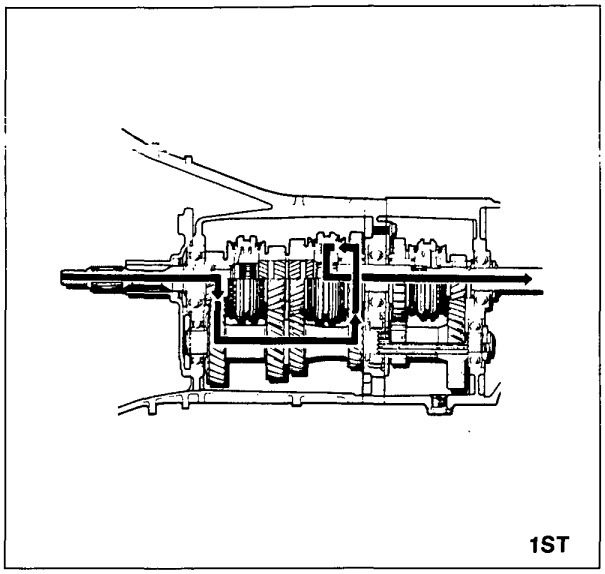


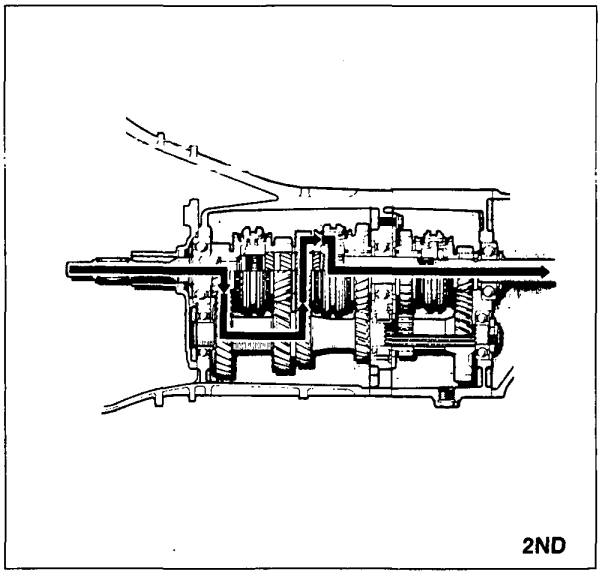
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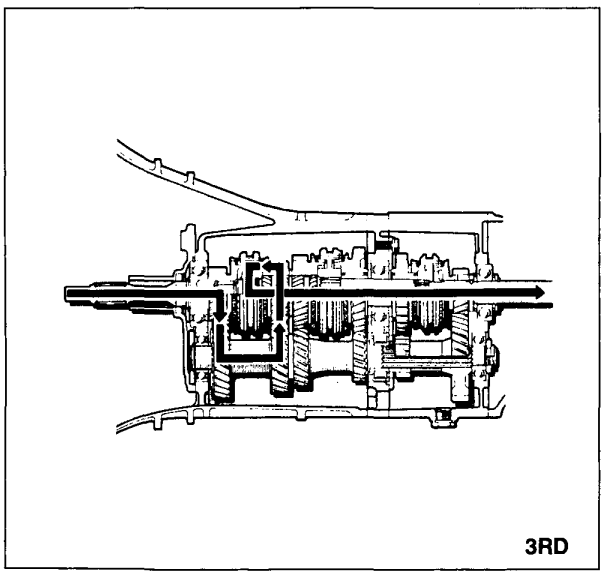
1. Front cover
2. Transmission case
3. Intermediate housing
4. Extension housing
5. Shift fork and rod (5th/Reverse)
6. Shift fork and rod (1st/2nd)
7. Shift fork and rod (3rd/4th)
8. Mainshaft gear assembly
9. Main drive gear
10. Bearing housing
11. Countershaft
12. Reverse idler gear
13. 5th gear
14. Reverse gear
15. Counter 5th gear
16. Counter reverse gear

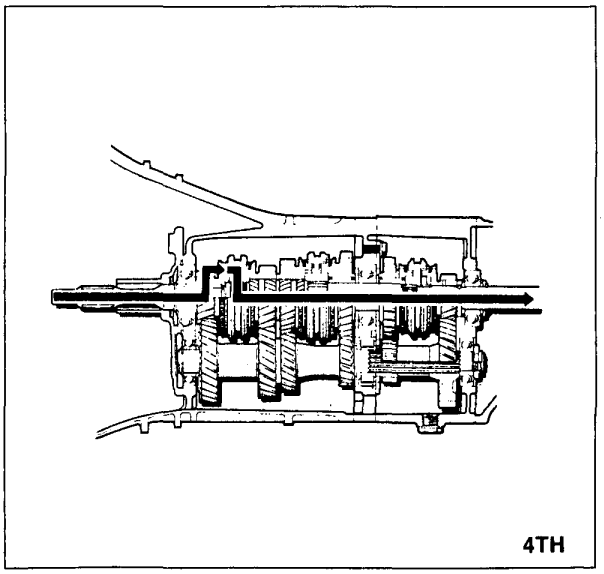
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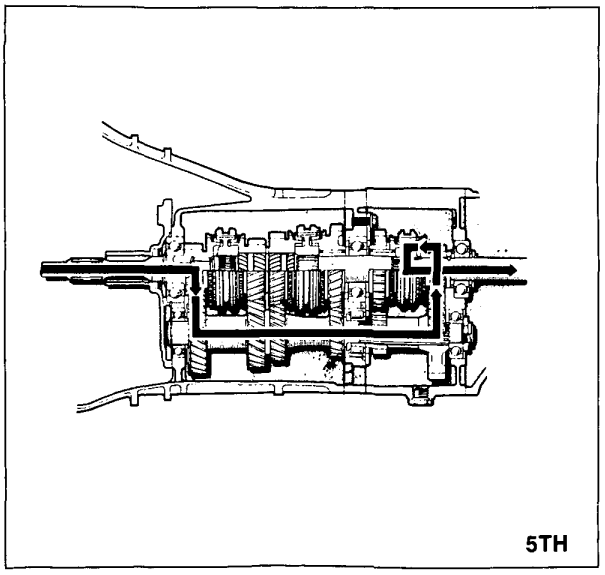
POWERFLOW

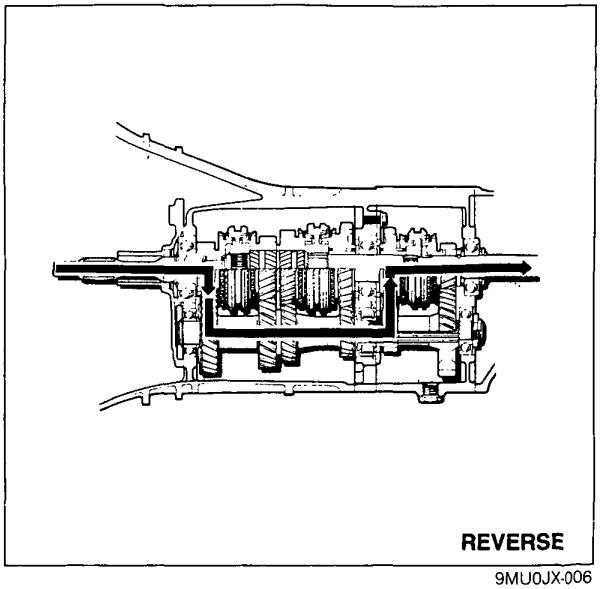

1ST


2ND


3RD


4TH


5TH


REVERSE

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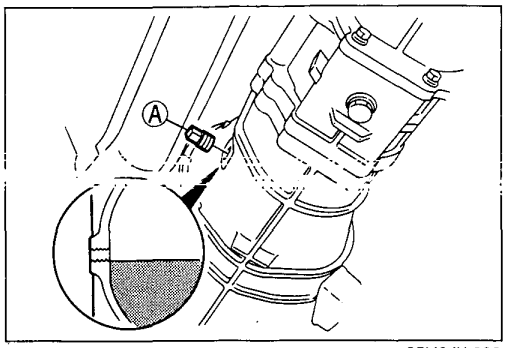
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TROUBLESHOOTING GUIDE

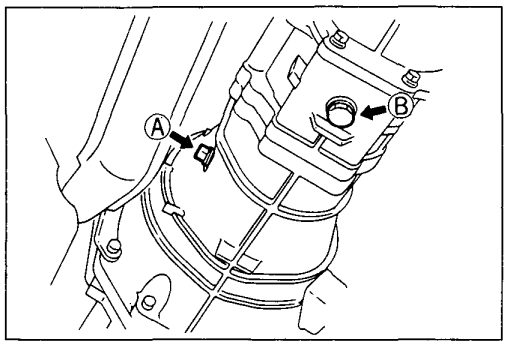
Problem	Possible Cause	Action	Page
Abnormal noise	Insufficient oil	Add oil	J– 8
	Deterioration of oil quality	Replace with specified oil	J– 8
	Worn bearing	Replace	J–24
	Worn contact surface of countershaft gear	Replace	J–23
	Worn contact surface of gears	Replace	J–23
	Excessive gear backlash	Replace	—
	Damaged gear teeth	Replace	J–23
Difficult to shift	Insufficient oil	Add oil	J– 8
	Deterioration of oil quality	Replace with specified oil	J– 8
	Worn synchronizer ring	Replace	J–24
	Worn synchronizer cone of gear	Replace	J–24
	Poor contact of synchronizer ring and gear cone	Replace	J–24
	Excessive longitudinal play of gears	Replace	J–23
	Worn bearing	Replace	J–24
	Improper disengagement of clutch	Refer to Section H	—
Jumps out of gear	Weak detent ball spring	Replace	J–25
	Worn shift fork	Replace	J–24
	Worn clutch hub	Replace	J–23
	Worn clutch hub sleeve	Replace	J–23
	Worn gears	Replace	J–23
	Excessive gear backlash	Replace	—
	Worn bearing	Replace	J–24
Vibration	Incorrect installation of or loose power plant frame	Correct or tighten	J–45

05U0JX-005

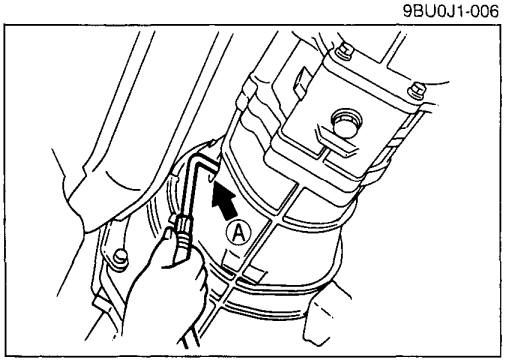
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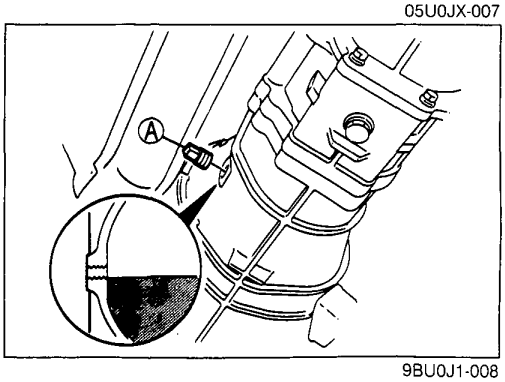
05U0JX-006



9BU0J1-006



05U0JX-007



9BU0J1-008

TRANSMISSION OIL

INSPECTION

1. Remove check plug Ⓐ.
2. Verify that the oil is at the bottom of the check plug hole. If it is low, add the specified oil from check plug Ⓐ.
3. Wipe clean and apply sealant to the plug threads before installing.

Tightening torque:
Ⓐ: 25—39 N·m (2.5—4.0 m-kg, 18—29 ft-lb)

REPLACEMENT

Note
- **Replace drain plug Ⓑ washer with a new one whenever the drain plug is removed.**

1. Remove the plugs (Ⓐ and Ⓑ with washer).
2. Drain the oil into a suitable container.
3. Wipe all plugs clean.
4. Apply sealant to plug thread Ⓐ.
5. Install the drain plug (Ⓑ with new washer).

Tightening torque:
Ⓑ: 39—59 N·m (4.0—6.0 m-kg, 29—43 ft-lb)

6. Add the specified oil from check plug Ⓐ port until the level reaches the bottom of check plug hole.

Specified oil:
API service GL-4 or GL-5
All-season: SAE 75W-90
Above 10°C (50°F): SAE 80W-90

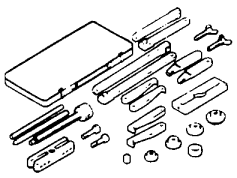
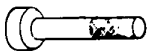
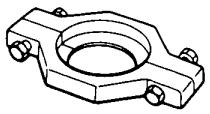
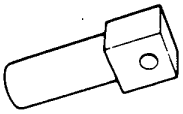
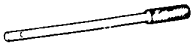
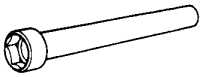
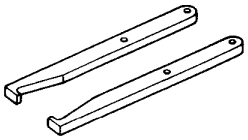
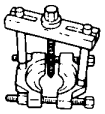
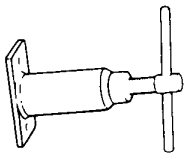
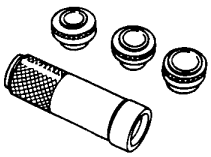
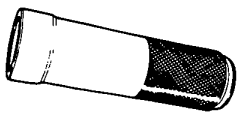
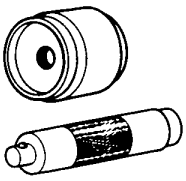
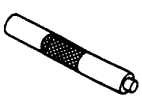
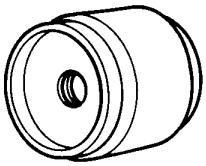
7. Install plug Ⓐ.

Tightening torque:
Ⓐ: 25—39 N·m (2.5—4.0 m-kg, 18—29 ft-lb)

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TRANSMISSION

PREPARATION
SST

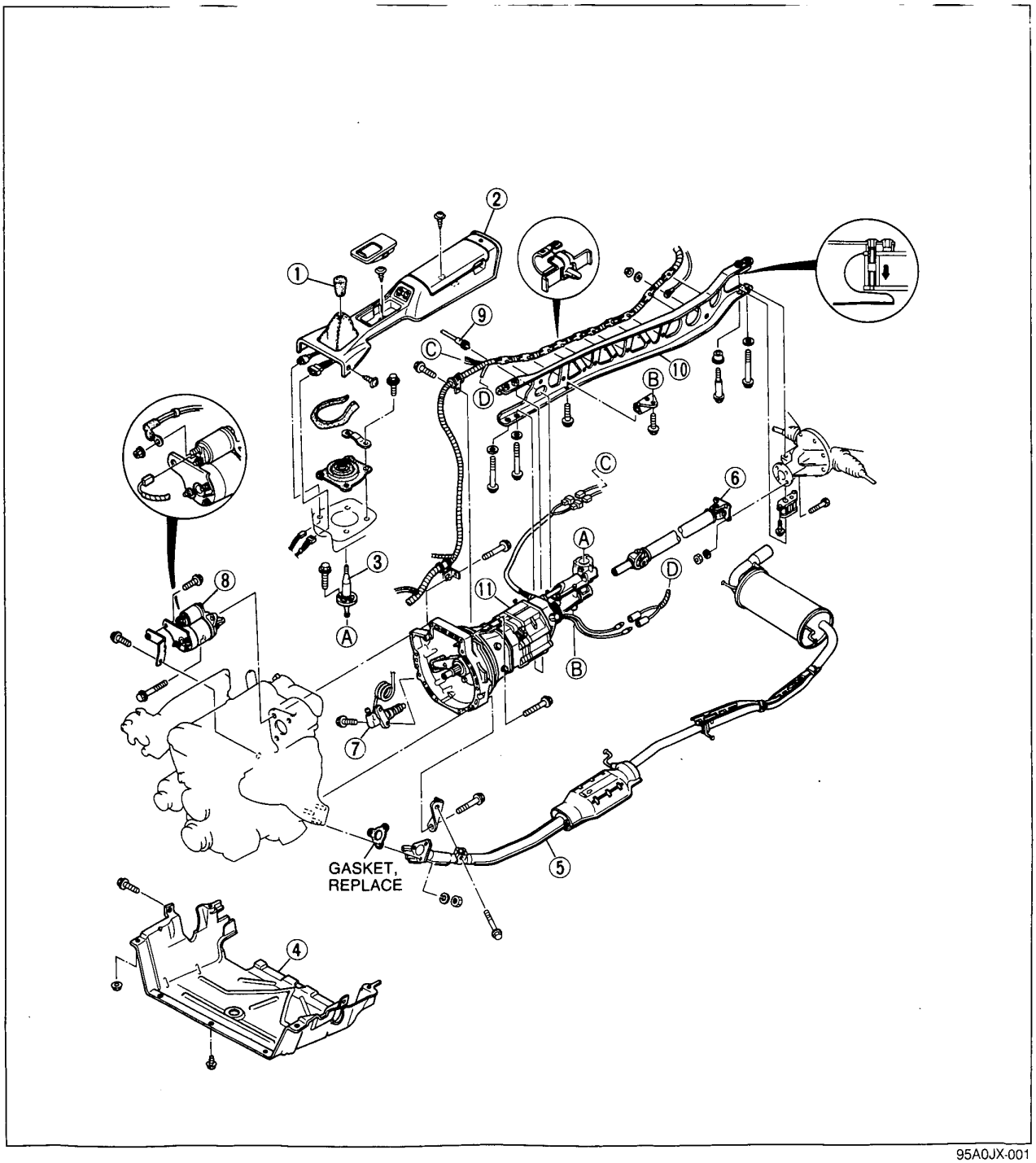
49 0839 425C Puller set, bearing 	For removal of bearing	49 0500 330 Installer, transmission bearing 	For installation of bearing
49 0636 145 Puller, fan pulley boss 	For removal of clutch hub assembly	49 0259 440 Holder, mainshaft 	For holding mainshaft
49 0862 350 Guide, shift fork 	For installation of interlock pin	49 1243 465A Wrench, main-shaft locknut 	For removal of locknut
49 H017 101 Hook 	For removal of bearing	49 0710 520 Puller, bearing 	For removal of bearing
49 0305 430 Pusher, main drive shaft 	For removal of transmission case	49 0180 321A Installer, bearing 	For installation of bearing
49 0187 451A Guide, interlock pin	For installation of spring and ball	49 F401 330B Installer set, bearing 	For installation of bearing
49 F401 331 Body (Part of 49 F401 330B) 	For installation of clutch hub assembly	49 B025 0A0 Installer, oil seal 	For installation of dust seal
49 G030 797 Handle (Part of 49 B025 0A0) 	For installation of oil seal	49 B025 001 Body (Part of 49 B025 0A0) 	For installation of oil seal

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REMOVAL

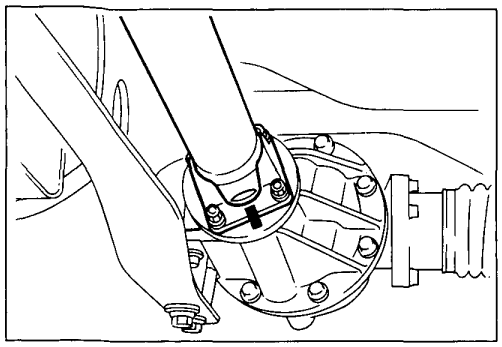
1. Disconnect the negative battery cable.
2. Raise the vehicle and support it with safety stands.
3. Drain the transmission oil into a suitable container.
4. Remove in the order shown in the figure, referring to **Removal Note**.



95A0JX-001

1. Shift lever knob
2. Rear console
3. Shift lever
4. Undercover
5. Exhaust pipe
6. Propeller shaft
   Removal Note... page J–11
7. Clutch release cylinder
8. Starter
9. Speedometer cable
10. Power plant frame (PPF)
    Removal Note... page J–11
11. Transmission
    Removal Note... page J–12

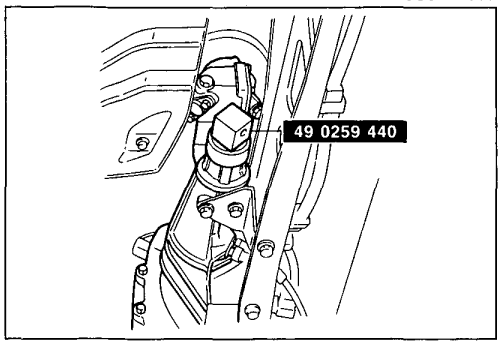
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05U0MX-065

Removal note
Propeller shaft

1. Before removing the propeller shaft, mark the flanges for correct installation.

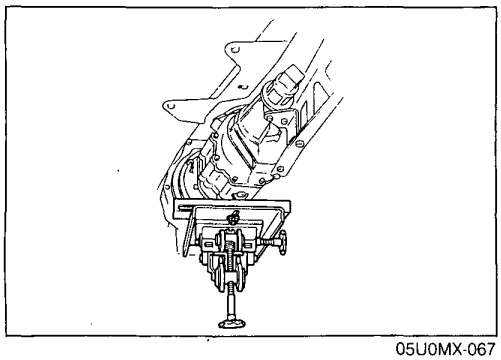


05U0MX-066

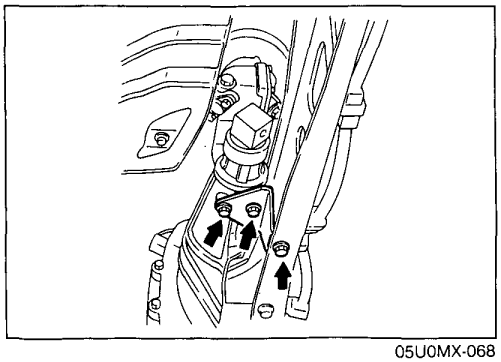
2. When the propeller shaft is removed from the extension housing, immediately install the **SST** to prevent oil leakage.

Power plant frame (PPF)

1. Disconnect the wire harness from the PPF.
2. Support the transmission with a jack.

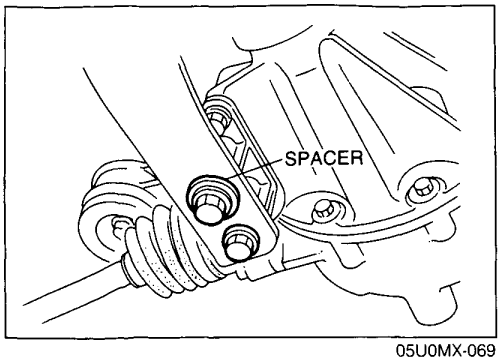


05U0MX-067



05U0MX-068

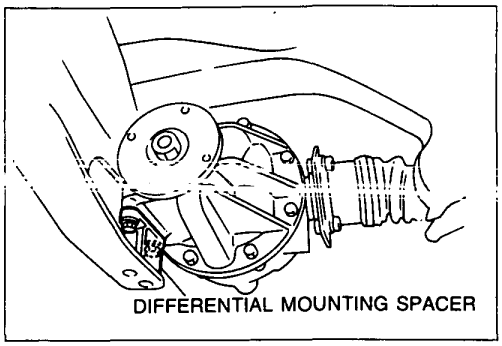
3. Remove the power plant frame bracket.



05U0MX-069

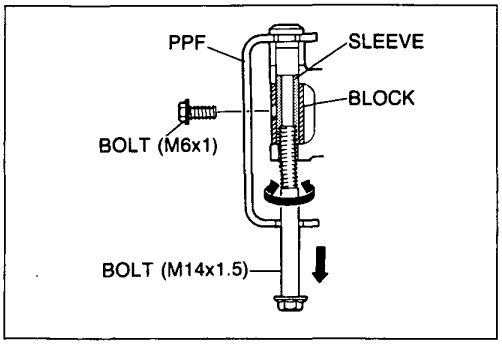
4. Remove the differential-side bolts, and pry out the spacer.

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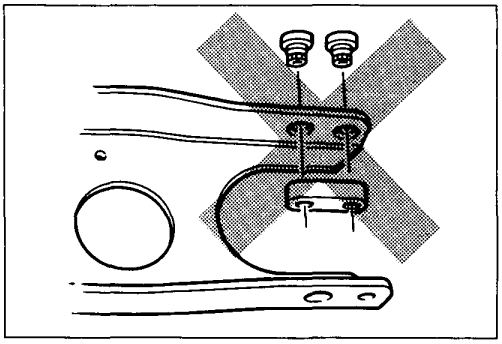
05U0MX-125

5. Remove the differential mounting spacer bolts.



05U0MX-070

6. Turn a bolt (M14x1.5) into the sleeve.
7. Twist and pull the bolt downward.
8. Install a bolt (M6x1) into the hole in the block to hold the sleeve, and remove the long bolt (M14x1.5).
9. Remove the bolt (M6x1).



05U0MX-071

Caution
- **Do not remove the spacers shown in the figure from the PPF.**
- **If they are removed, repalce the PPF as an assembly.**

10. Remove the transmission-side bolts, and remove the PPF.

Transmission

Caution
- **Do not violently shake the transmission, the crank angle sensor may be damaged.**

05U0JX-010

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DISASSEMBLY

Precaution

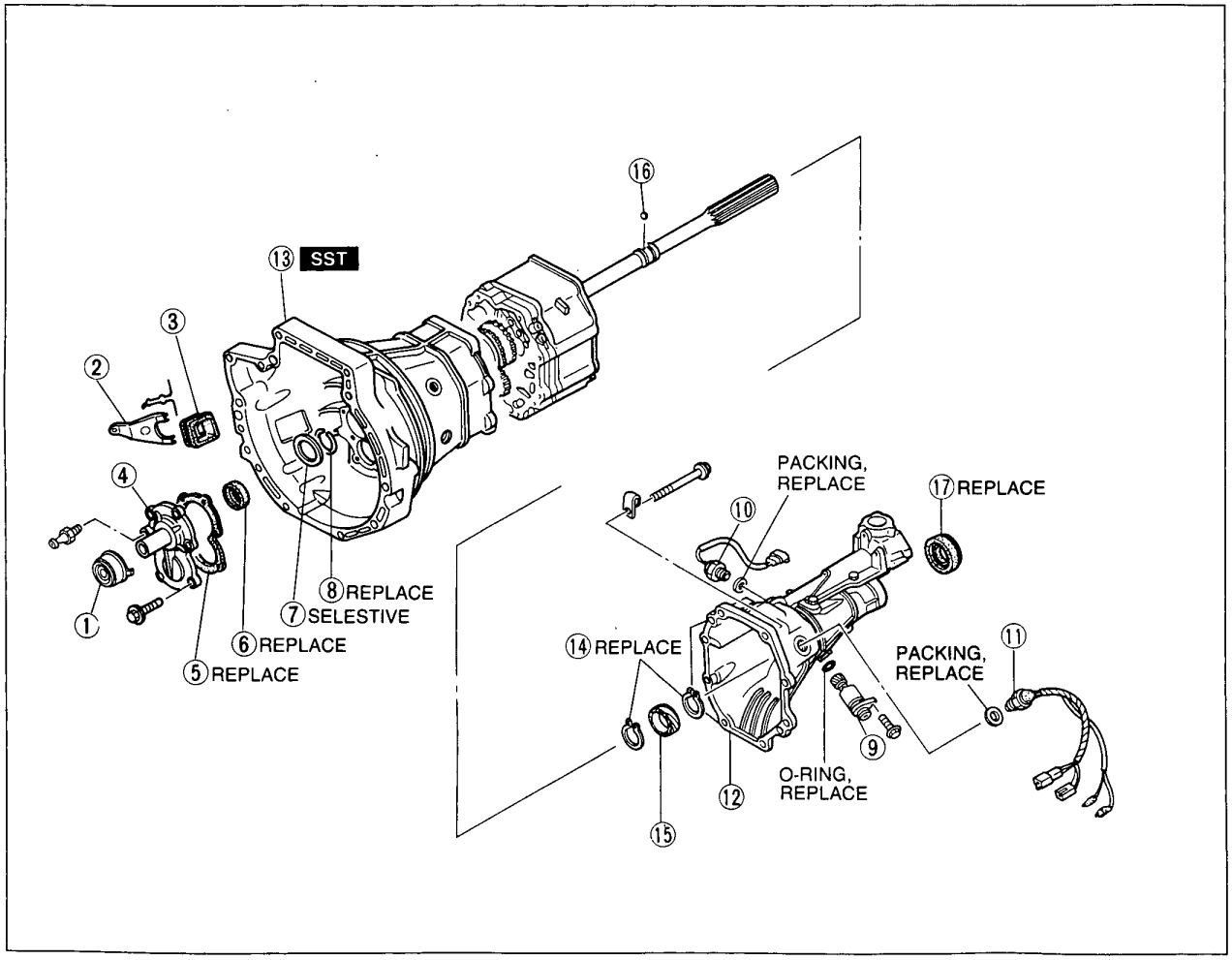
1. Clean the transmission exterior thoroughly with a steam cleaner or cleaning solvent before disassembly.
2. Clean the removed parts (except sealed bearings) and all sealing surfaces with cleaning solvent, and dry with compressed air.
   Clean out all holes and passages with a compressed air, and check that there are no obstructions.
3. Wear eye protection when using compressed air to clean components.

Housing Components

Note

- **Do not remove the front and rear oil seals if not necessary.**

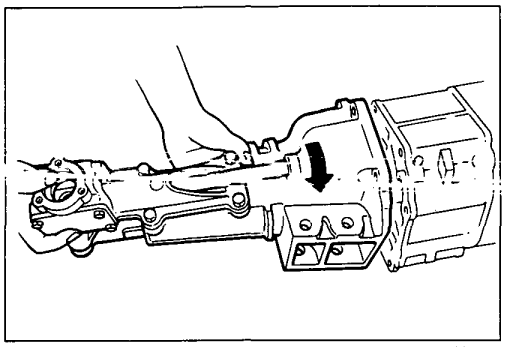
Disassemble in the order shown in the figure, referring to **Disassembly Note**.



05U0JX-011

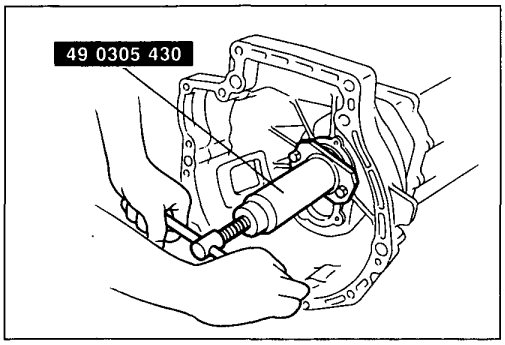
1. Release bearing
2. Release fork
3. Boot
4. Front cover
5. Gasket
6. Oil seal (front)
   Inspect for damage of oil seal lip. If necessary, replace it.
7. Adjustment shim
8. Snap ring
9. Speedometer driven gear
10. Neutral switch
11. Back-up light switch
12. Extension housing
    Disassembly Note ..... page J–14
    Disassembly ..... page J–22
13. Transmission case
    Disassembly Note ..... page J–14
14. Snap rings
15. Speedometer drive gear
16. Steel ball
17. Oil seal (rear)
    Inspect for damage of oil seal lip
    If necessary, replace it.
    Replace (on-vehicle) ..... page J–14

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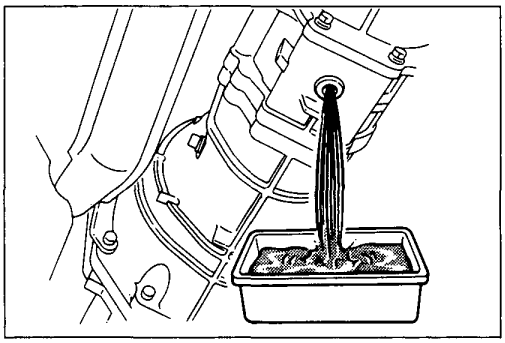
05U0JX-012

Disassembly note
Extension housing
1. Turn the extension housing to remove it.



9BU0J1-013

Transmission case
1. Remove the transmission case from the intermediate housing and gear assembly with the **SST**.

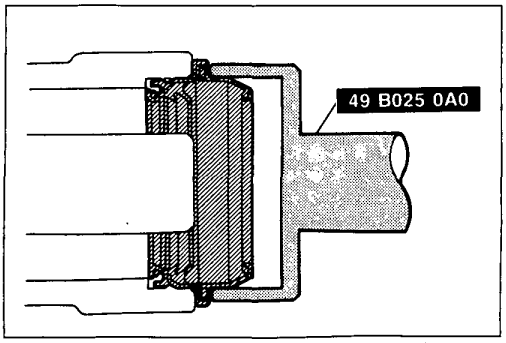


05U0JX-013

On-vehicle replacement
Oil seal (rear)

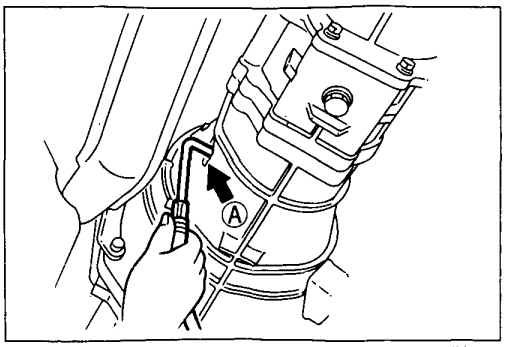
Caution
- **Do not damage the mainshaft splines.**

1. Raise the vehicle and support it with safety stands.
2. Drain the transmission oil into a suitable container.
3. Remove the exhaust pipe.
4. Remove the propeller shaft. (Refer to Section L.)
5. Remove the oil seal from the extension housing.



05U0JX-014

6. Apply transmission oil to outer periphery.
7. Install a new oil seal with the **SST**.



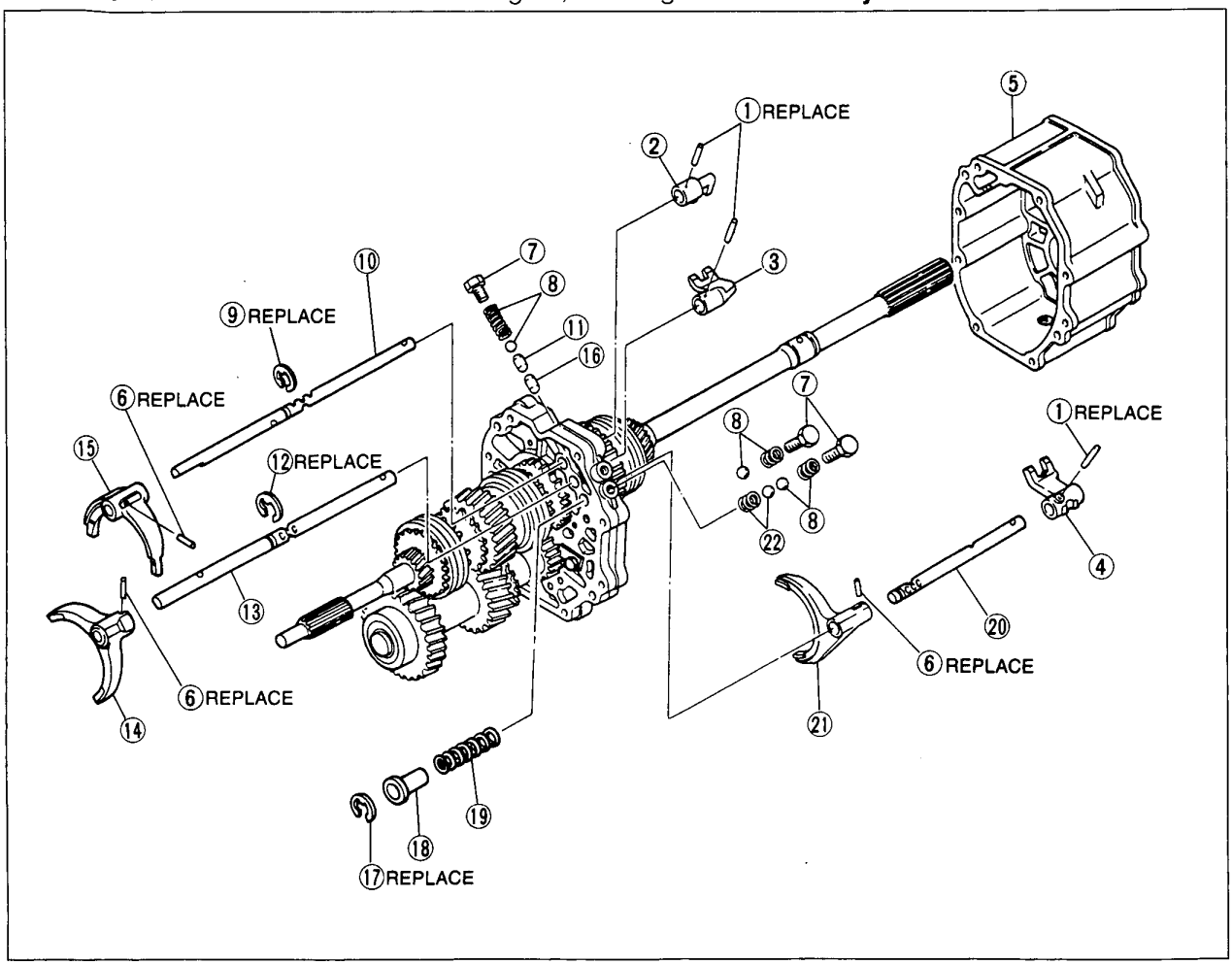
05U0JX-015

8. Install the propeller shaft. (Refer to Section L.)
9. Install the exhaust pipe.
10. Add the specified oil from check plug Ⓐport until the level reaches the bottom of the check plug hole. (Refer to page J–8.)

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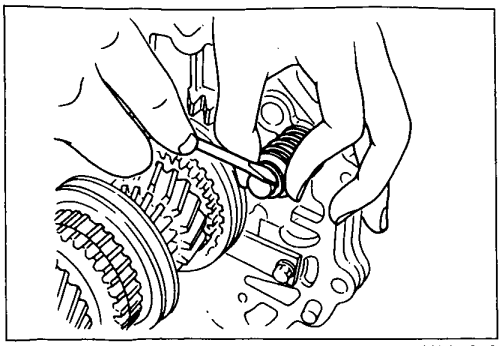
Shift Fork and Shift Rod Parts

1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.



05U0JX-016

1. Roll pin
2. 1st/2nd shift rod end
3. 3rd/4th shift rod end
4. 5th/Reverse shift rod end
5. Intermediate housing
   Inspection ..... page J–25
6. Roll pin
7. Cap plug
8. Spring and ball
   Inspection ..... page J–25
9. Clip
10. 1st/2nd shift rod
11. Interlock pin
12. Clip
13. 3rd/4th shift rod
14. 3rd/4th shift fork
    Inspection ..... page J–24
15. 1st/2nd shift fork
    Inspection ..... page J–24
16. Interlock pin
17. Clip
    Disassembly Note
    ..... page J–15
18. Spacer
19. Spring
    Inspection ..... page J–25
20. 5th/Reverse shift rod
21. 5th/Reverse shift fork
    Inspection ..... page J–24
22. Spring and ball
    Inspection ..... page J–25



97U0J1-016

Disassembly note
Clip

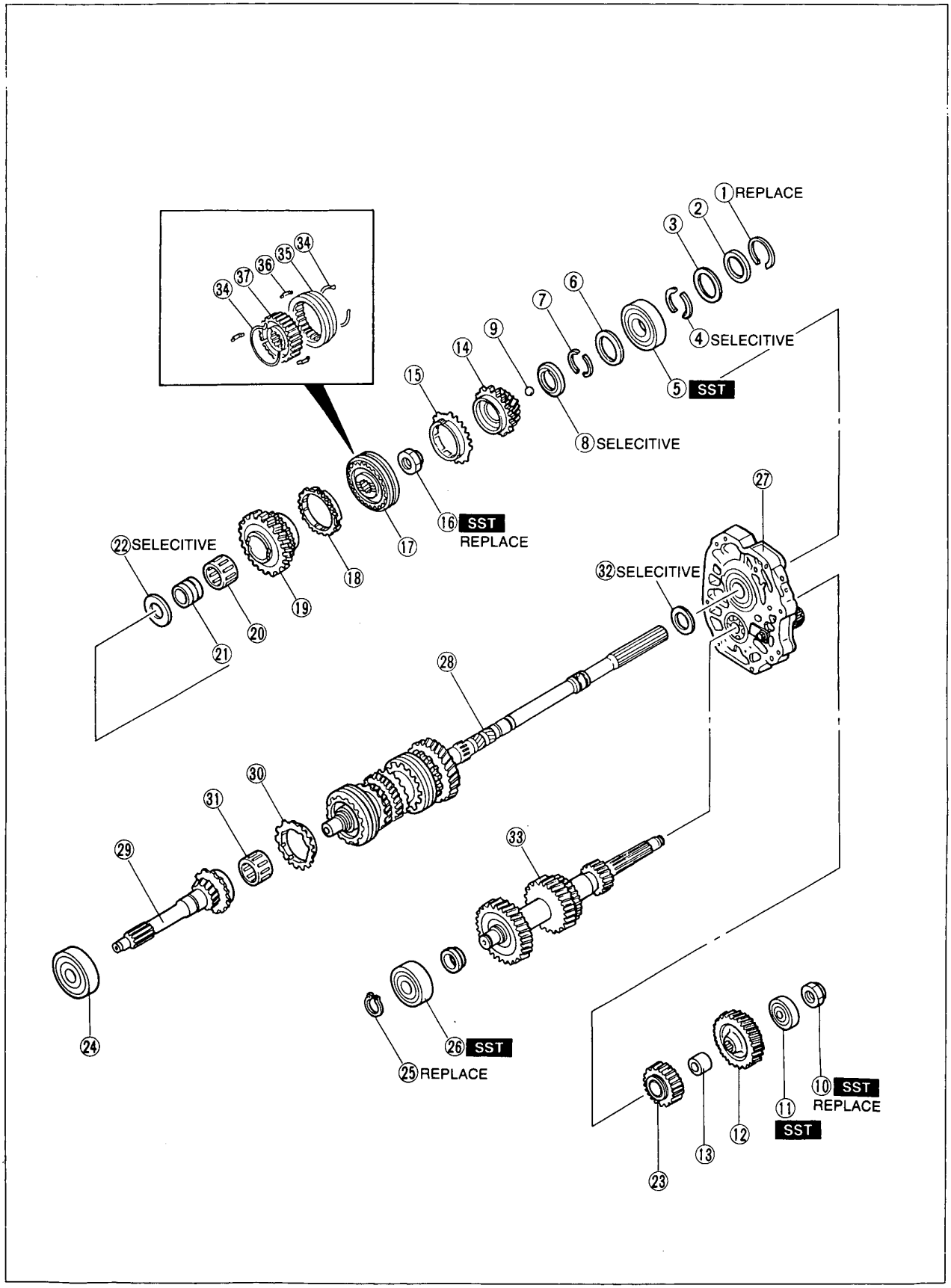
Caution
- **Hold the spacer and spring to prevent it from jumping out.**

1. Remove the clip, spacer, and spring from the 5th/Reverse shift rod.

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Mainshaft and Countershaft Parts

1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.

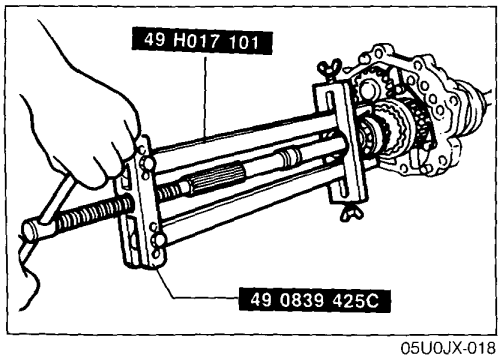


97U0J1-017

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1. Snap ring
2. Washer
3. Retaining ring
4. C-washer
5. Mainshaft rear bearing
   Disassembly Note ..... page J–17
   Inspection ..... page J–24
6. Retaining ring
7. C-washer
8. Thrust lock washer
9. Steel ball
10. Locknut (Countershaft)
    Disassembly Note ..... page J–17
11. Countershaft rear bearing
    Disassembly Note ..... page J–18
    Inspection ..... page J–24
12. Counter 5th gear
    Inspection ..... page J–23
13. Spacer
14. 5th gear
    Inspection ..... page J–23
15. Synchronizer ring (5th)
    Inspection ..... page J–24
16. Locknut (Mainshaft)
    Disassembly Note ..... page J–18
17. Clutch hub assembly (5th/Reverse)
    Inspection ..... page J–23
18. Synchronizer ring (Reverse)
    Inspection ..... page J–24
19. Reverse gear
    Inspection ..... page J–23
20. Needle bearing
    Inspection ..... page J–24
21. Inner race
22. Washer
23. Counter reverse gear
    Inspection ..... page J–23
24. Main drive gear bearing
    Disassembly Note ..... page J–18
    Inspection ..... page J–24
25. Snap ring
26. Countershaft front bearing
    Disassembly Note ..... page J–18
    Inspection ..... page J–24
27. Bearing housing assembly
    Disassembly Note ..... page J–18
    Disassembly ..... page J–20
28. Mainshaft gear assembly
29. Main drive gear
    Inspection ..... page J–23
30. Synchronizer ring (4th)
    Inspection ..... page J–24
31. Needle bearing
    Inspection ..... page J–24
32. Washer
33. Countershaft
    Inspection ..... page J–23
34. Synchronizer key spring
35. Clutch hub sleeve
36. Synchronizer key
37. Clutch hub

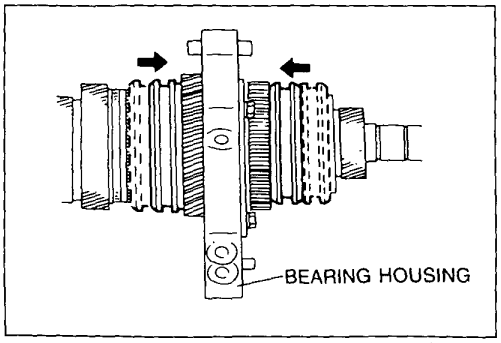
05U0JX-017



05U0JX-018

Disassembly note
Mainshaft rear bearing

1. Remove the mainshaft rear bearing with the **SST**.



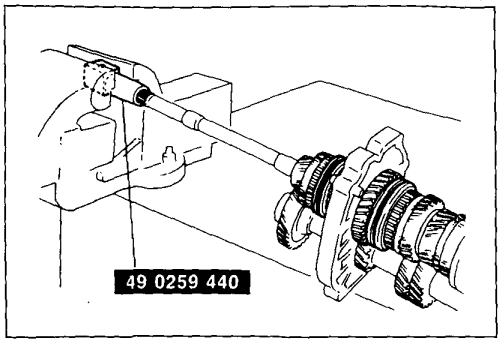
97U0J1-020

Locknut (Countershaft)

1. Shift the clutch hub sleeves to first gear and reverse gear to put the gears in the double-engaged condition.

Caution
- **Do not reuse the locknut.**
- **Do not damage the countershaft.**

2. Use a suitable tool to uncrimp the tabs of the locknut.

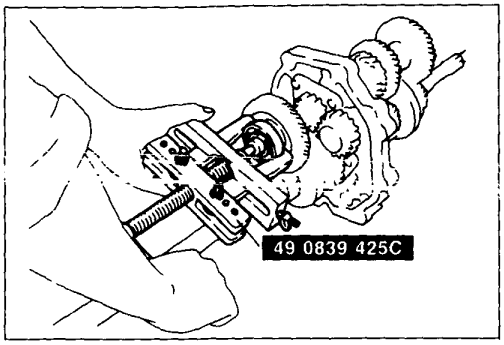


97U0J1-021

Note
- **Use pads in the vise to prevent damaging the SST.**

3. Connect the **SST** to the mainshaft and tighten it securely in a vise.
4. Remove the locknut.

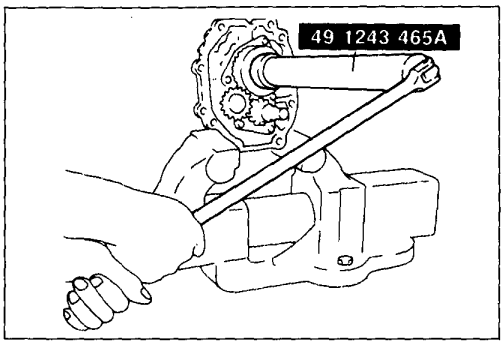
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97U0J1-022

Countershaft rear bearing

1. Remove the countershaft rear bearing with the **SST**.



05U0JX-019

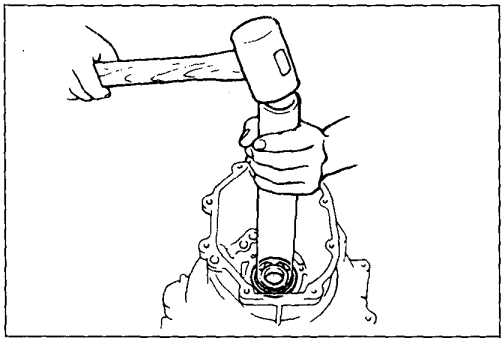
Locknut (Mainshaft)

1. Shift the clutch hub sleeves to first gear and reverse gear to put the gears in the double-engaged condition.

Caution

- **Do not reuse the locknut.**
- **Do not damage the mainshaft and clutch hub assembly.**

2. Use a suitable tool to uncrimp the tabs of the locknut.


97U0J1-024

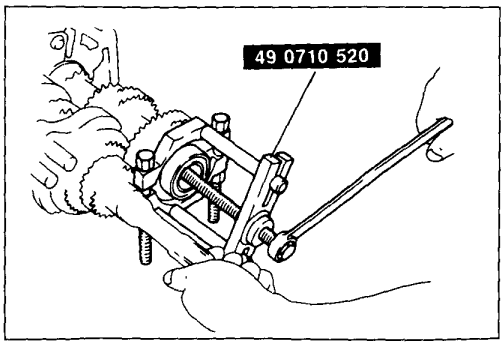
Note

- **Use pads in the vise to prevent damaging the bearing housing.**

3. Secure the bearing housing in a vise.
4. Remove the locknut with the **SST**.

Main drive gear bearing

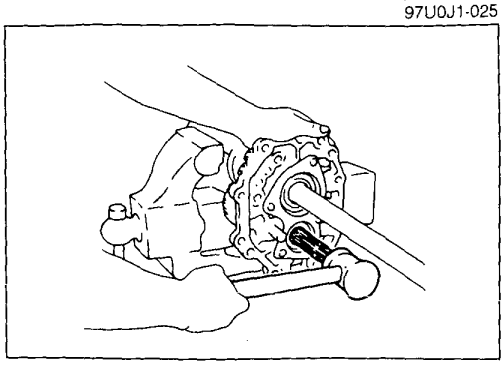
1. Remove the main drive gear bearing with a suitable pipe.



97U0J1-025

Countershaft front bearing

1. Remove the countershaft front bearing with the **SST**.


97U0J1-026

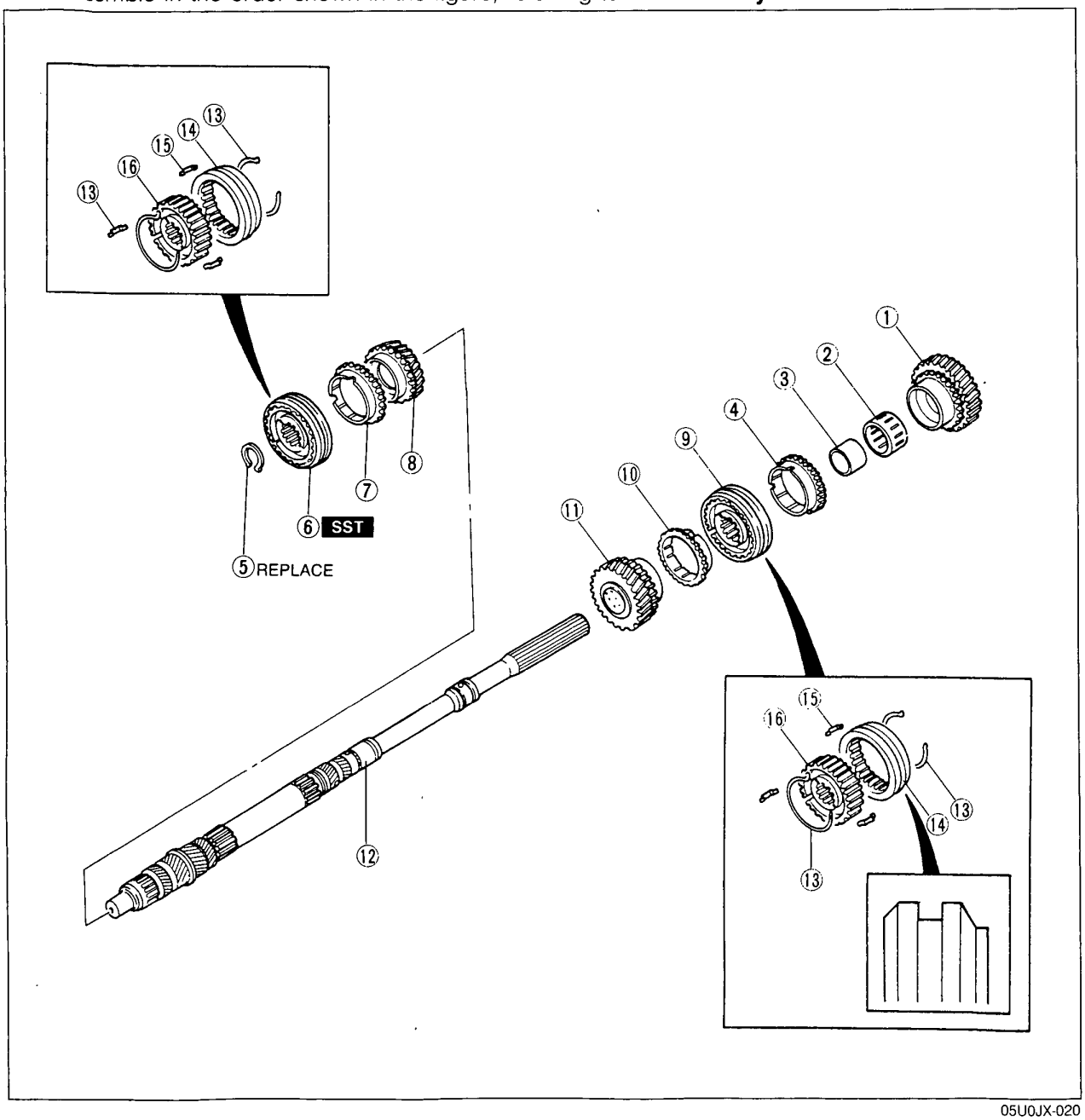
Bearing housing assembly

1. Remove the bearing housing by lightly tapping the countershaft with a copper hammer.

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Mainshaft Parts

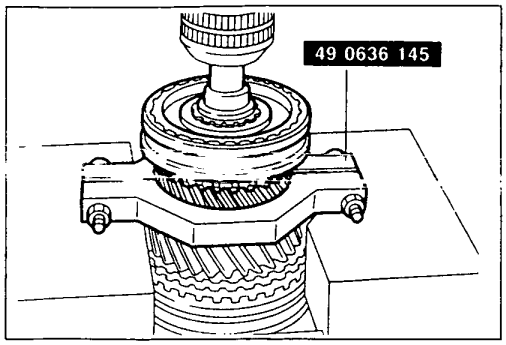
1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.



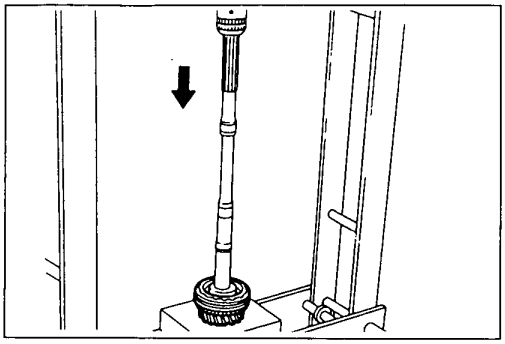
05U0JX-020

1. 1st gear
   Inspection ..... page J–23
2. Needle bearing
   Inspection ..... page J–24
3. Inner race
4. Synchronizer ring (1st)
   Inspection ..... page J–24
5. Snap ring
6. Clutch hub assembly (3rd/4th)
   Disassembly Note ..... page J–20
   Inspection ..... page J–23
7. Synchronizer ring (3rd)
   Inspection ..... page J–24
8. 3rd gear
   Inspection ..... page J–23
9. Clutch hub assembly (1st/2nd)
   Disassembly Note ..... page J–20
   Inspection ..... page J–23
10. Synchronizer ring (2nd)
    Inspection ..... page J–24
11. 2nd gear
    Inspection ..... page J–23
12. Mainshaft
    Inspection ..... page J–23
13. Synchronizer key spring
14. Clutch hub sleeve
15. Synchronizer key
16. Clutch hub

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97U0J1-028



97U0J1-029

Disassembly note
Clutch hub assembly (3rd/4th)

1. Position the **SST** between 2nd and 3rd gears.

Caution
- **Hold the mainshaft with one hand so that it does not fall.**

2. Press the mainshaft out of the clutch hub assembly (3rd/4th) and 3rd gear.

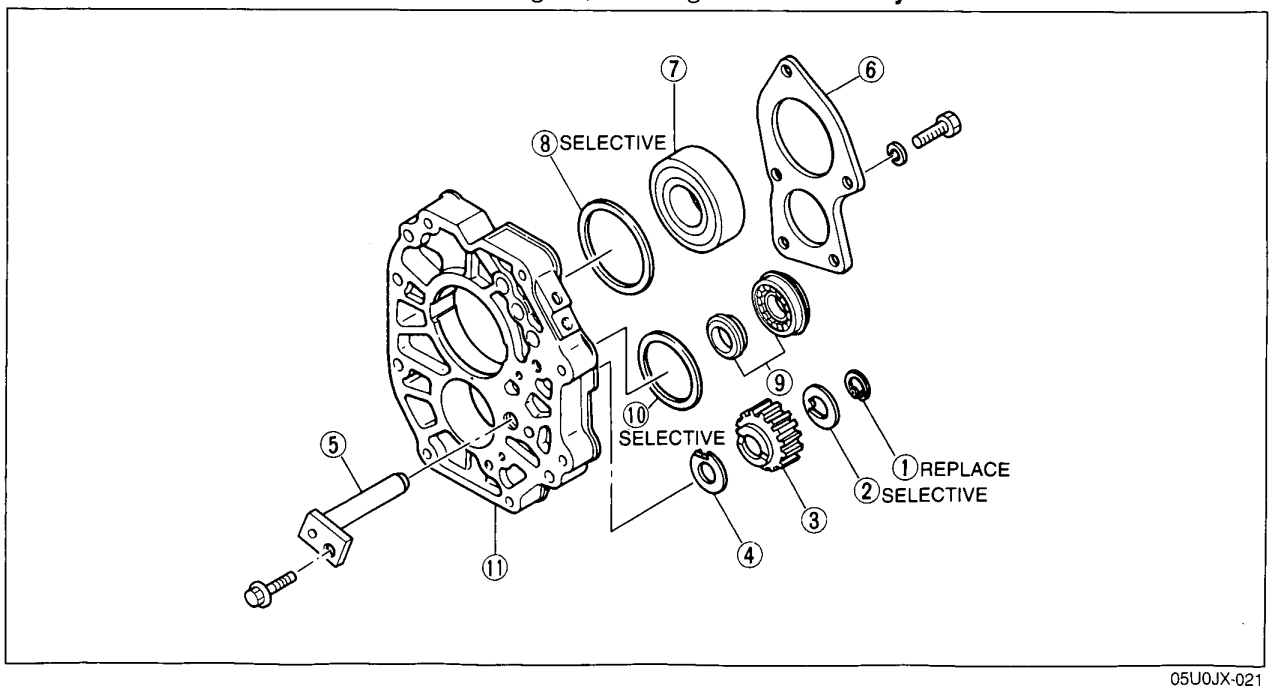
Clutch hub assembly (1st/2nd)

Caution
- **Hold the mainshaft with one hand so that it does not fall.**

1. Press the mainshaft out of the clutch hub assembly (1st/2nd) and 2nd gear.

Bearing Housing Parts

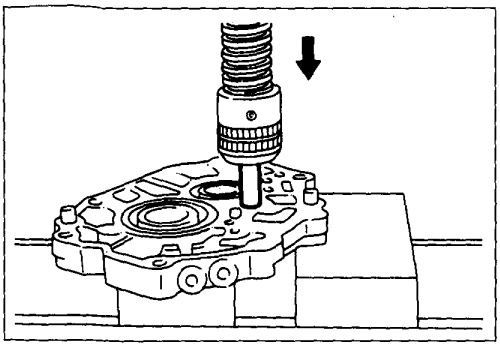
1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.



05U0JX-021

1. Snap ring
2. Adjustment washer
3. Reverse idler gear
   Inspection ..... page J–24
4. Thrust washer
5. Reverse idler gear shaft
   Disassembly Note
   ..... page J–21
   Inspection ..... page J–24
6. Bearing cover
7. Mainshaft front bearing
   Disassembly Note
   ..... page J–21
   Inspection ..... page J–24
8. Adjustment shim
9. Countershaft center bearing
   Disassembly Note
   ..... page J–21
   Inspection ..... page J–24
10. Adjustment shim
11. Bearing housing

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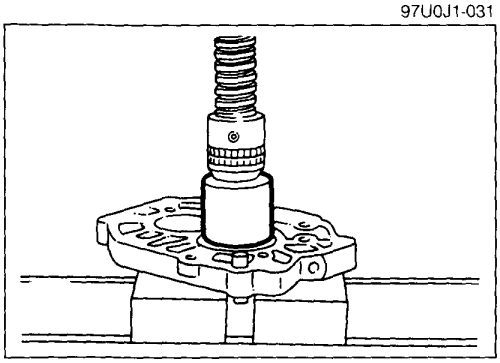


97U0J1-031

Disassembly note
Reverse idler gear shaft

Caution
- **Support the reverse idler gear shaft with one hand so that it does not fall.**

1. Press the reverse idler gear shaft out of the bearing housing.

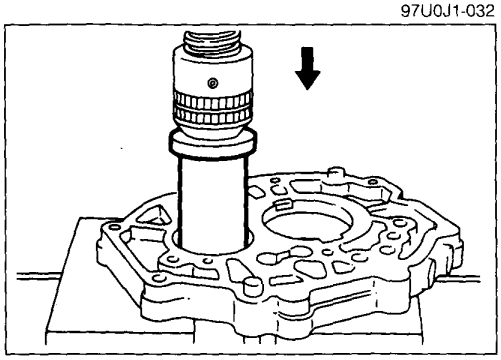


97U0J1-032

Mainshaft front bearing

Caution
- **Support the mainshaft front bearing with one hand so that it does not fall.**

1. Remove the mainshaft front bearing with a suitable pipe.



97U0J1-033

Countershaft center bearing

Caution
- **Support the countershaft center bearing with one hand so that it does not fall.**

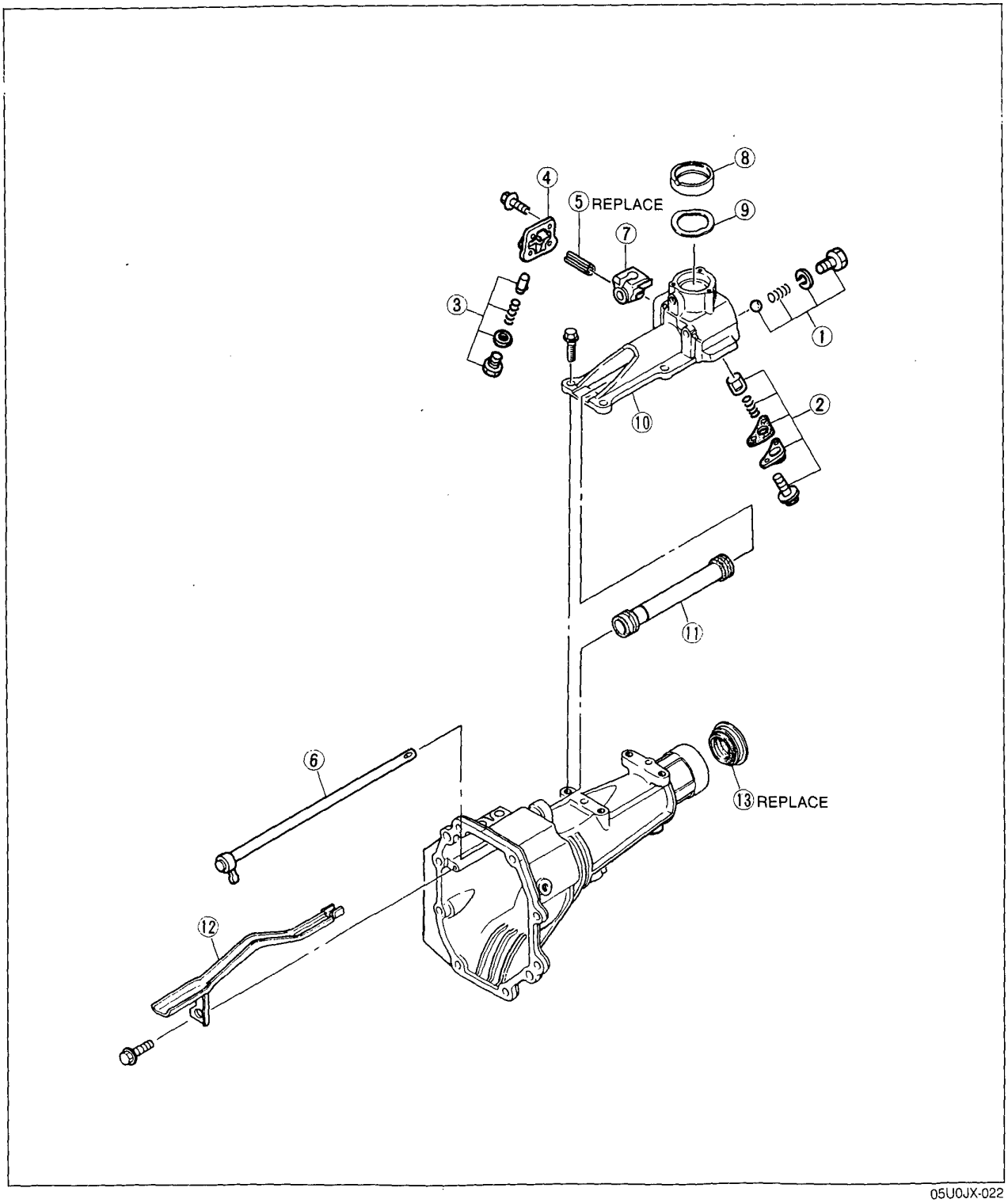
Note
- **If countershaft center bearing is replaced, replace the spacer also.**

1. Remove the countershaft center bearing with a suitable pipe.

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Extension Housing Parts

1. Disassemble in the order shown in the figure.



05U0JX-022

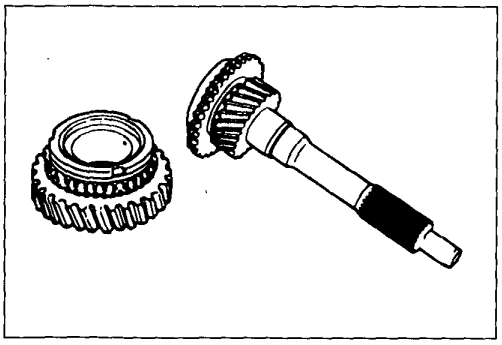
1. Steel ball, spring, and spring cap
2. Select-lock spindle, spring, and spring cap
3. Plug, spring, and pushpin
4. Blind cover
5. Roll pin
6. Control lever
7. Control lever end
8. Change bushing
9. Wave washer
10. Change control case
11. Rod cover
12. Oil passage
13. Oil seal
    Do not remove if not necessary

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INSPECTION

1. Inspect all parts and repair or replace as necessary.

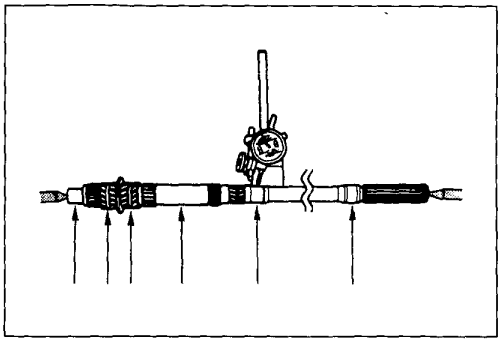
05U0JX-023



05U0JX-065

Each gear and main drive gear

1. Inspect the synchronizer cones for wear.
2. Inspect the individual gear teeth for wear and cracks.
3. Inspect the synchronizer ring matching teeth for damage and wear.
4. Inspect the main drive gear splines for damage and wear.



9MU0JX-056

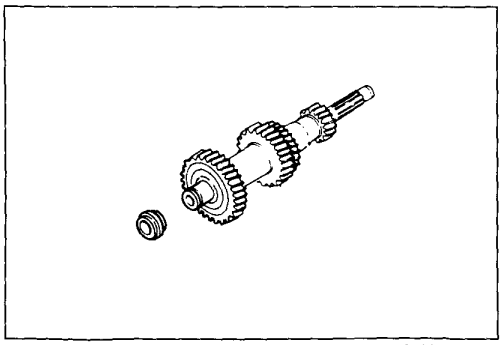
Mainshaft

1. Measure the mainshaft runout.

   Maximum runout: 0.03mm (0.0012 in)

2. Inspect splines for damage or wear.
3. Measure the clearance between mainshaft and gear (or bush).

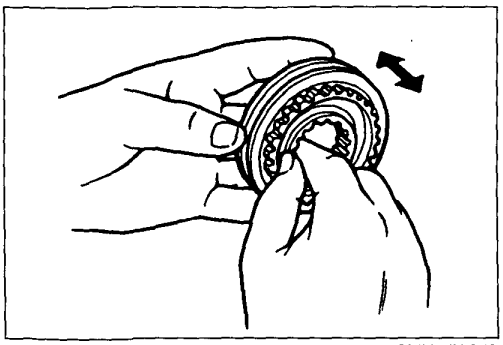
   Maximum clearance: 0.15mm (0.006 in)



05U0JX-066

Countershaft

1. Inspect the gear teeth for wear and cracks.
2. Inspect the splines for damage and wear.

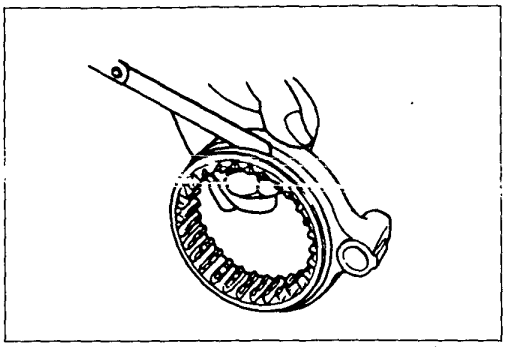


9MU0JX-059

Clutch hub assembly

1. Inspect the clutch hub sleeve and hub operation.
2. Inspect the individual gear teeth for damge, wear, and cracks.
3. Inspect the synchronizer key for damage, wear, and cracks.

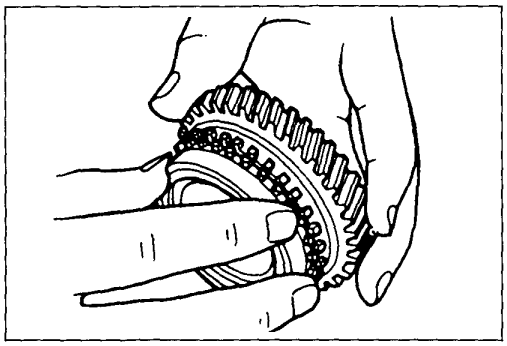
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9MU0JX-060

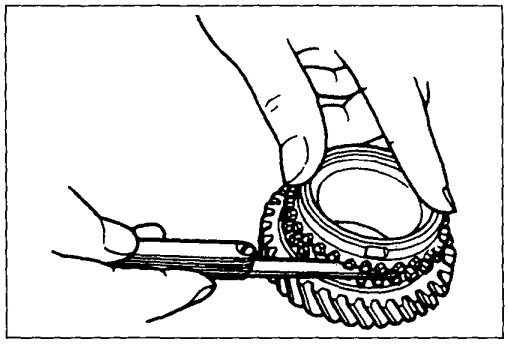
4. Measure the clearance between hub sleeve and shift fork.

Standard clearance: 0.2—0.3mm (0.008—0.012 in)
Maximum: 0.5mm (0.020 in)



05U0JX-067

Synchronizer ring
1. Inspect the individual synchronizer ring teeth for wear and cracks.
2. Inspect the taper surface for wear and cracks.

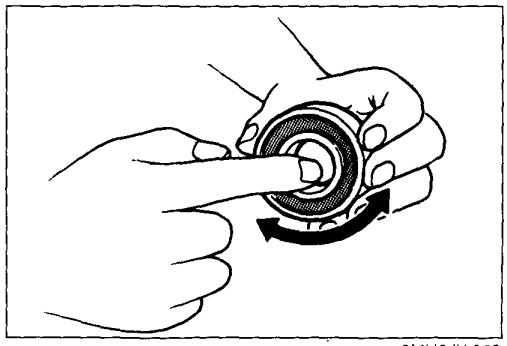


9MU0JX-062

Note
- **Set the synchronizer ring squarely in the gear; then measure around the circumference.**

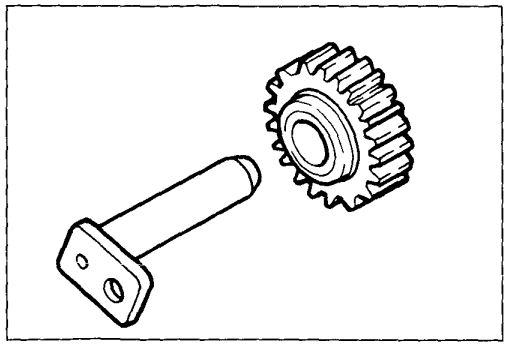
3. Measure the clearance the between synchronizer ring and flank surface of gear.

Standard clearance: 1.5mm (0.059 in)
Minimum: 0.8mm (0.031 in)



9MU0JX-063

Bearing
1. Inspect for damage and rough rotation.

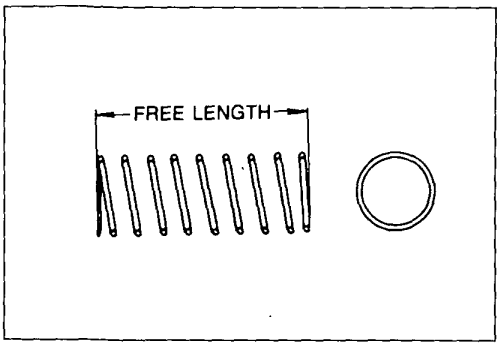


05U0JX-068

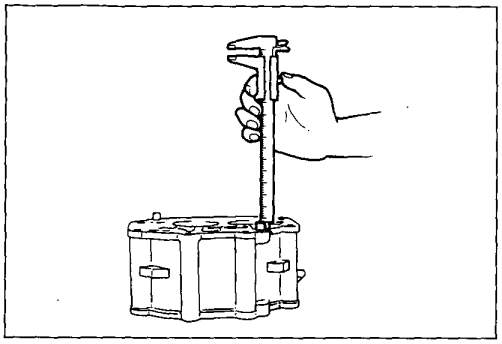
Reverse idler gear and shaft
1. Inspect the gear teeth for wear and cracks.
2. Measure the clearance between the reverse idler gear bushing and shaft.

Standard clearance:
0.02—0.05mm (0.0008—0.0020 in)
Maximum: 0.15mm (0.006 in)

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97U0J1-038



97U0J1-039

Springs

1. Measure the free length of the springs.

Standard free length
Shift rod (5th/Reverse) spring: 75mm (2.953 in)
Detent ball spring (1st/2nd, 3rd/4th): 22.5mm (0.886 in)
Detent ball spring (5th/Reverse): 17.0mm (0.669 in)

Intermediate housing

1. Measure the intermediate housing pin height.

Standard height: 9.0—10.0mm (0.354—0.394 in)

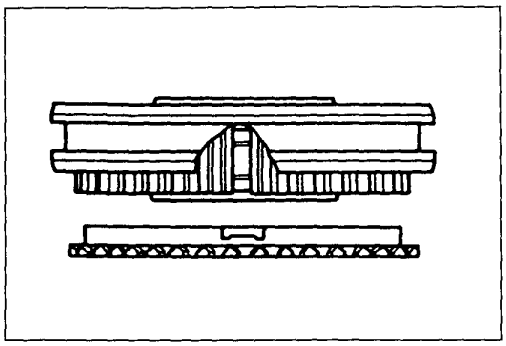
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ASSEMBLY

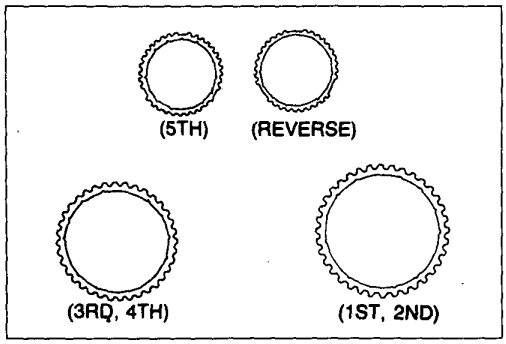
Precaution

1. All O-rings and gasket must be replaced with the new ones included in the overhaul kit.
2. Before assembly, make sure all parts are completely clean.
3. Assemble the parts within 10 minutes after applying sealant. Allow all sealant to cure at least 30 minutes after assembly before filling the transmission with transmission oil.

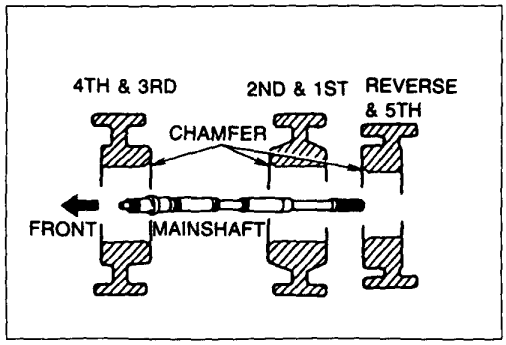
05U0JX-024



9MU0JX-067



05U0JX-025



97U0J1-041

Clutch hub

Caution

- **Align the synchronizer ring grooves with the clutch hub keys during installation.**

Note

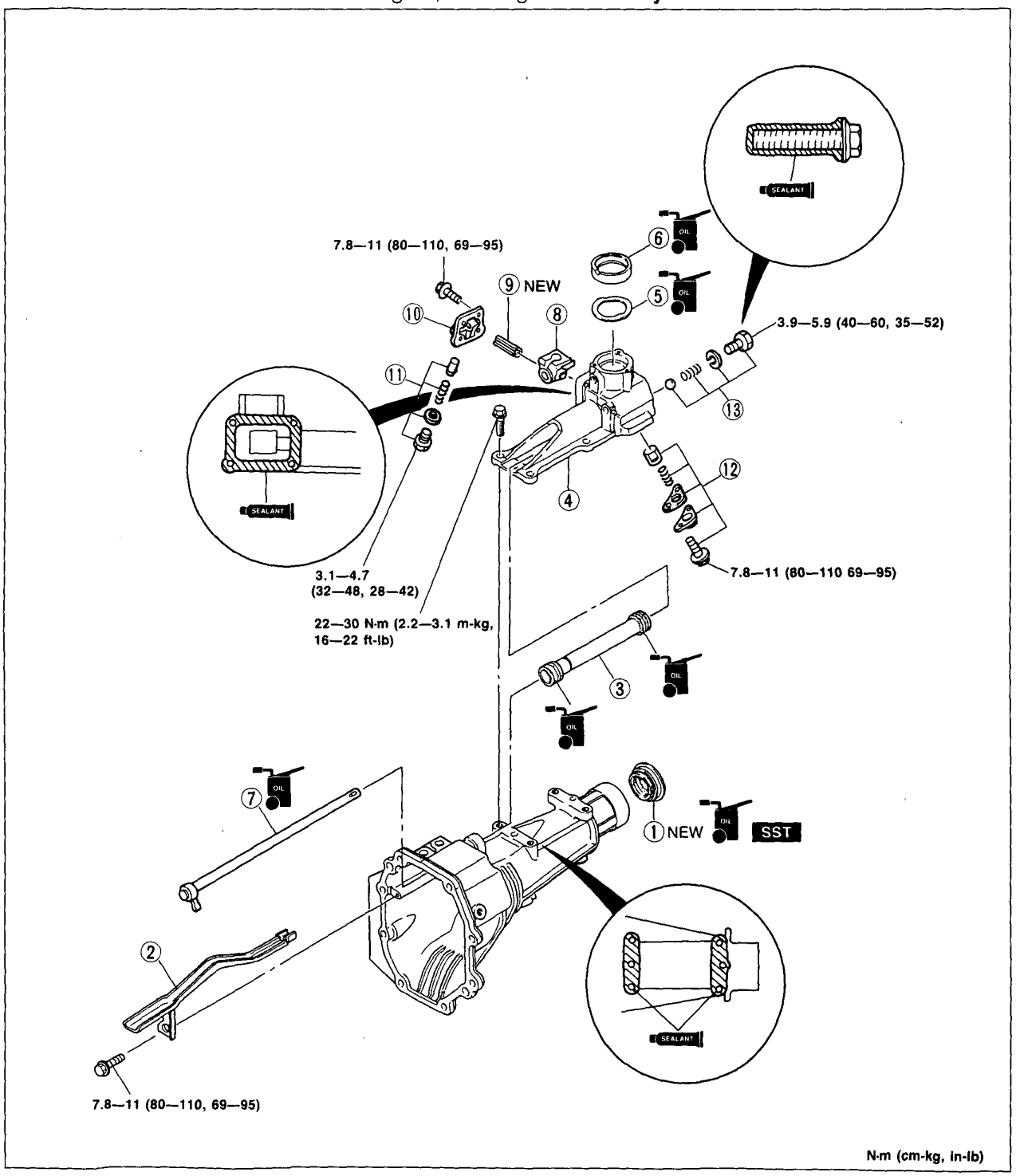
- **The synchronizer rings all have the same basic shape. Carefully note these distinguishing features:**
  - **a) 5th and Reverse synchronizer rings are the smallest.**
  - **b) Reverse has 2 notches in the teeth.**
  - **c) 4th and 3rd are the next larger and are exactly the same.**
  - **d) 2nd and 1st are the biggest and are exactly the same.**

- **Press each clutch hub assembly onto the mainshaft in the proper direction.**
- **Install the clutch hubs with the chamfers of the inner gear teeth as shown.**

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Extension Housing Parts

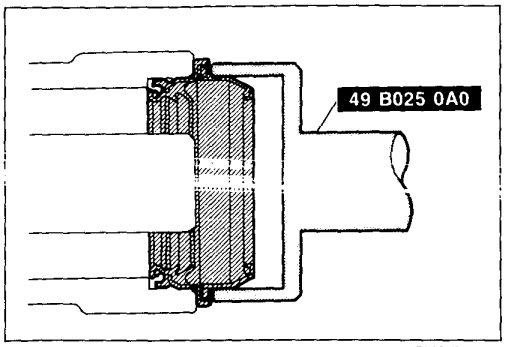
1. Assemble in the order shown in the figure, referring to **Assembly Note**.



05U0JX-026

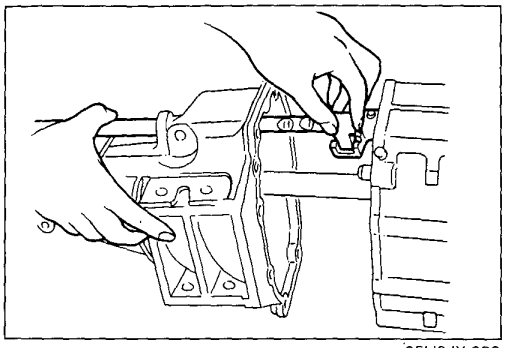
1. Oil seal
   Assembly Note. page J–28
2. Oil passage
3. Rod cover
   Assembly Note. page J–28
4. Change control case
5. Wave washer
6. Change bushing
7. Control lever
8. Control lever end
9. Roll pin
   Assembly Note. page J–28
10. Blind cover
11. Plug, spring, and pushpin
12. Select-lock spindle, spring, and spring cap
    Assembly Note. page J–28
13. Steel ball, spring, and spring cap

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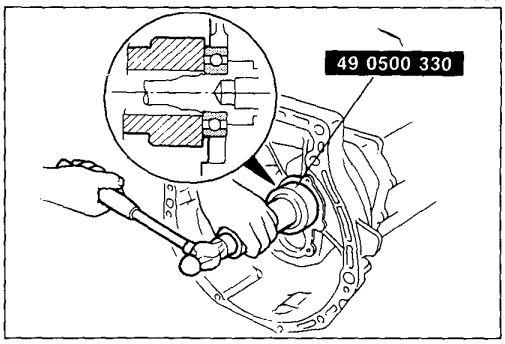


05U0JX-027

Assembly note
Oil seal
1. Apply transmission oil to outer periphery.
2. Install a new oil seal with the **SST**.


05U0JX-028

Rod cover
1. Apply transmission oil to rubbers on the rod cover.
2. Install the rod cover with the mark facing forward.

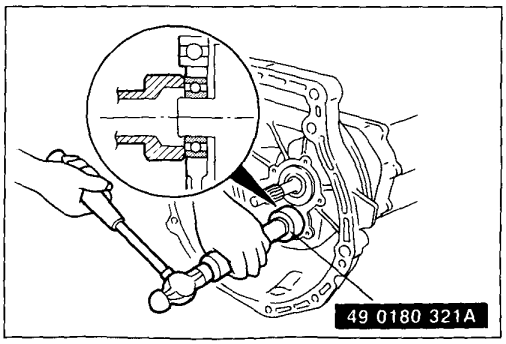


05U0JX-029

Roll pin

Caution
- **Install the roll pin with the seam facing as shown in the figure.**

1. Install a new roll pin into the control lever end.



05U0JX-030

Select-lock spindle, spring, and spring cap
1. Install the select-lock spindle, spring, and spring cap.

Tightening torque:
7.8—11 N·m (80—110 cm-kg, 69—95 in-lb)

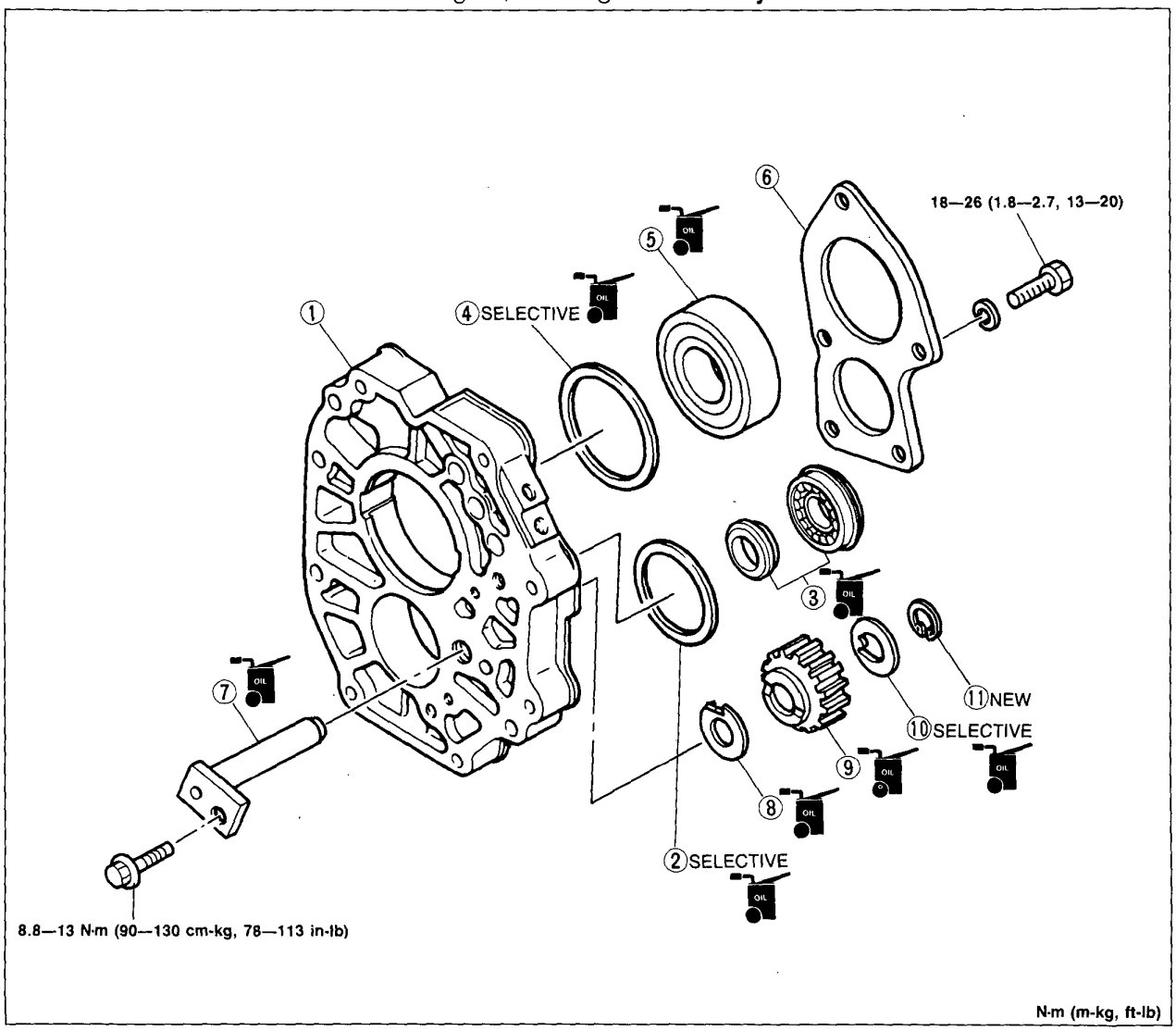
Note
- **If the select-lock spindle is not pushed down, the ball will not correctly engage the select-lock spindle.**

2. Push the select-lock spindle down by pushing on the control rod.

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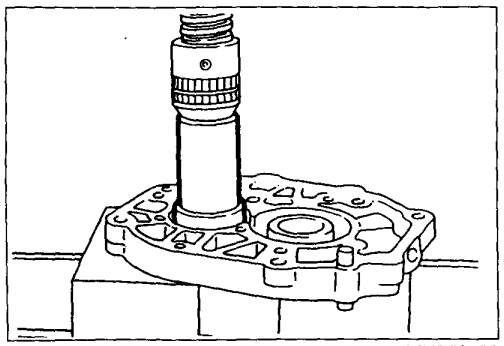
Bearing Housing Parts

1. Assemble in the order shown in the figure, referring to **Assembly Note**.



05U0JX-031

1. Bearing housing
2. Adjustment shim
   Assembly Note. page J–30
3. Countershaft center bearing
   Assembly Note. page J–29
4. Adjustment shim
   Assembly Note. page J–30
5. Mainshaft front bearing
   Assembly Note. page J–30
6. Bearing cover
7. Reverse idler gear shaft
   Assembly Note. page J–30
8. Thrust washer
9. Reverse idler gear
10. Adjustment washer
    Assembly Note. page J–30
11. Snap ring

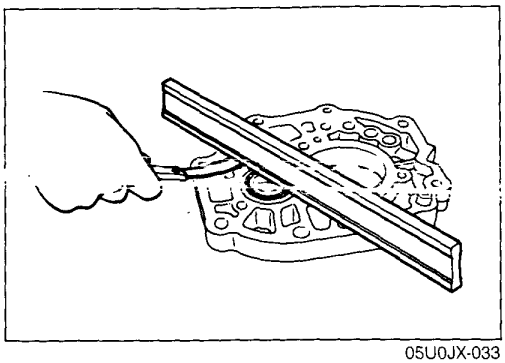


05U0JX-032

Assembly note
Countershaft center bearing

1. Press the countershaft center bearing into the bearing housing with a suitable pipe.

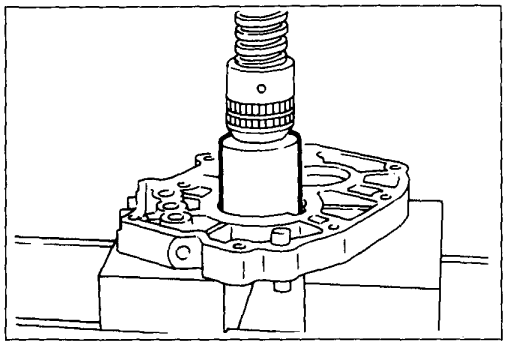
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05U0JX-033

Adjustment shim

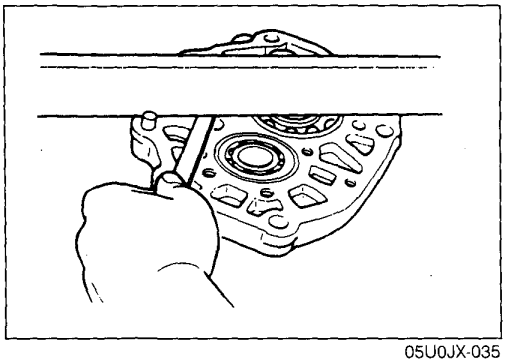
1. Measure the clearance between the countershaft center bearing and the bearing housing.
   If not within specification, adjust the clearance by installing the correct adjustment shim(s).

Standard clearance: 0—0.1mm (0—0.004 in)
Adjustment shim:
0.1mm (0.004 in), 0.3mm (0.012 in)


05U0JX-034

Mainshaft front bearing

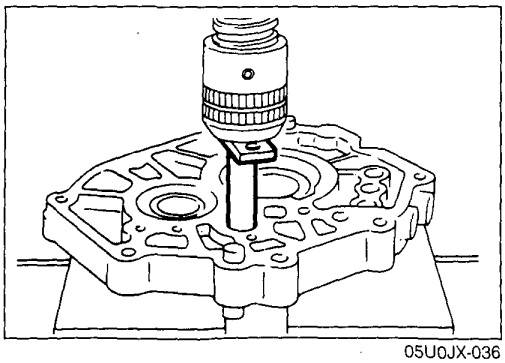
1. Press the mainshaft front bearing into the bearing housing with a suitable pipe.


05U0JX-035

Adjustment shim

1. Measure the clearance between the mainshaft front bearing and the bearing housing.
   If not within specification, adjust the clearance by installing the correct adjustment shim(s).

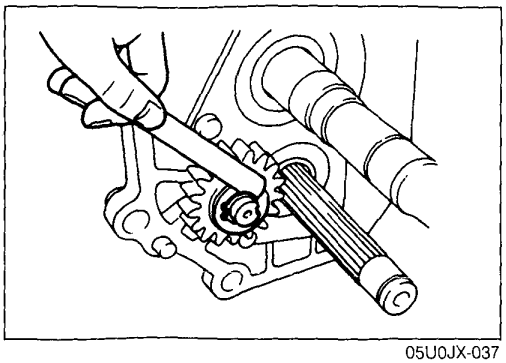
Standard clearance: 0—0.1mm (0—0.004 in)
Adjustment shim:
0.1mm (0.004 in), 0.15mm (0.006 in), 0.3mm (0.012 in)


05U0JX-036

Reverse idler gear shaft

1. Press the reverse idler gear into the bearing housing.

Tightening torque:
7.8—11 N·m (80—110 cm-kg, 69—95 in)


05U0JX-037

Adjustment washer

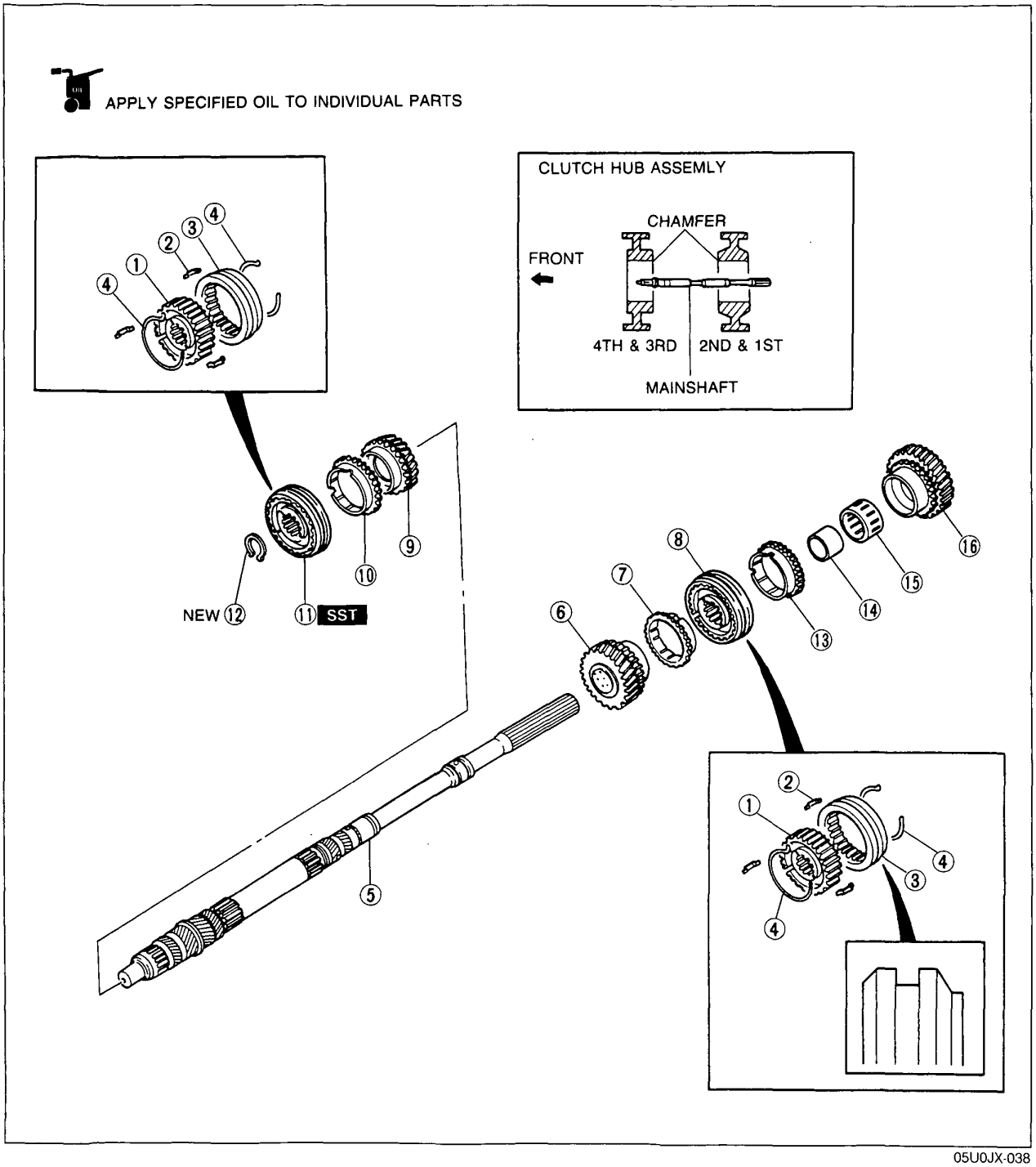
1. Measure the clearance between the adjustment washer and snap ring.
   If not within specification, adjust the clearance by installing the correct adjustment washer.

Maximum clearance: 0.1mm (0.004 in)
Adjustment washer:
2.6mm (0.102 in), 2.8mm (0.110 in), 3.0mm (0.118 in)

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Mainshaft Parts

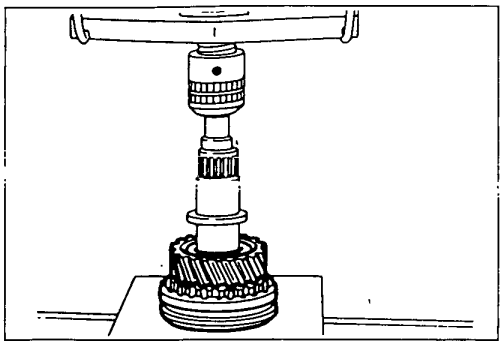
1. Assemble in the order shown in the figure, referring to **Assembly Note**.



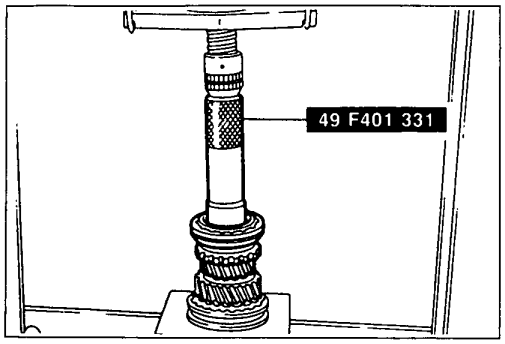
05U0JX-038

1. Clutch hub
2. Synchronizer key
3. Clutch hub sleeve
4. Synchronizer key spring
5. Mainshaft
6. 2nd gear
   Assembly Note. page J–32
7. Synchronizer ring
8. Clutch hub assembly (1st/2nd)
   Assembly Note. page J–32
9. 3rd gear
   Assembly Note. page J–32
10. Synchronizer ring (3rd)
11. Clutch hub assembly (3rd/4th)
    Assembly Note. page J–32
12. Snap ring
    Assembly Note. page J–32
13. Synchronizer ring
14. Inner race
    Assembly Note. page J–32
15. Needle bearing
    Assembly Note. page J–32
16. 1st gear
    Assembly Note. page J–32

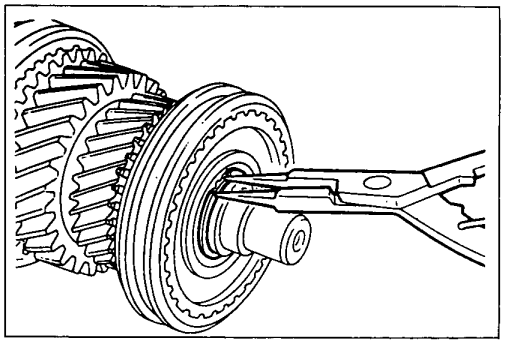
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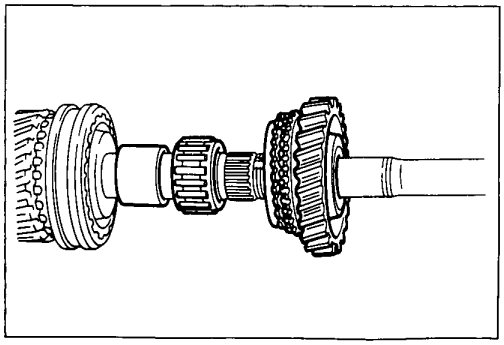
97U0J1-052



97U0J1-053



9MU0JX-073



97U0J1-054

Assembly note
Clutch hub assembly

1. Set the 2nd gear and the 1st/2nd clutch hub assembly on the mainshaft, then press in the mainshaft.
2. Set the 3rd gear and 3rd/4th clutch hub assembly on the mainshaft, then press on the 3rd/4th clutch hub assembly with the **SST**.
3. Install a new snap ring on the front of the mainshaft.
4. Install the inner race, needle bearing, and 1st gear.

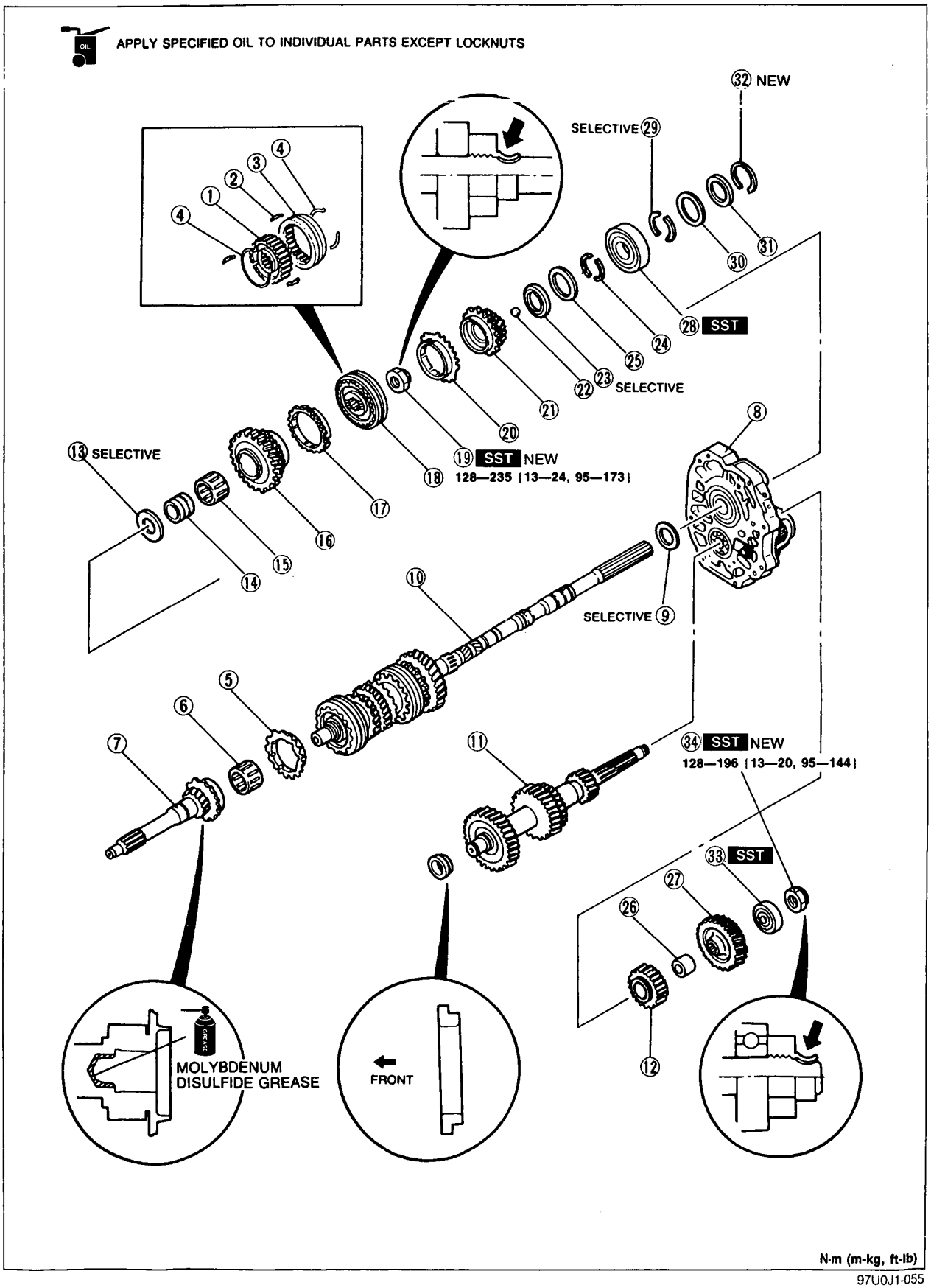
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Mainshaft and Countershaft Parts

Assemble in the order shown in the figure, referring to **Assembly Note**.

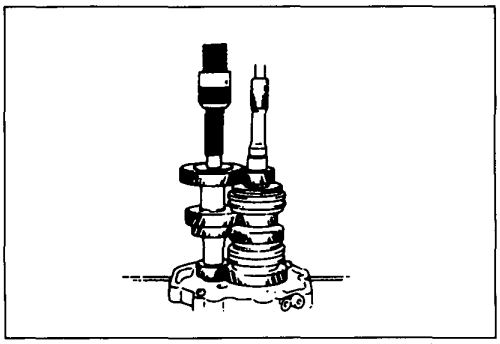


97U0J1-055

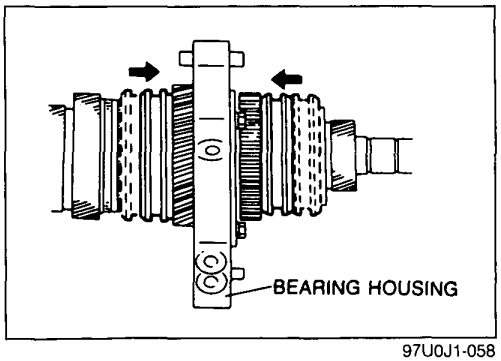
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1. Clutch hub
2. Synchronizer key
3. Clutch hub sleeve
4. Synchronizer key spring
5. Synchronizer ring (4th)
6. Needle bearing
7. Main drive gear
8. Bearing housing assembly
9. Washer
10. Mainshaft gear assembly
    Assembly Note ..... below
11. Countershaft
    Assembly Note ..... below
12. Counter reverse gear
13. Washer
14. Inner race
15. Needle bearing
16. Reverse gear
17. Synchronizer ring (Reverse)
18. Clutch hub assembly
19. Locknut (Mainshaft)
    Assembly Note ..... below
20. Synchronizer ring (5th)
21. 5th gear
22. Steel ball
23. Thrust lock washer
    Assembly Note. page J–36
24. C-washer
    Assembly Note. page J–36
25. Retaining ring
    Assembly Note. page J–36
26. Spacer
27. Counter 5th gear
28. Mainshaft rear bearing
    Assembly Note. page J–36
29. C-washer
    Assembly Note. page J–36
30. Retaining ring
    Assembly Note. page J–36
31. Washer
    Assembly Note. page J–36
32. Snap ring
33. Countershaft rear bearing
    Assembly Note. page J–36
34. Locknut (Countershaft)
    Assembly Note. page J–37

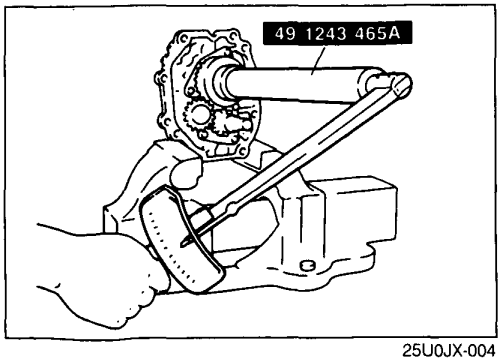
25U0JX-003



97U0J1-057



97U0J1-058



25U0JX-004

Assembly note
Mainshaft and countershaft

1. Place the mainshaft gear assembly and the countershaft on the bearing housing.
2. Use a suitable bar to press in the countershaft.

Locknut (Mainshaft)

Note
- **Use pads in the vise to prevent damaging the bearing housing.**

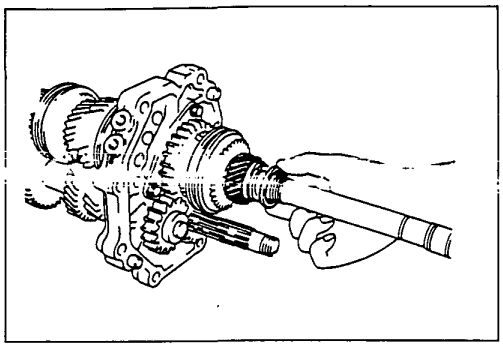
1. Secure the bearing housing in a vise.
2. Slide the clutch hub sleeves onto 1st and reverse gears to lock the mainshaft.

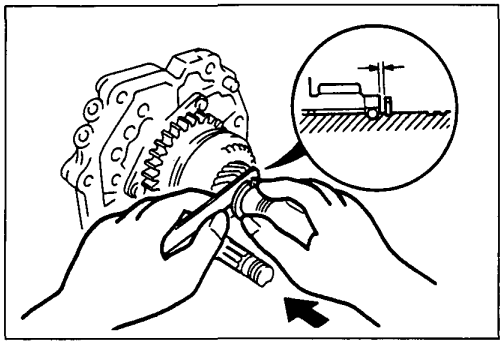
3. Tighten a new locknut by using the **SST**.

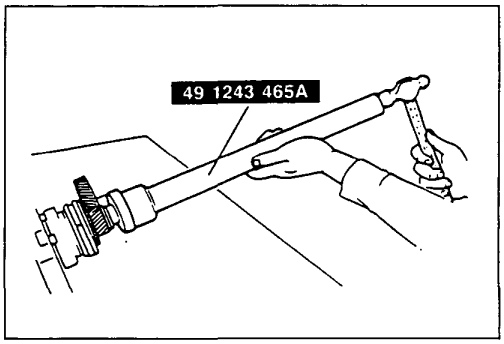
Tightening torque:
128—196 N·m (13—20 m-kg, 94—145 ft-lb)

4. Use a chisel to stake the locknut.

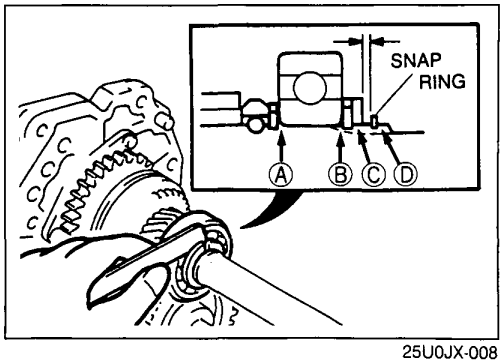
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25U0JX-005

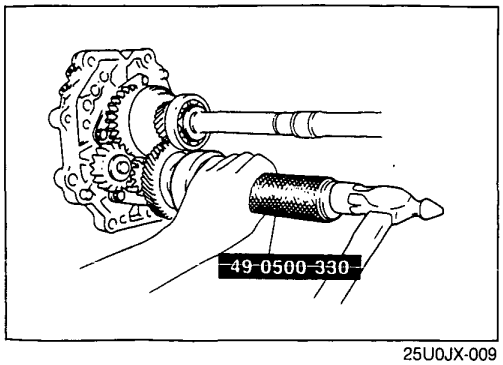

25U0JX-006



25U0JX-007



25U0JX-008



25U0JX-009

Thrust lock washer

1. Install the synchronizer ring and 5th gear.
2. Insert the steel ball and thrust lock washer.
3. Install only the two 3.0mm (0.118 in) thick C-washers in the front mainshaft groove.

Caution

- **If the C-washers are not pushed fully foward the 5th gear side, the measurement will be incorrect.**

4. While pushing the C-washers toward the 5th gear side, measure the clearance between the thrust lock washer and C-washers.
   If the clearance is not as specified select the proper thrust lock washer.

Standard play: 0.1—0.3mm (0.004—0.012 in)
Thrust lock washer thickness:
6.2mm (0.244 in), 6.4mm (0.252 in), 6.5mm (0.256 in), 6.6mm (0.260 in)

5. Install the retaining ring.

Mainshaft Rear Bearing

1. Drive on the mainshaft rear bearing using the **SST**, fully seating it against the front C-washers.
2. Install the original C-washers and hold them with the retaining ring.
3. Install the washer and new snap ring.

Caution

- **If points A through D, as shown in the figure, are not pressed together tightly, the measurement will be incorrect.**
- **If the C-washers will not fit into the rear mainshaft groove, select the proper thickness C-washers. Ensure both C-washers at this position are the same thickness.**

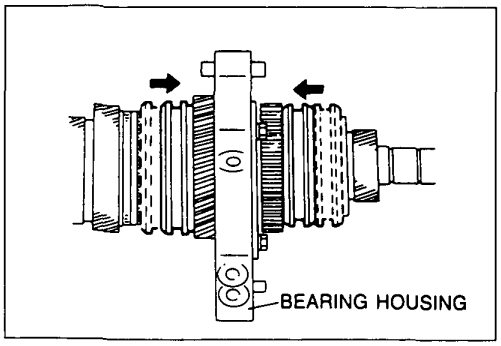
4. With points A through D pressed tightly, together, measure the clearance between the washer and snap ring.
   If the clearance is not as specified, select the proper C-washers.

Standard play: 0—0.1mm (0—0.004 in)
C-washer thickness:
2.9mm (0.114 in), 3.0mm (0.118 in), 3.1mm (0.122 in), 3.2mm (0.126 in)

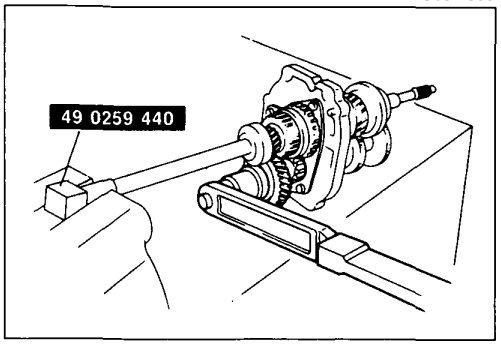
Countershaft rear bearing

Drive the countershaft rear bearing onto the countershaft by using the **SST**.

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97U0J1-065



05U0JX-042

Locknut (Countershaft)

1. Shift the clutch hub sleeves to 1st gear and reverse gear to put the gears in a double-engaged condition.

Note

- ***Use pads in the vise to prevent damaging the SST.***

2. Connect the **SST** to the mainshaft and tighten it securely in a vise.
3. Tighten a new locknut.

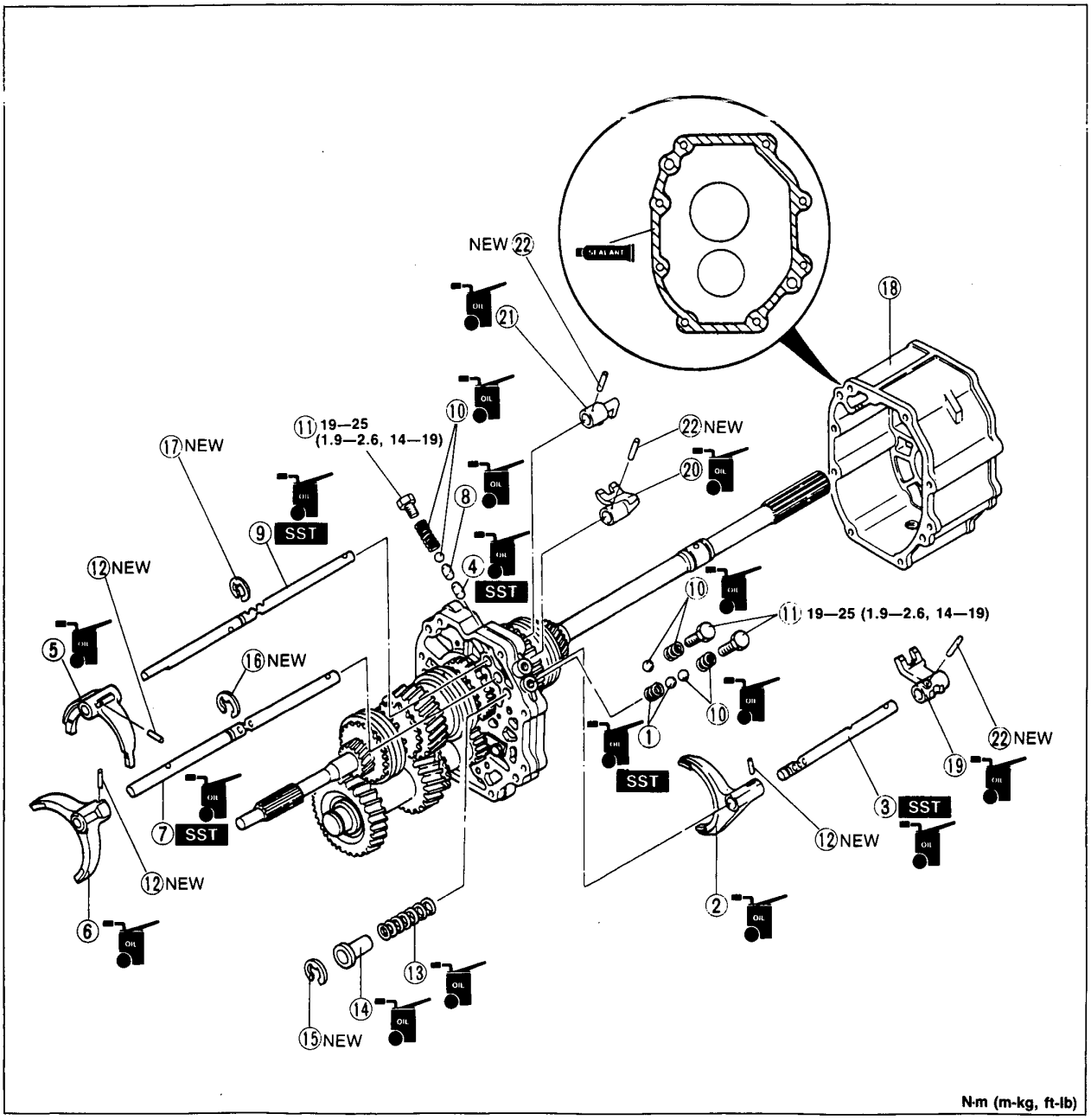
Tightening torque:
128—196 N·m (13—20 m-kg, 94—145 ft-lb)

4. Use a chisel to stake the locknut.

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Shift Fork and Shift Rod Parts

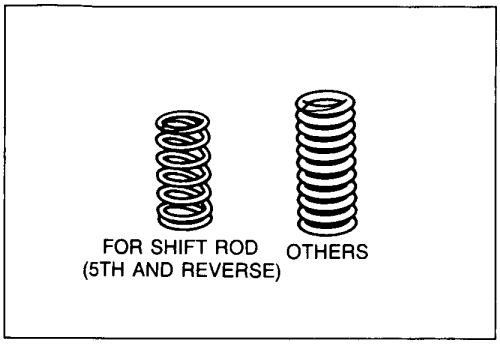
1. Assemble in the order shown in the figure, referring to **Assembly Note**.



05U0JX-043

1. Spring and ball
   Assembly Note. page J–39
2. 5th/Reverse shift fork
   Assembly Note. page J–39
3. 5th/Reverse shift rod
   Assembly Note. page J–39
4. Interlock pin
   Assembly Note. page J–39
5. 1st/2nd shift fork
   Assembly Note. page J–40
6. 3rd/4th shift fork
   Assembly Note. page J–40
7. 3rd/4th shift rod
   Assembly Note. page J–40
8. Interlock pin
   Assembly Note. page J–40
9. 1st/2nd shift rod
10. Ball and spring
11. Cap plug
12. Roll pin
    Assembly Note. page J–40
13. Spring
    Assembly Note. page J–40
14. Spacer
    Assembly Note. page J–40
15. Clip
    Assembly Note. page J–40
16. Clip
    Assembly Note. page J–40
17. Clip
    Assembly Note. page J–40
18. Intermediate housing
    Assembly Note. page J–41
19. 5th/Reverse shift rod end
20. 3rd/4th shift rod end
21. 1st/2nd shift rod end
22. Roll pin
    Assembly Note. page J–41

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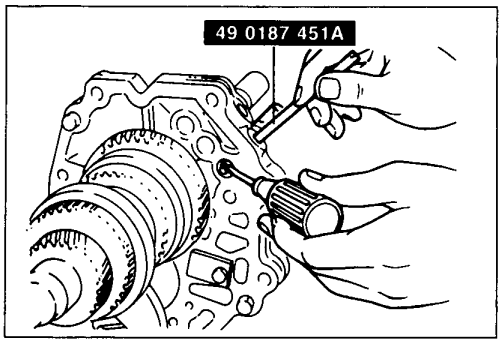


05U0JX-044

Assembly note
Spring and ball

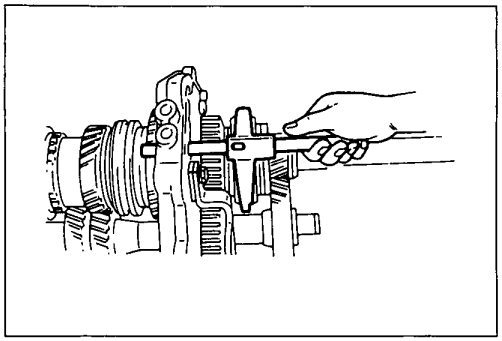
Note
- **There are 2 types of springs; be sure to install them correctly.**

1. Insert the spring and ball (5th/Reverse) into the bearing housing.



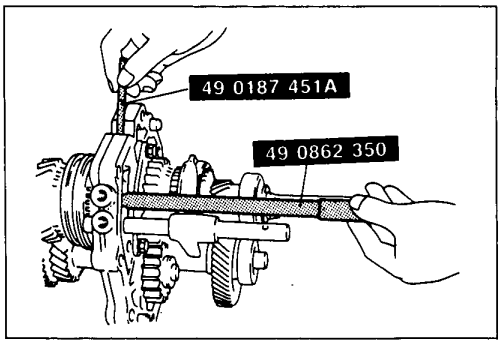
05U0JX-045

2. Press the spring and ball (5th/Reverse) with a screwdriver and the **SST** to install the shift rod.



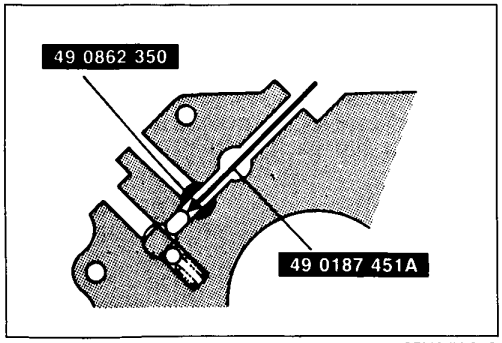
05U0JX-046

Shift fork and rod
1. Install the 5th/Reverse shift fork and 5th/Reverse shift rod into the bearing housing.



05U0JX-047

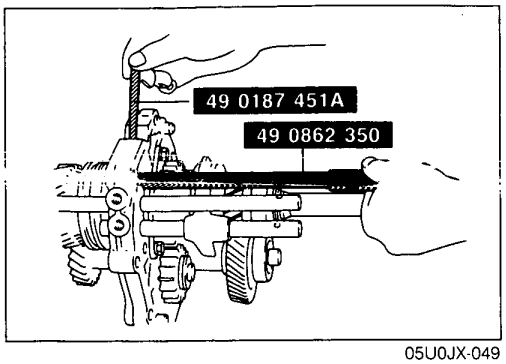
Interlock pin
1. Position the interlock pin into the bearing housing with the **SST**.



05U0JX-048

2. Verify that the interlock pin is correctly installed.

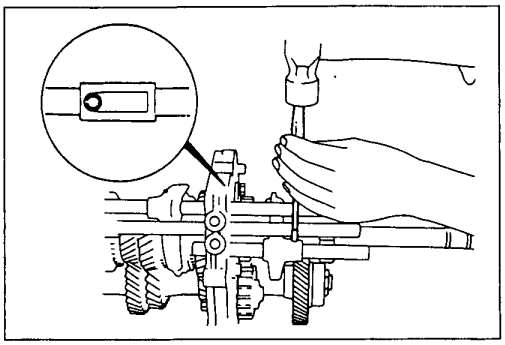
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05U0JX-049

Shift fork and rod, interlock pin

1. Set the 1st/2nd shift fork onto the 1st/2nd clutch hub assembly.
2. Install the 3rd/4th shift fork and 3rd/4th shift rod, and install the interlock pin into the bearing housing as in Step 4.



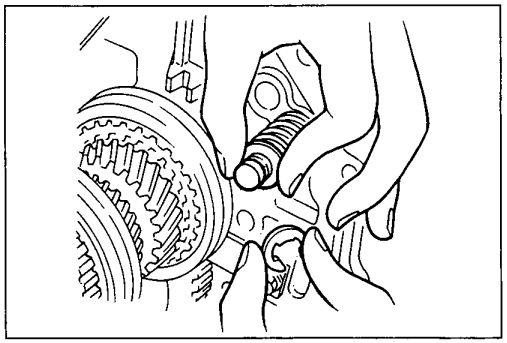
05U0JX-050

Roll pin

Caution

- **Install the roll pin with the seam facing as shown in the figure.**

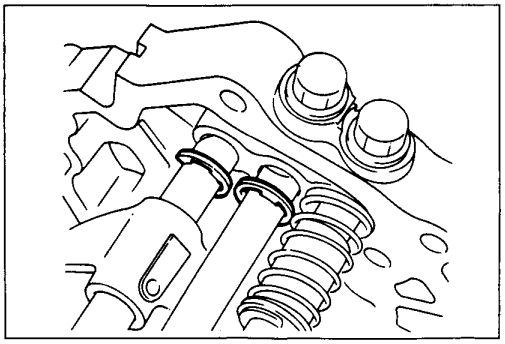
1. Install a new roll pin into each shift fork.



05U0JX-051

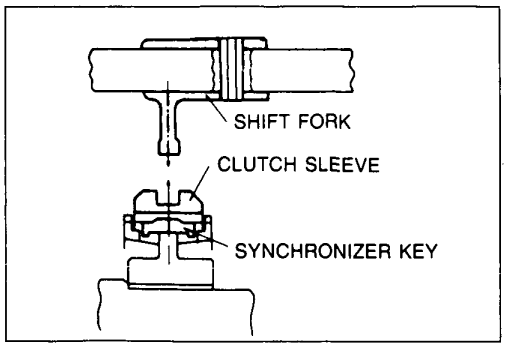
Spring, spacer, clip

1. Slide the spring and spacer onto the 5th/Reverse shift rod. While pressing the spacer, install a new clip.



05U0JX-052

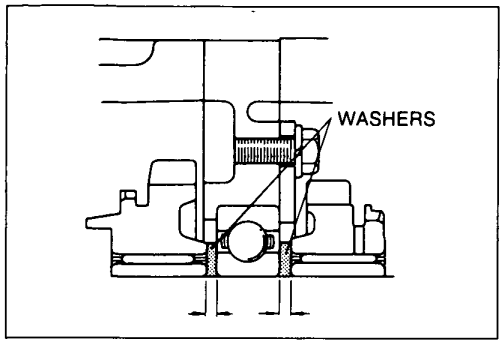
2. Install new clips to the 3rd/4th shift rod and 1st/2nd shift rod.



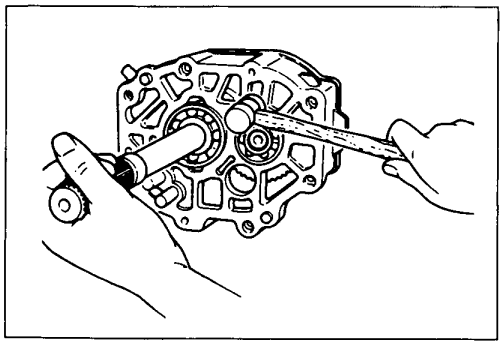
05U0JX-053

3. Verify that the centers of the shift fork and clutch hub sleeve are aligned properly.
   If they are not, select the proper washer for between 1st gear and the mainshaft front bearing, and between reverse gear and the mainshaft front bearing.

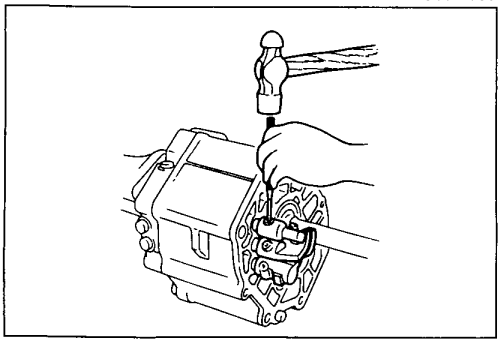
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05U0JX-054



97U0J1-080



05U0JX-055

Caution
- **The total thickness of the front and rear washers should be 5.9—6.0mm (0.2323—0.2362 in).**

4. The following washer thicknesses are available.

2.2mm (0.0866 in)	3.2mm (0.1260 in)
2.7mm (0.1063 in)	3.7mm (0.1457 in)
3.0mm (0.1181 in)	

Intermediate housing

1. Apply sealant to the contacting surfaces of the intermediate housing and bearing housing.
2. Mount the intermediate housing to the bearing housing by tapping it lightly with a plastic hammer.

Roll pin

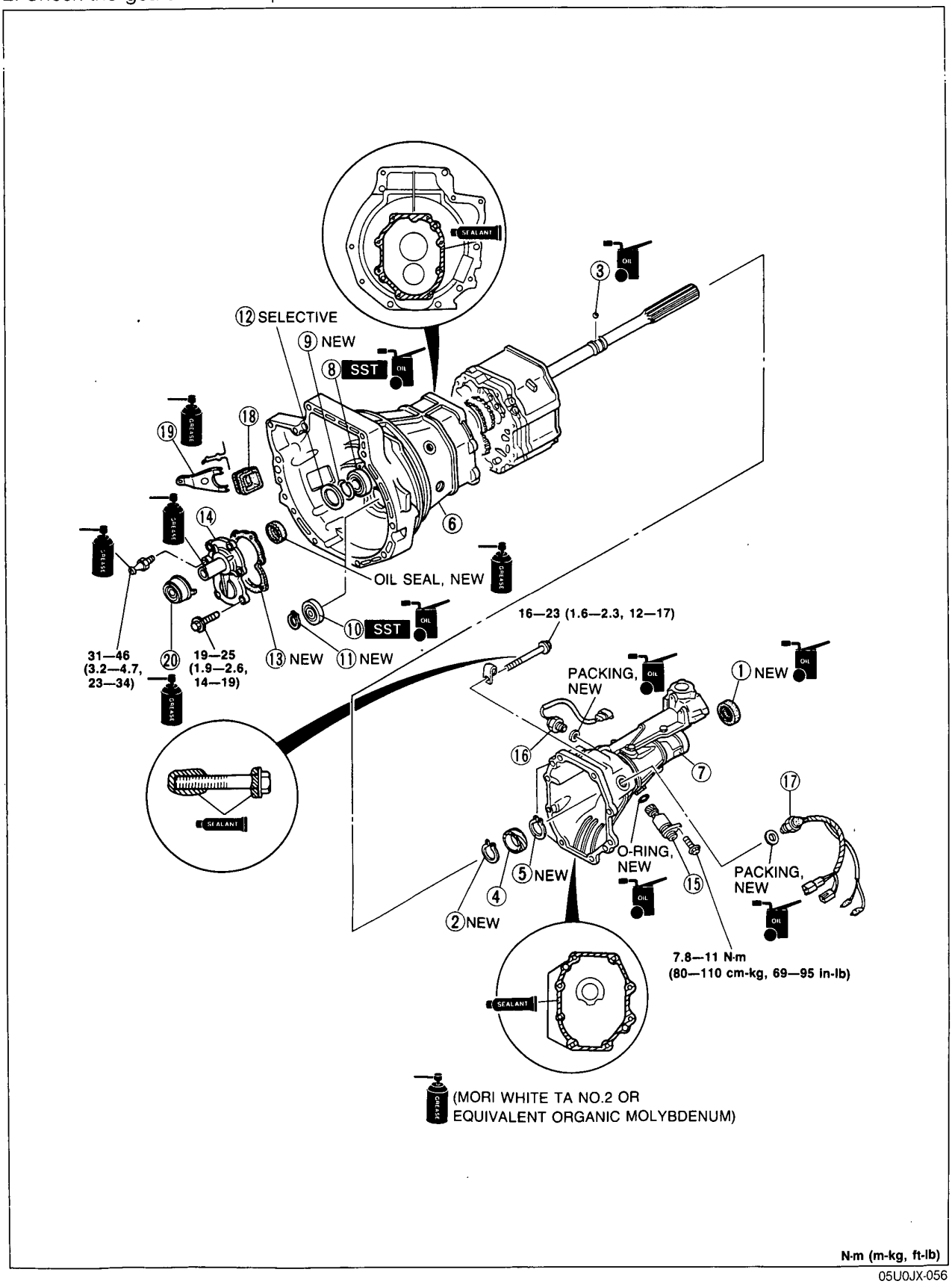
Caution
- **Install the roll pin with the seam facing forward.**

1. Install a new roll pin into each shift rod end.

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Housing Components

1. Assemble in the order shown in the figure, referring to **Assembly Note**.
2. Check the gearshift lever operation.

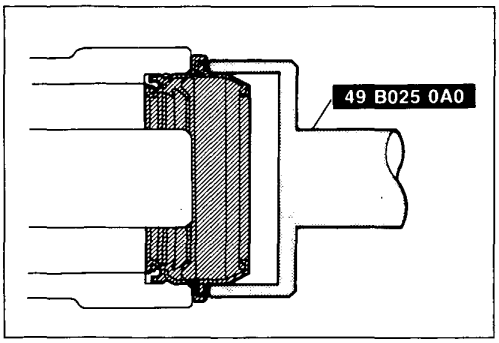


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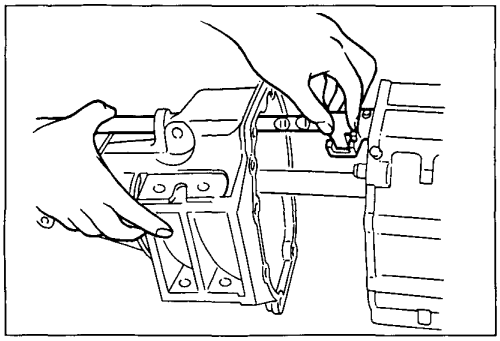
1. Oil seal
   Assembly Note. page J–43
2. Snap ring
3. Steel ball
4. Speedometer drive gear
5. Snap ring
6. Transmission case
7. Extension housing
   Assembly Note. page J–43
8. Main drive gear bearing
   Assembly Note. page J–43
9. Snap ring
10. Countershaft front bearing
    Assembly Note. page J–43
11. Snap ring
12. Adjustment shim
    Assembly Note. page J–44
13. Gasket
14. Front cover
15. Speedometer driven gear
16. Neutral switch
17. Back-up light switch
18. Boot
19. Release fork
    Assembly Note. page J–44
20. Release bearing
    Assembly Note. page J–44

05U0JX-057



05U0JX-058

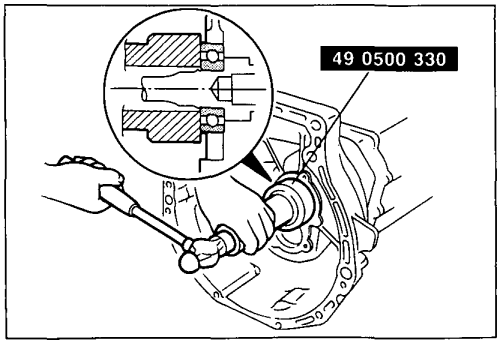
Assembly note
Oil seal
1. Apply transmission oil to outer periphery.
2. Install a new oil seal with the **SST**.



05U0JX-059

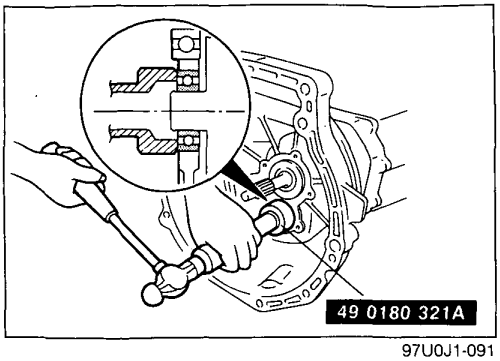
Extension housing
1. Apply sealant to the contact surfaces of the bearing housing and transmission case.
2. Align the inner shift lever and shift rod end groove, and install the extension housing.
3. Apply sealant to the bolt threads, and install the bolts.

Tightening torque:
16—23 N·m (1.6—2.3 m-kg, 12—17 ft-lb)



97U0J1-090

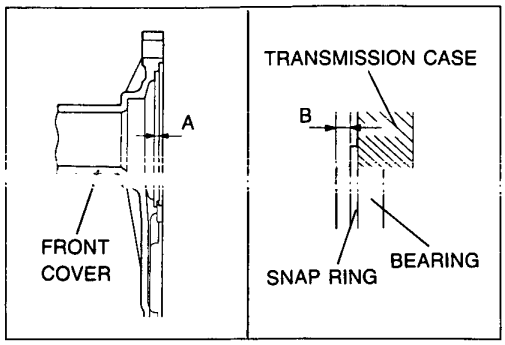
Main drive gear bearing
1. Drive on the main drive gear bearing with the **SST**, and secure it with a new snap ring.



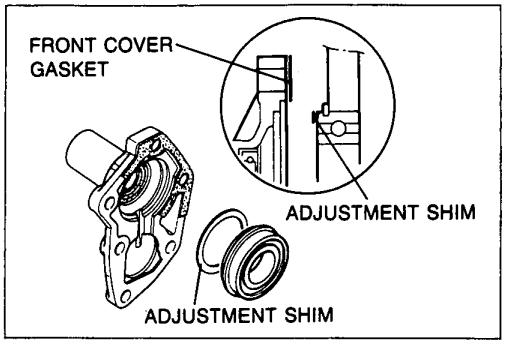
97U0J1-091

Countershaft front bearing
1. Drive on the countershaft front bearing with the **SST**, and secure it with a new snap ring.

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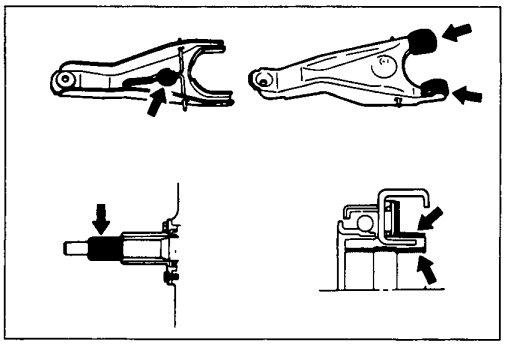
05U0JX-060



Adjustment shim

1. After measuring dimensions (A) and (B) shown in the figure, use an adjustment shim(s), as specified below, of the thickness corresponding to the value of (A) minus (B), so that bearing end play will be within specification.

Bearing end play: 0 —0.1mm (0—0.004 in)
Adjustment shim thickness:
0.10mm (0.004 in), 0.15mm (0.006 in), 0.30mm (0.012 in)



9MU0JX-110

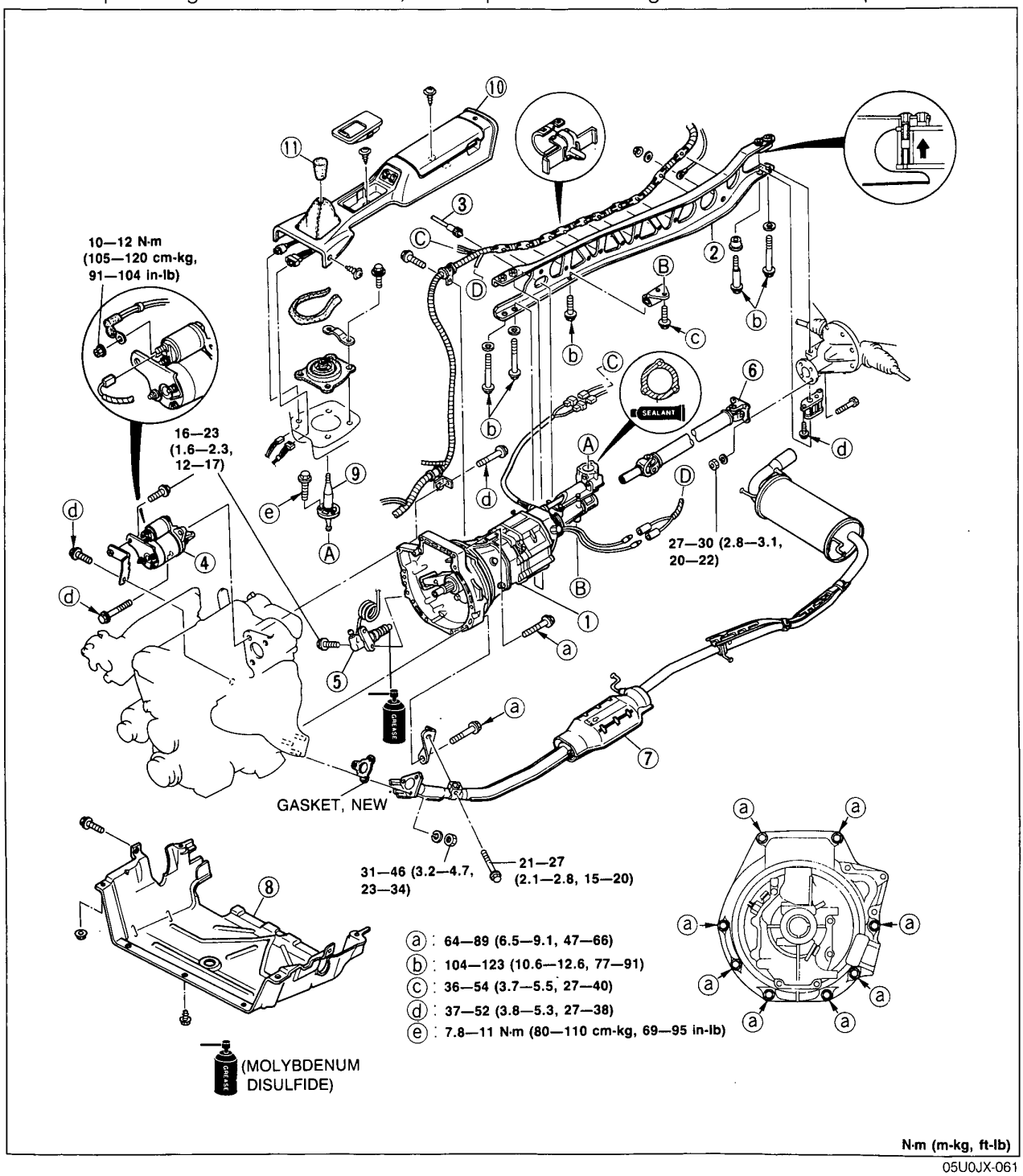
Release fork

1. Apply Mori white TA No.2 or equivalent organic molybdenum grease to the shaded areas of the release bearing and release fork.
2. Install the release bearing and release fork.

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INSTALLATION

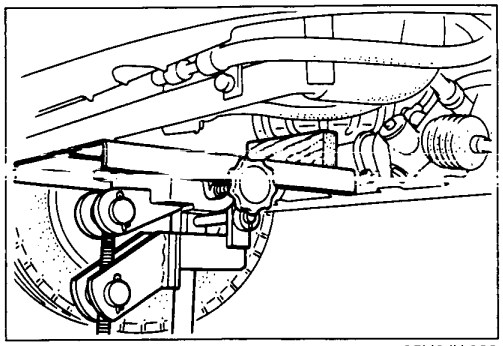
1. Raise the vehicle and support it with safety stands.
2. Install in the order shown in the figure, referring to **Installation Note**.
3. Add the specified amount of the specified transmission oil. (Refer to page J–8.)
4. Warm up the engine and transmission, and inspect for oil leakage and transmission operation.



05U0JX-061

1. Transmission
   Installation Note page J–46
2. Power plant frame (PPF)
   Installation Note page J–46
3. Speedometer cable
4. Starter
5. Clutch release cylinder
6. Propeller shaft
   Installation Note page J–47
7. Exhaust pipe
8. Undercover
9. Shift lever
   Installation Note page J–47
10. Rear console
11. Shift lever knob

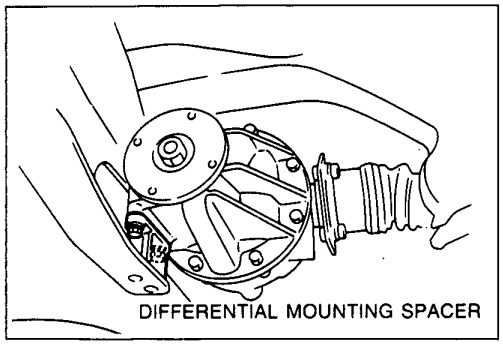
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Installation note
Transmission

1. Tilt the engine by pushing up on the front of oil pan with a wooden block and a jack for easy installation of the transmission.



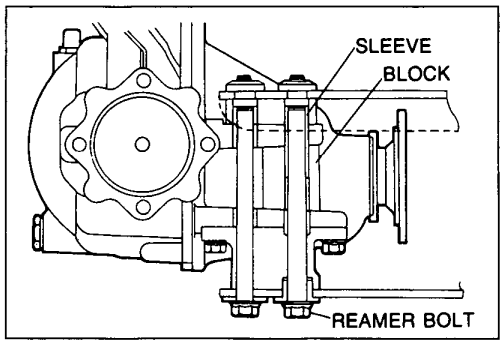
05U0MX-078

Power plant frame (PPF)

1. Install the differential mounting spacer.

Tightening torque:
37—52 N·m (3.8—5.3 m-kg, 27—38 ft-lb)

2. Support the transmission with a jack so that it is level.
3. Position the PPF and snugly tighten the transmission-side bolts by hand.

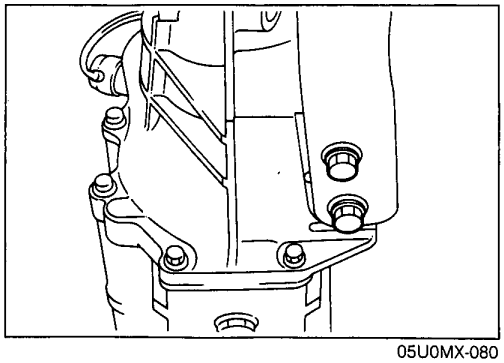


05U0MX-079

4. Verify that the sleeve is installed into the block.

Note
- **The reamer bolt is installed in the forward hole.**

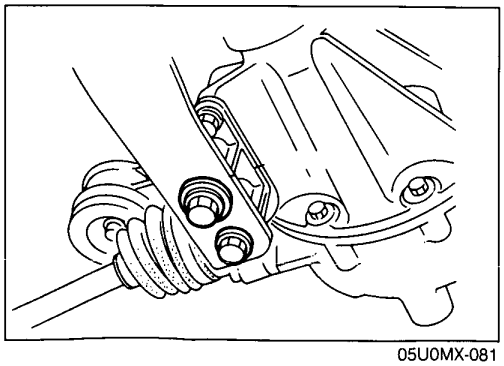
5. Install the spacer and bolts, then snugly tighten them.



05U0MX-080

6. Snugly install the power plant frame bracket.
7. Tighten the transmission-side bolts.

Tightening torque:
104—123 N·m (10.6—12.6 m-kg, 77—91 ft-lb)

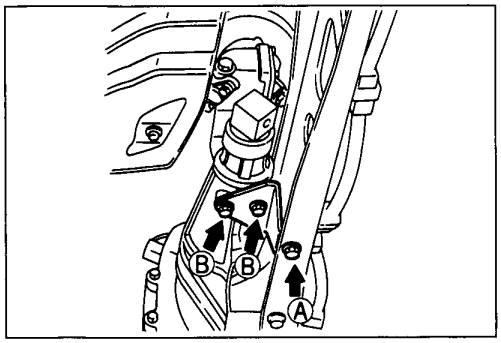


05U0MX-081

8. Tighten the differential-side bolts.

Tightening torque:
104—123 N·m (10.6—12.6 m-kg, 77—91 ft-lb)

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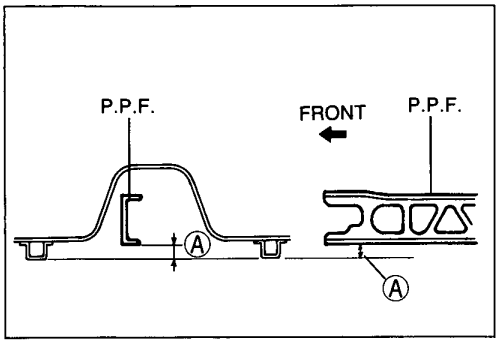


05U0MX-082

9. Install the power plant frame bracket.

Tightening torque:
Ⓐ 104—123 N·m (10.6—12.6 m-kg, 77—91 ft-lb)
Ⓑ 36—54 N·m (3.7—5.5 m-kg, 27—40 ft-lb)

10. Remove the jack, and connect the wire harness.

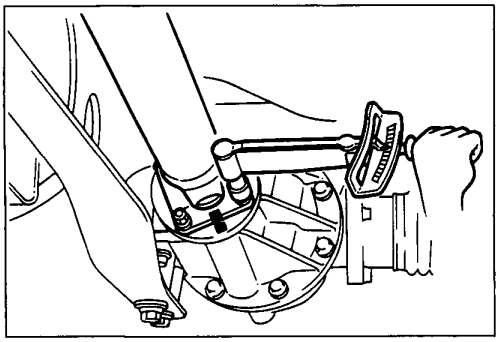


15U0JX-009

11. Measure distance A with a straightedge and vernier calipers.

Distance A: 66.0 ± 5mm (2.60 ± 0.197 in)

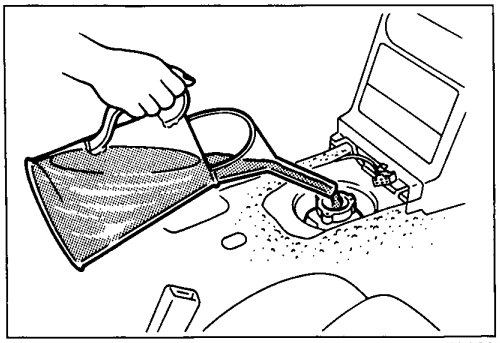
12. If the distance is not within specification, repositon the PPF at the transmission.


05U0MX-083

Propeller shaft

1. Align the marks, and install the propeller shaft.

Tightening torque:
27—30 N·m (2.8—3.1 m-kg, 20—22 ft-lb)

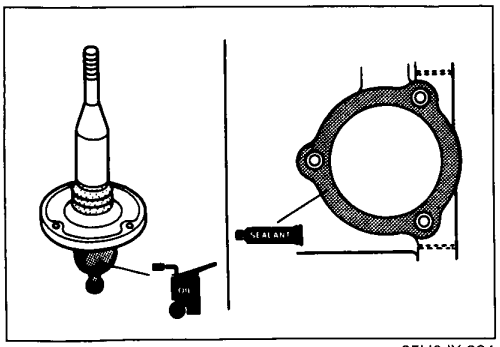

05U0JX-063

Shift lever

Note
- **Add the specified oil whenever the extension housing has been removed or the transmission has been overhauled.**

1. Pour the specified amount of oil into the change control case.

Specified oil:
Grade: API service GL-4 or GL-5
All season: SAE 75W-90
Above 10°C (50°F): SAE 80W-90
Specified amount: 80—95 cc (4.9—5.8 cu in)



05U0JX-064

2. Apply oil to the shift lever as shown.
3. Apply sealant to the contact surfaces of the boot panel and change control case.

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PROPELLER SHAFT

OUTLINE ..... **L– 2**
SPECIFICATIONS ..... **L– 2**
TROUBLESHOOTING GUIDE ..... **L– 2**
PROPELLER SHAFT ..... **L– 2**
PREPARATION ..... **L– 2**
REMOVAL / INSPECTION / INSTALLATION .. **L– 3**

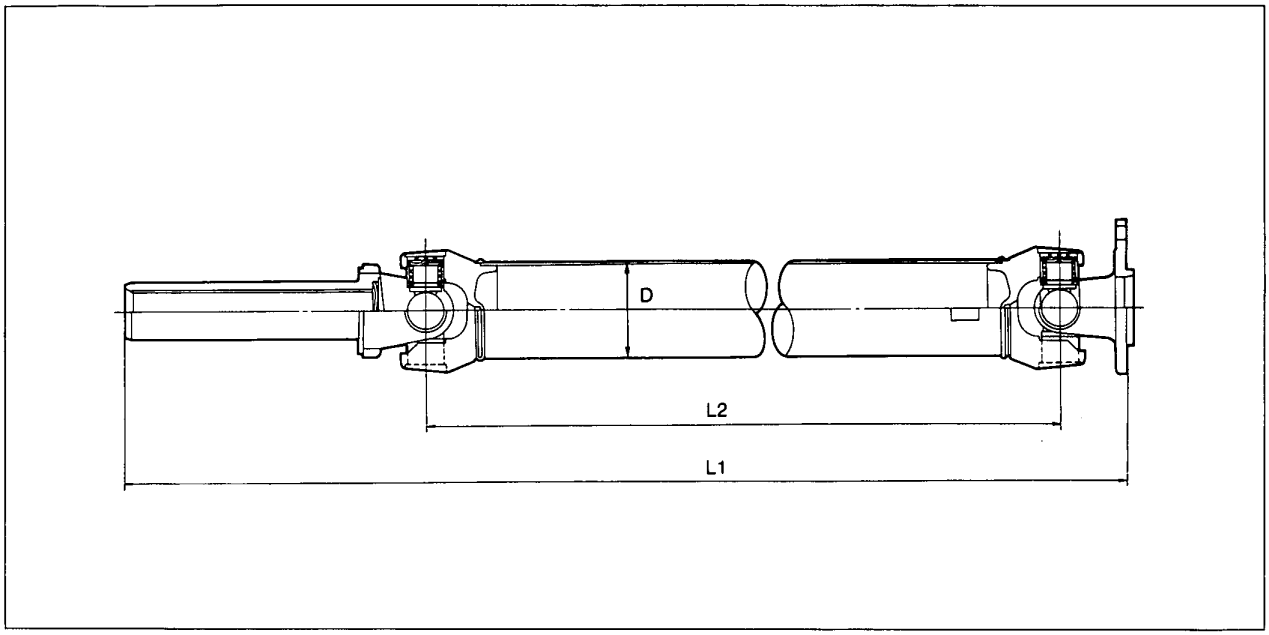
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OUTLINE

SPECIFICATIONS

Item \ Engine/Transmission Model			B6 DOHC M5M-D
Length	mm (in)	L1	1,049 (41.30)
		L2	864 (34.02)
Outer diameter	mm (in)	D	57 (2.24)



05U0LX-002

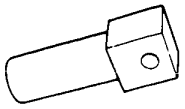
TROUBLESHOOTING GUIDE

Problem	Possible Cause	Action	Page
Vibration	Worn universal joint	Replace	L–3
	Bent propeller shaft	Replace	L–3
	Worn slip yoke splines	Replace	L–3
	Runout of propeller shaft	Replace	L–3
	Unbalanced propeller shaft	Replace	L–3
Abnormal noise	Worn or damaged universal joint	Replace	L–3
	Worn slip yoke splines	Replace	L–3

05U0LX-003

PROPELLER SHAFT

PREPARATION
SST

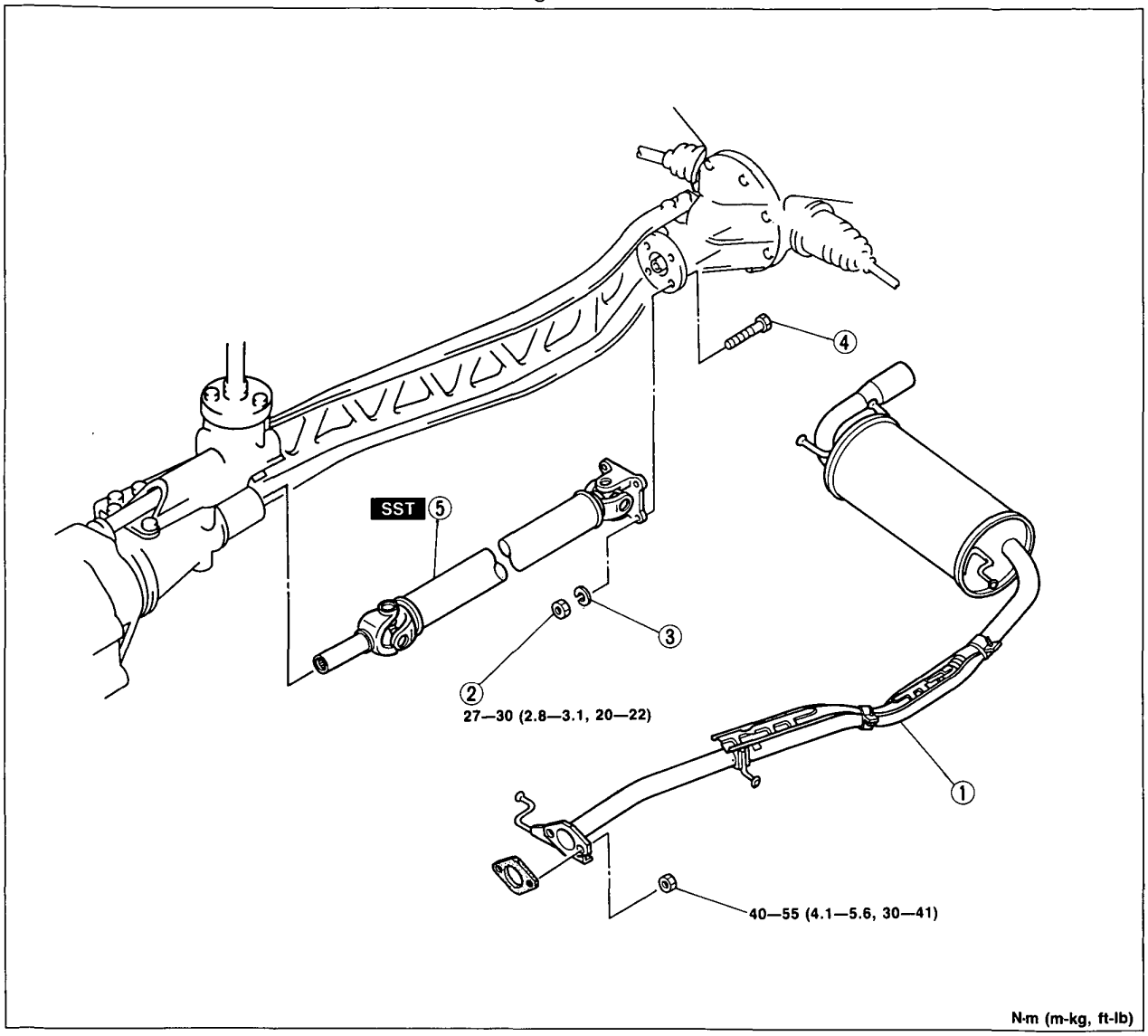
49 0259 440 Holder, main shaft		For prevention of oil leakage

05U0LX-004

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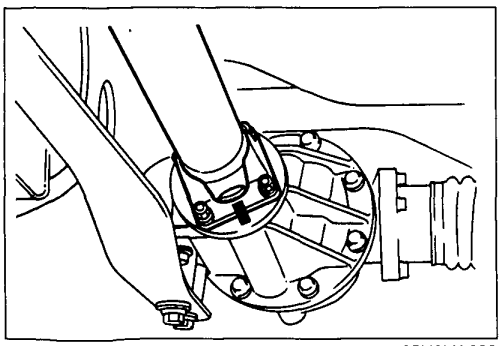
REMOVAL / INSPECTION / INSTALLATION

1. Remove in the order shown in the figure, referring to **Removal Note**.
2. Inspect all parts and repair or replace as necessary.
3. Install in the reverse order of removal, referring to **Installation Note**.



05U0LX-005

1. Exhaust pipe
2. Nut
3. Lock washer
4. Bolt
5. Propeller shaft
   Removal Note .. page L– 3
   Inspection..... page L– 4
   Installation Note page L– 4

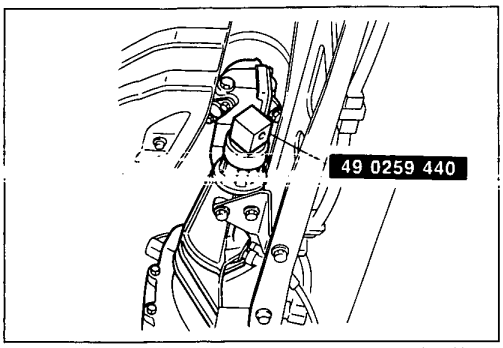


05U0LX-006

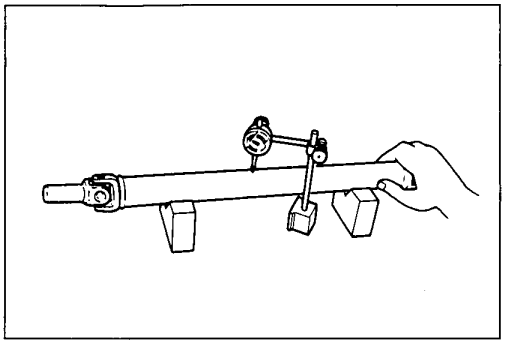
Removal Note
Propeller shaft

1. Before removing the propeller shaft, mark the flanges for correct installation.

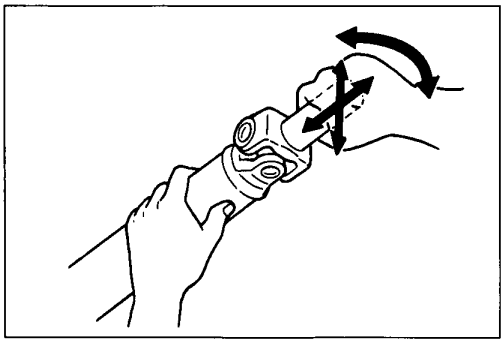
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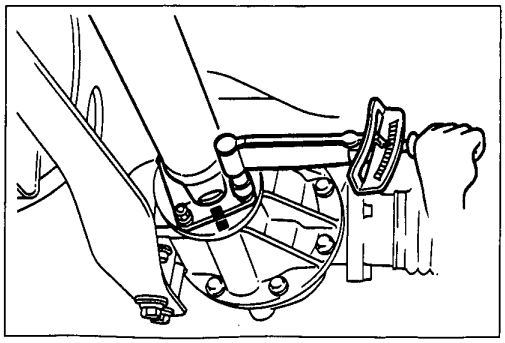
05U0LX-007



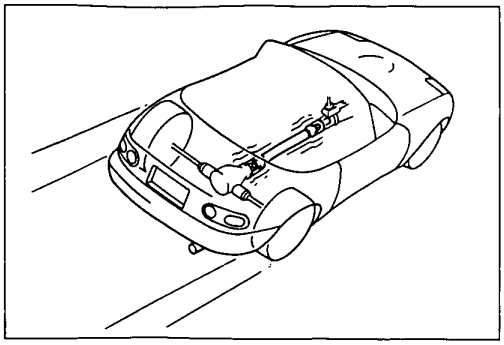
05U0LX-008



97U0LX-008



05U0LX-009



05U0LX-010

2. When the propeller shaft is removed from the extension housing, immediately install the **SST** to prevent oil leakage.

INSPECTION

Propeller shaft

Note

- **Clean the propeller shaft (except universal joints) thoroughly with a steam cleaner or cleaning solvent before inspection.**

1. Measure the propeller shaft runout with a dial indicator. Replace the propeller shaft if runout is excessive.

   Maximum runout: 0.4mm (0.016 in)

2. Move the universal joints in the directions shown, and check for universal joint looseness.
   If there is looseness, replace the propeller shaft.
3. Check operation of the universal joint.
   If the universal joint has excessive resistance, replace the propeller shaft.

Installation Note

1. Align the marks, and install the propeller shaft.

   Tightening torque:
   27—30 N·m (2.8—3.1 m-kg, 20—22 ft-lb)

2. Check that there is no abnormal noise or vibration when driving the vehicle.
   If noise or vibration occurs from the propeller shaft, replace the propeller shaft.

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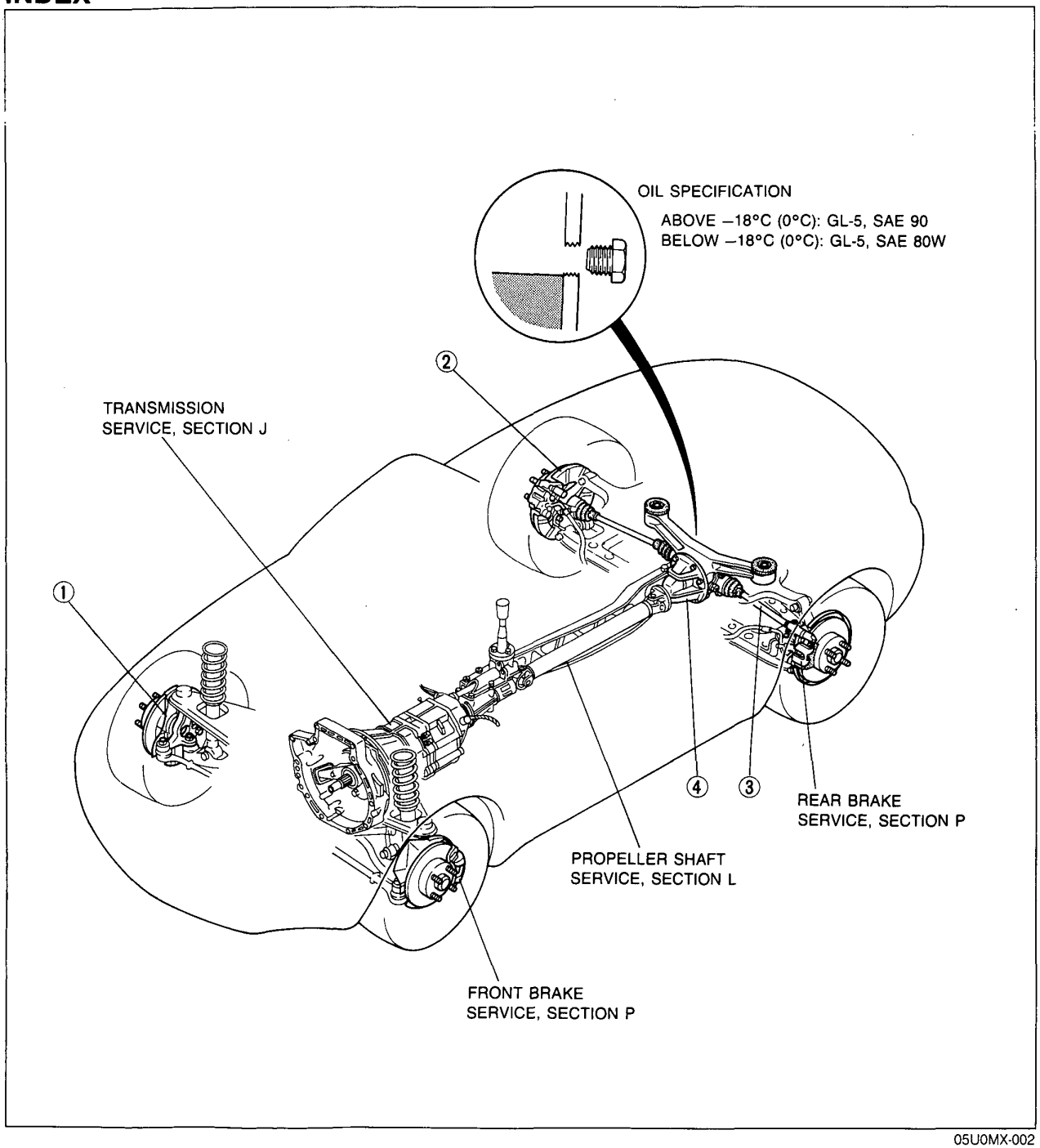
FRONT AND REAR AXLES

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PREPARATION ..... **M– 9**
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OPERATION INSPECTION **M–26**
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2. Rear axle
Inspection / Removal / Installation ..... page M–10
Disassembly / Inspection / Assembly ..... page M–12
3. Driveshaft
Inspection / Removal / Installation ..... page M–16
Overhaul ..... page M–18
4. Differential
(Standard, Viscous limited slip differential)
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Operation inspection ..... page M–26
Removal / Installation ..... page M–27
Overhaul ..... page M–32

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OUTLINE

SPECIFICATIONS

Item \ Engine/Transmission Model			B6 DOHC	
			M5M-D	
Front axle	Type		Double-wishbone	
	Bearing		Angular ball bearing	
	Maximum wheel bearing play	mm (in)	0.05 (0.002)	
Rear axle	Type		Double-wishbone	
	Bearing		Angular ball bearing	
	Maximum wheel bearing play	mm (in)	0.05 (0.002)	
Differential	Type		Standard	Viscous L.S.D.
	Reduction gear		Hypoid gear	
	Reduction ratio		4.300	
	Differential gear		Straight-bevel gear	
	Ring gear size		162.16 (6.384)	
	Oil	Grade	API service GL-5	
		Viscosity	Above −18°C (0°F): SAE 90 Below −18°C (0°F): SAE 80W	
		Capacity liter (US qt, Imp qt)	0.65 (0.69, 0.57)	
Driveshaft	Type		Constant velocity (double offset) joint	
	Length	mm (in)	659.3 (25.957)	

Viscous L.S.D.: Viscous Limited Slip Differential

05U0MX-003

TROUBLESHOOTING GUIDE

FRONT AXLE

Problem	Possible Cause	Action	Page
Steering wheel vibration	Worn or damaged wheel bearing	Replace	M– 5
Pulls or one-sided braking	Worn or damaged wheel bearing	Replace	M– 5

05U0MX-004

REAR AXLE

Problem	Possible Cause	Action	Page
Abnormal noise	Bent driveshaft Worn or damaged wheel bearing Worn driveshaft spline	Replace Replace Replace	M–16 M–12 M–16

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REAR AXLE (Cont'd)

Problem	Possible Cause	Action	Page
Body "rolls"	Worn or deteriorated upper arm bushing	Replace	M–12, Section R
Body leans	Worn or deteriorated upper arm bushing	Replace	M–12, Section R
Abnormal noise from suspension system	Worn or deteriorated upper arm bushing	Replace	M–12, Section R

05U0MX-005

DIFFERENTIAL, STANDARD

Problem	Possible Cause	Action	Page
Abnormal noise	Insufficient differential oil	Add oil	M–24
	Incorrect differential oil	Replace	M–24
	Improperly adjusted ring gear backlash	Adjust	M–40
	Poor contact of ring gear teeth	Adjust	M–41
	Worn or damaged side bearing	Replace	M–32
	Worn or damaged ring gear	Replace	M–32
	Worn or damaged drive pinion bearing	Replace	M–32
	Worn or damaged pinion and side gear	Replace	M–32
	Seized side gear and case	Replace	M–32
	Worn side gear spline	Replace	M–32
	Worn pinion shaft	Replace	M–32
	Worn thrust washer	Replace	M–32
	Improperly adjusted side gear backlash	Adjust	M–40
	Improperly adjusted drive pinion gear preload	Adjust	M–38
Heat buildup	Insufficient differential oil	Add oil	M–24
	Insufficient gear backlash	Adjust	M–40
	Excessive bearing preload	Adjust	M–38,40
Oil leakage	Excessive differential oil	Remove oil	M–24
	Loose differential carrier	Tighten or repair	M–42
	Worn or damaged oil seal	Replace	M–32
No differential operation	Misassembled	Repair	M–32

05U0MX-006

DIFFERENTIAL, VISCOUS LIMITED SLIP

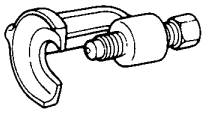
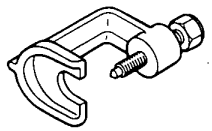
Problem	Possible Cause	Action	Page
Abnormal noise	Insufficient differential oil	Add oil	M–24
	Incorrect differential oil	Replace	M–24
	Improperly adjusted ring gear backlash	Adjust	M–40
	Poor contact of ring gear teeth	Adjust	M–41
	Worn or damaged viscous limited slip differential oil seal	Replace	M–24,32
	Worn or damaged ring gear	Replace	M–32
	Worn or damaged drive pinion bearing	Replace	M–32
Heat buildup	Insufficient differential oil	Add oil	M–24
	Excessive bearing preload	Adjust	M–38,40
Oil leakage	Excessive differential oil	Remove oil	M–24
	Loose differential carrier	Tighten or repair	M–42
	Worn or damaged oil seal	Replace	M–24,32
No differential operation	Misassembled	Repair	M–32

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FRONT AXLE

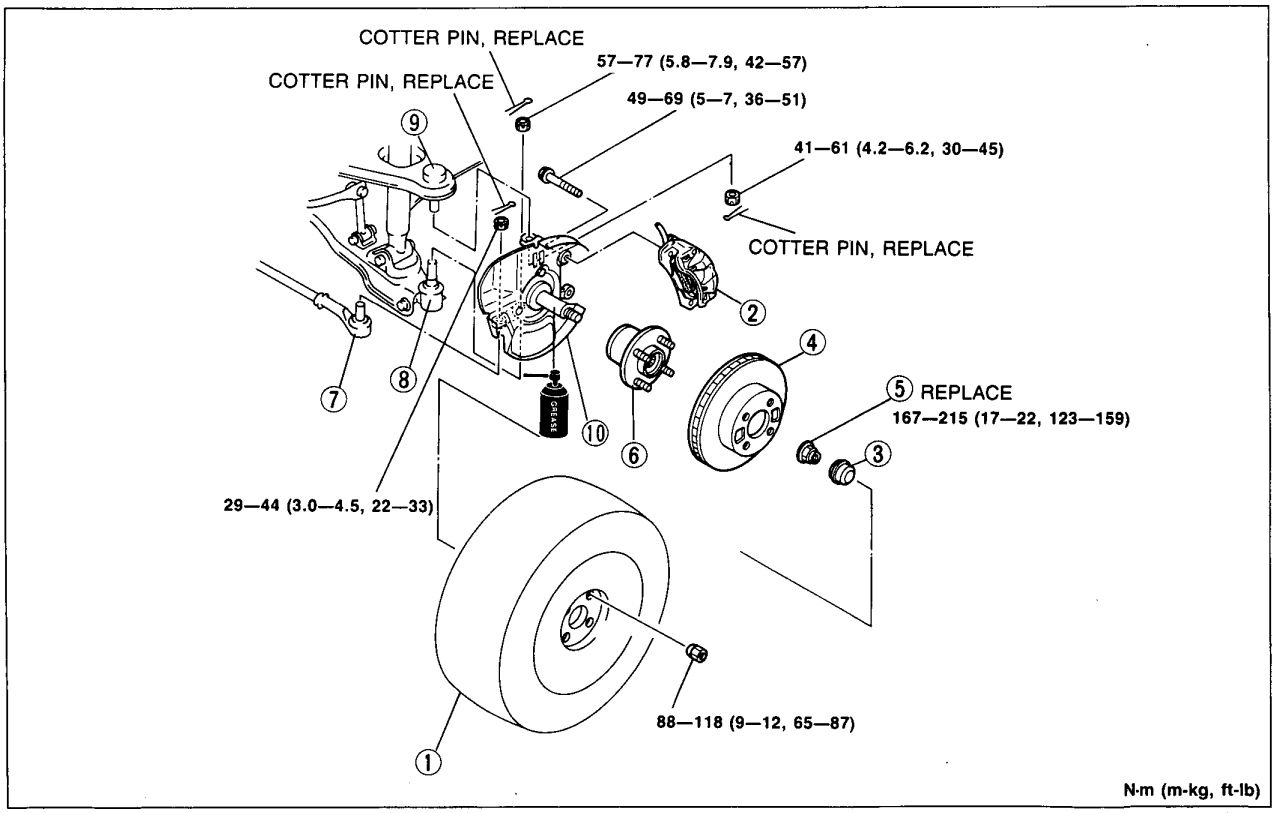
PREPARATION
SST

49 0118 850C Puller, ball joint		For disconnection of tie-rod end and upper arm ball joint	49 0727 575 Puller, ball joint 	For disconnection of lower arm ball joint

05U0MX-008

WHEEL HUB, STEERING KNUCKLE
Inspection / Removal / Installation

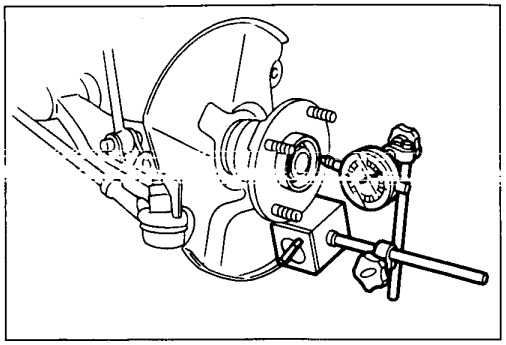
1. Inspect wheel bearing play, referring to **Inspection**.
2. Remove in the order shown in the figure, referring to **Removal Note**.
3. Inspect all parts and repair or replace as necessary.
4. Install in the reverse order of removal, referring to **Installation Note**.

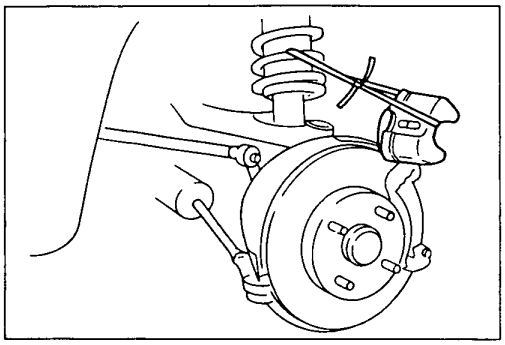


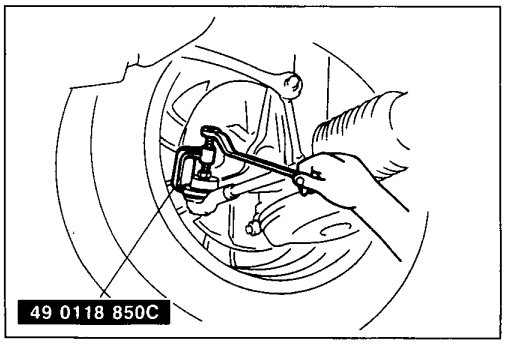
05U0MX-009

1. Front wheel
2. Brake caliper assembly
   Removal Note ..... page M–6
3. Hub cap
4. Disc plate
5. Locknut
   Installation Note ..... page M–7
6. Front wheel hub assembly
   Inspect for cracks and damage
   Disassembly / Inspection / Assembly ..... page M–8
7. Tie-rod end
   Removal Note ..... page M–6
   Service ..... Section N
8. Lower arm
   Removal Note ..... page M–6
   Service ..... Section R
9. Upper arm
   Removal Note ..... page M–6
   Service ..... Section R
10. Dust cover and knuckle spindle
    Inspect dust cover for damage and distortion
    Inspect knuckle spindle for cracks and damage

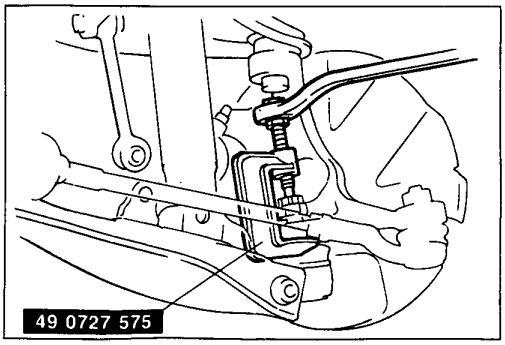
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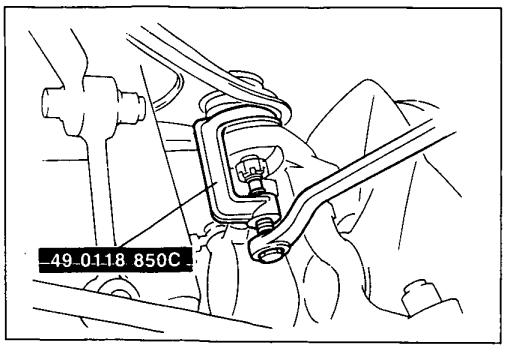

05U0MX-011



05U0MX-012



9MU0MX-010



05U0MX-013

Inspection
Wheel bearing play
1. Remove the wheel, brake caliper assembly, and disc plate, referring to **Removal note** below.
2. Position a dial indicator against the wheel hub. Push and pull the wheel hub by hand in the axial direction and measure the wheel bearing play.
   If the bearing play exceeds specification, check and adjust the locknut torque or replace the wheel hub assembly if necessary.

Maximum wheel bearing play: 0.05mm (0.002 in)

Removal note
Brake caliper assembly

Note
- **For easier installation, do not depress the brake pedal after removing the brake caliper assembly.**

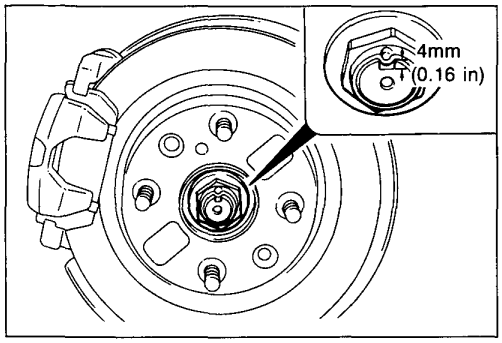
1. Suspend the brake caliper assembly with a rope.

Tie-rod end
1. Loosen the nut and disconnect the tie-rod end with the **SST**.

Lower arm
1. Loosen the nut and disconnect the lower arm with the **SST**.

Upper arm
1. Loosen the nut and disconnect the upper arm with the **SST**.

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05U0MX-014

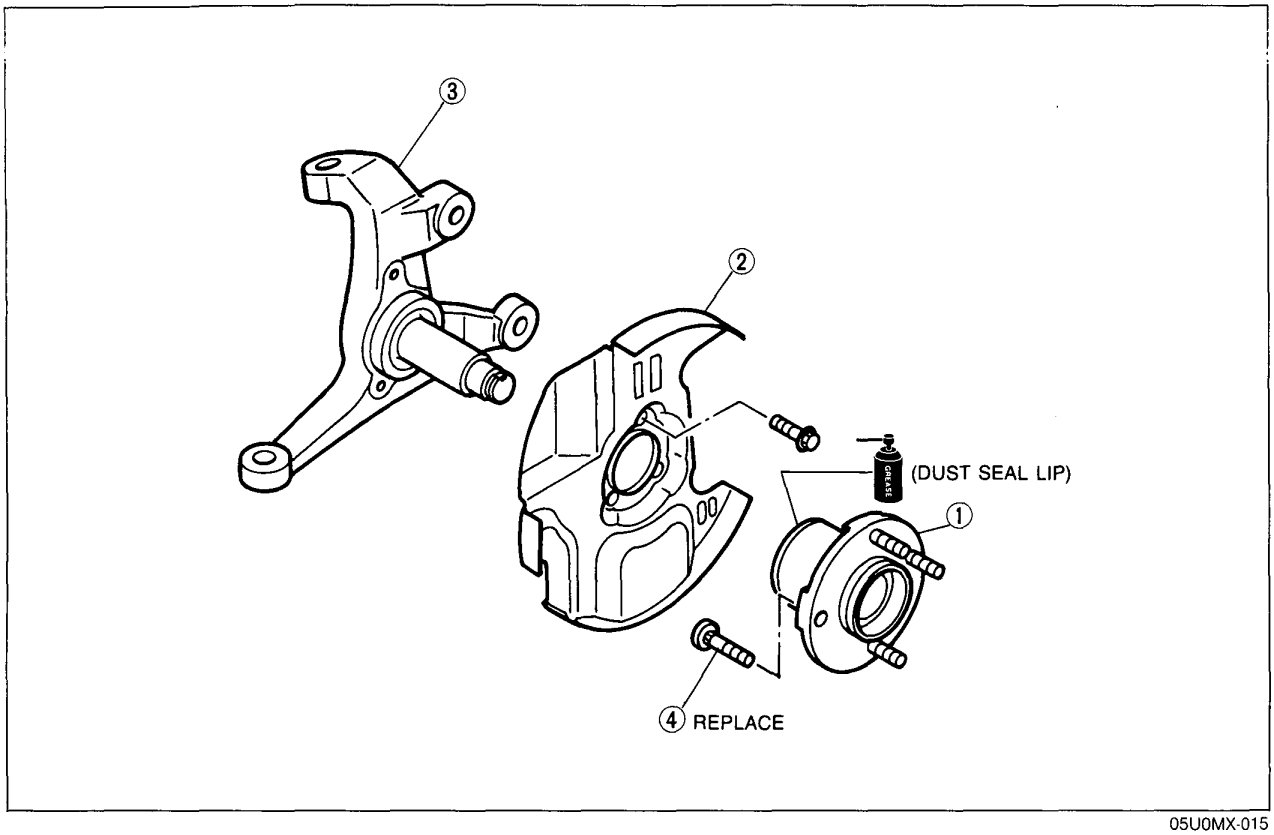
Installation note
Locknut
1. Install a new locknut and stake it.

Tightening torque:
167—216 N·m (17—22 m-kg, 123—159 ft-lb)

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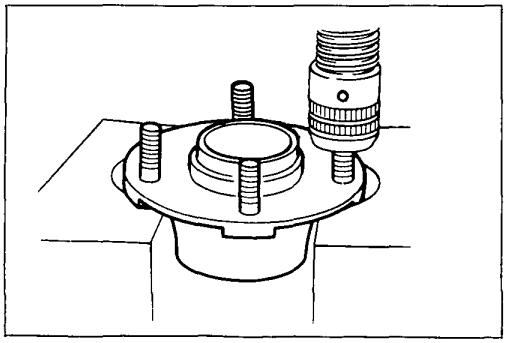
Disassembly / Inspection / Assembly

1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Inspect all parts and repair or replace as necessary.
3. Assemble in the reverse order of disassembly, referring to **Assembly Note**.

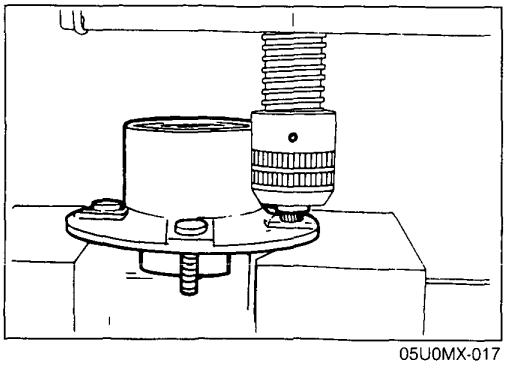


05U0MX-015

1. Front wheel hub assembly
2. Dust cover
3. Knuckle spindle
4. Hub bolt
   Disassembly Note..... page M-8
   Assembly Note ..... page M-8



05U0MX-016



05U0MX-017

Disassembly note
Hub bolts

Caution
- **Do not remove the hub bolts if not necessary.**
- **Do not reuse the removed hub bolts.**

1. Remove the hub bolts with a press.

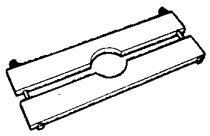
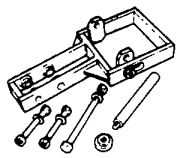
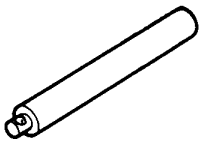
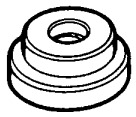
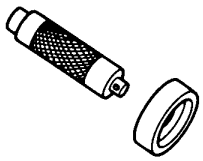
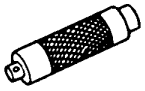
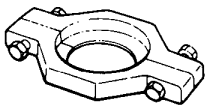
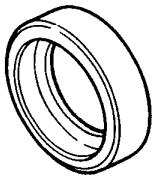
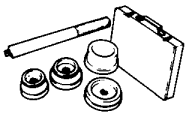
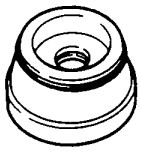
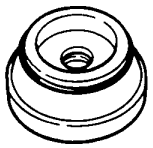
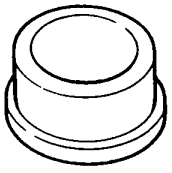
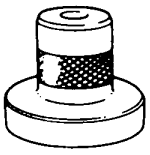
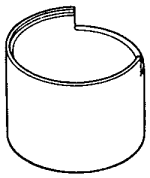
Assembly note
Hub bolts

1. Install the new hub bolts with a press.

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REAR AXLE

PREPARATION
SST

49 F026 103 Puller, wheel hub 	For disassembly and assembly of rear axle	49 B026 1A0 Puller, wheel hub 	For disassembly and assembly of wheel hub
49 G033 102 Handle (Part of 49 B026 1A0) 	For removal and installation of rear wheel hub	49 G030 727 Attachment A (Part of 49 B026 1A0) 	For removal and installation of rear wheel hub
49 G030 795 Installer, oil seal 	For installation of oil seal	49 G030 797 Handle (Part of 49 G030 795) 	For removal and installation of wheel bearing
49 0636 145 Puller, fan pulley boss 	For removal of wheel bearing	49 G033 107 Installer, dust cover 	For installation of dust cover
49 F027 0A1 Installer set, bearing 	For installation of bearing	49 F027 005 Attachment 62 (Part of 49 F027 0A1) 	For assembly of rear axle
49 F027 007 Attachment 72 (Part of 49 F027 0A1) 	For assembly of rear axle	49 F027 009 Attachment 68 & 77 (Part of 49 F027 0A1) 	For assembly of rear axle
49 V001 795 Installer, oil seal 	For installation of oil seal	49 B034 201 Support, block 	For replacement of rear knuckle bushing

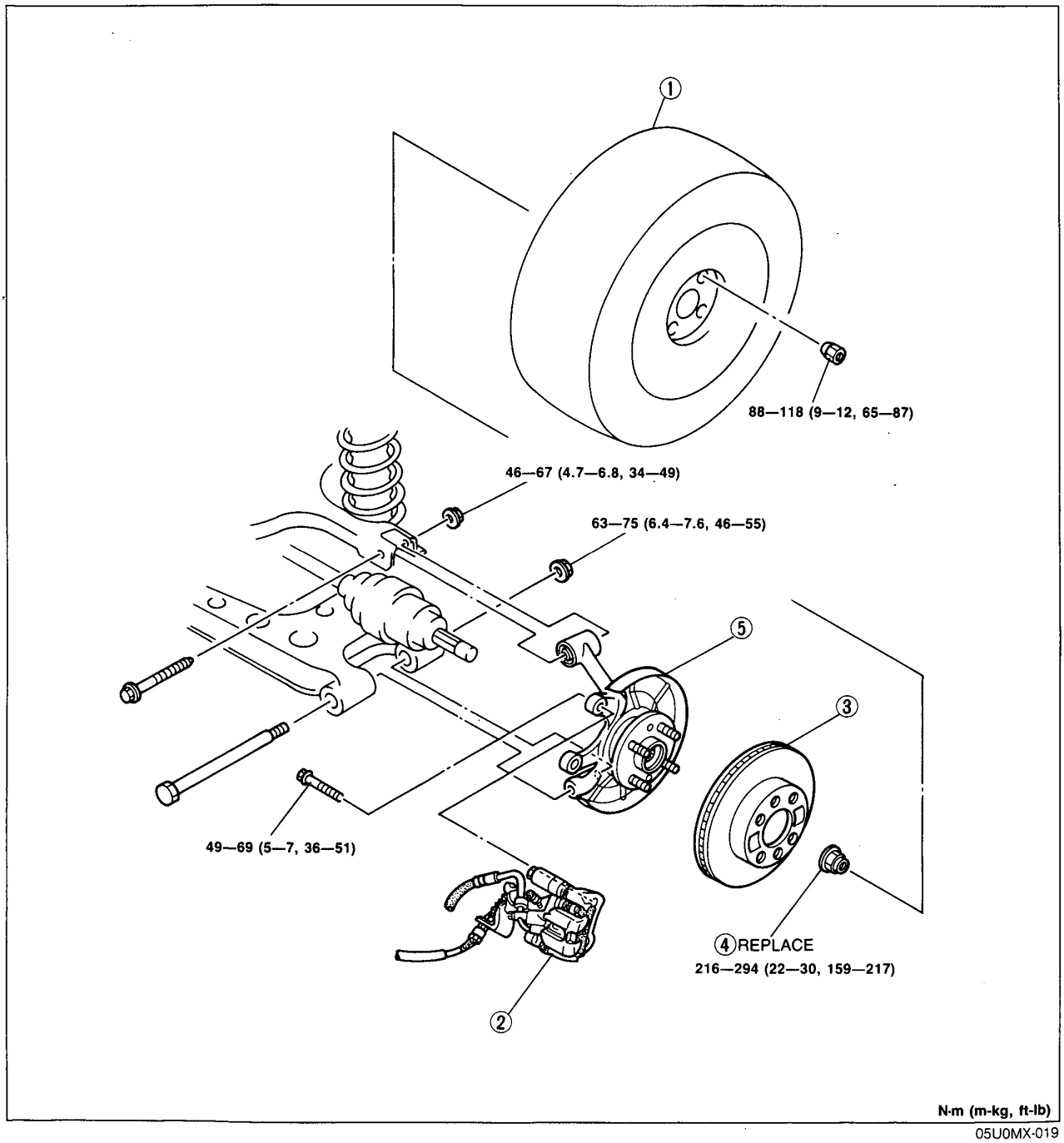
95A0MX-001

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DISC BRAKE TYPE

Inspection / Removal / Installation

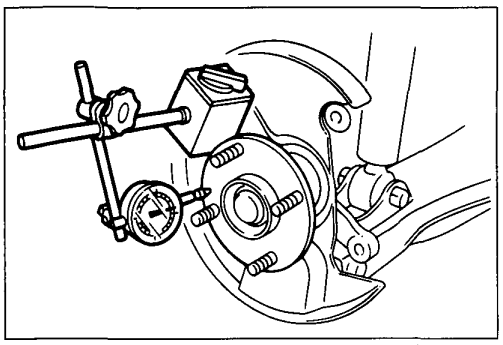
1. Inspect wheel bearing play, referring to **Inspection**.
2. Remove in the order shown in the figure, referring to **Removal Note**.
3. Inspect all parts and repair or replace as necessary.
4. Install in the reverse order of removal, referring to **Installation Note**.
5. After installation, adjust the rear wheel alignment. (Refer to Section R.)



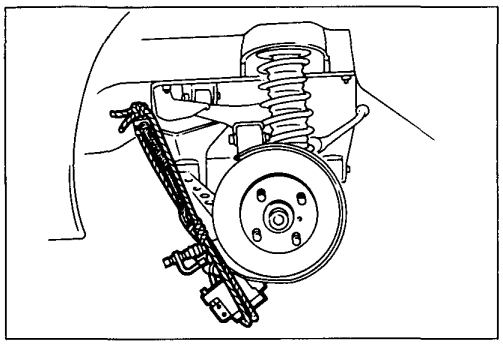
05U0MX-019

1. Rear wheel
2. Brake caliper assembly
   Removal Note ..... page M–11
3. Disc plate
4. Locknut
   Installation Note ..... page M–11
5. Knuckle, wheel hub, and dust cover
   Inspect knuckle for cracks and damage
   Inspect wheel hub for cracks and damage
   Inspect dust cover for damage and distortion
   Disassembly / Inspection / Assembly ..... page M–12

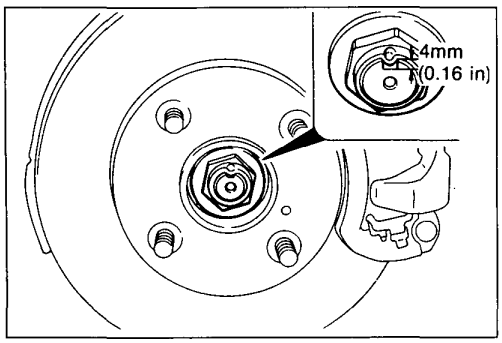
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05U0MX-020



05U0MX-021



05U0MX-022

Inspection
Wheel bearing play

1. Remove the wheel, brake caliper assembly, and disc plate, referring to **Removal note** below.
2. Position a dial indicator against the wheel hub. Push and pull the wheel hub by hand in the axial direction and measure the wheel bearing play.
   If the bearing play exceeds specification, check and adjust the locknut torque or replace the wheel bearing if necessary.

Maximum wheel bearing play: 0.05mm (0.002 in)

Removal note
Brake caliper assembly

Note
- **For easier installation, do not depress the brake pedal after removing the brake caliper assembly.**

1. Suspend the brake caliper assembly with a rope.

Installation note
Locknut

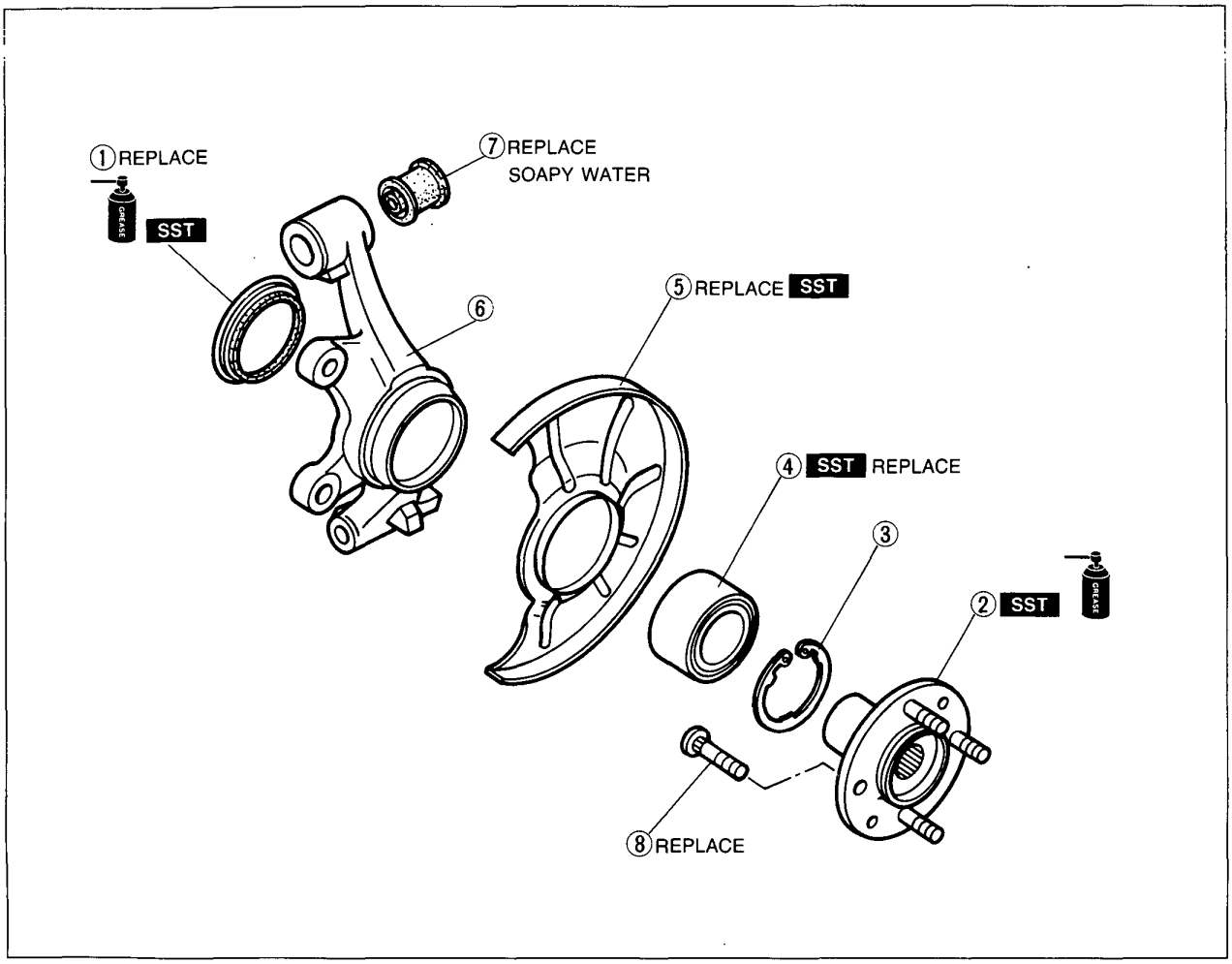
1. Install a new locknut and stake it.

Tightening torque:
216—294 N·m (22—30 m-kg, 159—217 ft-lb)

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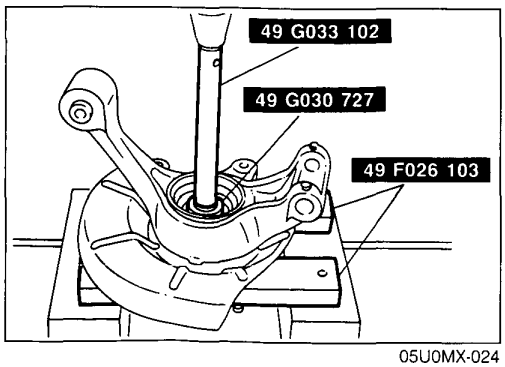
Disassembly / Inspection / Assembly

1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Inspect all parts and repair or replace as necessary.
3. Assemble in the reverse order of disassembly, referring to **Assembly Note**.



05U0MX-023

1. Oil seal
   Assembly Note ..... page M–15
2. Rear wheel hub assembly
   Disassembly Note..... page M–12
   Assembly Note ..... page M–15
3. Retaining ring
4. Wheel bearing
   Disassembly Note..... page M–13
   Assembly Note ..... page M–14
5. Dust cover
   Disassembly Note..... page M–13
   Assembly Note ..... page M–14
6. Knuckle
7. Bushing
8. Hub bolt
   Disassembly Note..... page M–14
   Assembly Note ..... page M–14



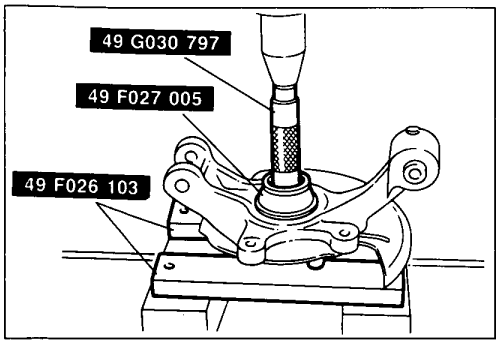
05U0MX-024

Disassembly note

Rear wheel hub assembly

1. Press out the rear wheel hub assembly with the **SST**.

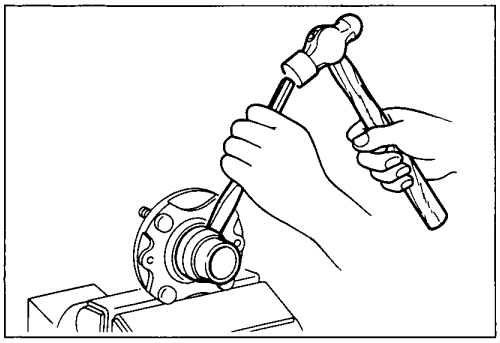
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05U0MX-025

Wheel bearing

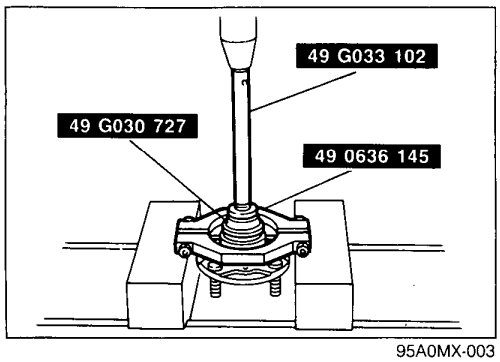
1. Press out the wheel bearing with the **SST**.


95A0MX-002

Note

- **If the bearing inner race remains on the rear wheel hub assembly, remove as follows.**

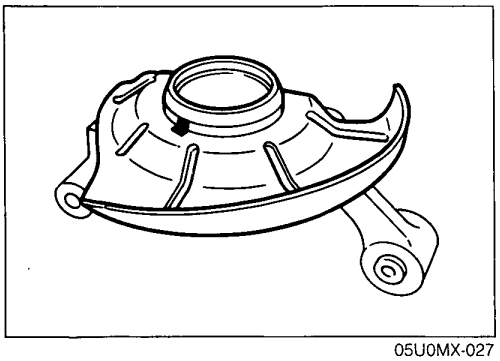
2. Move the bearing inner race away from the rear wheel hub assembly with a chisel.



95A0MX-003

3. Press the bearing inner race off the wheel hub with the **SST**.

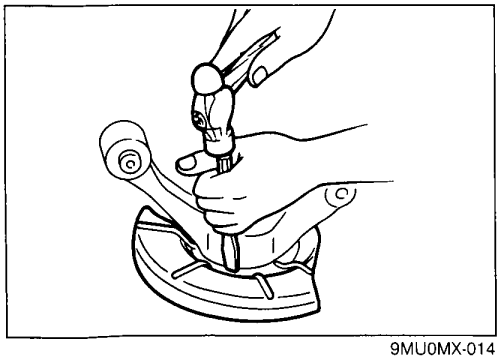
Dust cover


05U0MX-027

Caution

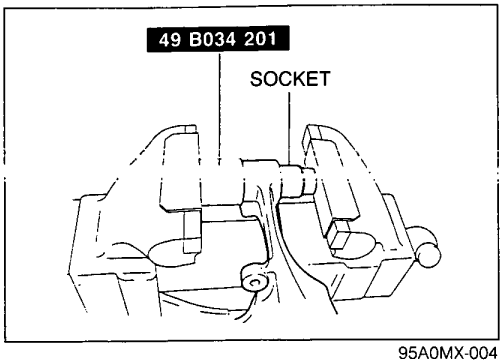
- **Do not remove the dust cover if not necessary.**
- **Do not reuse the removed dust cover.**

1. Mark the dust cover and knuckle for proper reassembly.


9MU0MX-014

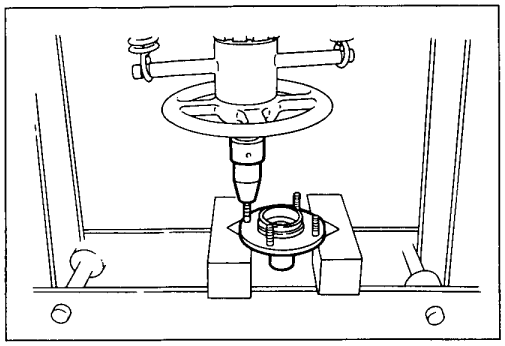
2. Remove the dust cover with a chisel.

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95A0MX-004

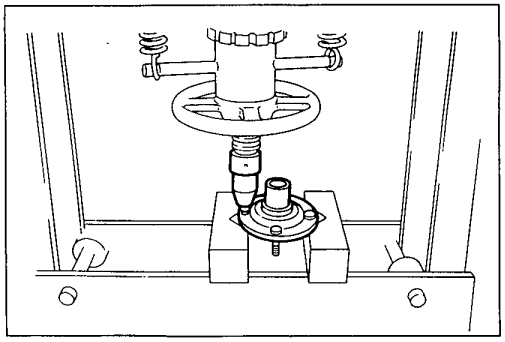
Bushing
1. Press out the bushing with the **SST** and a socket.


05U0MX-028

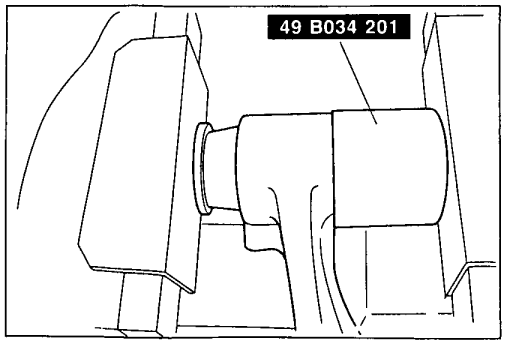
Hub bolt

Caution
- **Do not remove the hub bolts if not necessary.**
- **Do not reuse the removed hub bolts.**

1. Press out the hub bolts.

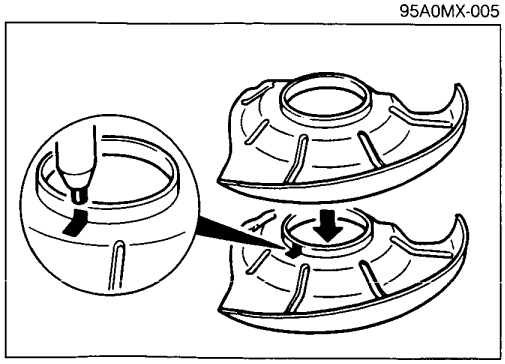

9MU0MX-620

Assembly note
Hub bolt
1. Press in new hub bolts.



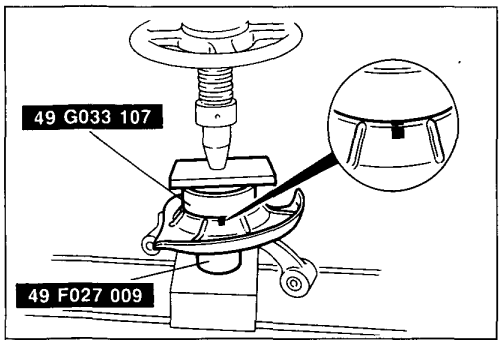
95A0MX-005

Bushing
1. Apply soapy water to the bushing, then press it into the knuckle with the **SST**.


05U0MX-029

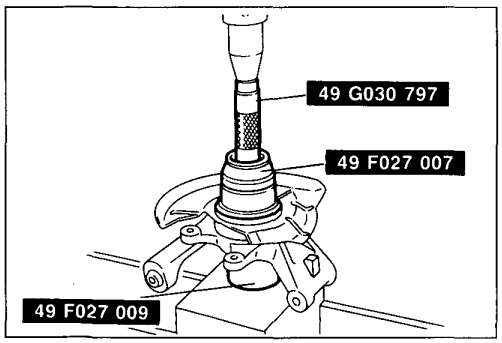
Dust cover
1. Mark the new dust cover as the removed one.

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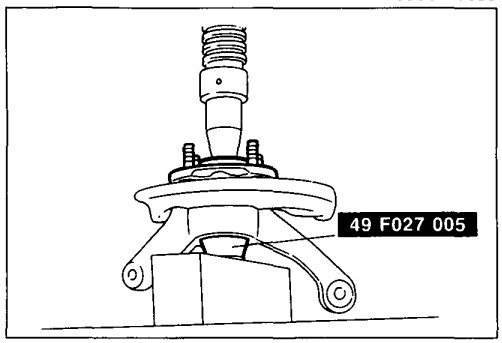
9MU0MX-622

2. Align the marks of the new dust cover and the knuckle.
3. Install the new dust cover with the **SST**.



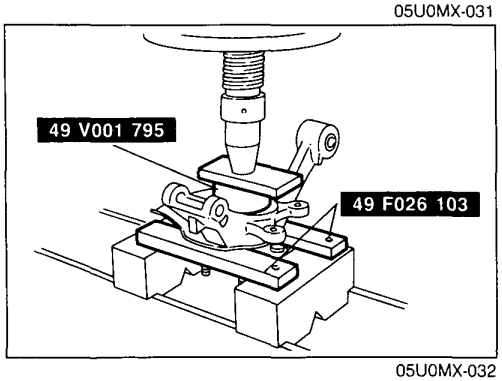
05U0MX-030

Wheel bearing
Press the new wheel bearing into the knuckle with the **SST**.



05U0MX-031

Rear wheel hub assembly
1. Apply grease to the wheel bearing inner race.
2. Press the rear wheel hub assembly in with the **SST**.



05U0MX-032

Oil seal
1. Apply grease to the new oil seal lip.
2. Install the new oil seal with the **SST**.

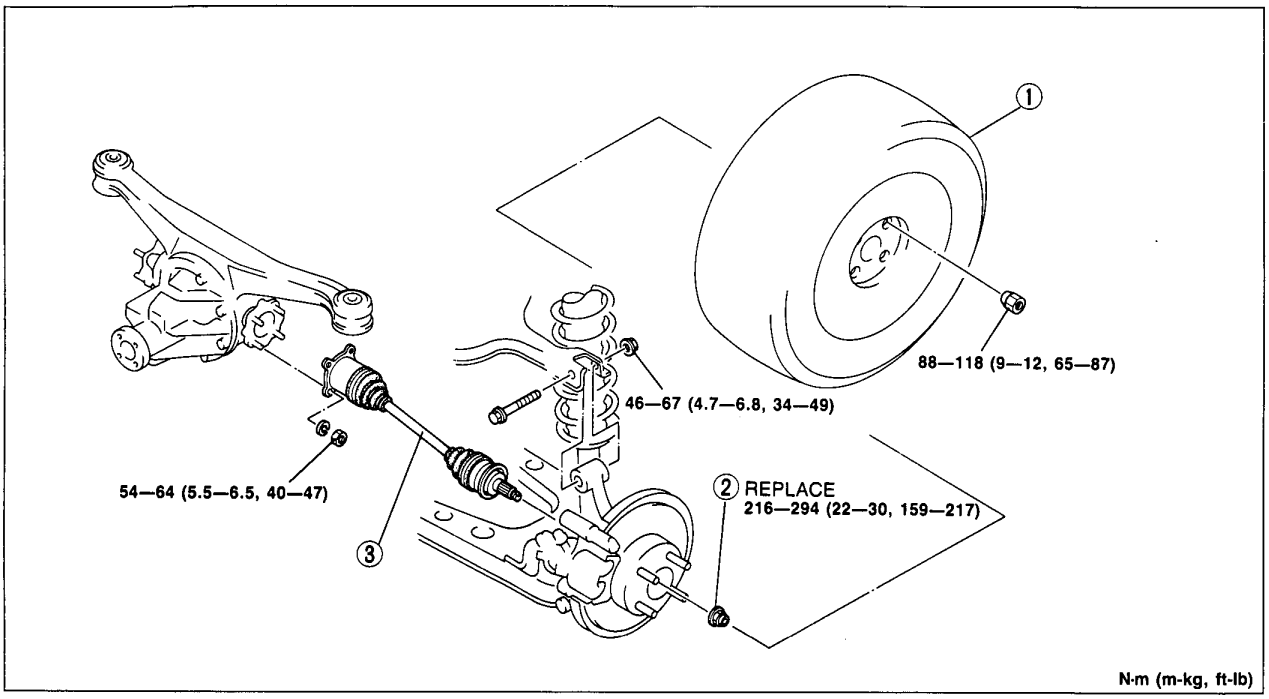
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DRIVESHAFT

DOUBLE OFFSET JOINT

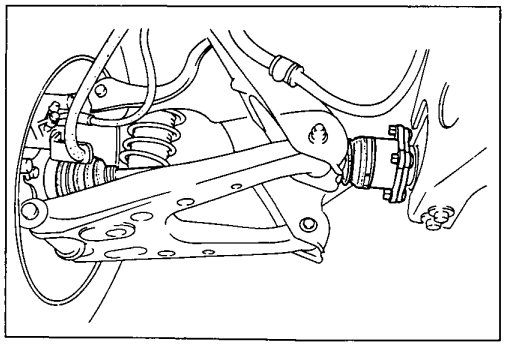
Inspection / Removal / Installation

1. Inspect the driveshaft, referring to **Inspection**.
2. Remove in the order shown in the figure, referring to **Removal Note**.
3. Install in the reverse order of removal, referring to **Installation Note**.
4. After installation, adjust the rear wheel alignment. (Refer to Section R.)

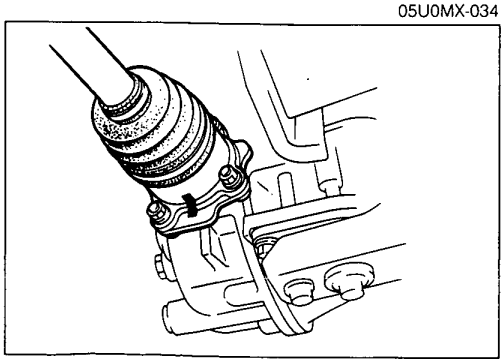


05U0MX-033

1. Rear wheel
2. Locknut
   Installation Note ..... page M–17
3. Driveshaft
   Removal Note ..... page M–16
   Overhaul ..... page M–18



05U0MX-034



05U0MX-035

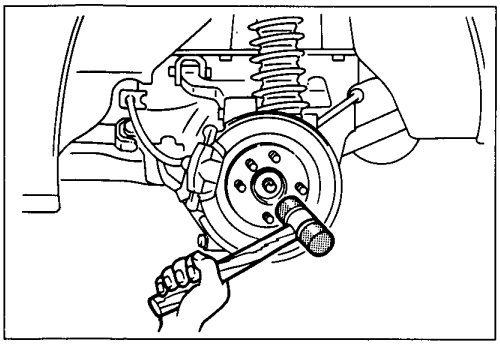
Inspection
Driveshaft

1. Check the dust boot on the driveshaft for cracks, damage, leaking grease, and a loose boot band.
2. Check the driveshaft for bending, cracks, and wear of joints or splines.
3. Repair or replace the driveshaft if necessary.

Removal note
Driveshaft

1. Before removing the driveshaft, mark the driveshaft and output shaft for proper installation.

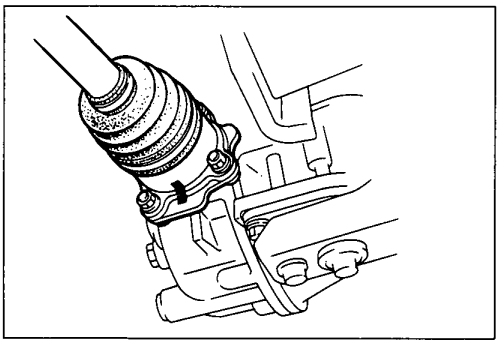
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05U0MX-036

Note

- **If the driveshaft is stuck to the wheel hub, install a used locknut so that it is flush with the end of the shaft, and tap the nut with a plastic hammer.**

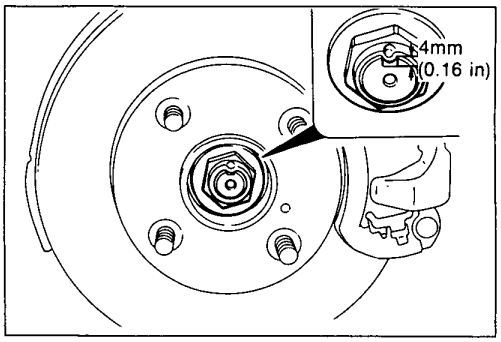


05U0MX-037

Installation note
Driveshaft

1. Align the marks and install the driveshaft.

Tightening torque:
54—64 N·m (5.5—6.5 m-kg, 40—47 ft-lb)



05U0MX-038

Locknut

1. Install a new locknut and stake it.

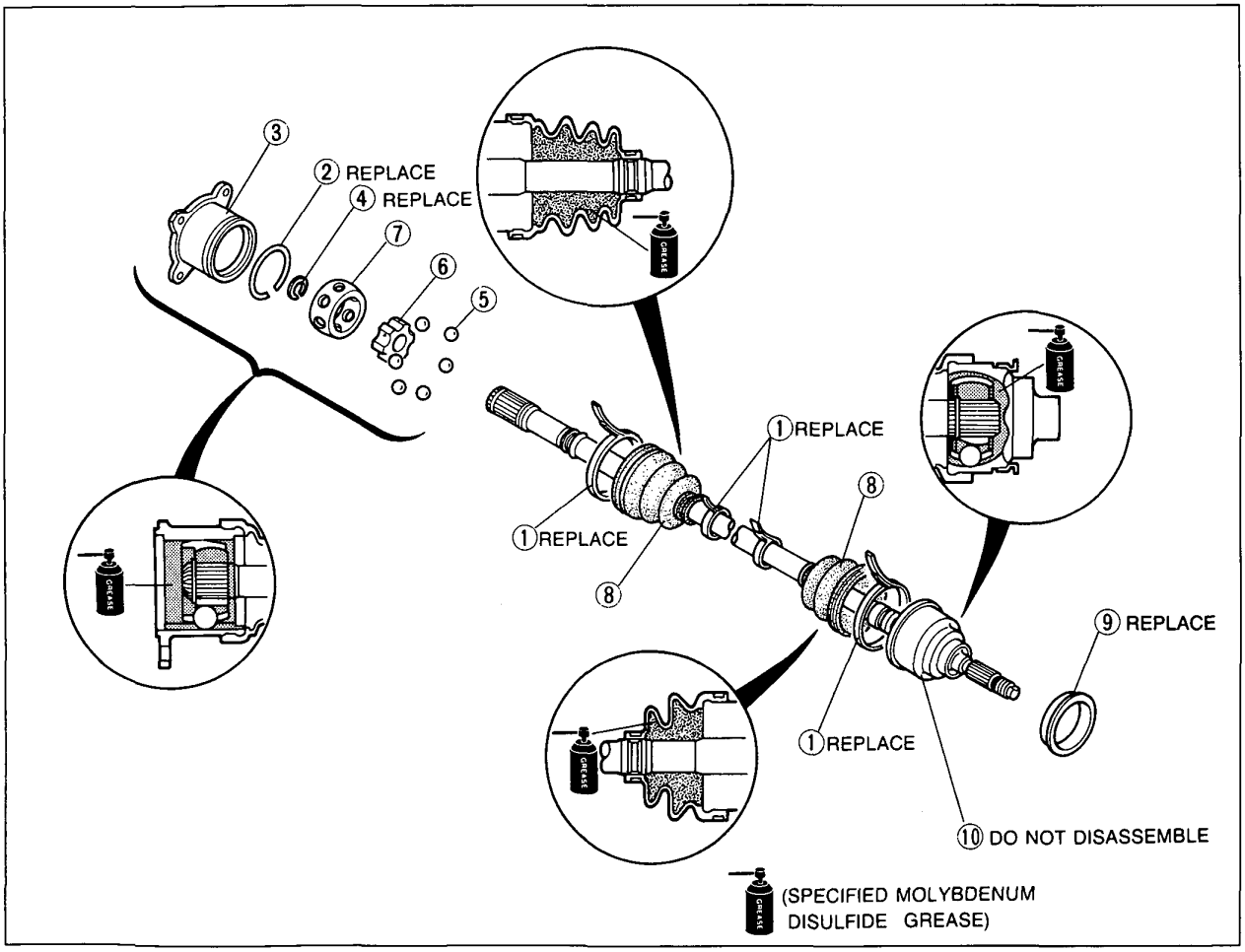
Tightening torque:
216—294 N·m (22—30 m-kg, 159—217 ft-lb)

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Overhaul

Caution
- **Secure the joint in a vise with protective material (such as copper plates) on the vise jaws.**
- **Be careful that dust or other foreign material does not enter the joint while the work is being performed.**
- **Do not disassemble the wheel-side ball joint.**
- **Do not wash the joint unless it is being disassembled.**

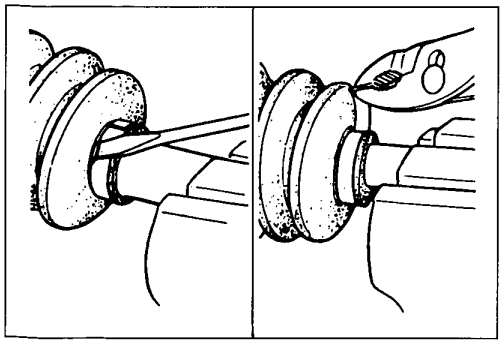
1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Inspect all parts and repair or replace as necessary.
3. Assemble in the reverse order of disassembly, referring to **Assembly Note**.



05U0MX-039

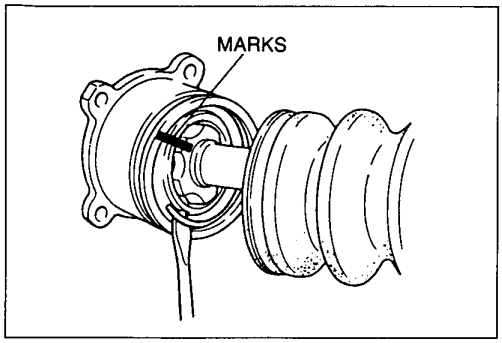
1. Boot bands
   - Disassembly Note ..... page M–19
   - Assembly Note ..... page M–21
2. Clip
   - Disassembly Note ..... page M–19
3. Outer ring
   - Inspect inside bore for wear, corrosion, and scoring
4. Snap ring
   - Disassembly Note ..... page M–19
5. Balls
   - Disassembly Note ..... page M–19
   - Assembly Note ..... page M–20
6. Inner ring
   - Disassembly Note ..... page M–19
   - Assembly Note ..... page M–20
7. Cage
   - Disassembly Note ..... page M–19
   - Assembly Note ..... page M–20
8. Boots
   - Disassembly Note ..... page M–20
   - Assembly Note ..... page M–20
9. Dust cover
10. Shaft and ball joint assembly
    - Inspect splines for damage and wear
    - Inspect wheel-side joint for excessive play and rough rotation

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05U0MX-040

Disassembly note
Boot bands
1. To remove the boot bands, pry up the locking clip with a screwdriver, then raise the end of the band.

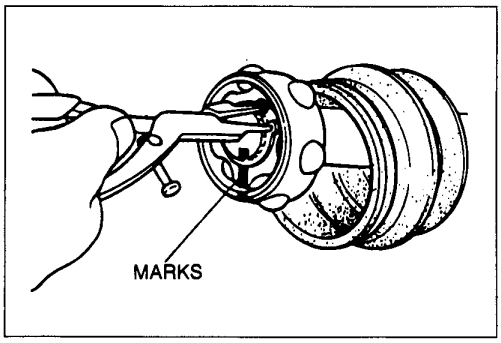


05U0MX-041

Clip

Note
- **Mark with paint; do not use a punch.**

1. Mark the driveshaft and outer ring for proper reassembly.
2. Remove the clip.

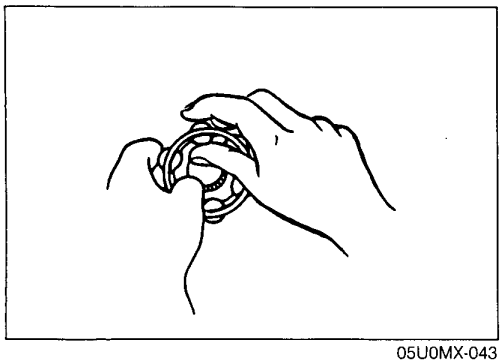


05U0MX-042

Snap ring

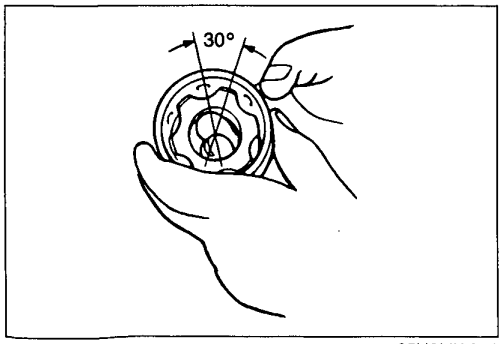
Note
- **Mark with paint; do not use a punch.**

1. Mark the driveshaft end and inner ring.
2. Remove the snap ring with snap ring pliers.



05U0MX-043

Cage, inner ring, and balls
Disassemble in the following order:
1. Insert a screwdriver between the inner ring and cage to remove the balls.

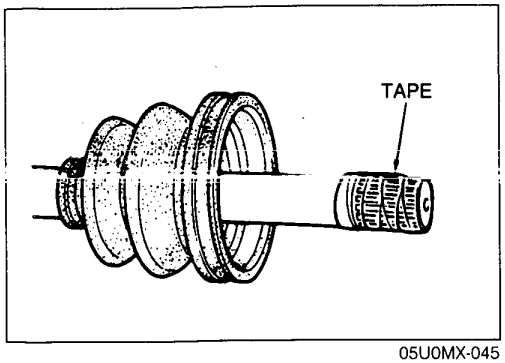


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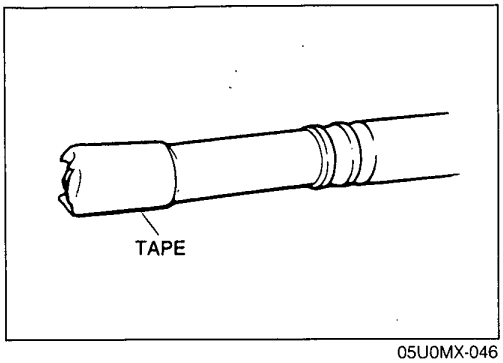
Note
- **Mark with paint; do not use a punch.**

2. Mark the inner ring and cage.
3. Turn the cage approximately 30°, then pull it away from the inner ring.

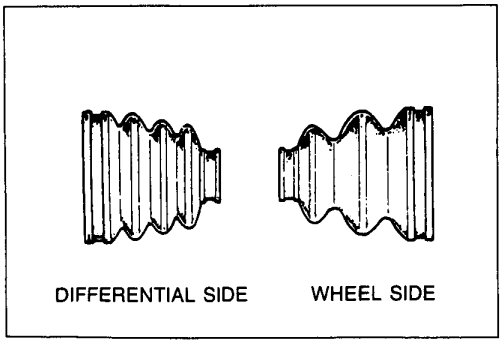
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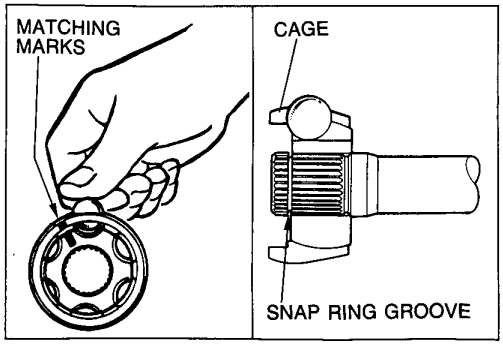
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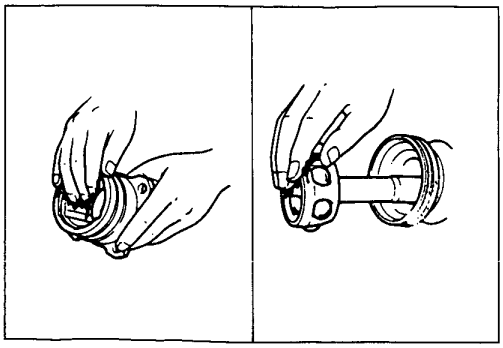
05U0MX-046



05U0MX-047



15U0MX-017



15U0MX-018

Boots

1. Wrap the shaft splines with tape.
2. Remove the boot.

Assembly note

Boots

1. Before putting the boot onto the shaft, wrap the shaft splines with tape.

Note

- **The shape of the ball-joint boots at the wheel side and the differential side differ; be careful not to install them incorrectly.**

Outer diameter of large boot end

Diffrential side: 87.4mm (3.441 in)
Wheel side : 90.8mm (3.575 in)

Cage, inner ring, and balls

1. Align the marks and install the balls to the inner ring.

Caution

- **Install the cage with the larger diameter facing the snap ring groove. If reversely installed wrongly, the driveshaft may become disengaged.**

2. Install the cage, inner ring, and ball assembly to the driveshaft in the direction shown in the figure.
3. Install a new snap ring in the driveshaft snap ring groove.

Caution

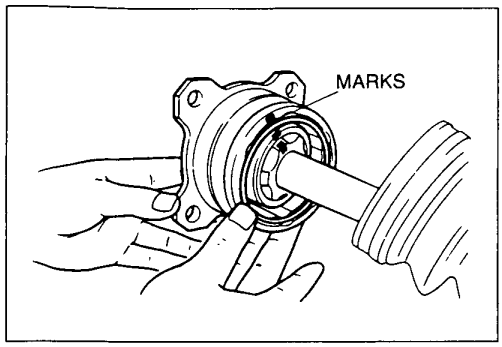
- **Do not use any other than the specified grease.**

4. Apply the specified grease **(molybdenum disulfide)** to the joints and boots.

Total quantity

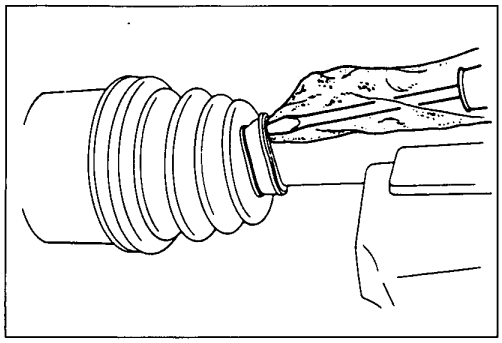
Differential side: 75—95 g (2.65—3.35 oz)
Wheel side : 55—75 g (1.94—2.65 oz)

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05U0MX-050

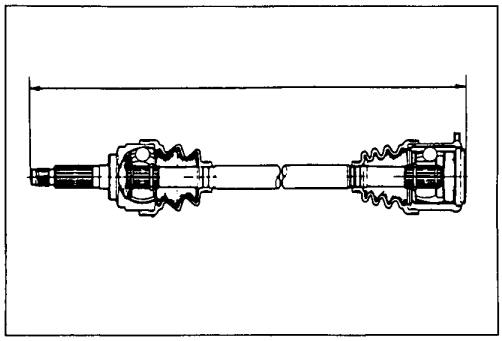
3. Align the marks, then install a new clip.


05U0MX-051

Boot bands

Caution
- **Be sure the boot is not dented or twisted.**
- **Carefully lift up the small end of the boot to release any trapped air.**

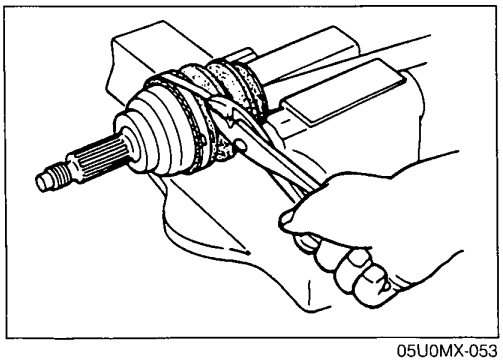
1. Set the boots onto the rings.


05U0MX-052

2. Measure the driveshaft length.
   If not within specification, return to Step 1.

Standard length:659.7—669.7mm (25.972—26.366 in)

Note
- **Standard length (On-vehicle): 659.3mm (25.957 in)**


05U0MX-053

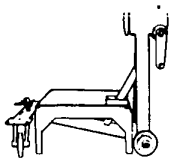
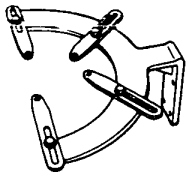
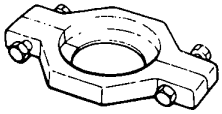
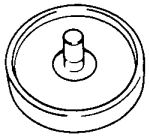
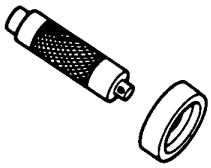
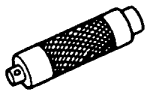
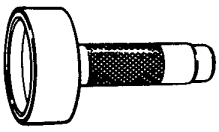
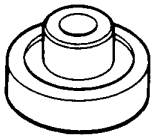
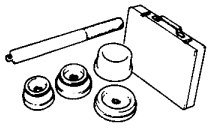
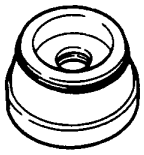
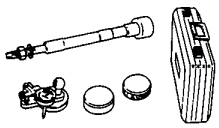
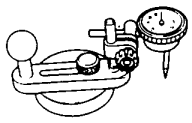
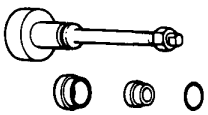
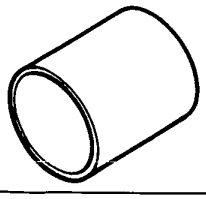
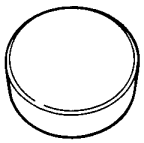
Note
- **Always use a new band.**
- **The band should be folded in the direction opposite the forward revolving direction of the driveshaft.**

3. Fold the band back by pulling on the end of it with pliers.
4. Lock the end of the band by bending the locking clips.

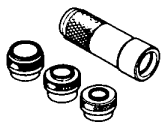
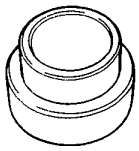
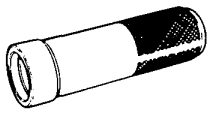
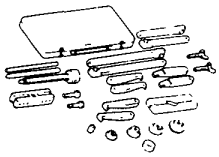
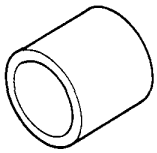
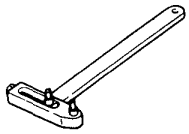
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DIFFERENTIAL

PREPARATION
SST

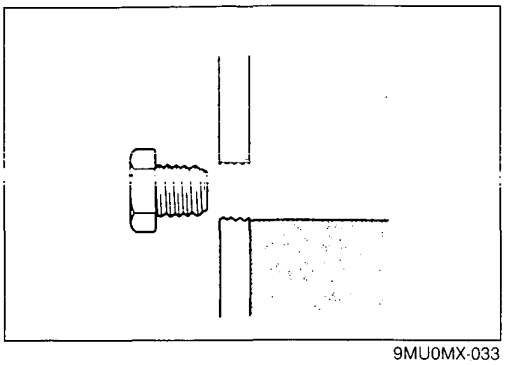
49 0107 680A Engine stand 	For disassembly and assembly of differential	49 M005 561 Hanger, differential carrier 	For disassembly and assembly of differential
49 0636 145 Puller, fan pulley boss 	For removal of bearing inner race (side bearing)	49 N034 213 Installer, rubber bushing 	For installation of differential mounting rubber
49 G030 795 Installer, oil seal 	For installation of oil seal	49 G030 797 Handle (Part of 49 G030 795) 	For installation of bearing outer race
49 B001 795 Installer, oil seal 	For installation of oil seal (output shaft)	49 H033 101 Remover, bearing 	For installation of bearing outer race (front bearing)
49 F027 0A1 Installer set, bearing 	For installation of bearing	49 F027 005 Attachment ϕ62 (Part of 49 F027 0A1) 	For installation of bearing outer race (rear bearing)
49 F027 0A0 Gauge set, pinion height adjustment 	For adjustment of pinion height	49 0727 570 Gauge body, pinion height (Part of 49 F027 0A0) 	For adjustment of pinion height
49 8531 565 Pinion model 	For adjustment of pinion height	49 8531 567 Collar A (Part of 49 8531 565) 	For adjustment of pinion height
49 H027 001 Collar 	For adjustment of pinion height	49 N027 001 Gauge block 	For adjustment of pinion height

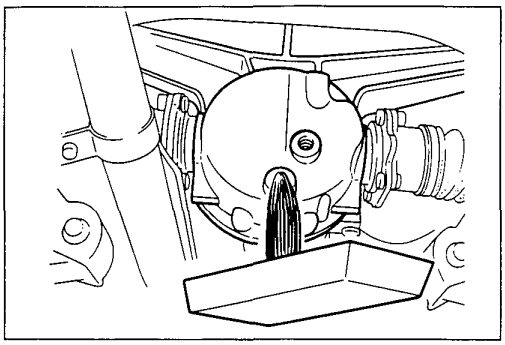
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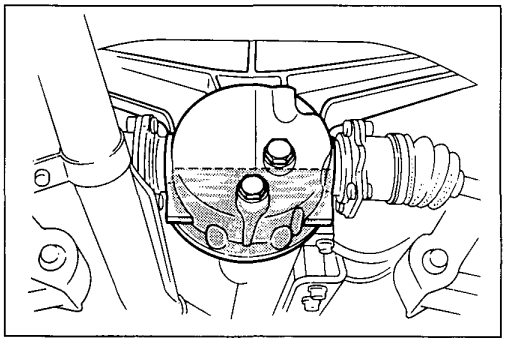
49 D017 2A1 Installer set, bearing 	For installation of bearing	49 F401 336B Attachment B (Part of 49 D017 2A1) 	For installation of bearing inner race (rear bearing)
49 F401 331 Body (Part of 49 D017 2A1) 	For installation of bearing inner race (rear bearing)	49 F401 337A Attachment C (Part of 49 D017 2A1) 	For installation of bearing inner race (side bearing)
49 S120 710 Holder, coupling flange 	For removal and installation of companion flange	49 0839 425C Puller set, bearing 	For removal and installation of companion flange
49 U027 003 Installer, oil seal 	For installation of oil seal (*companion* flange)	49 0259 720 Wrench, *differential side* bearing adjusting nut 	For adjustment of drive pinion and ring gear backlash

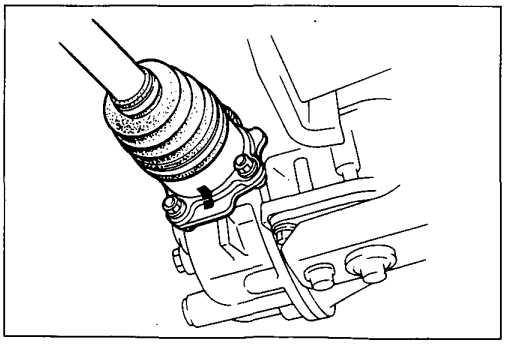
05U0MX-054

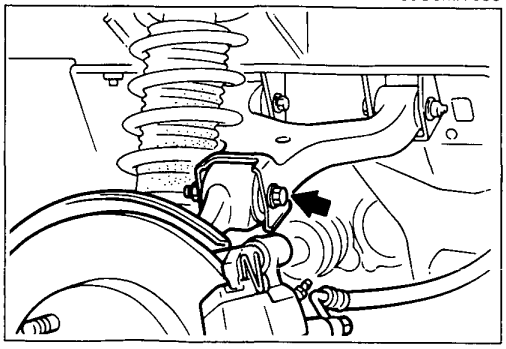
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9MU0MX-033


97U0MX-048


05U0MX-055


05U0MX-056


05U0MX-057

DIFFERENTIAL OIL

Inspection

1. Remove the filler plug.
2. Verify that the oil is at the bottom of the filler plug hole. If it is low, add the specified oil.
3. Install the filler plug.

Tightening torque:
39—54 N·m (4.0—5.5 m-kg, 29—40 ft-lb)

Replacement

1. Remove the filler and drain plugs.
2. Drain the differential oil into a suitable container.
3. Wipe the plugs clean.
4. Install the drain plug and washer.

Tightening torque:
39—54 N·m (4.0—5.5 m-kg, 29—40 ft-lb)

5. Add the specified oil from the filler plug until the level reaches the bottom of the plug hole.

Specified oil
Type:
Above −18°C (0°F): API GL-5, SAE 90
Below −18°C (0°F): API GL-5, SAE 80W
Capacity: 0.65 liter (0.69 US qt, 0.57 Imp qt)

6. Install the filler plug.

Tightening torque:
39—54 N·m (4.0—5.5 m-kg, 29—40 ft-lb)

OIL SEAL (OUTPUT SHAFT)

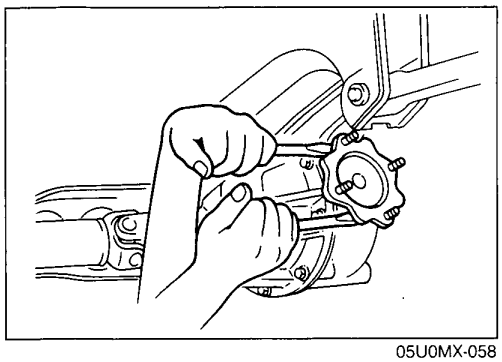
Replacement

1. Jack up the vehicle and support it with safety stands.
2. Drain the differential gear oil.

Note
- **Mark the driveshaft and output shaft flanges for proper reassembly.**

3. Remove the upper arm installation bolt and nut.

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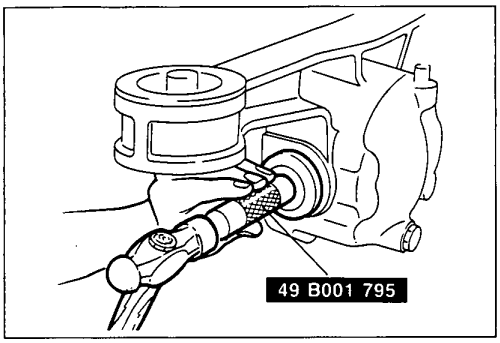


05U0MX-058

4. Separate the driveshaft from the differential and suspend it.

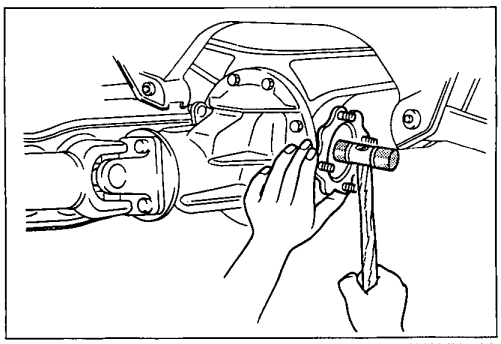
Note
- **Use caution during the removal operation, because the shaft may suddenly drop.**

5. Remove the output shaft with two pry bars as shown in the figure.
6. Remove the oil seal.



05U0MX-059

7. Apply lithium-based grease to the new oil seal lip and install it with the **SST**.

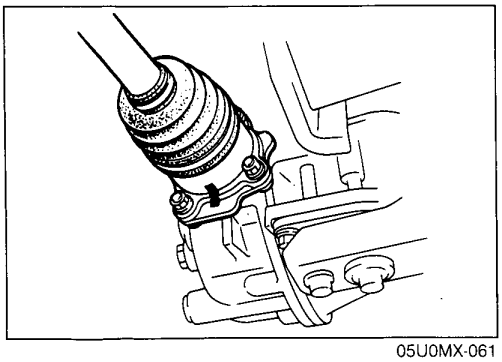


05U0MX-060

8. Install the new clips.

Caution
- **With viscous L.S.D., the right output shaft is longer than the left shaft.**

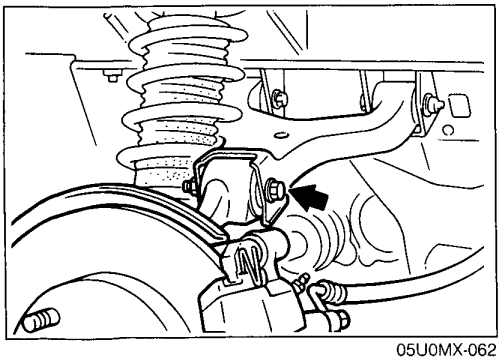
9. Install the output shaft into the side gears by lightly tapping with a plastic hammer.
10. Verify that the output shaft is hooked into the side gears by pulling it by hand.



05U0MX-061

11. Align the marks and install the driveshaft.

Tightening torque:
54—64 N·m (5.5—6.5 m-kg, 40—47 ft-lb)



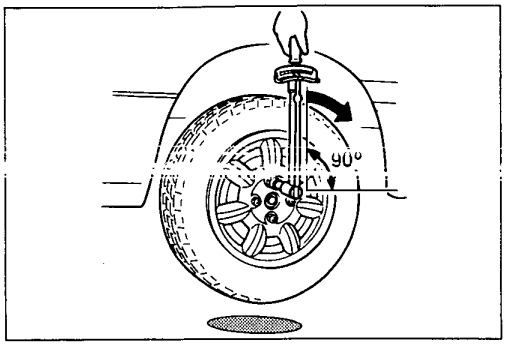
05U0MX-062

12. Install the upper arm installation bolt and nut.

Tightening torque:
46—67 N·m (4.7—6.8 m-kg, 34—49 ft-lb)

13. Add the specified oil.
14. Adjust the rear wheel alignment. (Refer to Section R.)

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05U0MX-063

OPERATION INSPECTION

Viscous Limited Slip Differential

1. Turn off the engine and shift the transmission into reverse.
2. Block the front wheels with wheel chocks.
3. Jack up the rear wheels and support the vehicle with safety stands.
4. Release the parking brake.
5. Using a torque wrench on a wheel lug nut, measure the time it takes to turn the wheel **90°** while applying the specified torque.

   Specified torque: 15 N·m (1.5 m-kg, 11 ft-lb)
   Specified time: 4.0 sec. min.

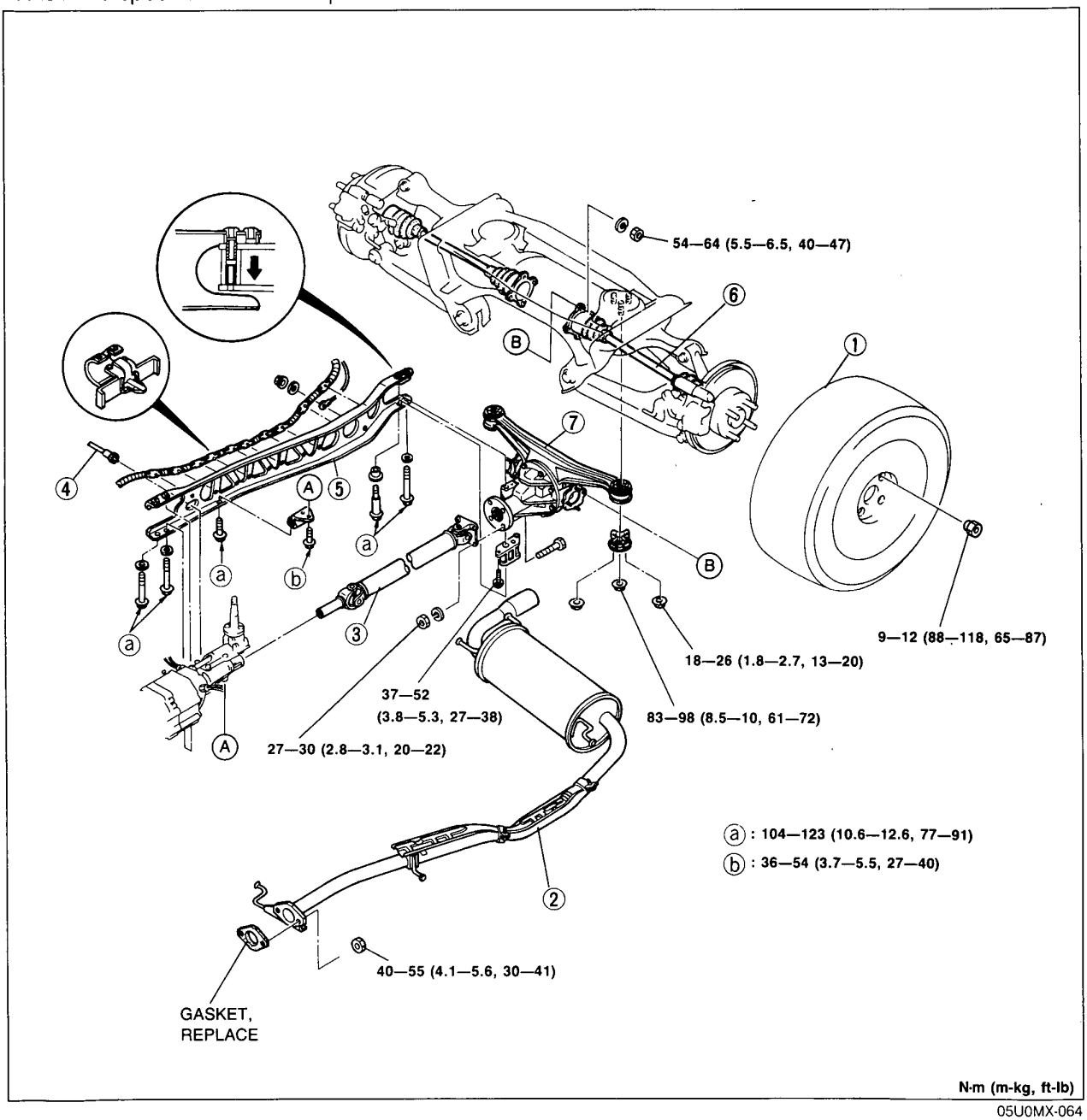
6. If not as specified, replace the viscous limited slip differential and fill the differential with new specified oil. (Refer to pages M–24, 32.)

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DIFFERENTIAL, STANDARD; DIFFERENTIAL, VISCOUS LIMITED SLIP (VISCOUS L.S.D.)

Removal / Installation

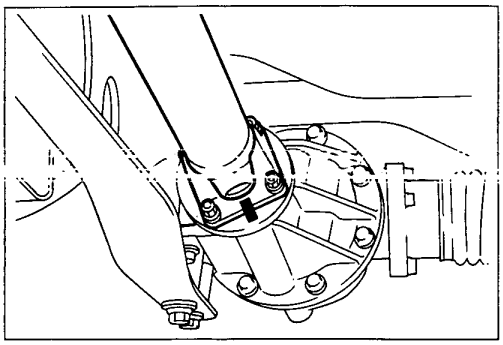
1. Drain the differential oil.
2. Remove in the order shown in the figure, referring to **Removal Note**.
3. Install in the reverse order of removal, referring to **Installation Note**.
4. Add the specified oil to the specified level.



05U0MX-064

1. Rear wheel
2. Exhaust pipe
3. Propeller shaft
   - Removal Note ..... page M–28
   - Installation Note ..... page M–31
4. Speedometer cable
5. Power plant frame (PPF)
   - Removal Note ..... page M–28
   - Installation Note ..... page M–30
6. Driveshaft
   - Removal Note ..... page M–29
7. Differential
   - Removal Note ..... page M–29
   - Installation Note ..... page M–30
   - Overhaul ..... page M–32

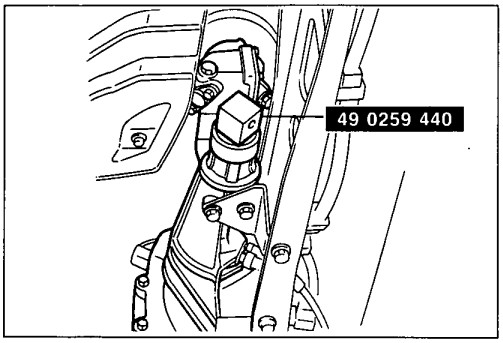
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05U0MX-065

Removal note
Propeller shaft

1. Before removing the propeller shaft, mark the flanges for correct installation.

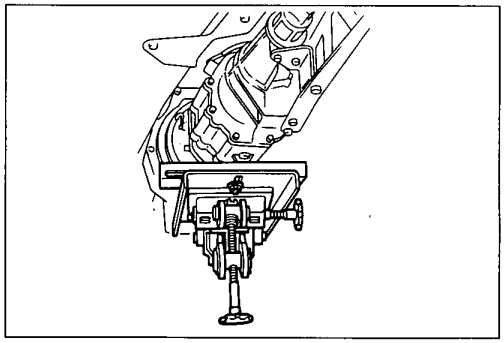


05U0MX-066

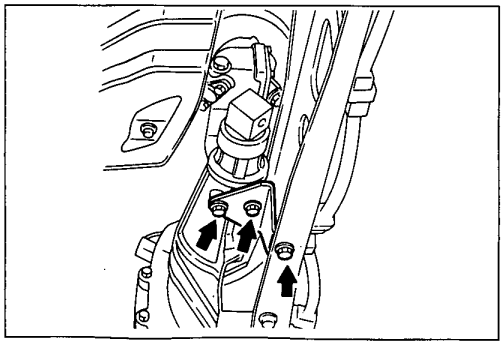
2. When the propeller shaft is removed from the extension housing, immediately install the **SST** to prevent oil leakage.

Power plant frame (PPF)

1. Disconnect the wire harness from the PPF.
2. Support the transmission with a jack.

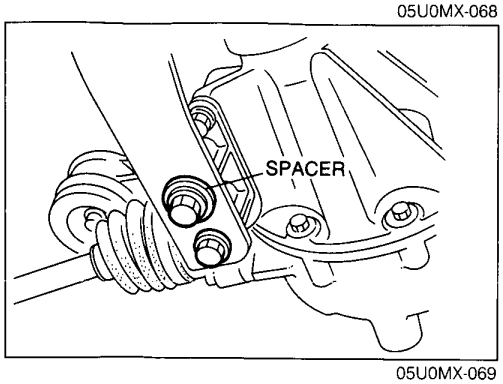


05U0MX-067



05U0MX-068

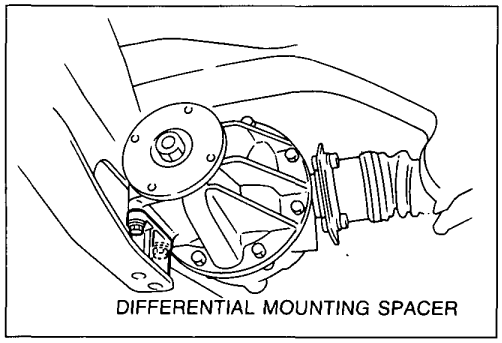
3. Remove the power plant frame bracket.



05U0MX-069

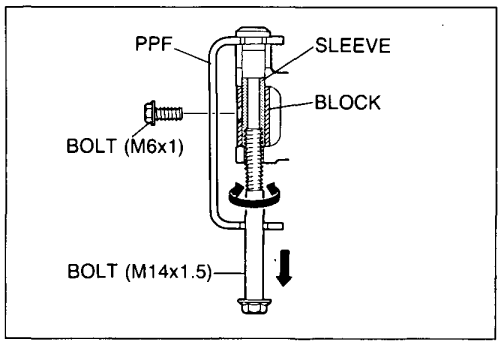
4. Remove the differential-side bolts, and pry out the spacer.

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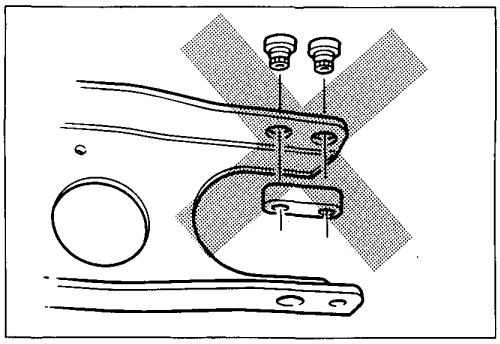
05U0MX-125

5. Remove the differential mounting spacer.



05U0MX-070

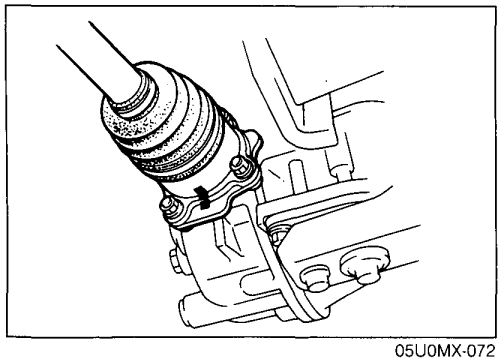
6. Turn a bolt (M14x1.5) into the sleeve.
7. Twist and pull the bolt downward.
8. Install a bolt (M6x1) into the hole in the block to hold the sleeve, and remove the long bolt (M14x1.5).
9. Remove the bolt (M6x1).



05U0MX-071

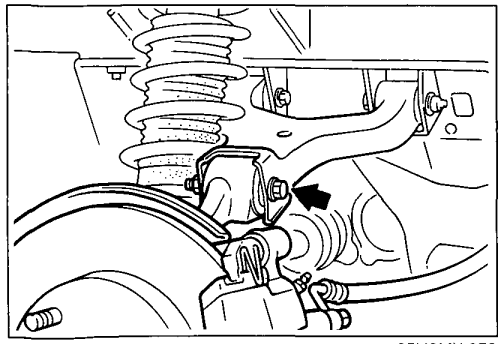
Caution
- **Do not remove the spacers shown in the figure from the PPF.**
- **If they are removed, repalce the PPF as an assembly.**

10. Remove the transmission-side bolts, and remove the PPF.



05U0MX-072

Driveshaft
1. Mark the driveshaft and output shaft for proper installation.



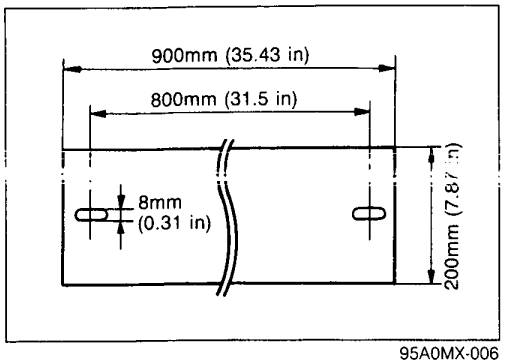
05U0MX-073

Differential
1. Support the differential with a jack.
2. Down and move it forward.

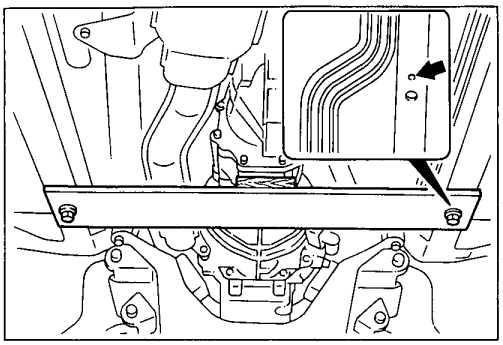
Note
- **If it is difficult to separate the driveshaft from the output shaft, remove one side upper arm installation bolt and nut.**

3. Separate the driveshaft from the output shaft.

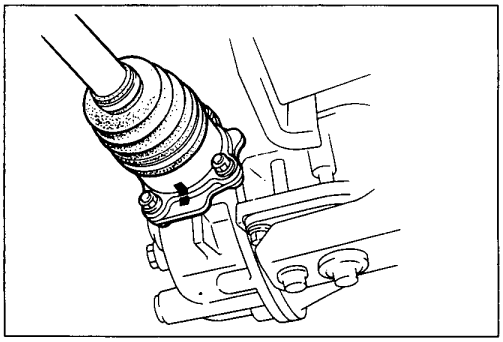
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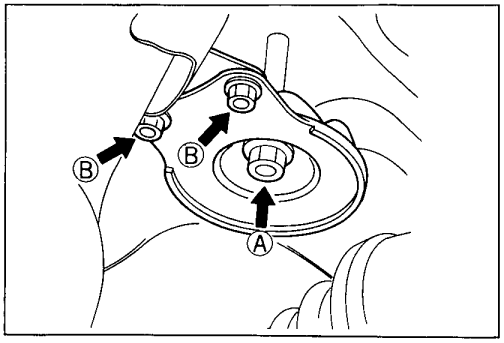
95A0MX-006



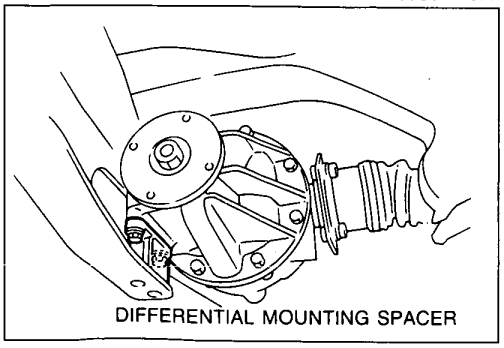
95A0MX-007



05U0MX-076



05U0MX-077



05U0MX-078

Note

- **After removing the differential, support the transmission as follows to prevent damaging the fire wall, crank angle sensor, and engine mount.**

4. Prepare a steel plate as shown in the figure, a wooden block, bolts (8x1.25mm), and washers.

5. Install the parts as shown in the figure.

Installation note
Differential

1. Connect the driveshaft to the output shaft with the marks aligned.

2. Install the differential.

Tightening torque
Ⓐ: 83—98 N·m (8.5—10 m-kg, 61—72 ft-lb)
Ⓑ: 18—26 N·m (1.8—2.7 m-kg, 13—20 ft-lb)

Caution

- **Adjust the rear wheel alignment after installation, if the upper arm installation bolt and nut are removed. (Refer to Section R.)**

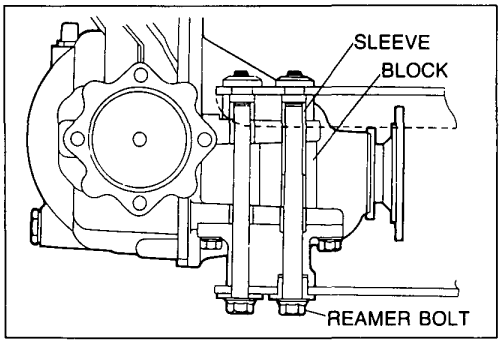
Power plant frame (PPF)

1. Install the differential mounting spacer.

Tightening torque:
37—52 N·m (3.8—5.3 m-kg, 27—38 ft-lb)

2. Support the transmission with a jack so that it is level.
3. Position the PPF and snugly tighten the transmission-side bolts by hand.

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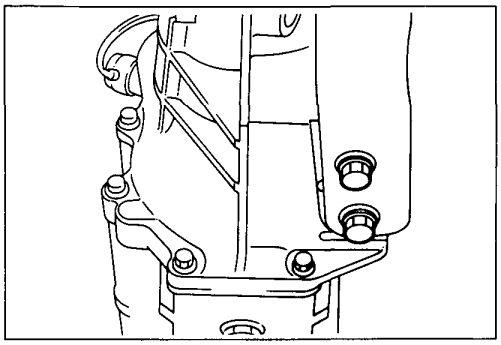


05U0MX-079

4. Verify that the sleeve is installed into the block.

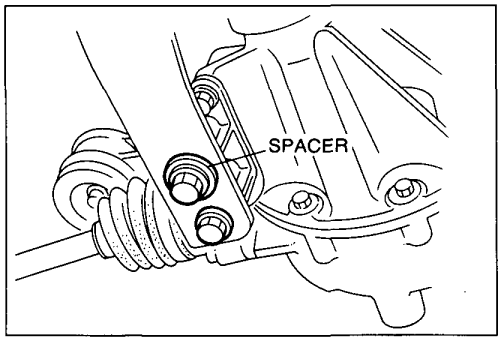
Note
- **The reamer bolt is installed in the forward hole.**

5. Install the spacer and bolts and snugly tighten them.


05U0MX-080

6. Snugly install the power plant frame bracket.
7. Tighten the transmission-side bolts.

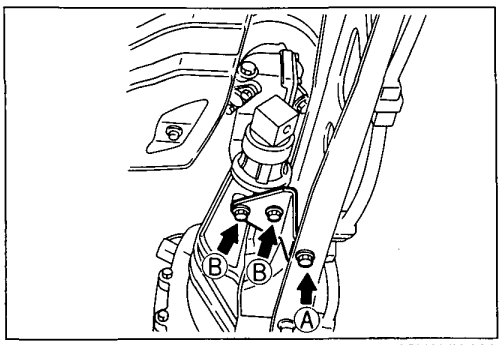
Tightening torque:
104—123 N·m (10.6—12.6 m-kg, 77—91 ft-lb)



05U0MX-081

8. Tighten the differential-side bolts.

Tightening torque:
104—123 N·m (10.6—12.6 m-kg, 77—91 ft-lb)

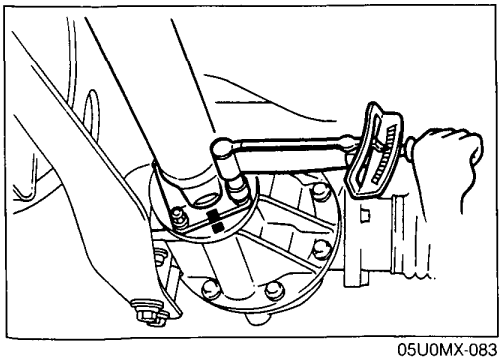


05U0MX-082

9. Install the power plant frame bracket.

Tightening torque
Ⓐ: 104—123 N·m (10.6—12.6 m-kg, 77—91 ft-lb)
Ⓑ: 36—54 N·m (3.7—5.5 m-kg, 27—40 ft-lb)

10. Remove the jack, and connect the wire harness.


05U0MX-083

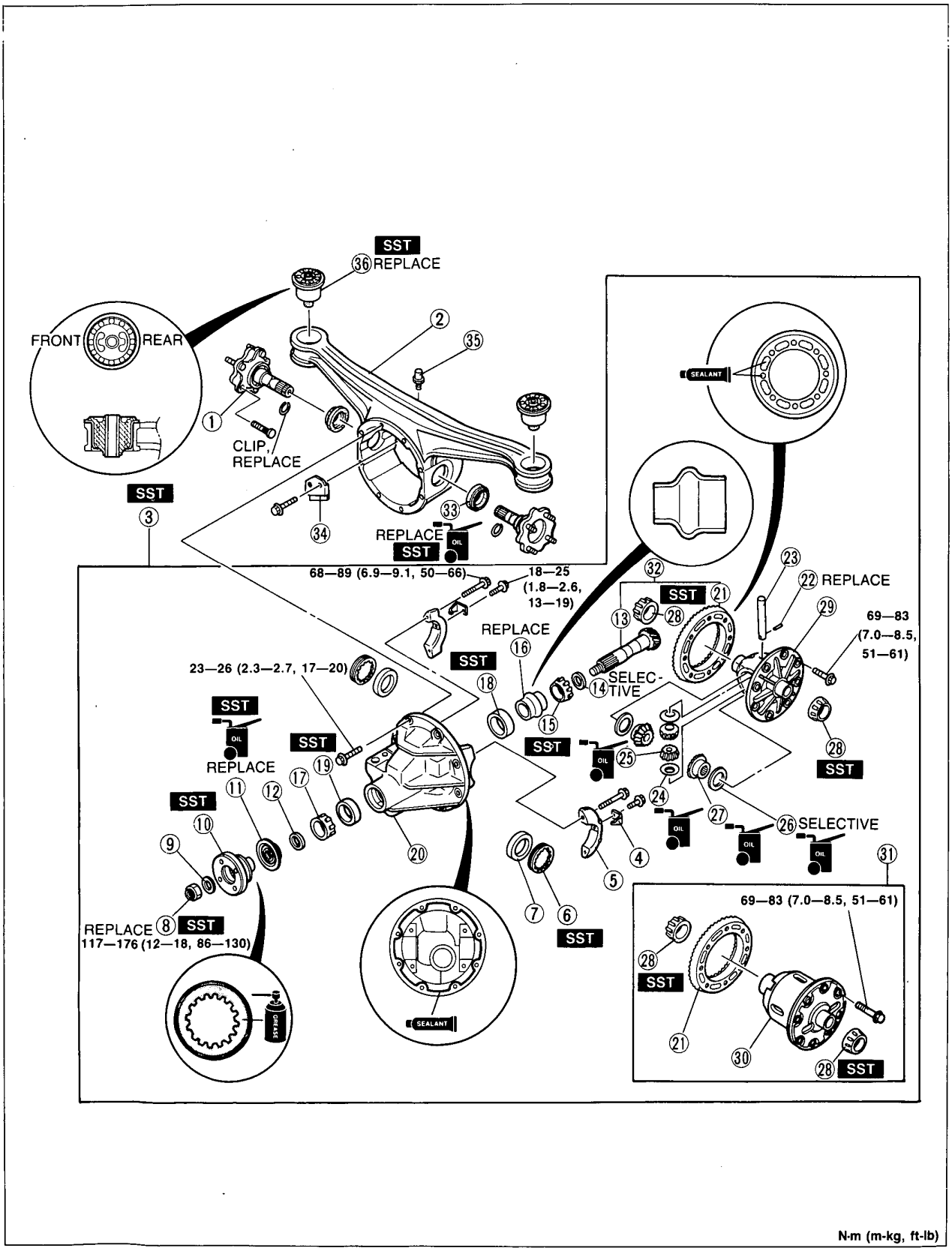
Propeller shaft
1. Remove the **SST**.
2. Align the marks, and install the propeller shaft.

Tightening torque:
27—30 N·m (2.8—3.1 m-kg, 20—22 ft-lb)

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Overhaul

1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Inspect all parts and repair or replace as necessary.
3. Assemble in the reverse order of disassembly, referring to **Assembly Note**.



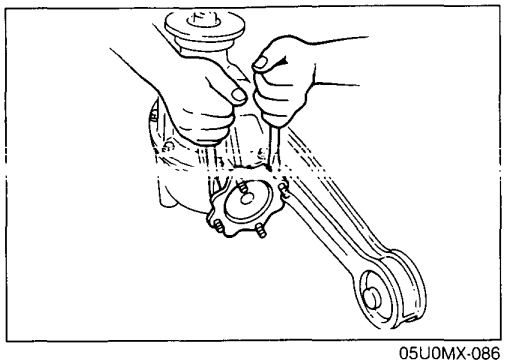
05U0MX-084

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1. Output shafts
   - Disassembly Note ..... page M–34
   - Assembly Note ..... page M–43
2. Differential case
   - Disassembly Note ..... page M–34
   - Assembly Note ..... page M–42
3. Differential gear assembly
   - Disassembly Note ..... page M–34
4. Lock plates
   - Assembly Note ..... page M–42
5. Bearing caps
   - Disassembly Note ..... page M–34
   - Assembly Note ..... page M–42
6. Adjusting nuts
   - Disassembly Note ..... page M–34
   - Assembly Note ..... page M–40
7. Bearing outer races (Side bearing)
8. Locknut (Companion flange)
   - Disassembly Note ..... page M–34
   - Assembly Note ..... page M–38
9. Washer
10. Companion flange
    - Disassembly Note ..... page M–34
    - Inspect splines for wear and damage
    - Assembly Note ..... page M–38
11. Oil seal (Companion flange)
    - Assembly Note ..... page M–38
12. Washer
13. Drive pinion
    - Disassembly Note ..... page M–35
    - Inspect splines for wear and damage
    - Inspect individual gear teeth for wear and cracks
14. Spacer
    - Assembly Note ..... page M–36
15. Bearing inner race (Front bearing)
    - Inspect for damage and rough rotation
16. Collapsible spacer
17. Bearing inner race (Rear bearing)
    - Disassembly Note ..... page M–35
    - Inspect for damage and rough rotation
    - Assembly Note ..... page M–38
18. Bearing outer race (Rear bearing)
    - Disassembly Note ..... page M–35
    - Assembly Note ..... page M–36
19. Bearing outer race (Front bearing)
    - Disassembly Note ..... page M–35
    - Assembly Note ..... page M–36
20. Differential carrier
21. Ring gear
    - Inspect individual gear teeth for wear and cracks
    - Assembly Note ..... page M–40
22. Roll pin (Standard)
    - Disassembly Note ..... page M–35
    - Assembly Note ..... page M–40
23. Pinion shaft (Standard)
24. Thrust washers (Standard)
25. Pinion gears (Standard)
    - Inspect individual gear teeth for wear and cracks
26. Thrust washers (Standard)
    - Assembly Note ..... page M–40
27. Side gears (Standard)
    - Inspect individual gear teeth for wear and cracks
28. Bearing inner races (Side bearing)
    - Disassembly Note ..... page M–35
    - Inspect for damage and rough rotation
    - Assembly Note ..... page M–40
29. Gear case (Standard)
30. Gear case (Viscous L.S.D.)
31. Viscous L.S.D.
32. Final gear set
33. Oil seal (Output shaft)
    - On-vehicle replacement ..... page M–24
    - Assembly Note ..... page M–36
34. Baffle
35. Breather
36. Differential mounting rubber
    - Disassembly Note ..... page M–36
    - Assembly Note ..... page M–36

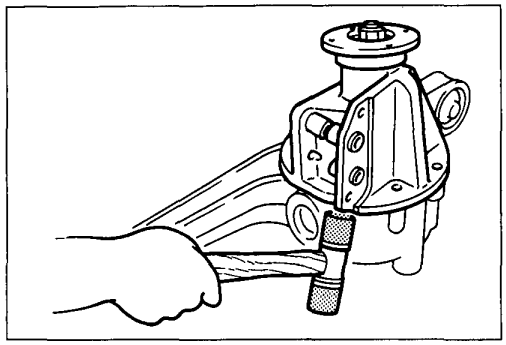
05U0MX-085

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05U0MX-086

Disassembly note
Output shafts
1. Remove the output shafts with two pry bars as shown in the figure.

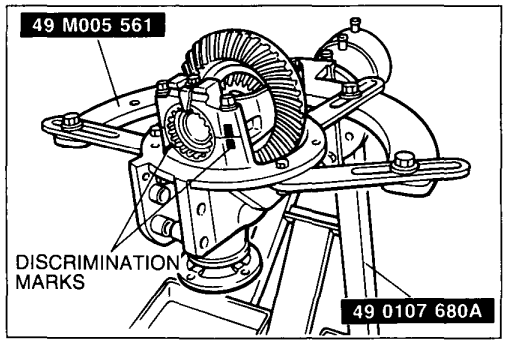


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Differential case

Caution
- **Do not strike the aluminum alloy differential case.**

1. Strike the differential carrier with a copper hammer to separate it from the case.

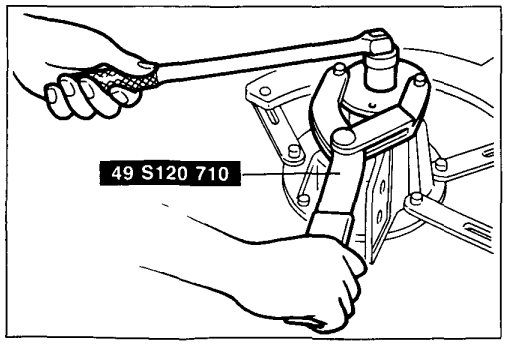


05U0MX-088

Differential gear assembly
1. Mount the differential gear assembly on the **SST**.

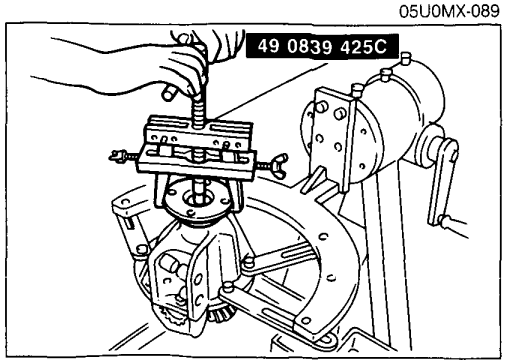
Bearing caps
1. Mark one bearing cap and the carrier.

Adjuting nuts
1. Mark one adjusting nuts and the carrier.



05U0MX-089

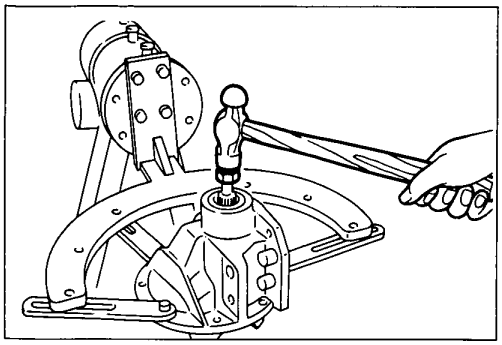
Locknut (Companion flange)
1. Hold the companion flange with the **SST** and remove the locknut.



05U0MX-090

Companion flange
1. Pull the companion flange off with the **SST**.

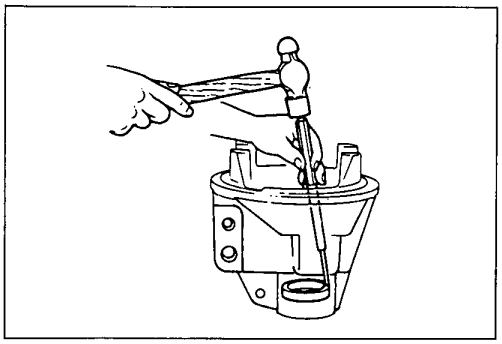
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05U0MX-091

Drive pinion

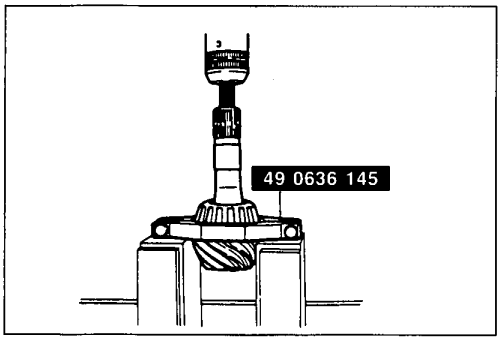
1. Push out the drive pinion by attaching a miscellaneous locknut to the drive pinion, and tapping it with a copper hammer.



05U0MX-092

Bearing outer races (Front, and rear bearing)

1. Remove the bearing outer races using the two grooves in the carrier and alternately tapping the sides of the races.

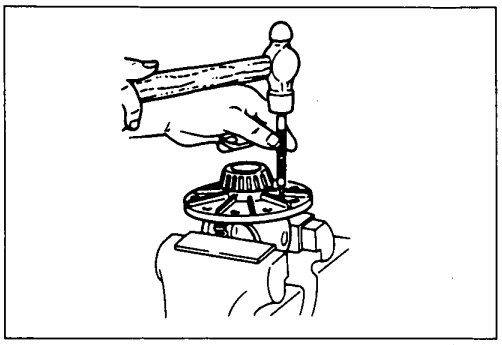


05U0MX-093

Bearing inner race (Rear bearing)

Note
- **Support the drive pinion by hand so that it will not fall.**

1. Remove the bearing inner race (rear bearing) with the **SST**.

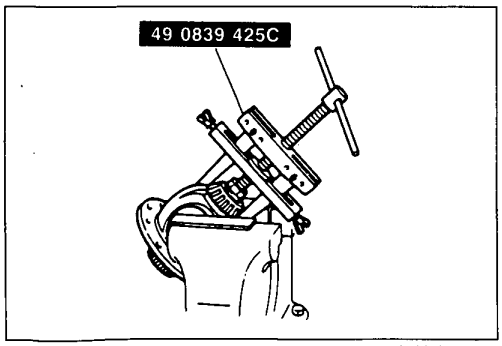


05U0MX-094

Roll pin

Note
- **Use protective plates in the vise.**
- **Tap out toward the ring gear side.**

1. Secure the gear case in a vise and remove the roll pin.



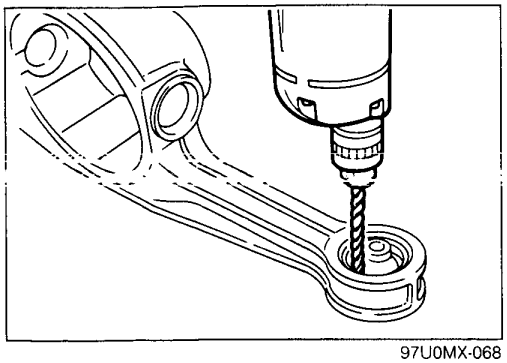
05U0MX-095

Bearing inner races (Side bearing)

Note
- **Use protective plates in the vise.**
- **Identify the bearings so that they can later be reinstalled in the same position.**

1. Remove the bearing inner races (side bearing) from the gear case with the **SST**.

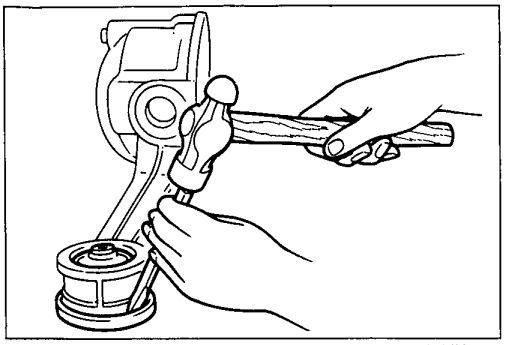
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97U0MX-068

Differential mounting rubber

1. Drill holes around the differential mounting rubber.

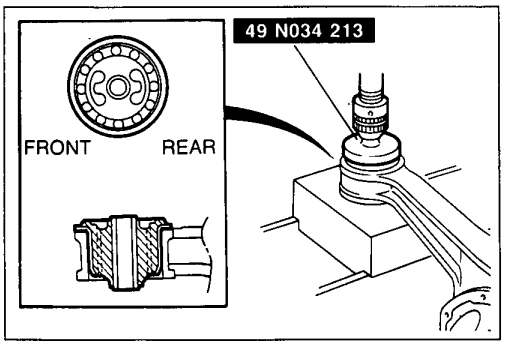


97U0MX-069

Note

- **Use a new mounting rubber when reassembling.**

2. Hit the edge of the differential mounting rubber to remove it.



05U0MX-096

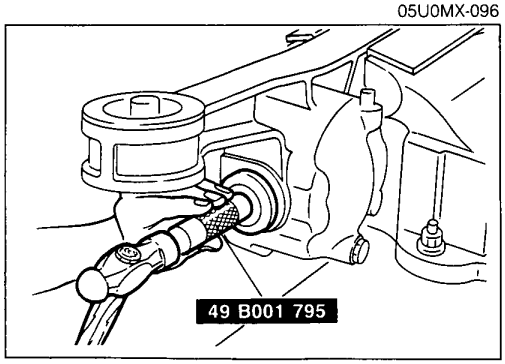
Assembly note
Differential mounting rubber

Note

- **Install the mounting rubber with the voids facing fore and aft.**

1. Press in the new differential mounting rubber with the **SST**.

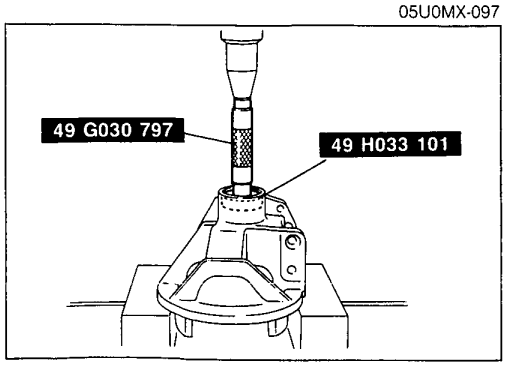
Press force: 2,000 kg (2 tons)



05U0MX-097

Oil seal (Output shaft)

1. Apply lithium based grease to the new oil seal lip and install it with the **SST**.

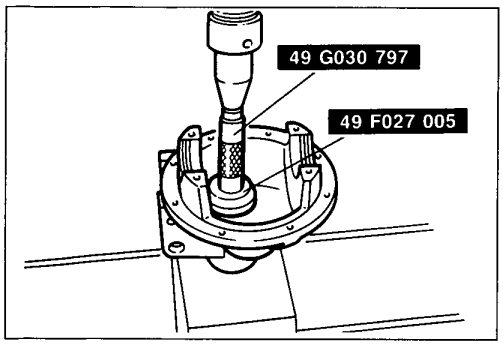


05U0MX-098

Adjustment of pinion height

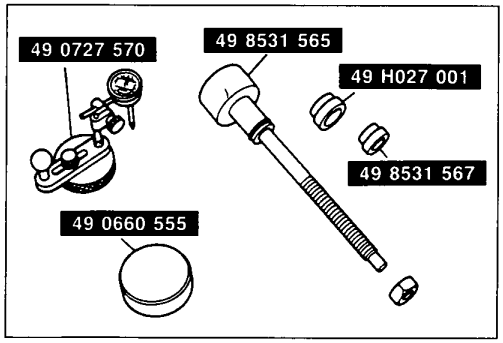
1. Install the bearing outer race (front bearing) with the **SST**.

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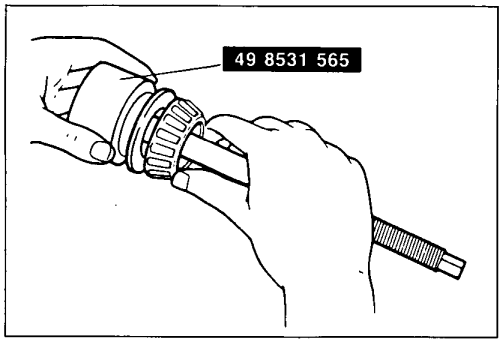
05U0MX-099

2. Install the bearing outer race (rear bearing) with the **SST**.



69G09X-169

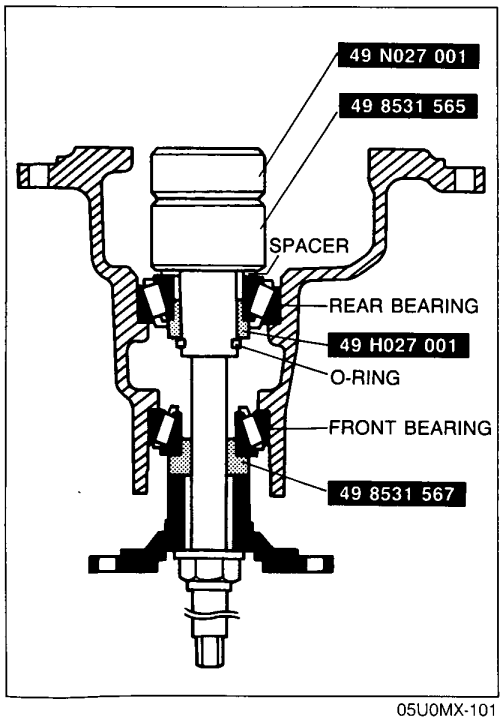
3. Adjust the drive pinion height as follows with the **SST**.



05U0MX-100

Note
- **Use the spacer that was removed.**

4. Install the spacer and bearing inner race (rear bearing) onto the **SST**.

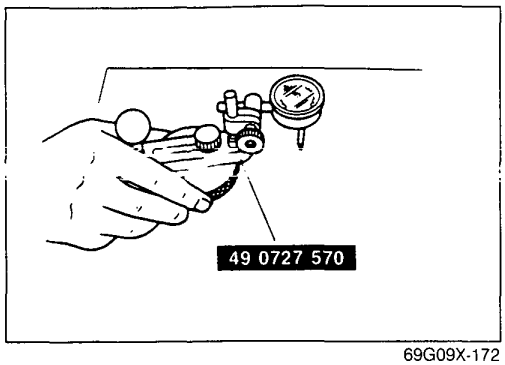


05U0MX-101

Note
- **Use the same spacer and nut removed during disassembly.**

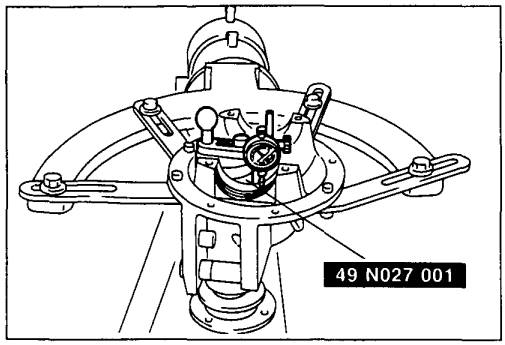
5. Assemble the spacer, bearing inner race (rear bearing), and **SST**.
   Secure the **SST** with the O-ring. Install this assembly in the carrier.
   Install the bearing inner race (front bearing), the **SST**, companion flange, washer, and nut.
6. Tighten the nut just enough so that the companion flange can still be turned by hand.

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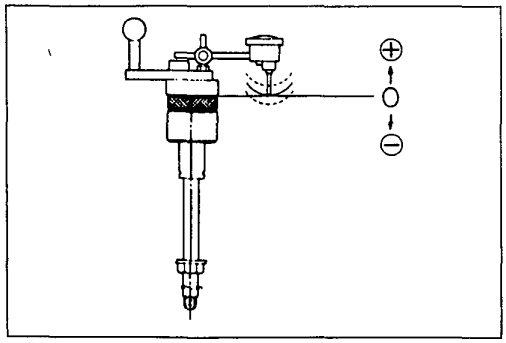
69G09X-172

7. Place the **SST** on the surface plate and set the dial indicator to "Zero".



05U0MX-102

8. Place the **SST** atop the drive pinion model. Set the gauge body atop the gauge block.
9. Place the feeler of the dial indicator so that it contacts where the bearing inner race (side bearing) is installed in the carrier. Measure the lowest position on the left and right sides of the carrier.



05U0MX-103

10. Add the two (left and right) values obtained in Step 9 and divide the total by 2.

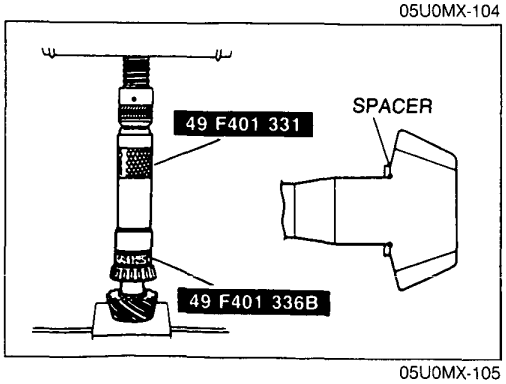
Specification: 0mm (0 in)

Mark	Thickness	Mark	Thickness
08	3.08mm (0.1213 in)	29	3.29mm (0.1295 in)
11	3.11mm (0.1224 in)	32	3.32mm (0.1307 in)
14	3.14mm (0.1224 in)	35	3.35mm (0.1319 in)
17	3.17mm (0.1248 in)	38	3.38mm (0.1331 in)
20	3.20mm (0.1260 in)	41	3.41mm (0.1343 in)
23	3.23mm (0.1271 in)	44	3.44mm (0.1354 in)
26	3.26mm (0.1283 in)	47	3.47mm (0.1366 in)

05U0MX-104

Note
- **Spacers are available in increments of 0.03mm. Select the spacer thickness that is closest to that necessary.**

11. If not within specification, adjust the pinion height by selection of a spacer.



05U0MX-105

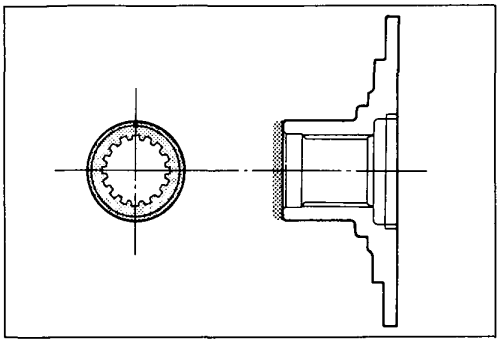
Adjustment of drive pinion preload

1. Install the spacer.

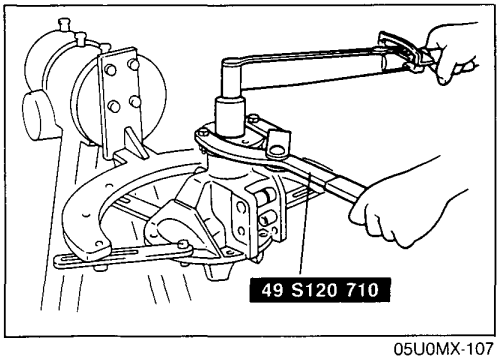
Note
- **Press on until the force required suddenly increases.**
- **Install the spacer selected for the pinion height adjustment, being careful that the installation direction is correct.**

2. Press the bearing inner race (rear bearing) on with the **SST**.

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05U0MX-106

3. Apply a light coat of grease to the end face of the companion flange.



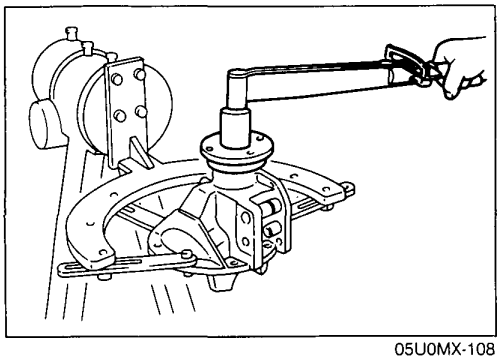
05U0MX-107

4. Install a new collapsible spacer.
5. Install the drive pinion assembly.

Note
- **Do not install the oil seal.**

6. Install the companion flange, and tighten the locknut with the **SST**.

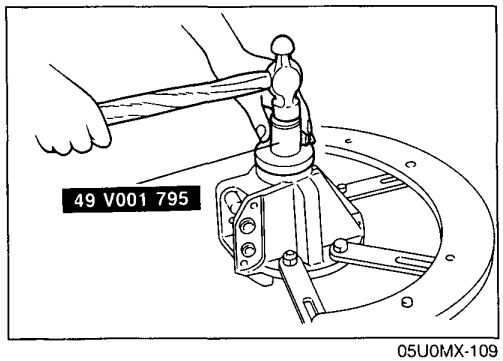
Tightening torque: 118 N·m (12 m-kg, 87 ft-lb)


05U0MX-108

7. Turn the companion flange several turns by hand to seat the bearing.
8. Measure the drive pinion preload.
   Adjust the preload by tightening the locknut and record the tightening torque.

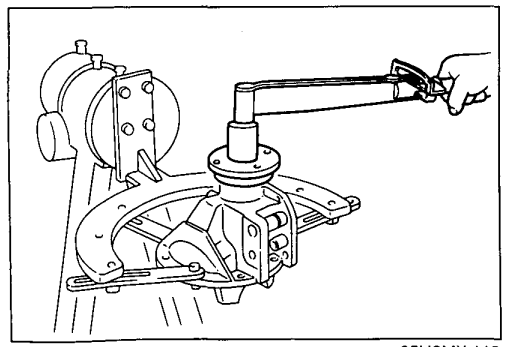
Preload:
0.3—0.7 N·m (3—7 cm-kg, 2.6—6.1 in-lb)

Tightening torque:
118—177 N·m (12—18 m-kg, 87—130 ft-lb)



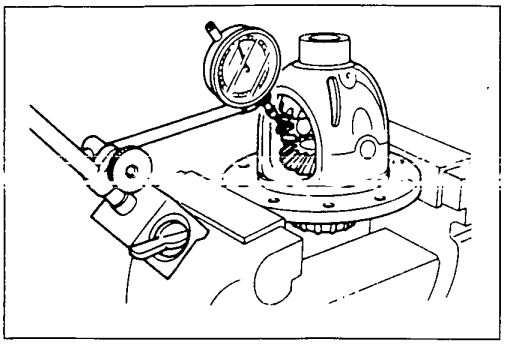
05U0MX-109

9. Remove the nut, washer, and companion flange.
10. Tap a new oil seal into the differential carrier with the **SST**.

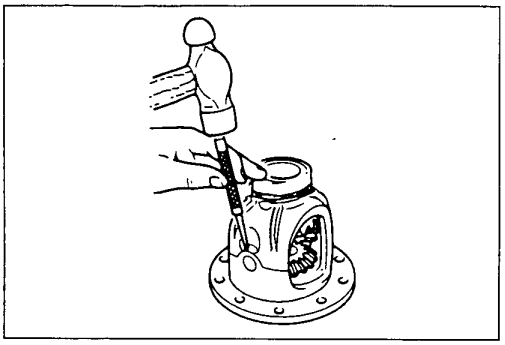

05U0MX-110

11. Install the companion flange and washer, and tighten the locknut to the tightening torque recoreded in Step 8.

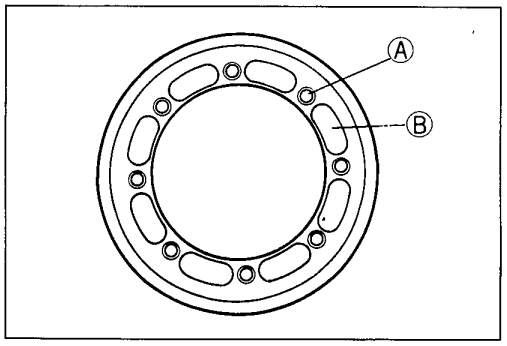
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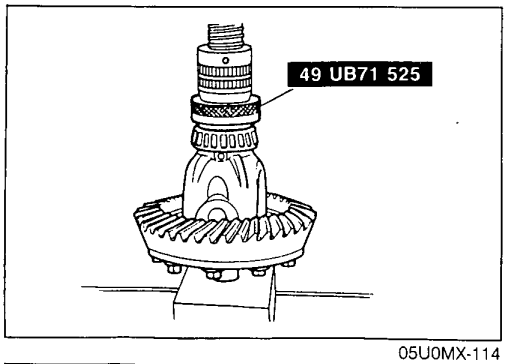
05U0MX-111



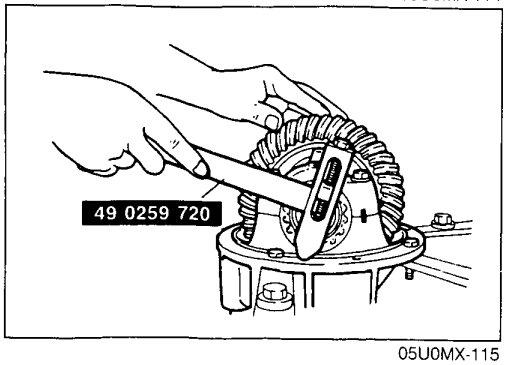
05U0MX-112



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05U0MX-115

Adjustment of backlash

1. Check the backlash of the side gears and pinion gears. Adjust by inserting the proper thickness thrust washer at both sides. (Standard)
   If not within specification, replace the differential gear as an assembly. (Viscous L.S.D.)

Standard backlash: 0—0.1mm (0—0.004 in)

Thrust washer thickness:

Identification mark	Thickness
0	1.95—2.00mm (0.0768—0.0787 in)
1	2.05—2.10mm (0.0807—0.0827 in)
2	2.15—2.20mm (0.0846—0.0866 in)

2. Install the knock pin to secure the pinion shaft. Stake the pin with a punch to prevent it from coming out of the case.

Adjustment of drive pinion and ring gear backlash

Note
- **Apply approx. 0.04 cc (0.0024 cu in) of thread-locking compound at each point.**

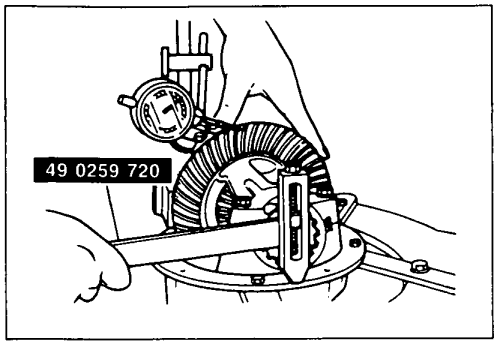
1. Apply thread-locking compound to the bolt threads Ⓐ and point Ⓑ of the gear back face.
2. Install the ring gear onto the gear case.

Tightening torque:
69—83 N·m (7.0—8.5 m-kg, 51—61 ft-lb)

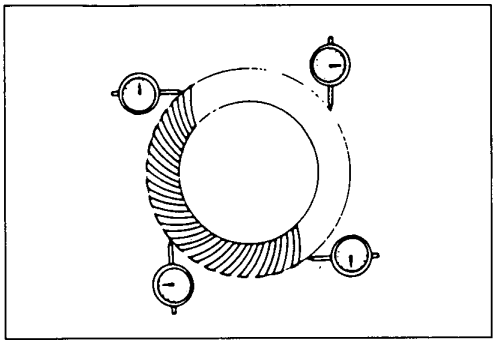
3. Press the bearing inner races (side bearing) on with the **SST**.

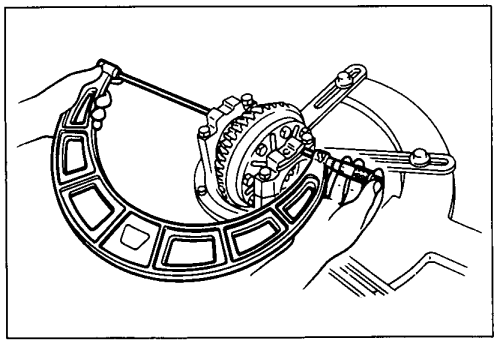
4. Install the differential gear assembly in the carrier.
5. Note the identification marks on the adjusting nuts, and install them on their respective sides.
6. Install the differential bearing caps, making sure that the identification mark on the cap corresponds with the one on the carrier with the **SST**.

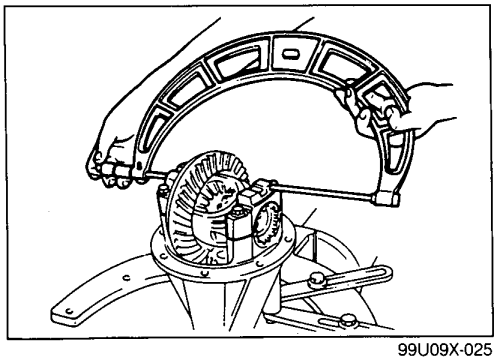
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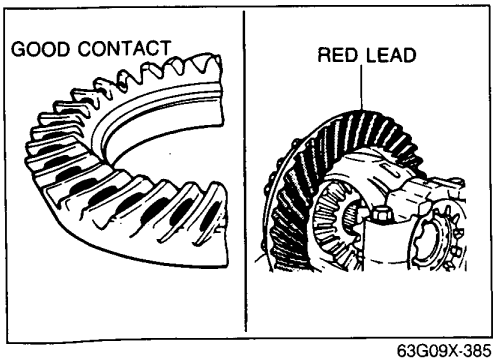


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05U0MX-117


05U0MX-118


99U09X-025



63G09X-385

7. Mark the ring gear at four points at approx. **90°** intervals. Mount a dial indicator to the carrier so that the feeler comes in contact at a right angle with one of the ring gear teeth.
8. Turn both bearing adjusters equally with the **SST** until the backlash is **0.09—0.11mm (0.0035—0.0043 in)**.
9. Check the backlash at the three other marked points, and make sure the maximum backlash is less than **0.07mm (0.0028 in)**.

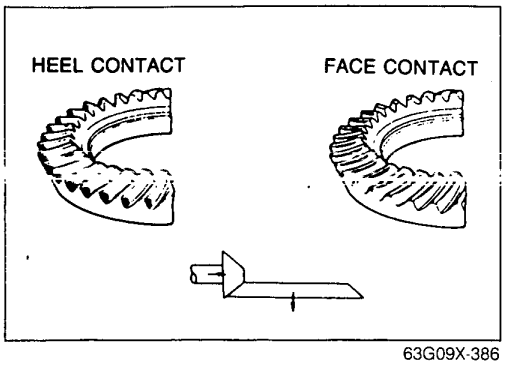
Note
- **When adjusting the differential bearing preload, be careful not to affect the backlash of the drive pinion and ring gear.**

10. Tighten the adjusting nuts equally until the distance between the pilot sections on the bearing caps is **150.137—150.200mm (5.9105—5.9130 in)**.

Inspection and adjustment of teeth contact
1. Coat both surfaces of 6—8 teeth of the ring gear with a thin coat of red lead.
2. While moving the ring gear back and forth by hand, rotate the drive pinion several times and check the tooth contact.
3. If the tooth contact is good, wipe off the red lead.
4. If it is not good, adjust the pinion height, and then adjust the backlash.

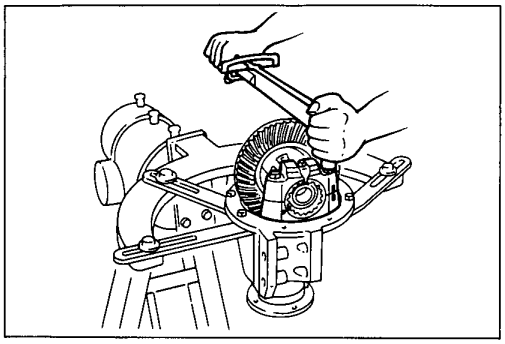
(1) Toe and flank contact
Replace the spacer with a thinner one to move the drive pinion outward.

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63G09X-386

(2) Heel and face contact
Replace the spacer with a thicker one to bring the drive pinion in.

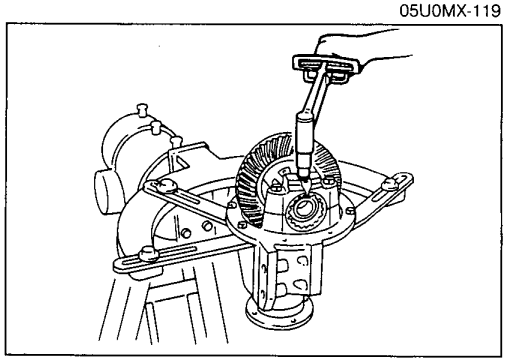


05U0MX-119

Bearing caps

1. Tighten the bearing cap bolts.

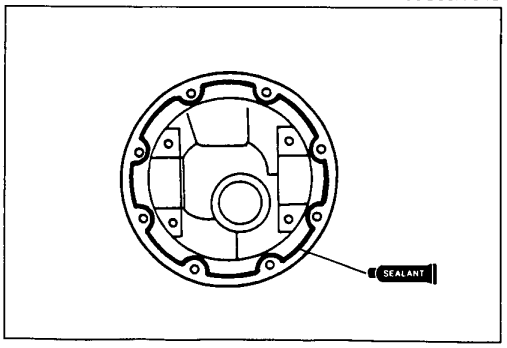
Tightening torque:
68—89 N·m (6.9—9.1 m-kg, 50—66 ft-lb)



99U09X-043

2. Install the lock plates on the bearing caps.

Tightening torque:
18—25 N·m (1.8—2.6 m-kg, 13—19 ft-lb)

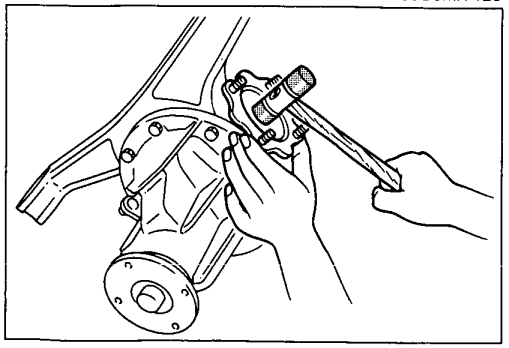


05U0MX-120

Differential case

1. Apply sealant to the housing face.
2. Tighten the bolts.

Tightening torque:
23—26 N·m (2.3—2.7 m-kg, 10—20 ft-lb)



05U0MX-121

Output shaft

Caution
- **With viscous L.S.D., the right output shaft is longer than the left shaft.**

1. Install a new clip.
2. Install the output shafts into the side gears by lightly tapping them with a plastic hammer.
3. Verify that the output shafts are hooked into the side gears by pulling them by hand.

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STEERING SYSTEM

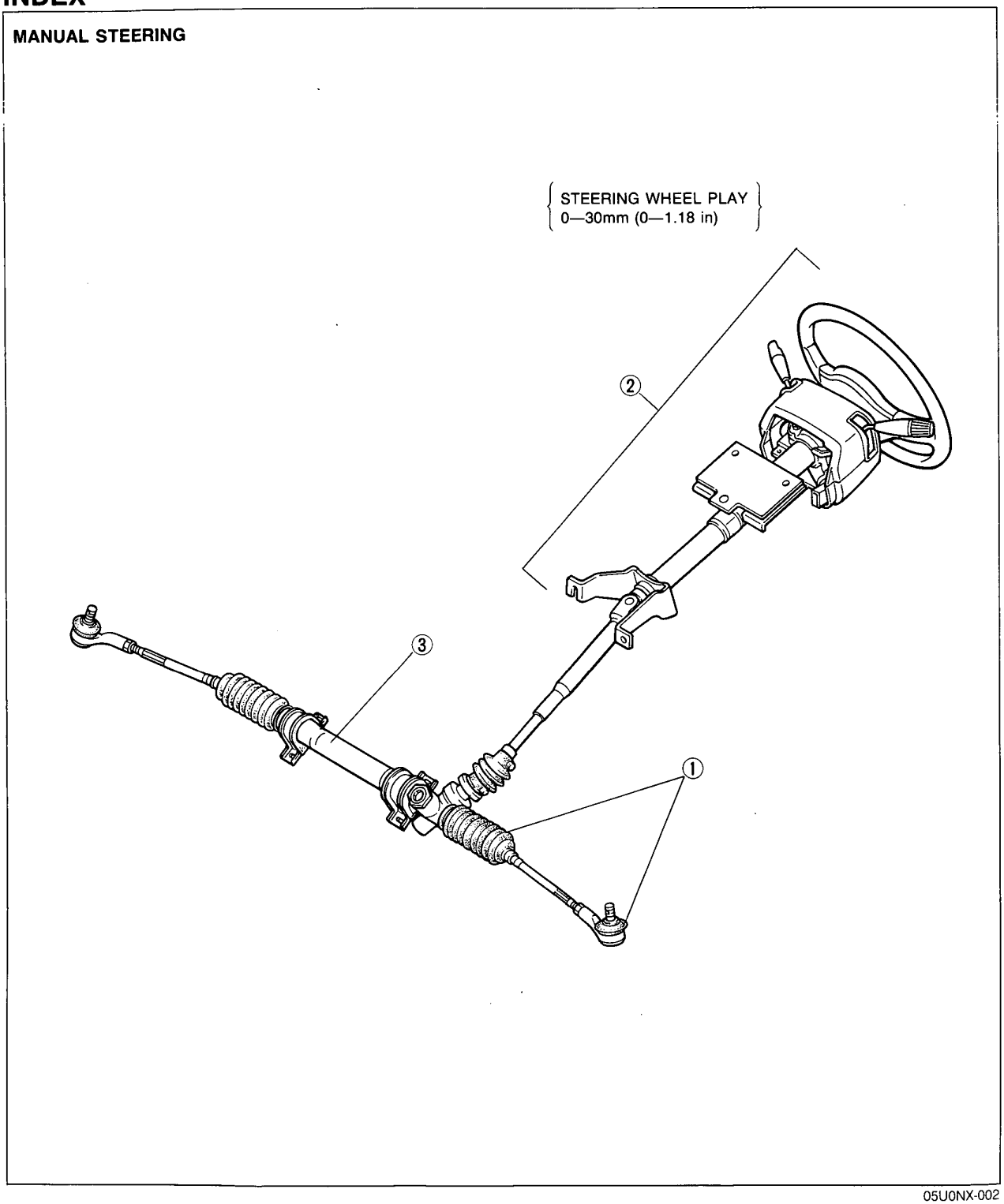
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ENGINE SPEED SENSING POWER STEERING **N–18**
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MANUAL STEERING

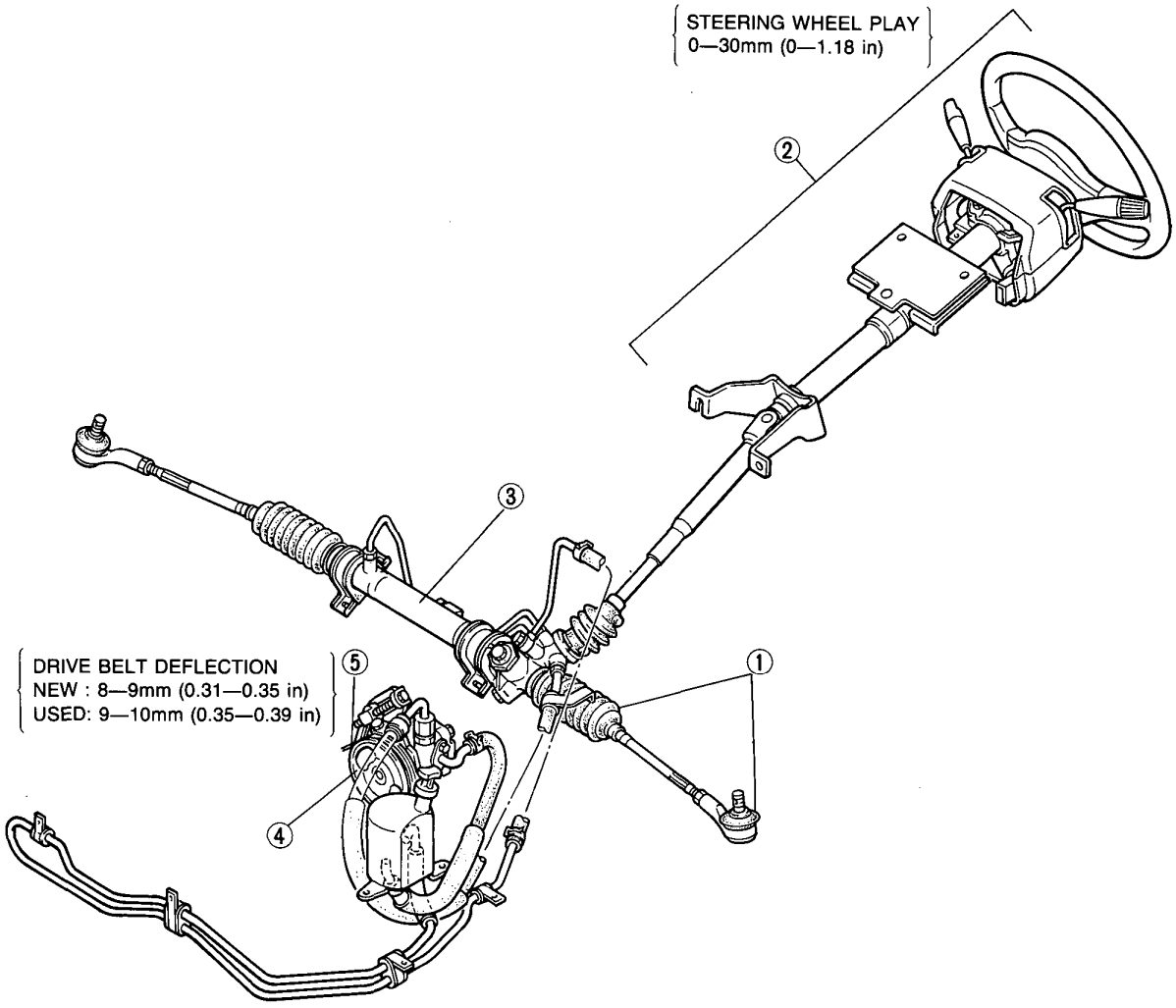


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ENGINE SPEED SENSING POWER STEERING



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OUTLINE

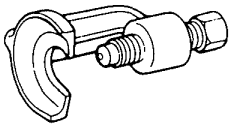
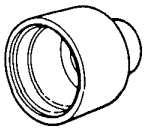
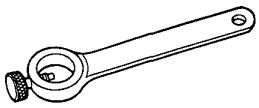
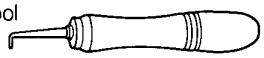
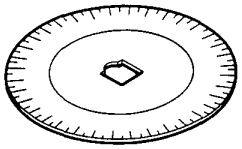
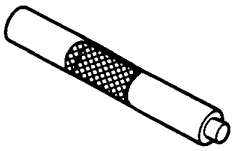
SPECIFICATIONS

Item	Type	Manual steering	Power steering
Steering wheel	Outer diameter mm (in)	370 (14.6)	
	Lock-to-lock turns	3.36	2.8
Steering shaft and joint	Shaft	Collapsible, non-tilt	
	Joint	2-cross joint	
Steering gear	Power assist	—	Engine speed sensing
	Gear	Rack-and-pinion	
	Gear ratio	∞ (infinite)	
	Rack stroke mm (in)	121.0 (4.76)	
	Power steering fluid	—	ATF DEXRON-II or M-III
	Fluid capacity liter (US qt, Imp qt)	—	0.8 (0.85, 0.70)

05U0NX-004

MANUAL STEERING

PREPARATION
SST

49 0118 850C Puller, ball joint 	For removal of tie-rod end	49 1243 785 Installer, boot 	For installation of tie-rod end boot
49 0180 510B Preload attachment 	For measurement of pinion torque	49 0208 701A Boot air out tool 	For removal of oil seal
49 H032 321A Hexagon wrench 	For removal and installation of adjusting cover	49 G032 316 Protractor 	For tightening of adjusting cover
49 G030 797 Handle 	For installation of bushing		

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TROUBLESHOOTING GUIDE

Problem	Possible Cause	Action	Page/Section
Steering heavy	Poor lubrication, foreign material, or abnormal wear of steering ball joint	Lubricate or replace	N–12
	Stuck or damaged lower arm ball joints	Replace	Section R
	Improper steering pinion preload	Adjust	N–12
	Damaged steering gear	Replace	N–12
	Malfunction of steering shaft joint	Replace	N– 9
	Improperly adjusted wheel alignment	Adjust	Section R
	Malfunctioning steering gear	Replace	N–12
	Incorrect tire pressure	Adjust	Section Q
Steering wheel pulls to one side	Incorrect tire pressure	Adjust	Section Q
	Unevenly worn tires	Replace	Section Q
	Weak front spring	Replace	Section R
	Worn or damaged stabilizer and/or suspension arm bushings	Replace	Section R
	Dragging brake	Repair	Section P
	Loose lower arm	Tighten	Section R
	Improperly adjusted wheel alignment	Adjust	Section R
General instability while driving	Incorrect tire pressure	Adjust	Section Q
	Damaged or unbalanced wheel	Adjust or replace	Section Q
	Worn or damaged steering joints	Replace	N– 9
	Improper steering pinion preload	Adjust	N–12
	Weak front coil spring	Replace	Section R
	Worn or damaged stabilizer and/or suspension arm bushings	Replace	Section R
	Malfunctioning shock absorber	Replace	Section R
	Improperly adjusted wheel alignment	Adjust	Section R
Shake (Steering wheel vibrates up/down)	Excessive tire and/or wheel runout	Replace	Section Q
	Loose lug nuts	Tighten	Section Q
	Unbalanced wheel(s)	Adjust or replace	Section Q
	Cracked or worn engine mount rubber	Replace	Section B
	Cracked or worn transmission mount rubber	Replace	Section J
Shimmy (Steering wheel vibrates left/right)	Cracked or worn steering gear mount rubber	Replace	N–12
	Loose steering gear mounting bolts	Tighten	N–12
	Stuck or damaged steering ball joint	Replace	N–14
	Excessive tire and/or wheel runout	Replace	Section Q
	Loose lug nuts	Tighten	Section Q
	Unbalanced wheel(s)	Adjust or replace	Section Q
	Incorrect tire pressure	Adjust	Section Q
	Unevenly worn tires	Replace	Section Q
	Malfunction of shock absorber	Replace	Section R
	Loose shock absorber mounting bolts	Tighten	Section R
	Stuck or damaged lower arm ball joint	Replace	Section R
	Cracked or worn suspension bushings	Replace	Section R
	Damaged or worn front wheel bearing	Replace	Section M
	Improperly adjusted front wheel alignment	Adjust	Section R
Excessive steering wheel play	Worn steering gear	Replace	N–12
	Worn or damaged steering joints	Replace	N– 9
	Worn or damaged suspension arm bushings	Replace	Section R
	Loose steering gear mounting bolts	Tighten	N–12
	Worn linkage or tie-rod ball joint	Replace	N–12
Poor steering wheel return	Incorrect tire pressure	Adjust	Section Q
	Stuck or damaged steering joints	Replace	N– 9
	Improperly adjusted front wheel alignment	Adjust	Section R
	Improper steering pinion preload	Adjust	N–12
	Ball joint not operating smoothly	Replace	N–14
	Steering shaft contacting something	Repair	N– 9
Abnormal noise from steering system	Loose steering gear	Tighten	N–12
	Malfunctioning steering gear	Replace	N–12
	Obstruction near steering column	Repair or replace	N–12
	Loose steering linkage	Tighten or replace	N–12
	Worn steering joints	Replace	N– 9

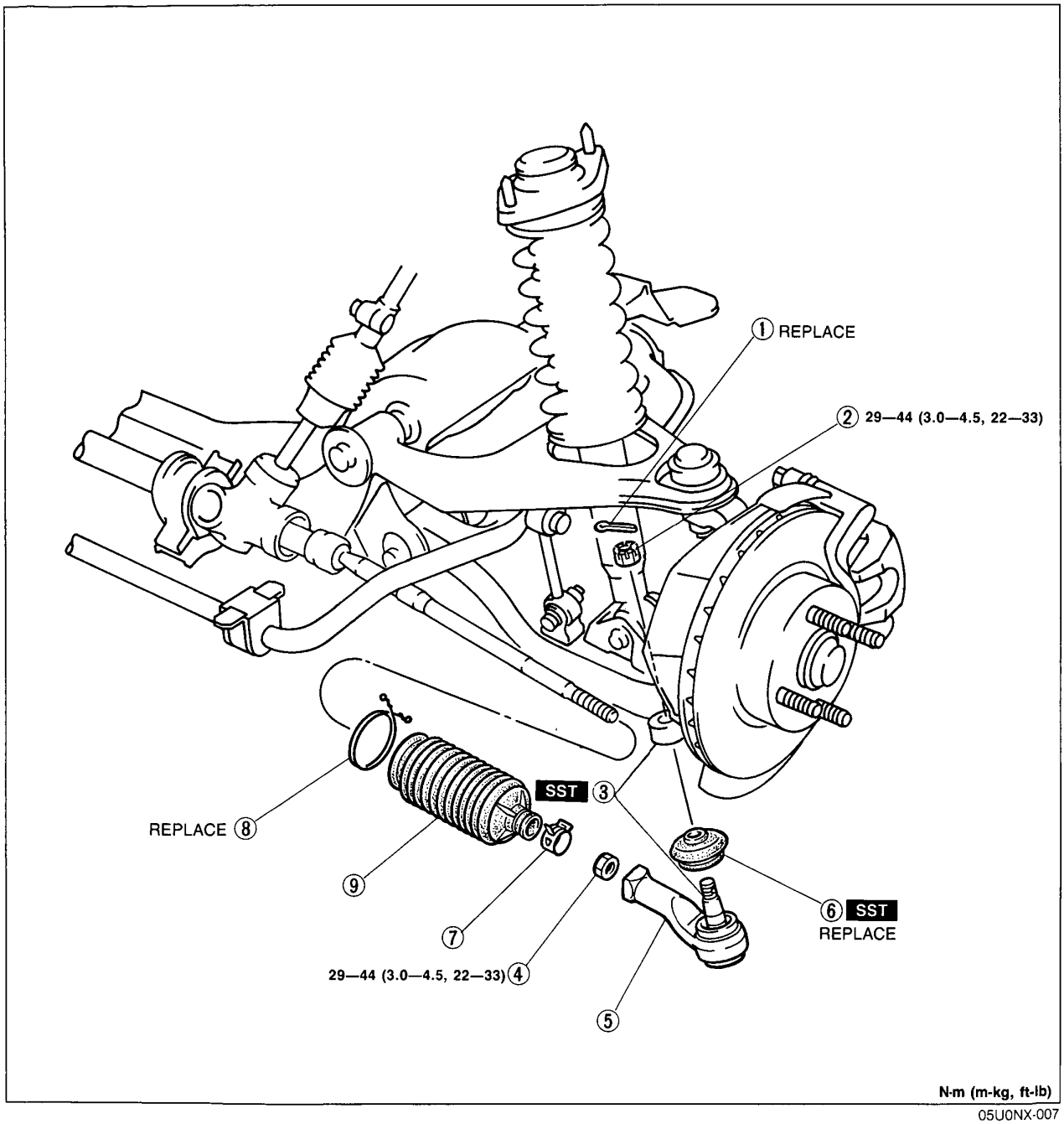
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BOOT

Replacement

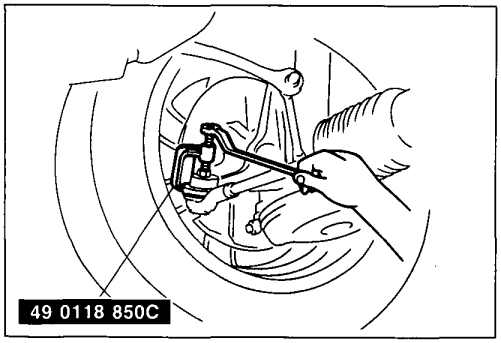
1. Loosen the wheel lug nuts.
2. Jack up the front of the vehicle and support it with safety stands.
3. Remove the wheel.
4. Remove in the order shown in the figure, referring to **Removal Note**.
5. Install in the reverse order of removal, referring to **Installation Note**.
6. After installation, check the steering angle and toe-in and adjust if necessary. (Refer to Section R.)



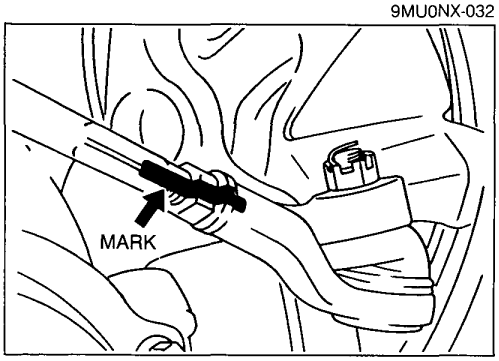
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1. Cotter pin
2. Nut
3. Tie-rod end / Steering knuckle
   Removal Note ..... page N–7
4. Locknut
   Removal Note ..... page N–7
5. Tie-rod end
6. Tie-rod end boot
   Removal / Installation Note..... page N–7
7. Boot clamp
8. Boot wire
9. Steering gear boot

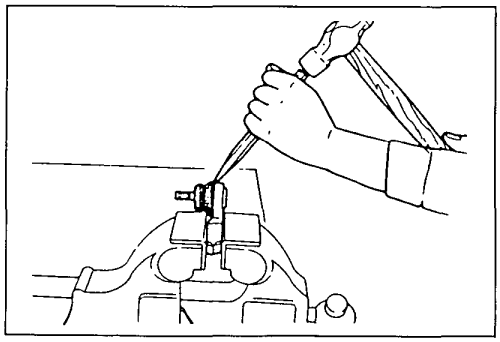
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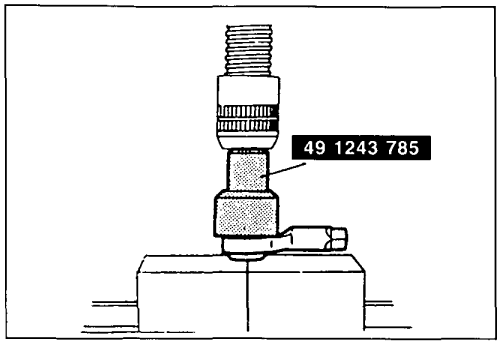
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Removal note
Tie-rod end

1. Loosen the tie-rod nut.
2. With the nut protecting the tie-rod end stud, separate the tie-rod end from the steering knuckle with the **SST**.

Locknut

1. Before loosening the locknut from the tie-rod end, make a mark for reference when tightening.

Tie-rod end boot

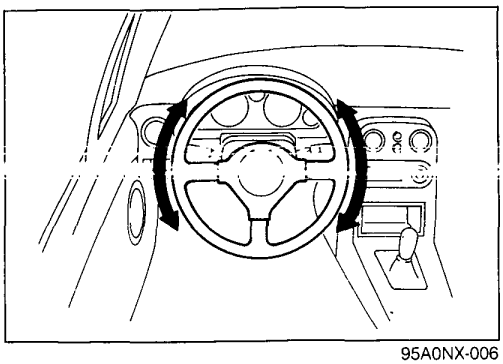
Caution
- **Do not scar the part where the boot is attached to the tie-rod end.**

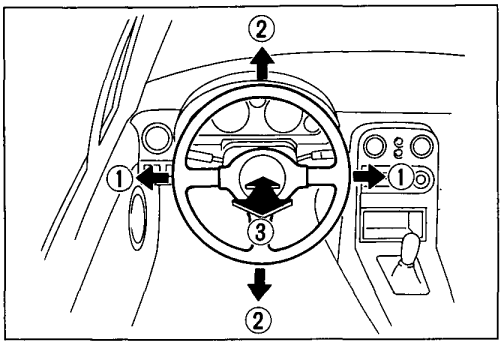
1. Secure the tie-rod end in a vise. Place a chisel against the boot and hold it at the angle shown. Remove the boot by tapping it with a hammer.

Installation note
Tie-rod end boot

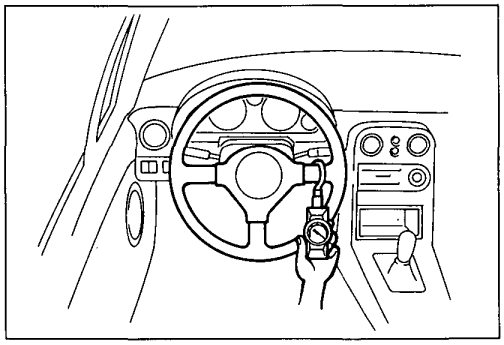
1. Put a small amount of grease (lithium base) into the new boot and set it onto the tie-rod end. Press the boot onto the tie-rod end with the **SST** and a press.

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05U0NX-012

STEERING WHEEL AND COLUMN

On-vehicle Inspection

Steering wheel play

1. With the wheels in the straight-ahead position, gently turn the steering wheel to the left and right and verify that the play is within specification.

Play: 0—30mm (0—1.18 in)

Note

- **If the play exceeds specification, either the steering joints are worn or the backlash of the steering gear is excessive.**

Looseness or play of steering wheel

1. Move the steering wheel in directions ①, ②, and ③ to check for column bearing wear, steering shaft joint play, steering wheel looseness, and column looseness.

Steering wheel effort

1. Jack up the front of the vehicle.
2. Turn the steering wheel fully to the left and right at least 5 times.
3. Move the steering wheel to put the wheels in the straight-ahead position.
4. Attach a pull scale to the outermost point of the steering wheel spoke.
   Then, starting with the wheels in the straight-ahead position, measure the effort required to turn the steering wheel to the left and to the right.

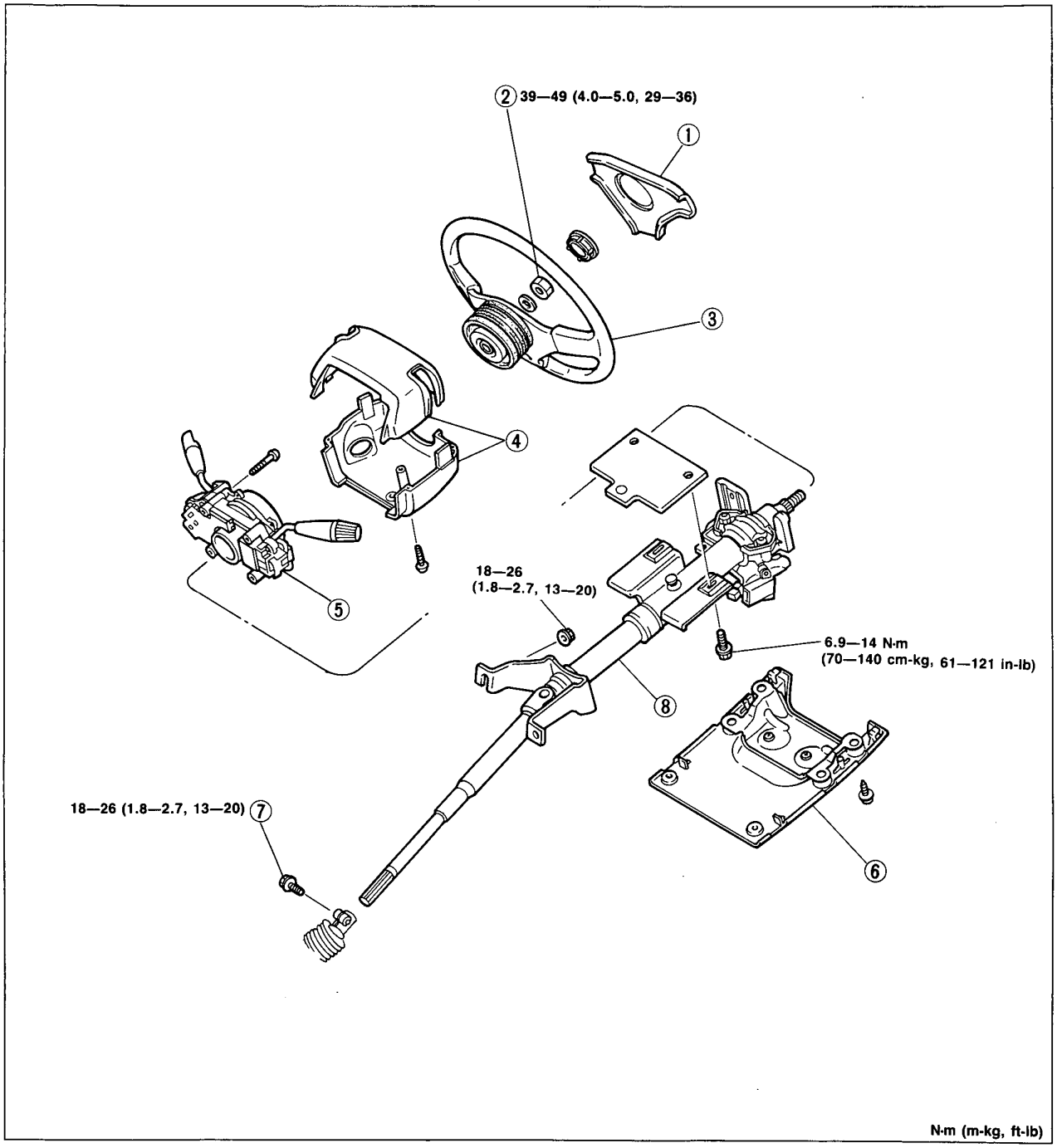
Steering wheel effort:
4.9—29.4 N (0.5—3.0 kg, 1.1—6.6 lb)
[during one turn of steering wheel]

5. If not within specification, check the following: rotation starting torque of pinion, rotation torque of each ball joint, and steering joints.

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Removal / Installation

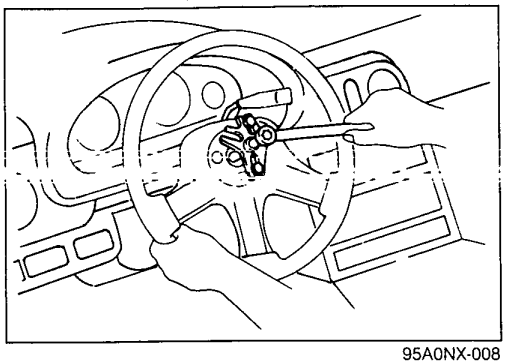
1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure, referring to **Removal Note**.
3. Install in the reverse order of removal.
4. Tighten all necessary nuts and bolts to the specified torque.



95E0NX-004

1. Horn pad
2. Locknut
3. Steering wheel
   Removal Note ..... page N–10
4. Column cover
5. Combination switch
   Removal / Installation ..... Section T
6. Lower panel
7. Intermediate shaft bolt
8. Steering shaft
   Disassembly / Inspection / Assembly ..... page N–10

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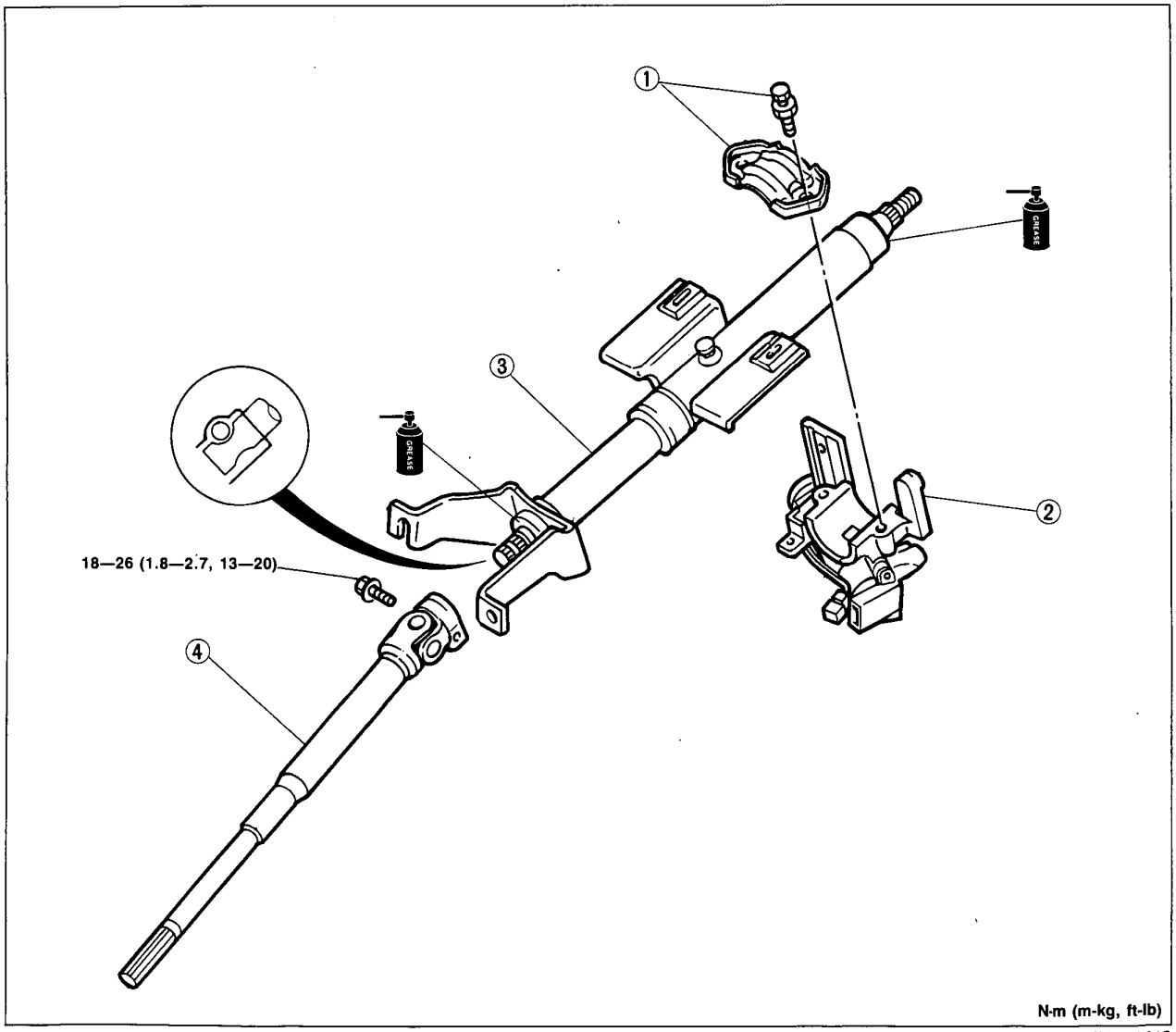
Removal note
Steering wheel

Caution
- **Do not try to remove the steering wheel by hitting the shaft with a hammer. The column will collapse.**

1. Remove the steering wheel with a suitable puller.

Disassembly / Assembly / Inspection

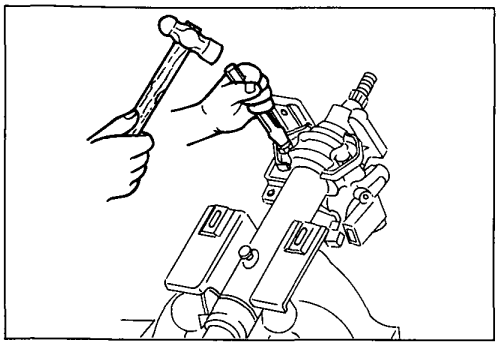
1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Assemble in the reverse order of disassembly, referring to **Assembly Note**.



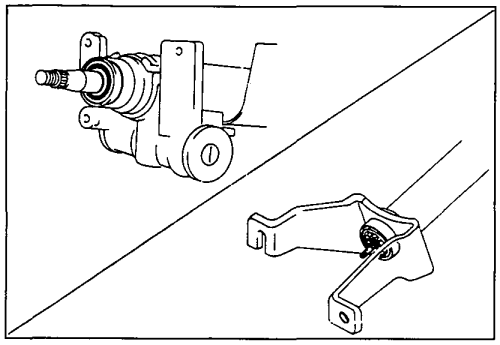
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1. Steering lock mounting bolts and bracket
   Disassembly Note ..... page N–11
   Assembly Note..... page N–11
2. Steering lock assembly
3. Steering shaft
   Inspection..... page N–11
4. Intermediate shaft
   Inspect universal joint for looseness, abnormal noise, and sticking

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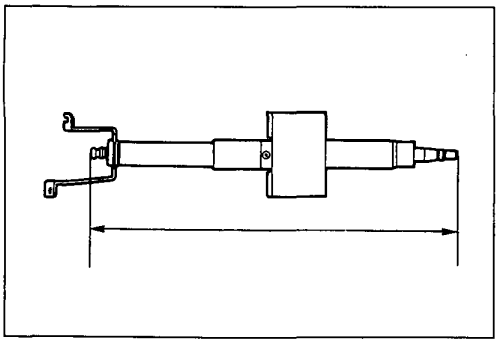

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Disassembly note
Steering lock mounting bolts and bracket
1. Use a chisel to make a groove in the heads of the steering lock mounting bolts.
2. Remove the bolts with a screwdriver.
3. Remove the steering lock assembly.


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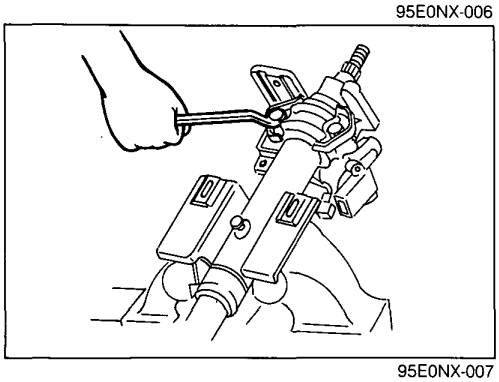
Inspection
Check for the following and replace the column assembly if necessary.

Steering shaft
1. Column bearing damage.
2. Column bushing damage.


95E0NX-006

3. Steering shaft length.

Length: 604.7 ± 1mm (23.81 ± 0.04 in)


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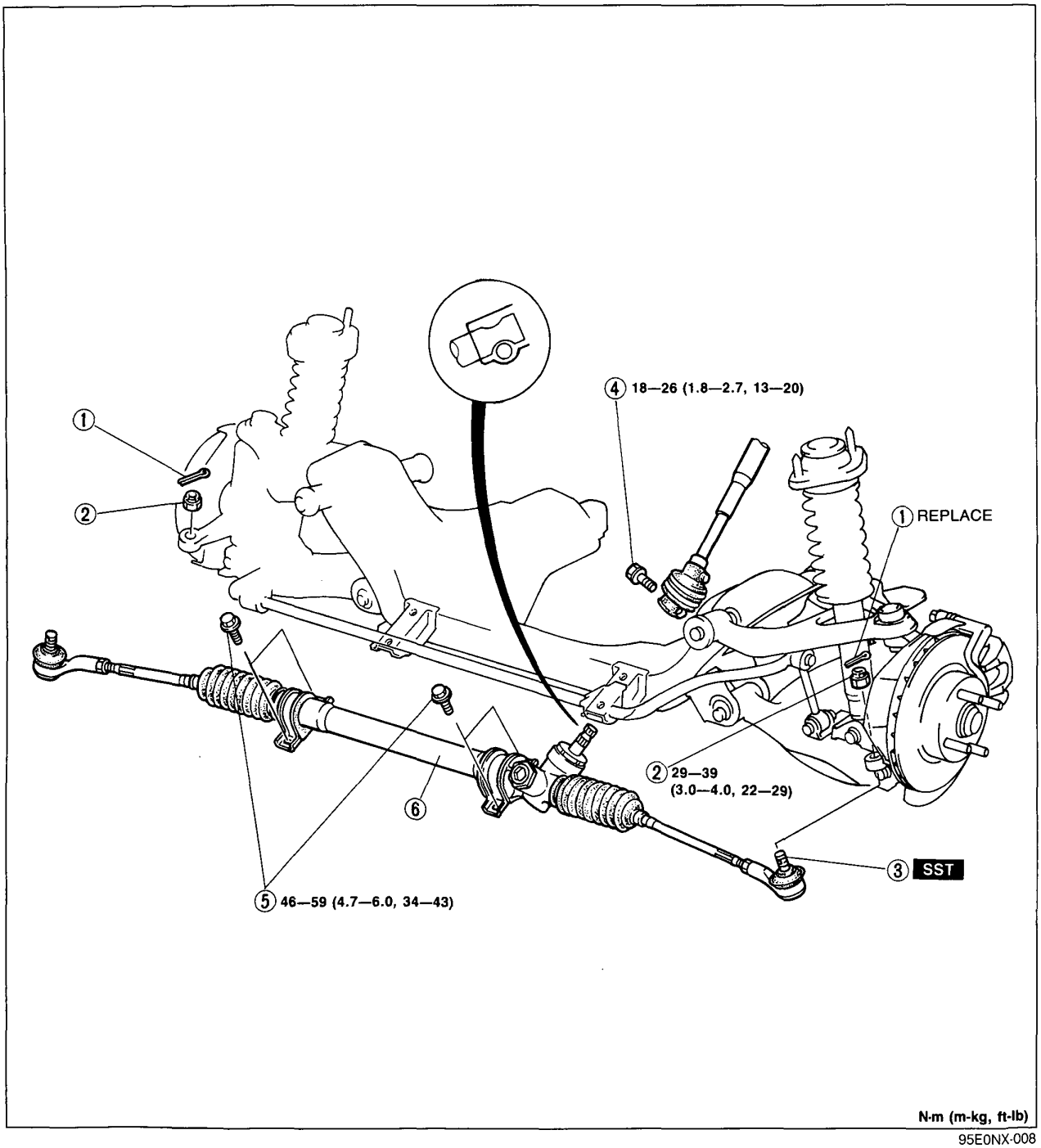
Assembly note
Steering lock mounting bolts and bracket
1. Install the steering lock assembly on the jacket.
2. Install the new steering lock mounting bolts.
3. Tighten the bolts until the heads break off.

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STEERING GEAR AND LINKAGE

Removal / Installation

1. Loosen the wheel lug nuts.
2. Jack up the front of the vehicle and support it with safety stands.
3. Remove the wheel.
4. Remove the undercover.
5. Remove in the order shown in the figure, referring to **Removal Note**.
6. Install in the reverse order of removal.

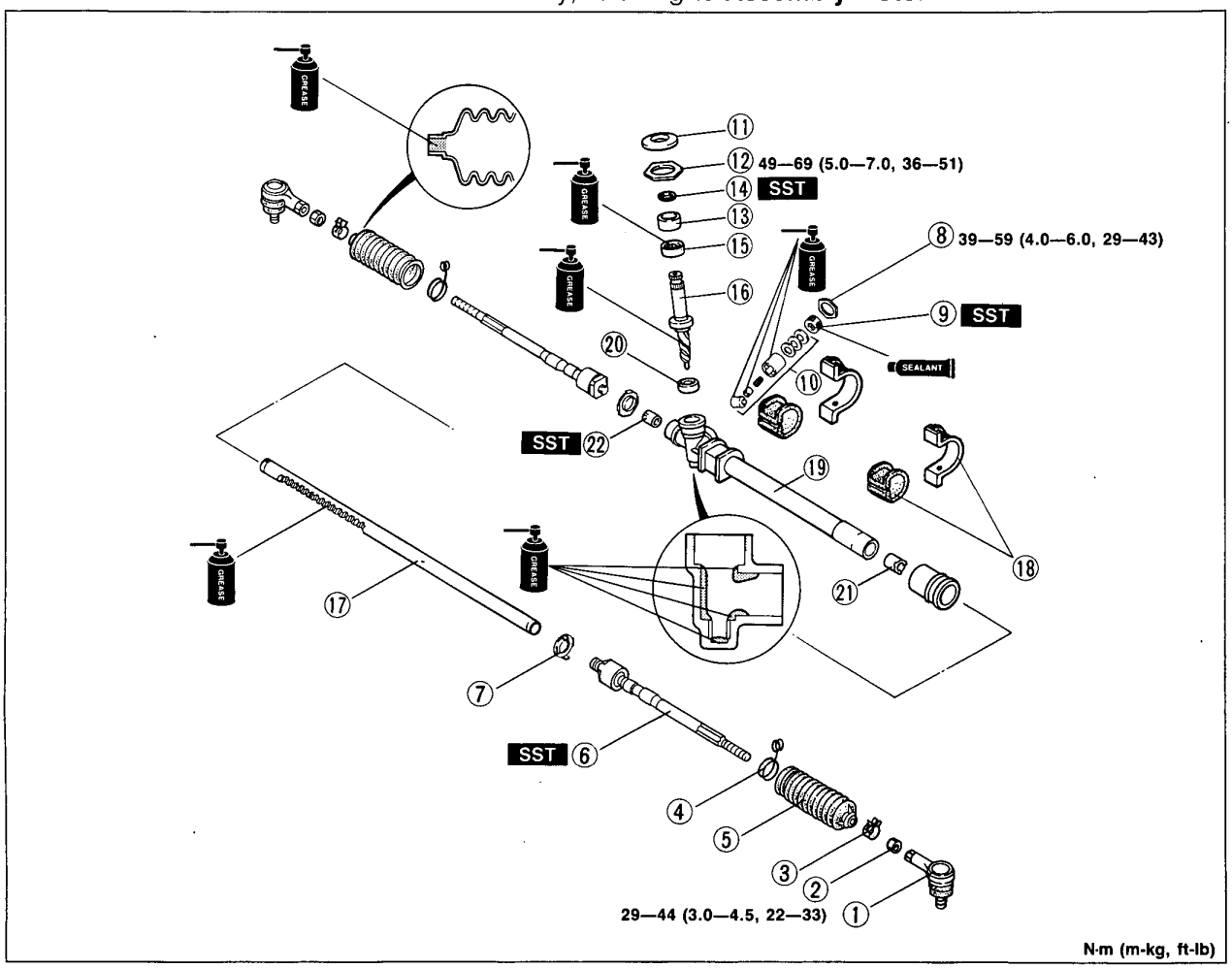


1. Cotter pin
2. Locknut
3. Tie-rod end
   Removal Note ..... page N–7
4. Intermediate shaft bolt
5. Mounting bracket bolt
6. Steering gear and linkage

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Disassembly / Inspection / Assembly

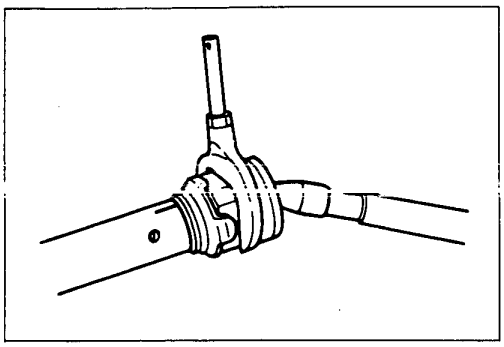
1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Assemble in the reverse order of disassembly, referring to **Assembly Note**.



95E0NX-009

1. Tie-rod end
   Inspect ball joint for damage and malfunction
2. Locknut (Tie-rod end)
3. Boot band
4. Boot wire
5. Boot
   Inspect for cracks and other damage
6. Tie-rod
   Disassembly note ..... page N–14
7. Washer
8. Locknut (Adjusting cover)
9. Adjusting cover
   Disassembly note ..... page N–14
   Assembly note. page N–17
10. Roller assembly
    Inspect parts for wear, damage, weakness and malfunction
11. Dust cover
12. Locknut (Rear cover)
13. Rear cover
    Assembly note. page N–17
14. Oil seal
    Disassembly note ..... page N–14
15. Upper bearing
16. Pinion shaft
    Assembly note. page N–16
    Inspect teeth for wear, damage and cracks
17. Rack
    Disassembly note ..... page N–14
    Inspection ..... page N–15
    Assembly note. page N–16
18. Mounting bracket and rubber
19. Gear box
    Inspect for cracks and other damage
20. Lower bearing
    Disassembly note ..... page N–14
    Assembly note. page N–16
    Inspect for wear, damage, and malfunction
21. Rack bushing
    Disassembly note ..... page N–15
    Assembly note. page N–15
    Inspect for wear and damage
22. Bushing
    Disassembly note ..... page N–15
    Assembly note. page N–15
    Inspect for wear and damage

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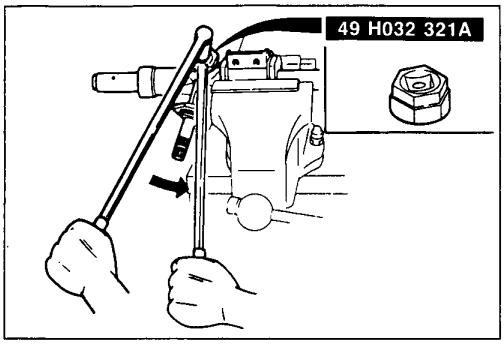


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Disassembly note
Tie-rod

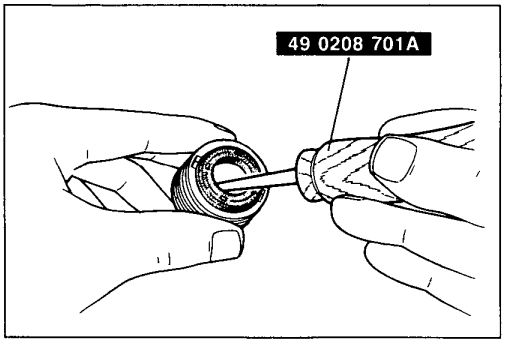
Caution
- **Use copper or aluminum plates in the jaws of the vise.**

1. Uncrimp the washer.
2. Remove the tie-rod.



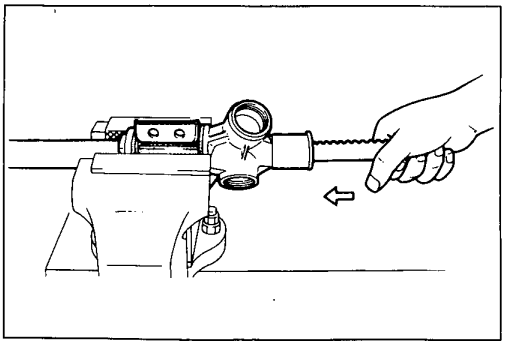
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Adjusting cover
1. Remove the adjusting cover with the **SST**.



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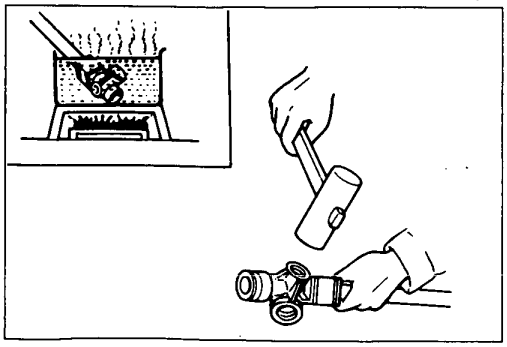
Oil seal
1. Remove the oil seal with the **SST**.



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Rack
1. Remove the rack from the tube side.

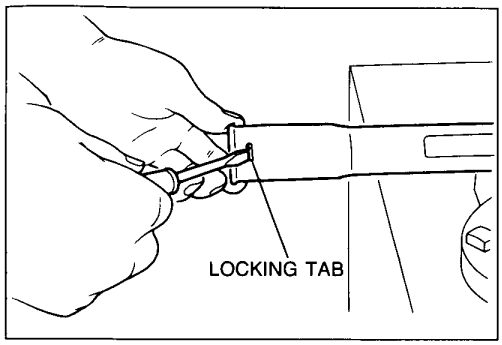
Caution
- **Do not damage the rack bushing with the rack teeth.**



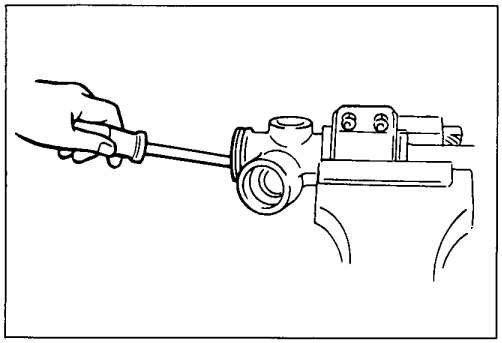
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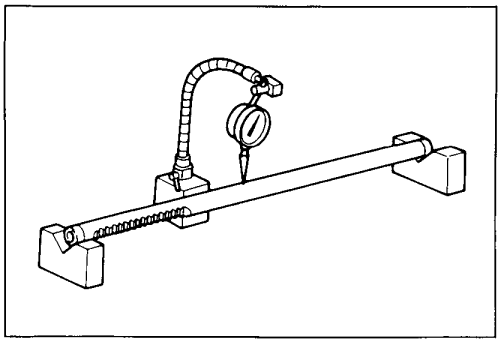
Lower bearing
1. Heat the gear housing in the water to about **80°C (180°F)**.
2. Tap the end of the housing with a plastic hammer to remove the lower bearing.

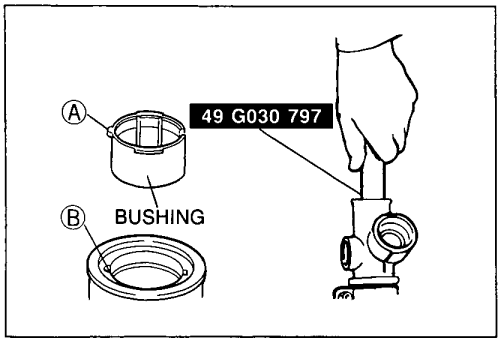
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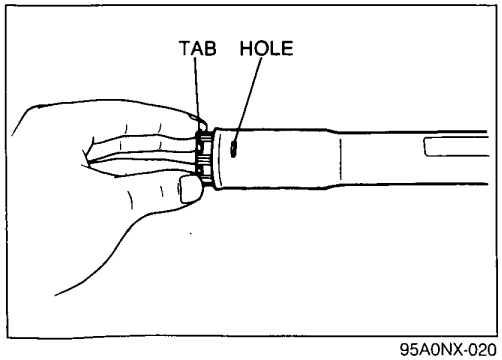
95A0NX-016


95A0NX-017


95A0NX-018



95A0NX-019



95A0NX-020

Rack bushing

Caution
- **Do not remove the rack bushing if not necessary.**
- **Do not damage the column when removing.**

1. Depress the locking tab to remove the rack bushing.

Bushing

Caution
- **Do not remove the bushing if not necessary.**
- **Do not damage the gear housing when removing.**

1. Break the bushing to remove it.

Inspection
Rack

1. Inspect for cracking, damage, and tooth wear, replace if necessary.
2. Measure runout of the the rack.

Runout: 0.3mm (0.012 in) max.

3. If not within specification, replace the rack.

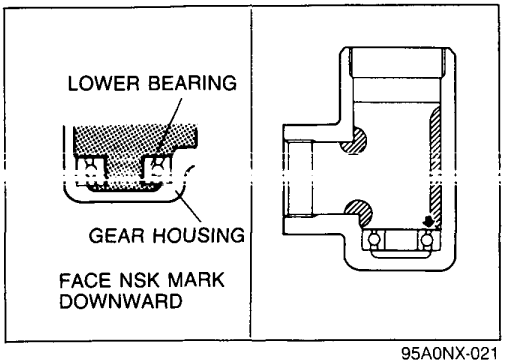
Assembly note
Bushing

1. Align A and B and press the bushing into the gear housing with the **SST** until it is fully seated.

Rack bushing

1. Align the tab of the rack bushing with hole in the column.
2. Push the rack bushing in until it is locked in place by the tab.

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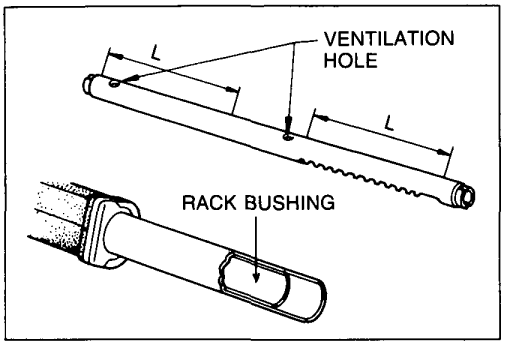
95A0NX-021

Lower bearing

1. Apply grease to the lower bearing.

Caution
- **Face the NSK mark downward.**

2. Insert the pinion shaft with the lower bearing.
3. Press the pinion shaft to seat the lower bearing.
4. Apply grease to the inside of the gear housing as shown.



95A0NX-022

Rack

1. Secure the mounting bracket in a vise.

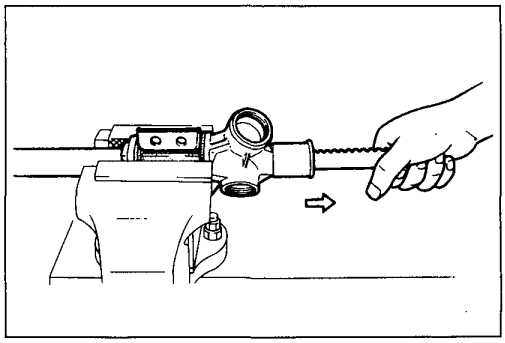
Caution
- **Use copper or aluminum plates in the jaws of the vise.**

2. Apply grease to the rack bushing.
3. Apply grease to the rack teeth and the sliding surface.

Caution
- **Do not plug the ventilation holes with the grease.**

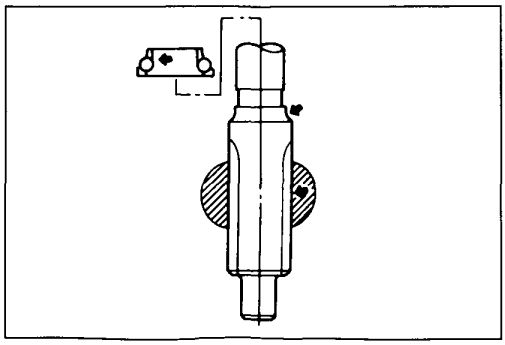
4. Slide the rack in from the tube side.

Caution
- **Do not damage the rack bushing.**


95A0NX-023

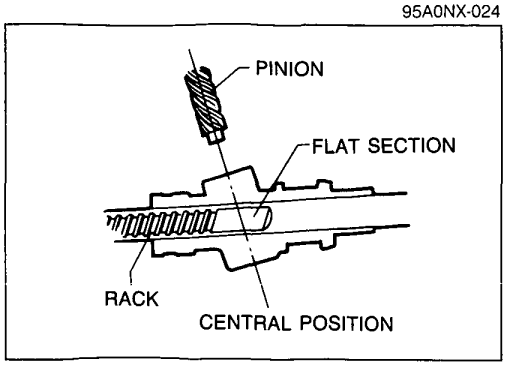
Pinion shaft

1. Apply grease to the inner race of the upper bearing and install it to the pinion shaft.
2. Apply grease to the teeth of the pinion shaft.


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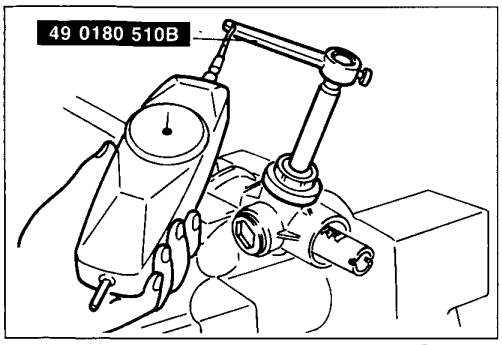
3. Turn the flat section of the rack toward the pinion, and insert the pinion.

Caution
- **This flat section is for adjustment of the pinion bearing preload without the pinion engaging the rack.**

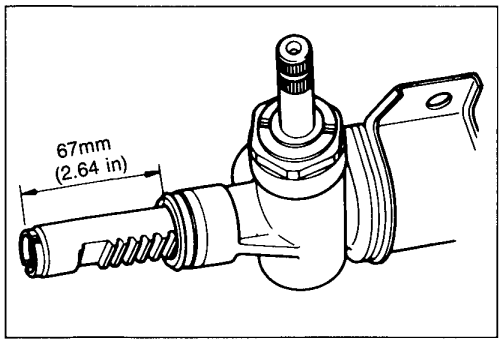


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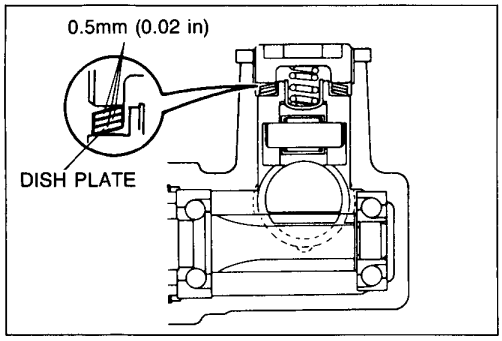
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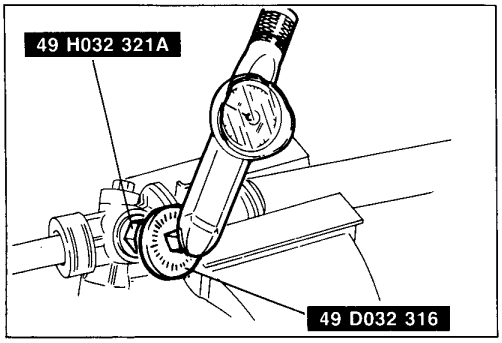
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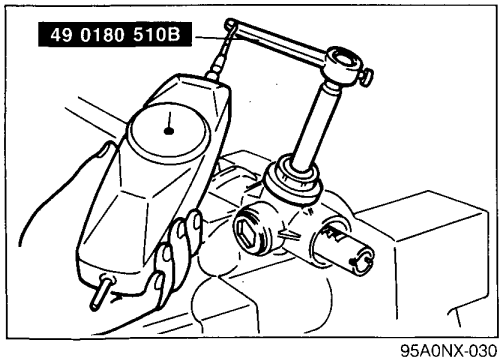
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95E0NX-012



95A0NX-029



95A0NX-030

Rear cover

1. Apply grease to the outer race of the upper bearing and install it in the gear housing.
2. Apply sealant to the threads of the rear cover and install it into the gear housing.

Caution
- **Before measuring the torque, rotate the pinion to the left and right a few times to seat the bearing.**

3. Tighten the rear cover so that the starting torque of the pinion is **200—350 g (7.1—13.8 oz)** as checked with the **SST** and a pull gauge.
4. Tighten the locknut.

Tightening torque:
49—69 N·m (5.0—7.0 m-kg, 36—51 ft-lb)

Caution
- **Do not allow the rear cover to turn.**

Adjusting cover

1. Carefully move the rack so that the pinion is set to the center (neutral position) of the rack gear as shown.
2. Install the roller assembly, needle roller, holder, dish springs, friction block, and spring.

Caution
- **Install the roller bearing so that it contacts the rack correctly.**

Note
- **Apply sealant to the threads of the adjusting cover.**

3. Torque the adjusting cover to **9.8 N·m (1 m-kg, 85 in-lb)**, then loosen it 25°—45°. Use the **SST** to secure the adjusting cover with the locknut.

Locknut tightening torque:
39—59 N·m (4.0—6.0 m-kg, 29—43 ft-lb)

4. Measure the starting torque of the pinion with the **SST**.

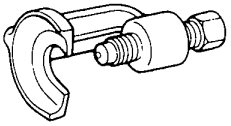
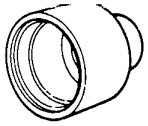
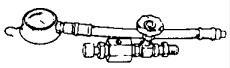
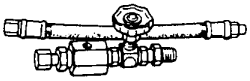
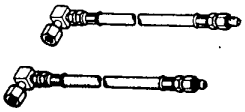
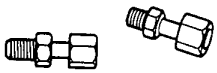
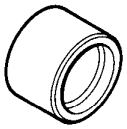
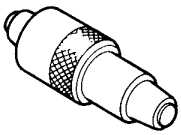
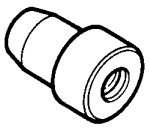
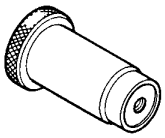
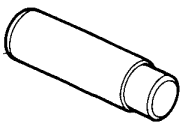
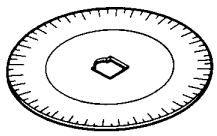
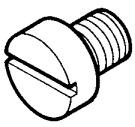
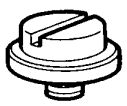
Center position ± 90°
Pull gauge reading: 1,000—1,400 g (35—50 oz)
Any other position
Pull gauge reading: less than 1,700 g (60 oz)

5. If not within specification, repeat Steps 2 and 3.

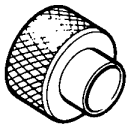
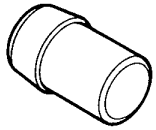
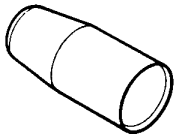
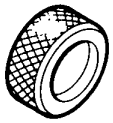
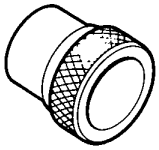
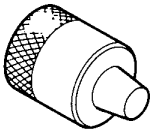
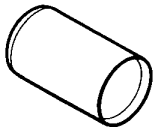
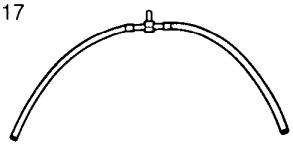
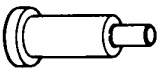
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ENGINE SPEED SENSING POWER STEERING

PREPARATION
SST

49 0118 850C Puller, ball joint 	For removal of tie-rod end	49 1243 785 Installer, boot 	For installation of tie-rod end boot
49 1232 670A Gauge set, power steering 	For inspection of power steering fluid pressure	49 1232 672 Gauge (Part of 49 1232 670A) 	For inspection of power steering fluid pressure
49 1232 673 Valve body (Part of 49 1232 670A) 	For inspection of power steering fluid pressure	49 H002 671 Adapter, power steering gauge 	For inspection of power steering fluid pressure
49 B032 302 Adapter, power steering gauge 	For inspection of power steering fluid pressure	49 D032 306 Support block 	For removal and installation of upper bearing For pressurize oil seal
49 D032 304 Installer, oil seal and bearing 	For removal of upper bearing For pressurize oil seal	49 F032 303 Handle 	For removal of backup ring and oil seal
49 N032 303 Remover, backup ring and oil seal 	For removal of backup ring and oil seal	49 D032 301 Installer body, oil seal and bearing 	For installtion of oil seal and center bearing
49 D032 307 Remover, oil seal and bearing 	For removal of oil seal and center bearing	49 D032 316 Protractor 	For installation of adjusting cover
49 D032 303 Attachment 	For installation of center bearing	49 D032 302 Attachment 	For installtion of oil seal

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49 N032 301 Protector body, oil seal 	For installation of oil seal	49 N032 302 Guide, oil seal 	For installation of oil seal
49 N032 305 Protector, backup ring and oil seal 	For installtion of steering rack assembly	49 N032 304 Protector, oil seal 	For installation of holder
49 D032 313 Seal ring former 	For formation of seal ring of pinion shaft	49 D032 315 Former and guide, seal ring 	For formation of seal ring of control valve
49 D032 305 Remover, oil seal and bearing 	For pressurize upper bearing	49 D032 310 Protector, pinion shaft 	For installation of plug assembly
49 G032 317 Hose 	For inspection of cylinder sealing	49 G032 319 Adapter 	For inspection of cylinder sealing
49 B032 305 Holder 	For disassembly of oil pump		

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TROUBLESHOOTING GUIDE

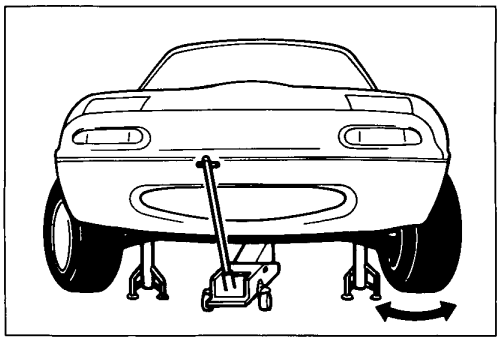
Problem	Possible Cause	Action	Page/Section
Steering feels heavy	Poor lubrication, foreign material, or abnormal wear of steering ball joint	Lubricate or replace	N–25
	Stuck or damaged lower arm ball joints	Replace	Section R
	Improper steering pinion preload	Adjust	N–32
	Damaged steering gear	Replace	N–25
	Malfunctioning steering shaft joint	Replace	N– 9
	Improperly adjusted wheel alignment	Adjust	Section R
	Malfunctioning steering gear	Replace	N–25
	Incorrect tire pressure	Adjust	Section Q
	Loose or damaged oil pump drive belt	Adjust or replace	N–37
	Low fluid level or air in fluid	Add fluid or bleed air	N–21, 22
	Leakage of fluid	Repair or replace	—
	Insufficient oil pump pressure	Replace	N–33
Steering wheel pulls to one side	Incorrect tire pressure	Adjust	Section Q
	Unevenly worn tires	Replace	Section Q
	Weak front spring	Replace	Section R
	Worn or damaged stabilizer and/or upper or lower arm bushing	Replace	Section R
	Dragging brake	Repair	Section P
	Loose lower arm	Tighten or replace	Section R
	Improperly adjusted wheel alignment	Adjust	Section R
General instability while driving	Incorrect tire pressure	Adjust	Section Q
	Damaged or unbalanced wheel	Adjust or replace	Section Q
	Worn or damaged steering joint(s)	Replace	N– 9
	Improper steering pinion preload	Adjust	N–32
	Weak front coil spring	Replace	Section R
	Worn or damaged stabilizer and/or upper or lower arm bushing	Replace	Section R
	Malfunctioning shock absorber	Replace	Section R
	Improperly adjusted wheel alignment	Adjust	Section R
Shake (Steering wheel vibrates up/down)	Excessive tire and/or wheel runout	Replace	Section Q
	Loose lug nuts	Tighten	Section Q
	Unbalanced wheel(s)	Adjust or replace	Section Q
	Cracked or worn engine mount rubber	Replace	Section B
	Cracked or worn transmission mount rubber	Replace	Section J
Shimmy (Steering wheel vibrates left/right)	Cracked or worn steering gear mount rubber	Replace	N–25
	Loose steering gear mounting bolts	Tighten	N–25
	Stuck or damaged steering ball joint	Replace	N–25
	Excessive tire and/or wheel runout	Replace	Section Q
	Loose lug nuts	Tighten	Section Q
	Unbalanced wheel(s)	Adjust or replace	Section Q
	Incorrect tire pressure	Adjust	Section Q
	Unevenly worn tires	Replace	Section Q
	Malfunctioning shock absorber	Replace	Section R
	Loose shock absorber mounting bolts	Tighten	Section R
	Stuck or damaged lower arm ball joint	Replace	Section R
	Cracked or worn suspension bushings	Replace	Section R
	Damaged or worn front wheel bearing	Replace	Section M
	Improperly adjusted front wheel alignment	Adjust	Section R
Excessive steering wheel play	Worn steering gear	Replace	N–25
	Worn or damaged steering joints	Replace	N– 9
	Worn or damaged lower arm bushing	Replace	Section R
	Loose steering gear mounting bolts	Tighten	N–25
	Worn linkage or tie-rod ball joint	Replace	N–25
Poor steering wheel return	Incorrect tire pressure	Adjust	Section Q
	Stuck or damaged steering joints	Replace	N– 9
	Improperly adjusted front wheel alignment	Adjust	Section R
	Improper steering pinion preload	Adjust	N–25
	Ball joint not operating smoothly	Replace	N–25
	Steering shaft contacting something	Repair	N– 9

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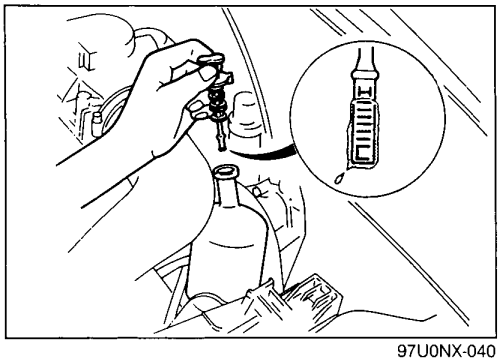
TROUBLESHOOTING GUIDE (Cont'd)

Problem	Possible Cause	Action	Page/Section
Abnormal noise from steering system	Loose oil pump	Tighten	N–33
	Loose steering gear	Tighten	N–25
	Loose oil pump bracket	Tighten	Section B
	Drive belt loose/tight	Adjust	N–37
	Air in system	Bleed air	N–21
	Malfunctioning steering gear	Replace	N–25
	Malfunctioning oil pump	Replace	N–33
	Obstruction near steering column or pressure hose	Repair or replace	N– 9
	Loose steering linkage	Tighten or replace	N–25
	Worn steering joints	Replace	N– 9

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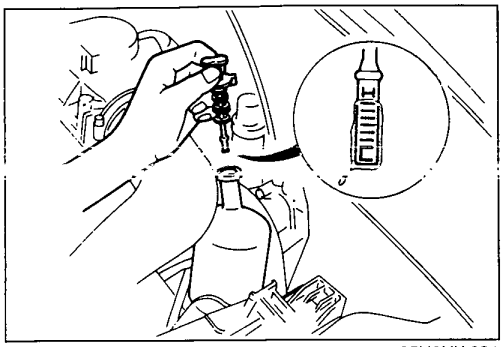


97U0NX-040

AIR BLEEDING

1. Check the fluid level. (Refer to page N–22.)
2. Turn the steering wheel fully to the left and right several times with the engine not running.
3. Recheck the fluid level. If it has dropped, add fluid.
4. Repeat Steps 2 and 3 until the fluid level stabilizes.
5. Start the engine and let it idle.
6. Turn the steering wheel fully to the left and right several times.
7. Verify that the fluid is not foamy and that the fluid level has not dropped.
8. Add fluid if necessary and repeat Steps 6 and 7.

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05U0NX-024

POWER STEERING FLUID

Inspection

Fluid level

Check the power steering fluid level. Add fluid to the specified level, if necessary.

Caution
- **Use only the specified power steering fluid.**

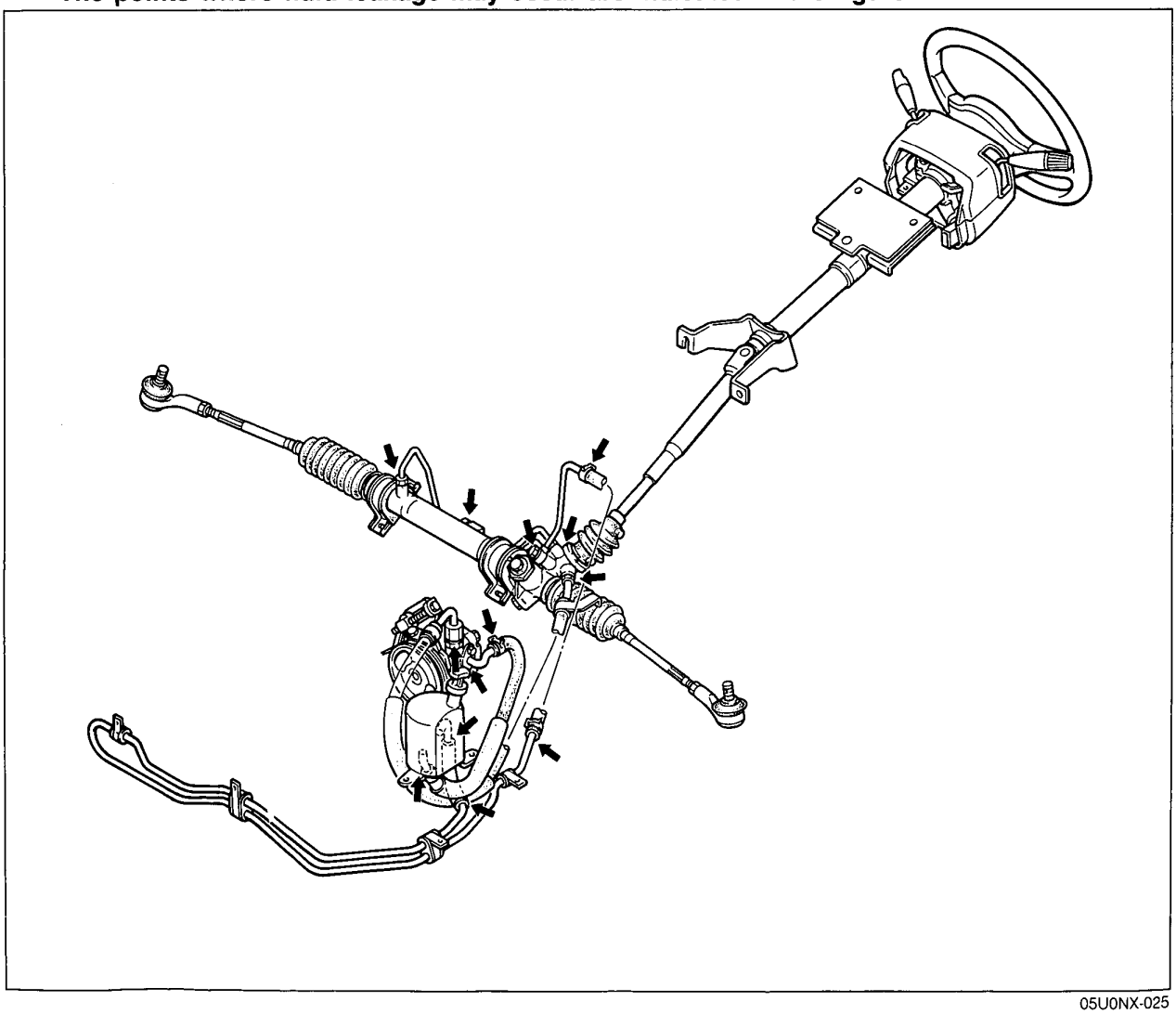
Fluid specification:
ATF DEXRON-II or M-III

Fluid leakage

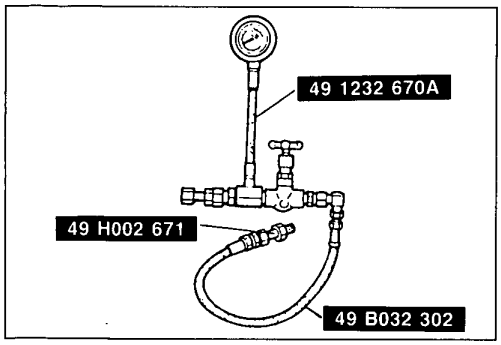
Caution
- **To prevent damage to the steering system, do not keep the steering wheel in the fully turned position for more than 15 seconds.**

Start the engine and let it idle. Turn the steering wheel fully to the left and right to apply fluid pressure. Check for fluid leakage.

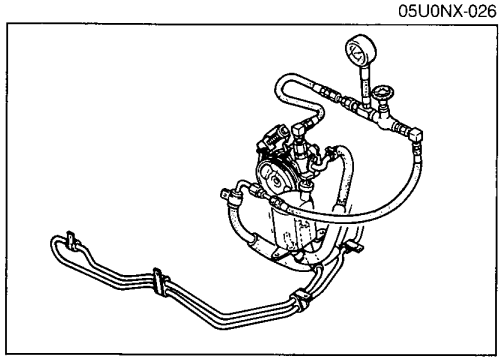
Note
- **The points where fluid leakage may occur are indicated in the figure.**

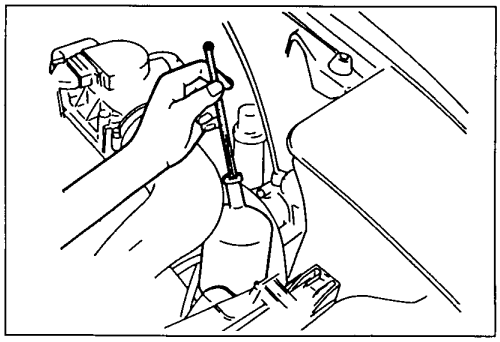

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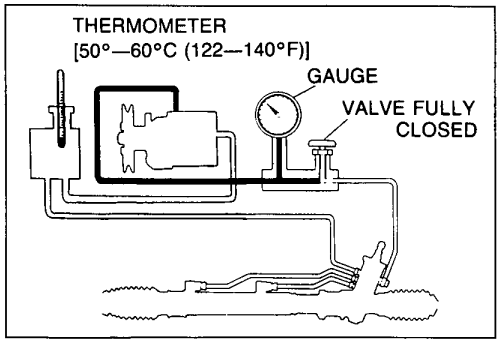
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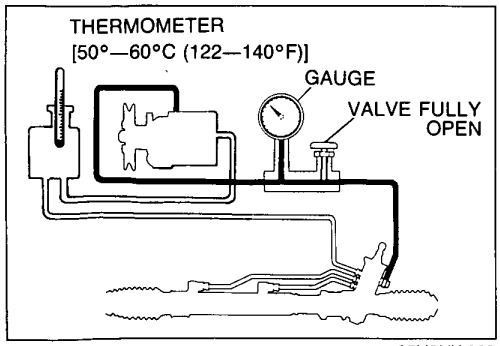
05U0NX-026


95E0NX-016


9MU0NX-010



05U0NX-028



05U0NX-029

Fluid pressure

1. Assemble the **SST** as shown in the figure.

Tightening torque:
39—49 N·m (4.0—5.0 m-kg, 29—36 ft-lb)

Note
- **Before disconnecting the hose, make marks at the connections for proper reinstallation.**

2. Disconnect the high-pressure hose from the oil pump. Attach the **SST**.
3. Bleed the air from the system. (Refer to page N–21.)

4. Open the gauge valve fully. Start the engine and turn the steering wheel fully left and right to raise the fluid temperature to **50—60°C (122—140°F)**.

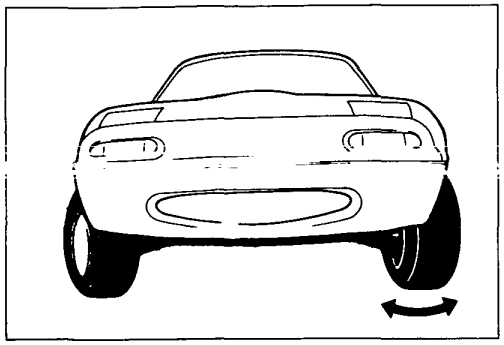
Caution
- **If the valve is left closed for more than 15 seconds, the fluid temperature will increase excessively and adversely affect the oil pump.**

5. Close the gauge valve completely. Increase the engine speed to **1,000—1,500 rpm** and measure the fluid pressure generated by the oil pump. If the pressure is not within specification, replace the oil pump assembly.

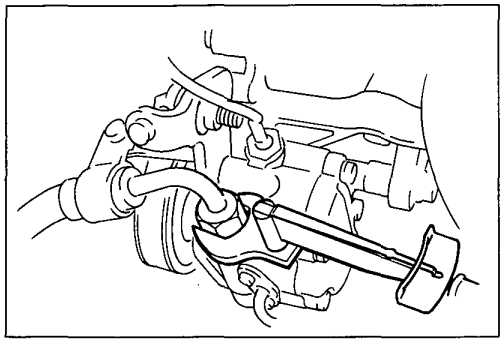
Oil pump fluid pressure: 7,603—8,339 kPa (77.5—85.0 kg/cm^2, 1,102—1,209 psi)

6. Open the gauge valve fully and increase the engine speed to **1,000—1,500 rpm**.

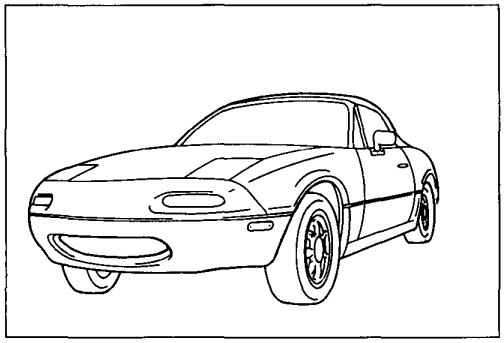
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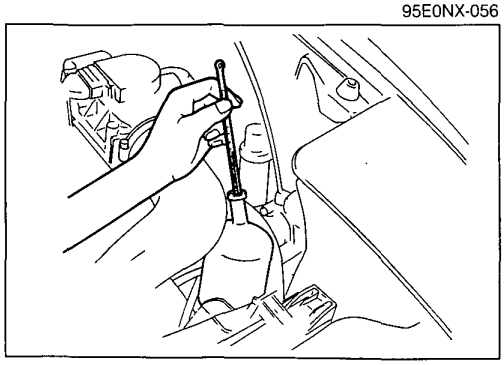
05U0NX-030



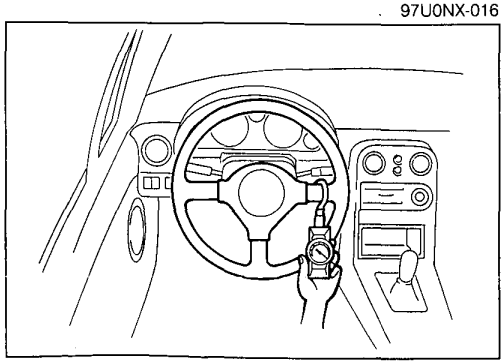
95E0NX-017



95E0NX-056



97U0NX-016



05U0NX-033

Caution

- **If the steering wheel is kept in the fully turned position for more than 15 seconds, the fluid temperature will rise excessively and adversely affect the oil pump.**

7. Turn the steering wheel fully to the left and right and measure the fluid pressure generated by the gear housing. If the pressure is not within specification, replace the gear housing assembly.

   Gear housing fluid pressure: 7,603—8,339 kPa (77.5—85.0 kg/cm^2, 1,102—1,209 psi)

8. Remove the gauge set. Install and tighten the high-pressure hose to the specified torque.

   Tightening torque:
   31—47 N·m (3.2—4.8 m-kg, 23—35 ft-lb)

9. Bleed the air from the system. (Refer to page N–21.)

STEERING WHEEL AND COLUMN

On-vehicle Inspection

Steering wheel effort

1. With the vehicle on a hard, level surface, put the wheels in the straight-ahead position.

2. Start the engine and warm the power steering fluid to **50—60°C (122—140°F)**.

3. With the engine running at idle, attach a pull scale to the outermost point of the steering wheel spoke.
   Then, starting with the wheels in the straight-ahead position, measure the effort required to turn the steering wheel to the left and to the right.

   Steering wheel effort:
   23.5—35.3 N (2.4—3.6 kg, 5.3—8.0 lb)
   [during one turn of the steering wheel]

4. If not within specification, check the following: fluid level, air in system, fluid leakage at hose or connections, function of oil pump and gear box, and tire pressure.

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STEERING GEAR AND LINKAGE

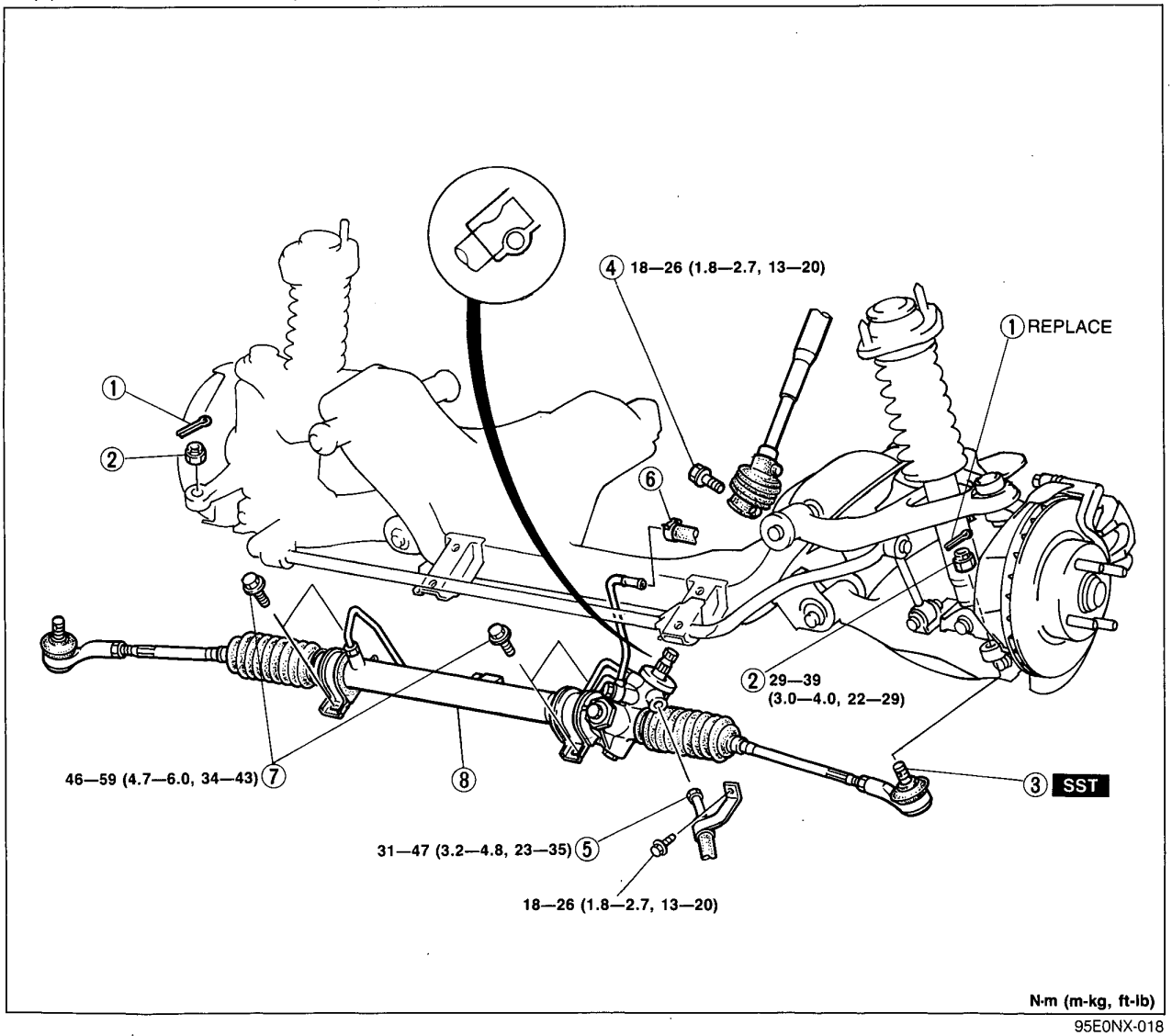
Removal / Installation

1. Loosen the wheel lug nuts.
2. Jack up the front of the vehicle and support it with safety stands.
3. Remove the wheels.
4. Remove in the order shown in the figure, referring to **Removal Note**.

Note

- **Use a container or rags to collect the power steering fluid when disconnecting the pressure pipe and return hose.**

5. Install in the reverse order of removal.
6. Tighten all necessary bolts and nuts to the specified torque.
7. After installation:
   (1) Check for fluid leakage. (Refer to page N–22.)
   (2) Bleed air from the system. (Refer to page N–21.)



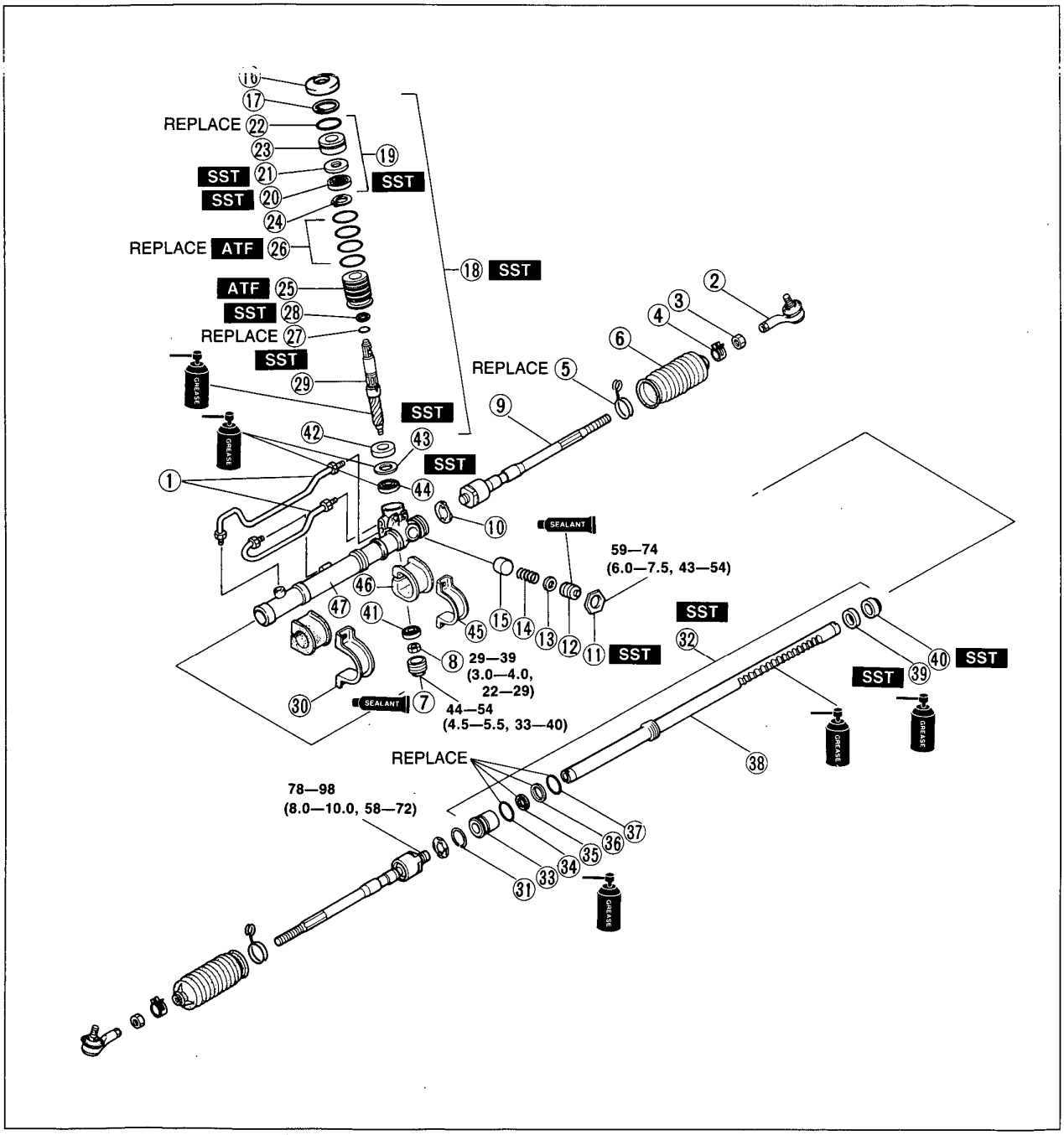
95E0NX-018

1. Cotter pin
2. Nut
3. Tie-rod end
   Removal Note ..... page N–7
4. Bolt
5. Pressure pipe
6. Return hose
7. Mounting bracket bolt
8. Steering gear and linkage

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Disassembly / Inspection / Assembly

1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Assemble in the reverse order of disassembly, referring to **Assembly Note**.



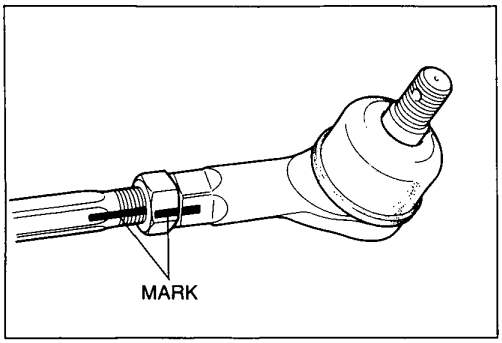
95E0NX-019

1. Oil pipe
   Inspect for clogging and damage
2. Tie-rod end
   Disassembly note..... page N–27
   Inspect ball joint for damage and malfunction
3. Locknut (Tie-rod end)
4. Boot clamp
5. Boot wire
6. Boot
   Inspect for cracks and other damage
7. Housing cover
8. Locknut (Pinion shaft)
9. Tie-rod
   Disassembly note..... page N–27
   Inspect for bending
   Inspect ball joint for damage and malfunction
10. Washer

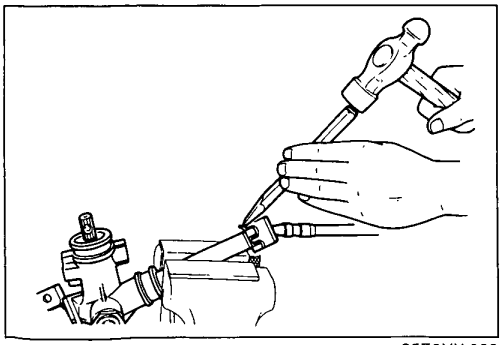
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11. Locknut (Adjusting cover)
12. Adjusting cover
    Assembly note ..... page N–32
13. Plate
14. Yoke spring
    Inspect for weakness and damage
15. Support yoke
    Inspect for damage and wear
16. Dust cover
17. Retaining ring
18. Pinion shaft assembly
    Disassembly note..... page N–28
    Inspection..... page N–29
    Assembly note ..... page N–31
19. Plug assembly
    Disassembly note..... page N–28
    Assembly note ..... page N–31
20. Upper bearing
    Inspect for wear, damage and malfunction
21. Oil seal
22. O-ring
23. Plug
24. Snap ring
25. Control valve
    Assembly note ..... page N–31
26. Seal ring
27. O-ring
28. Seal ring
29. Pinion shaft
30. Mounting bracket
31. Stop ring
32. Steering rack assembly
    Disassembly note..... page N–28
    Assembly note ..... page N–30
33. Holder
    Assembly note ..... page N–30
    Inspect for wear and damage
34. O-ring
35. Y-packing
36. Seal ring
37. O-ring
38. Steering rack
    Inspect for cracks, damage and wear
39. Oil seal
    Disassembly note..... page N–28
    Assembly note ..... page N–30
40. Backup ring
    Disassembly note..... page N–28
    Assembly note ..... page N–30
    Inspect for cracks and other damage
41. Lower bearing
    Disassembly note..... page N–29
    Inspect for wear, damage and malfunction
42. Oil seal
    Disassembly note..... page N–29
    Assembly note ..... page N–29
43. Spacer
    Disassembly note..... page N–29
    Inspect for cracks, damage and wear
44. Center bearing
    Disassembly note..... page N–29
    Assembly note ..... page N–29
    Inspect for wear, damage and malfunction
45. Mounting bracket
46. Mounting rubber
47. Gear housing

95E0NX-020



95E0NX-021



95E0NX-022

Disassembly note

Tie-rod end

1. Mark the tie-rod, locknut and tie-rod end for proper reassembly.

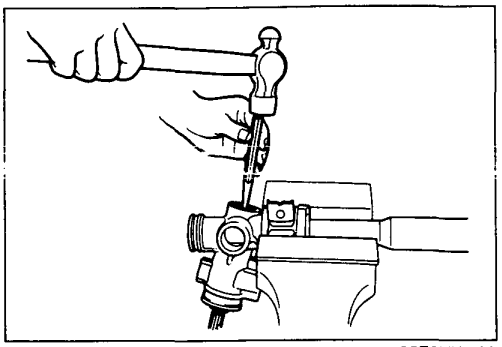
Tie-rod

Caution
- **Use copper or aluminum plates in the jaws of the vise.**

1. Uncrimp the washer.
2. Remove the tie-rod.

Caution
- **Do not damage the tie-rod or the rack.**

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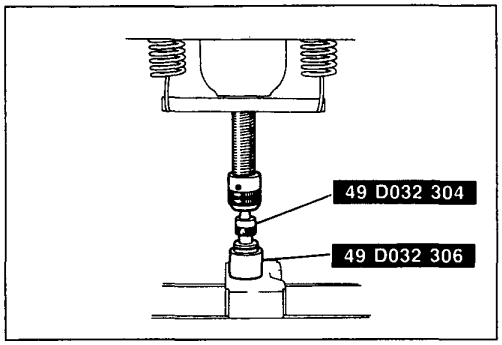
95E0NX-023

Pinion shaft assembly

1. Secure the mounting bracket in a vise.
2. Remove the retaining ring.
3. Tap the pinion shaft with a punch to remove it.

Caution

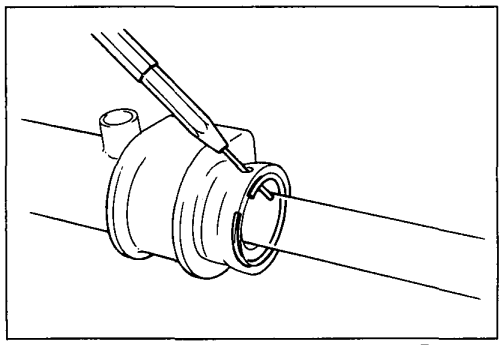
- **Do not tap on the lower bearing.**



95E0NX-024

Plug assembly

1. Remove the plug assembly from the pinion shaft.
2. Press out the upper bearing and oil seal with the **SST**.
3. Remove the O-ring from the plug.



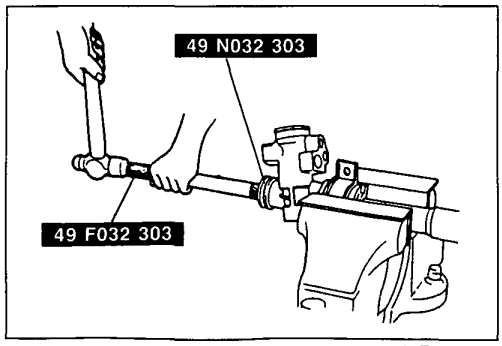
95E0NX-025

Steering rack

1. Remove the stop ring with a pin punch.
2. Temporarily tighen the tie-rod to the tube side and pull it to remove the rack.

Caution

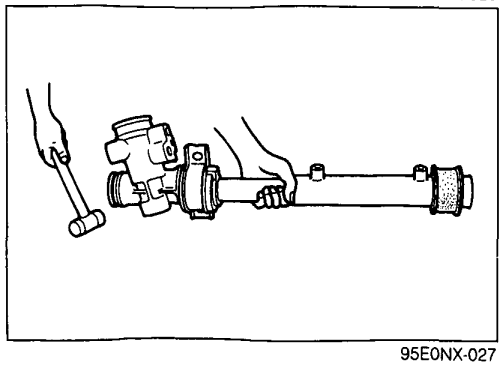
- **Do not damage the rack.**



95E0NX-026

Backup ring and oil seal

1. Tap the **SST** from gear housing side to remove the back-up ring and the oil seal.



95E0NX-027

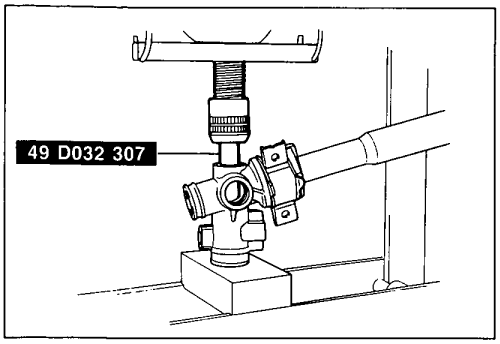
Lower bearing

1. Tap the end of gear housing column to remove the lower bearing.

Caution

- **Do not tap the gear housing bearing section.**

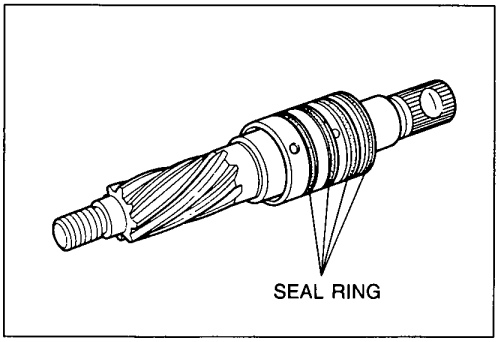
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95E0NX-028

Oil seal, spacer and center bearing

1. Press out the oil seal, the spacer and the center bearing with the **SST**.

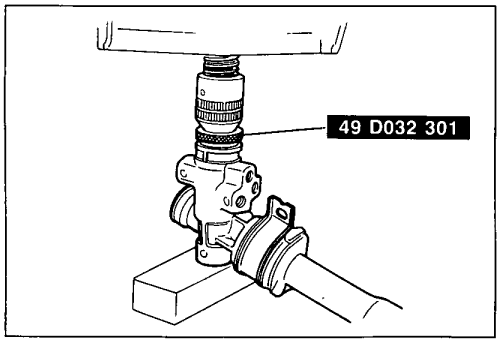


95E0NX-029

Inspection

Pinion shaft assembly

1. Inspect the teeth of the pinion shaft for wear and damage. Replace the pinion shaft assembly if necessary.
2. Inspect the control valve for damage, oil passage clogging and seal ring and friction surface wear and damage. Replace the pinion shaft assembly if necessary.

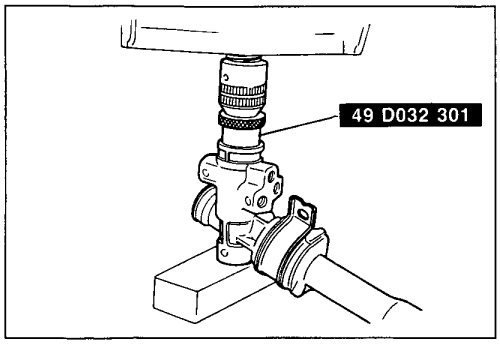


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Assembly note

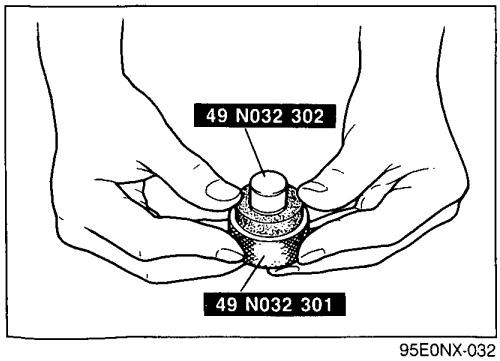
Oil seal, center bearing

1. Apply grease to the center bearing and set it in the gear housing.
2. Press in the center bearing with the **SST**.



95E0NX-031

3. Set the spacer in the gear housing.
4. Apply grease to the seal and set it in the gear housing.
5. Press in the oil seal with the **SST**.

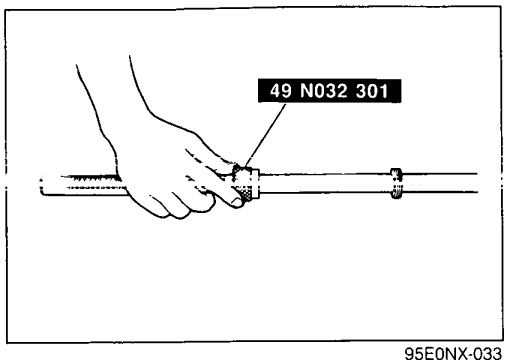


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Backup ring and oil seal

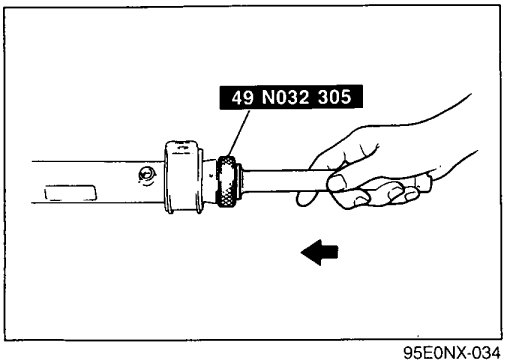
1. Apply grease to the oil seal.
2. Install the oil seal to the **SST (Protector body and guide)**.
3. Remove the **SST (guide)**.

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95E0NX-033

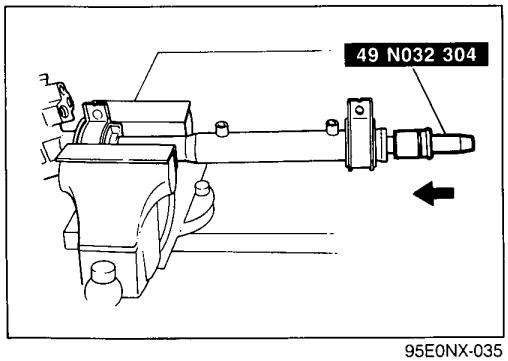
4. Slide the oil seal and the **SST** over the rack from the gear side to the piston. Remove the **SST**.
5. Install the backup ring.



95E0NX-034

Steering rack

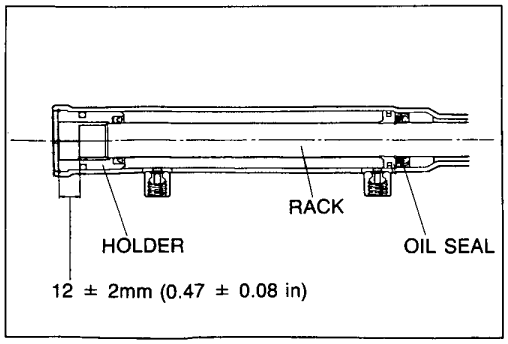
1. Apply grease to the teeth and friction surface of the rack.
2. Slide the rack into the gear housing from the tube side.



95E0NX-035

Holder

1. Apply grease to a new Y-packing and install it into the holder.
2. Install the O-ring onto the holder.
3. Install the **SST** over the rack end and install the holder.
4. Install the stop ring.



95E0NX-036

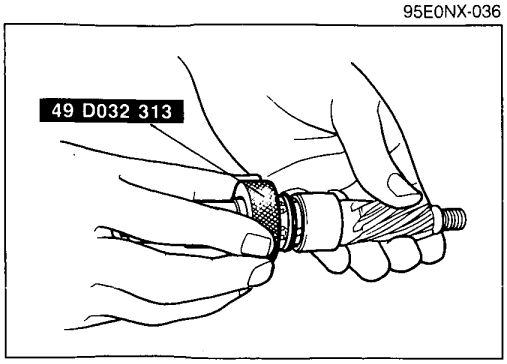
Oil seal

1. Press in the oil seal from tube side with a suitable pipe (Dia. 22mm (0.86 in)).

Caution

- **Do not press over 400 kg (880 lb).**

2. Verify that the distance between the end of the rack and the holder is 12 ± 2mm (0.47 ± 0.08 in).

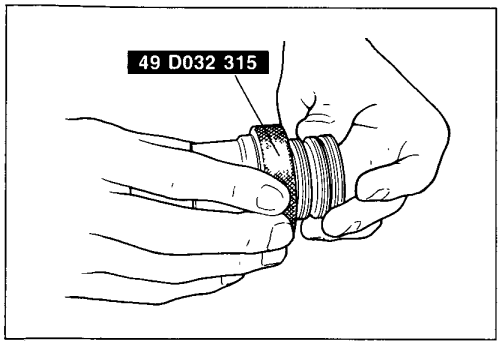


95E0NX-037

Control valve

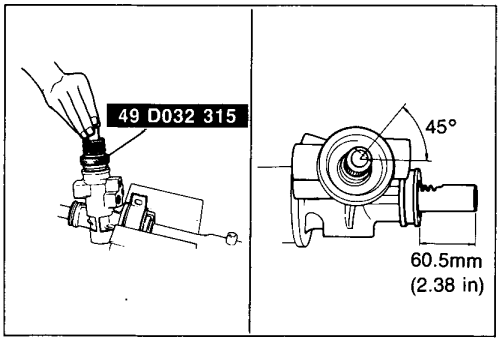
1. Install the O-ring and the seal ring onto the pinion shaft.
2. Pass the pinion shaft back and forth through the **SST** to form the O-ring and the seal rings.

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95E0NX-038

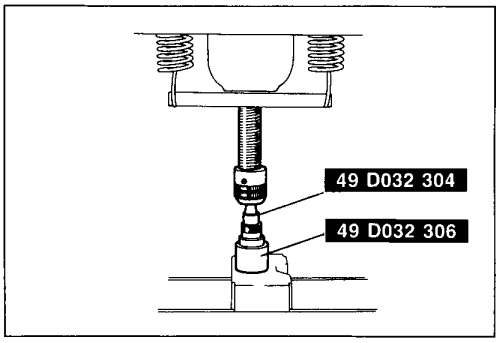
3. Install seal rings onto the control valve and form them with the **SST**.
4. Remove the **SST** from pinion shaft and align pin position of control valve with thread of pinion shaft assembly and install control valve assembly.
5. Install the snap ring to the pinion shaft assembly.



95E0NX-039

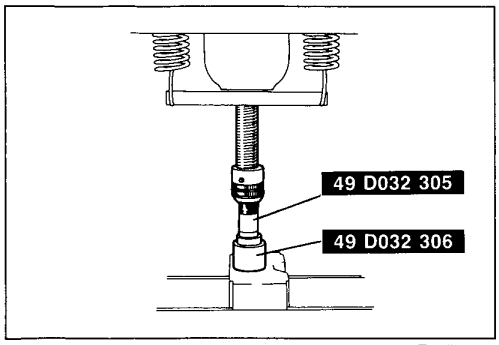
Pinion shaft assembly
1. Apply sufficeint grease to the teeth of the pinion shaft.
2. Apply ATF to the seal ring and the friction surface of the control valve.
3. Attach the **SST** to the gear housing and install the pinion shaft.

Caution
- **Do not damage the edge of the seal ring and the control valve.**



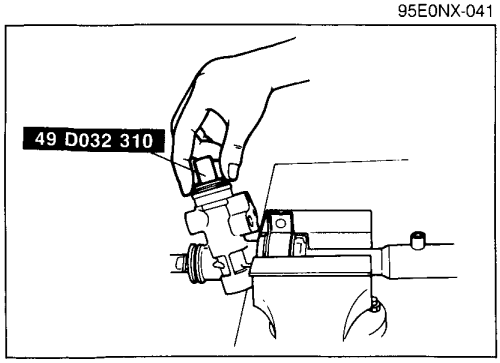
95E0NX-040

Plug assembly
1. Apply ATF to the upper bearing and the oil seal.
2. Set the oil seal into the plug.
3. Press in the oil seal with the **ST**.



95E0NX-041

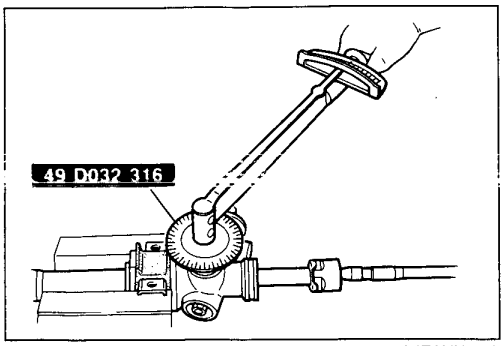
4. Put the upper bearing into the plug.
5. Press in the upper bearing with the **SST**.
6. Install the O-ring to the plug assembly.



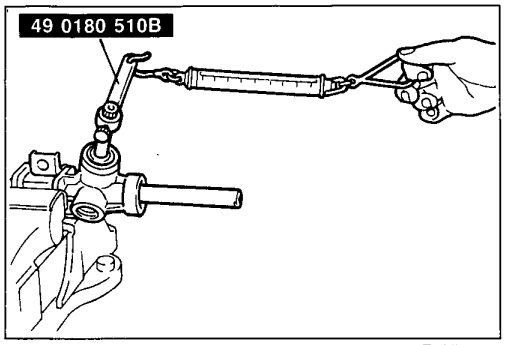
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7. Attach the **SST** to the pinion and install the plug assembly.

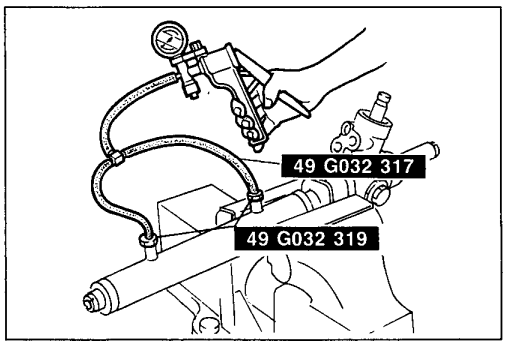
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95E0NX-044



95E0NX-045

Adjusting cover

1. Tighten the mounting, bracket in a vise.
2. Set the rack to the center position.
3. Tighten the adjusting cover to **4.9 N·m (50 cm-kg, 43 in-lb)** with the **SST** three times, then return it **25°**.
4. Apply sealant to the threads of the locknut.
5. Attach the locknut.
6. Measure pinion torque with the **SST** and a pull scale.

   Standard:
   Center of rack ± 90°
   1.0—1.2 N·m (10—12 cm-kg, 8.7—10.4 in-lb)
   Scale reading 1.0—1.2 kg (35.3—42.4 oz)

7. If not within specification, repeat Steps 3 through 6.

Hearmetic sealing inspection

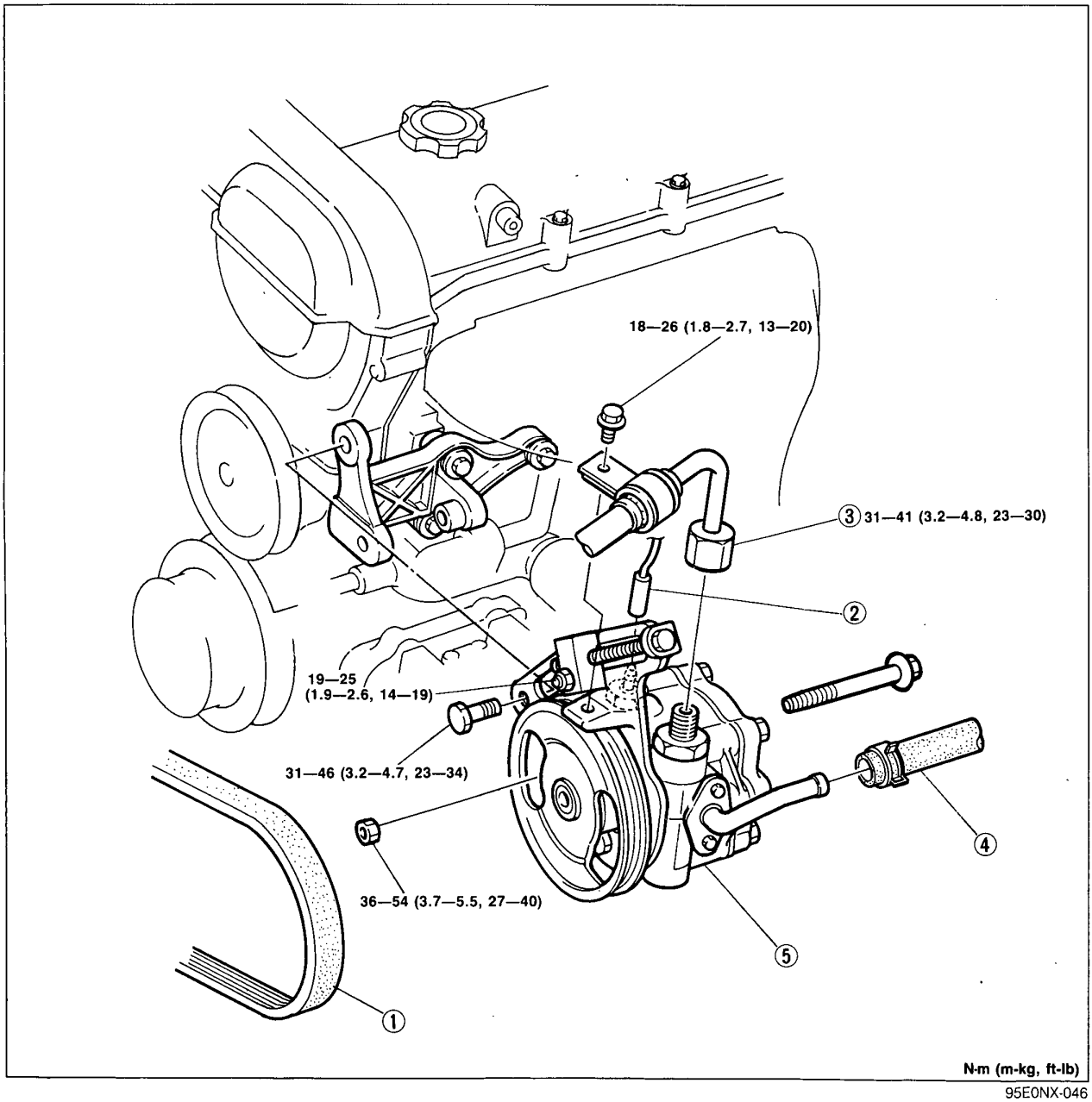
1. Connect the **SST** to the power cylinder section of the gear housing.
2. Apply **400 mmHg (15.7 inHg)** vacuum with a vacuum pump and verify that it is held for at least **30 seconds**.
3. If vacuum is not held, replace the oil seal.

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POWER STEERING OIL PUMP
Removal / Installation
1. Remove in the order shown in the figure.

Note
- **Use a container or rags to collect the power steering fluid when disconnecting the pressure pipe and return hose.**

2. Install in the reverse order of removal.
3. After installation:
   (1) Check connections for fluid leakage. (Refer to page N–22.)
   (2) Bleed air from system. (Refer to page N–21.)



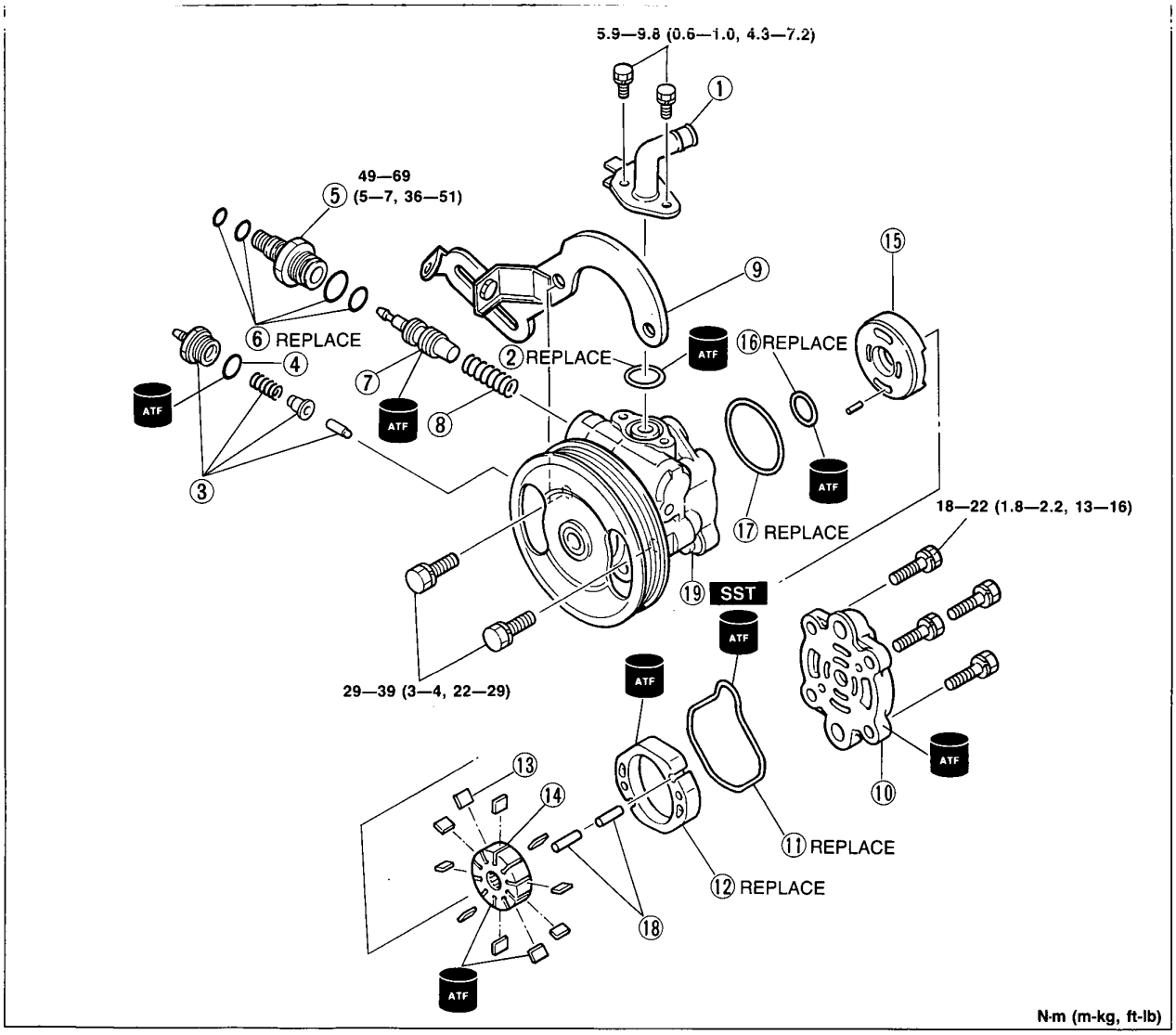
95E0NX-046

1. Drive belt
   Inspection ..... page N–37
   Adjustment ..... page N–37
   Replacement ..... page N–37
2. Power steering pressure switch connector
3. Pressure pipe
4. Return hose
5. Oil pump assembly

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Disassembly / Inspection / Assembly

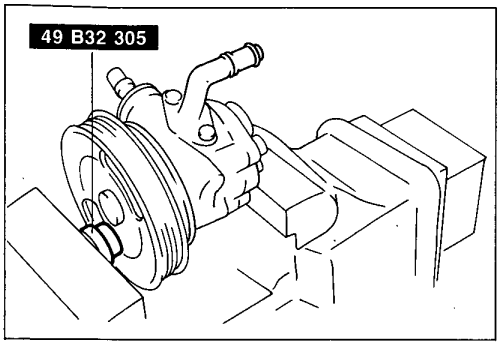
1. The following precedure is for replacement of the O-ring only. Replace the pump assembly if other repairs are necessary.
2. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
3. Assemble in the reverse order of disassembly, referring to **Assembly Note**.



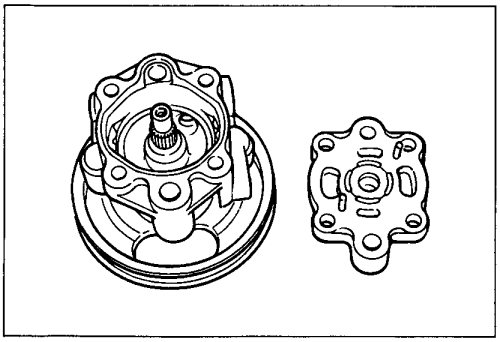
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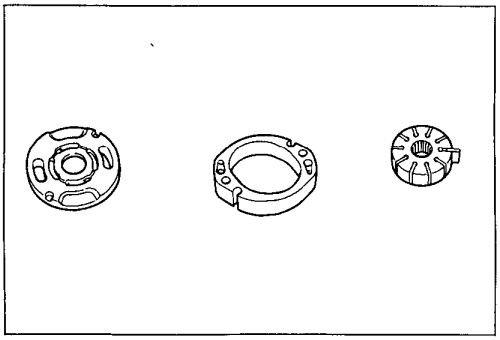
1. Suction pipe
2. O-ring
3. Pressure switch assembly
4. O-ring
5. Connector
6. O-ring
7. Control valve
   Inspection..... page N–35
8. Spring
   Inspection..... page N–35
9. Bracket
10. Pump body rear
    Inspection..... page N–35
11. O-ring
12. Cam ring
    Inspection..... page N–35
    Assembly note ..... page N–36
13. Blade
    Inspection..... page N–35
    Assembly note ..... page N–36
14. Rotor
    Inspection..... page N–35
    Assembly note ..... page N–35
15. Side plate
    Inspection..... page N–35
16. O-ring
17. O-ring
18. Pin
19. Pump body front
    Inspection..... page N–35

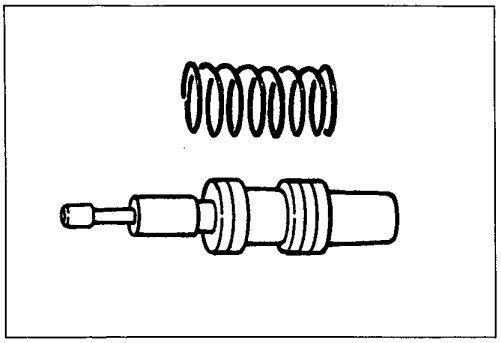
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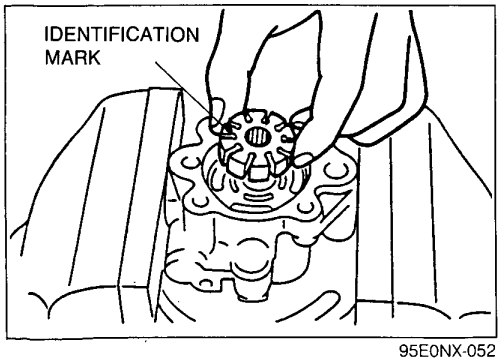


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95E0NX-051



95E0NX-052

Disassembly note
Oil pump

Caution
- **To secure the oil pump in a vise, use the SST as shown to prevent damage to the pump.**

Inspection

Caution
- **Replace the pump assembly if damaged.**

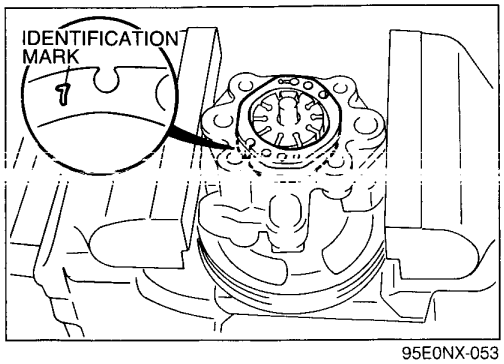
Pump body
1. Inspect the front and rear of the pump body for cracks and damage and the friction surface of rotor for wear.

Cam ring, rotor, blade, side plate
1. Inspect the blade friction surface of the cam ring for wear.
2. Inspect the pump body of the rotor and side plate friction surface for wear.
3. Inspect the cam ring friction surface of the blade for wear.
4. Inspect clearance between the rotor and blade.

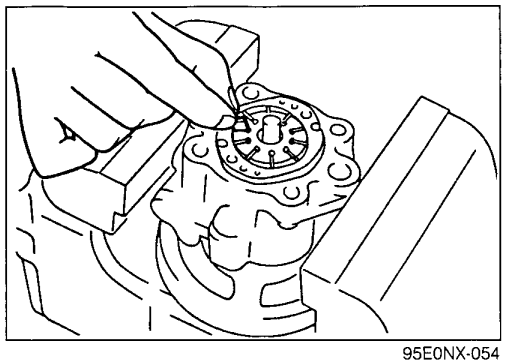
Control valve spring
1. Inspect the control valve for cracks, damage and clogging, and the friction surface for wear.
2. Inspect the spring for damage.

Assembly note
Rotor
1. Install the rotor with the indentification mark facing upward.

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95E0NX-054

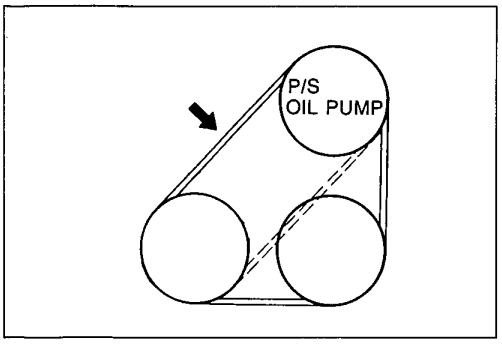
Cam ring

1. Install cam ring with the identification mark facing downward.

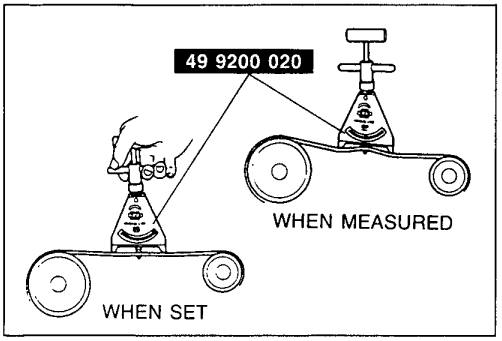
Blade

1. Install the blades into rotor with the rounded edges outward.

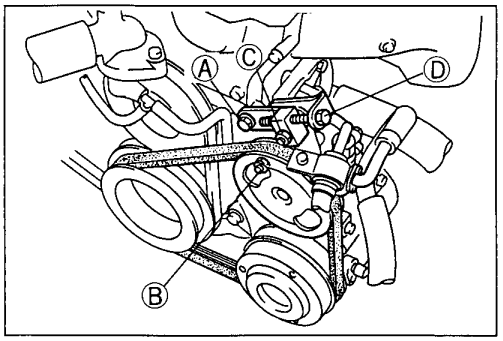
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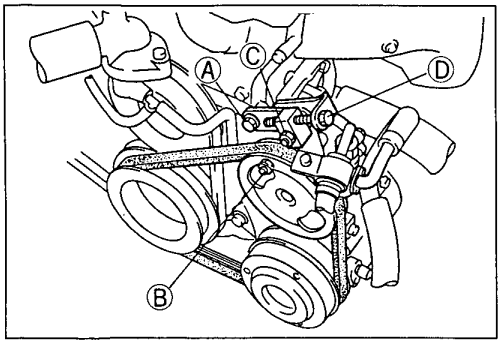
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05U0NX-040



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DRIVE BELT

Inspection

1. Check the drive belt for wear, cracks, and fraying. Replace if necessary.
2. Check the drive belt deflection by applying mode rate pressure **(98 N, 10 kg, 22 lb)** midway between the pulleys. Adjust if necessary.

Deflection (Depressed at 98 N [10 kg, 22 lb])
New : 8—9mm (0.31—0.35 in)
Used: 9—10mm (0.35—0.39 in)

Tension
New : 491—589 N (50—60 kg, 110—132 lb)
Used: 422—491 N (43—50 kg, 95—110 lb)

Note
- **Belt tension can be measured between any pulleys.**

Adjustment

1 Loosen P/S oil pump bolt Ⓐ and nuts Ⓑ and Ⓒ. Adjust the belt deflection by turning the adjusting bolt Ⓓ.

Tightening torque:
Ⓐ 31—46 N·m (3.2—4.7 m-kg, 23—34 ft-lb)
Ⓑ 36—54 N·m (3.7—5.5 m-kg, 27—40 ft-lb)
Ⓒ 19—25 N·m (1.9—2.6 m-kg, 14—19 ft-lb)

Replacement

1. Lossen bolt Ⓐ, nuts Ⓑ and Ⓒ, and adjusting bolt Ⓓ.
2. Remove and replace the drive belt.
3. Adjust the deflection (tension). (Refer to above.)

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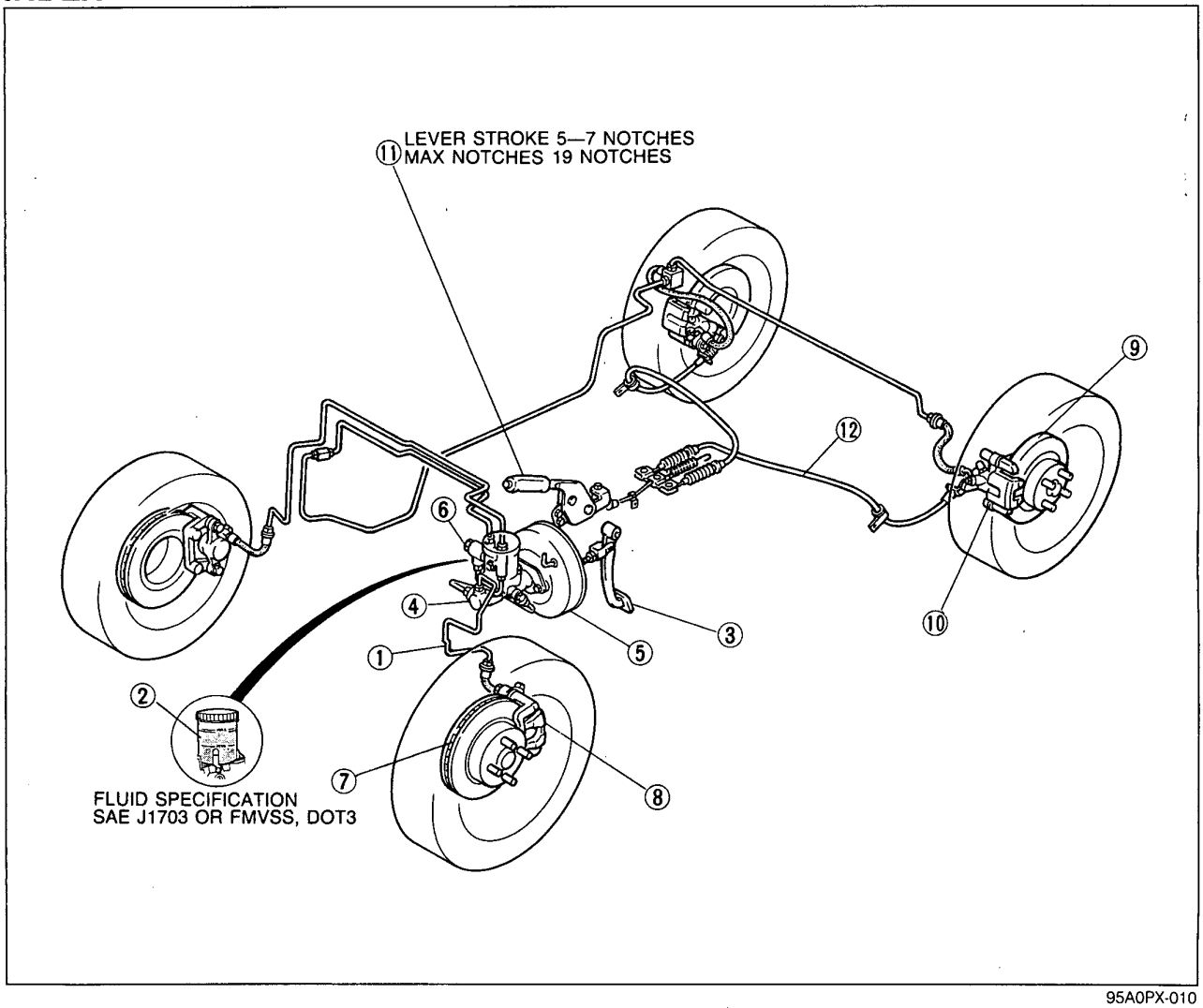
BRAKING SYSTEM

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BRAKE SYSTEM ..... **P– 4**
PREPARATION ..... **P– 4**
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BRAKE FLUID ..... **P– 7**
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MASTER CYLINDER **P–10**
POWER BRAKE UNIT **P–13**
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FRONT BRAKE (DISC) **P–18**
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REAR BRAKE (DISC) **P–22**
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OUTLINE

SPECIFICATIONS

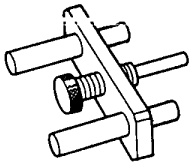
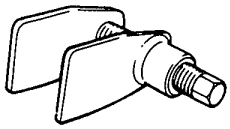
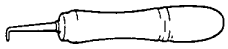
Item		Specifications
Brake pedal	Type	Suspended
	Pedal level ratio	4.1 : 1
	Maximum stroke mm (in)	133 (5.24)
Master cylinder	Type	Tandem (with level sensor)
	Bore mm (in)	22.22 (0.875)
Front disc brake	Type	Disc (ventilated)
	Cylinder bore mm (in)	51.1 (2.01)
	Pad dimensions (mm^2 x mm) (area x thickness) (in^2 x in)	3,700 x 9.5 (5.73 x 0.37)
	Disc plate dimension mm (in) (effective diameter x thickness)	235 x 18 (9.25 x 0.71)
Rear disc brake	Type	Disc (solid)
	Cylinder bore mm (in)	31.75 (1.25)
	Pad dimensions (mm^2 x mm) (area x thickness) (in^2 x in)	2,600 x 8.0 (4.03 x 0.31)
	Disc plate dimensions mm (in) (effective diameter x thickness)	231 x 9 (9.09 x 0.35)
Power brake unit	Type	Vacuum multiplier
	Size mm (in)	214 (8)
Braking force control device	Type	Proportioning bypass valve (PBV)
Brake fluid		SAE J1703 or FMVSS 116, DOT-3
Parking brake	Type	Mechanical, two rear brakes
	Operation system	Hand lever

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BRAKE SYSTEM

PREPARATION
SST

49 0259 770B Wrench, flare nut 	For removal and installation of brake pipes	49 F043 001 Adjust gauge 	For adjustment of push rod clearance
49 0221 600C Expand tool, disc brake 	For installation of disc pads	49 0208 701A Boot air out tool 	For removal of piston seal

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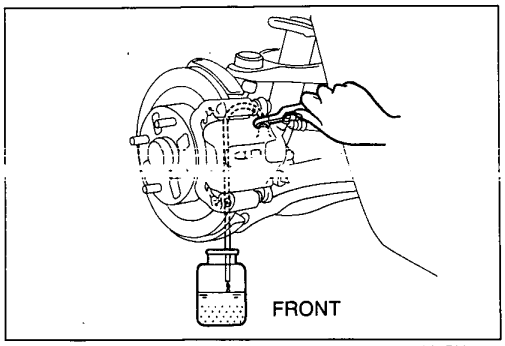
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TROUBLESHOOTING GUIDE

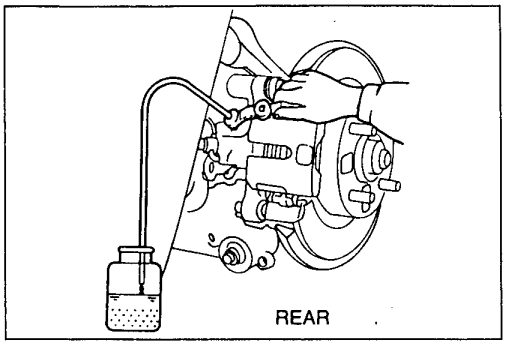
Problem	Possible cause	Action	Page
Poor braking	Leakage of brake fluid	Repair	—
	Air in lines	Air bleed	P– 6
	Worn pad	Replace	P–18,22
	Brake fluid, grease, oil, or water on pad	Clean or replace	P–18,22
	Hardening of pad surface or poor contact	Grind or replace	P–18,22
	Malfunction of disc brake piston	Replace	P–19,23
	Malfunction of master cylinder	Repair or replace	P–10
	Malfunction of power brake unit	Repair or replace	P–15
	Malfunction of check valve (vacuum hose)	Repair or replace	P–15
	Damaged vacuum hose	Replace	P–15
	Deterioration of flexible hose	Replace	P– 6
	Malfunction of proportioning bypass valve (PBV)	Replace	P–16
Brakes pull to one side	Worn pad	Replace	P–18,22
	Brake fluid, grease, oil, or water on pad	Clean or replace	P–18,22
	Hardening of pad surface or poor contact	Grind or replace	P–18,22
	Abnormal wear, distortion, or eccentricity of disc	Repair or replace	Section M
	Malfunction of automatic adjuster in rear brake	Repair	—
	Looseness or deformation of dust cover mounting bolt	Tighten or replace	Section M
	Malfunction of disc brake piston	Repair or replace	P–19,23
	Worn or improperly adjusted wheel bearing preload	Replace or adjust	Section M
	Improper adjustment of wheel alignment	Adjust	Section R
	Unequal tire air pressure	Adjust	Section Q
Brakes do not release	No brake pedal play	Adjust	P– 8
	Improper adjustment of push rod clearance	Adjust	P–11
	Clogged master cylinder return port	Clean	—
	Pad not returning properly	Repair	—
	Improper return of malfunction of brake caliper piston	Replace	P–21,25
	Excessive runout of disc plate	Replace	Section M
	Improper adjustment of wheel bearing preload	Adjust or replace	Section M
Pedal goes too far (Too much pedal stroke)	Air in system because of insufficient brake fluid	Add fluid and bleed air	P– 6
	Improper adjustment of pedal play	Adjust	P– 8
	Worn pad	Replace	P–18,22
	Air in lines	Bleed air	P– 6
Abnormal noise or vibration during braking	Worn pad	Replace	P–18,22
	Deterioration of pads	Grind or replace	P–18,22
	Brakes do not release	Repair	—
	Foreign material or scratches on disc plate contact surface	Clean	—
	Looseness of caliper mounting bolt(s)	Tighten	P–19,23
	Damage or deviation of disc contact surface	Replace	Section M
	Poor contact of pads	Repair or replace	P–18,22
	Insufficient grease on sliding parts	Apply grease	—

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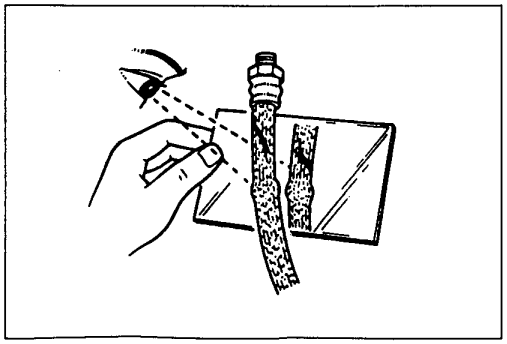


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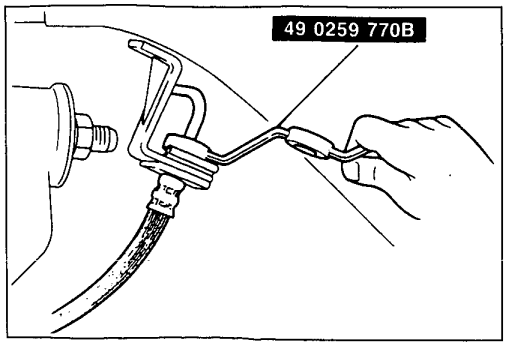
AIR BLEEDING

Caution
- **The fluid in the reservoir must be maintained at the 3/4 level or higher during air bleeding.**
- **Do not spill brake fluid onto painted surfaces.**

1. Jack up the vehicle and support it with safety stands.
2. Remove the bleeder cap and attach a vinyl tube to the bleeder screw.
3. Place the other end of the vinyl tube in a clear container and keep the tube end immersed in brake fluid during air bleeding.
4. Pump the brake pedal several times.
5. While the brake pedal is depressed, loosen the bleeder screw to let fluid and air escape.
6. Repeat Steps 4 and 5 until there are no air bubbles in the fluid.
7. Check for correct brake operation.
8. Check that there is no fluid leakage. Be sure to clean away any spilled fluid with rags.
9. After bleeding the air, add brake fluid to the specified level in the reservoir.



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05U0PX-008

BRAKE HYDRAULIC LINE

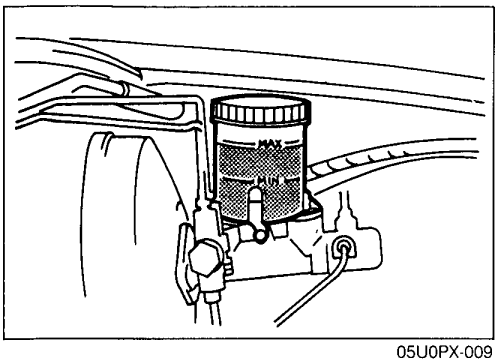
Inspection

Check the following and replace parts as necessary.
1. Cracks, damage, and corrosion of the brake hose
2. Damage to the brake hose threads
3. Scars, cracks, and swelling of the flexible hose
4. All lines for fluid leakage

Removal / Installation

1. When disconnecting the flexible hose and brake line, remove the clip after loosening the flare nut.
2. When connecting the flexible hose, do not tighten it too tight or twist it.
3. Check that the hose does not contact other parts when the vehicle bounces or when the steering wheel is turned all the way to the left or right.
4. Bleed the air from the brake system.

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BRAKE FLUID

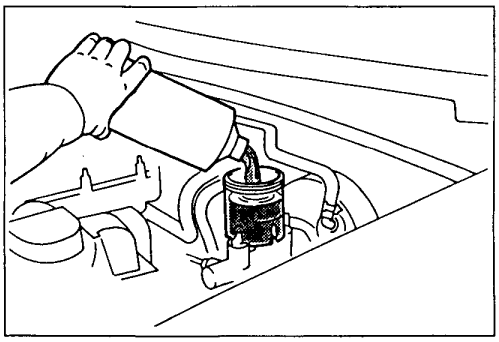
Inspection

Check the fluid level in the reservoir. It should be between MAX and MIN.
If the fluid level is extremely low, check the brake system for leaks.

Fluid specification:
SAE J1703 or FMVSS 116, DOT-3

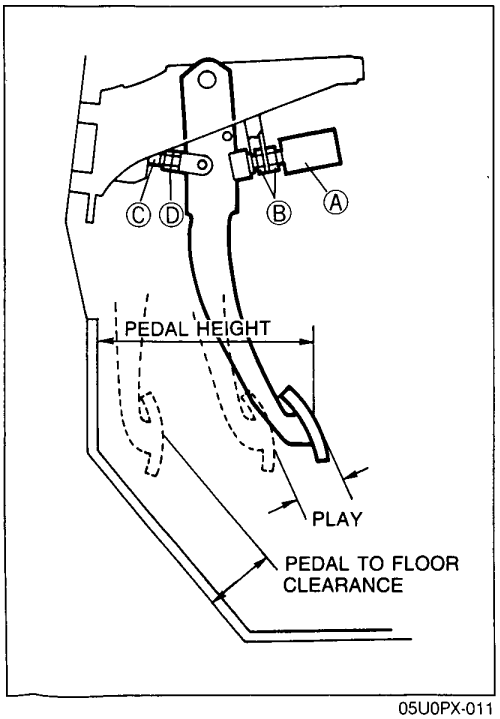
Caution

- **The fluid in the reservoir must be maintained at 3/4 level or higher during bleeding.**
- **Do not allow the brake fluid to get on painted surfaces.**


05U0PX-010

Replacement

1. Remove the brake fluid from the reservoir with a suction pump.
2. Fill the reservoir with clean brake fluid.
3. Attach a vinyl tube to the bleeder screw and place the other end of the tube in a clear container.
4. Pump out the old brake fluid by loosening the bleeder screws one by one and pumping the brake pedal until only clean fluid is expelled.
5. Fill the reservoir to the specified level.



05U0PX-011

BRAKE PEDAL

On-vehicle Inspection

Pedal height

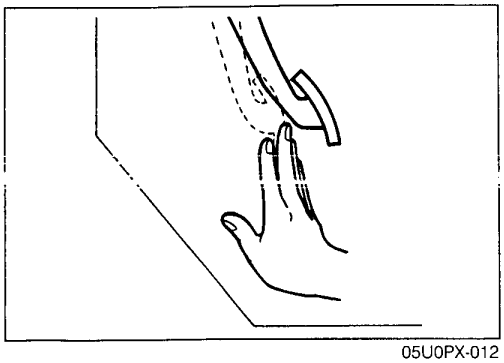
Check that the distance from the center of the upper surface of the pedal pad to the carpet is as specified.

Pedal height: 171—181mm (6.93—7.13 in)
(With carpet)

Adjustment

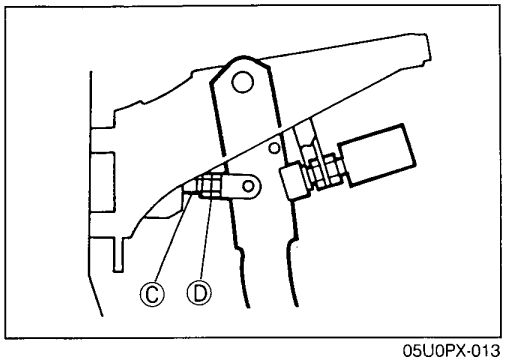
1. Disconnect the stoplight switch connector.
2. Loosen locknut Ⓑ and turn switch Ⓐ until it does not contact the pedal.
3. Loosen locknut Ⓓ and turn rod Ⓒ to adjust the height.
4. Adjust the pedal free play and tighten operating rod locknut Ⓓ.
5. Turn the stoplight switch until it contacts the pedal; then turn an additional 1/2 turn. Tighten the locknut.

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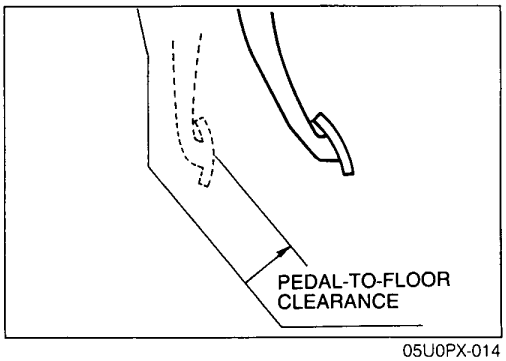
Pedal play
1. Depress the pedal a few times to eliminate the vacuum in the system.
2. Lightly depress the pedal by hand until resistance is felt, and check the free play.

Free play: 4—7mm (0.16—0.28 in)



05U0PX-013

Adjustment
1. Loosen locknuts Ⓓ and turn rod Ⓒ to adjust the free play.
2. Tighten locknuts Ⓓ.



05U0PX-014

Pedal-to-floor clearance
Check that the distance from the floor panel to the center of the upper surface of the pedal pad is as specified when the pedal is depressed with a force of **589 N (60 kg, 132 lb)**.

Pedal-to-floor clearance: 95mm (3.74 in)
(Without carpet)

If the distance is less than specified, inspect for air in the brake system.

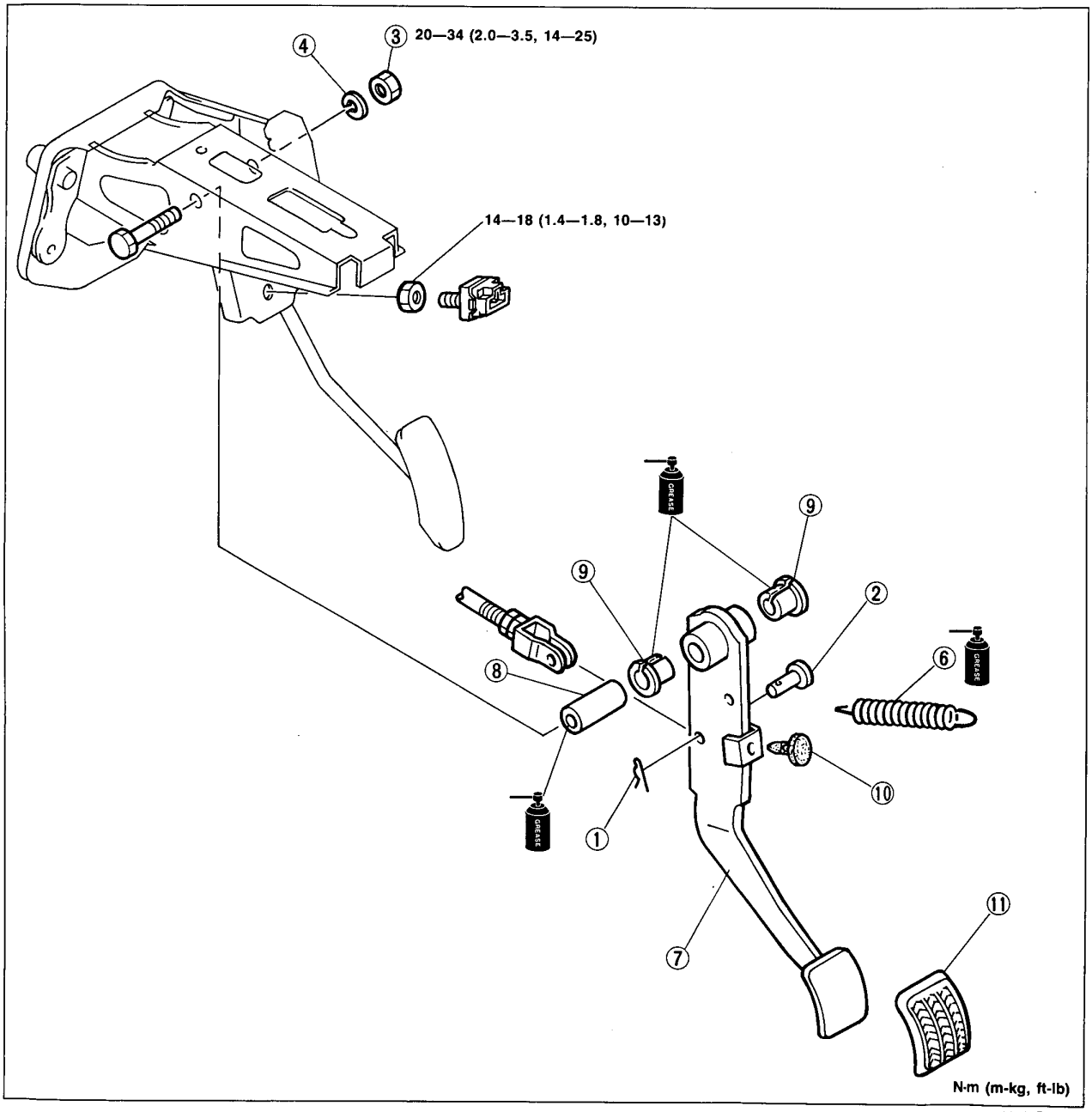
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Removal / Inspection / Installation

1. Remove in the order shown in the figure.
2. Inspect all parts and repair or replace as necessary.
3. Install in the reverse order of removal.
4. After installation, check and adjust the pedal height and free play if necessary.

Caution

- **Apply grease to the inner surface of the bushing and to the contact surfaces of the clevis pin and spring.**



05U0PX-015

1. Spring clip
2. Clevis pin
3. Nut
4. Spring washer
5. Bolt
6. Return spring
   Inspect for weakness and damage
7. Brake pedal
   Inspect for bending
8. Guide pipe
9. Bushing
   Inspect for wear
10. Stopper rubber
    Inspect for wear
11. Pedal pad
    Inspect for wear and damage

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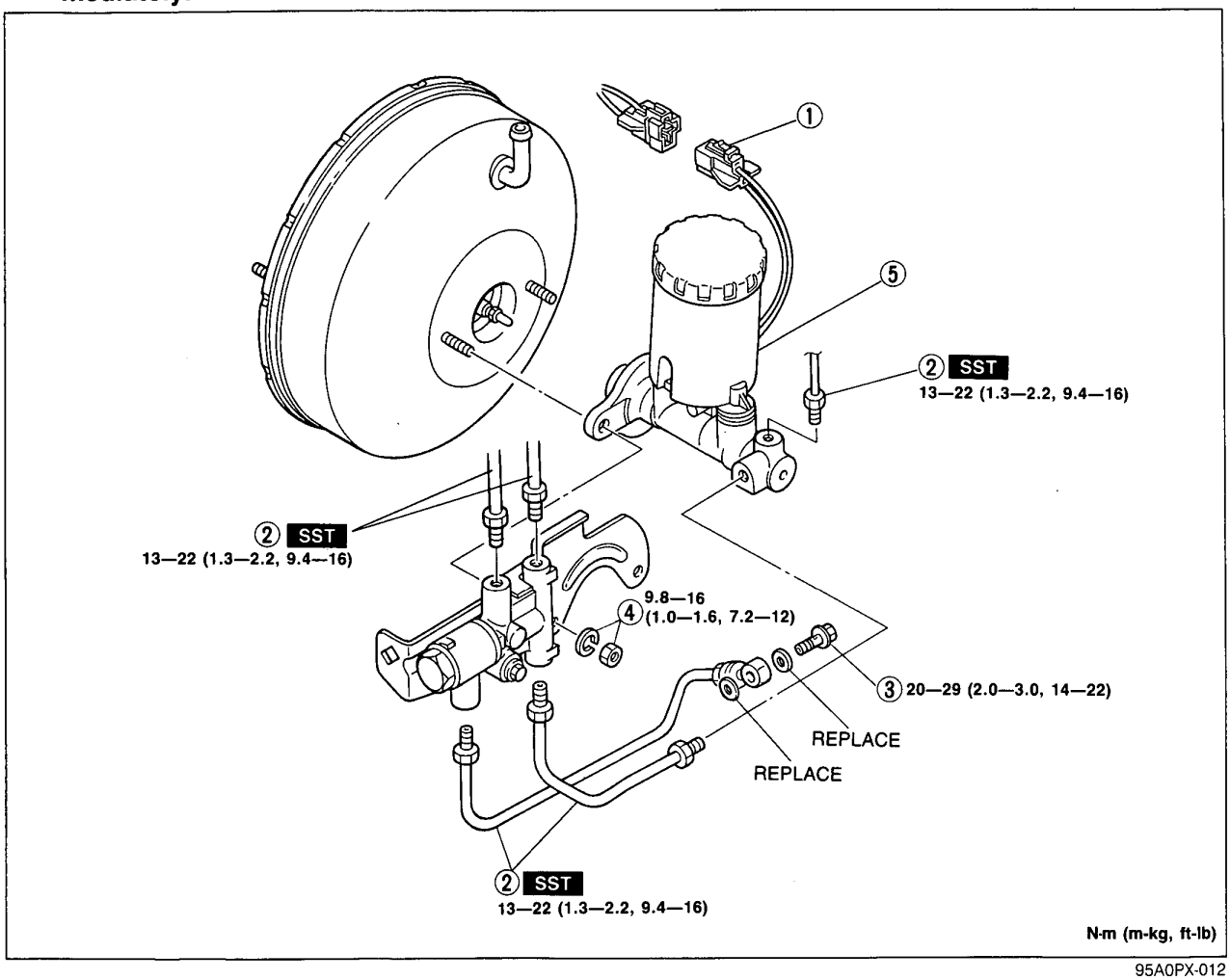
MASTER CYLINDER

Removal / Installation

1. Remove in the order shown in the figure, referring to **Removal Note**.
2. Install in the reverse order of removal, referring to **Installation Note**.
3. After installation, add brake fluid, bleed air, and check for fluid leakage.

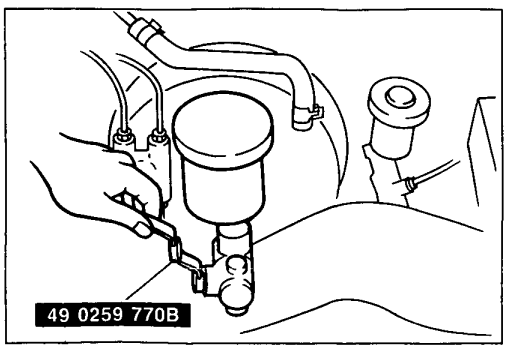
Caution

- **Brake fluid will damage painted surfaces. If it does get on a painted surface, wipe it off immediately.**



95A0PX-012

1. Fluid level sensor connector
2. Brake pipe
   Removal note ..... below
3. Connector bolt
4. Nut and washer
5. Reservoir and master cylinder
   Disassembly / Assembly / Inspection ..... page P–12



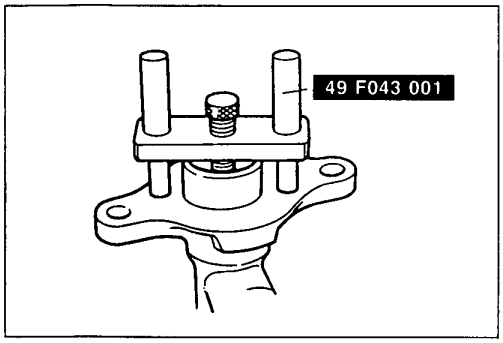
9MU0PX-020

Removal note

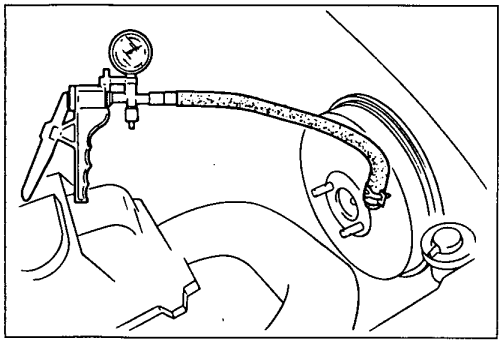
Brake pipe

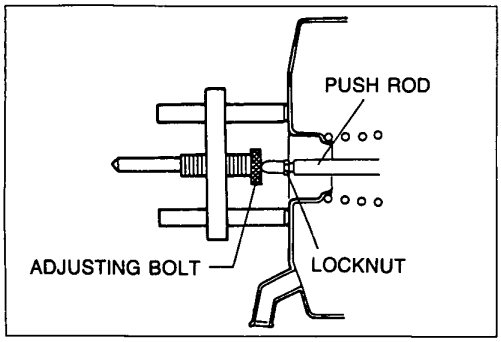
Disconnect/connect the brake pipe from/to the master cylinder with the **SST**.

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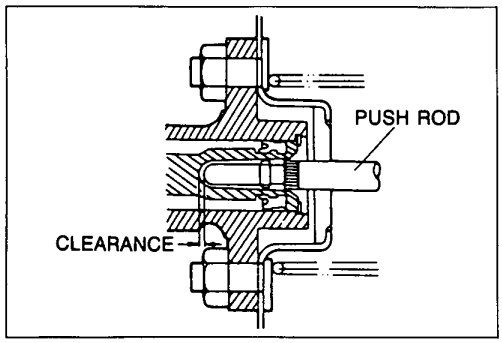


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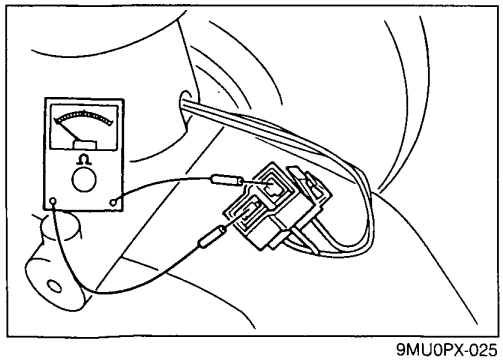

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05U0PX-018



05U0PX-019


9MU0PX-025

Installation note

Push rod clearance

Measure the clearance between the push rod of the power brake unit and the piston of the master cylinder.

1. Place the **SST** atop the master cylinder. Turn the adjustment bolt until it bottoms in the piston.
2. Apply **500 mmHg (19.7 inHg)** vacuum to the power brake unit with a vacuum pump.
3. Invert the adjustment gauge used in Step 1, and place it on the power brake unit.
4. Measure the clearance between the end of the adjustment bolt and the push rod of the power brake unit.
   If it is not **0mm (0 in)**, loosen the push rod locknut and turn the push rod to make the adjustment.

Reference

By making the above adjustment, the clearance between the push rod and piston (after installation of the brake master cylinder and the power brake unit) will be as shown in the table below.

	Clearance
When vacuum applied to unit is approx. 500 mmHg (19.7 inHg)	0.1—0.3mm (0.004—0.012 in)

Inspection

Fluid level sensor

1. Disconnect the sensor connector.
2. Connect an ohmmeter to the connector.
3. Starting with the fluid level above the MIN mark on the reservoir, verify that there is no continuity.
4. Remove the brake fluid and verify continuity when the level is below the MIN mark.
5. Replace the sensor if necessary.

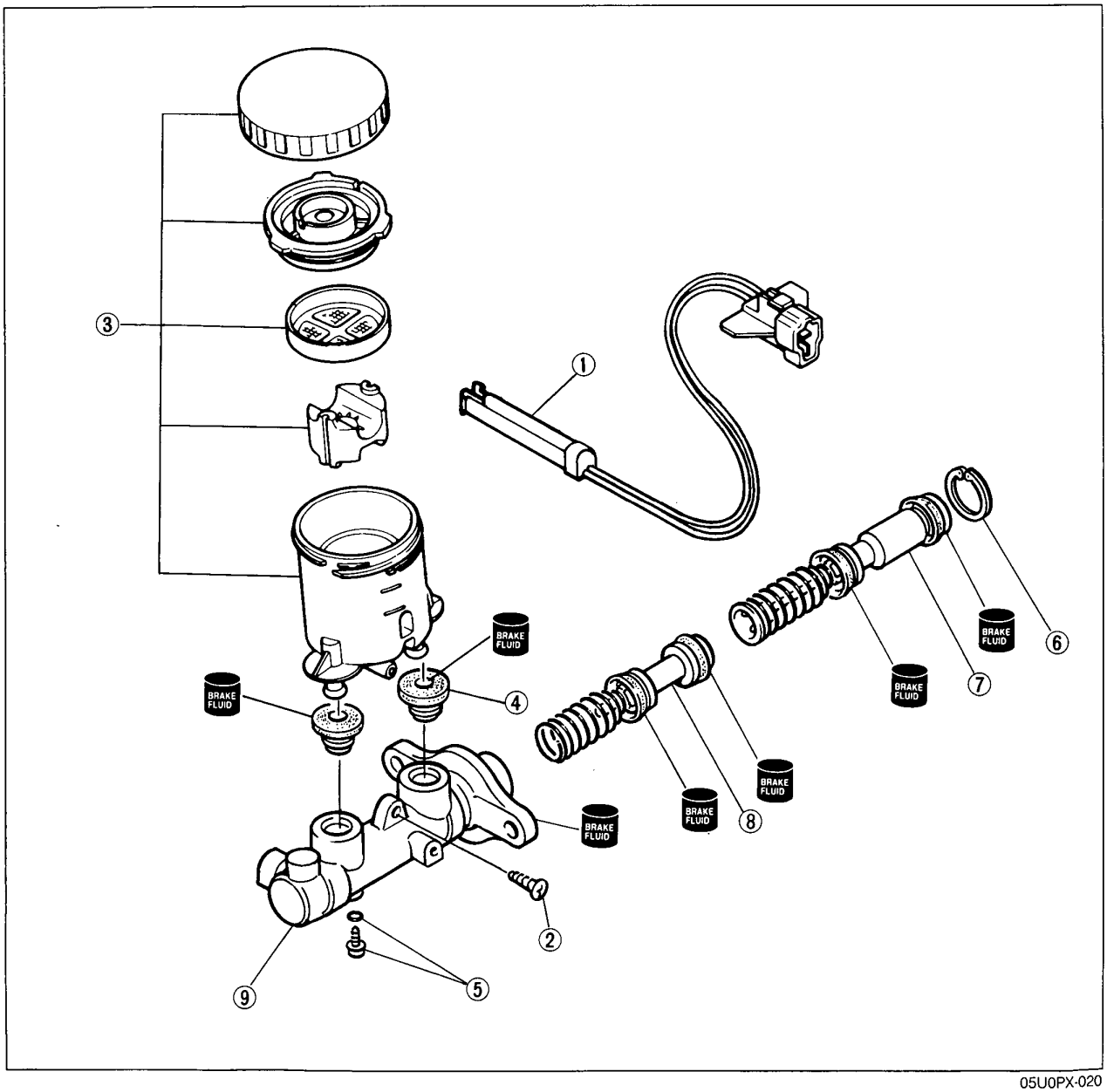
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Disassembly / Assembly / Inspection

1. After removing the brake fluid, disassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Inspect all parts and repair or replace as necessary.
3. Assemble in the reverse order of removal, referring to **Assembly Note**.

Caution

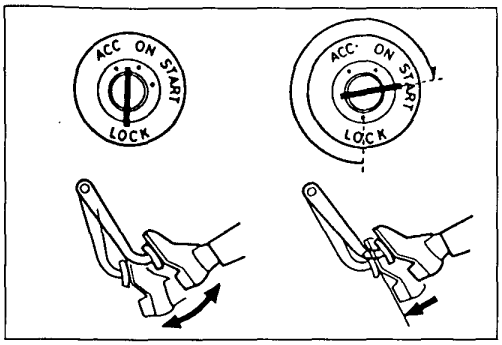
- **Secure the master cylinder flange in a vise when necessary.**
- **Replace the piston assembly if necessary.**
- **Do not let foreign material enter the cylinder, and do not scratch the inside of the cylinder or the outer surface of the piston.**



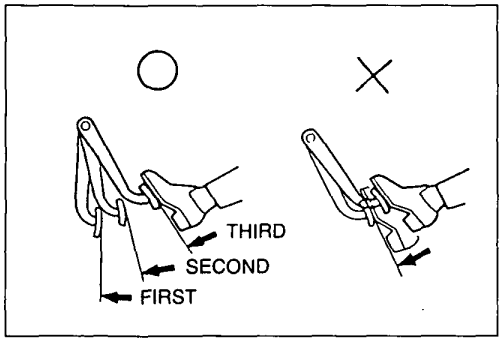
05U0PX-020

1. Fluid level sensor
2. Screw
3. Reservoir assembly
   Inspect for damage and deformation
4. Bushings
5. Stopper screw and O-ring
6. Snap ring
7. Primary piston assembly
   Inspect for abnormal wear, rust, and damage
8. Secondary piston assembly
   Inspect for abnormal wear, rust, and damage
9. Cylinder
   Inspect for abnormal wear, rust, and damage

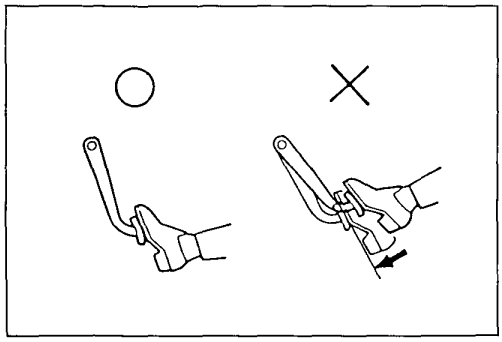
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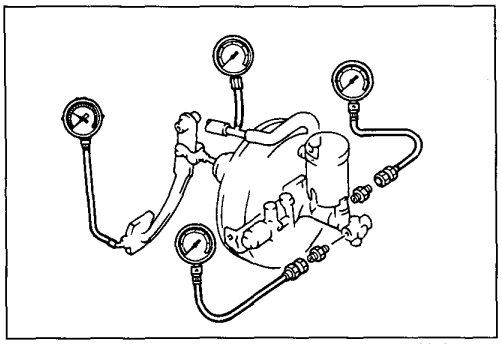


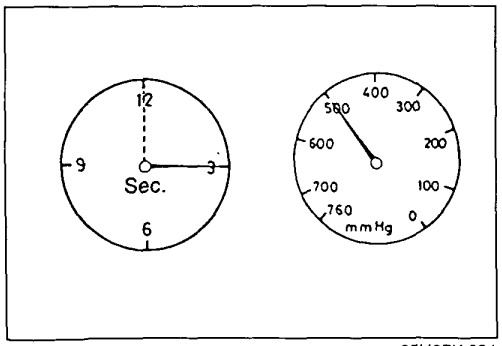
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05U0PX-022


05U0PX-023


9MU0PX-033



05U0PX-024

POWER BRAKE UNIT

Quick Inspection, On-vehicle

Power brake unit function check (Simple method)

Step 1

1. With the engine stopped, depress the pedal a few times.
2. With the pedal depressed, start the engine.
3. If immediately after the engine starts the pedal moves down slightly, the unit is operating.

Step 2

1. Start the engine and let it run **1 or 2 minutes**.
2. Stop the engine.
3. Depress the pedal with the usual force.
4. If the first pedal stroke is long and becomes shorter with subsequent strokes, the unit is operating.
5. If a problem is found, inspect for damage or improper connection of the check valve or vacuum hose. Repair if necessary, and inspect it once again.

Step 3

1. Start the engine.
2. Depress the pedal with the usual force.
3. Stop the engine with the pedal depressed.
4. Hold the pedal down for **about 30 seconds**.
5. If the pedal height does not change, the unit is operating.
6. If there is a problem, check for damage or improper connection of the check valve or vacuum hose. Repair if necessary, and check once again.

If the nature of the problem is still not clear after following the 3 steps above, follow the more detailed check described in "Method using tester," below.

(Method using tester)

Connect a pressure gauge, vacuum gauge, and pedal depression force gauge as shown in the figure. After bleeding the air from the pressure gauge, conduct the test as described in the 3 steps below.

Note

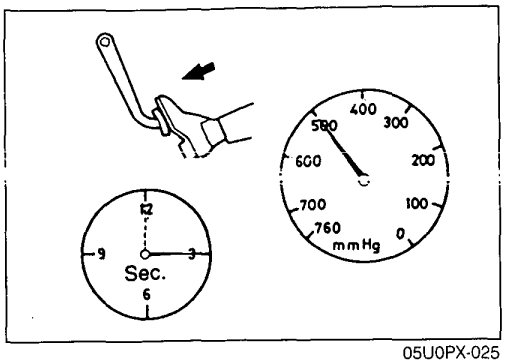
- **Use commercially available gauges and pedal depression force gauge.**

a) Checking for vacuum loss

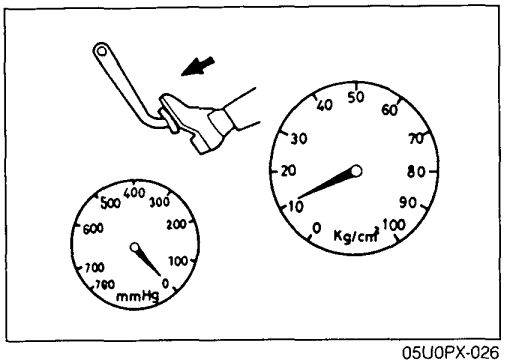
Unloaded condition

1. Start the engine.
2. Stop the engine when the vacuum gauge indicates **500 mmHg (19.7 inHg)**.
3. Observe the vacuum gauge for **15 seconds**. If the gauge indicates **475—500 mmHg (18.7—19.7 inHg)**, the unit is operating.

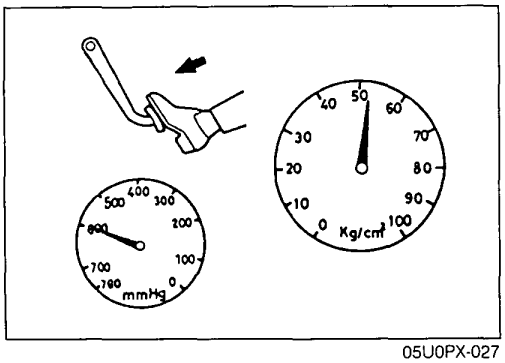
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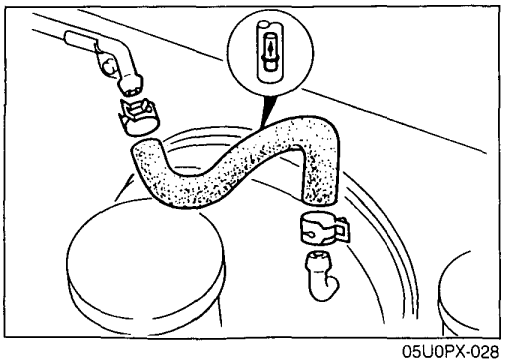
05U0PX-025



05U0PX-026



05U0PX-027



05U0PX-028

Loaded condition

1. Start the engine.
2. Depress the brake pedal with a force of **196 N (20 kg, 44 lb)**.
3. With the brake pedal depressed, stop the engine when the vacuum gauge indicates **500 mmHg (19.7 inHg)**.
4. Observe the vacuum gauge for **15 seconds**. If the gauge indicates **475—500 mmHg (18.7—19.7 inHg)**, the unit is operating.

b) Checking for hydraulic pressure

1. If with the engine stopped **(vacuum 0 mmHg [0 inHg])** the fluid pressure is within specification, the unit is operating.

Pedal force	Fluid pressure
196 N (20 kg, 44 lb)	1,079—1,177 kPa (11—12 kg/cm^2, 156—171 psi)

2. Start the engine. Depress the brake pedal when the vacuum reaches **500 mmHg (19.7 inHg)**. If the fluid pressure is within specification, the unit is operating.

Pedal force	Fluid pressure
196 N (20 kg, 44 lb)	5,199—5,494 kPa (53—56 kg/cm^2, 754—796 psi)

Inspection of check valve

Note

- **The check valve is pressed into the vacuum hose. There is an arrow on the hose to indicate direction of hose installation.**

Inspection

1. Disconnect the vacuum hose from the engine.
2. Apply suction and pressure to the hose from the engine side. Verify that air flows only toward the engine. If the air passes in both directions or not at all, replace the vacuum hose (along with the check valve).

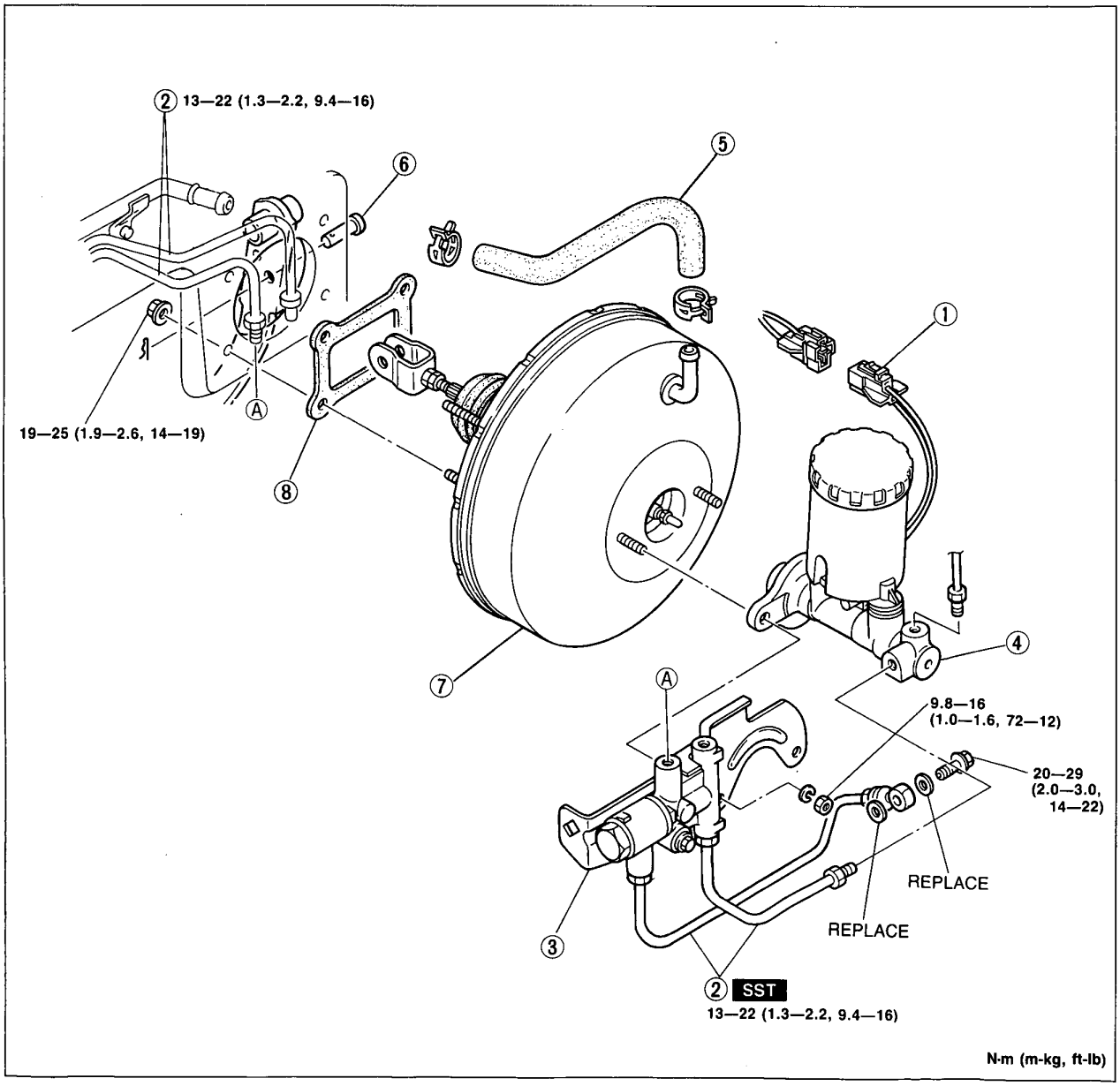
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Removal / Installation

1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.
3. Take the following steps after installation:
   (1) Check and adjust the push rod and piston clearance. (Refer to page P–11.)
   (2) Add fluid and bleed the air. (Refer to page P–6.)
   (3) Check all parts for fluid leakage.
   (4) Make an on-vehicle check of the unit. (Refer to page P–13.)
   (5) Check that the vacuum hose does not contact other parts.

Caution

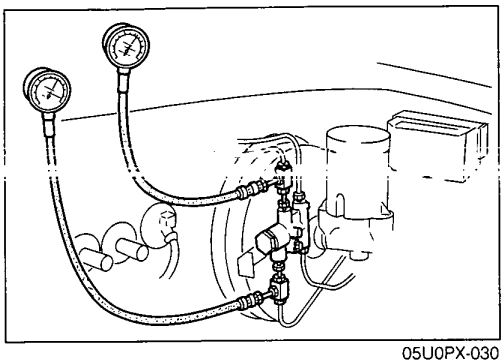
- **Apply grease to the clevis pin.**
- **Apply sealant to the gasket contact surface.**



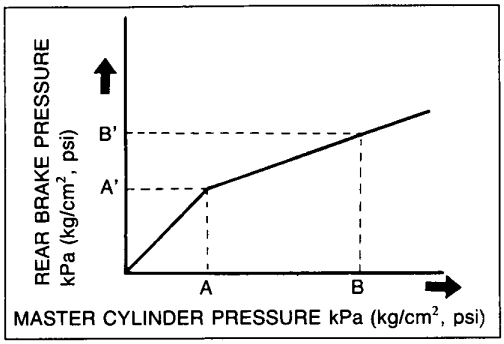
05U0PX-029

1. Fluid level sensor connector
2. Brake pipe
3. Proportioning bypass valve
4. Master cylinder
5. Vacuum hose with check valve
6. Clevis pin
7. Power brake unit
8. Gasket

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05U0PX-030



05U0PX-031

PROPORTIONING BYPASS VALVE

Inspection

1. Connect two pressure gauges [9,810 kPa (100 kg/cm², 1,422 psi)] to the pipes.
2. Measure the fluid pressure from the master cylinder and to the rear brake.

Specification

Fluid pressure kPa (kg/cm², psi)			
A	A'	B	B'
2,943 (30, 427)	2,943 ± 196 (30 ± 2, 427 ± 28)	6,867 (70, 995)	4,120 ± 294 (42 ± 3, 597 ± 43)

Caution

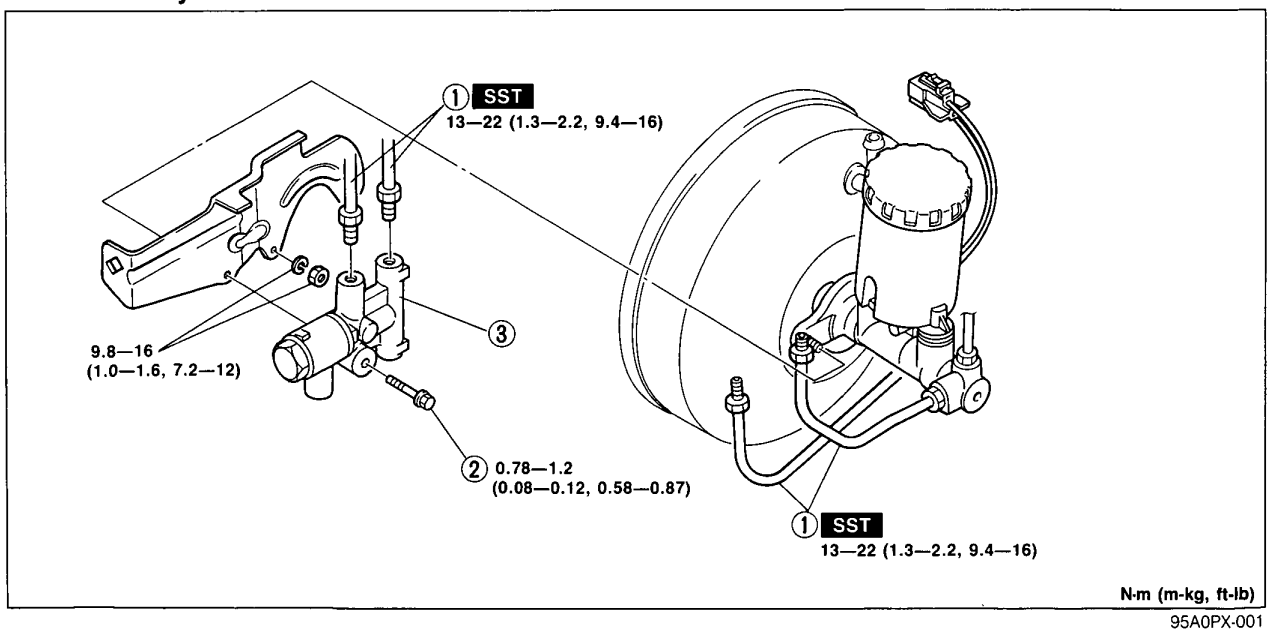
- **If not as specified, replace the valve assembly.**
- **After inspection:**
  Add brake fluid and bleed the air.
  (Refer to page P–6.)
  Check the brake lines for fluid leakage.

Replacement

1. Remove in the order shown in the figure, referring to **Removal Note**.
2. Install in the reverse order of removal, referring to **Installation Note**.
3. After installation:
   (1) Add brake fluid and bleed the air. (Refer to page P–6.)
   (2) Check the brake lines for fluid leakage.

Caution

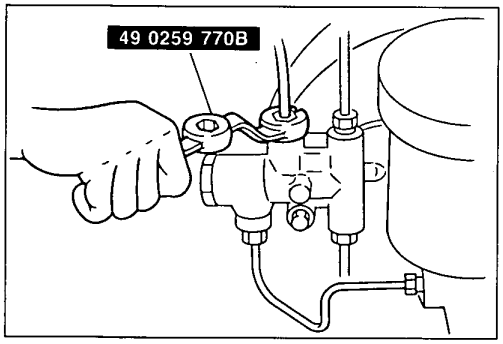
- **Brake fluid will damage painted surfaces. If it does get on a painted surface, wipe it off immediately.**



95A0PX-001

1. Brake pipe
   Removal / Installation note..... page P–17
   Installation..... page P–17
2. Bolt
3. Proportioning bypass valve

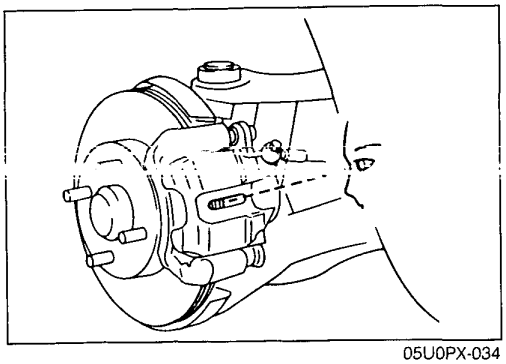
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05U0PX-033

Removal / Installation Note
Brake pipe
Disconnect/connect the brake pipes with the **SST**.

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05U0PX-034

FRONT BRAKE (DISC)

Quick Inspection, On-vehicle

Disc pad

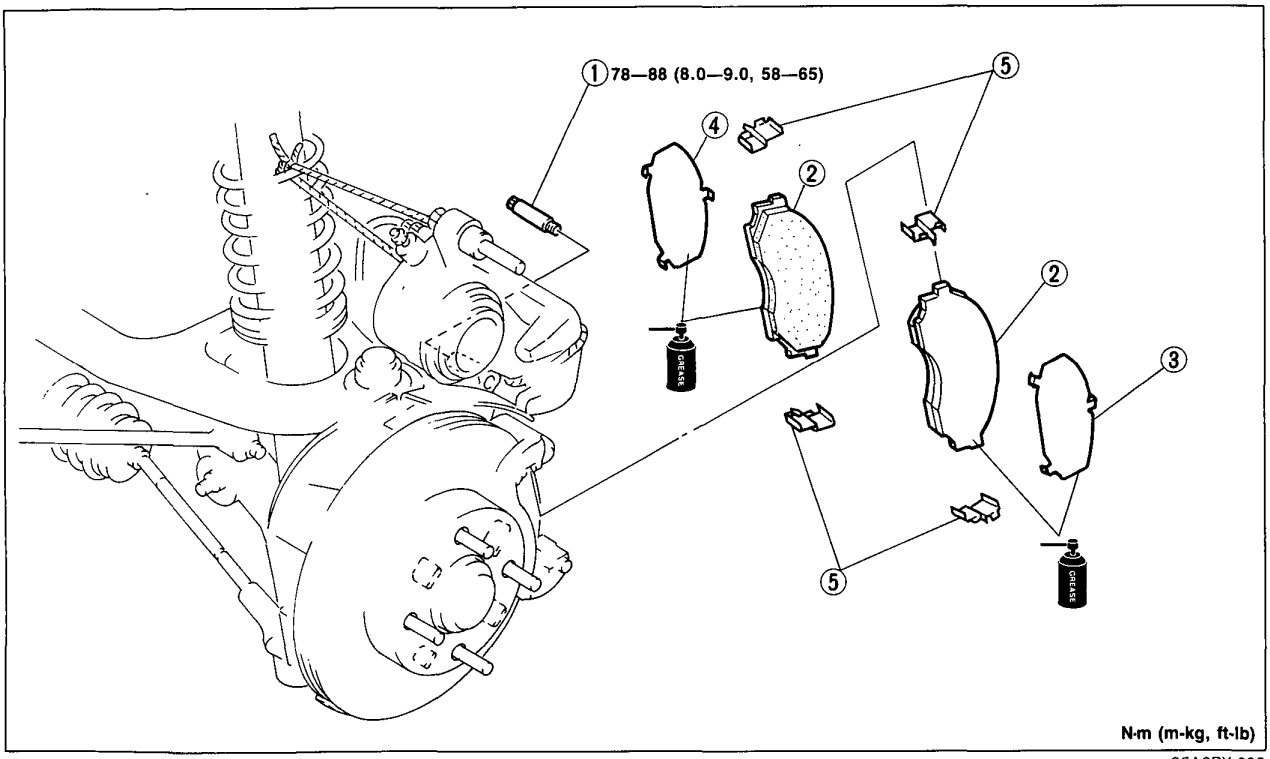
1. Jack up the front of the vehicle and support it with safety stands.
2. Remove the wheels.
3. Sight through the caliper inspection hole and verify the remaining thickness of the pad.

Thickness: 1.0mm (0.04 in) min.

Replacement

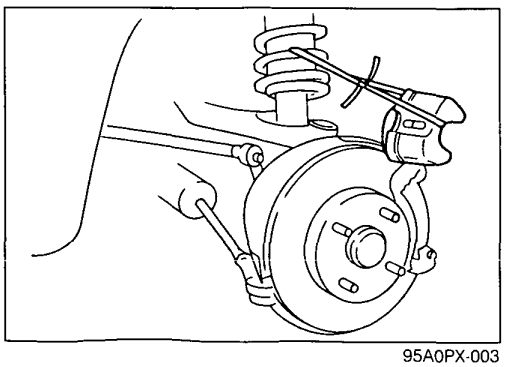
Disc pad

1. Remove in the order shown in the figure, referring to **Removal Note**.
2. Install in the reverse order of removal, referring to **Installation Note**.



95A0PX-002

1. Lock bolt
   Removal note..... below
2. Disc pad
   Installation note..... page P–19
3. Outer shim
4. Inner shim
5. Guide plate

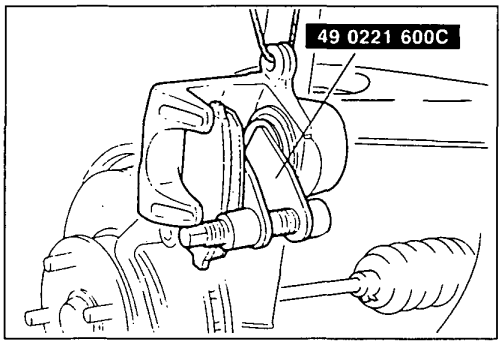

95A0PX-003

Removal note

Lock bolt

1. Remove the lower lock bolt.
2. Rotate the caliper upward and support it with a piece of rope.

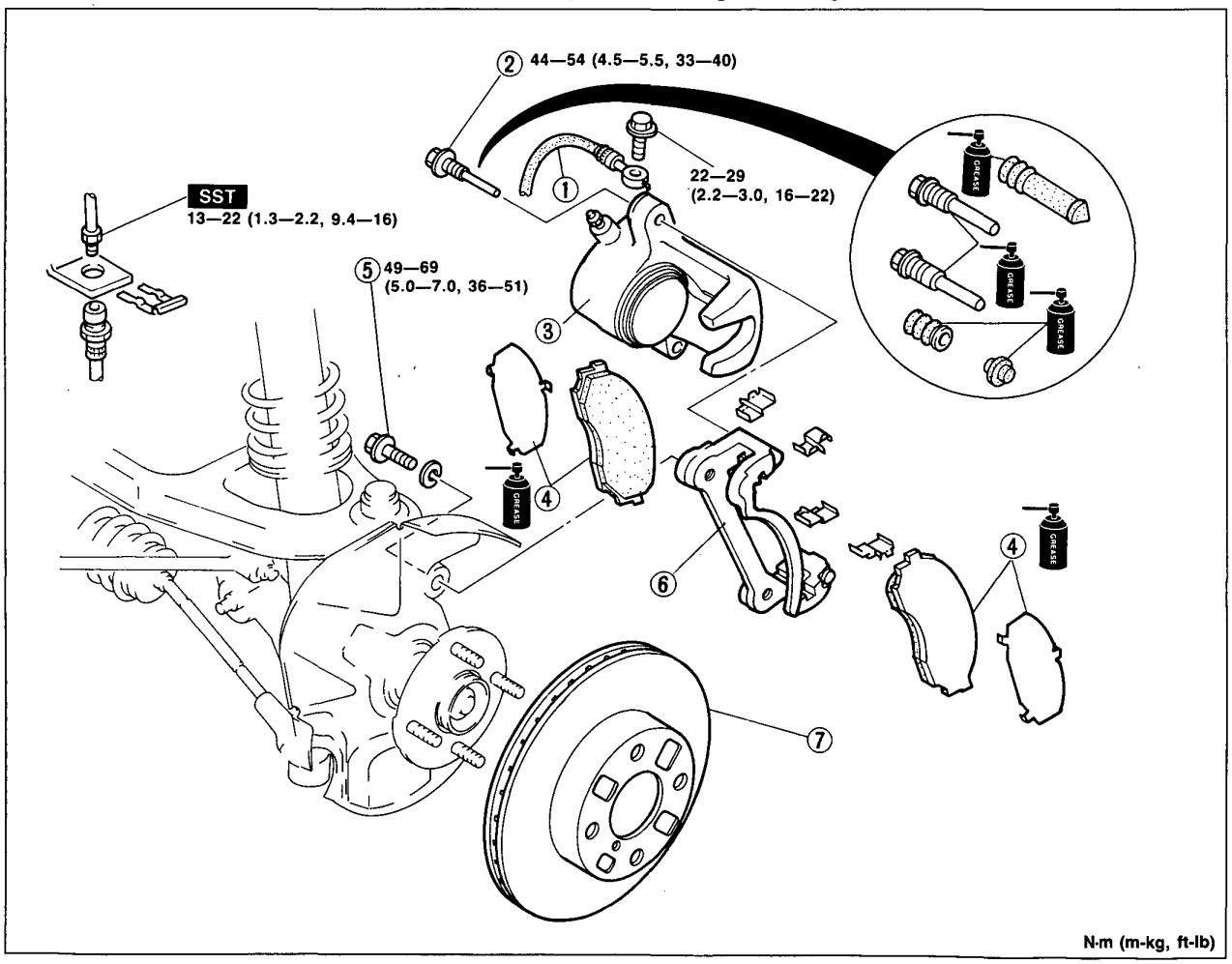
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95A0PX-004

Installation note
Disc pad
1. Push the piston inward with the **SST**.
2. Install the new pads in the mounting support.

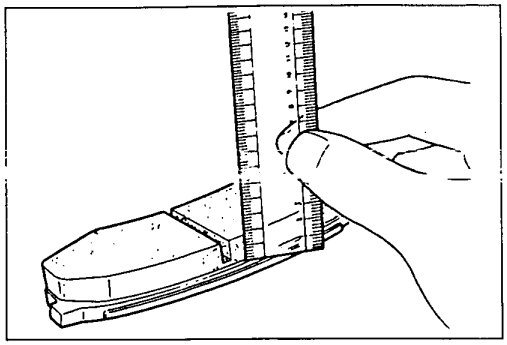
Removal / Installation
Caliper
1. Jack up the front of the vehicle and support it with safety stands.
2. Remove the wheels; then remove components in the order shown in the figure.
3. Install in the reverse order of removal.
4. Tighten all nuts and bolts to the specified torques, referring to the figure.

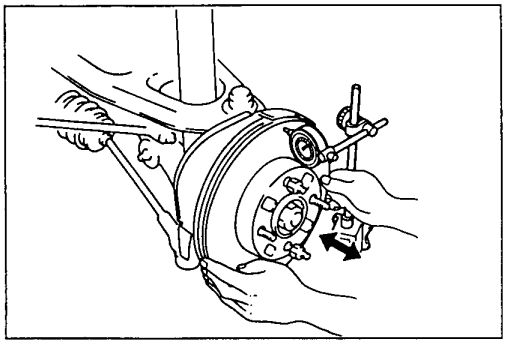


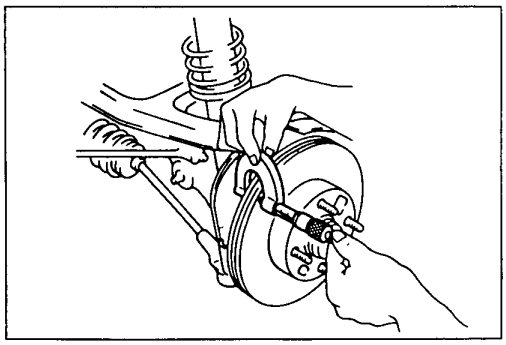
05U0PX-038

1. Brake hose
2. Lock bolt
3. Brake caliper assembly
   Disassembly / Assembly ..... page P–21
4. Disc pad assembly
   Inspection ..... page P–20
5. Bolt
6. Mounting support
7. Disc plate
   Inspection ..... page P–20

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05U0PX-039


05U0PX-040


05U0PX-041

Inspection
Check the following and repair or replace parts as necessary.

Disc pad
1. Oil or grease on facing.
2. Abnormal wear or cracks.
3. Deterioration or damage by heat.
4. Remaining lining thickness.

Thickness: 1.0mm (0.04 in) min.

Disc plate
1. Runout.

Runout: 0.1mm (0.004 in) max.

Caution
- **There must be no wheel bearing looseness.**
- **The measurement must be taken at the outer edge of the disc plate surface.**

2. Wear and damage.

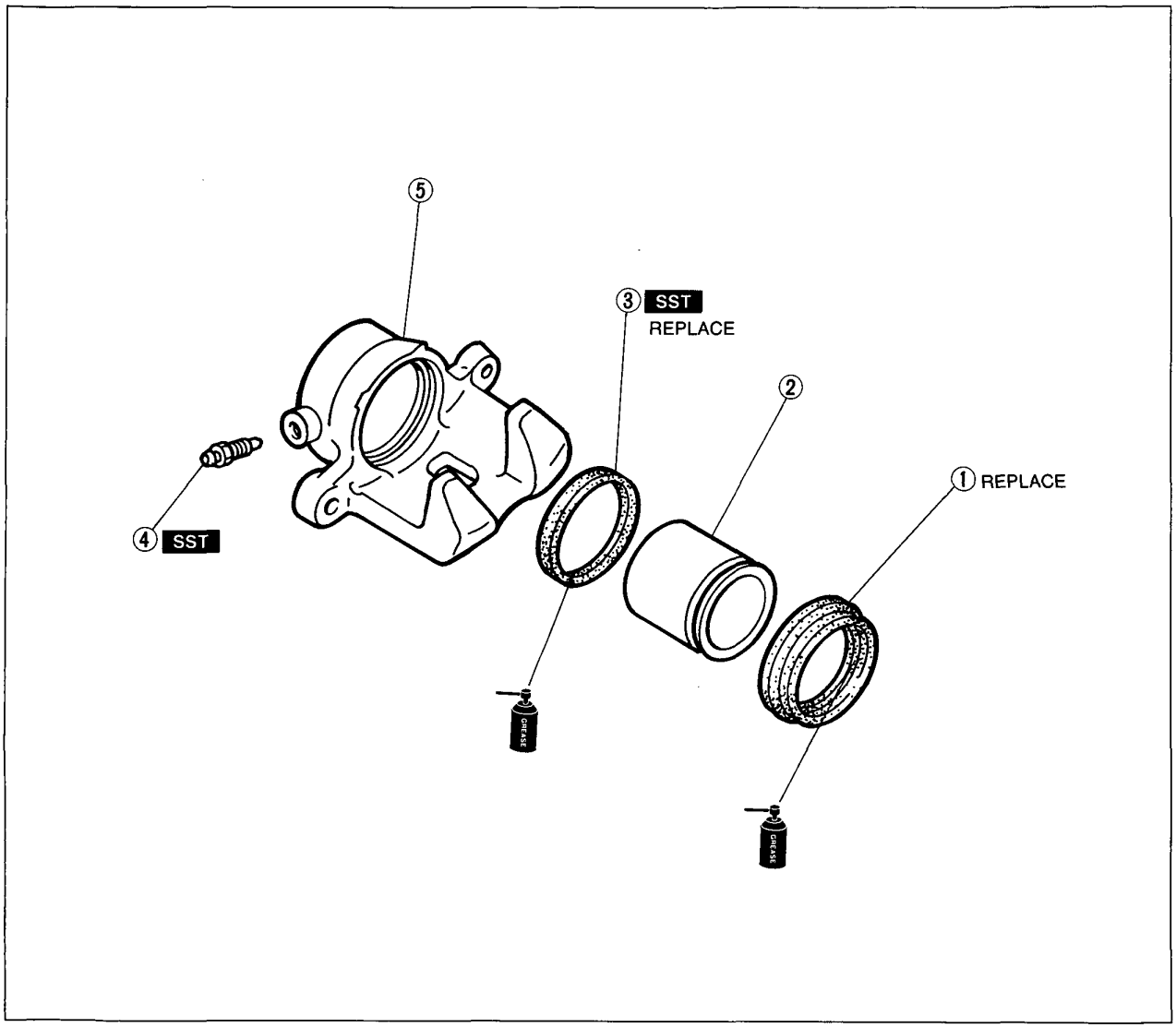
Thickness
Standard: 18mm (0.71 in)
Minimum: 16mm (0.63 in)

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CALIPER

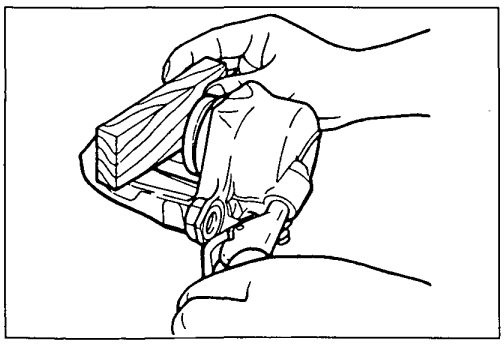
Disassembly / Inspection / Assembly

1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Install in the reverse order of removal.



05U0PX-042

1. Dust seal
   Inspect for damage and poor sealing
2. Piston
   Disassembly ..... page P–21
   Inspect for wear and rust
3. Piston seal
4. Bleeder screw
5. Caliper body
   Inspect for damage and cracks



9MU0PX-075

Disassembly note

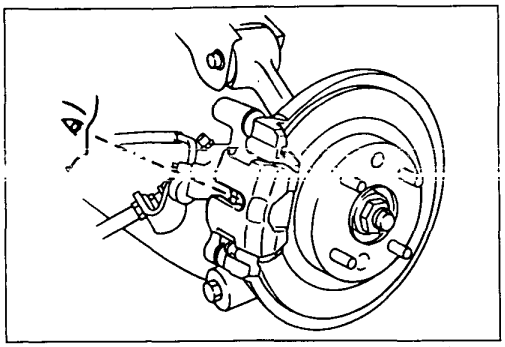
Piston

1. Place a piece of wood in the caliper; then blow compressed air through the hole to force the piston out of the caliper.

Caution

- **Blow the compressed air slowly to prevent the piston from popping out.**

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05U0PX-043

REAR BRAKE (DISC)

Quick Inspection, On-vehicle

Disc pad

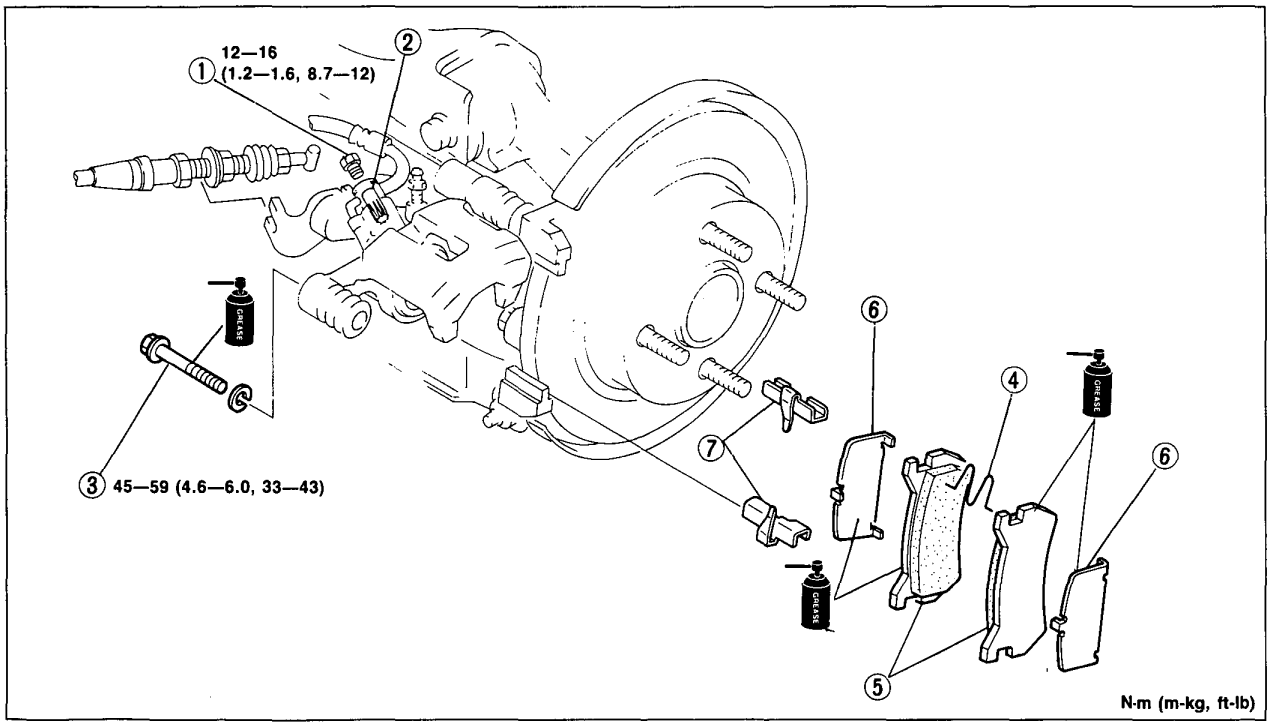
1. Jack up the rear of the vehicle and support it with safety stands.
2. Remove the wheels.
3. Sight through the caliper inspection hole and verify the remaining thickness of the pad.

Thickness: 1.0mm (0.04 in) min.

Replacement

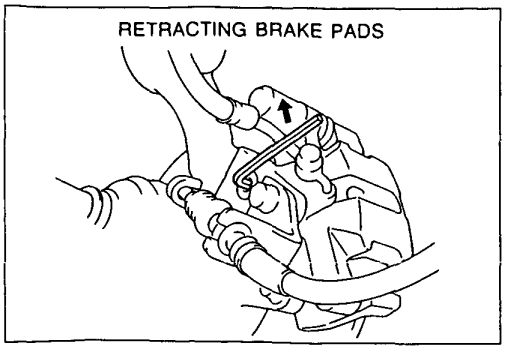
Disc pad

1. Remove in the order shown in the figure, referring to **Removal Note**.
2. Install in the reverse order of removal, referring to **Installation Note**.



95A0PX-005

1. Plug
2. Manual adjustment gear
   Removal note ..... below
   Installation note ..... page P–23
3. Lock bolt
4. M-spring
5. Disc pad
   Inspection ..... page P–24
6. Shim
7. Guide plate



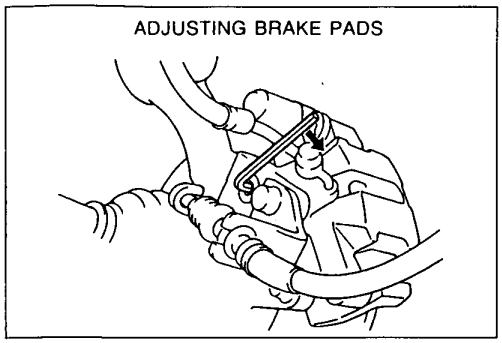
05U0PX-045

Removal note

Manual adjustment gear

1. Turn the manual adjustment gear counterclockwise with an Allen wrench to pull the brake caliper piston back.

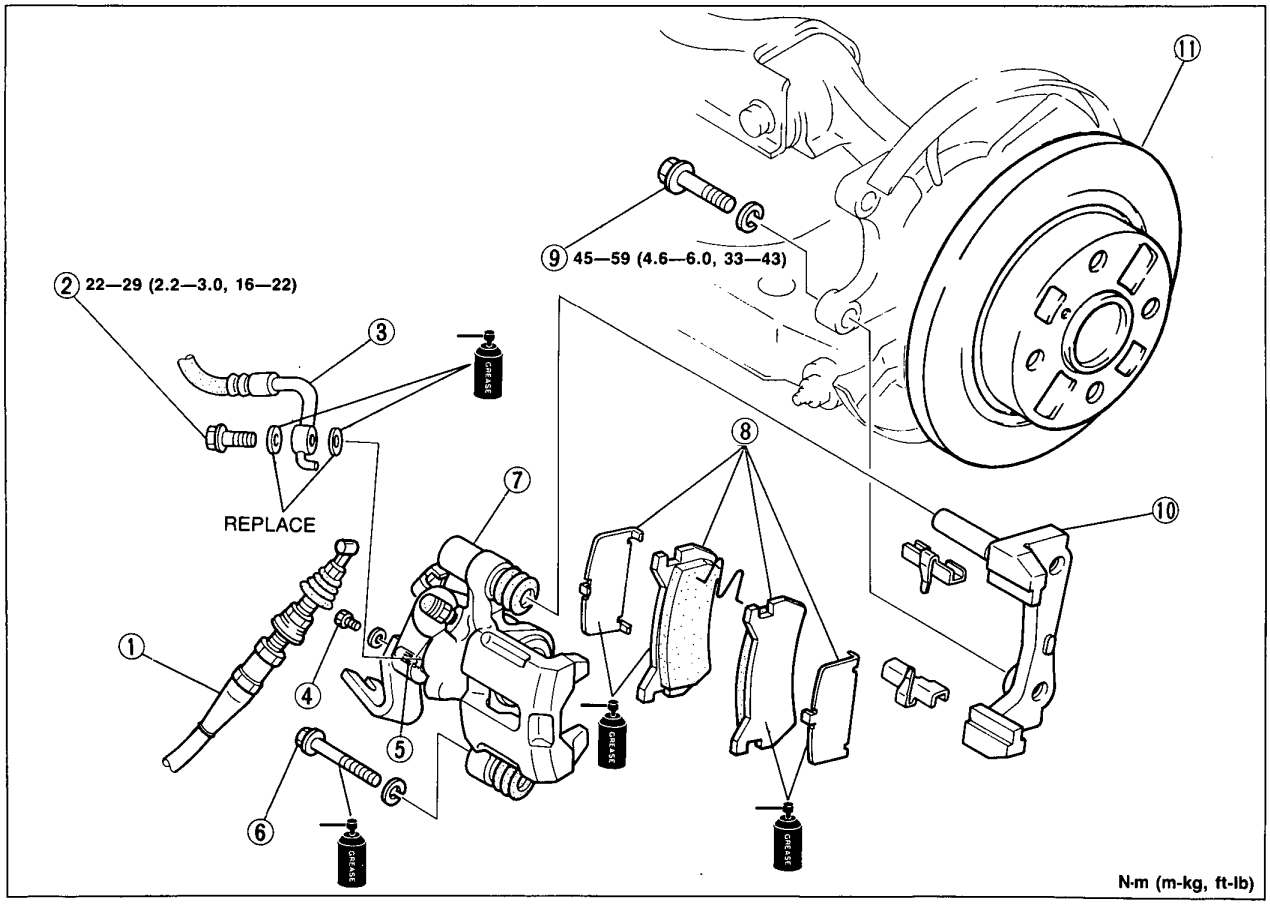
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05U0PX-046

Installation note
Manual adjustment
1. Turn the manual adjustment gear clockwise until the brake pads just touch the disc plate.
2. Return the manual adjustment gear counterclockwise 1/3 turn.

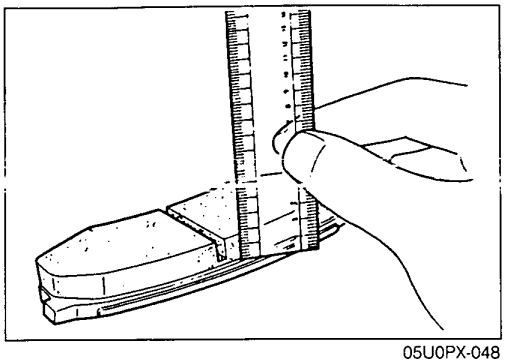
Removal / Installation
Caliper
1. Jack up the rear of the vehicle and support it with safety stands.
2. Remove the wheels; then remove components in the order shown in the figure, referring to **Removal Note**.
3. Install in the reverse order of removal.
4. Tighten all nuts and bolts to the specified torques, referring to the figure, referring to **Installation Note**.

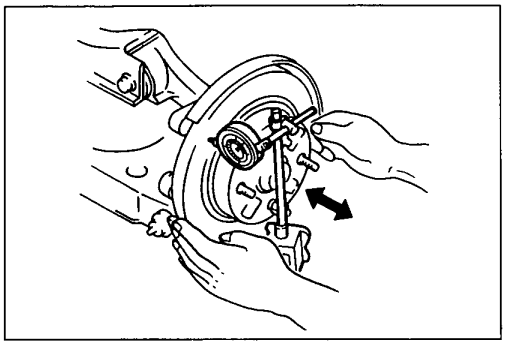


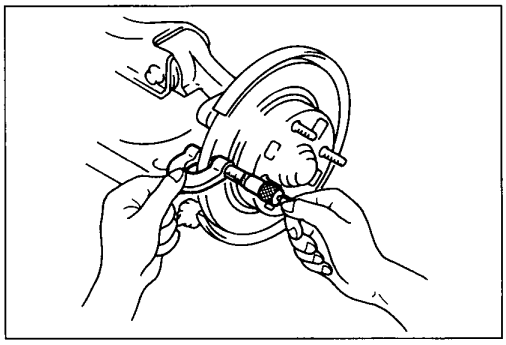
95A0PX-006

1. Parking cable
   Removal / Inspection / Installation page P–29
2. Connecting bolt
3. Brake hose
4. Plug
5. Manual adjustment gear
   Removal note ..... page P–22
   Installation note..... page P–23
6. Lock bolt
7. Caliper
   Disassembly / Assembly ..... page P–25
8. Disc pad assembly
   Replacement..... page P–22
   Inspection ..... page P–24
9. Bolt
10. Mounting support
11. Disc plate
    Inspection ..... page P–24

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05U0PX-048


05U0PX-049


05U0PX-050

Inspection
Check the following and repair or replace parts as necessary.

Disc pad
1. Oil or grease on facing.
2. Abnormal wear or cracks.
3. Deterioration or damage by heat.
4. Remaining lining thickness.

Thickness: 1.0mm (0.04 in) min.

Disc plate
1. Runout.

Runout: 0.1mm (0.004 in) max.

Caution
- **There must be no wheel bearing looseness.**
- **The measurement must be taken at the outer edge of the disc plate surface.**

2. Wear or damage.

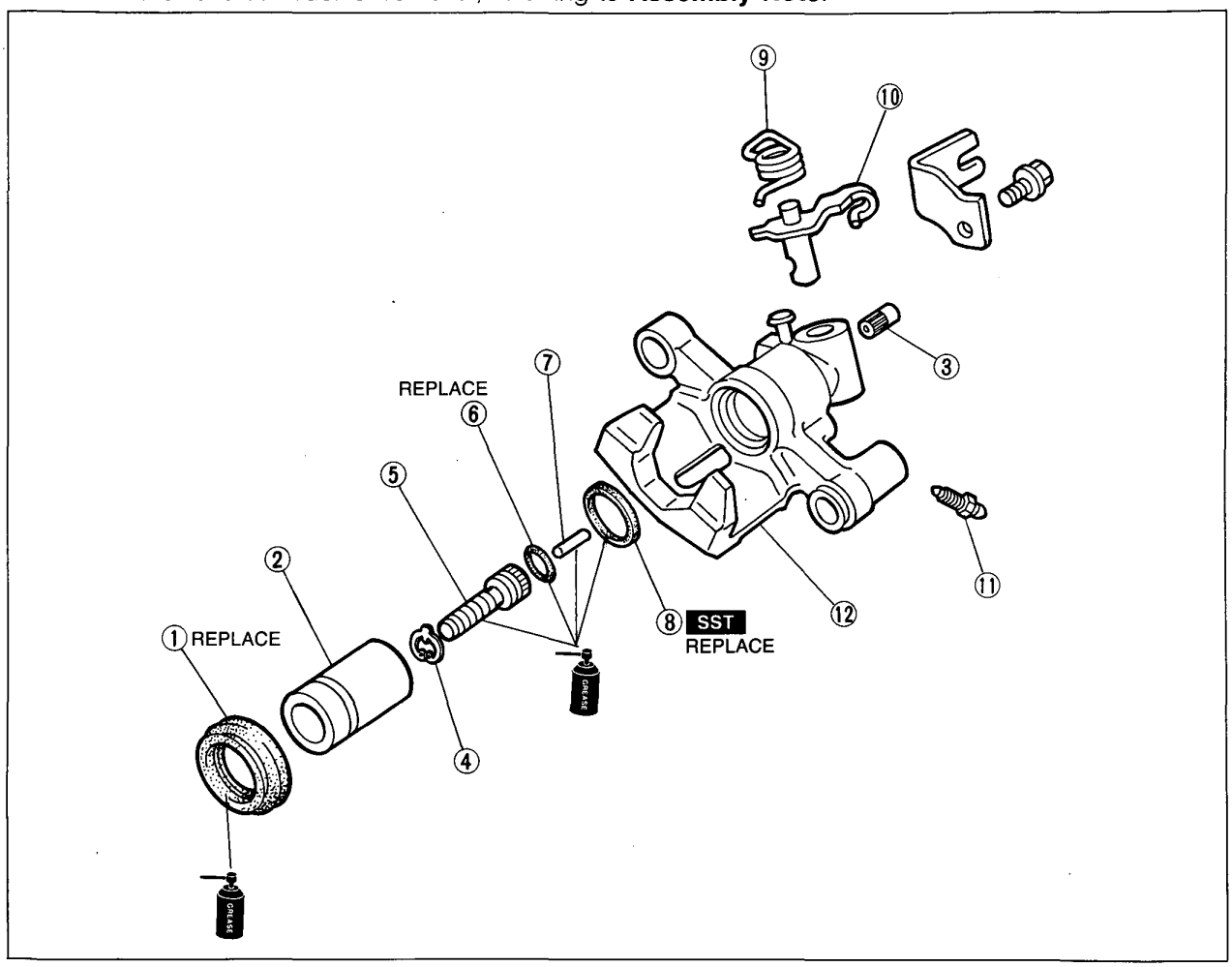
Thickness
Standard: 9.0mm (0.35 in)
Minimum: 7.0mm (0.28 in)

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CALIPER

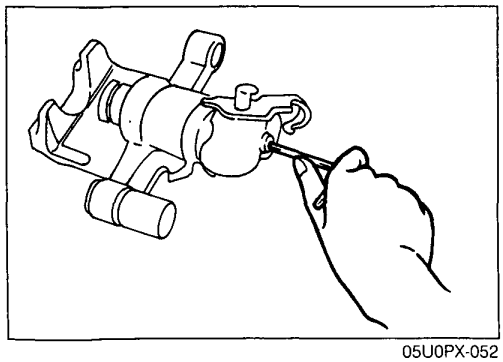
Disassembly / Inspection / Assembly

1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Install in the reverse order of removal, referring to **Assembly Note**.



95A0PX-007

1. Dust seal
   Inspect for damage and poor sealing
2. Piston
   Disassembly note..... below
   Assembly note..... page P–26
   Inspect for wear and rust
3. Manual adjustment gear
4. Snap ring
5. Adjusting bolt
6. O-ring
7. Connecting link
8. Piston seal
9. Spring
10. Operating lever
11. Cap and bleeder screw
12. Caliper body
    Inspect for damage and cracks



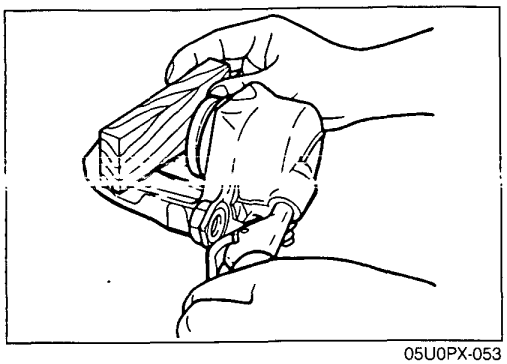
05U0PX-052

Disassembly note

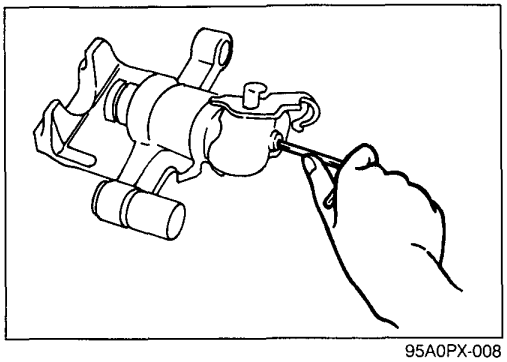
Piston

1. Turn the adjustment gear clockwise with an Allen wrench to remove the piston from it. (Turn the adjustment gear until it turns easily.)

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05U0PX-053



95A0PX-008

2. Place a piece of wood in the caliper; then blow compressed air through the hole to force the piston out of the caliper.

Caution

- **Blow the compressed air slowly to prevent the piston from popping out.**

Assembly note

Piston

1. Insert the piston into the caliper and turn the adjustment gear counterclockwise with an Allen wrench to pull the piston in fully. (Turn the adjustment gear until it stops.)

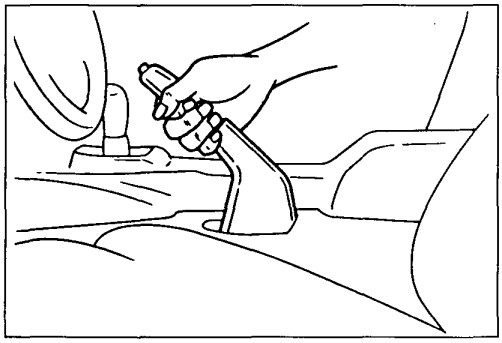
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PARKING BRAKE SYSTEM

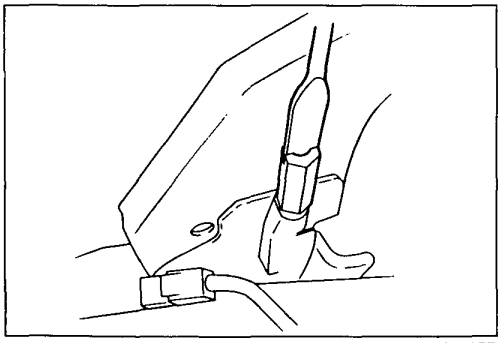
TROUBLESHOOTING GUIDE

Problem	Possible cause	Action	Page
Brakes do not release	Improper return of parking brake cable or improper adjustment	Repair or adjust	P–29
Parking brake does not hold well	Excessive lever stroke Brake cable stuck or damaged Brake fluid or oil on pads Hardening of pad surfaces or poor contact	Adjust Repair or replace Clean or replace Grind or replace	P–27 P–29 P–18,22 P–18,22

05U0PX-055



05U0PX-056



05U0PX-057

PARKING BRAKE LEVER

Inspection

1. Depress the brake pedal several times.
2. Verify that the stroke is within specification when the parking brake lever is pulled with a force of **98 N (10 kg, 22 lb)**.

Stroke: 5—7 notches

Adjustment

1. Jack up the rear of the vehicle until the wheels are free to turn and support it with stands.
2. Depress the brake pedal several times.
3. Turn the adjusting nut to adjust the lever stroke.
4. Check that the parking brake warning light illuminates when the brake lever is pulled one notch.

Caution

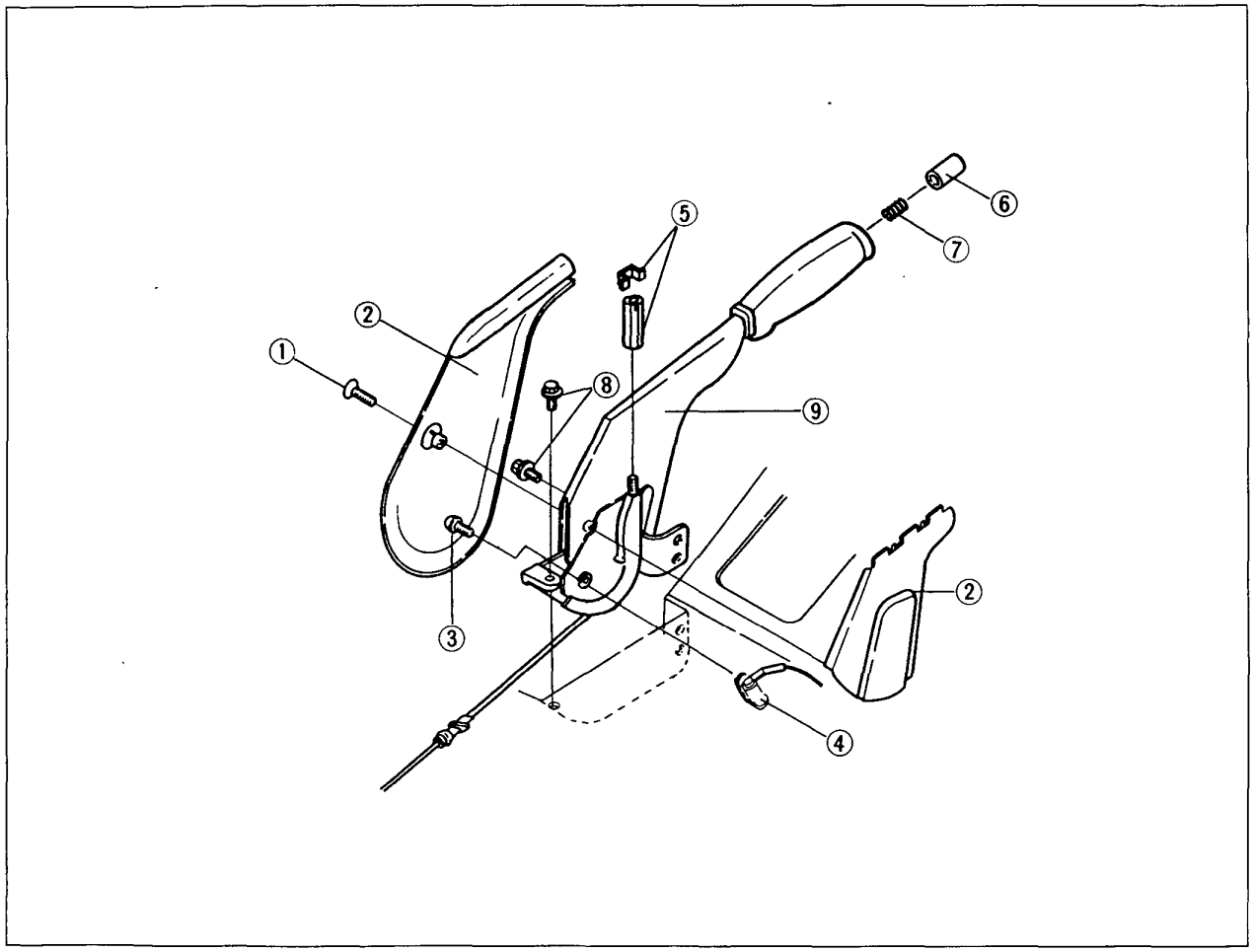
- **Verify that the brakes do not drag.**

5. Lower the vehicle.

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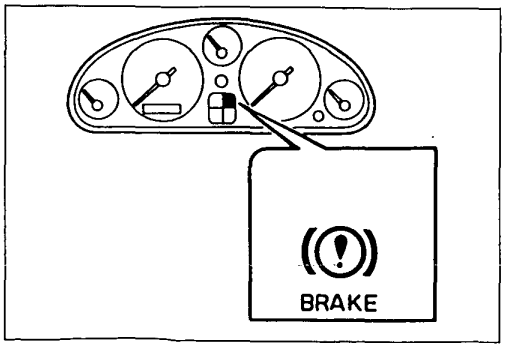
Removal / Inspection / Installation

1. Block the wheels firmly.
2. Release the parking brake.
3. Remove in the order shown in the figure.
4. Inspect all parts and repair or replace as necessary.
5. Install in the reverse order of removal, referring to **Installation Note**
6. After installation:
   Adjust the parking lever stroke. (Refer to page P–27.)



95A0PX-009

1. Screw
2. Cover
3. Bolt
4. Parking brake switch
   Installation note ..... below
5. Adjusting nut and clip
6. Cap
7. Spring
   Inspect for weakness
8. Bolt
9. Parking brake lever
   Inspect for damage and cracks



9MU0PX-110

Installation note

Parking brake switch

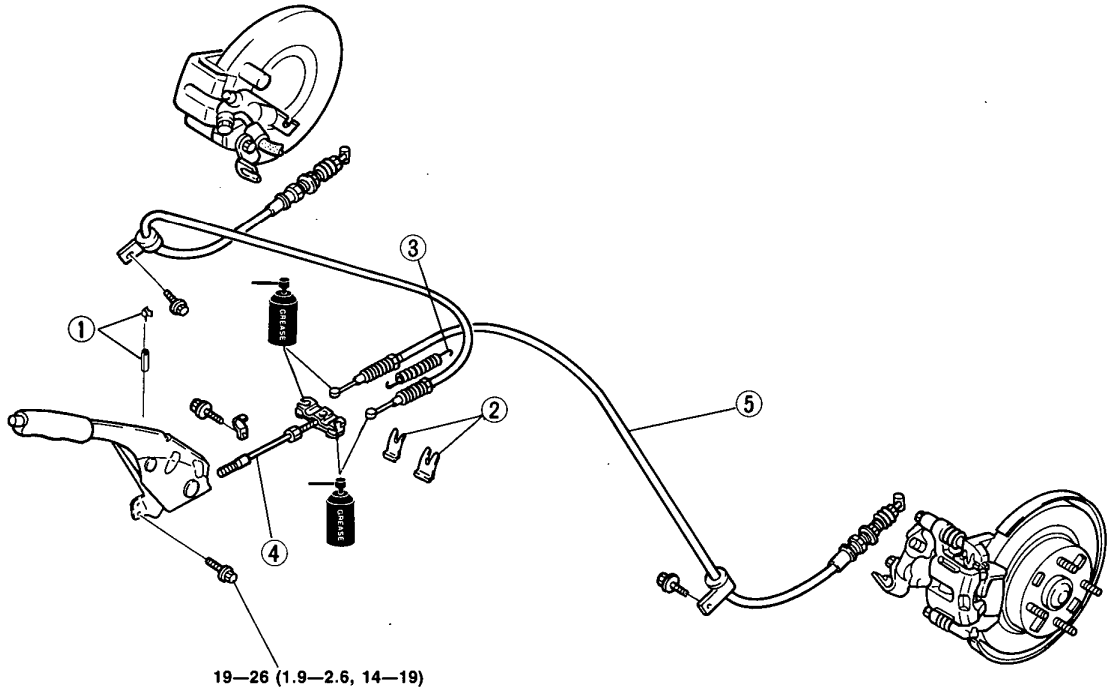
1. Install the parking brake switch so that it contacts the parking brake lever when the lever is fully released.
2. Turn the ignition switch ON, and check that the parking brake warning lamp illuminates with the lever pulled one notch.

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PARKING BRAKE CABLE

Removal / Inspection / Installation

1. Block the wheels firmly.
2. Release the parking brake.
3. Remove the parking brake lever.
4. Jack up the vehicle and support it with safety stands.
5. Remove the parking brake cable in the order shown in the figure.
6. Install in the reverse order of removal.
7. After installation:
   (1) Adjust the parking brake lever stroke.
   (2) Depress the brake pedal a few times.
   (3) Verify that the rear brakes do not drag while the wheels are rotated by hand.



N·m (m-kg, ft-lb)

05U0PX-059

1. Adjusting nut and clip
2. Clip
3. Spring
   Inspect for weakness
4. Front cable
   Inspect for damage
5. Rear cable
   Inspect for damage

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WHEELS AND TIRES

OUTLINE ..... **Q– 2**
SPECIFICATIONS ..... **Q– 2**
TROUBLESHOOTING GUIDE ..... **Q– 2**
WHEELS AND TIRES ..... **Q– 3**
SPECIAL NOTES ABOUT WHEELS AND TIRES ..... **Q– 3**
NOTES REGARDING TIRE REPLACEMENT. **Q– 3**
INSPECTION / ADJUSTMENT ..... **Q– 3**
REMOVAL / INSTALLATION ..... **Q– 4**
TIRE ROTATION ..... **Q– 4**
WHEEL BALANCE ADJUSTMENT ..... **Q– 5**

05U0QX-001

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OUTLINE

SPECIFICATIONS

Item \ Type		Standard	Temporary spare
Wheels	Size	14 x 5 1/2-JJ	14 x 4T
	Offset mm (in)	45 (1.77)	
	Pitch circle diameter mm (in)	100 (3.94)	
	Material	Aluminum alloy	Steel
Tires	Size	P185/60R14 82H	T115/70D14
	Air pressure kPa (kgf/cm^2, psi)	177 (1.8, 26)	412 (4.2, 60)

95A0QX-001

TROUBLESHOOTING GUIDE

Problem	Possible Cause	Action	Page
Excessive or irregular tire wear	Refer to page Q–4 for details.		
Premature tire wear	Incorrect tire pressure	Adjust	Q–3
Tire squeal	Incorrect tire pressure	Adjust	Q–3
	Tire deterioration	Replace	—
Road noise or body vibration	Insufficient tire pressure	Adjust	Q–3
	Unbalanced wheel(s)	Adjust	Q–5
	Deformed wheel(s) or tire(s)	Repair or replace	—
	Irregular tire wear	Replace	—
Shake (Steering wheel vibrates up/down)	Excessive tire and wheel runout	Replace	—
	Loose lug nuts	Tighten	Q–4
	Unbalanced wheel(s)	Adjust or replace	Q–5
	Cracked or worn engine mount rubber	Replace	Section B
	Cracked or worn transmission mount rubber	Replace	Section J
Shimmy (Steering wheel vibrates left/right)	Cracked or worn steering gear mount rubber	Replace	Section N
	Loose steering gear mounting bolts	Tighten	Section N
	Stuck or damaged steering ball joint	Replace	Section N
	Excessive tire and wheel runout	Replace	—
	Loose lug nuts	Tighten	Q–4
	Unbalanced wheel(s)	Adjust or replace	Q–5
	Insufficient tire pressure	Adjust	Q–3
	Unevenly worn tires	Replace	—
	Malfunction of shock absorber	Replace	Section R
	Loose shock absorber mounting bolts	Tighten	Section R
	Struck or damaged lower arm ball joint	Replace	Section R
	Cracked or worn suspension bushings	Replace	Section R
	Damaged or worn front wheel bearing	Replace	Section M
	Impropery adjusted front wheel alignment	Adjust	Section R
Uneven (one-sided) braking	Unequal tire pressures	Adjust	Q–3
Steering wheel doesn't return properly or pulls to either left or right	Incorrect tire pressure	Adjust	Q–3
	Irregular tire wear (left/right)	Replace	—
	Unequal tire pressures	Adjust	Q–3
	Different types or brands of tires mixed (left/right)	Replace	—
	Loose lug nuts	Tighten	Q–4
General driving instability	Unequal tire pressures	Adjust	Q–3
	Damaged or unbalanced wheel(s)	Replace or adjust	Q–5
	Loose lug nuts	Tighten	Q–4
Excessive steering wheel play	Loose lug nuts	Tighten	Q–4

95A0QX-002

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WHEELS AND TIRES

SPECIAL NOTES ABOUT WHEELS AND TIRES

1. Do not use wheels or tires other than the specified types.
2. Aluminum wheels are easily scratched. When washing them, use a soft cloth, never a wire brush. If the vehicle is steam cleaned, do not allow boiling water to contact the wheels.
3. If alkaline compounds (such as saltwater or road salts) get on aluminum wheels, wash them as soon as possible to prevent damage. Use only a neutral detergent.

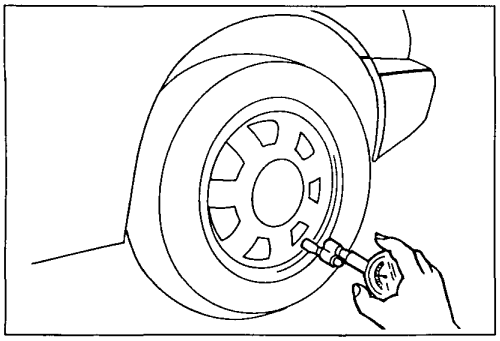
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NOTES REGARDING TIRE REPLACEMENT

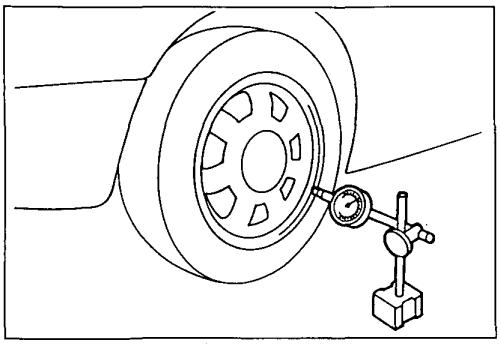
Note the following points when tires are to be removed from or mounted onto the wheels.

1. Be careful not to damage the tire bead, the rim bead, or the edge of the rim.
2. Apply a soapy solution to the tire bead and the edge of the rim.
3. Use a wire brush, sandpaper, or cloth to clean and remove all rust and dirt from the rim edge and the rim bead. For aluminum wheels, use only a cloth for this purpose; never use a wire brush or sandpaper.
4. Remove pebbles, glass, nails, and other foreign items embedded in the tire tread.
5. Be sure the air valve is installed correctly.
6. After mounting a tire onto a wheel, inflate it to 250—300 kPa (2.55—3.06 kg/cm^2, 35.55—42.66 psi). Verify that the bead is seated correctly onto the rim and that there are no air leaks. Then reduce the pressure to the specified level.
7. If a tire iron is used to change a tire on an aluminum wheel, be sure to use a piece of rubber between the iron lever and the wheel to avoid damage to the wheel. Work should be done on a rubber mat, not on a hard or rough surface.

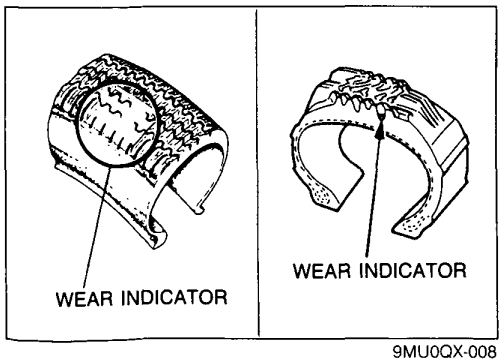
05U0QX-004



05U0QX-005



05U0QX-006



9MU0QX-008

INSPECTION / ADJUSTMENT

Check the following and adjust or replace as necessary.

1. Air pressure.
   Check the air pressure of all tires, including the spare tire, with an air pressure gauge.

   Air pressure:
   Standard tires 177 kPa (1.8 kgf/cm^2, 26 psi)
   Temporary spare tires 412 kPa (4.2 kgf/cm^2, 60 psi)

   Caution
   - **The air pressure must be measured when the tire is cold.**

2. Wheel runout.
   Set the probe of a dial indicator against the wheel, and turn the wheel one full revolution.

   Wheel runout: Horizontal 2.0mm (0.079 in) max.
   Vertical 1.5mm (0.059 in) max.

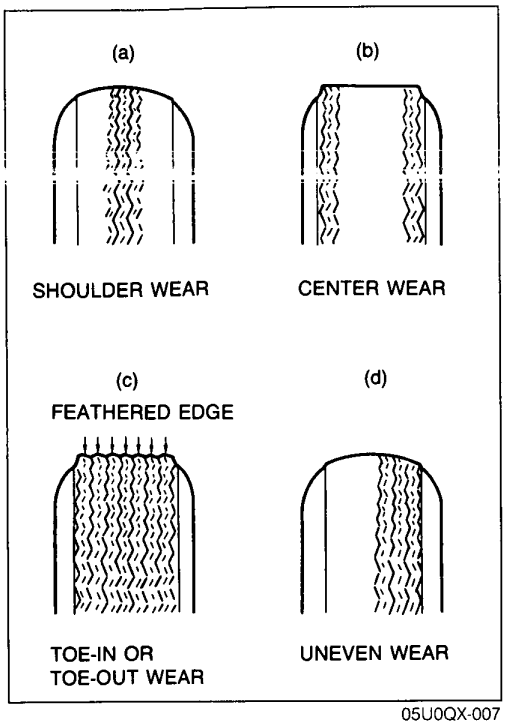
3. Tire wear.

Specifications

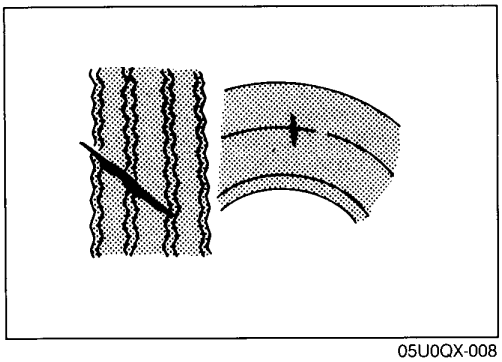
Remaining tread
Ordinary tires: 1.6mm (0.063 in) min.
(Tire should be replaced if wear indicators are exposed.)

Snow tires: 50% of tread
(Tire should be replaced if wear indicators are exposed.)

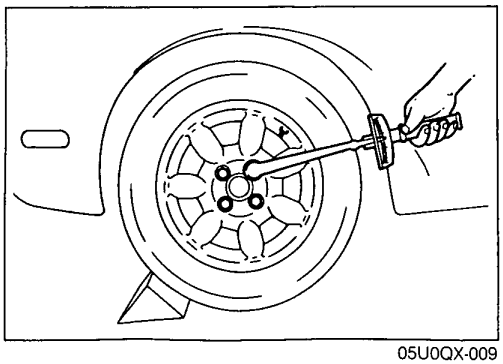
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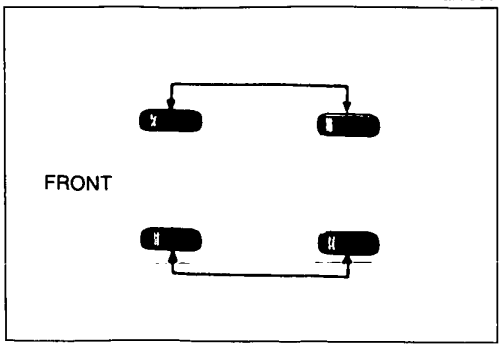
05U0QX-007



05U0QX-008



05U0QX-009



05U0QX-010

Troubleshooting guide

Abnormal tire wear patterns shown in the illustration can occur. Refer to the chart for the possible causes and actions.

	Possible cause	Action
(a)	• Underinflation (both sides worn) • Incorrect camber (one side worn) • Hard cornering • Lack of rotation	• Measure and adjust pressure • Repair or replace suspension parts • Reduce speed • Rotate tires
(b)	• Overinflation • Lack of rotation	• Measure and adjust pressure • Rotate tires
(c)	• Incorrect toe-in	• Adjust toe-in
(d)	• Incorrect camber or caster • Malfunctioning suspension • Unbalanced wheel • Out-of-round brake drum or disc • Other mechanical conditions • Lack of rotation	• Repair or replace suspension parts • Repair or replace • Balance or replace • Correct or replace • Correct or replace • Rotate tires

4. Cracks, damage, and foreign matter (such as metal pieces, nails, and stones) in the tire and cracks, deformation, and damage to the wheel.
5. Loose wheel lug nut(s).
6. Air leaking from valve stem.

REMOVAL / INSTALLATION

Tighten the lug nuts to the specified torque in a crisscross fashion.

Tightening torque:
88—118 N·m (9—12 m-kg, 65—87 ft-lb)

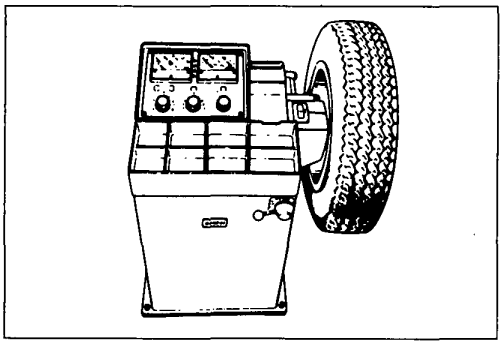
Caution
- **The wheel-to-hub contact surfaces must be clean.**
- **Never apply oil to the nuts, bolts, or wheels, which cause looseness or seizure of the lug nuts.**

TIRE ROTATION

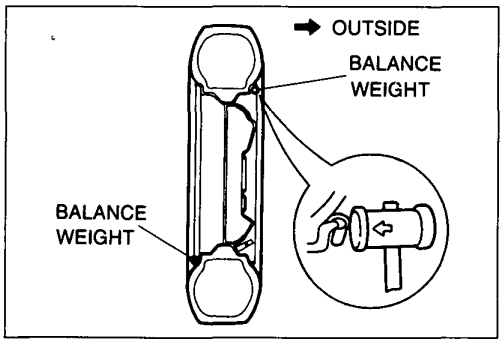
To prolong tire life and assure uniform tire wear, rotate the tires every 6,000 km (3,750 miles), sooner if irregular wear develops.

Caution
- **Do not include "TEMPORARY USE ONLY" spare tire in rotation.**
- **After rotating the tires, adjust each tire to the specified air pressure. (Refer to page Q–3.)**

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05U0QX-011

WHEEL BALANCE ADJUSTMENT

If a wheel becomes unbalanced or if a tire is replaced or repaired, the wheel must be rebalanced to within specification.

Maximum unbalance (at rim edge): 10 g (0.35 oz)

Caution

- **Do not use more than two balance weights on the inner or outer side of the wheel. if the total weight exceeds 100 g (3.5 oz), rebalance after moving the tire around on the rim.**
- **Attach the balance weights tightly so that they do not protrude more than 3mm (0.12 in) beyond the wheel edge.**
- **Select suitable balance weights for aluminum alloy wheels.**

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SUSPENSION

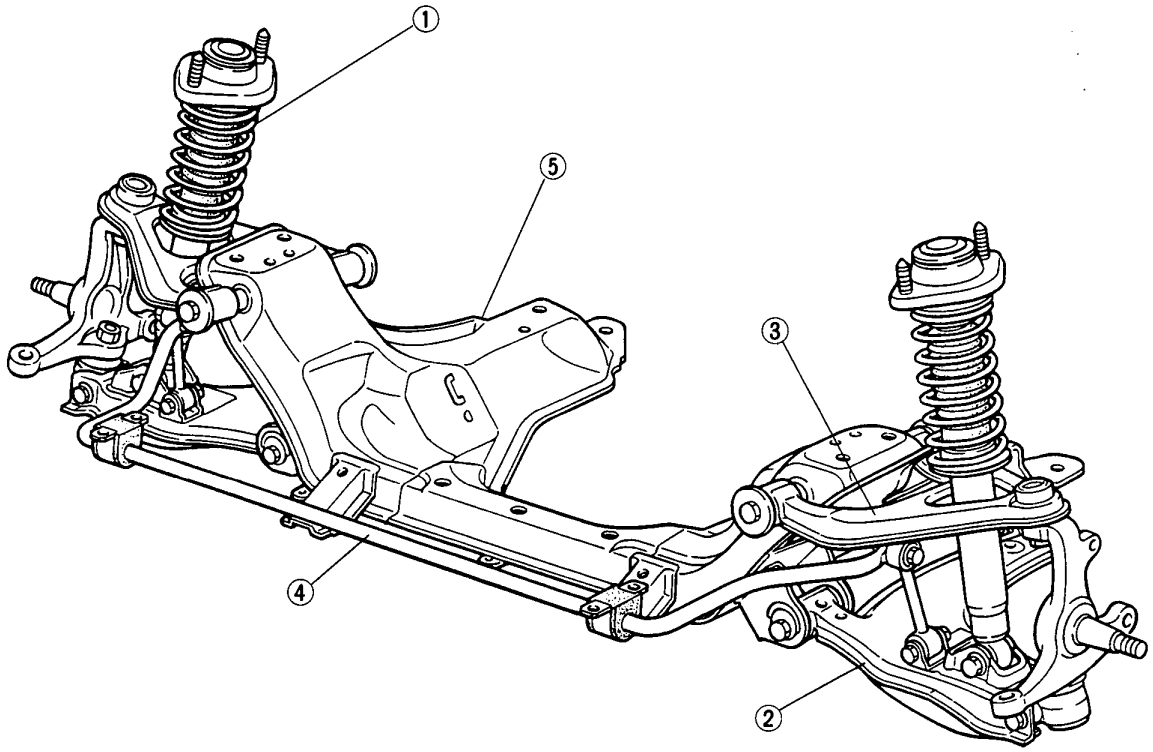
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OUTLINE ..... **R– 4**
SPECIFICATIONS ..... **R– 4**
TROUBLESHOOTING GUIDE ..... **R– 5**
WHEEL ALIGNMENT ..... **R– 6**
PRE-INSPECTION ..... **R– 6**
FRONT WHEEL ALIGNMENT ..... **R– 6**
REAR WHEEL ALIGNMENT **R–10**
FRONT SUSPENSION (DOUBLE-WISHBONE) **R–13**
PREPARATION **R–13**
SHOCK ABSORBER AND SPRING **R–14**
LOWER ARM **R–17**
UPPER ARM **R–20**
STABILIZER **R–23**
CROSSMEMBER **R–24**
REAR SUSPENSION (DOUBLE-WISHBONE) . **R–25**
PREPARATION **R–25**
SHOCK ABSORBER AND SPRING **R–26**
LOWER ARM **R–27**
UPPER ARM **R–29**
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FRONT SUSPENSION

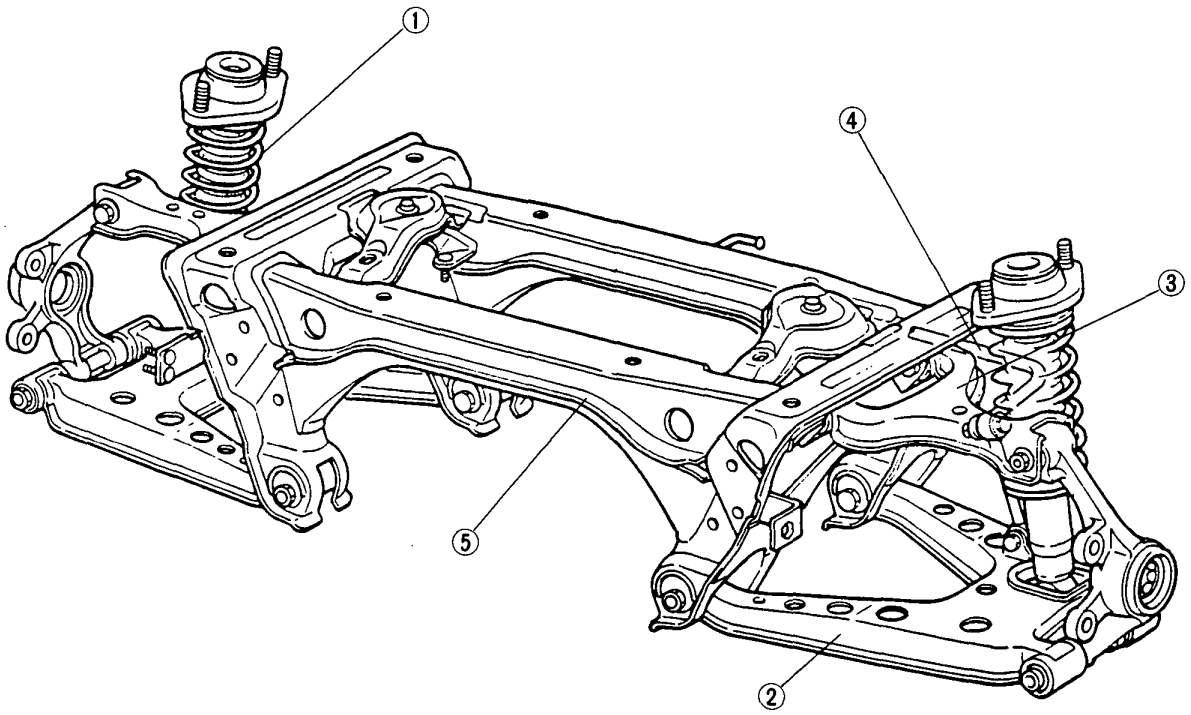


95A0RX-002

1. Shock absorber and spring
Removal / Installation ..... page R–14
Disassembly / Inspection / Assembly ..... page R–15
2. Lower arm
Removal / Inspection / Installation page R–17
3. Upper arm
Removal / Inspection / Installation page R–20
4. Stabilizer
Removal / Inspection / Installation page R–23
5. Crossmember
Removal / Inspection / Installation page R–24

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REAR SUSPENSION



95A0RX-003

1. Shock absorber and spring
   Removal / Installation ..... page R–26
   Disassembly / Inspection / Assembly ..... page R–15
2. Lower arm
   Removal / Inspection / Installation page R–27
3. Upper arm
   Removal / Inspection / Installation page R–29
4. Stabilizer
   Removal / Inspection / Installation page R–31
5. Crossmember
   Removal / Inspection / Installation page R–32

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OUTLINE

SPECIFICATIONS

Front Suspension

Item			Specifications
Suspension type			Double-wishbone
Stabilizer	Type		Torsion bar
	Diameter	mm (in)	19 (0.75)
Shock absorber			Cylindrical double acting, low-pressure-gas charged
Coil spring	Identification mark color		Red
	Wire diameter		10.8 (0.43)
	Coil inner diameter		83 (3.27)
	Free length	mm (in)	282.5 (11.12)
	Coil number		5.91
Front wheel alignment (Unladed*1)	Total toe-in	mm (in)	3 ± 3 (0.12 ± 0.12)
		degree	0°18' ± 18'
	Maximum steering angle	Inner	37° 23' ± 2°
		Outer	32° 32' ± 2°
	Camber angle*2		0°24 ± 45'
	Caster angle*3		4°30' ± 45'
	Kingpin angle		11°20'

95A0RX-044

Rear Suspension

Item			Specifications
Suspension type			Double-wishbone
Stabilizer	Type		Torsion bar
	Diameter	mm (in)	12 (0.47)
Shock absorber			Cylindrical double acting, low-pressure-gas charged
Coil springs	Identification mark color		Blue
	Wire diameter	mm (in)	10.1 (0.40)
	Coil inner diameter	mm (in)	83 (3.27)
	Free length	mm (in)	339.5 (13.37)
	Coil number		7.68
Rear wheel alignment (Unladed*1)	Total toe-in	mm (in)	3 ± 3 (0.12 ± 0.12)
		degree	0°18' ± 18'
	Camber angle*2		−0°43' ± 30'

95A0RX-045

*1 Fuel tank full; radiator coolant and engine oil at specified levels; spare tire, jack, and tools in designated positions.
*2 Difference between left and right must not exceed 1°.
*3 Difference between left and right must not exceed 1°30'.

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TROUBLESHOOTING GUIDE

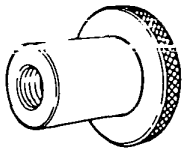
Problem	Possible cause	Action	Page
General instability	Weak coil spring	Replace	R–15
	Malfunction of shock absorber	Replace	R–14,26
	Worn or damaged stabilizer and/or suspension arm bushings	Replace	R–17,20,23 27,29,31 Section M
	Worn or damaged upper or lower arm ball joint	Replace	R–17,20
	Improperly adjusted wheel alignment	Adjust	R– 6
Body "rolls"	Weak stabilizer	Replace	R–23,31
	Worn or damaged stabilizer and/or suspension arm bushings	Replace	R–17,20,23 27,29,31 Section M
"Heavy" steering wheel operation	Insufficiently lubricated or stuck upper arm lower arm ball joint	Replace	R–17,20
	Improperly adjusted wheel alignment	Adjust	R– 6
Steering wheel pulls to one side	Weak coil spring	Replace	R–15
	Worn or damaged stabilizer and/or suspension arm bushings	Replace	R–17,20,23 27,29,31
	Deformed upper or lower arm or knuckle	Replace	R–17,20 Section M
	Loose upper or lower arm bushing	Replace	R–17,20
Excessive steering wheel play	Worn or damaged upper or lower arm bushing	Replace	R–17,20
	Worn or damaged upper or lower arm ball joint	Replace	R–17,20
Body leans	Weak coil spring	Replace	R–15
	Weak stabilizer and/or suspension arm bushings	Replace	R–17,20,23 27,29,31 Section M
Abnormal noise from suspension system	Loose mounting component	Tighten	—
	Poorly lubricated or worn upper or lower arm ball joint	Replace	R–17,20
	Malfunction of shock absorber	Replace	R–14,26
	Worn or damaged stabilizer and/or suspension arm bushings	Replace	R–17,20,23 27,29,31 Section M
Shake (Steering wheel vibrates up/down)	Excessive tire or wheel runout	Replace	—
	Loose lug nuts	Tighten	Section Q
	Unbalanced wheel(s)	Adjust or replace	Section Q
	Cracked or worn engine mounting rubber	Replace	Section B
	Cracked or worn transmission mounting rubber	Replace	Section J
Shimmy (Steering wheel vibrates left/right)	Cracked or worn steering gear mounting rubber	Replace	Section N
	Loose steering gear mounting bolts	Tighten	Section N
	Stuck or damaged steering ball joint	Replace	Section N
	Excessive tire or wheel runout	Replace	—
	Loose lug nuts	Tighten	Section Q
	Unbalanced wheel(s)	Adjust or replace	Section Q
	Insufficient tire pressure	Adjust	Section Q
	Unevenly worn tires	Replace	Section Q
	Malfunction of shock absorber	Replace	R–14,26
	Loose shock absorber mounting bolts	Tighten	R–14,26
	Stuck or damaged upper or lower arm ball joint	Replace	R–17,20
	Cracked or worn suspension bushings	Replace	R–17,20,23
	Damaged or worn front wheel bearing	Replace	Section M
	Improperly adjusted front wheel alignment	Adjust	R– 6

95A0RX-004

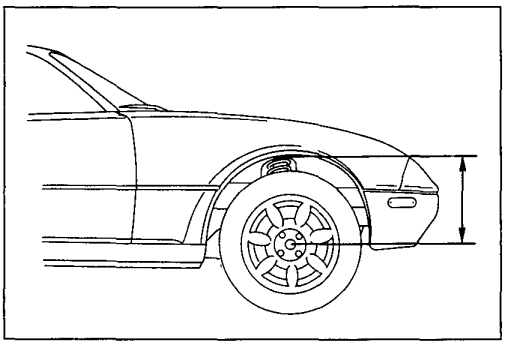
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WHEEL ALIGNMENT

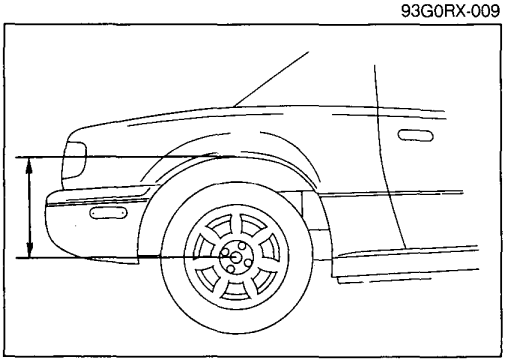
PREPARATION
SST

49 B001 605 Adapter, caster, camber gauge		For inspection of caster and camber

95A0RX-005



93G0RX-009



95A0RX-006

PRE-INSPECTION
1. Check the tire inflations and set to the recommended pressure, if necessary.
2. Inspect the front wheel bearing play; replace the bearing if necessary.
3. Inspect the wheel and tire runout.
4. Inspect the ball joints and steering linkage for any excessive looseness.
5. The vehicle must be on level ground and have no luggage or passenger load.
6. The difference in hight between the left and right sides from the center of the wheel to the fender brim must not exceed **10mm (0.39 in)**.
7. The difference in height between the front and rear from the center of the wheel to the fender brim must not exceed **10—30mm (0.39—1.18 in)**. (Rear is higher than front)
8. Shake the vehicle to check operation of the shock absorbers.

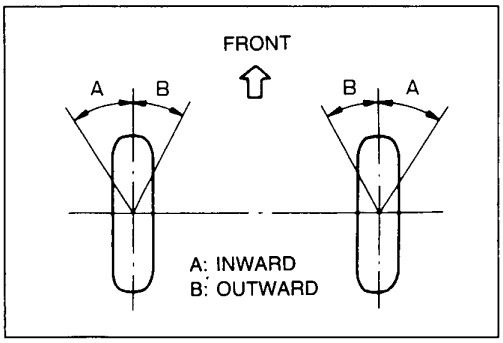
FRONT WHEEL ALIGNMENT
Specifications (Unladed*1)

Item			Specifications
Total toe-in		mm (in)	3 ± 3 (0.12 ± 0.12)
		degree	0°18' ±18'
Maximum steering angle		Inner	37°23' ± 2°
		Outer	32°32' ± 2°
Kingpin angle			11°20'
Camber angle*2	Height from center of wheel to fender brim mm (in)	328—337 (12.9—13.3)	−0°20' ± 45'
		338—347 (13.3—13.7)	0°03' ± 45'
		348—357 (13.7—14.1)	0°24' ± 45'
		358—367 (14.1—14.4)	0°44' ± 45'
		368—377 (14.4—14.8)	1°02' ± 45'
Caster angle*3	Height from center of wheel to fender brim mm (in)	328—337 (12.9—13.3)	4°53' ± 45'
		338—347 (13.3—13.7)	4°39' ± 45'
		348—357 (13.7—14.1)	4°26' ± 45'
		358—367 (14.1—14.4)	4°12' ± 45'
		368—377 (14.4—14.8)	3°58' ± 45'

95A0RX-007

*1 Fuel tank full; radiator coolant and engine oil at specified levels; spare tire, jack, and tools in designated positions.
*2 Difference between left and right must not exceed 1°.
*3 Difference between left and right must not exceed 1°30'.

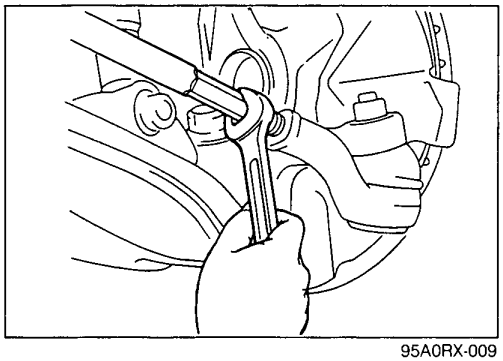
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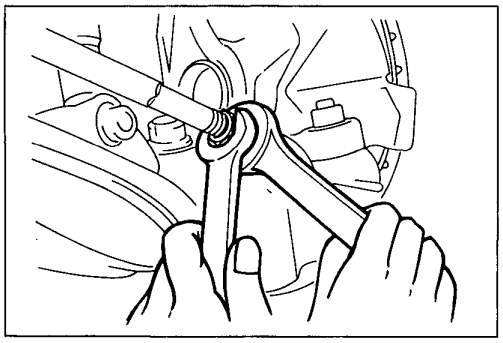
Maximum steering angle
Inspection
1. The steering angle is measured by placing the front wheels on a turning-radius gauge.

Inward : 37°23' ± 2°
Outward: 32°32' ± 2°


95A0RX-009

Adjustment
1. Remove the steering gear boot clamp.
2. Loosen the tie-rod locknut.
3. Turn the tie-rod to provide the correct maximum steering angle.

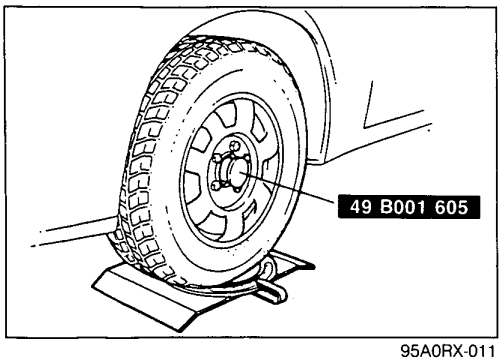
Maximum left/right difference: 3mm (0.12 in)


95A0RX-010

4. After adjustment, tighten the locknut to the specified torque.

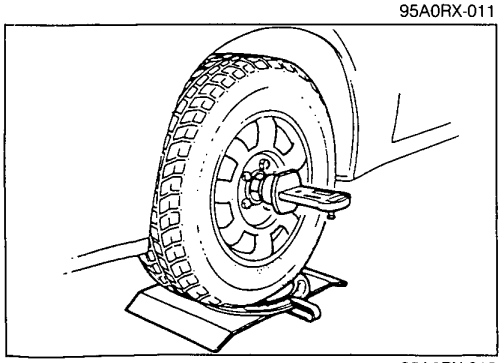
Tightening torque:
34—39 N·m (3.5—4.0 m-kg, 25—29 ft-lb)

5. Adjust the toe-in. (Refer to page R–9.)
6. Verify that the boot is not twisted, and install the boot clamp.



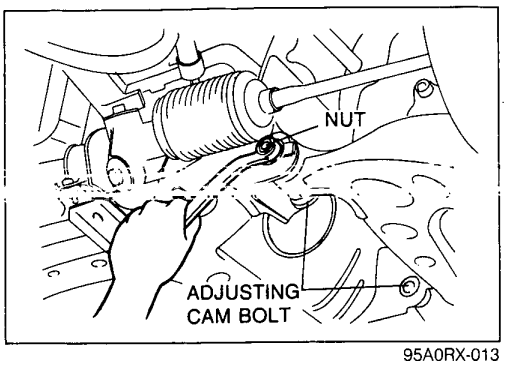
95A0RX-011

Caster/Camber
Inspection
1. Place the front wheels on a turning-radius gauge.
2. Remove the wheel hub cap and locknut.
3. Attach the **SST** to the wheel as shown in the figure.

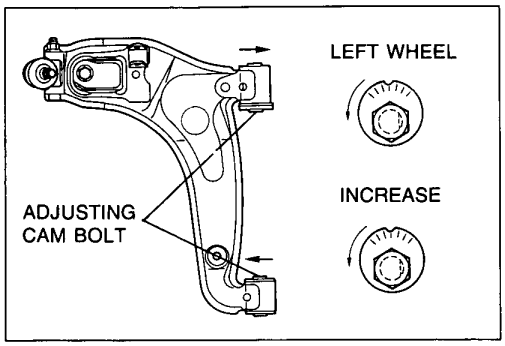

95A0RX-012

4. Attach the caster/camber gauge to the **SST**.
5. Measure the caster and camber.

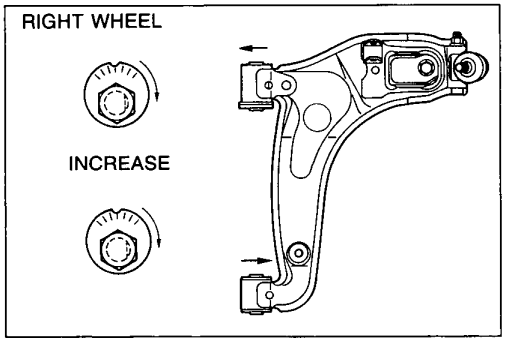
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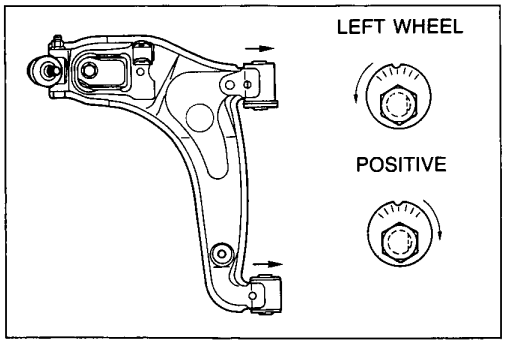
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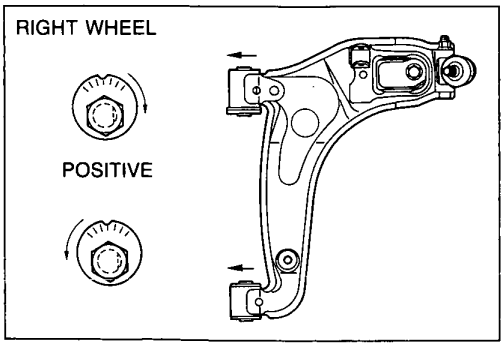
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05U0RX-014



95A0RX-014

Adjustment

Caster

Caster is adjusted by turning the front and/or rear adjusting cam bolt at the lower arm.

Caution

- **Adjust the caster before adjusting the camber.**

1. Loosen the front and/or rear cam nut.
2. Turn the front and/or rear adjusting cam bolt to provide the correct caster angle.

Caster	Left wheel		Right wheel	
	Front cam	Rear cam	Front cam	Rear cam
Increase	Counter-clockwise	Counter-clockwise	Clockwise	Clockwise
Decrease	Clockwise	Clockwise	Counter-clockwise	Counter-clockwise

Note

- **Turning the front cam one graduation on the scale changes the caster angle about 22' and the camber about 25'. Turning the rear cam one graduation changes the caster angle about 22' and the camber about 2'.**

3. Adjust the camber and the toe-in.

Camber

Camber is adjusted by turning the front and rear adjusting cam bolts at the lower arm.

Caution

- **Adjust the camber after adjusting the caster.**

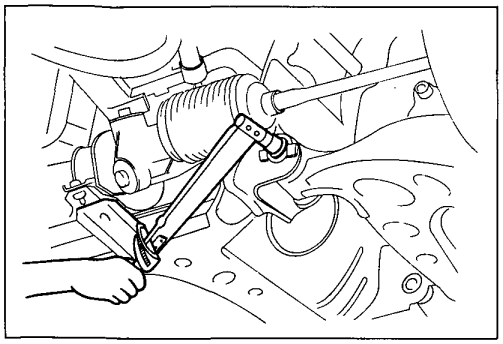
1. Loosen the front and rear cam nuts.
2. Turn the front and rear adjusting cam bolts the same amount in the opposite direction to provide the correct camber angle.

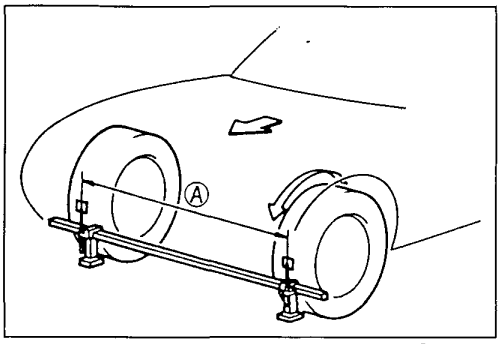
Camber	Left wheel		Right wheel	
	Front cam	Rear cam	Front cam	Rear cam
Positive	Counter-clockwise	Clockwise	Clockwise	Counter-clockwise
Negative	Clockwise	Counter-clockwise	Counter-clockwise	Clockwise

Note

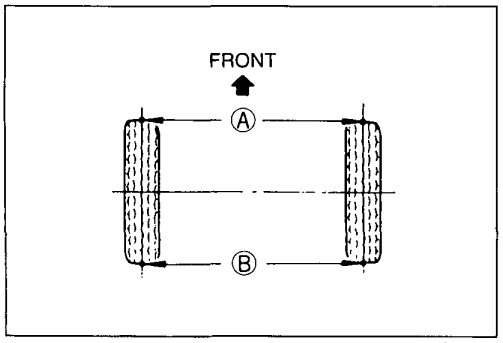
- **Turning the front cam one graduation changes the camber about 25' and the caster about 22'. Turning the rear cam one graduation changes the camber about 2' and the caster about 22'.**

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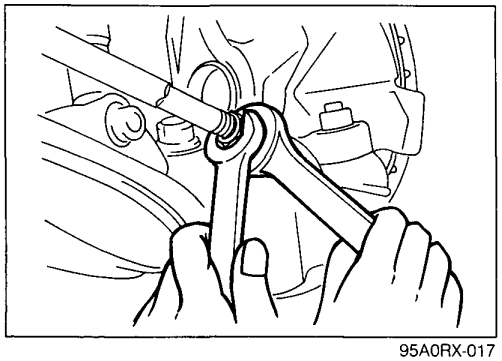

95A0RX-015



93G0RX-016



95A0RX-016


95A0RX-017

Note
- **If the cam cannot be turned far enough to make the adjustment, begin again at adjustment of the caster using the other cam.**

3. Tighten the nuts.

Tightening torque:
83—103 N·m (8.5—10.5 m-kg, 61—76 ft-lb)

4. Adjust the toe-in.

Total Toe-in
Inspection
1. Raise the front of the vehicle until the wheels clear the ground.
2. Turn the wheels by hand, mark a line in the center of each tire tread using a scribing block.
3. Place the front wheels in the straight-ahead position and lower the vehicle.

4. Measure the distance between the marked lines at the front and rear of the wheels.

Note
- **Both measurements must be taken at equal distances from the ground.**

Toe-in (distance greater at rear than front):
3 ± 3mm (0.12 ± 0.12 in)

Adjustment
1. Remove the steering gear boot clamp.
2. Loosen the left and right tie-rod locknuts, and turn the tie-rods by the same amount.

Caution
- **The left and right tie-rods are both right threaded. To increase the toe-in, turn the right tie-rod toward the front of the vehicle, and turn the left tie-rod by the same amount toward the rear.**
- **One turn of the tie-rod (one side) changes the toe-in by about 7mm (0.28 in).**
- **Adjust the toe-in after adjusting the steering angle.**

3. Tighten the tie-rod locknuts to the specified torque.

Tightening torque:
34—39 N·m (3.5—4.0 m-kg, 25—29 ft-lb)

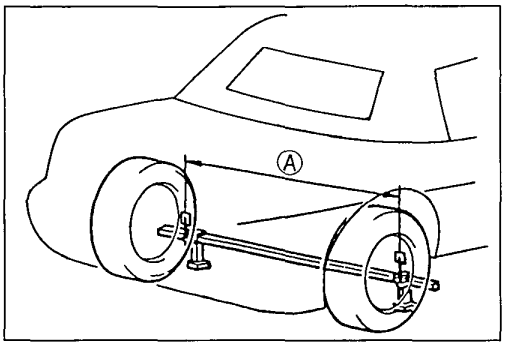
4. Verify that the boot is not twisted, and install the boot clamp.

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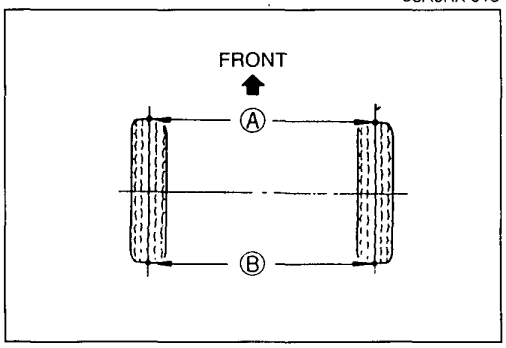
REAR WHEEL ALIGNMENT
Specifications (Unladed*)

Item			Specifications
Total toe-in		mm (in)	3 ± 3 (0.12 ± 0.12)
		degree	0°18' ± 18'
Camber angle	Height from center of wheel to fender brim mm (in)	346—355 (13.6—14.0)	−1°08' ± 30'
		356—365 (14.0—14.4)	−0°54' ± 30'
		366—375 (14.4—14.8)	−0°43' ± 30'
		376—385 (14.8—15.2)	−0°35' ± 30'
		386—395 (15.2—15.6)	−0°30' ± 30'

* Fuel tank full; radiator coolant and engine oil at specified levels; spare tire, jack, and tools in designated positions. 05U0RX-018



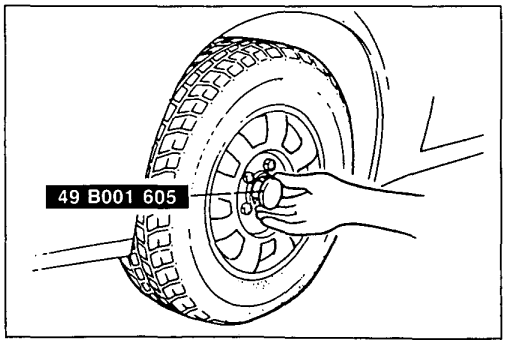
95A0RX-018



95A0RX-019

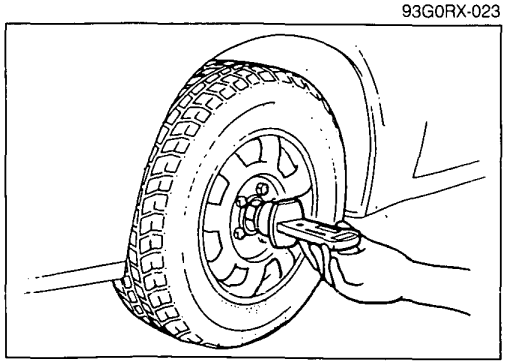
Total Toe-in
Inspection
1. Raise the rear of the vehicle until the wheels clear the ground.
2. Turn the wheels by hand, mark a line in the center of each tire tread using a scribing block.
3. Lower the vehicle.
4. Measure the distance between the marked lines at the front and rear of the wheels.

Toe-in: 3 ± 3mm (0.12 ± 0.12 in)



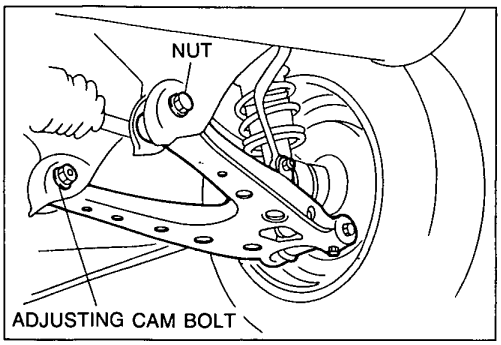
93G0RX-023

Camber
Inspection
1. Remove the wheel hub cap and locknut.
2. Attach the **SST** to the wheel hub as shown in the figure.

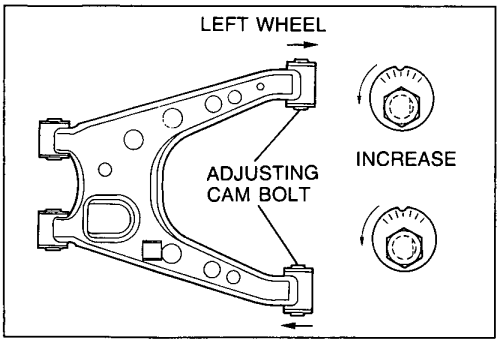

95A0RX-020

3. Attach the caster/camber gauge to the **SST**.
4. Measure the camber.

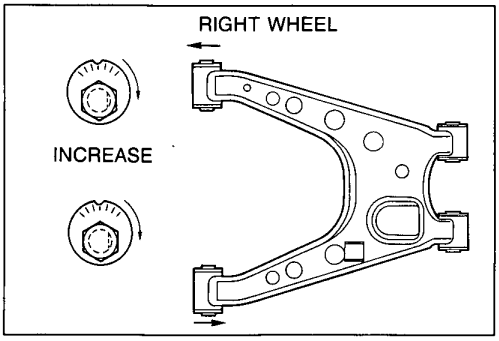
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95A0RX-021



05U0RX-020



Total Toe-in/Camber Adjustment

Total toe-in

Toe-in is adjusted by turning the front and/or rear adjusting cam bolt at the lower arm.

Caution

- **Adjust the toe-in before adjusting the camber.**

1. Loosen the front and/or rear cam nut.
2. Turn the front and/or rear adjusting cam bolt to provide the correct toe-in.

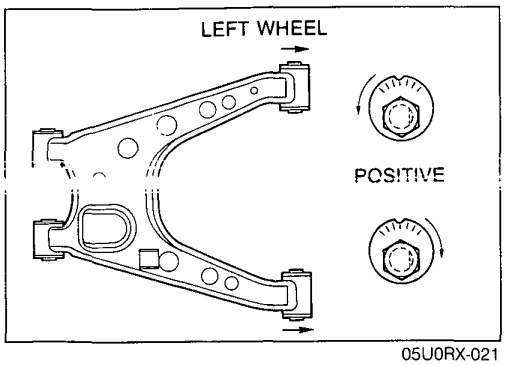
Toe-in	Left wheel		Right wheel	
	Front cam	Rear cam	Front cam	Rear cam
Increase	Counter-clockwise	Counter-clockwise	Clockwise	Clockwise
Decrease	Clockwise	Clockwise	Counter-clockwise	Counter-clockwise

Note

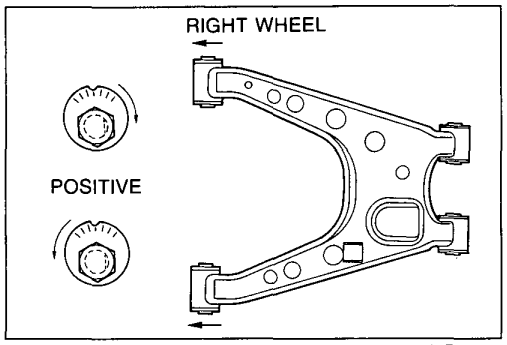
- **Turning the front cam one graduation changes the toe-in about 2.8mm (0.11 in) and the camber about 15'. Turning the rear cam one graduation changes the toe-in about 2.8mm (0.11 in) and the camber about 6'.**

3. Adjust the camber.

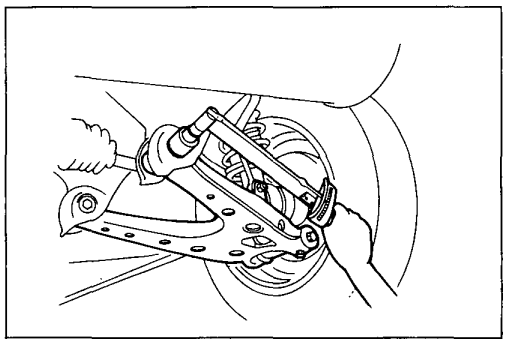
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05U0RX-021



05U0RX-022



Camber

Camber is adjusted by turning the front and rear cams at the lower arm.

Caution

- **Adjust the camber after adjusting the toe-in.**

1. Loosen the front and rear cam nuts.
2. Turn the front and rear adjusting cam bolts the same amount in the opposite direction to provide the correct camber angle.

Camber	Left wheel		Right wheel	
	Front cam	Rear cam	Front cam	Rear cam
Positive	Counter-clockwise	Clockwise	Clockwise	Counter-clockwise
Negative	Clockwise	Counter-clockwise	Counter-clockwise	Clockwise

Note

- **Turning the front cam one graduation changes the camber about 15' and the toe-in about 2.8mm (0.11 in). Turning the rear cam one graduation changes the camber about 6' and the toe-in about 2.8mm (0.11 in).**
- **If the cam cannot be turned far enough to make the adjustment, begin again at adjustment of the toe-in using the other cam.**

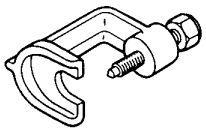
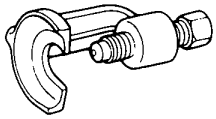
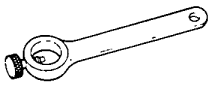
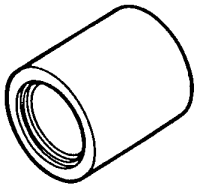
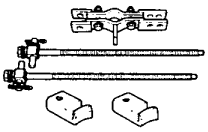
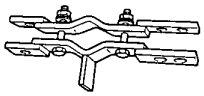
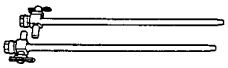
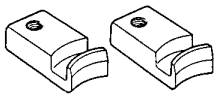
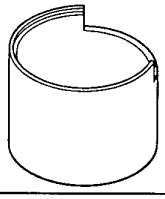
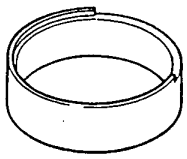
3. Tighten the nuts.

Tightening torque:
73—95 N·m (7.4—9.7 m-kg, 54—70 ft-lb)

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FRONT SUSPENSION (DOUBLE-WISHBONE)

PREPARATION
SST

49 0727 575 Puller, socket joint 	For removal of lower arm ball joint	49 0118 850C Puller, ball joint 	For removal of upper arm ball joint
49 0180 510B Attachment, steering worm bearing preload measuring 	For inspection of upper arm ball joint	49 H028 301 Installer, dust boot 	For installation of front lower arm boot
49 G034 1A0 Compressor, coil spring 	For removal and installation of coil spring	49 G034 101 Body (Part of 49 G034 1A0) 	For removal and installation of coil spring
49 G034 102 Screw (Part of 49 G030 1A0) 	For removal and installation of coil spring	49 G034 103 Arm (Part of 49 G030 1A0) 	For removal and installation of coil spring
49 B034 201 Support block 	For removal and installation of bushing	49 N028 201 Support block 	For removal of bushing

95A0RX-022

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SHOCK ABSORBER AND SPRING

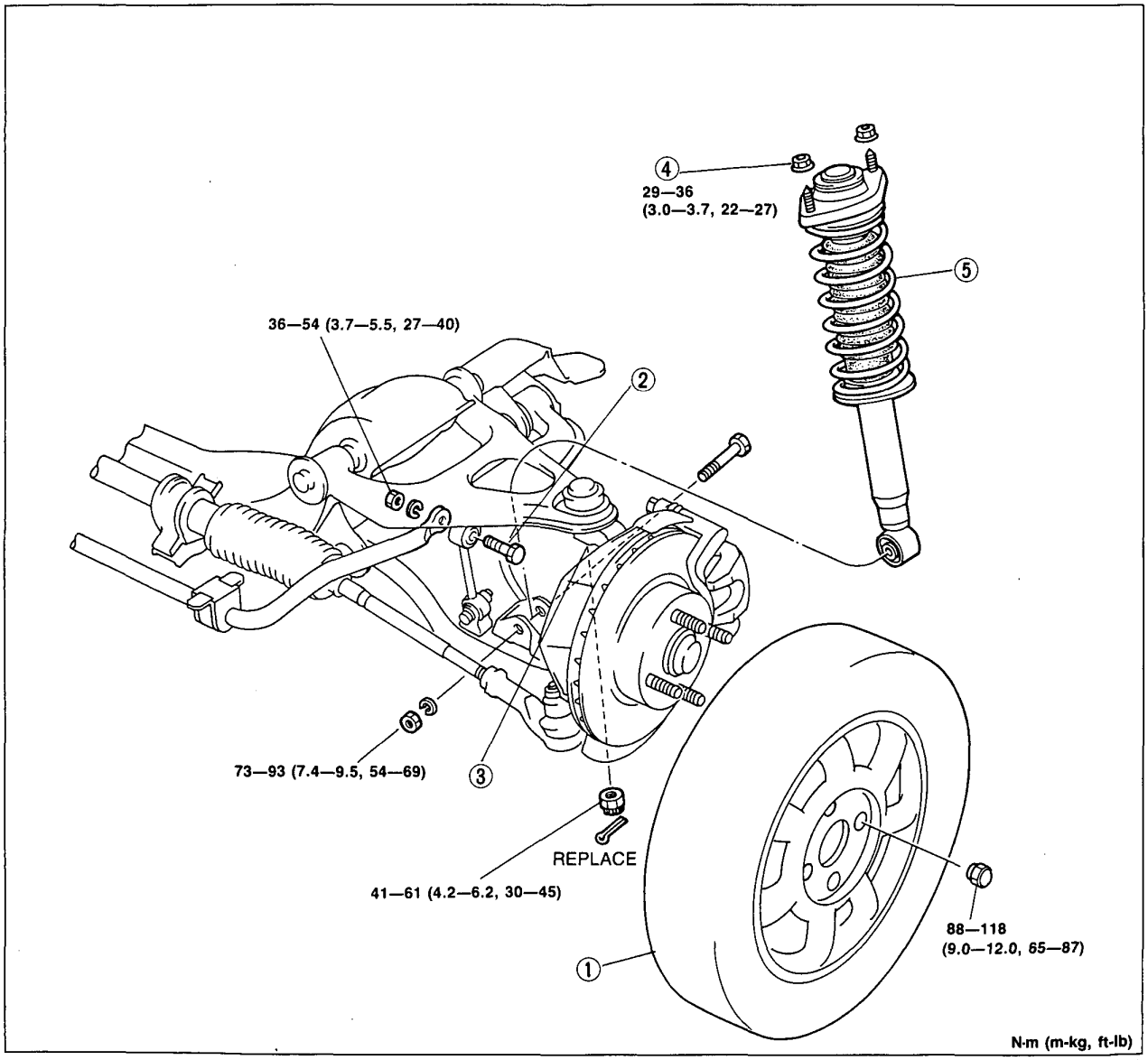
Removal / Installation

1. Jack up the front of the vehicle and support it with safety stands.
2. Remove the undercover.
3. Remove in the order shown in the figure, referring to **Removal Note**.
4. Inspect all parts and repair or replace as necessary.
5. Install in the reverse order of removal.
6. Tighten all nuts and bolts to the specified torques, referring to the figure.

Note

- **Loosely tighten the shock absorber, upper arm, stabilizer control link, and stabilizer bracket bolts. Lower the vehicle and tighten all nuts and bolts to the specified torques with the vehicle unladed.**

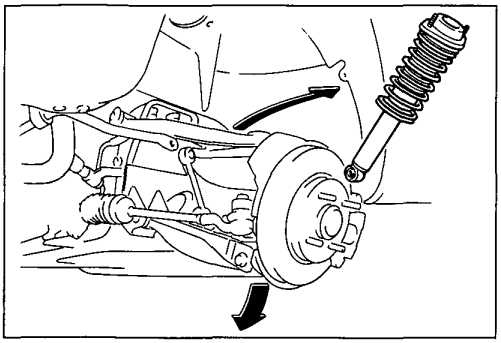
7. Adjust the front wheel alignment. (Refer to page R–6.)



95A0RX-023

1. Wheel and tire
2. Stabilizer control link bolt
3. Upper arm ball joint
   Removal Note..... page R–20
4. Mounting plate nut
5. Shock absorber and spring
   Removal Note..... page R–15
   Disassembly / Assembly..... page R–15

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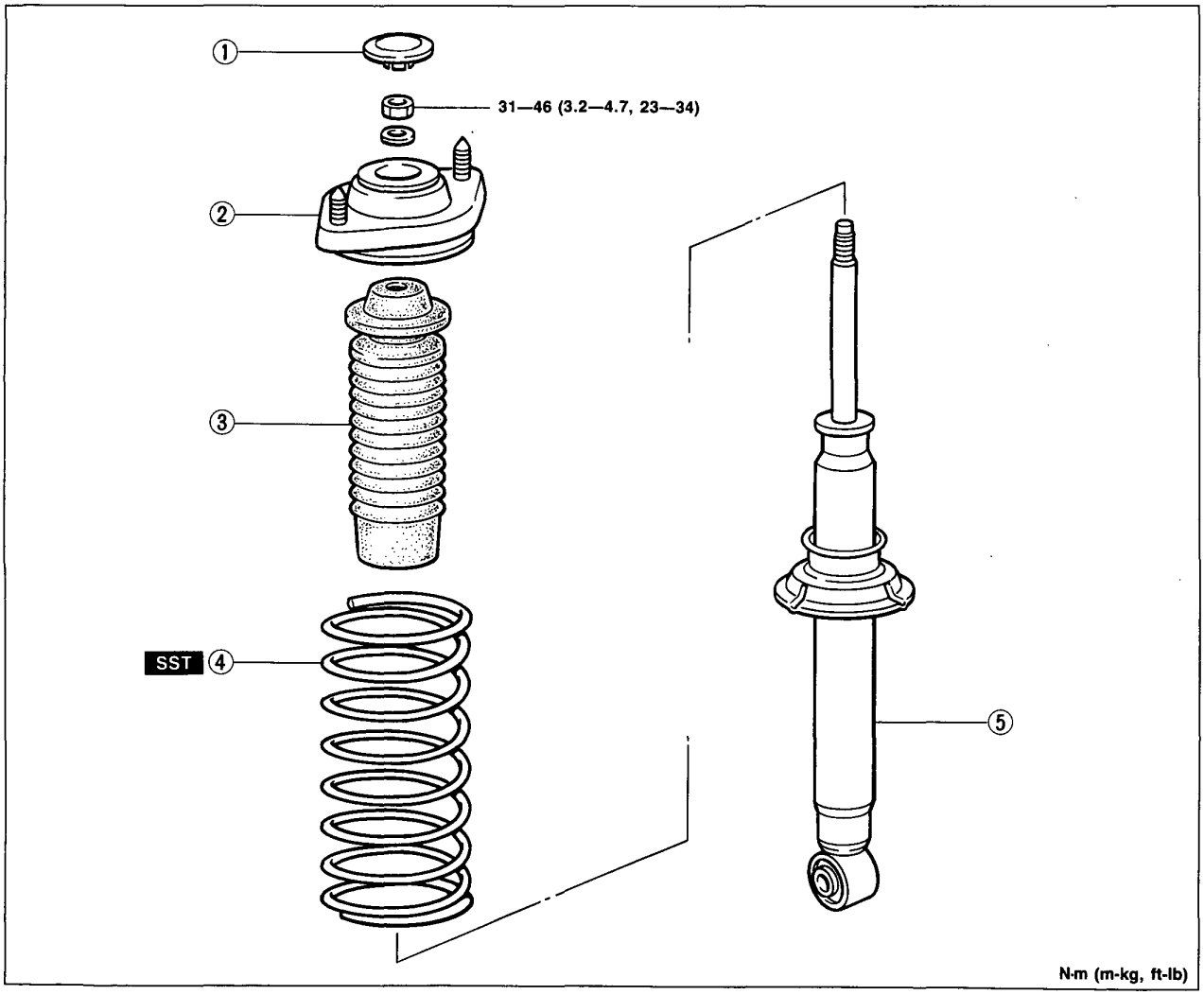


05U0RX-025

Removal note
Shock absorber and spring
1. Loosen the lower arm bolts.
2. Lower the lower arm to remove the shock absorber.

Caution
- **Do not lower the arm excessively, which may damage the brake hose.**

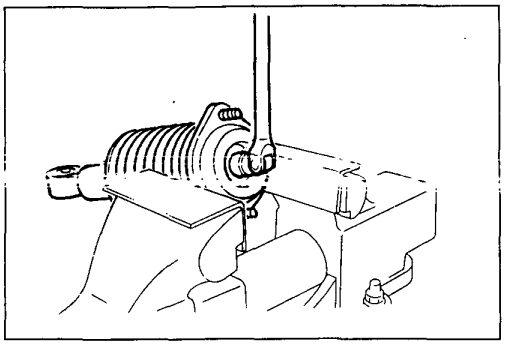
Disassembly / Inspection / Assembly
1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Inspect all parts and repair or replace as necessary.
3. Assemble in the reverse order of disassembly, referring to **Assembly Note**.
4. Tighten all nuts and bolts to the specified torques, referring to the figure.



95A0RX-024

1. Cap
2. Sheet (front only)
3. Mounting plate
4. Bound stopper
   Inspect for damage
5. Coil spring
   Disassembly Note ..... page R–16
   Assembly Note ..... page R–16
6. Shock absorber
   Inspect for oil leakage and abnormal noise

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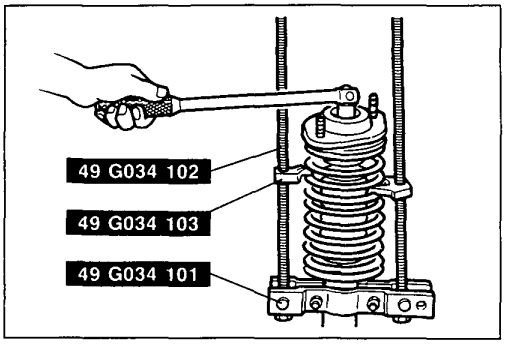


05U0RX-027

Disassembly note
Coil spring

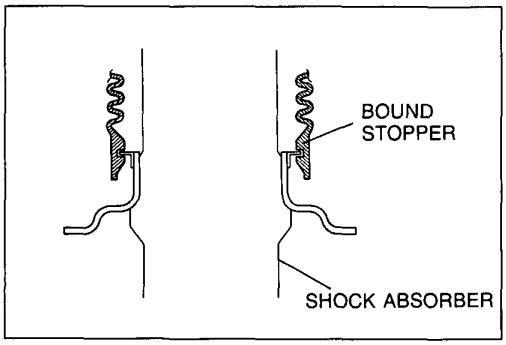
1. Loosen the piston rod upper nut several turns, but do not remove the nut.

Caution
- **Do not remove the nut.**
- **Use copper or aluminum plates in the jaws of the vise.**



05U0RX-028

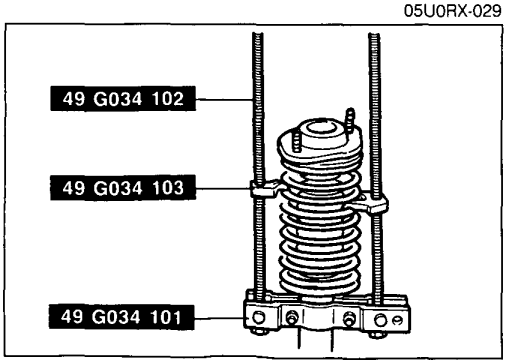
2. Assemble the **SST**.
3. Compress the coil spring with the **SST**, and remove the upper nut.
4. Remove the coil spring.



05U0RX-029

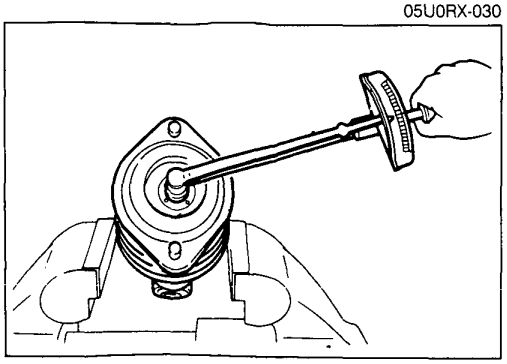
Assembly note
Coil spring and bound stopper

1. Set the shock absorber in a vise.
2. Install the bound stopper on the shock absorber as shown.



05U0RX-030

3. Install the compressed coil spring (compressed with **SST**).
4. Install the mounting plate.



05U0RX-031

5. Remove the **SST**.
6. Secure the mounting plate in a vise.

Caution
- **Use copper or aluminum plates in the jaws of the vise.**

7. Tighten the piston rod upper nut.

Tightening torque:
31—46 N·m (3.2—4.7 m-kg, 23—34 ft-lb)

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LOWER ARM

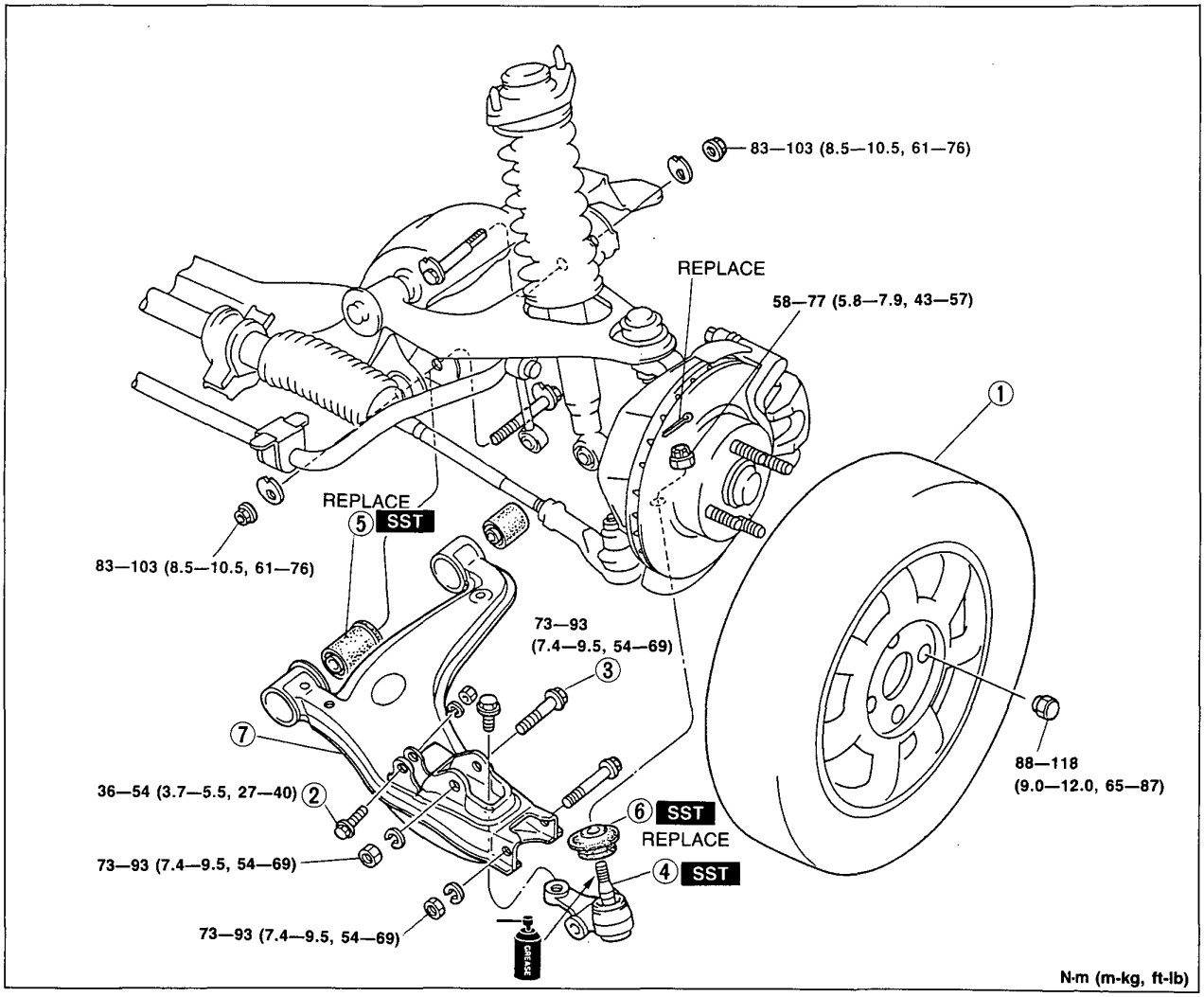
Removal / Inspection / Installation

1. Jack up the front of the vehicle and support it with safety stands.
2. Remove the undercover.
3. Remove in the order shown in the figure, referring to **Removal Note**.
4. Inspect all parts and repair or replace as necessary.
5. Install in the reverse order of removal, referring to **Installation Note**.
6. Tighten all nuts and bolts to the specified torques, referring to the figure.

Note

- **Loosely tighten the lower arm, shock absorber, and stabilizer control link bolts. Lower the vehicle and tighten all nuts and bolts to the specified torques with the vehicle unladed.**

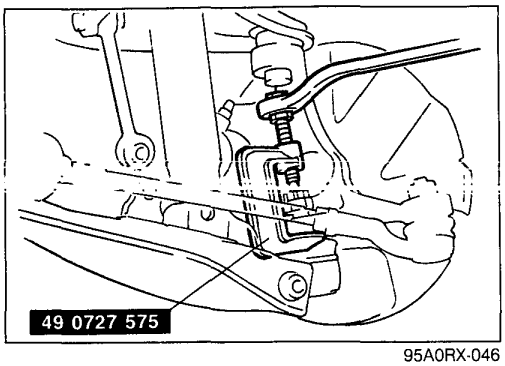
7. Adjust the front wheel alignment. (Refer to page R–6.)



95A0RX-025

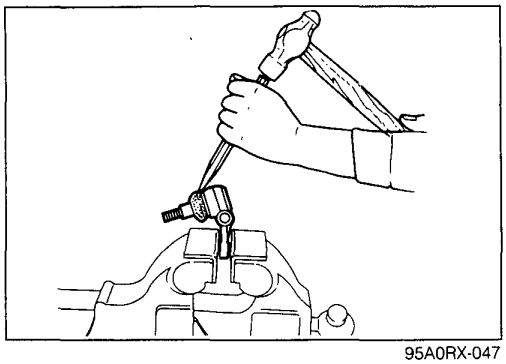
1. Wheel and tire
2. Stabilizer control link bolt
3. Shock absorber bolt
4. Lower arm ball joint
   - Removal Note..... page R–18
   - Inspection..... page R–19
5. Lower arm bushing (front and rear)
   - Removal note ..... page R–18
   - Installation note ..... page R–19
   - Inspect for deterioration and wear
6. Ball joint dust boot
   - Removal Note..... page R–18
   - Installation Note..... page R–18
7. Lower arm
   - Inspect for damage and cracks

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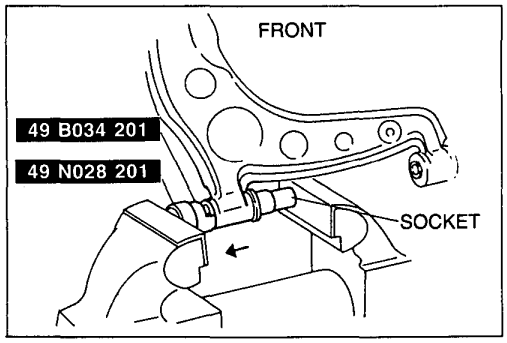
95A0RX-046

Removal note
Lower arm ball joint
1. Separate the ball joint from the knuckle with the **SST**.


95A0RX-047

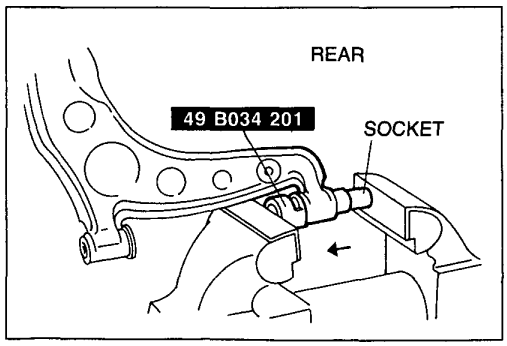
Ball joint dust boot
1. Remove the dust boot with a chisel.

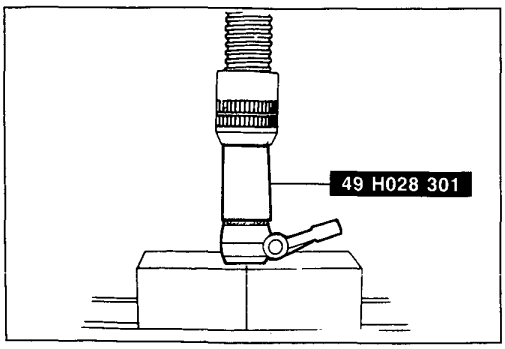
Caution
- **Do not damage the ball joint stud.**



95A0RX-026

Lower arm bushing (front and rear)
1. Press the lower arm bushing out with the **SST** and a socket as shown.

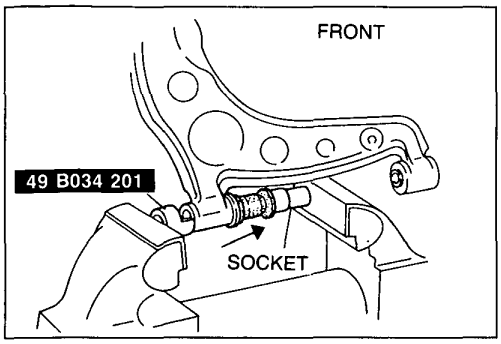




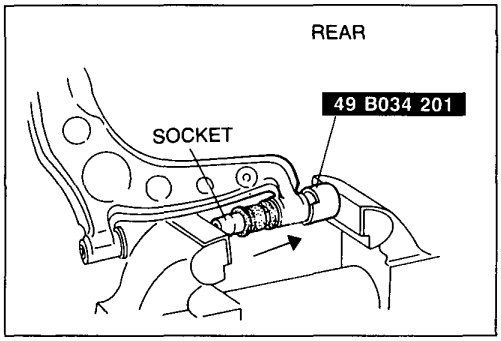
05U0RX-036

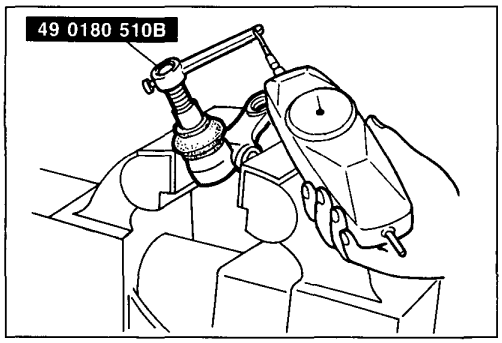
Installation note
Ball joint dust boot
1. Liberally coat the inside of the new dust boot with grease.
2. Press the dust boot onto the ball joint with the **SST**.

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95A0RX-027





05U0RX-037

Lower arm bushing (front and rear)

1. Apply soapy water to the lower arm bushing.
2. Press the bushing in with the **SST** and a socket in the direction of the arrow.

Inspection

Lower arm ball joint

Ball joint rotation torque

1. Shake the ball joint stud 5 times.
2. Connect the **SST** to the ball stud, and measure the rotation torque with a pull scale.

Rotation torque:
0.5—1.5 N·m (5—15 cm-kg, 4.3—13 in-lb)

Pull scale reading:
4.9—14.7 N (0.5—1.5 kg, 1.7—3.3 lb)

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UPPER ARM

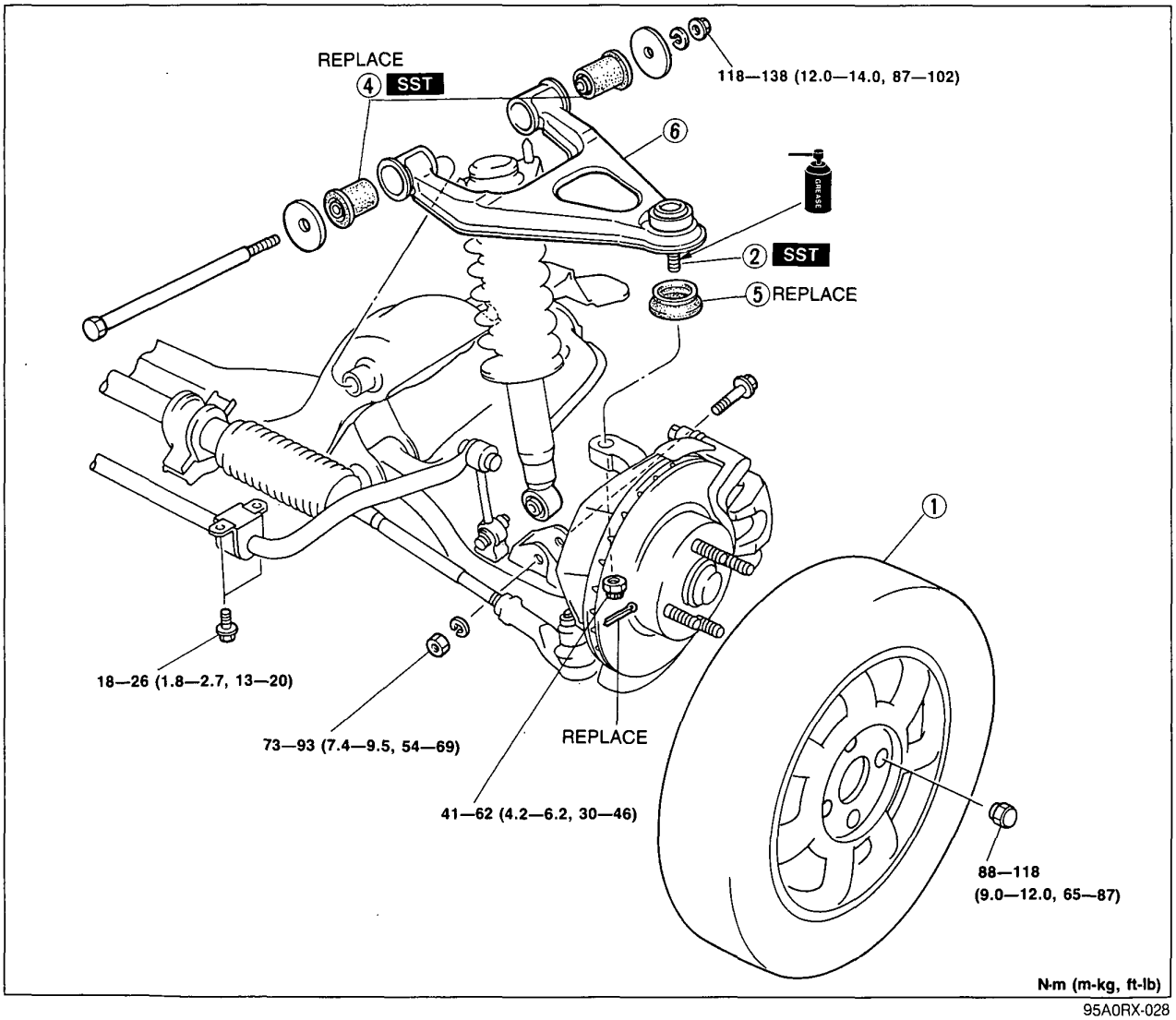
Removal / Inspection / Installation

1. Jack up the front of the vehicle and support it with safety stands.
2. Remove the undercover.
3. Remove in the order shown in the figure, referring to **Removal Note**.
4. Inspect all parts and repair or replace as necessary.
5. Install in the reverse order of removal, referring to **Installation Note**.
6. Tighten all nuts and bolts to the specified torques, referring the figure.

Note

- **Loosely tighten the upper arm and shock absorber bolts. Lower the vehicle and tighten all nuts and bolts to the specified torques with the vehicle unladed.**

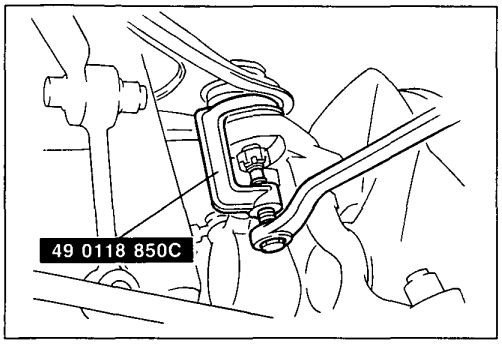
7. Adjust the front wheel alignment. (Refer to page R–6.)



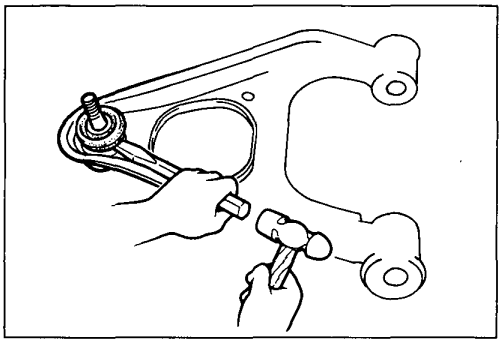
95A0RX-028

1. Wheel and tire
2. Upper arm ball joint
   Removal Note..... page R–21
3. Shock absorber bolt
4. Upper arm bushing (front and rear)
   Removal note..... page R–21
   Installation note..... page R–22
   Inspect for deterioration and damage
5. Ball joint dust boot
   Removal Note..... page R–21
   Installation Note..... page R–21
6. Upper arm
   Inspection..... page R–22

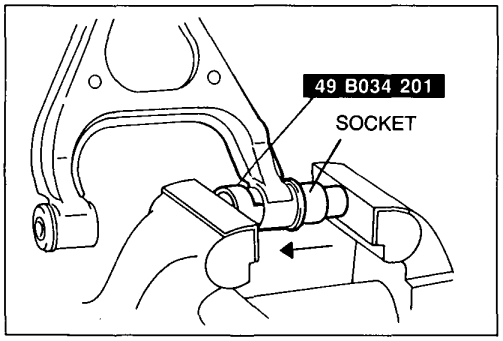
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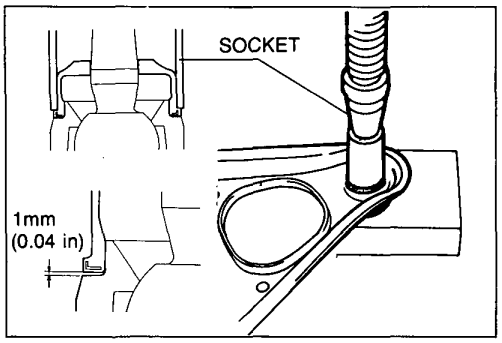
95A0RX-048



95A0RX-049



95A0RX-029



05U0RX-042

Removal note
Upper arm ball joint
1. Separate the upper arm ball joint from the knuckle with the **SST**.

Ball joint dust boot
1. Remove the dust boot with a chisel.

Caution
- **Do not damage the ball joint stud.**

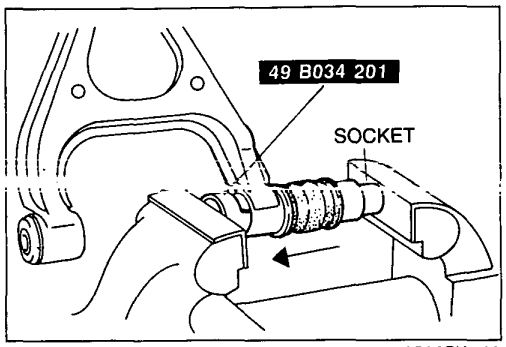
Upper arm bushing (front and rear)
1. Press the upper arm bushing out with the **SST** and a socket as shown.

Installation note
Ball joint dust boot
1. Press the dust boot on with a **30mm (1 1/8 in)** socket until the dust boot contacts the seat.

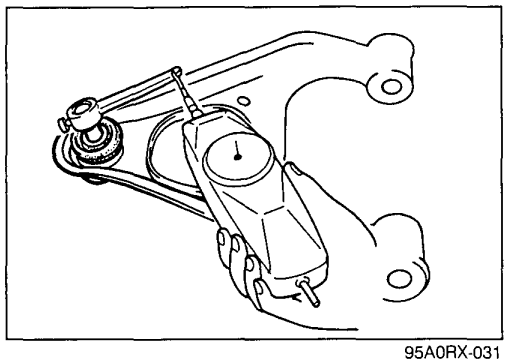
Caution
- **Install the dust boot squarely and do not press excessively; the inner metal ring will be deformed if not done correctly.**

2. Verify that the clearance between the boot and the seat is less than **1mm (0.04 in)**.
3. Shake the ball joint stud several times to make sure there is no grease leakage.

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95A0RX-030


95A0RX-031

Upper arm bushing (front and rear)

1. Apply soapy water to the upper arm bushing.
2. Press the bushing in with the **SST** and a socket in the direction of the arrow.

Inspection

Upper arm

Ball joint rotation torque

1. Shake the ball joint stud 5 times.
2. Connect the **SST** to the ball stud, and measure the rotation torque with a pull scale.

Rotation torque:
0.4—1.2 N·m (4—12 cm-kg, 3.5—10.0 in-lb)

Pull scale reading:
3.9—11.8 N (0.4—1.2 kg, 2.9—8.8 lb)

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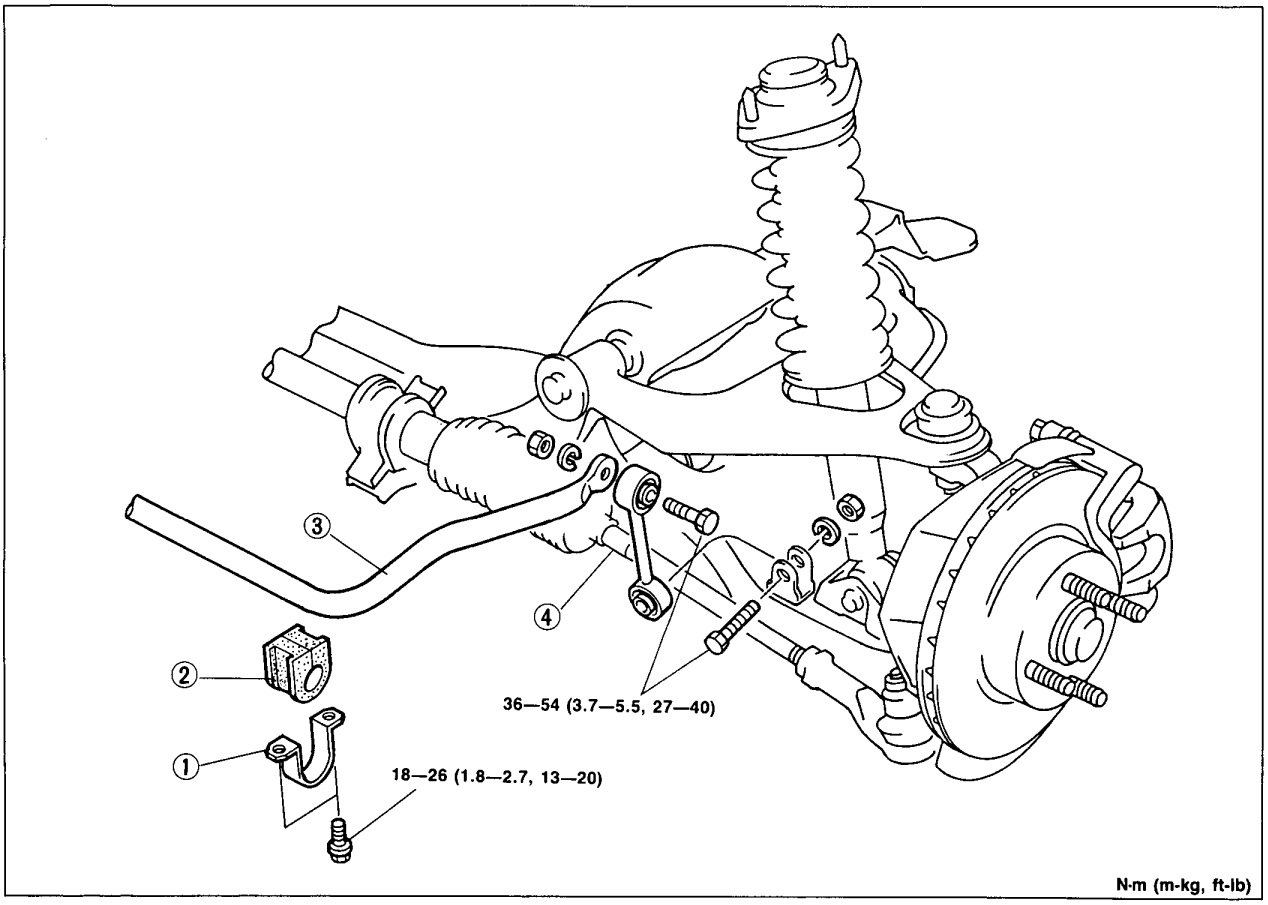
STABILIZER

Removal / Inspection / Installation

1. Jack up the front of the vehicle and support it with safety stands.
2. Remove the undercover.
3. Remove in the order shown in the figure.
4. Inspect all parts and repair or replace as necessary.
5. Install in the reverse order of removal, referring to **Installation Note**.
6. Tighten all nuts and bolts to the specified torques, referring to the figure.

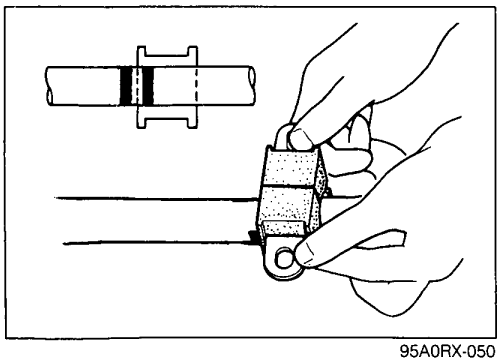
Note

- **Loosely tighten the stabilizer control link and bracket bolts. Lower the vehicle and tighten all nuts and bolts to the specified torques with the vehicle unladed.**



05U0RX-044

1. Stabilizer bracket
2. Stabilizer bushing
   Inspect for deterioration and wear
   Installation Note ..... below
3. Stabilizer
   Inspect for bending and damage
4. Stabilizer control link
   Inspect for bending and damage



95A0RX-050

Installation note

Stabilizer bushing

1. Align the bushing with the installation mark on the stabilizer.

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CROSSMEMBER

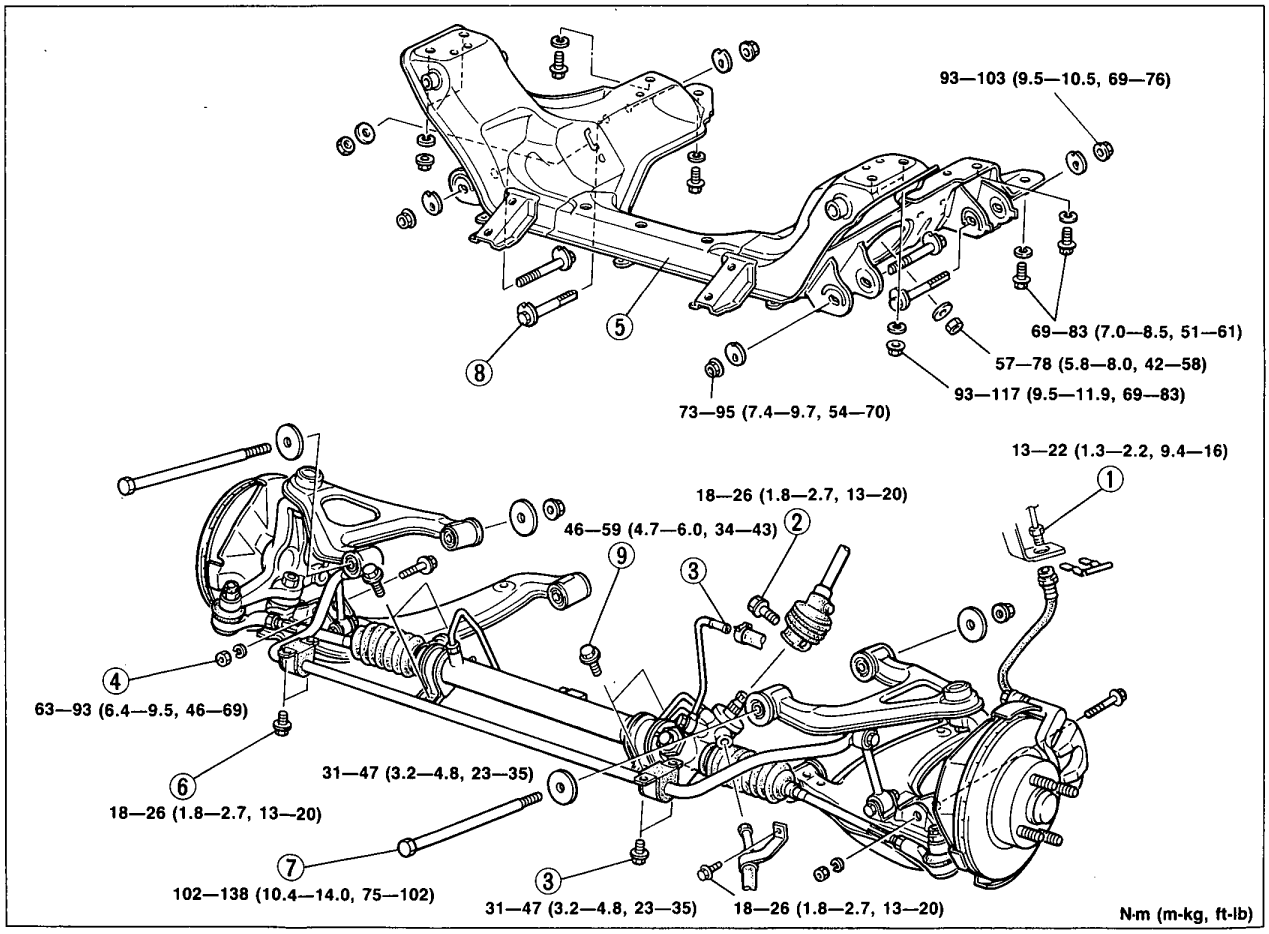
Removal / Inspection / Installation

1. Jack up the vehicle.
2. Remove the wheels and the undercover.
3. Support the engine with a hoist.
4. Remove in the order shown in the figure.
5. Inspect all parts and repair or replace as necessary.

Note

- **Use a container or rags to collect the power steering fluid when disconnecting the power steering pipes.**
- **Lower the crossmember and other suspension parts as an assembly, and then separate the parts.**
- **Loosely tighten the stabilizer bracket, upper arm, and lower arm bolts when assembling before installation. Lower the vehicle and tighten all nuts and bolts to the specified torques with the vehicle unladed.**

6. Install in the reverse order of removal.
7. Adjust the front wheel alignment. (Refer to page R–6.)
8. Bleed the air from the brake system. (Refer to Section P.)



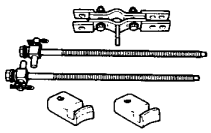
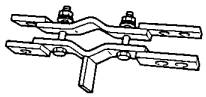
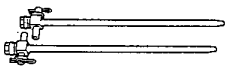
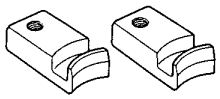
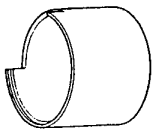
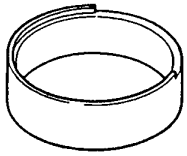
95A0RX-032

1. Brake pipe
   Removal / Installation ..... Section P
2. Pinion shaft bolt
   Removal / Installation ..... Section N
3. Power steering pipe
   Removal / Installation ..... Section N
4. Shock absorber bolt
5. Stabilizer bracket bolt
6. Upper arm bolt
7. Lower arm bolt
8. Steering gear bracket bolt
9. Front crossmember assembly
   Inspect for damage

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REAR SUSPENSION (DOUBLE-WISHBONE)

PREPARATION
SST

49 G030 1A0 Compressor, coil spring 	For removal and installation of coil spring	49 G030 101 Body (Part of 49 G030 1A0) 	For removal and installation of coil spring
49 G030 102 Screw (Part of 49 G030 1A0) 	For removal and installation of coil spring	49 G030 103 Arm (Part of 49 G030 1A0) 	For removal and installation of coil spring
49 B034 201 Support block 	For removal and installation of bushing	49 N028 201 Support block 	For removal and installation of bushing

95A0RX-033

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SHOCK ABSORBER AND SPRING

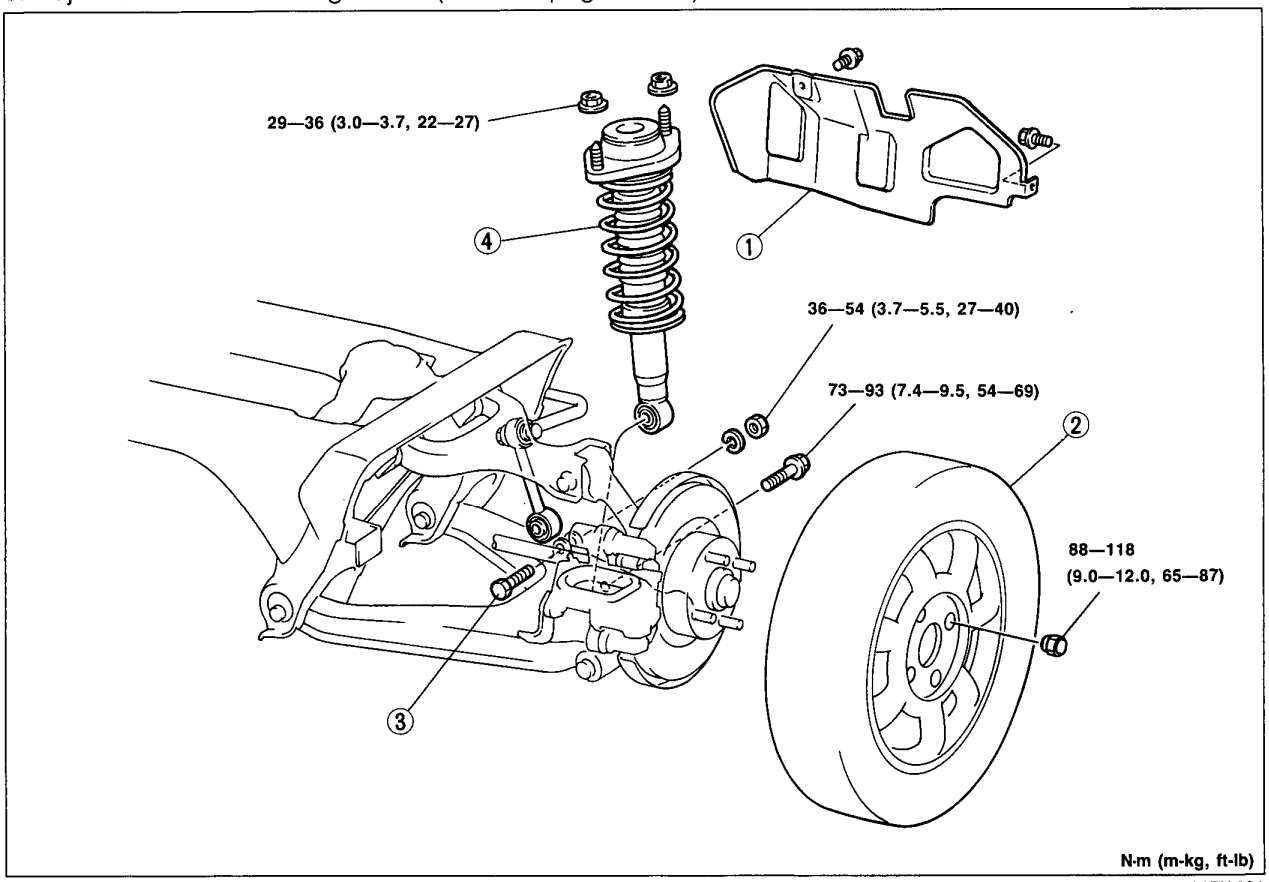
Removal / Installation

1. Jack up the front of the vehicle and support it with safety stands.
2. Remove in the order shown in the figure, referring to **Removal Note**.
3. Inspect all parts and repair or replace as necessary.
4. Install in the reverse order of removal.
5. Tighten all nuts and bolts to the specified torques, referring to the figure.

Note

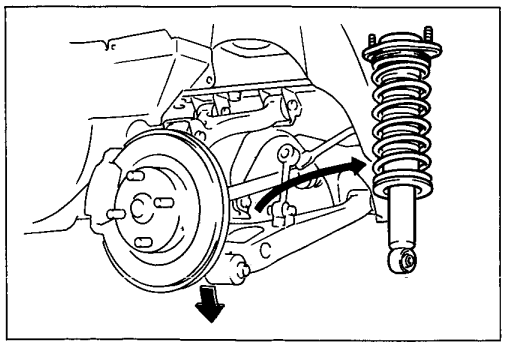
- **Loosely tighten the stabilizer control link bolt. Lower the vehicle and tighten all nuts and bolts to the specified torques with the vehicle unladed.**

6. Adjust the rear wheel alignment. (Refer to page R–10.)



95A0RX-034

1. Filler pipe protector (left side)
2. Wheel and tire
3. Stabilizer control link bolt
4. Shock absorber and spring
   Removal Note ..... below
   Disassembly / Inspection / Assembly ..... page R–15



05U0RX-049

Removal note

Shock absorber and spring

1. Loosen the upper and lower arm bolts.
2. Lower the upper and lower arms to remove the shock absorber and spring.

Caution

- **Do not lower the arms excessively, which may damage the brake hose.**

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LOWER ARM

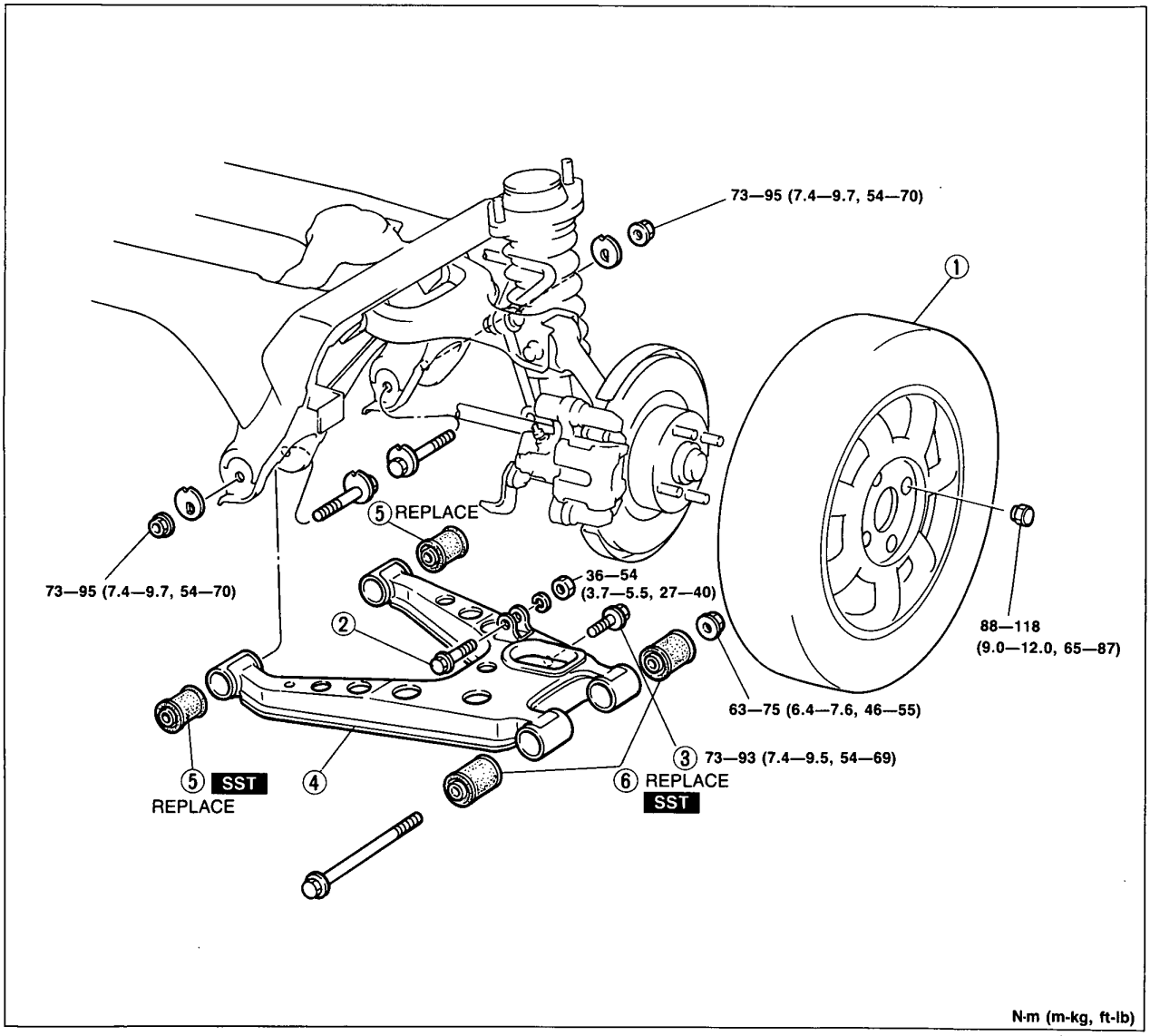
Removal / Inspection / Installation

1. Jack up the rear of the vehicle and support it with safety stands.
2. Remove in the order shown in the figure, referring to **Removal Note**.
3. Inspect all parts and repair or replace as necessary.
4. Install in the reverse order of removal.

Note

- **Loosely tighten the lower arm, shock absorber, and stabilizer control link bolts. Lower the vehicle and tighten all nuts and bolts to the specified torques with the vehicle unladed.**

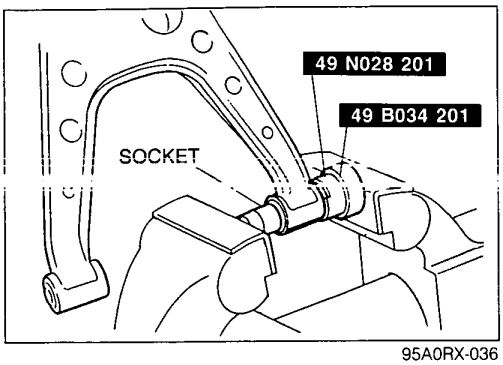
5. Adjust the rear wheel alignment. (Refer to page R–10.)



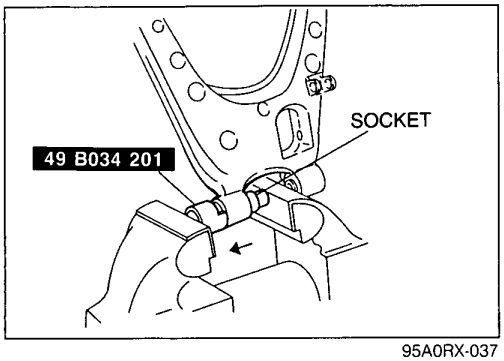
95A0RX-035

1. Wheel and tire
2. Stabilizer control link bolt
3. Shock absorber bolt
4. Lower arm
   Inspect for damage and cracks
5. Lower arm bushing (crossmember side)
   Removal note ..... page R–28
   Installation note ..... page R–28
   Inspect for deterioration and wear
6. Lower arm bushing (knuckle side)
   Removal note ..... page R–28
   Installation note ..... page R–28
   Inspection for deterioration and wear

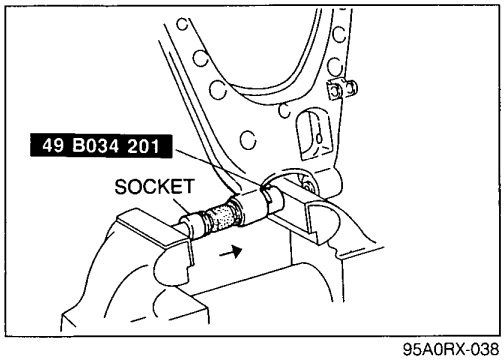
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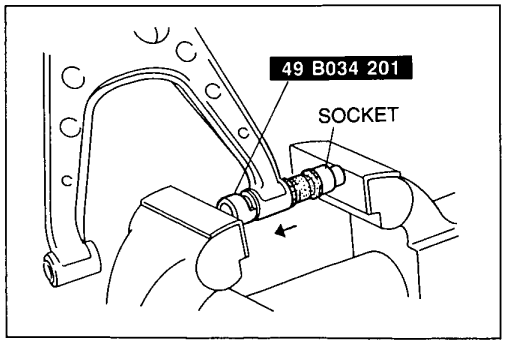
95A0RX-036



95A0RX-037



95A0RX-038



95A0RX-039

Removal note
Lower arm bushing (crossmember side)
1. Press the lower arm bushing out with the **SST** and a socket as shown.

Lower arm bushing (knuckle side)
1. Press the lower arm bushing out with the **SST** and a socket as shown.

Installation note
Lower arm bushing (knuckle side)

Caution
- **Install the bushing with a white mark for the front side.**

1. Apply soapy water to the lower arm bushing.
2. Press the bushing in with the **SST** and a socket in the direction of the arrow.

Lower arm bushing (crossmember side)
1. Apply soapy water to the lower arm bushing.
2. Press the bushing in with the **SST** and a socket in the direction of the arrow.

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UPPER ARM

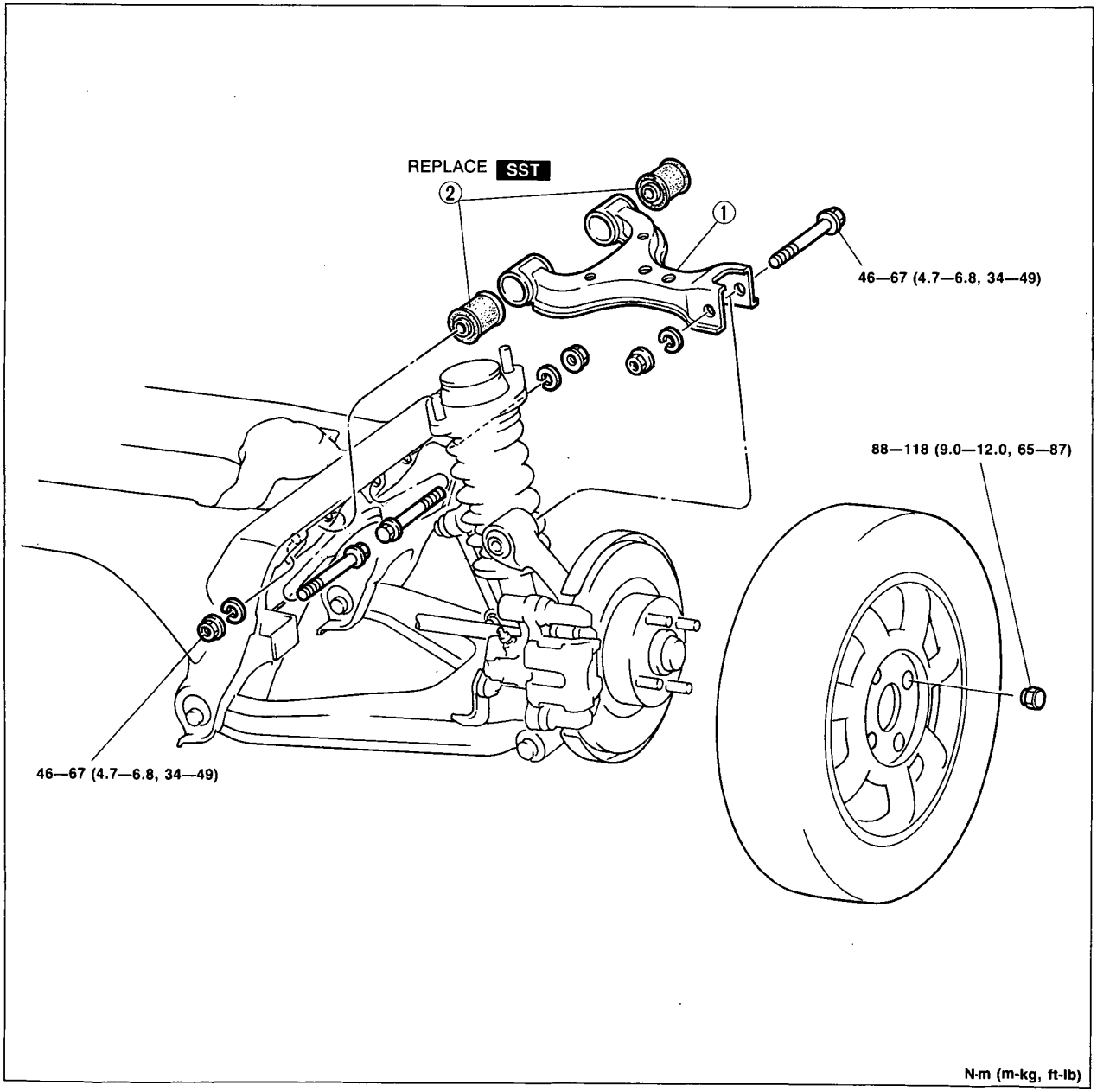
Removal / Inspection / Installation

1. Jack up the rear of the vehicle and support it with safety stands.
2. Remove in the order shown in the figure, referring to **Removal Note**.
3. Inspect all parts and repair or replace as necessary.
4. Install in the reverse of removal.

Note

- **Loosely tighten the upper arm bolts. Lower the vehicle and tighten all nuts and bolts to the specified torques with the vehicle unladed.**

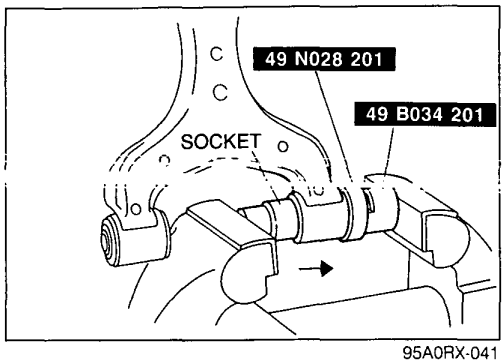
5. Adjust the rear wheel alignment. (Refer to page R–10.)



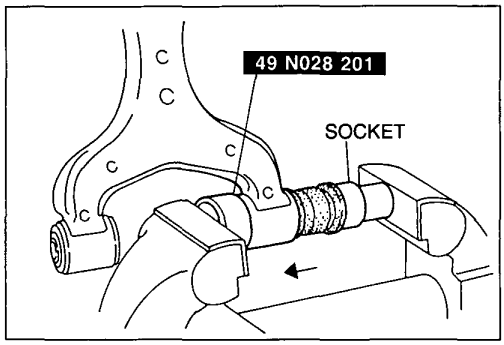
95A0RX-040

1. Upper arm
   Inspect for damage and cracks
2. Upper arm bushing
   Removal note ..... page R–30
   Installation note ..... page R–30
   Inspect for deterioration and wear

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95A0RX-041



95A0RX-042

Removal note
Upper arm bushing
1. Press the upper arm bushing out with the **SST** and a socket as shown.

Installation note
Upper arm bushing
1. Apply soapy water to the upper arm bushing.
2. Press the bushing in with the **SST** and a socket in the direction of the arrow.

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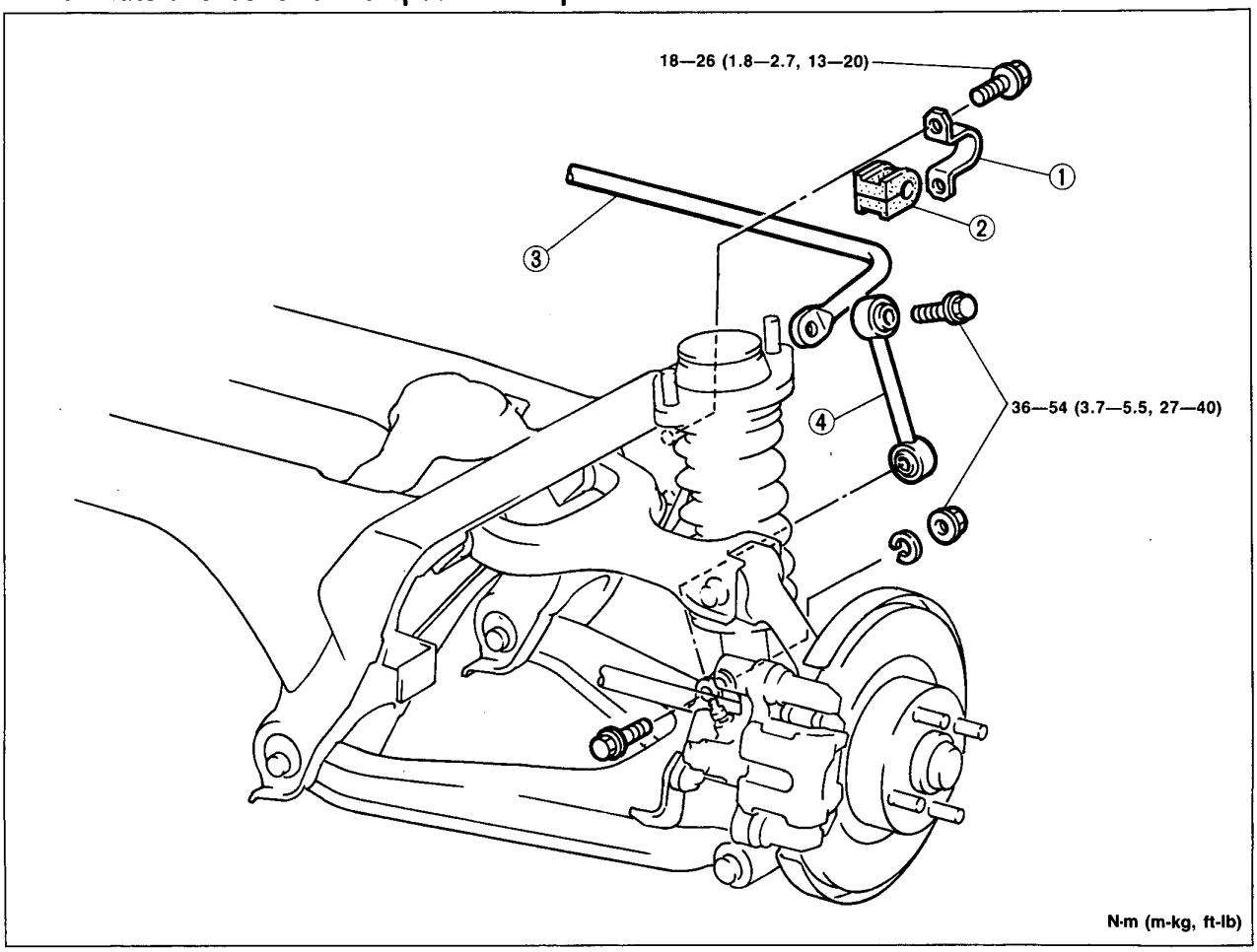
STABILIZER

Removal / Inspection / Installation

1. Jack up the rear of the vehicle and support it with safety stands.
2. Remove in the order shown in the figure.
3. Inspect all parts and repair or replace as necessary.
4. Install in the reverse order of removal, referring to **Installation Note**.

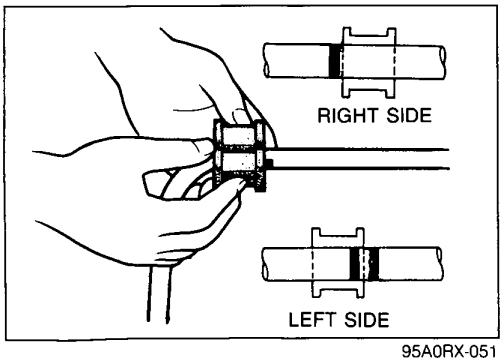
Note

- **Loosely tighten the stabilizer bracket and control link bolts. Lower the vehicle and tighten all nuts and bolts to the specified torques with the vehicle unladed.**



05U0RX-054

1. Stabilizer bracket
2. Stabilizer bushing
   Inspect for deterioration and wear
   Installation Note ..... below
3. Stabilizer
   Inspect for bending and damage
4. Control link
   Inspect for bending and damage



95A0RX-051

Installation note

Stabilizer bushing

1. Align the bushing with the installation mark on the stabilizer.

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CROSSMEMBER

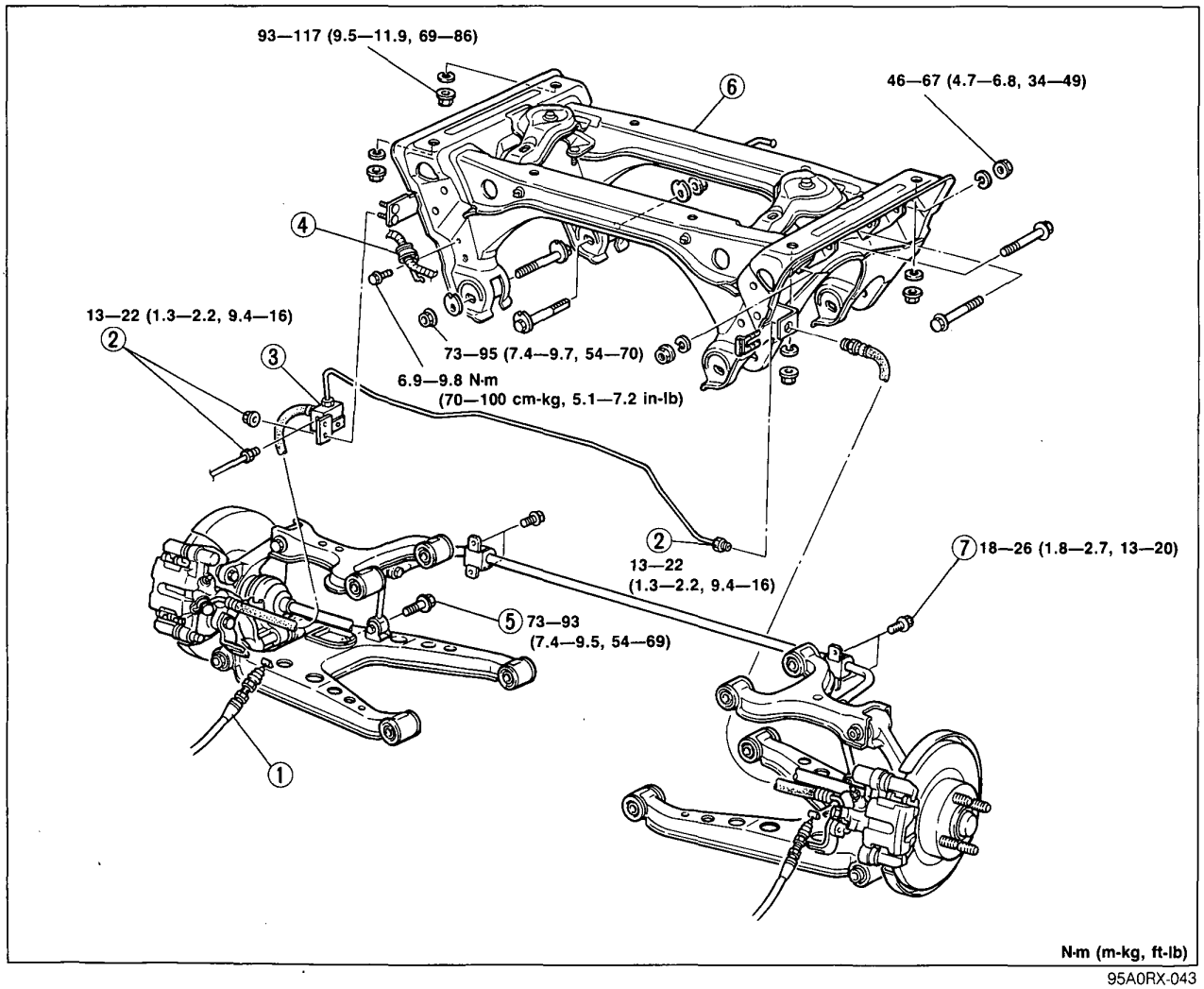
Removal / Inspection / Installation

1. Jack up the vehicle and support it with safety stands.
2. Remove the wheels and tires.
3. Remove the differential and the power plant frame. (Refer to Section M.)
4. Remove in the order shown in the figure.

Note

- **Lower the crossmember and other suspension parts as an assembly, and then separate the parts.**
- **Loosely tighten the stabilizer bracket, upper arm, and lower arm bolts when assembling before installation. Lower the vehicle and tighten all nuts and bolts to the specified torques with the vehicle unladed.**

5. Inspect parts and repair or replace as necessary.
6. Install in the reverse order of removal.
7. Adjust the rear wheel alignment. (Refer to page R–10.)
8. Bleed the air from the brake system. (Refer to Section P.)



95A0RX-043

1. Parking brake cable
   Removal / Installation..... Section P
2. Brake pipe
   Removal / Installation..... Section P
3. Brake pipe joint
4. Battery cable bracket
5. Shock absorber bolt
6. Rear crossmember assembly
   Inspect for damage
7. Stabilizer bracket
8. Upper arm bolt
9. Lower arm bolt

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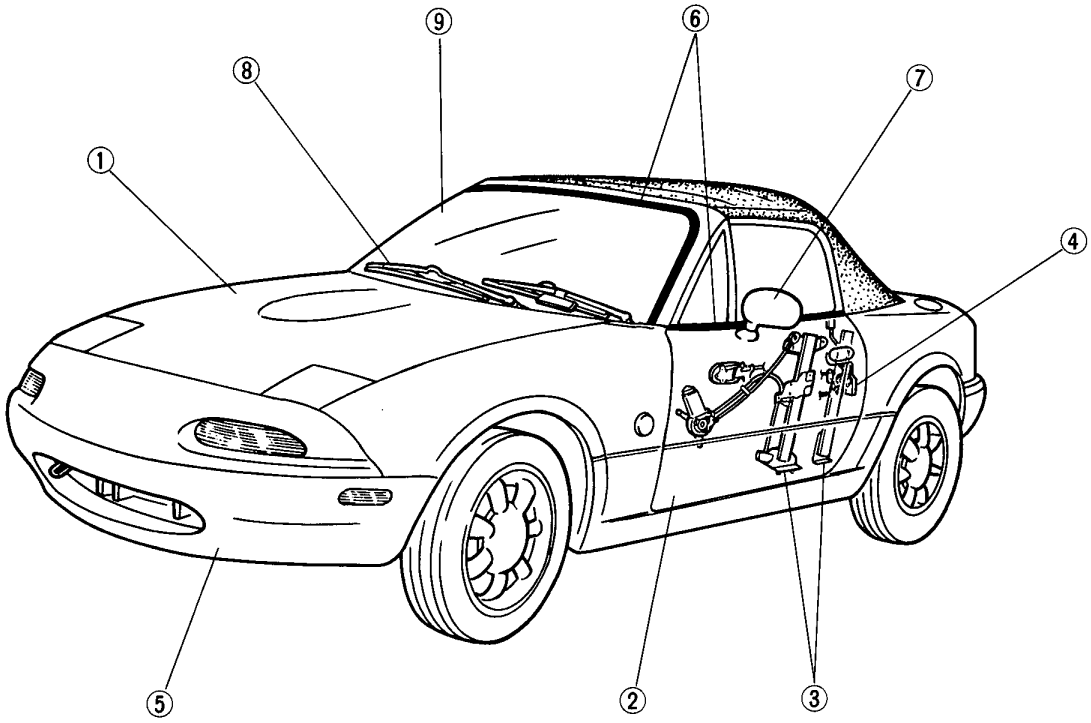
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95E0SX-001

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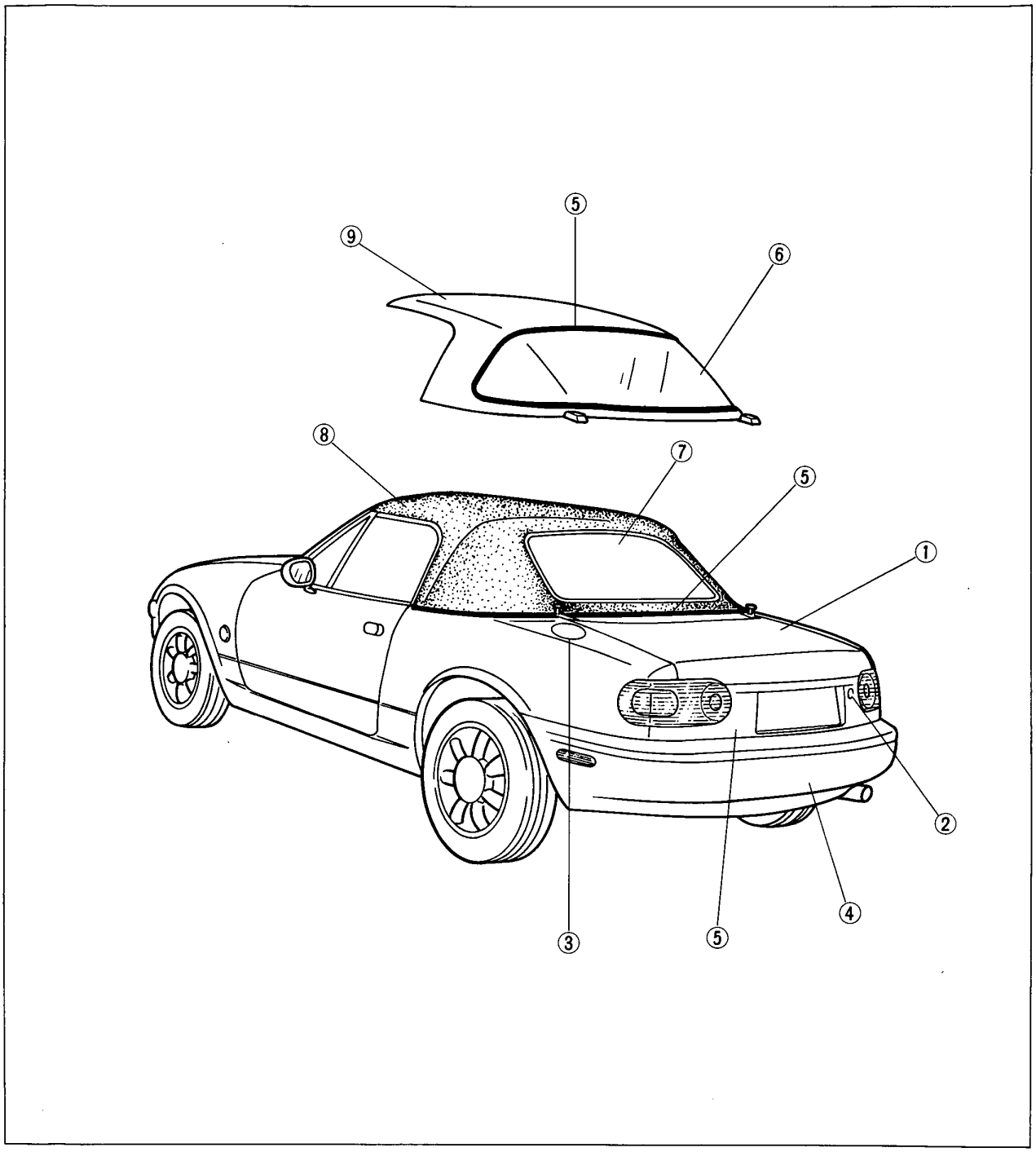
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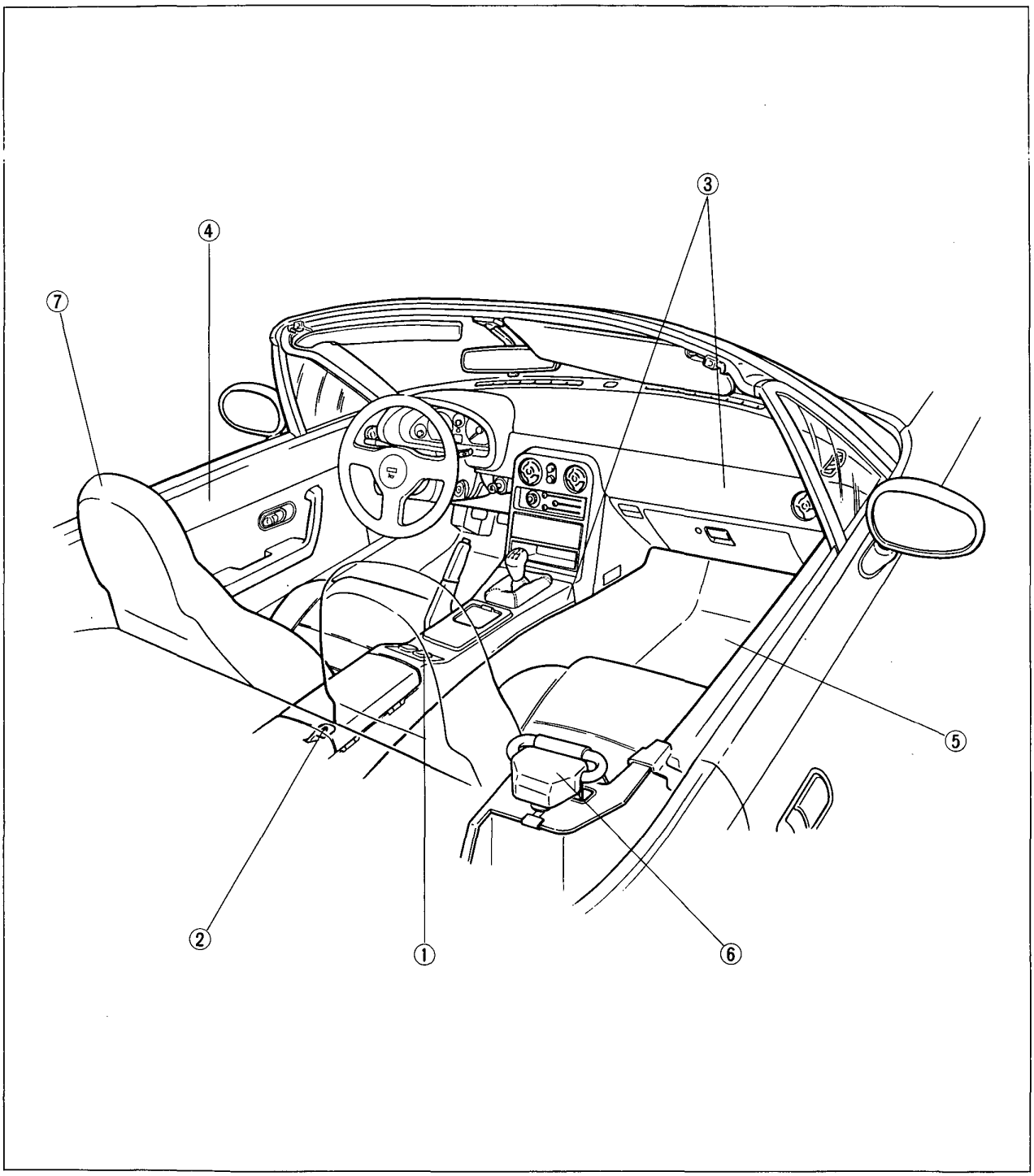
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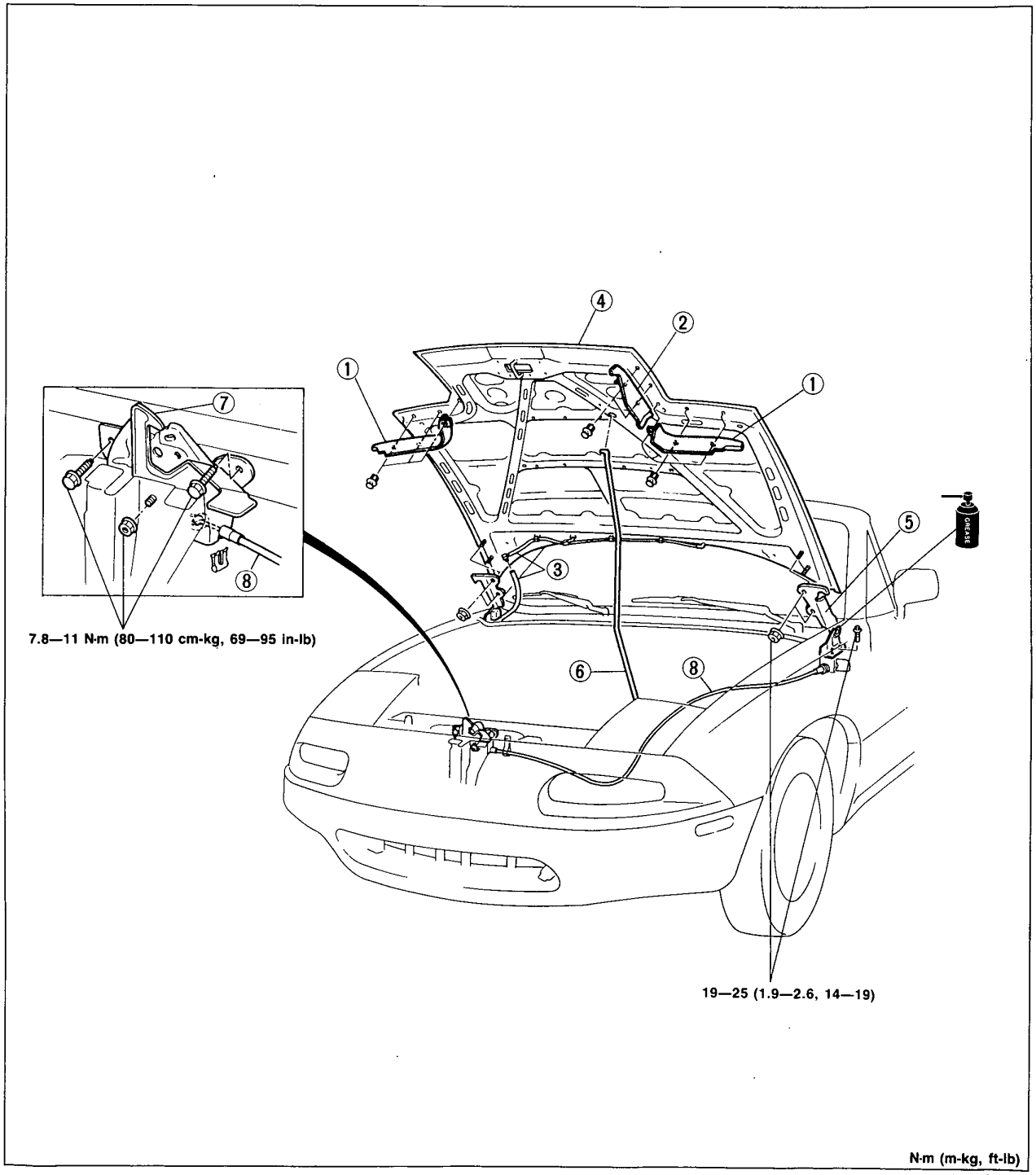
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BONNET

COMPONENTS

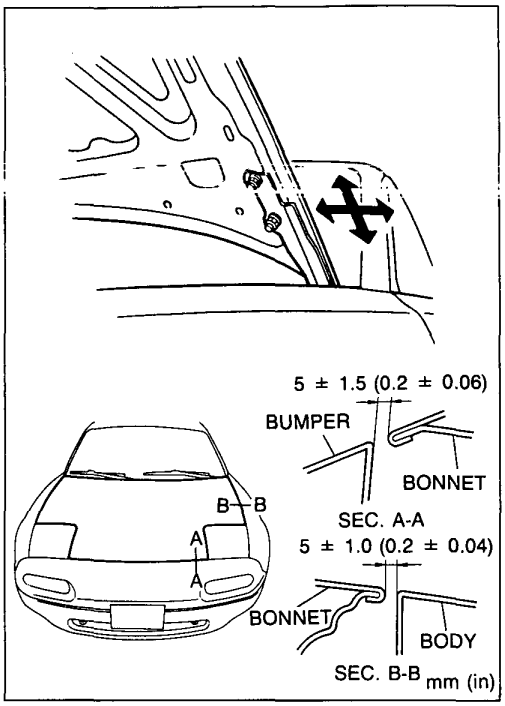
Removal / Installation

1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.

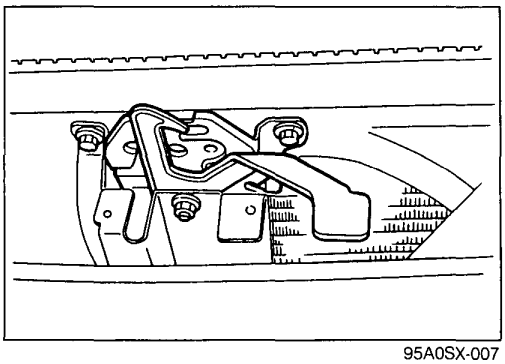


1. Headlight seal
2. Headlight side seal
3. Washer pipe
4. Bonnet
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6. Bonnet stay
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8. Release wire

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95A0SX-007

Adjustment

Bonnet

1. Adjust the bonnet laterally and vertically by loosening the bonnet-to-hinge mounting bolts and repositioning the bonnet.

Bonnet lock

1. Adjust the bonnet lock after the bonnet has been aligned. Loosen the bonnet lock mounting bolts and nut, and align the lock with the striker on the bonnet.

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DOOR

PREPARATION

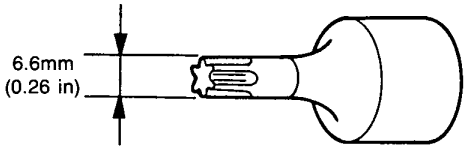
TORX TOOL (T40)	For installation and removal of door lock striker

95A0SX-008

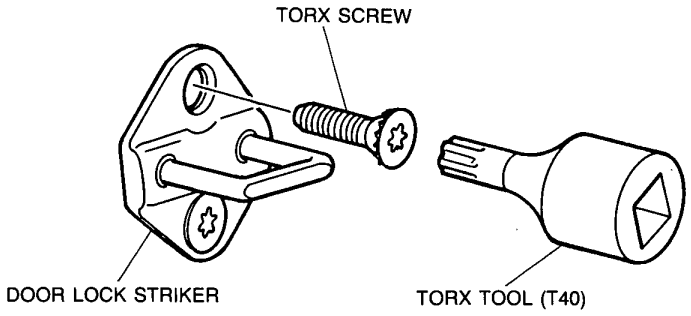
TORX TOOL (T40)

1. ILLUSTRATION





2. LOCATION TORX TOOL MUST BE USED



95A0SX-009

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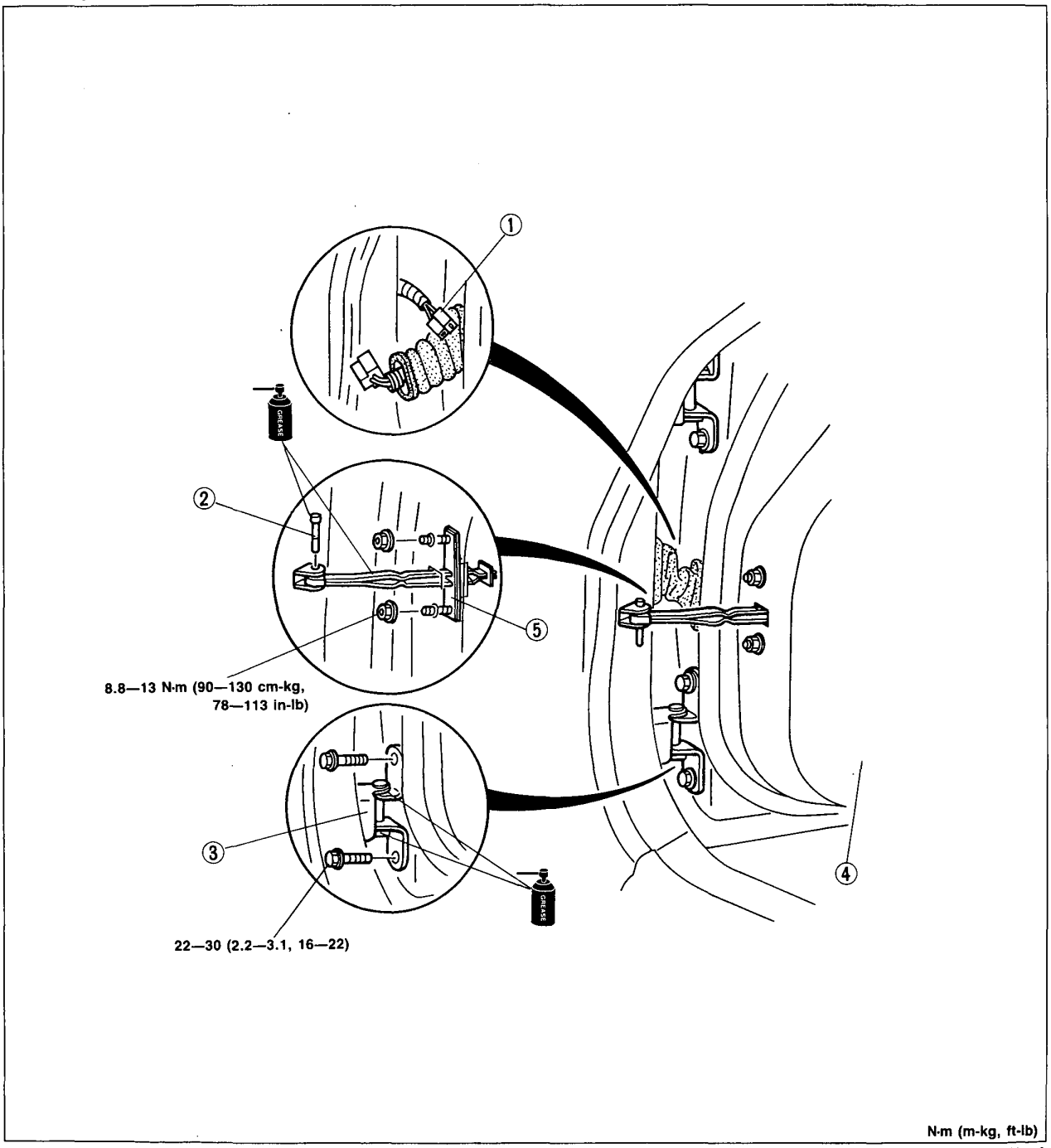
COMPONENTS

Removal / Installation

1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure.
3. Install in the reverse order of removal.

Note

- **Remove the trim and door screen for removal of the door checker. (Refer to page S–10.)**
- **Adjust the door lock striker. (Refer to page S–9.)**

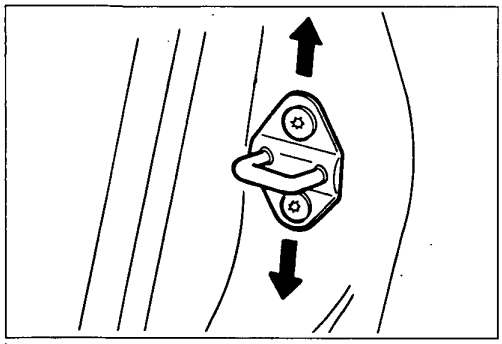


N·m (m-kg, ft-lb)

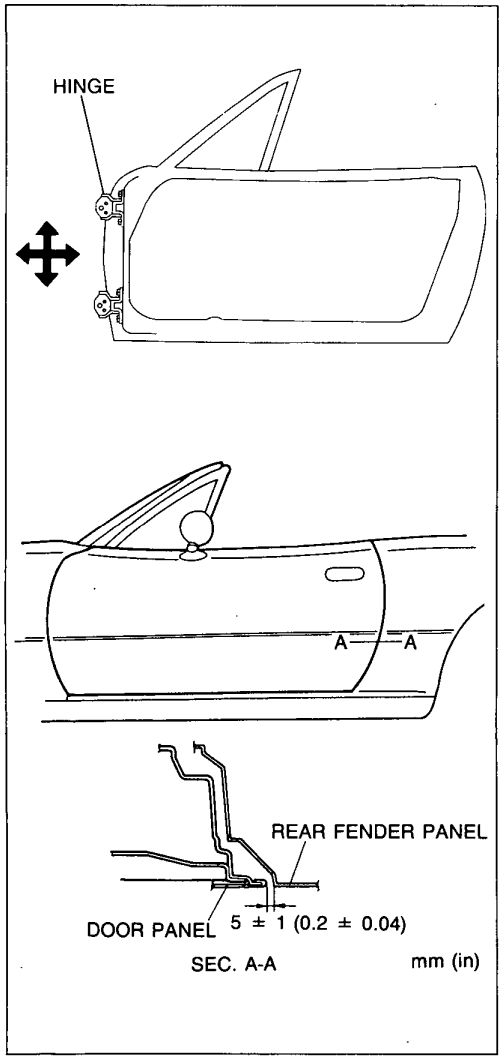
95A0SX-010

1. Harness connector
2. Checker pin
3. Hinge
4. Door
   Adjustment..... page S–9
5. Checker

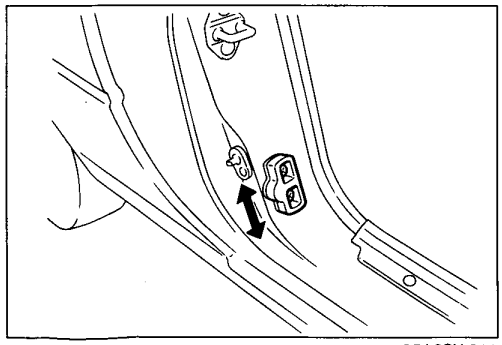
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95A0SX-139



05U0SX-009



95A0SX-011

Adjustment

Door lock striker

1. Verify that the door can be closed easily and that there is no looseness. If there is a problem, loosen the striker mounting screws and adjust by moving the striker vertically.
2. Verify the rear offset of the door to the body. If there is a problem, adjust by moving the door lock striker vertically.

Tightening torque:
18—26 N·m (1.8—2.7 m-kg, 13—20 ft-lb)

Door

1. Loosen the hinge bolts and adjust as shown in the figure. Tighten the bolts to the specified torque.

Tightening torque:
22—30 N·m (2.2—3.1 m-kg, 16—22 ft-lb)

Door wedge

1. Verify the alignment of the door wedge and dovetail. If there is a problem, adjust by moving the door wedge vertically.

Tightening torgue:
4.2—6.2 N·m (43—63 cm-kg, 37—55 in-lb)

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WINDOW REGULATOR, GLASS, AND GUIDE

COMPONENTS

Removal / Installation

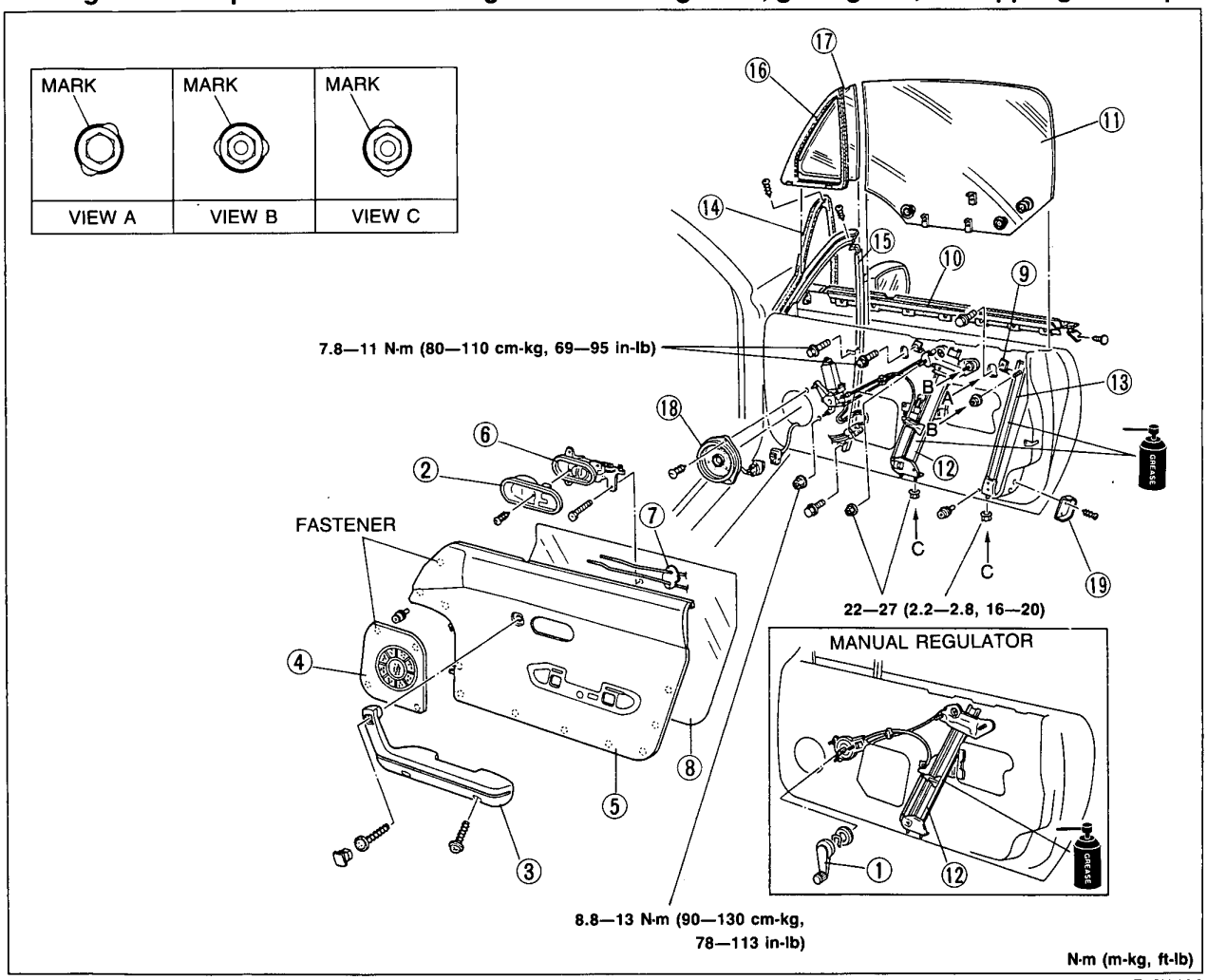
1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure, referring to **Removal Note**.
3. Install in the reverse order of removal, referring to **Installation Note**.

Caution

- **Remove the door screen carefully so that it may be reused.**

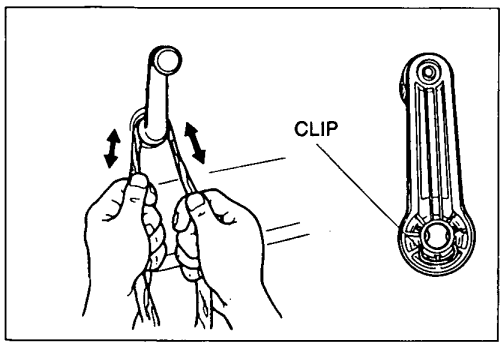
Note

- **Raise the door glass about 190mm (7.5 in) from fully-open position.**
- **Mark around the window regulator and glass guide mounting nuts and upper glass stop mounting bolts with paint before removing the window regulator, glass guide, and upper glass stops.**

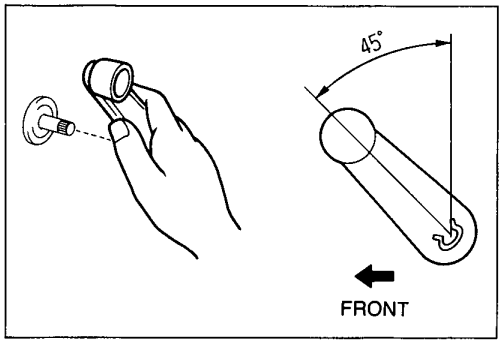


1. Regulator handle
   Removal Note .. page S–11
   Installation Note page S–11
2. Inner handle cover
3. Armrest
4. Speaker grille
   Removal Note .. page S–61
5. Door trim
   Removal Note .. page S–61
6. Inner handle
7. Sealing pad
8. Door screen
9. Upper glass stop
10. Front beltline molding
    Removal Note .. page S–29
11. Door glass
    Adjustment ..... page S–11
12. Window regulator
13. Glass guide
14. Door weatherstrip
15. Division channel
16. Weatherstrip
17. Quarter glass
18. Speaker (If necessary)
19. Dovetail (If necessary)

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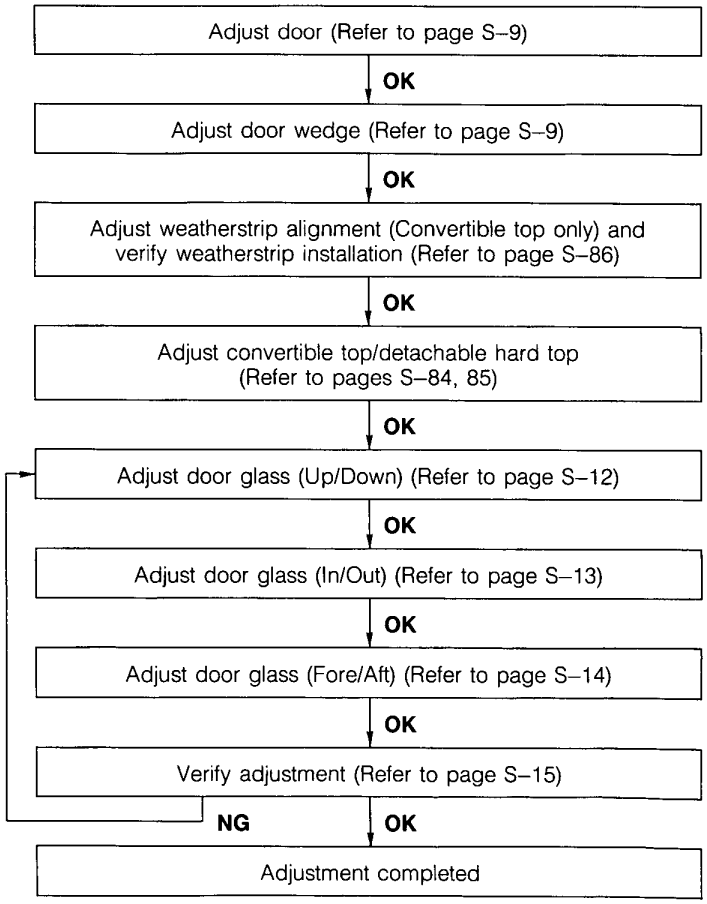
95A0SX-140

Removal Note
Regulator handle
1. Remove the regulator handle clip with a rag as shown.

Installation Note
Regulator handle
1. Install the regulator handle as shown.

Note
- **Set door glass at fully-closed position.**

Adjustment
Door glass
Adjustment of the door glass (convertible top/detachable hard top) is as follows:



95E0SX-006

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1. Vertical adjustment of door glass

Adjustment procedure

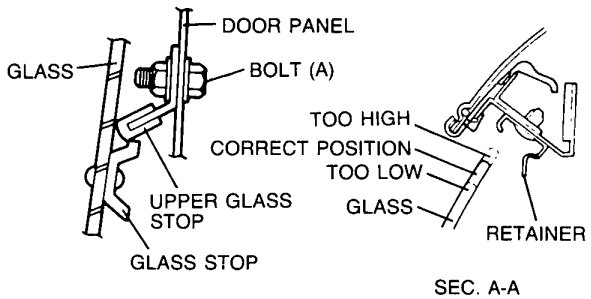
Remove the weatherstrip, and check alignment with the door glass in the fully-closed position.

(1) Loosen upper glass stop installation bolts (A).

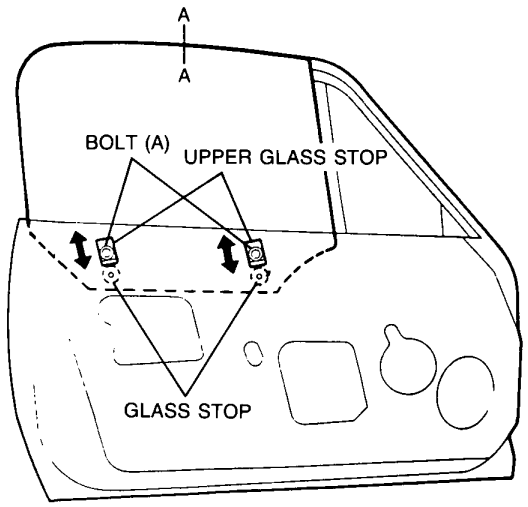
(2) Adjust by moving the upper glass stops up or down so that the upper edge of the door glass is in the correct position, and then tighten bolts (A).

Note

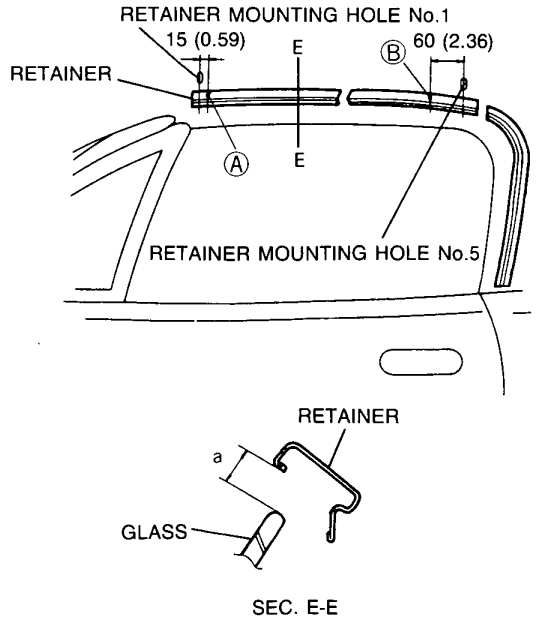
- **When the door glass is raised, both glass stops must contact the upper glass stops simultaneously.**
- **Before an upper glass stop is moved for adjustment, lower the door glass slightly.**



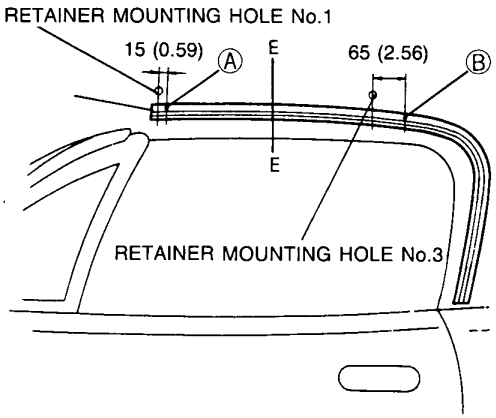
UPPER GLASS STOP INSTALLATION



CONVERTIBLE TOP



DETACHABLE HARD TOP



	a
Ⓐ	9.4 ± 2.0 (0.37 ± 0.08)
Ⓑ	9.1 ± 2.0 (0.36 ± 0.08)

mm (in)

95A0SX-014

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2. Inboard/Outboard adjustment of door glass

Adjustment procedure

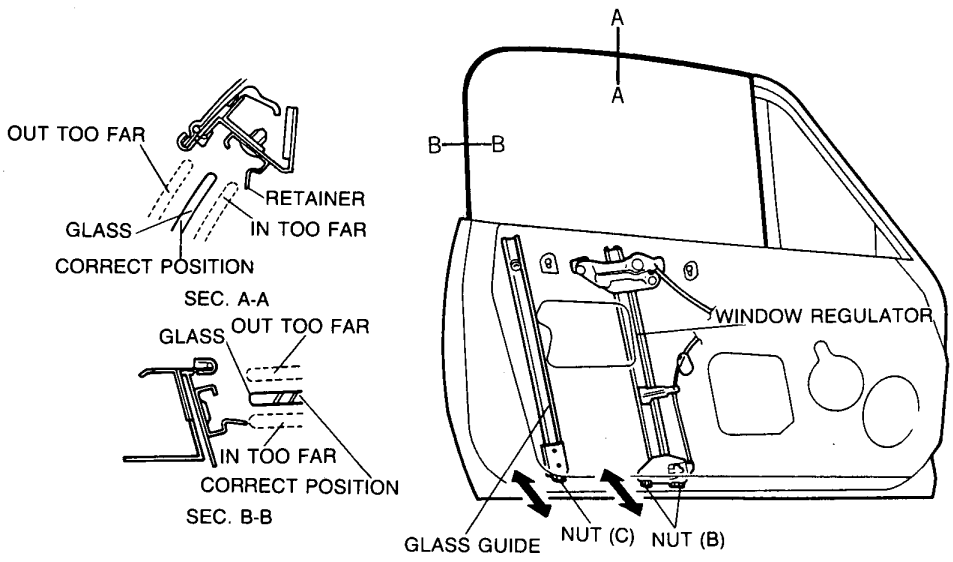
Remove the weatherstrip, and check alignment with the door glass in the fully-closed position.

(1) Loosen window regulator installation nuts (B) and glass guide installation nut (C).

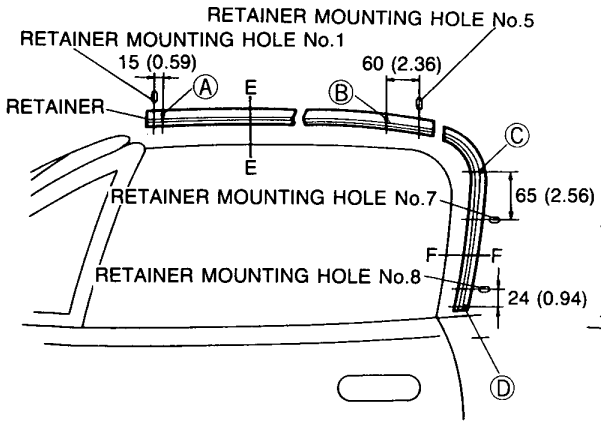
(2) Adjust by moving the window regulator and the glass guide inward or outward so that the upper and side edges of the door glass are in the correct position, and then tighten nuts (B) and (C).

Note

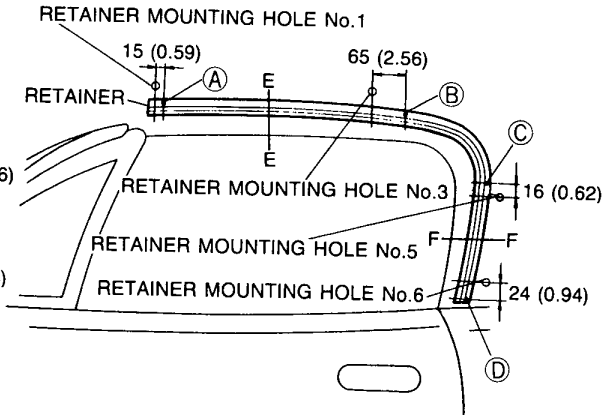
- **The window regulator and the glass guide should be tightened in approximately the same position in the slotted adjustment holes.**
- **The door glass must raise and lower smoothly with the door closed.**

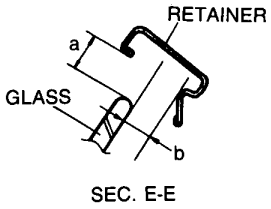


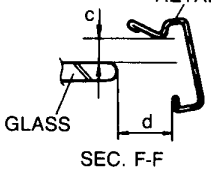
CONVERTIBLE TOP



DETACHABLE HARD TOP







	b
Ⓐ	9.3 ± 2.0 (0.37 ± 0.08)
Ⓑ	7.4 ± 2.0 (0.29 ± 0.08)

	c
Ⓒ	5.8 ± 2.0 (0.23 ± 0.08)
Ⓓ	11.1 ± 2.0 (0.44 ± 0.08)

mm (in)

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3. Fore and aft adjustment of side edge of door glass

Adjustment procedure

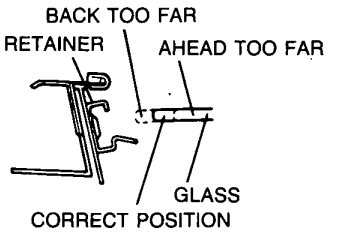
Remove the weatherstrip, and check alignment with the door glass in the fully-closed position.

(1) Loosen window regulator installation nuts (D) and glass guide installation nut (E).

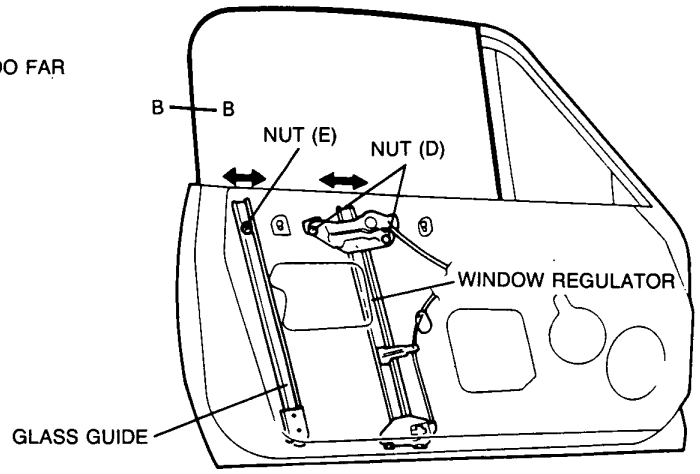
(2) Adjust by moving the window regulator and the glass guide fore or aft equally so that the side edge of the door glass is in the correct position, and then tighten nuts (D) and (E).

Note

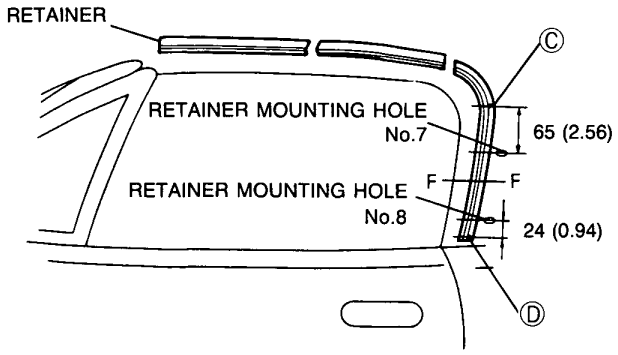
- **The window regulator and glass guide should be tightened in approximately the same position in the slotted adjustment holes.**
- **The door glass must raise and lower smoothly with the door closed.**



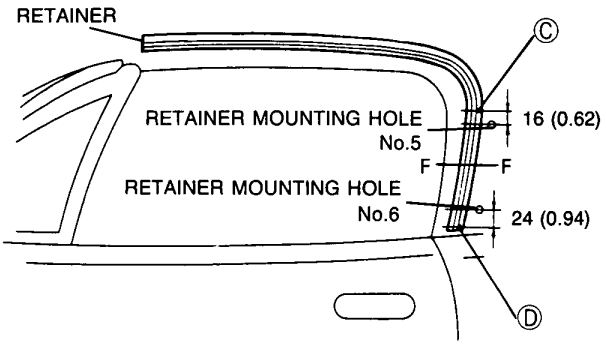
SEC. B-B

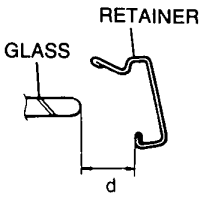


CONVERTIBLE TOP



DETACHABLE HARD TOP





SEC. F-F

	d
Ⓒ	12.5 ± 2.0 (0.49 ± 0.08)
Ⓓ	12.0 ± 2.0 (0.47 ± 0.08)

mm (in)

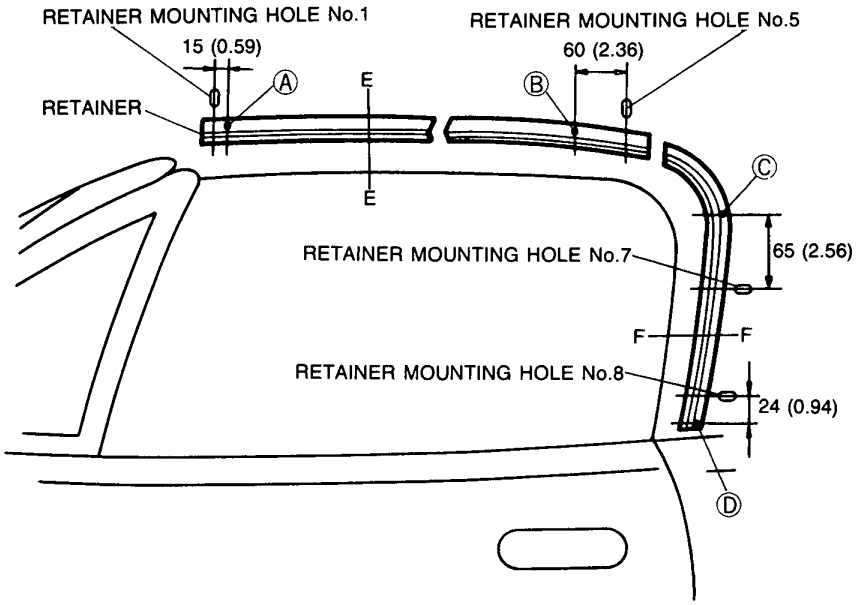
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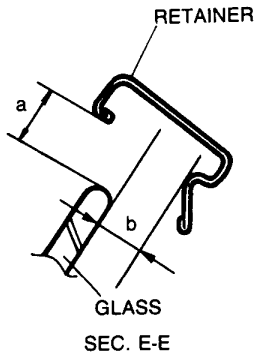
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After completion of adjustment, verify the points below

1. Verify the following with the weatherstrip removed.
   (1) When the door glass is raised, the glass stops contact the upper glass stops simultaneously.
   (2) The door glass is in the correct position when fully closed.
2. Verify the following with the weatherstrip installed.
   (1) The door glass raises and lowers smoothly with the door closed.
   (2) Alignment of the weatherstrip is correct. (Convertible top)
   (3) The weatherstrip mounting is correct.

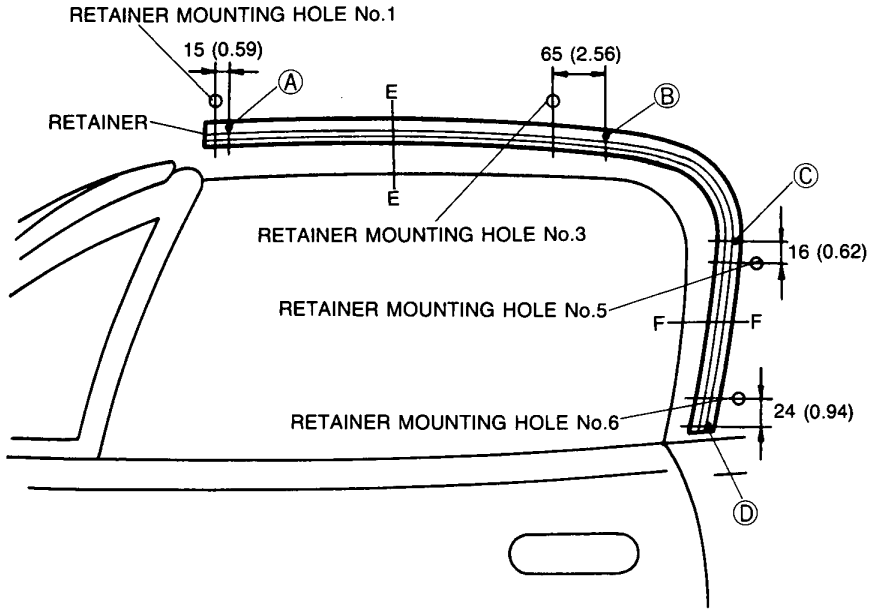
CONVERTIBLE TOP

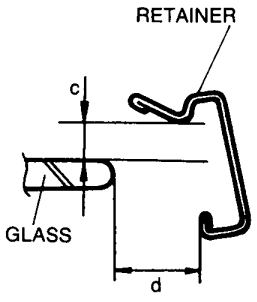




SEC. E-E

DETACHABLE HARD TOP





SEC. F-F

	a	b
Ⓐ	9.4 ± 2.0 (0.37 ± 0.08)	9.3 ± 2.0 (0.37 ± 0.08)
Ⓑ	9.1 ± 2.0 (0.36 ± 0.08)	7.4 ± 2.0 (0.29 ± 0.08)

	c	d
Ⓒ	5.8 ± 2.0 (0.23 ± 0.08)	12.5 ± 2.0 (0.49 ± 0.08)
Ⓓ	11.1 ± 2.0 (0.44 ± 0.08)	12.0 ± 2.0 (0.47 ± 0.08)

mm (in)

95A0SX-015

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DOOR LOCK AND OPENER

COMPONENTS

Removal / Installation

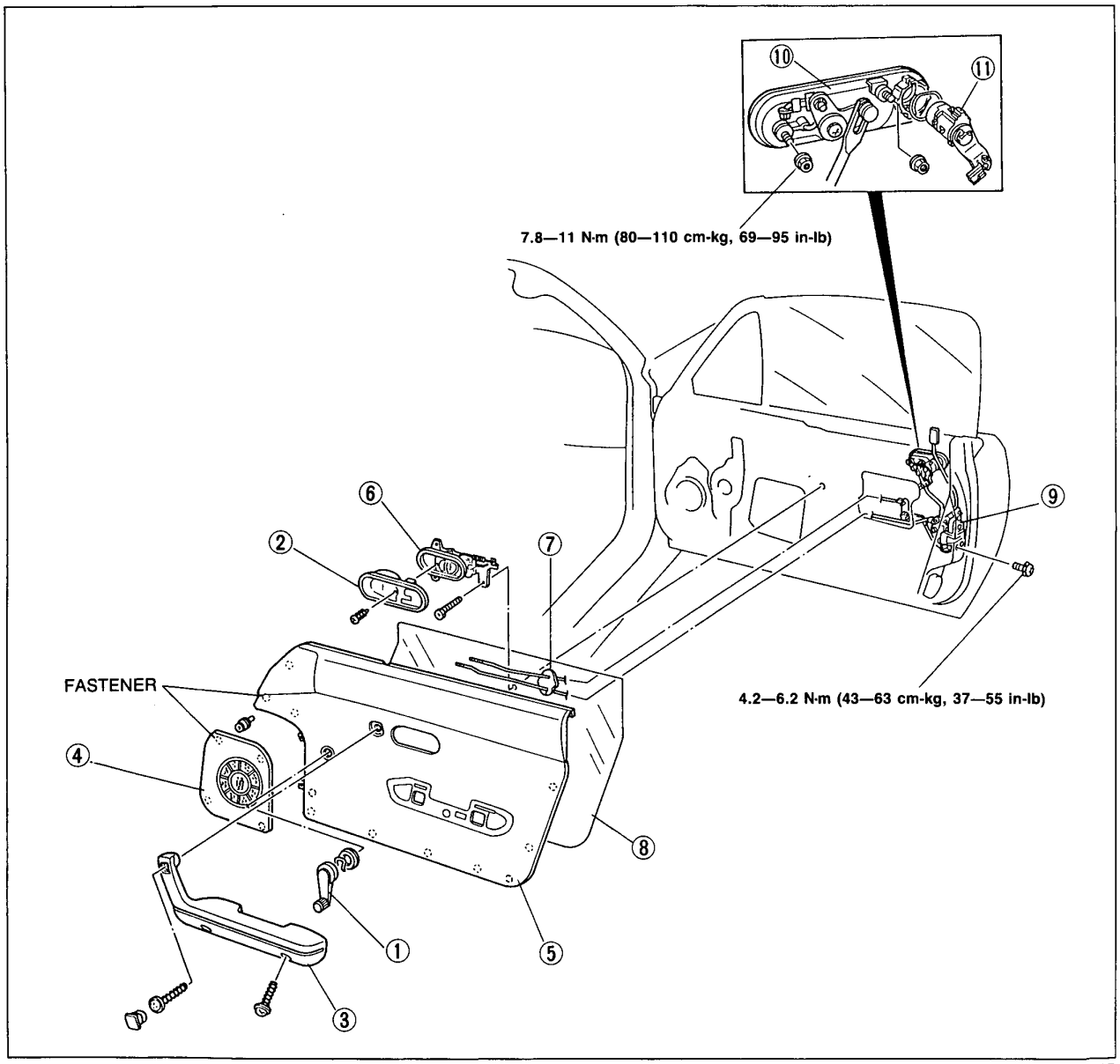
1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure, referring to **Removal Note**.
3. Install in the reverse order of removal, referring to **Installation Note**.

Caution

- **Remove the door screen carefully so that it may be reused.**

Note

- **Raise the door glass fully to remove the door lock assembly.**



95E0SX-007

1. Regulator handle
   Removal Note .. page S–11
   Installation Note page S–11
2. Inner handle cover
3. Armrest
4. Speaker grille
   Removal Note .. page S–61
5. Door trim
   Removal Note .. page S–61
6. Inner handle
7. Sealing pad
8. Door screen
9. Door lock assembly
10. Outer handle
11. Key cylinder

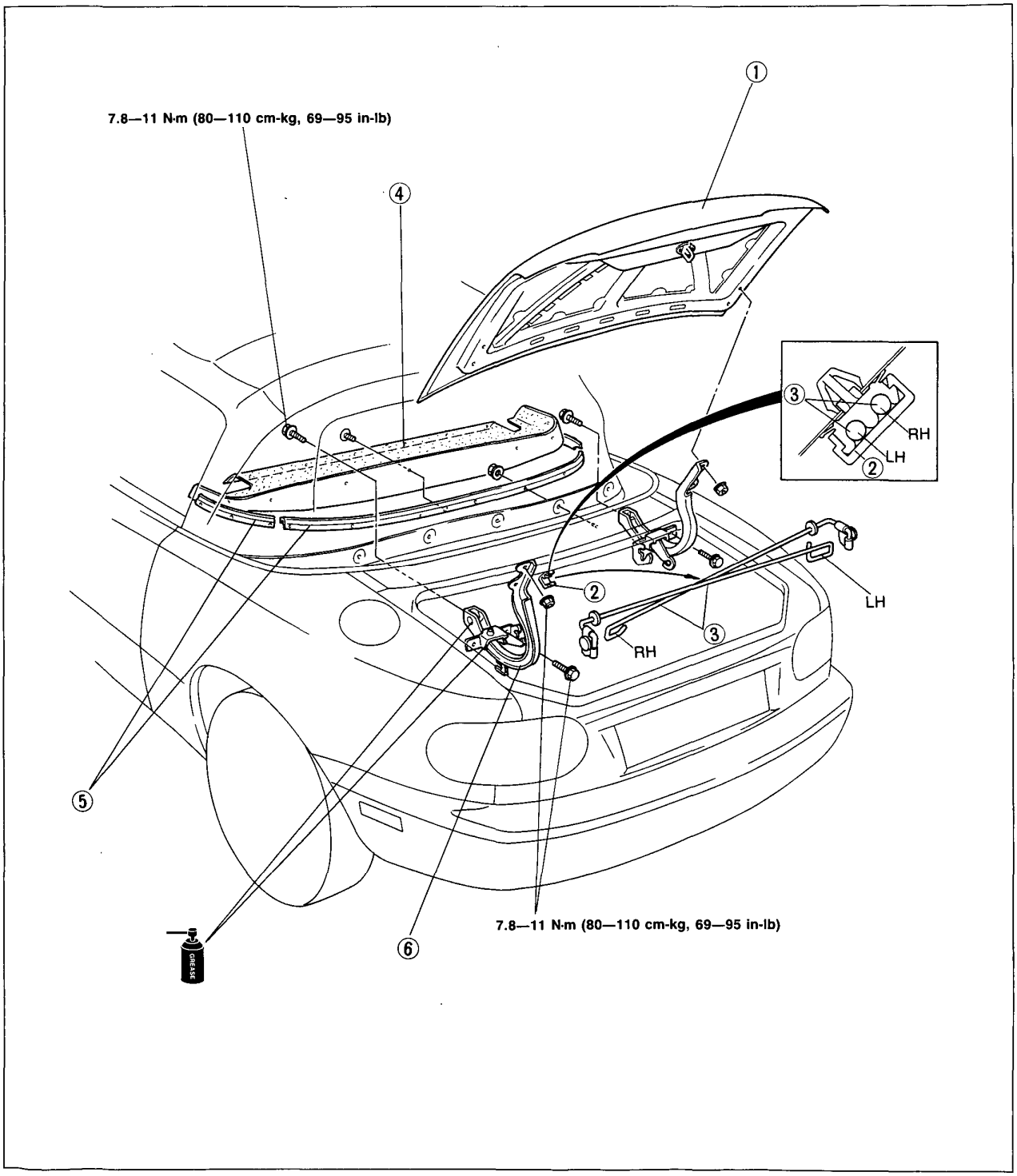
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TRUNK LID

COMPONENTS

Removal / Installation

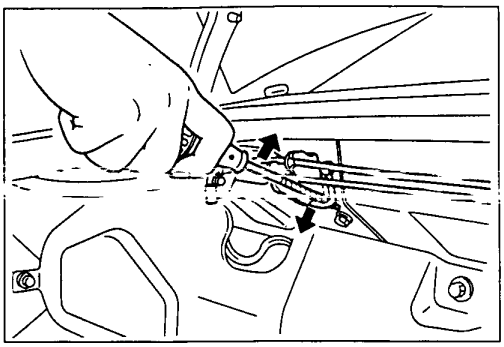
1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.



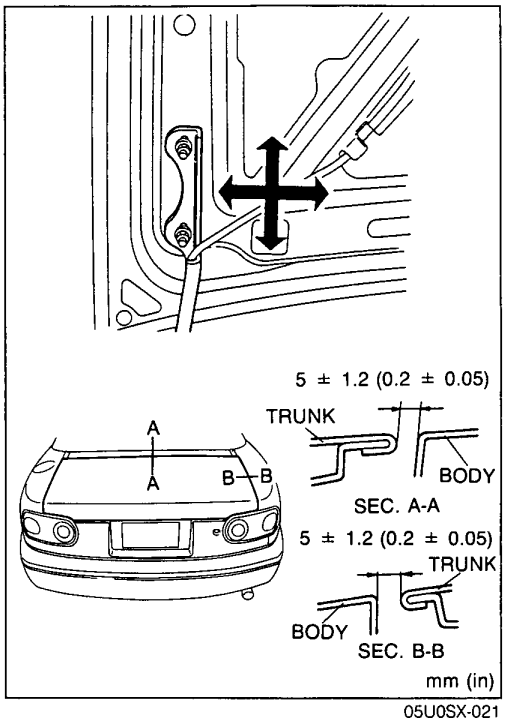
95E0SX-034

1. Trunk lid
   Adjustment ..... page S–18
2. Spring holder
3. Balance spring
   Removal Note .. page S–18
   Adjustment ..... page S–18
4. Rear package trim
5. Set plate
6. Hinge

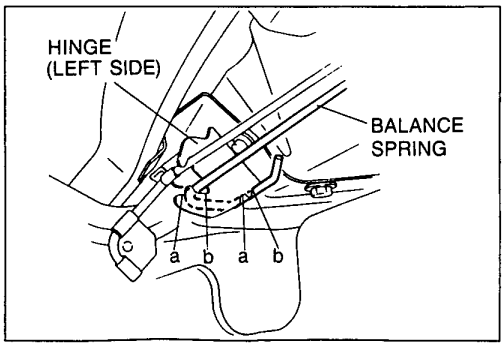
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05U0SX-020



05U0SX-021



95A0SX-018

Removal Note
Balance spring
1. Lift the balance spring with a protected screwdriver.
2. Remove the balance spring.

Warning
- **Use care when removing the balance spring; personal injury could result.**

Adjustment
Trunk lid
1. Loosen the trunk lid mounting nuts and adjust as shown.

Balance spring
1. Slide the balance spring to the desired position as described below with a protected screwdriver.

Tension \ Set position	Hinge	a	b
Standard	Left side		○
	Right side	○	
Increase	Left side	○	
	Right side	○	
Decrease	Left side		○
	Right side		○

○: Position

Warning
- **Use care when moving the balance spring; personal injury could result.**

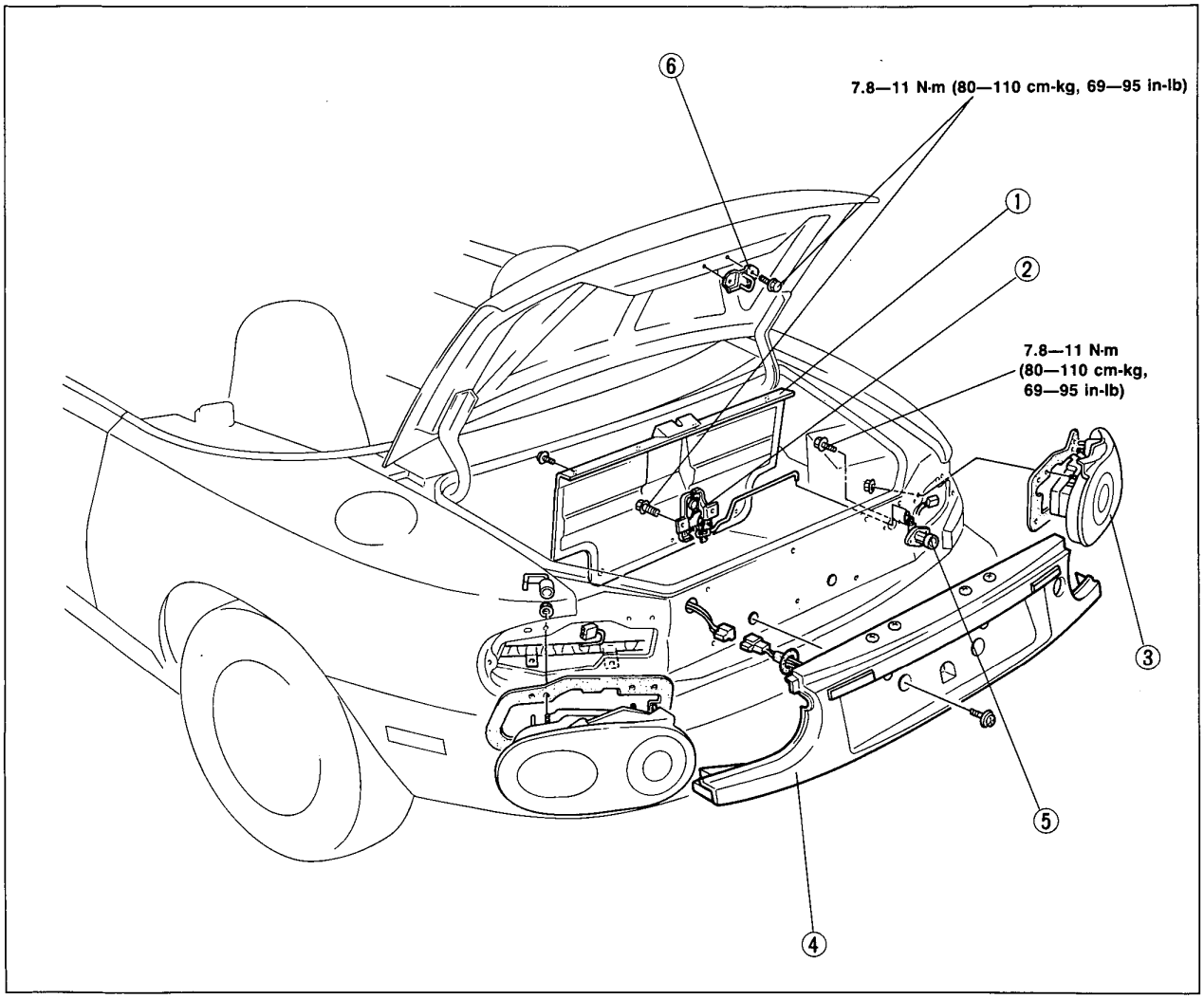
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TRUNK LID LOCK AND OPENER

COMPONENTS

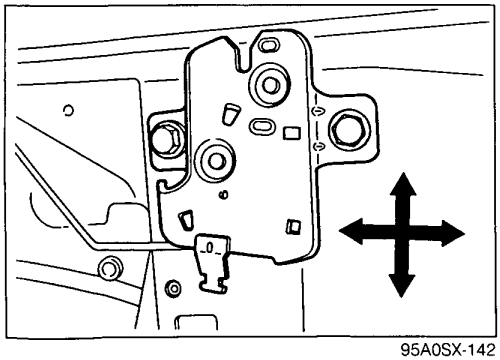
Removal / Installation

1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.



95A0SX-019

1. Trunk end trim
2. Trunk lid lock assembly
   Adjustment ..... below
3. Rear combination light
   Removal ..... Section T
4. Rear finisher
   Removal Note ..... page S–29
5. Key cylinder
6. Striker



95A0SX-142

Adjustment

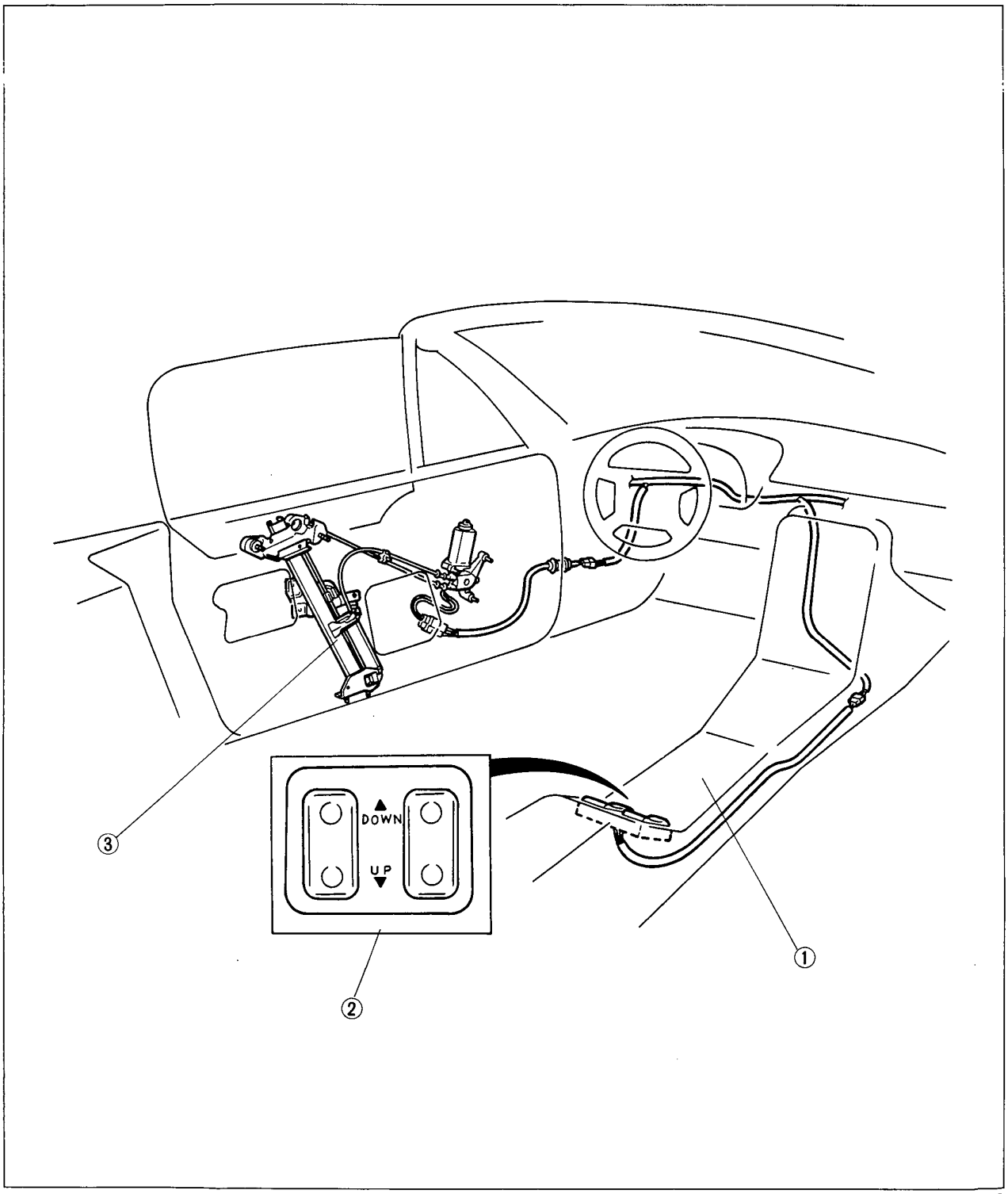
Trunk lid lock assembly

1. Verify that the trunk lid can be closed easily and that there is no looseness. If necessary, loosen the lock assembly mounting bolts and adjust the lock assembly.

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POWER WINDOW SYSTEM

STRUCTURAL VIEW

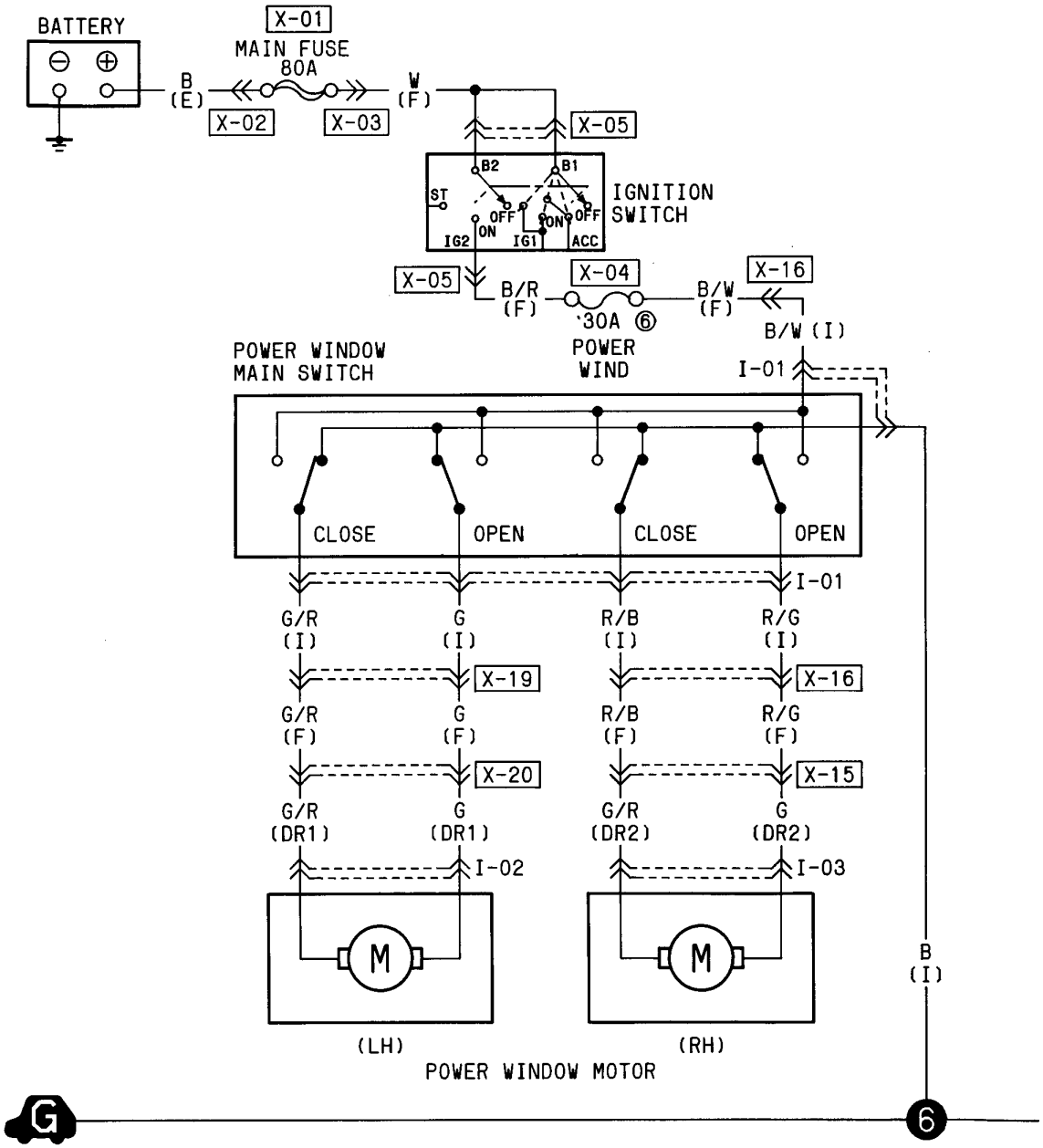


95E0SX-008

1. Rear console
   Removal / Installation ..... page S–56
2. Power window main switch
   Removal / Installation ..... page S–56
   Inspection ..... page S–23
3. Power window regulator
   Removal / Installation ..... page S–10

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TROUBLESHOOTING GUIDE



I-01 POWER WINDOW MAIN SWITCH (I)

R/B	G/R	B/W
R/G	G	B

I-02 POWER WINDOW MOTOR (LH)(DR1)

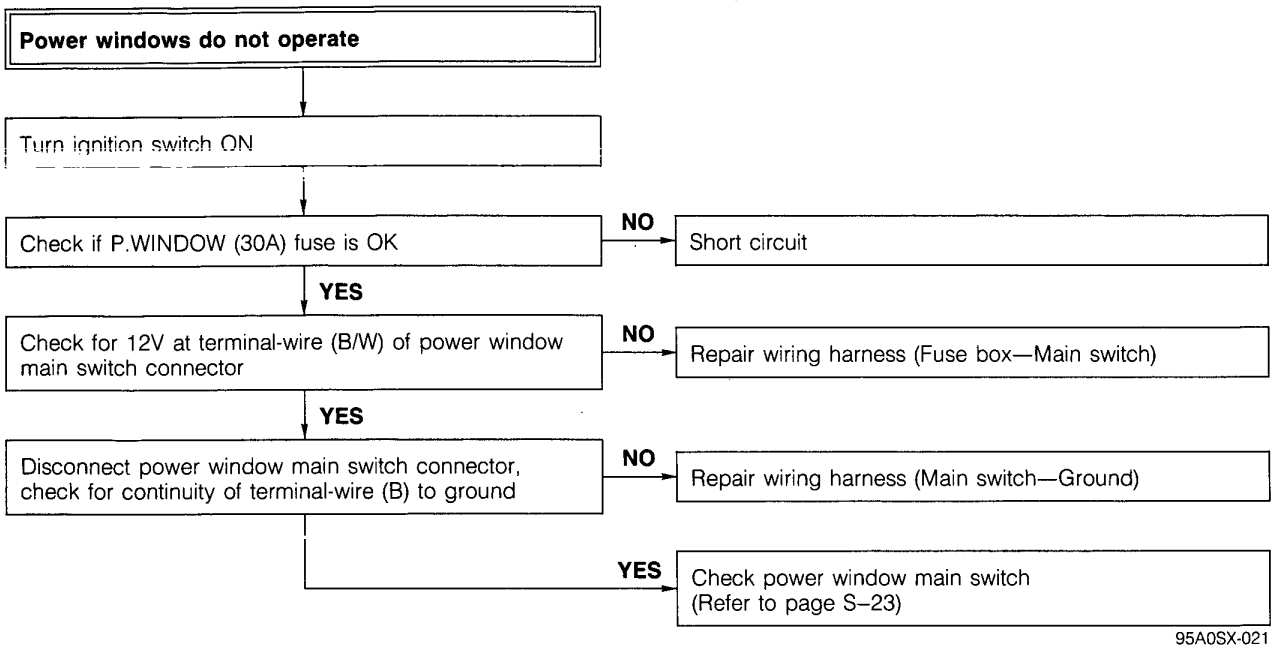
G/R
G

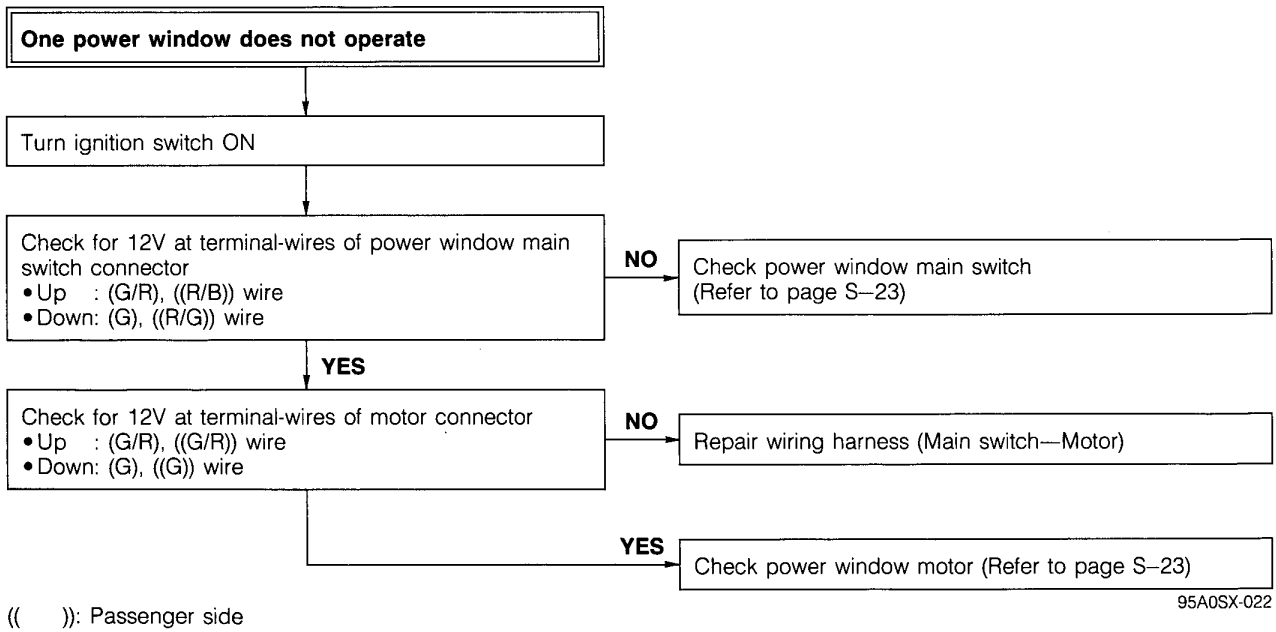
I-03 POWER WINDOW MOTOR (RH)(DR2)

G/R
G

05U0SX-026

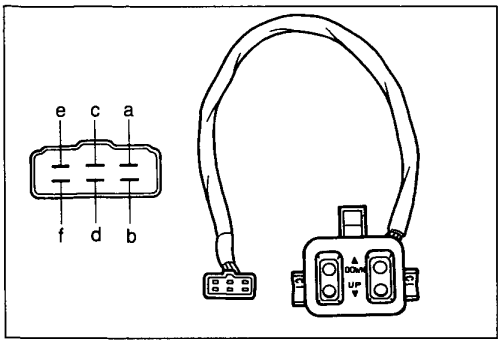
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(( )): Passenger side

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95A0SX-023

POWER WINDOW MAIN SWITCH

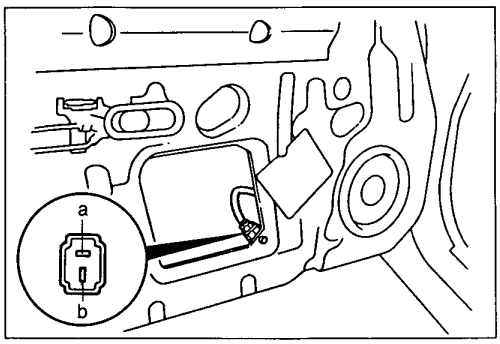
Inspection

1. Check for continuity between terminals of the switch.

Switch	Driver side				Passenger side			
Position \ Terminal	a	b	c	d	a	b	e	f
UP	○		○		○		○	
		○		○		○		○
OFF		○	○	○		○	○	○
DOWN	○			○	○			○
		○	○			○	○	

○—○: Indicates continuity

2. If not as specified, replace the power window main switch.



95A0SX-143

POWER WINDOW MOTOR

Inspection

1. Connect 12V to terminal a and ground terminal b of the motor connector. Verify that the motor operates.
2. Reverse the above connections and check for reverse operation of the motor.
3. If not as specified, replace the power window motor.

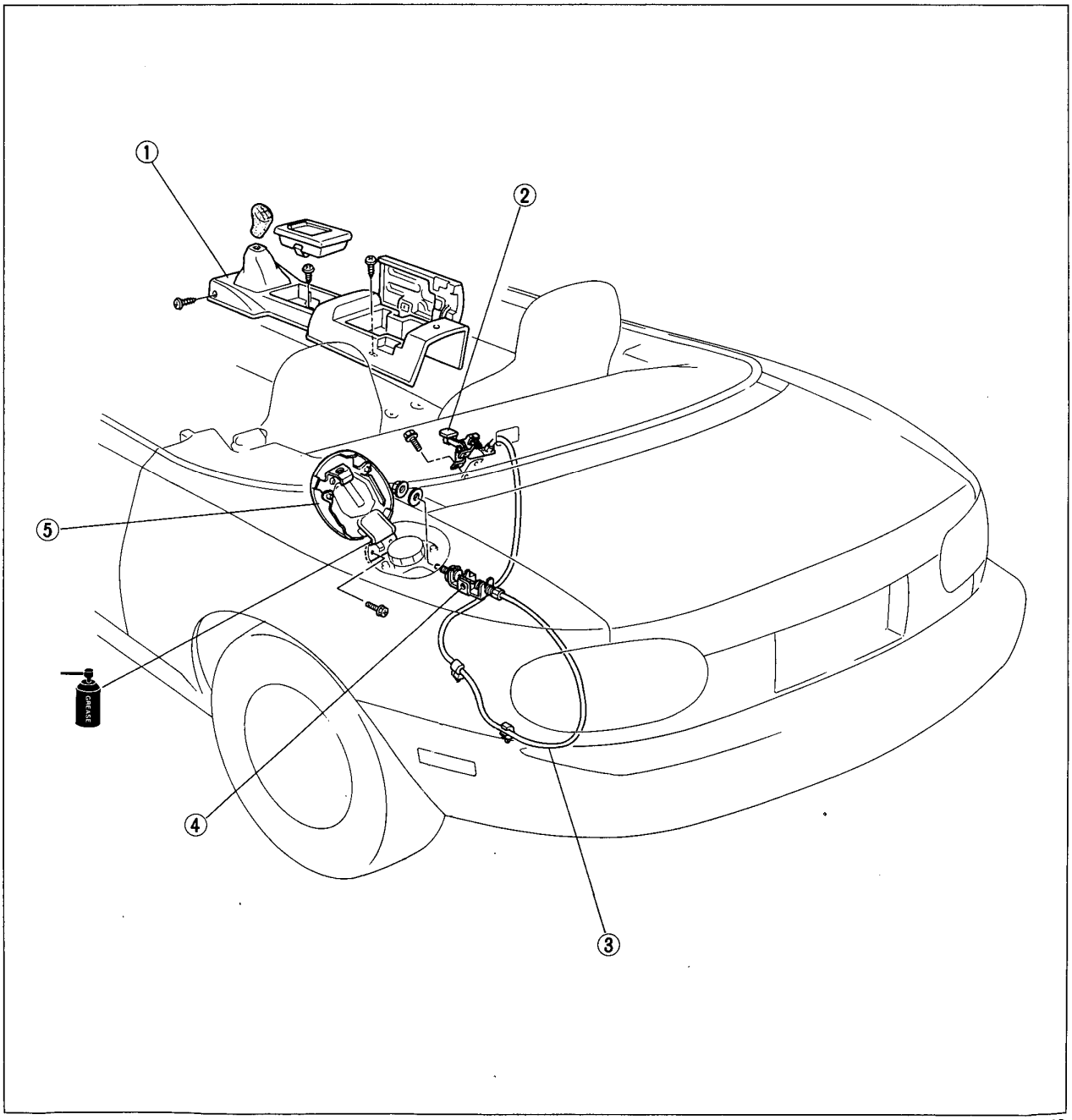
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FUEL-FILLER LID OPENER

COMPONENTS
Removal / Installation

Note
- Remove the rear console for removal of the opener lever.
- **Remove the rear end mat, rear package trim and bulkhead panel for removal of the cable.**

1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.



95E0SX-009

1. Rear console
   Removal / Installation ..... page S–56
2. Opener lever
3. Opener cable
4. Filler lid opener
5. Filler lid

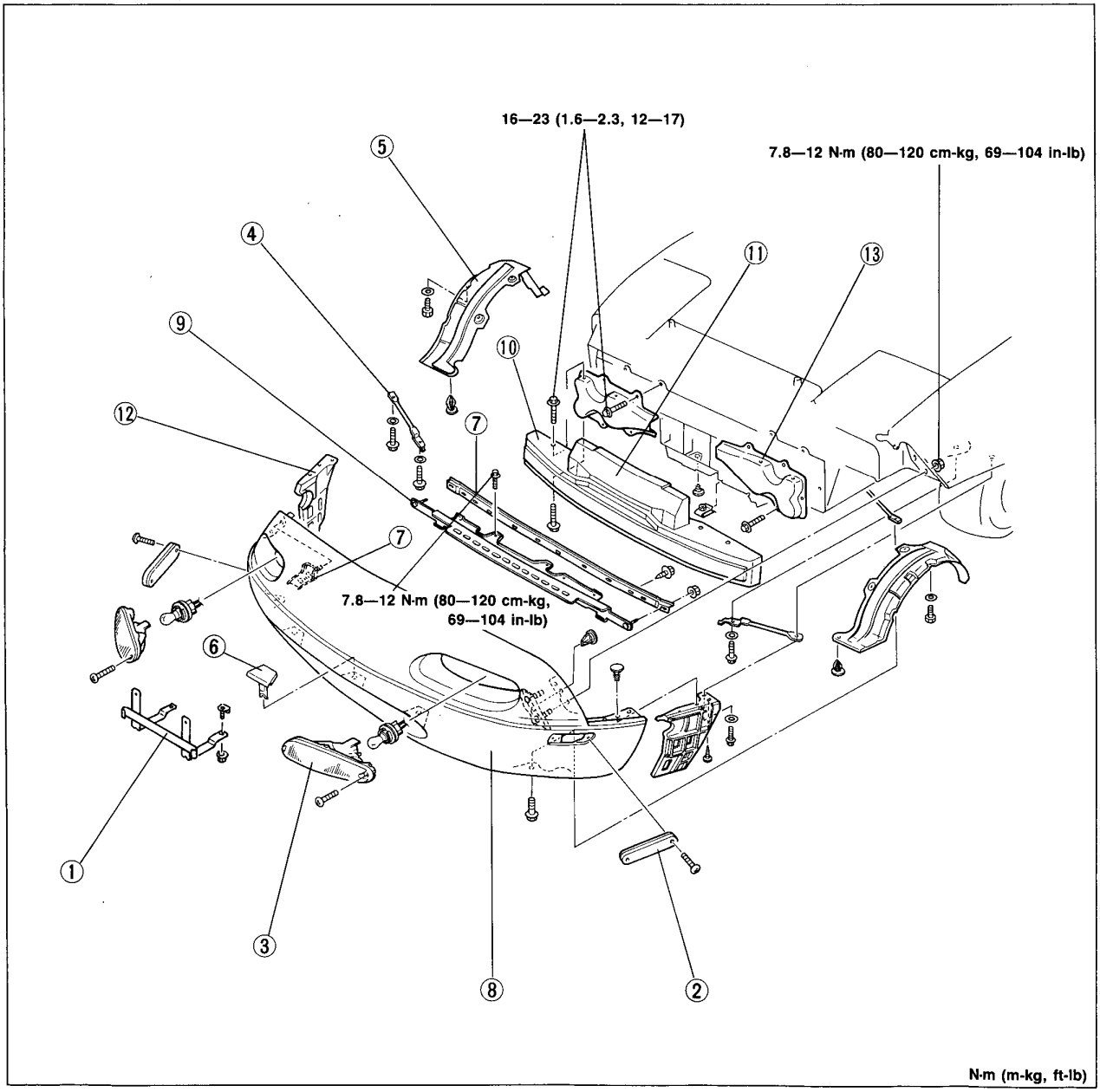
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FRONT BUMPER

COMPONENTS
Removal / Installation

Note
- **Raise the headlights.**

1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure.
3. Install in the reverse order of removal.



1. License plate holder
2. Lens
3. Front combination light
   Removal ..... Section T
4. Fender bracket
5. Mud guard
6. Grille cover
7. Set plate
8. Front fascia
9. Retainer
10. Bumper reinforcement
11. Spacer
12. Front bumper retainer
13. Front bumper bracket

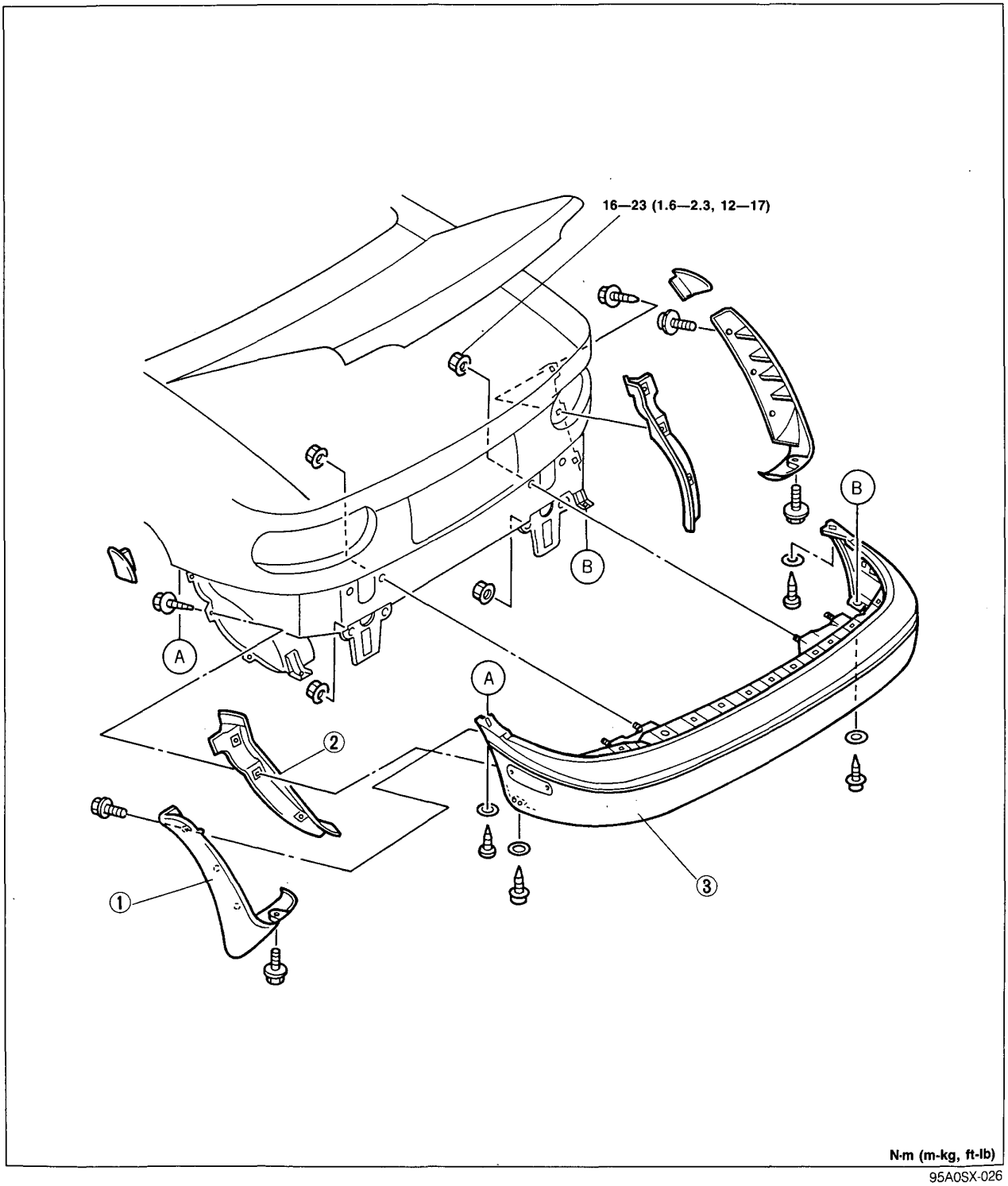
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REAR BUMPER

COMPONENTS

Removal / Installation

1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure.
3. Install in the reverse order of removal.

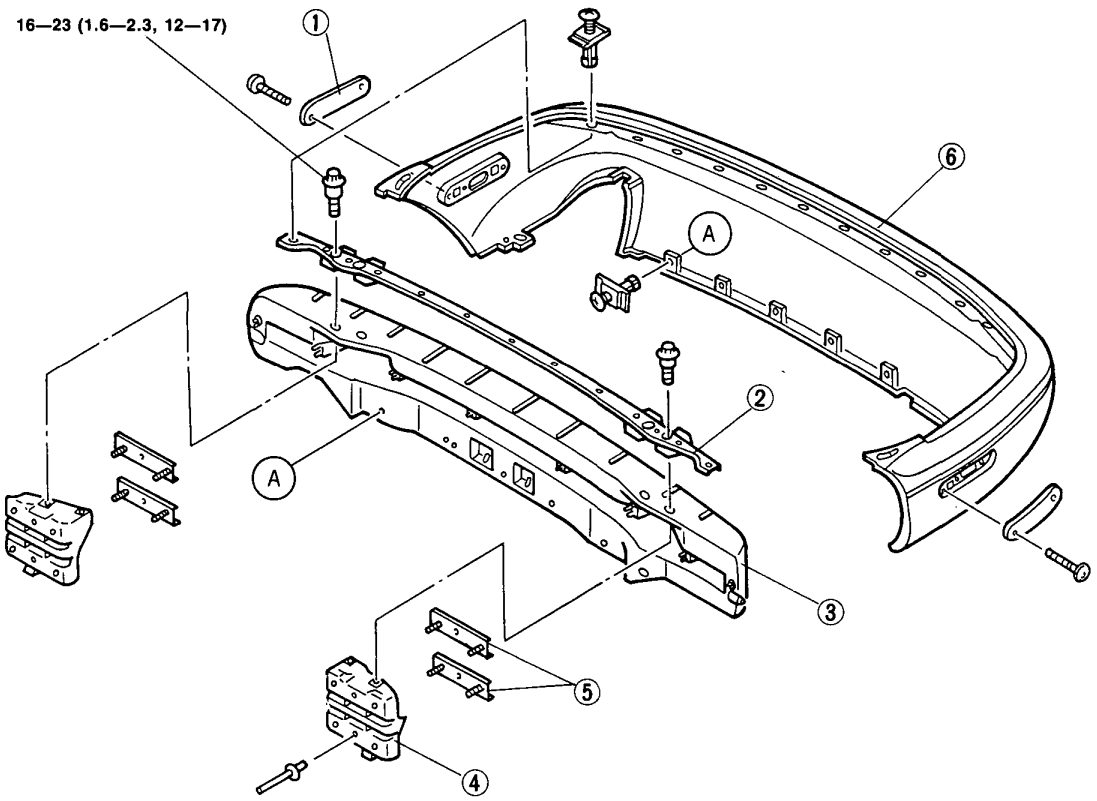


1. Rear flap
2. Splash shield
3. Rear bumper

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Disassembly / Assembly

1. Disassemble in the order shown in the figure.
2. Assemble in the reverse order of disassembly.



N·m (m-kg, ft-lb)

95A0SX-027

1. Lens
2. Retainer
3. Bumper reinforcement
4. Bumper stay
5. Set plate
6. Rear fascia

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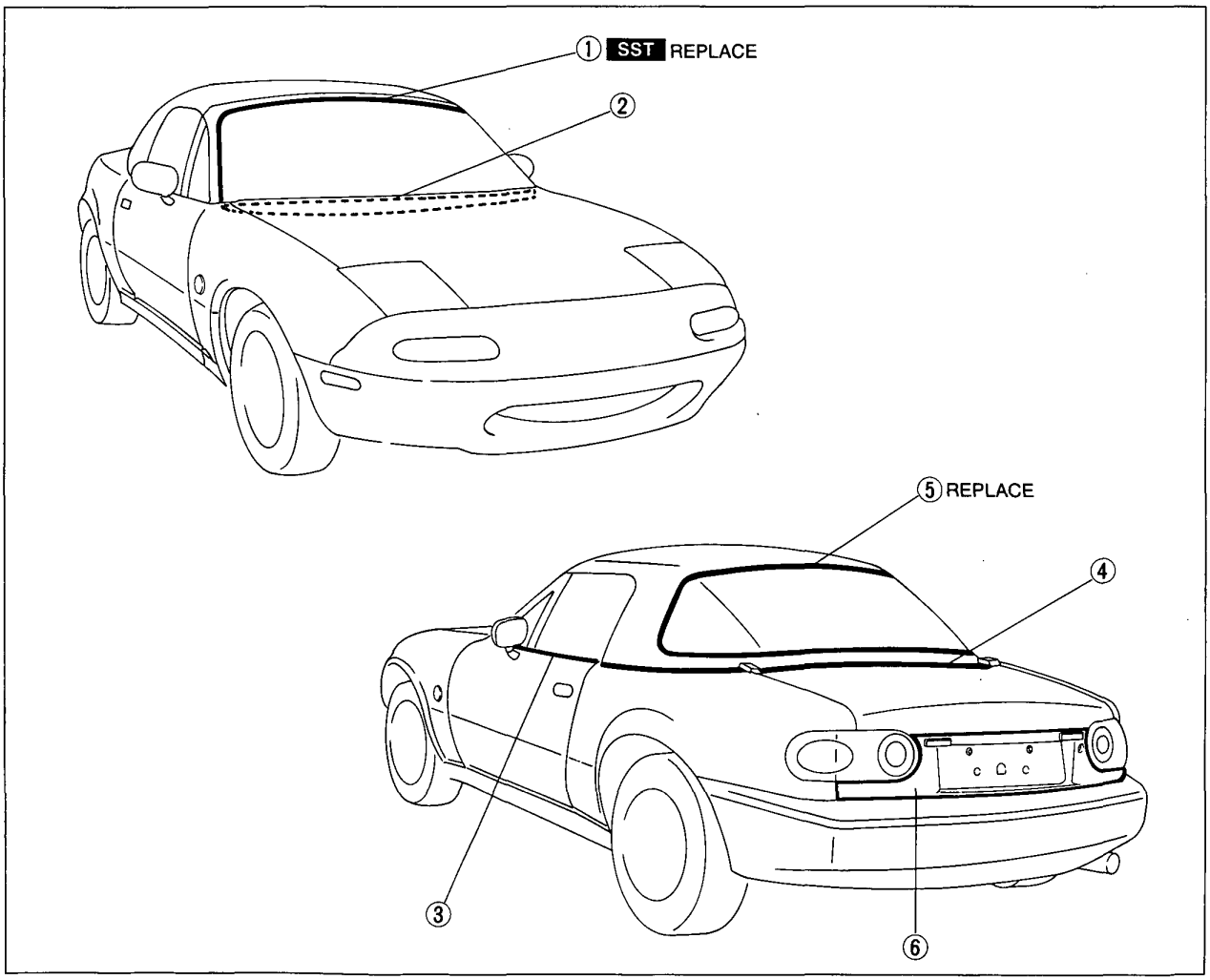
MOLDING AND GARNISH

PREPARATION
SST

[illegible] Remover, sealant		For removal of sealant

05U0SX-602

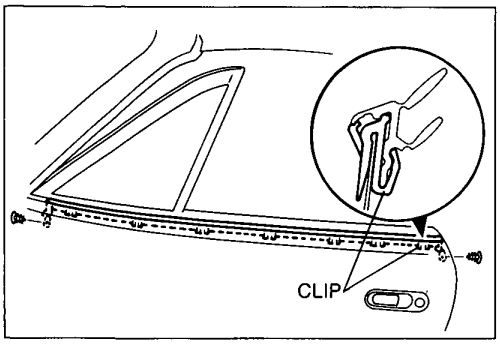
COMPONENTS
Removal / Installation
1. Remove in the order shown in the figure, referring to **Removal Note**.
2. Install in the reverse order of removal, referring to **Installation Note**.



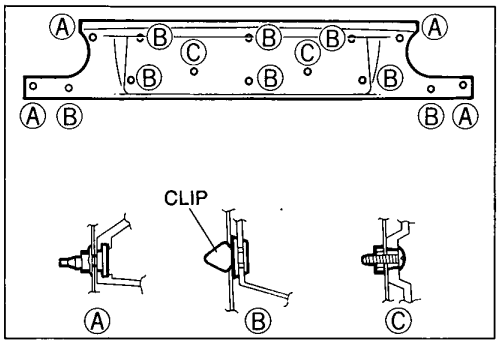
95A0SX-028

1. Windshield molding
   Installation Note ..... page S–29
2. Cowl grille
   Removal ..... page S–37
3. Front beltline molding
   Removal Note ..... page S–29
4. Beltline molding
   Removal Note ..... page S–29
   Installation Note ..... page S–31
5. Rear window molding (Detachable hard top)
   Installation Note ..... page S–31
6. Rear finisher
   Removal Note ..... page S–29

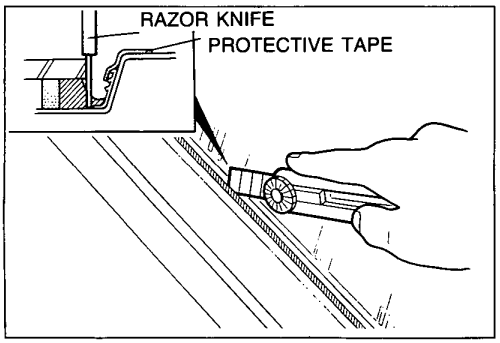
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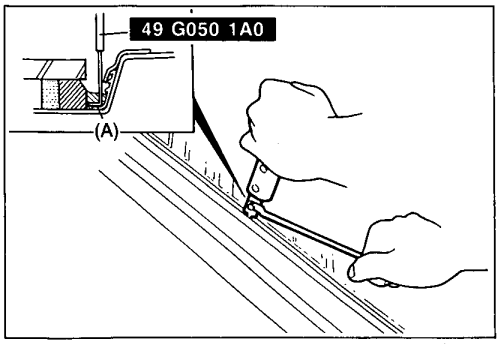
95A0SX-029



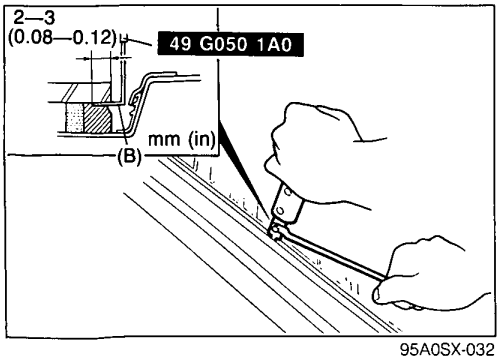
95E0SX-010



05U0SX-604



95A0SX-031



95A0SX-032

Removal Note
Front beltline molding
1. Remove the door mirror. (Refer to page S–32.)
2. Remove the front beltline molding.

Caution
- **Do not damage the body.**

Note
- **The clips are where shown in the figure.**

Rear finisher
1. Remove the rear combination lights. (Refer to Section T.)
2. Remove the rear finisher.

Note
- **The clips are where shown in the figure.**

Beltline molding
Remove the convertible top for removal of the beltline molding. (Refer to page S–68.)

Installation Note
Windshield molding
1. Apply protective tape along the edge of the body to protect it from damage.
2. Cut the upper and side sealant with a razor knife as shown.

Caution
- **Do not damage the glass or body.**

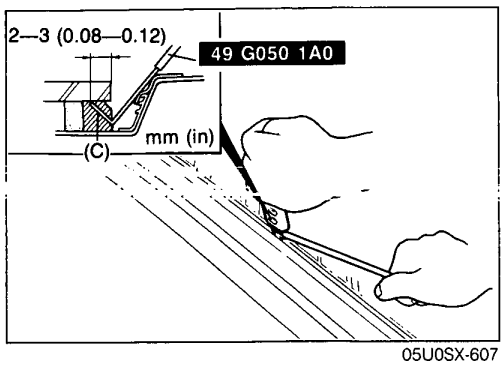
3. Insert the blade of the **SST** into the sealant, pull on the bar and cut the sealant near the body as shown (A).

Caution
- **Do not damage the body.**

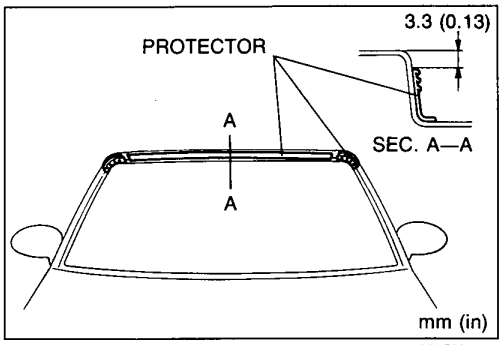
4. Insert the blade of the **SST** into the sealant, pull on the bar and cut the sealant near the glass as shown (B).

Caution
- **Do not damage the glass.**

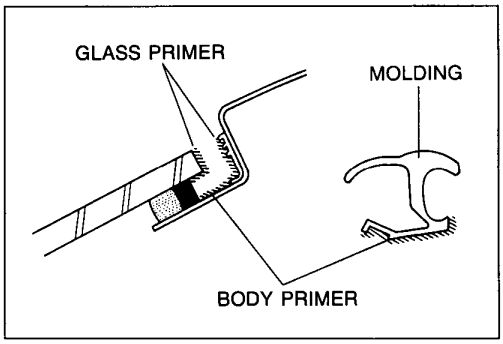
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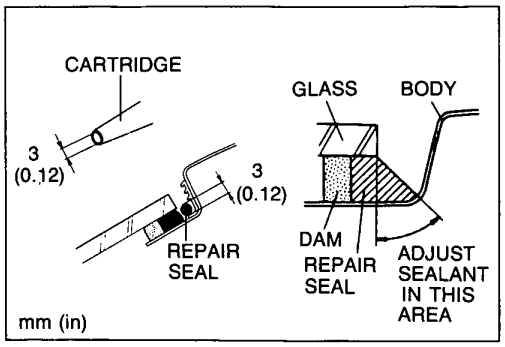
05U0SX-607



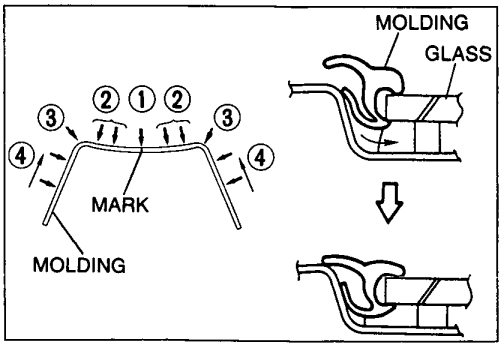
05U0SX-608



95A0SX-033



05U0SX-610



05U0SX-611

5. Cut the sealant near the glass (C).

Caution
- **Do not damage the glass**

6. Remove as much sealant as possible from between the body and glass.
7. If the protector is damaged, remove it from the body.

8. Carefully clean around the edge of the glass and the adhesion surface at the body.
9. If the body is damaged, touch up with paint.
10. If the protector was removed, bond a new protector onto the body as shown.

Note
- **Verify that the protector is straight and is set securely.**

11. Apply primer with a brush to the bonding area of the glass, the body and the new windshield molding, and allow it to dry for **approx. 30 minutes**.

Caution
- **Keep the area free of dirt and grease. Do not touch the surface. If primer gets on the skin, remove it immediately.**

Note
- **Use only the glass primer at the glass and the body primer at the body and molding.**

12. Apply a bead of repair seal to a height of **3mm (0.12 in)** between the glass and the body.

Note
- **With the repair seal cartridge prepared as shown, use a piece of wire to break through the seal film, and then apply the seal.**
- **If necessary, reshape the repair seal.**

Caution
- **Lower the convertible top to prevent the glass from being pushed out by air pressure if a door is closed.**

13. Align the center mark in the molding with the glass mark (①).
14. Install the upper portions of the molding into the body (②).
15. Push the corner of the molding into the body (③).
16. Push the side portions of the molding into the body, beginning from the bottom (④).

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Hardening time of repair seal

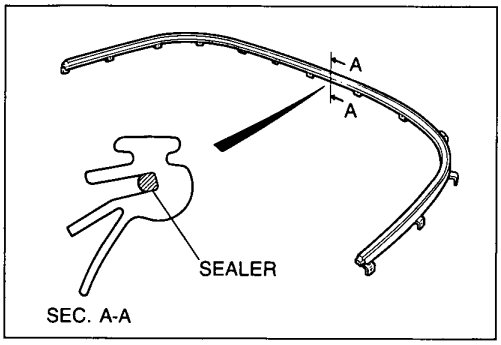
Temperature	Surface hardening time	Time required until car can be put into service
5°C (41°F)	Approx. 1.5 hr	12 hr
20°C (68°F)	Approx. 1hr	4 hr
35°C (95°F)	Approx. 10 min	2 hr

17. Check for water leaks. If a leak is found, wipe the water off well and repeat the installation.

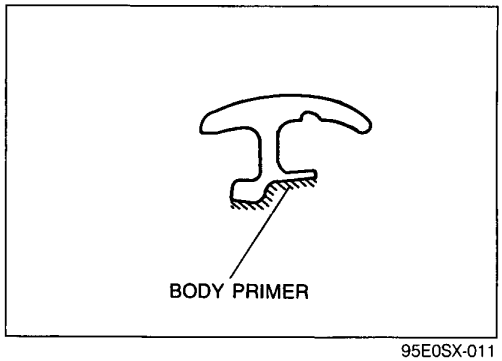
95A0SX-034

Beltline molding

1. Lay sealer **TP-33M** (0208 77 732) or equivalent in the groove of the beltline molding.
2. Install the beltline molding to the body.



05U0SX-612



95E0SX-011

Rear window molding (Detachable hard top)

1. Remove the rear window glass. (Refer to page S–48.)
2. Install the rear window glass. (Refer to page S–48.)

Note

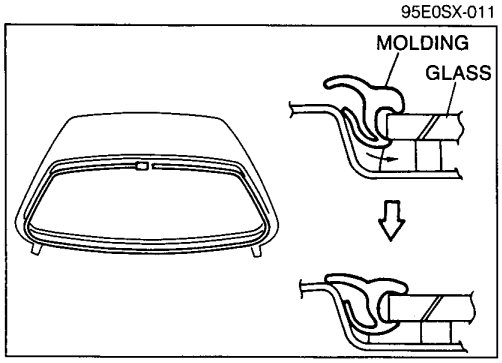
- **Use only the body primer at the molding.**

3. Apply primer with a brush to the bonding area of the new rear window molding, and allow it to dry for **approx. 30 minutes**.

Caution

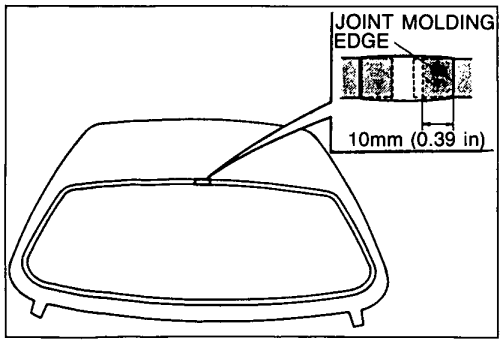
- **Keep the area free of dirt and grease. Do not touch the surface. If primer gets on the skin, remove it immediately.**

4. Install the rear window molding to the glass, as shown.



05U0SX-041

5. If the molding is too long, cut the excess molding **10mm (0.39 in)** inside the joint molding edge.
   Hardening time of repair seal (Above)
6. Check for water leaks. If a leak is found, wipe the water off well and repeat the installation.



05U0SX-042

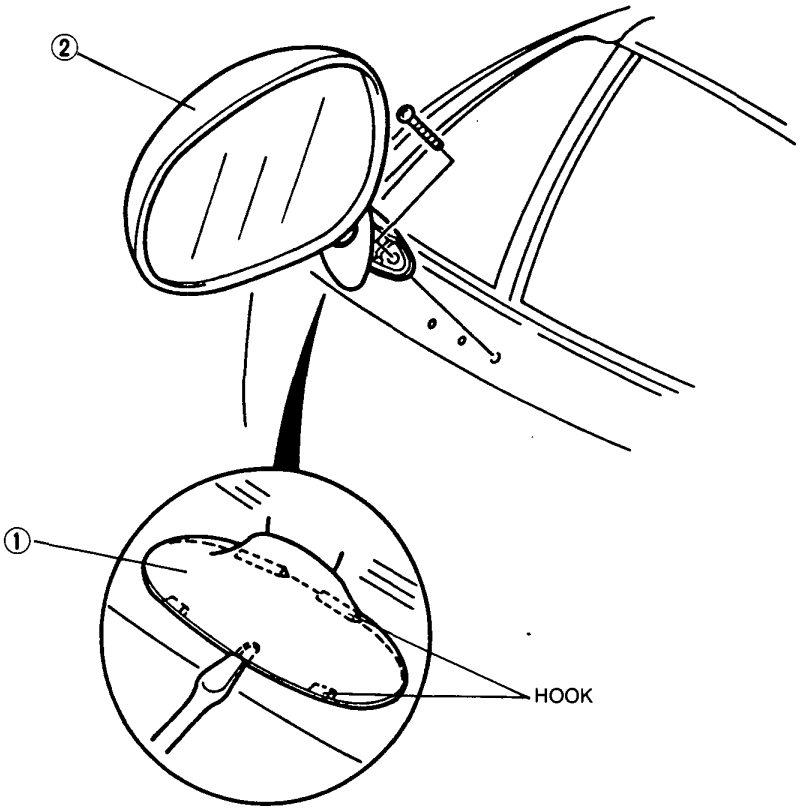
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DOOR MIRROR

COMPONENTS

Removal / Installation

1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.



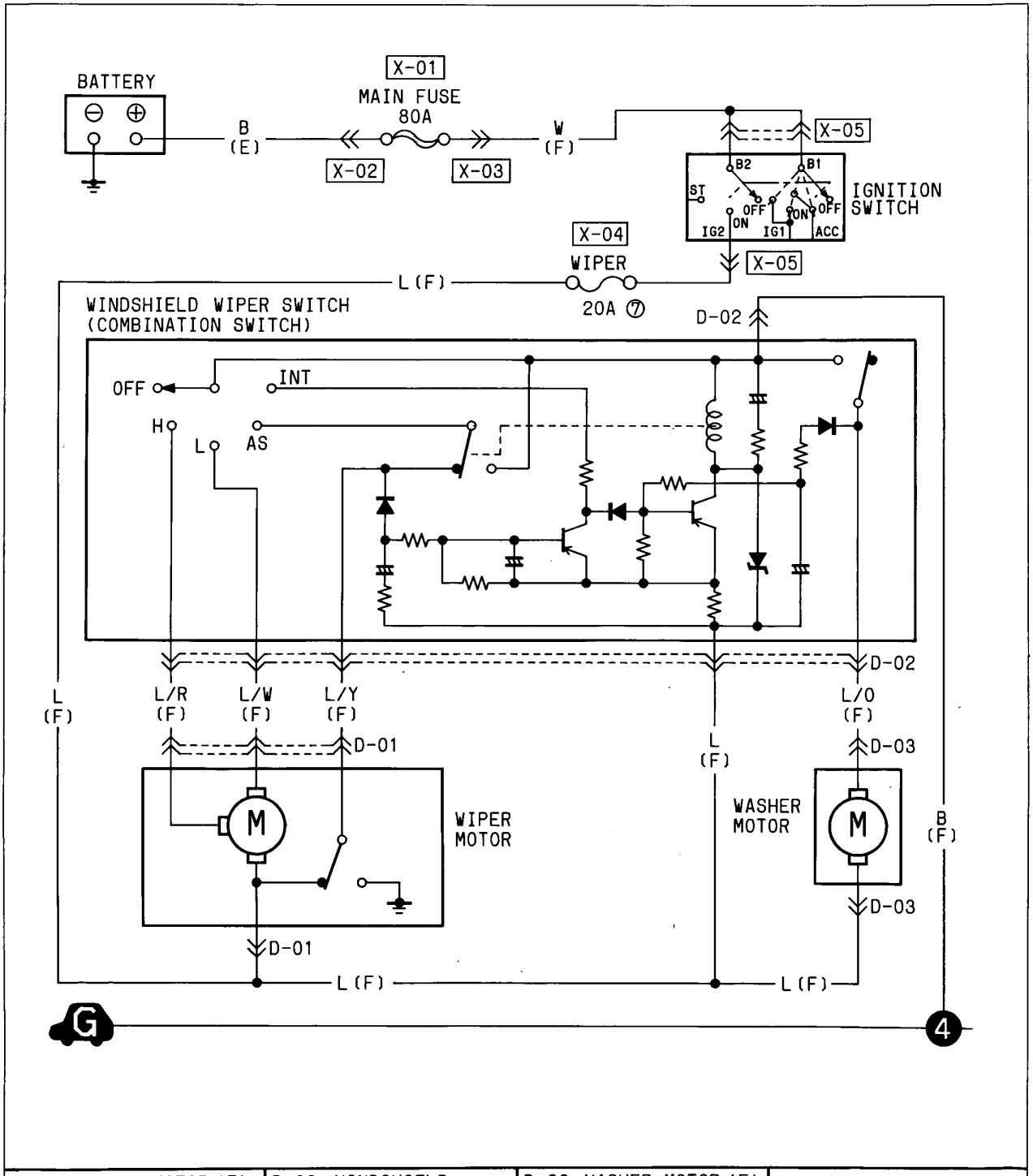
05U0SX-014

1. Mirror cover
2. Rearview mirror

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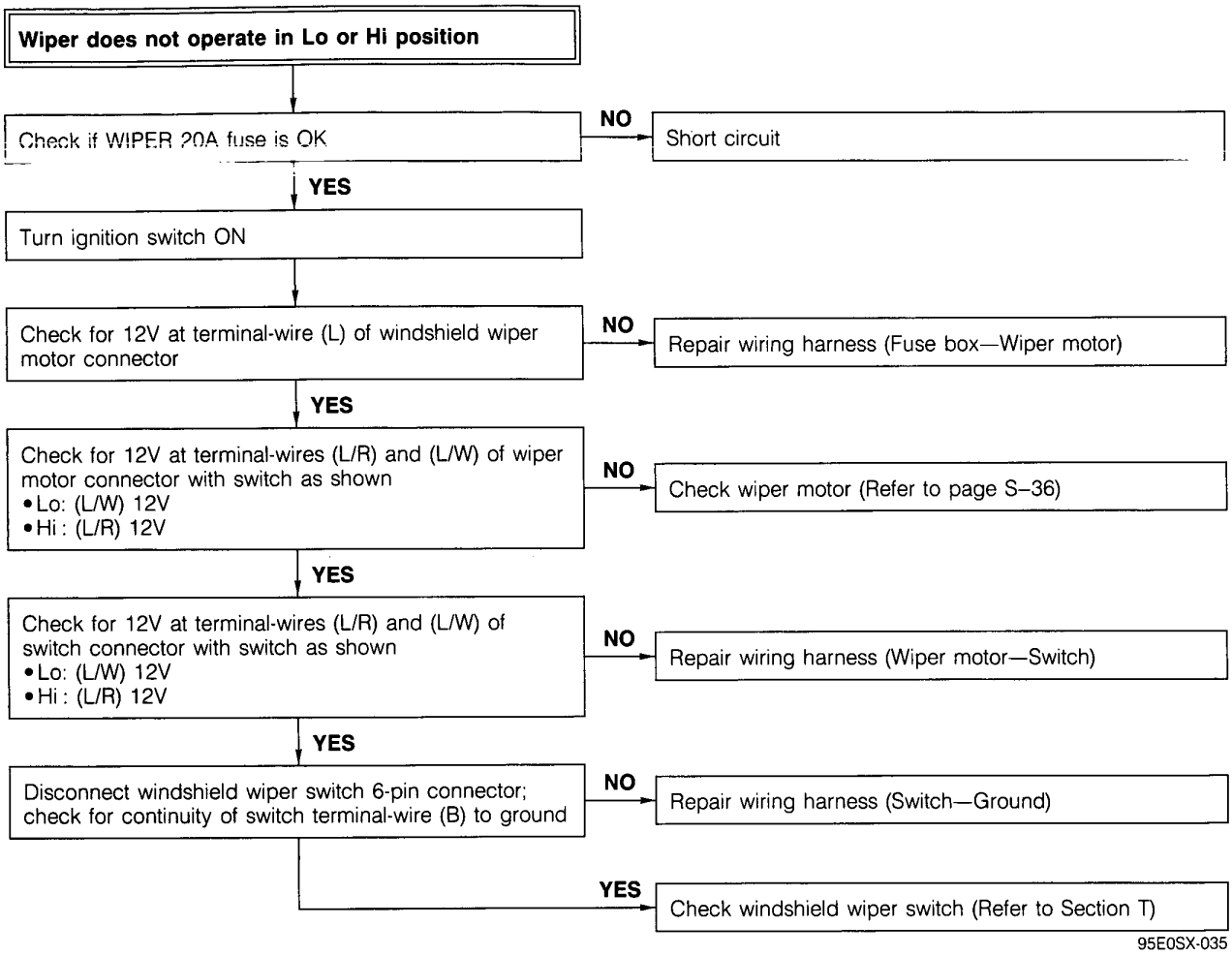
WINDSHIELD WIPER AND WASHER

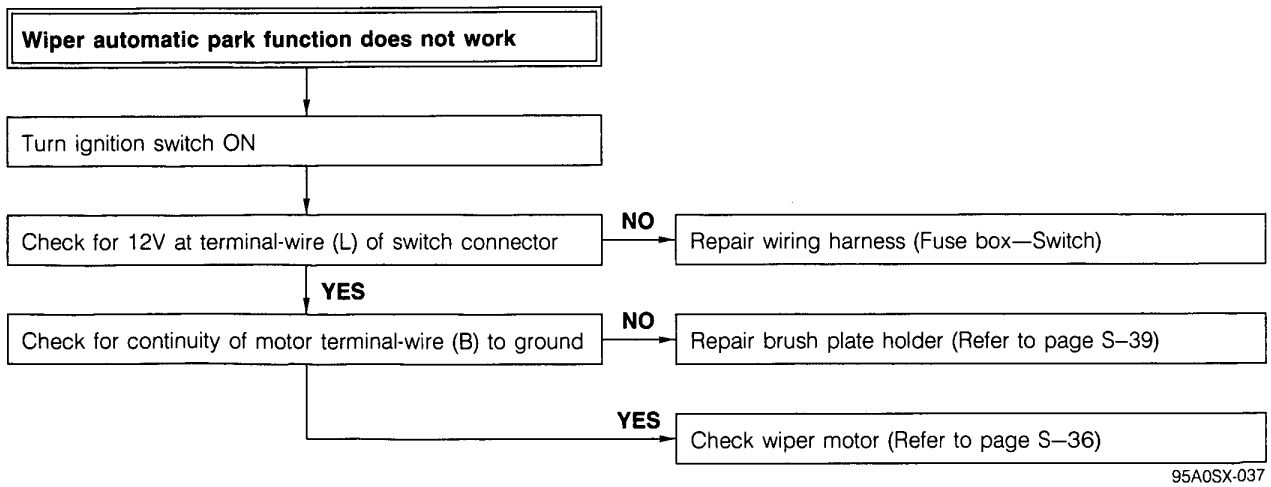
TROUBLESHOOTING GUIDE



D-01 WIPER MOTOR (F)	D-02 WINDSHIELD WIPER SWITCH (COMBINATION SWITCH) (F)	D-03 WASHER MOTOR (F)	
L/R | L/W L/Y | L	L/O | L | B L/W | L/Y | L/R	L/O L	

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Intermittent function does not operate

Disconnect windshield wiper switch 6-pin connector; check for continuity of switch terminal-wire (B) to ground

NO → Repair brush plate holder (Refer to page S–39)

YES → Check windshield wiper switch (Refer to Section T)

95E0SX-036

One-touch function does not operate → Check windshield wiper switch (Refer to Section T)

05U0SX-050

Wiper continues to operate when switch is OFF → Check windshield wiper switch (Refer to Section T)

05U0SX-051

Washer does not operate (Wiper operates OK)

Turn ignition switch ON

Check for 12V at terminal-wire (L) of windshield washer motor connector with washer switch ON

NO → Repair wiring harness (Fuse—Motor)

YES

Check if washer motor is OK (Refer to page S–36)

NO → Replace washer motor

YES

Check for 12V at terminal-wire (L/O) of washer switch connector with washer switch ON

NO → Repair wiring harness (Motor—Switch)

YES

Disconnect windshield wiper switch 6-pin connector; check for continuity of terminal-wire (B) to ground

NO → Repair wiring harness (Switch—Ground)

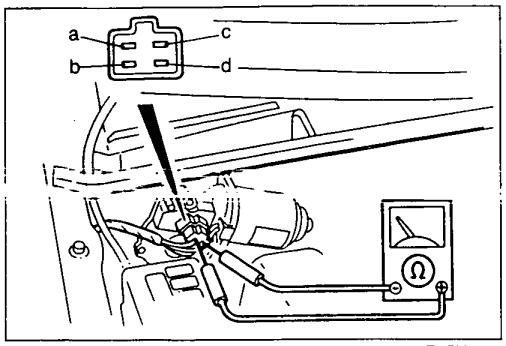
YES → Check windshield washer switch (Refer to Section T)

95A0SX-039

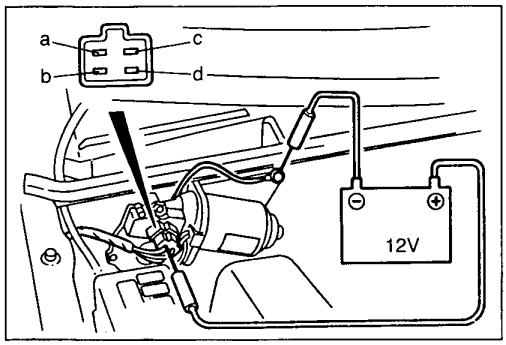
Washer continues to operate when switch is OFF → Check windshield washer switch (Refer to Section T)

05U0SX-052

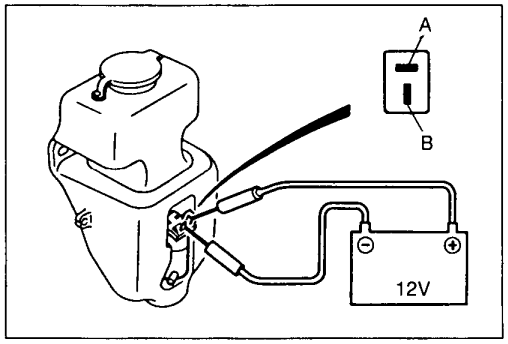
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95E0SX-012



95E0SX-013



95A0SX-144

WIPER MOTOR

Inspection

1. Check for continuity between the terminals with the wiper motor in the parked position.

Terminals	Continuity	Terminals	Continuity
a—b	No (Yes)	b—c	No (Yes)
a—c	Yes (Yes)	b—d	No (Yes)
a—d	Yes (Yes)	c—d	Yes (Yes)

( ): ENGLAND

2. Check operation of the motor when applying 12V and a ground to the terminals of the motor connector.

Terminal	Operation speed
12V	
a	Low
c	High

3. If not as specified, replace the wiper motor.

WASHER MOTOR

Inspection

1. Connect 12V to terminal b and a ground to terminal a, and verify that the motor operates.
2. If not as specified, replace the washer motor.

FRONT WIPER AND WASHER SWITCH

Inspection

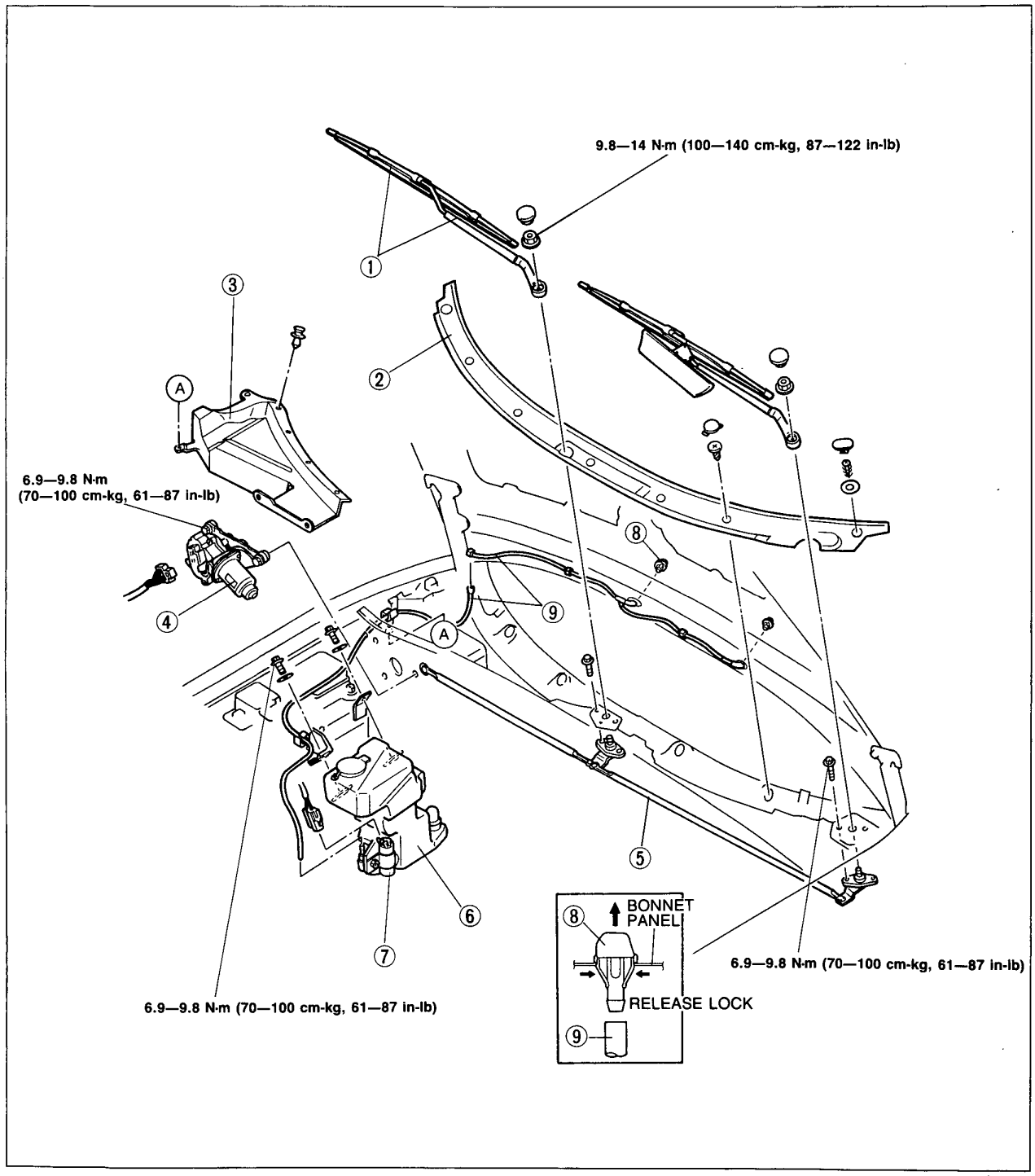
1. Refer to Section T.

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COMPONENTS

Removal / Installation

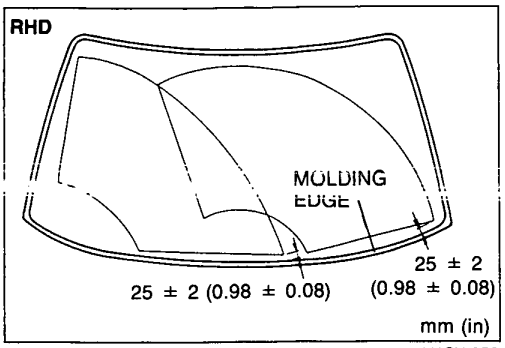
1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure.
3. Install in the reverse order of removal.



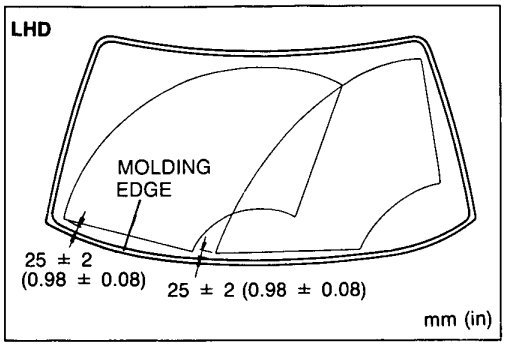
95A0SX-042

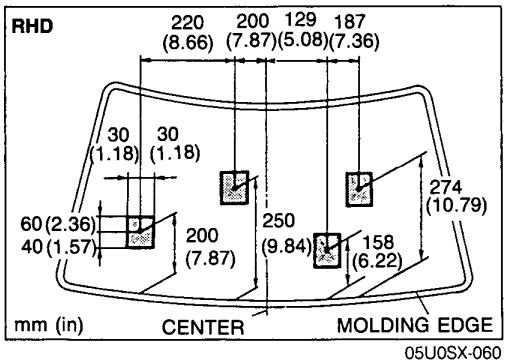
1. Wiper arm and blade
   Adjustment ..... page S–38
2. Cowl grille
3. Baffle cover
4. Wiper motor
   Inspection..... page S–36
5. Wiper link
6. Washer tank
7. Washer motor
   Inspection..... page S–36
8. Washer nozzle
   Adjustment ..... page S–38
9. Washer pipe

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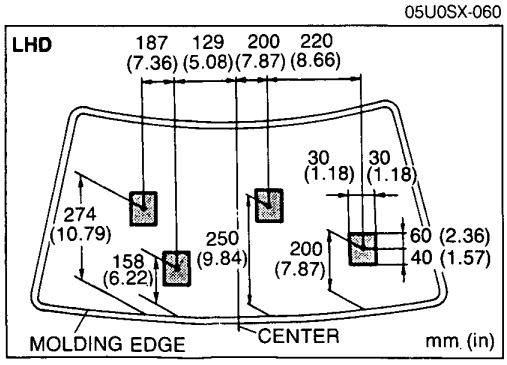


05U0SX-059





05U0SX-060



Adjustment

Arm height

1. Set the arm height as shown.

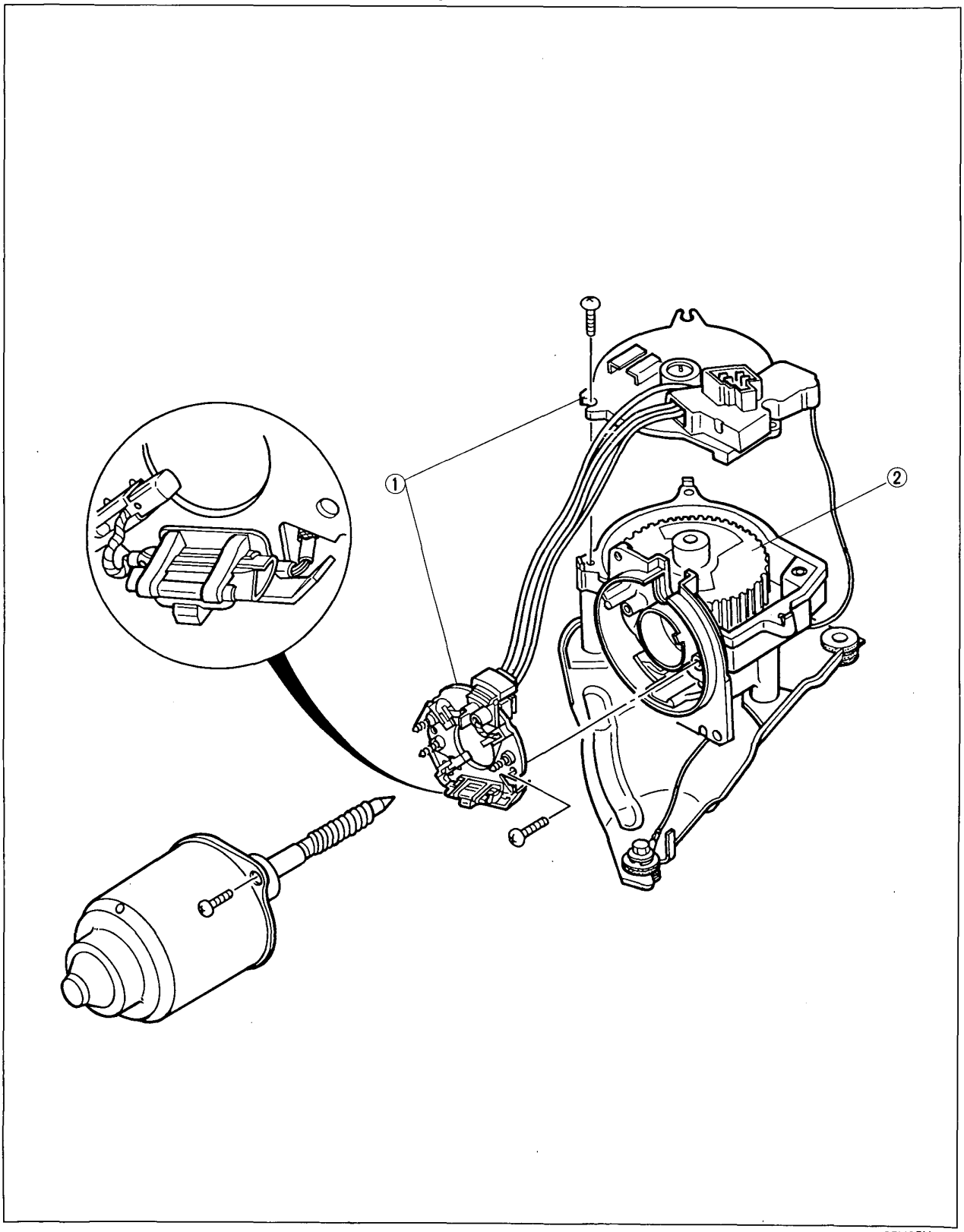
Washer nozzle

1. Insert a needle or similar object into the nozzle hole and move the nozzle to adjust the spray direction.

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Disassembly / Assembly

1. Disassemble in the order shown in the figure.
2. Assemble in the reverse order of disassembly.



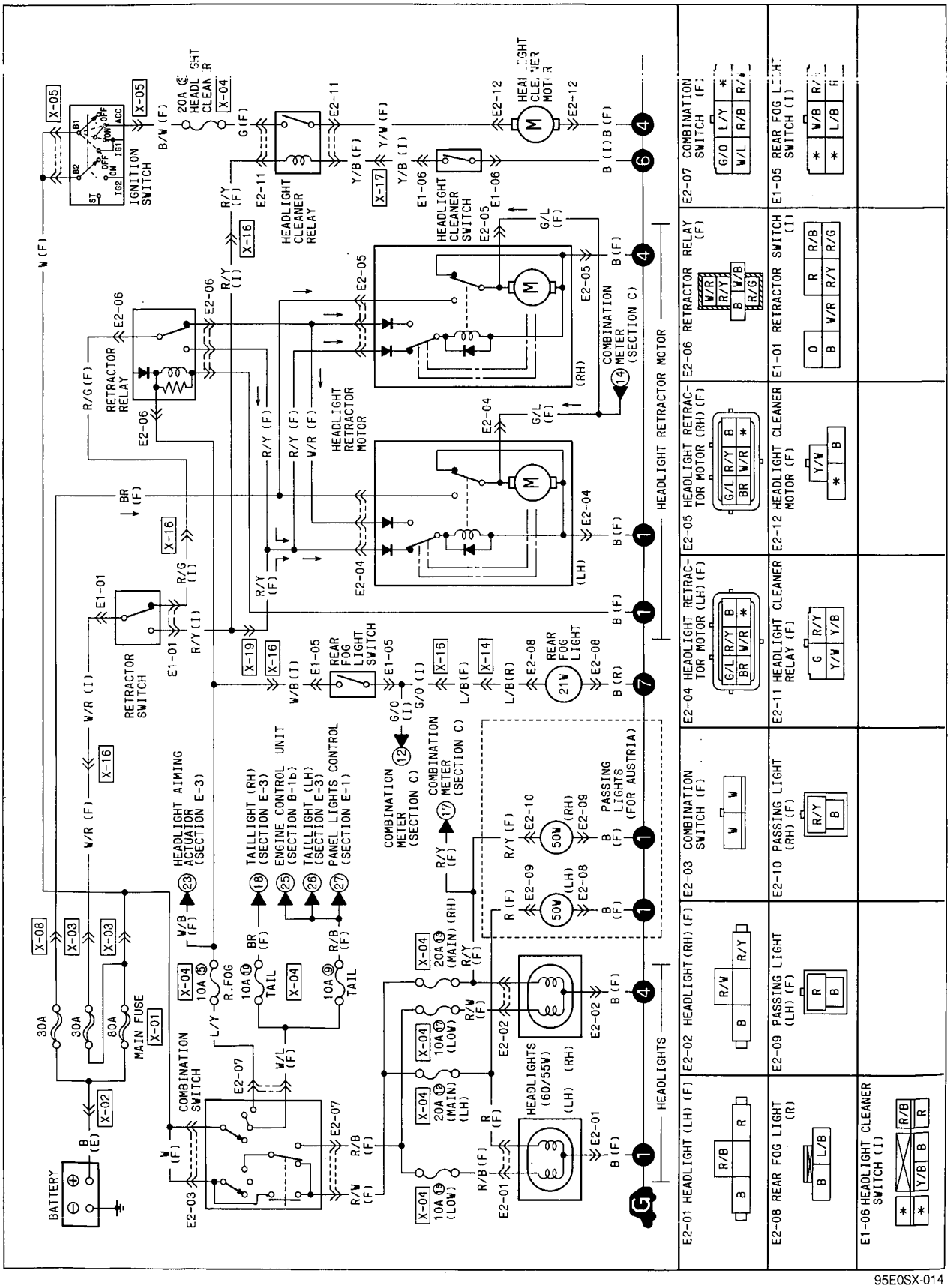
05U0SX-061

1. Brush plate holder
2. Motor gear shaft

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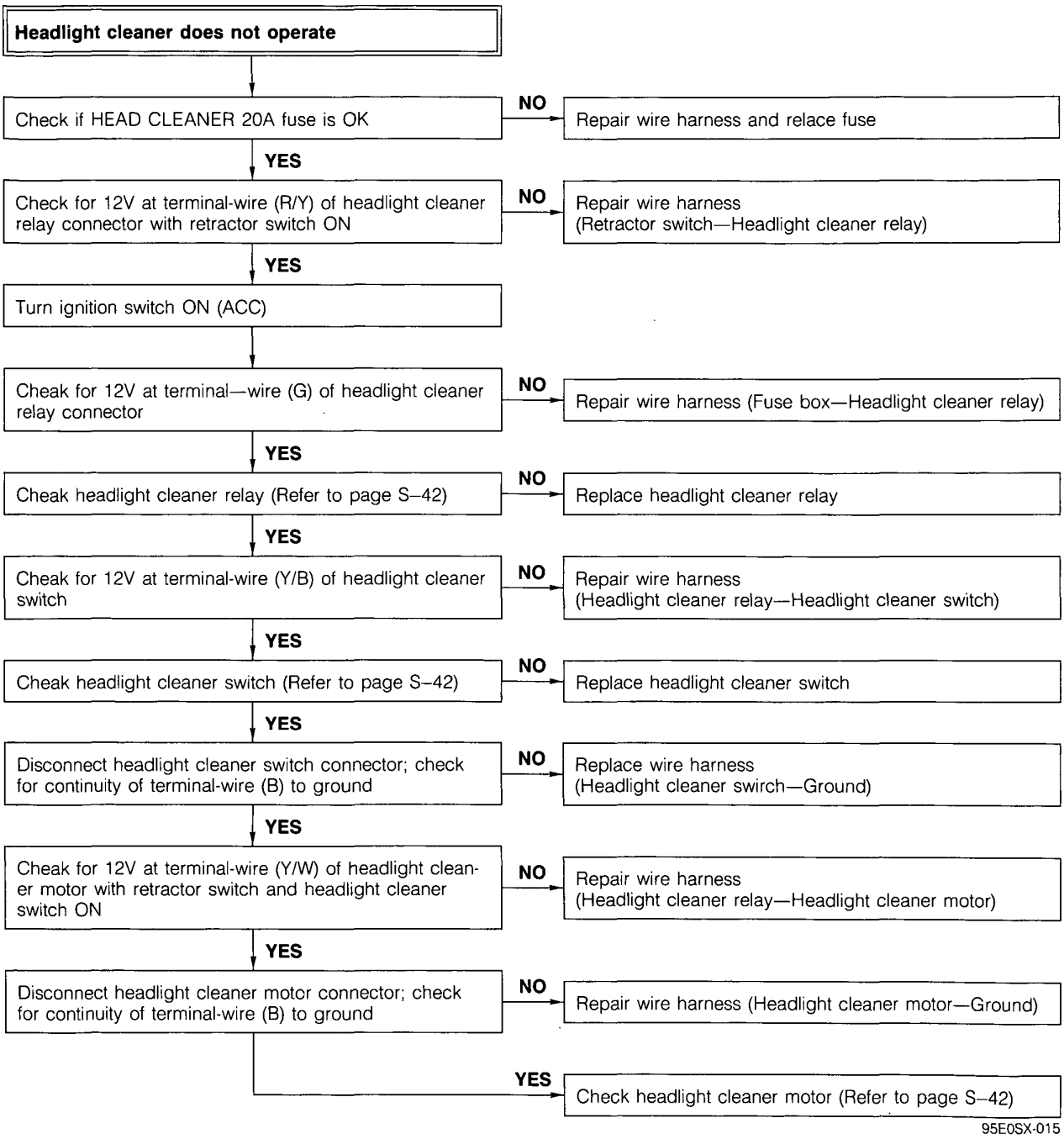
HEADLIGHT CLEANER

TROUBLESHOOTING GUIDE



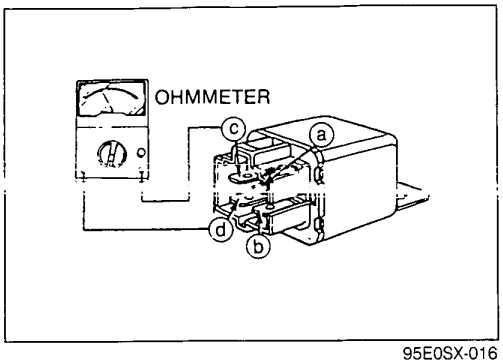
95E0SX-014

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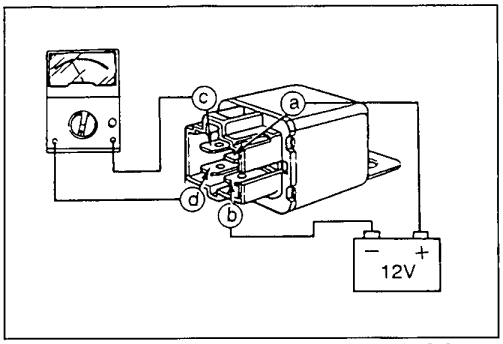


95E0SX-015

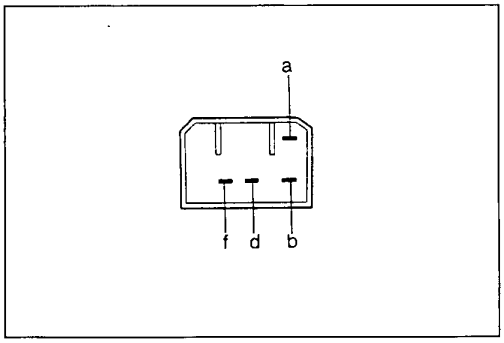
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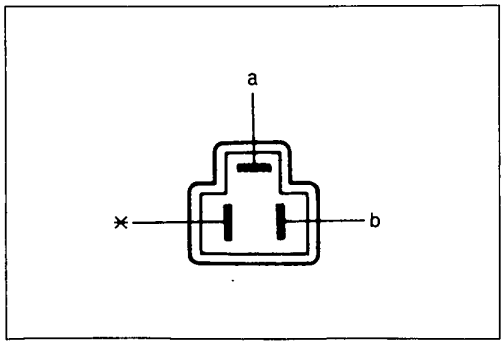
95E0SX-016



95E0SX-017



95E0SX-018



95E0SX-019

HEADLIGHT CLEANER RELAY

Inspection

1. Check for continuity between terminals of the relay.

Terminal	Continuity
a—b	Yes
c—d	No

2. Apply 12V to terminal a and ground terminal b. Check for continuity between terminals c and d.

Termibal	Continuty
c—d	Yes

3. If not as specified, replace the relay.

HEADLIGHT CLEANER SWITCH

Inspection

1. Check for continuity between terminals of the switch.

Switch condition \ Terminal	a	b	d	f
OFF	○——	——○		
ON	○——	——○	○——	——○

○——○: Indicates continuity

2. If not as specified, replace the swicth.

HEADLIGHT CLEANER MOTOR

Inspection

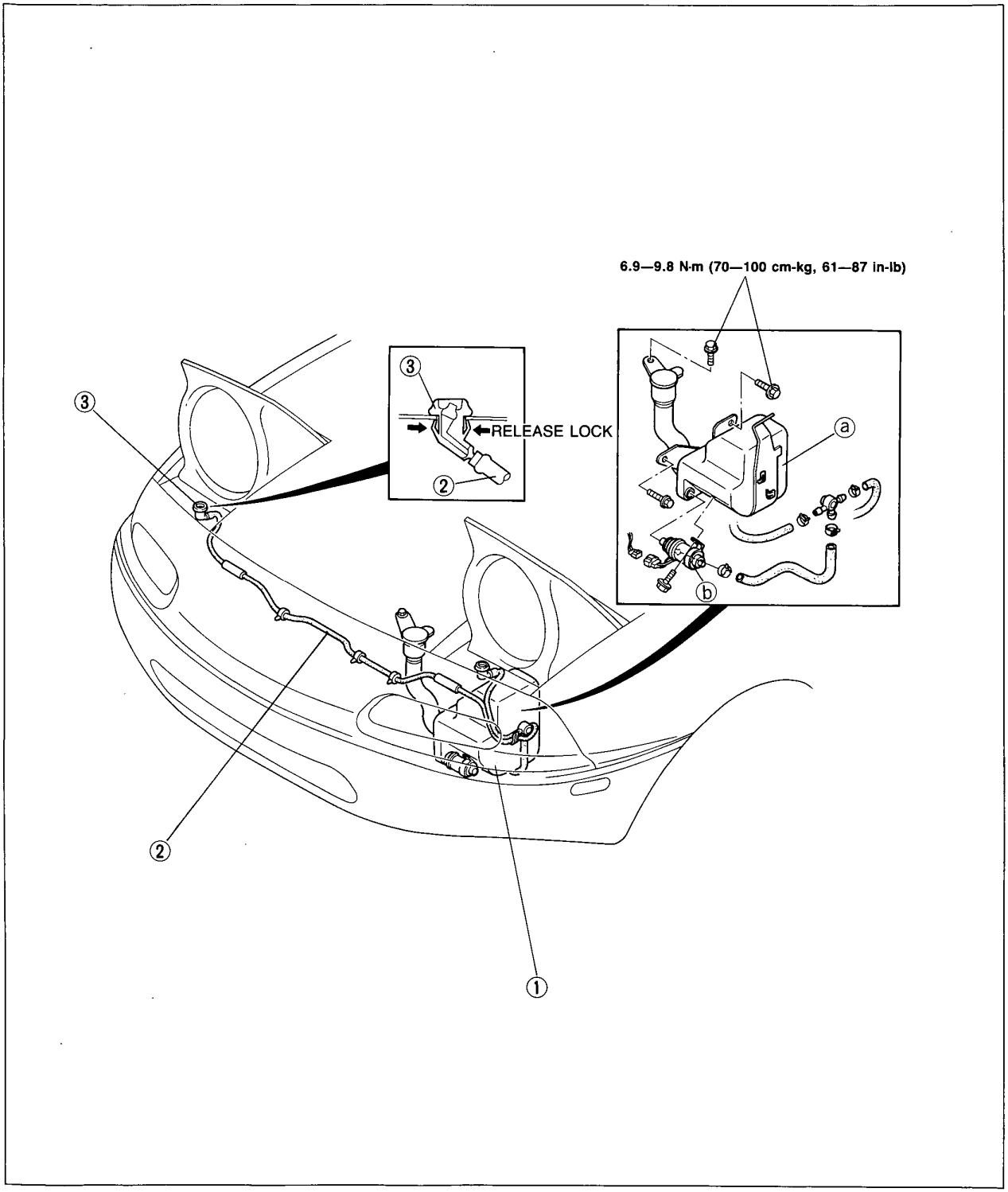
1. Apply 12V to terminal a and ground terminal b, and verify that the motor operates.
2. If not as specified, replace the motor.

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COMPONENTS

Removal / Installation

1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure.
3. Install in the reverse order of removal.



95E0SX-020

1. Tank and motor assembly
   a. Tank
   b. Motor
2. Pipe assembly
3. Cleaner nozzle

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WINDSHIELD

PREPARATION
SST

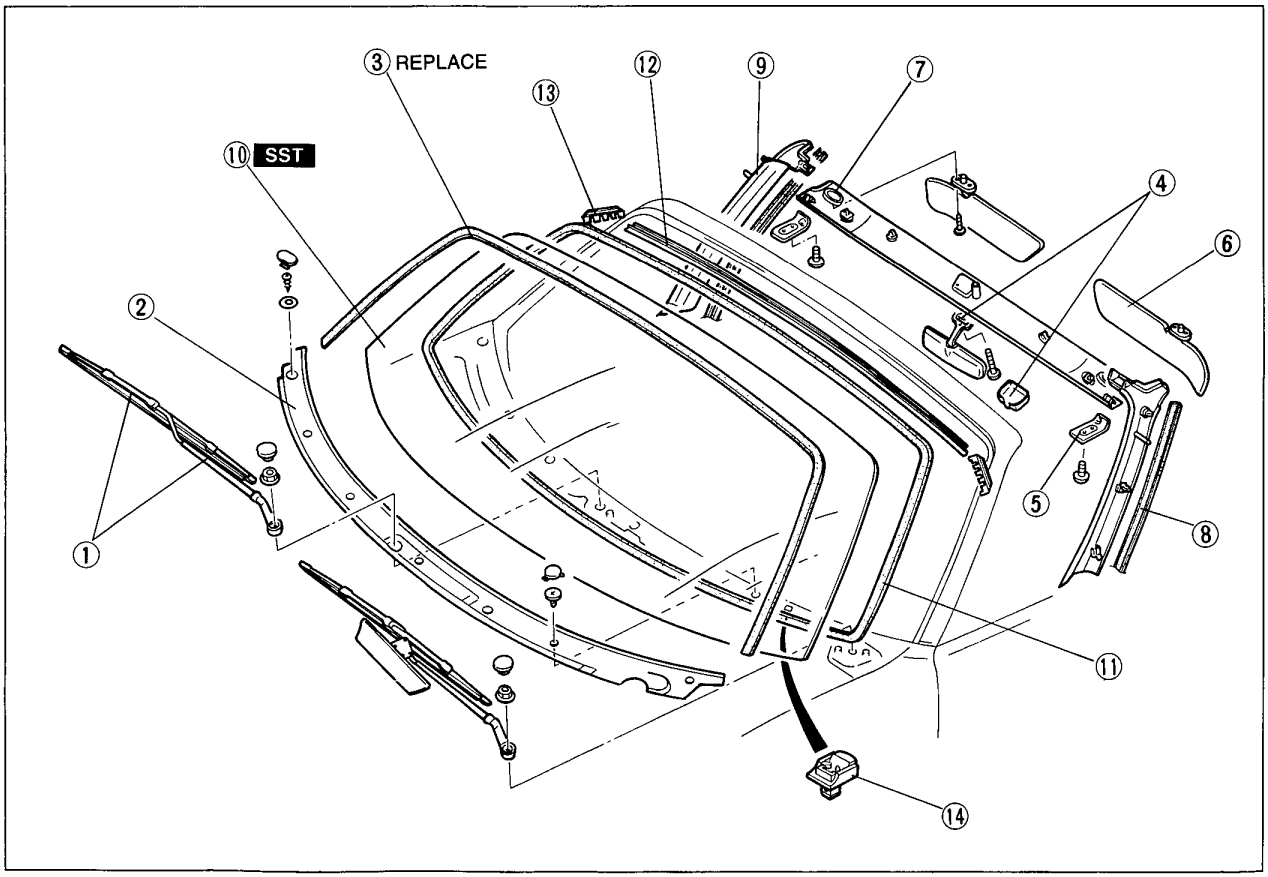
49 0305 870A Tool set, window		For removal and installation of windshield

95A0SX-043

COMPONENTS
Removal / Installation

Note
- **Use the SST (49 0305 870A) to remove and install the windshield.**

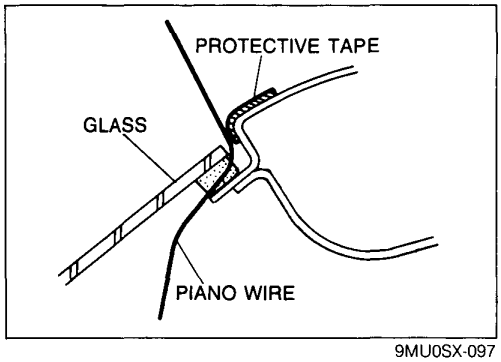
1. Remove in the order shown in the figure, referring to **Removal Note**.
2. Install in the reverse order of removal, referring to **Installation Note**.



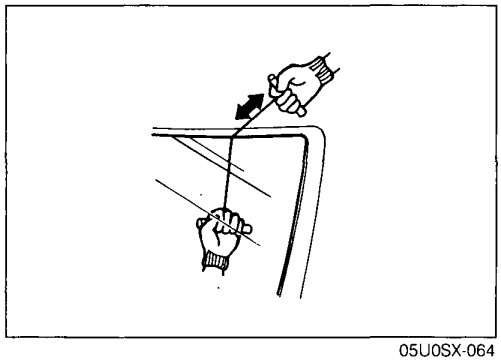
95E0SX-021

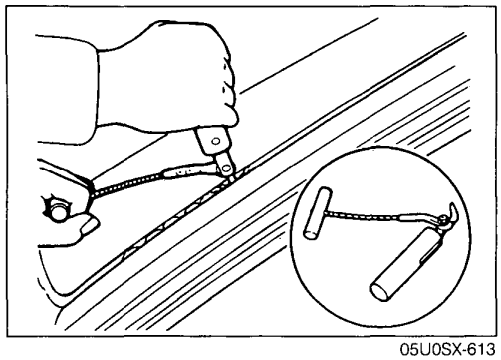
1. Wiper arm and blade
   Adjustment ..... page S–38
2. Cowl grille
3. Windshield molding
4. Cover and rearview mirror
5. Striker
   Removal / Installation
   ..... page S–67
6. Sunvisor
7. Front header trim
   Removal Note .. page S–60
8. Weatherstrip
9. A-pillar trim
   Removal Note .. page S–60
10. Windshield
    Removal Note .. page S–45
    Installation Note
    ..... page S–45
11. Dam
12. Upper protector
13. Side protector
14. Spacer

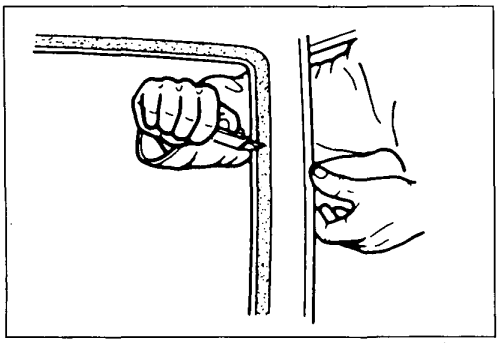
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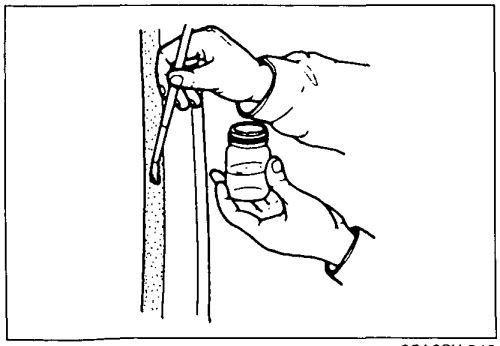


9MU0SX-097


05U0SX-064


05U0SX-613


95A0SX-045


95A0SX-046

Removal Note
Windshield

1. Apply protective tape along the edge of the body to protect it from damage.
2. Using an awl, make a hole through the sealant from the inside of the vehicle.
3. Pass piano wire through the hole.
4. Wind each end of the wire around a bar.
5. Working with another person, saw through the sealant around the edge of the glass. Then remove the glass.

Caution
- **Use a long sawing action to spread the work over the whole length of wire to prevent it from breaking.**
- **Be careful that the wire does not rub on the body or dashboard.**

Note
- **If the glass is not to be reused, a tool like that shown in the figure may be used.**

6. Insert the blade in the sealant, and pull on the bars.

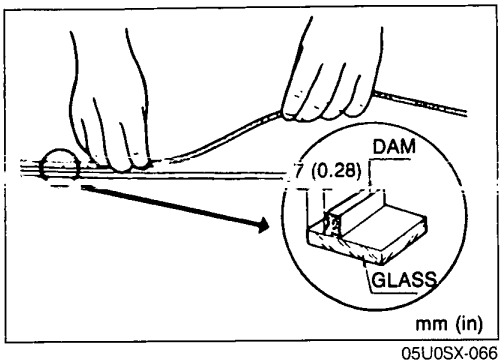
Installation Note
Windshield

1. Cut away the old sealant with a razor knife so that **1 to 2mm (0.04 to 0.08 in)** thickness of sealant remains around the circumference of the frame. If all the sealant has come off in any one place, apply some primer after degreasing, and allow it **30 minutes** to dry. Then put on new sealant to create a **2mm (0.08 in)** layer.
2. Carefully clean an area **5 cm (1.97 in)** wide around the circumference of the glass and the bonding area on the body.
3. Apply primer with a brush to the bonding area of the glass, the new windshield molding, and the body, and allow it to dry for **approx. 30 minutes**.

Caution
- **Keep the area free of dirt and grease. Do not touch the surface. If primer gets on the skin, remove it immediately.**

Note
- **Use only the glass primer at the glass and the body primer at the body and molding.**

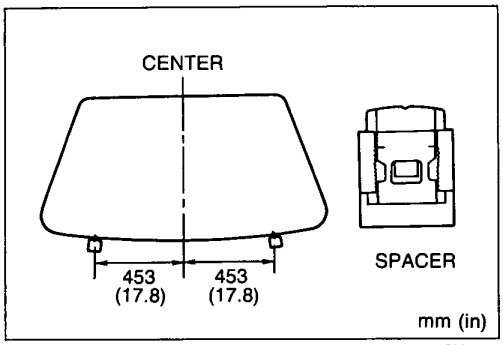
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05U0SX-066

4. Bond a new dam along the circumference of the glass **7mm (0.28 in)** from the edge.

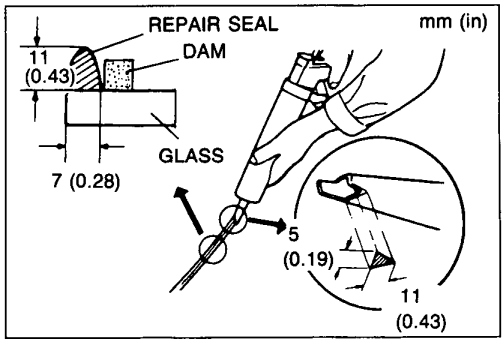
Caution
- **Bond the dam securely and allow it to dry.**



9MU0SX-103

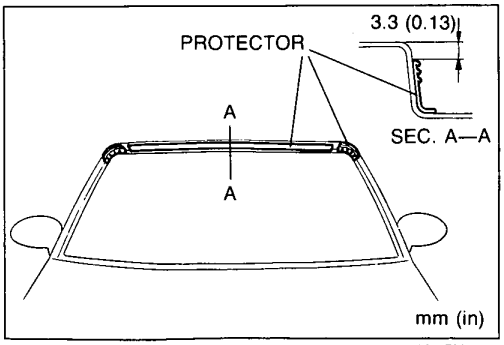
5. Install the spacers onto the body as shown.

Caution
- **Damaged spacers must be replaced.**



05U0SX-067

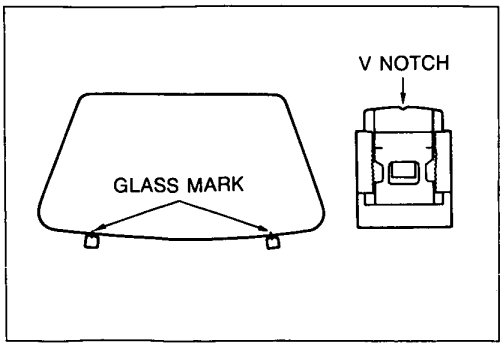
6. Prepare the nozzle of the sealant tube so that it has a flange that can run along the edge of the glass and a V from which the sealant can flow. Once the primer is dry, apply **repair seal** (B001 77 739) around the entire circumference to fill the gap between the dam and the edge of the glass with a ridge of sealant **11mm (0.43 in)** high.
Keep the bead of sealant smooth and even, reshaping it where necessary with a spatula.



95A0SX-047

7. If the protector is damaged, bond a new protector onto the body as shown.

Note
- **Verify that the protector is straight and is set securely.**



05U0SX-069

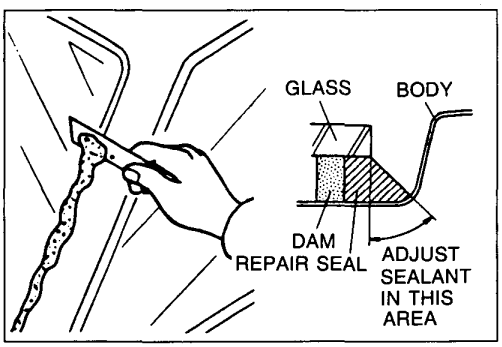
8. Install the glass, aligning the glass mark with the V notch in the spacer. Push it in lightly toward the vehicle to compress the sealant.

Caution
- **Lower the convertible top to prevent the glass from being pushed out by air pressure if a door is closed.**

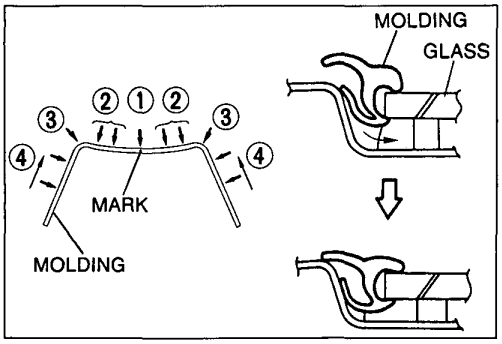
Hardening time of repair seal

Temperature	Surface hardening time	Time required until car can be put into service
5°C (41°F)	Approx. 1.5 hr	12 hr
20°C (68°F)	Approx. 1 hr	4 hr
35°C (95°F)	Approx. 10 min	2 hr

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95A0SX-048



95A0SX-049

9. Use a scraper to smooth away any sealant that oozes out. Add more sealant to any points of poor contact.

Note
- **Use a new windshield molding.**

10. Align the center mark in the molding with the glass mark (①).
11. Install the upper portions of the molding onto the glass (②).
12. Push the corner of the molding onto the glass (③).
13. Push the side portions of the molding onto the glass, begining from the bottom (④).

14. Check for water leaks.
15. If a leak is found, wipe the water off well and remove the molding. Reinstall new molding. (Refer to page S–29.)

05U0SX-071

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REAR WINDOW GLASS (DETACHABLE HARD TOP)

PREPARATION
SST

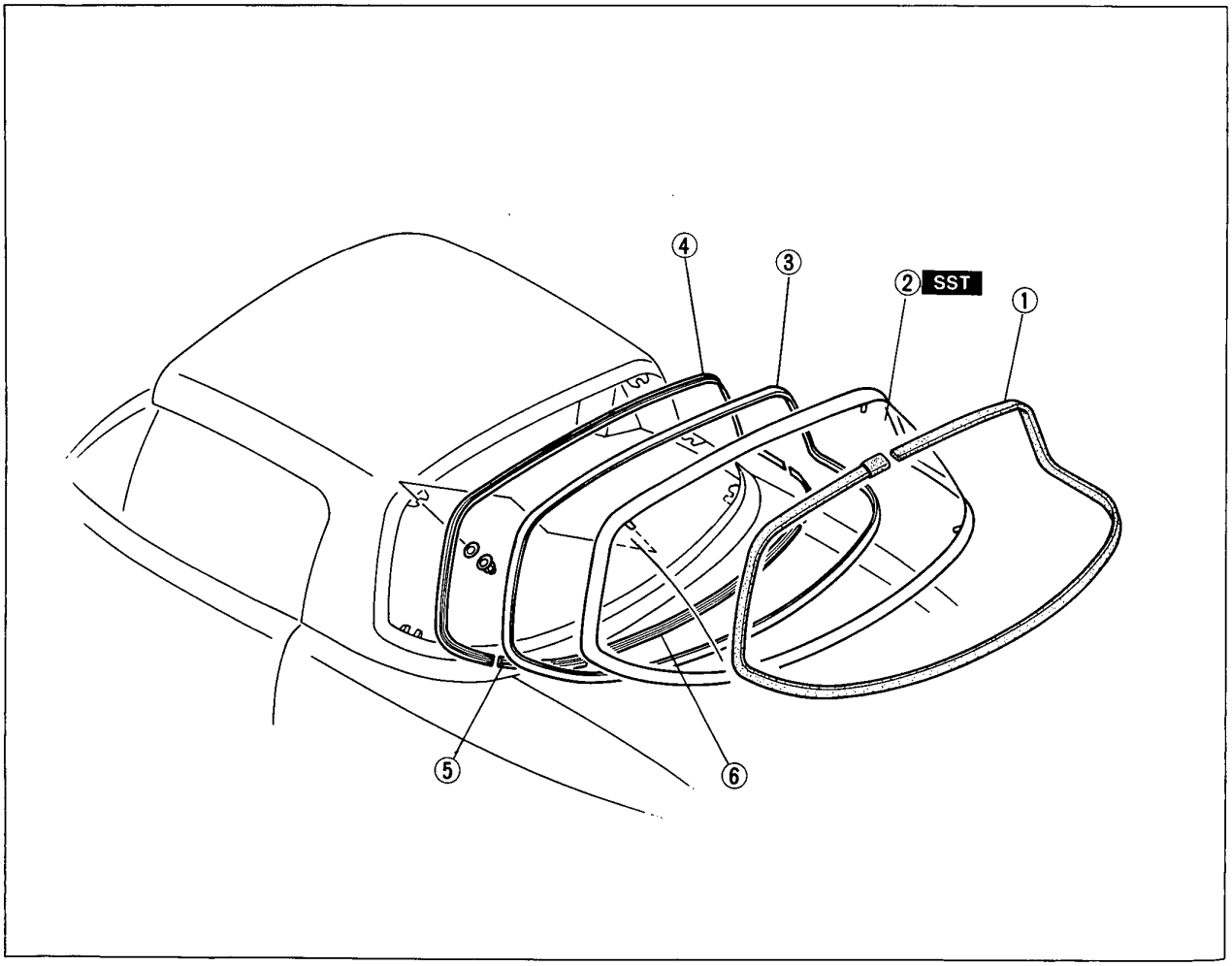
49 0305 870A Tool set, window		For removal and installation of rear window glass

95A0SX-051

COMPONENTS
Removal / Installation

Note
- **Use the SST (49 0305 870A) to remove and install the rear window glass.**

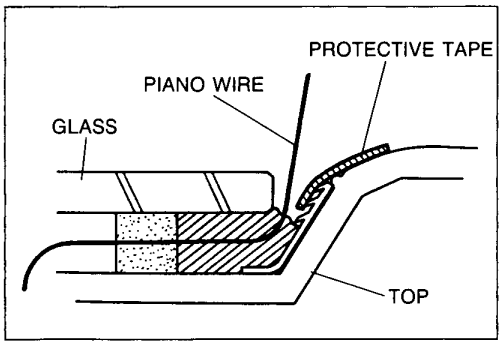
1. Remove in the order shown in the figure, referring to **Removal Note**.
2. Install in the reverse order of removal, referring to **Installation Note**.



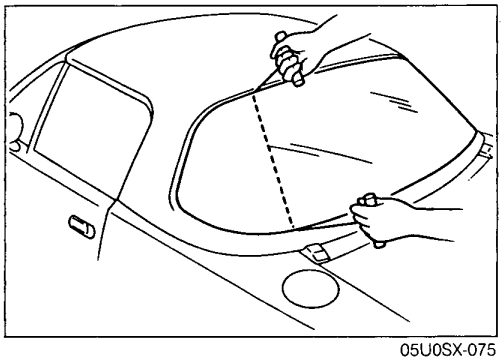
95E0SX-022

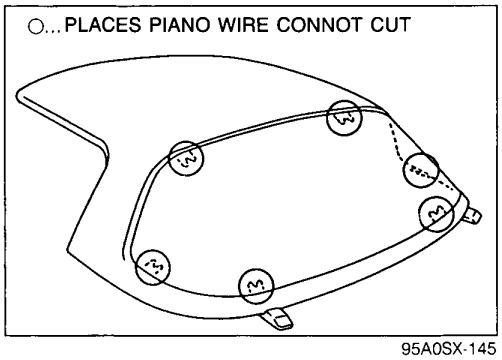
1. Rear window molding
2. Rear window glass
   - Removal Note ..... page S–49
   - Installation Note ..... page S–49
3. Dam
4. Upper protector
5. Side protector
6. Lower protector

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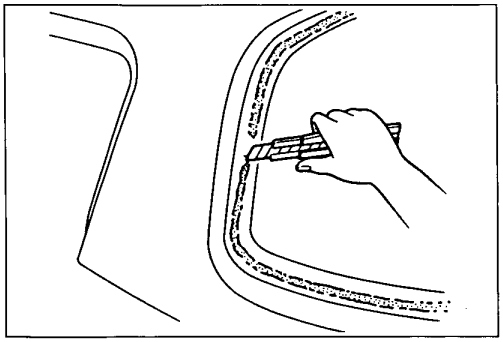


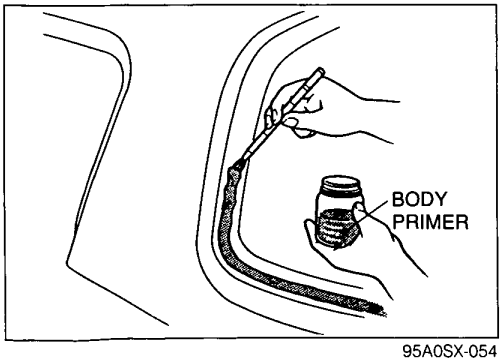
05U0SX-074


05U0SX-075



95A0SX-145


95A0SX-053



95A0SX-054

Removal Note
Rear window glass

1. Apply protective tape along the edge of the top to protect it from damage.
2. Remove the glass mounting nuts.
3. Using an awl, make a hole through the sealant from the inside of the vehicle.
4. Pass piano wire through the hole.
5. Wind each end of the wire around a bar.
6. Saw through the sealant around the edge of the glass. Then remove the glass.

Caution
- **Use a long sawing action to spread the work over the whole length of wire to prevent it from breaking.**
- **Be careful that the wire does not rub on the top.**

- **Use a razor knife to cut where the piano wire can not cut.**

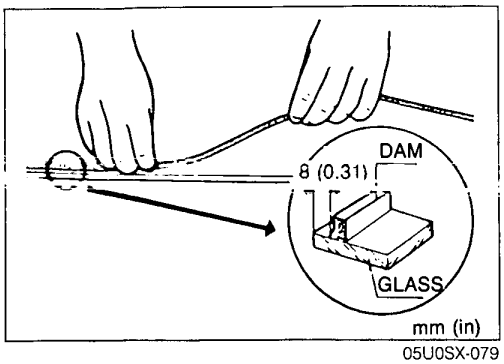
Installation Note
Rear window glass

1. Cut away the old sealant with a razor knife so that **1 to 2mm (0.04 to 0.08 in)** thickness of sealant remains around the circumference of the frame. If all the sealant has come off in any one place, apply some primer after degreasing, and allow it **30 minutes** to dry. Then put on new sealant to create a **2mm (0.08 in)** layer.
2. Carefully clean an area **5 cm (1.97 in)** wide around the circumference of the glass and the bonding area on the top.
3. Apply primer with a brush to the bonding area of the glass, the new rear window molding, and the top, and allow it to dry for **approx. 30 minutes**.

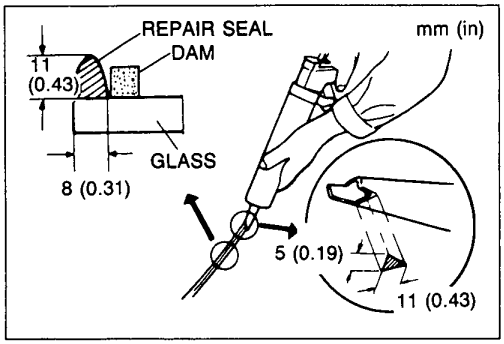
Caution
- **Keep the area free of dirt and grease. Do not touch the surface. If primer gets on the skin, remove it immediately.**

Note
- **Use only the glass primer at the glass and the body primer at the top and the molding.**

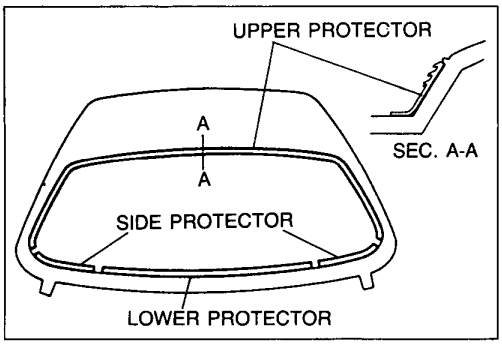
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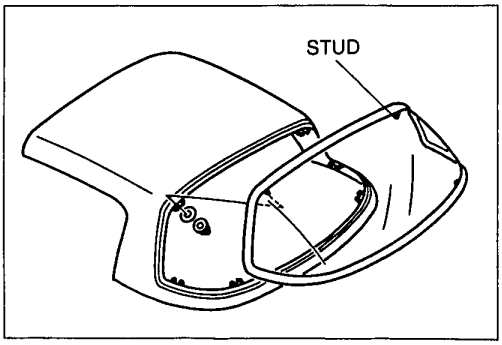
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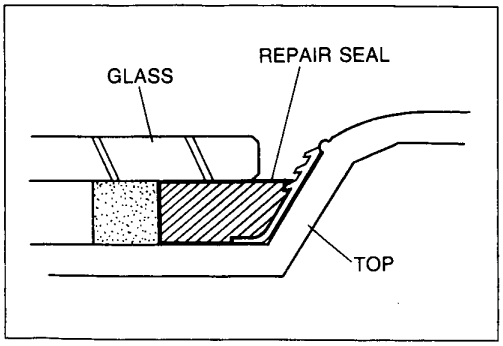
05U0SX-080



95A0SX-055



95A0SX-056



95A0SX-057

4. Bond a new dam along the circumference of the glass **8mm (0.31 in)** from the edge.

Caution
- **Bond the dam securely and allow it to dry.**

5. Prepare the nozzle of the sealant tube so that it has a flange that can run along the edge of the glass and a V from which the sealant can flow. Once the primer is dry, apply **repair seal** (B001 77 739) around the entire circumference to fill the gap between the dam and the edge of the glass with a ridge of sealant **11mm (0.43 in)** high.
Keep the bead of sealant smooth and even, reshaping it where necessary with a spatula.

6. If a protector is damaged, bond a new protector onto the detachable hard top at the specified location

Note
- **Verify that the protector is straight and is set securely.**

7. Align the studs of the glass with the detachable hard top and mount the glass.
8. Push the glass lightly toward the front to compress the sealant.
9. Tighten the glass mounting nuts.

Caution
- **Do not overtighten the nuts.**

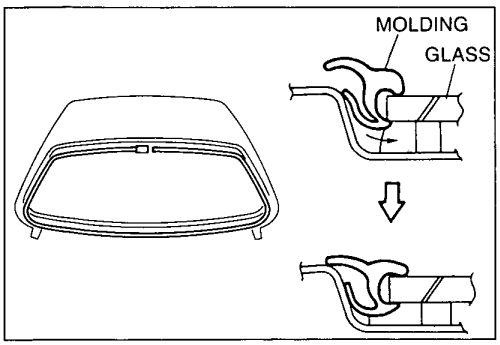
Tightening torque:
2.4—3.3 N·m (24—34 cm-kg, 21—29 in-lb)

10. Use a scraper to smooth away any sealant that oozes out. Add more sealant to any points of poor contact.

Hardening time of repair seal

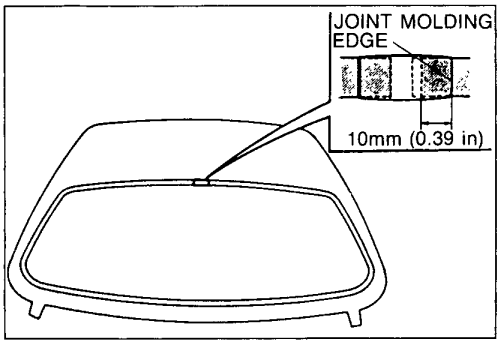
Temperature	Surface hardening time	Time required until car can be put into service
5°C (41°F)	Approx. 1.5 hr	12 hr
20°C (68°F)	Approx. 1 hr	4 hr
35°C (95°F)	Approx. 10 min	2 hr

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95A0SX-058

11. Install the new rear window molding to the glass, as shown.



95A0SX-059

12. If the molding is too long, cut the excess molding **10mm (0.39 in)** inside the joint molding edge.

13. Check for water leaks.
14. If a leak is found, wipe the water off well and remove the molding and rear window glass. Reinstall the glass and replace the molding with new molding.

95A0SX-060

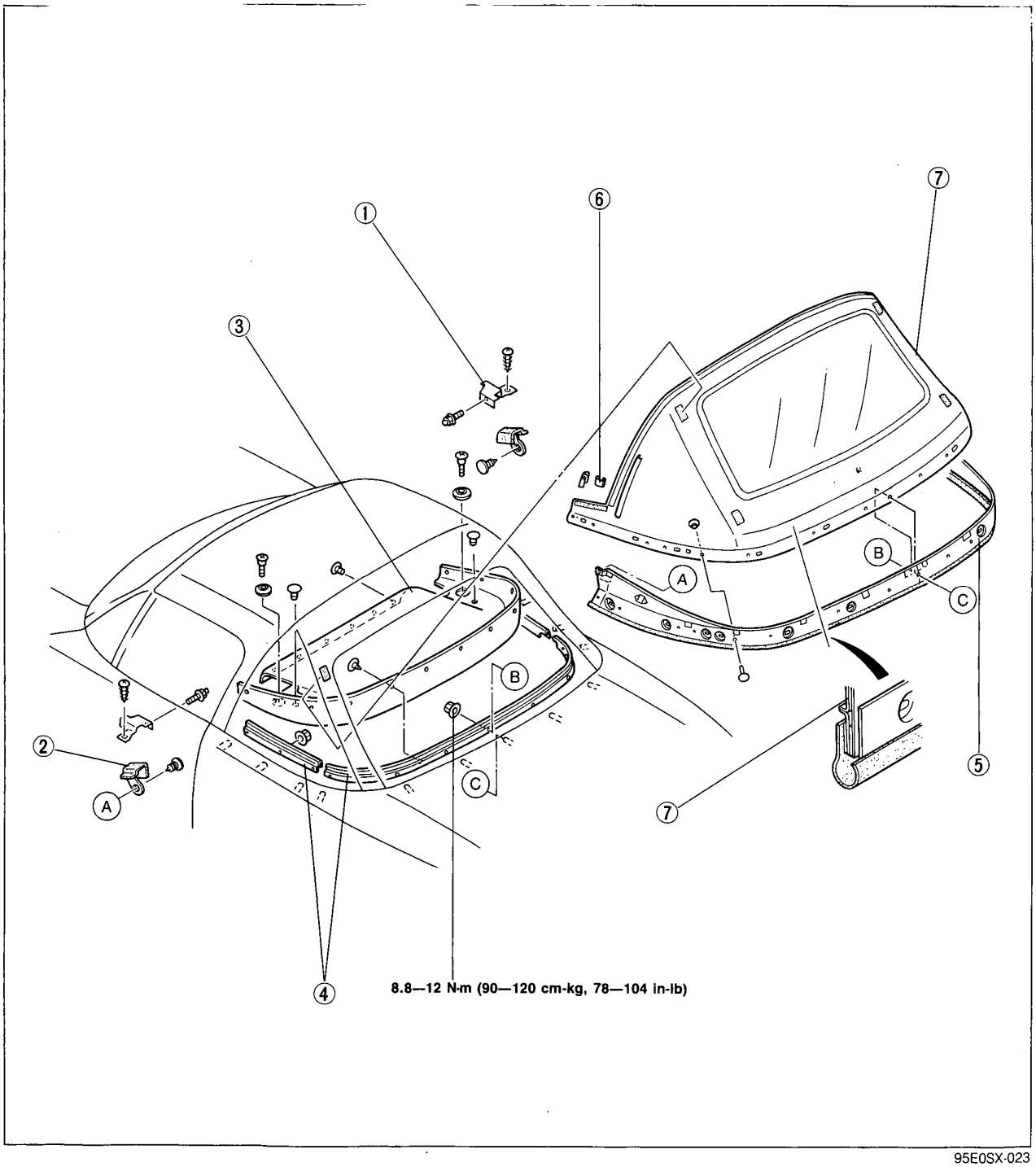
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REAR WINDOW (CONVERTIBLE TOP)

COMPONENTS

Removal / Installation

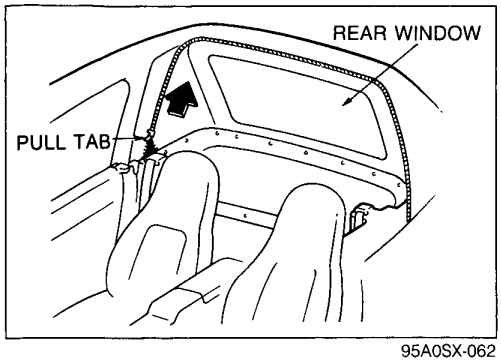
1. Remove in the order shown in the figure, referring to **Removal Note**.
2. Install in the reverse order of removal, referring to **Installation Note**.



95E0SX-023

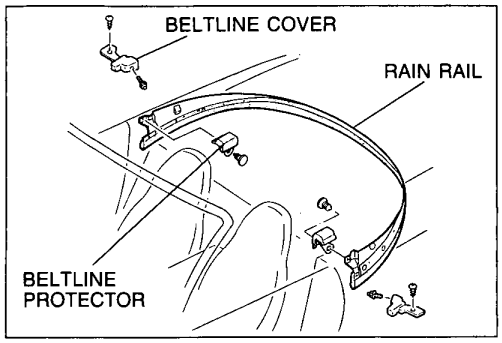
1. Beltline cover
2. Beltline protector
3. Rear package trim
4. Set plate
5. Rain rail
6. Zipper stop
7. Rear window
   - Removal Note ..... page S–53
   - Installation Note ..... page S–54

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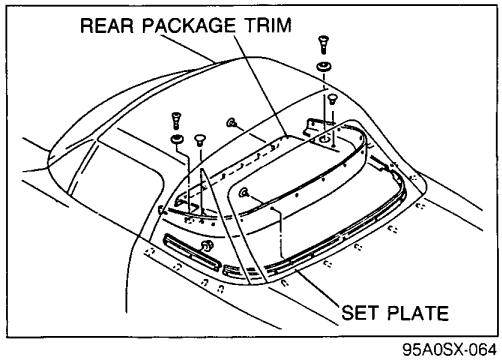
95A0SX-062

Removal Note
Rear window
1. Unlock the top latch assemblies.
2. Unzip the rear window, and lower the convertible top fully.



95A0SX-063

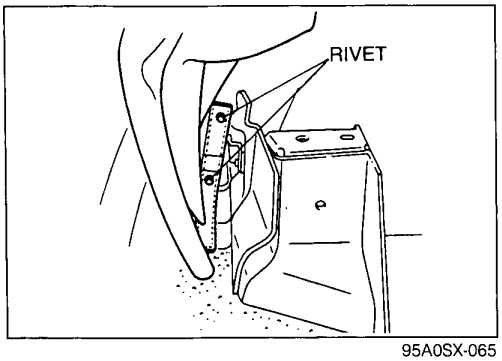
3. Remove the beltline covers.
4. Remove the beltline protector mounting fasteners from the body, and remove the beltline protectors.



95A0SX-064

Note
- **Raise the convertible top fully.**
- **Do not lock the top latch assemblies.**

5. Remove the rear package trim.
6. Remove the set plates.

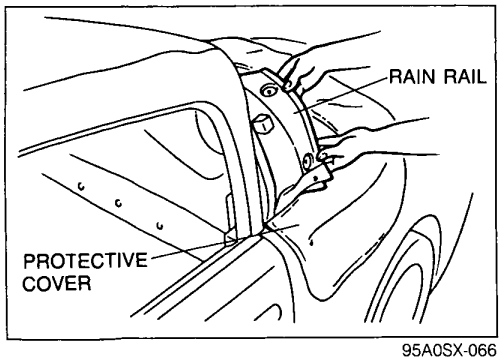


95A0SX-065

7. Remove the rain rail from the studs.
8. Remove the rivets from the link assembly with a drill.

Drill size: ϕ4.0mm (ϕ0.16 in)

Note
- **Remove any accumulated dirt, etc.**

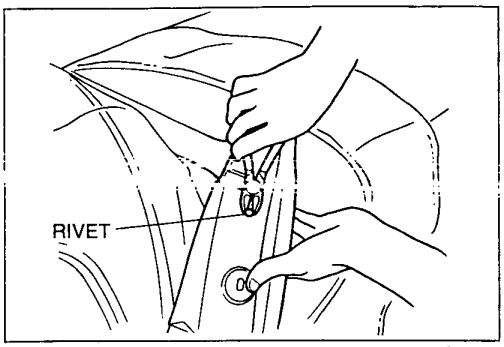


95A0SX-066

Caution
- **Cover the body to prevent it from damage.**

9. Remove the rain rail from the body.

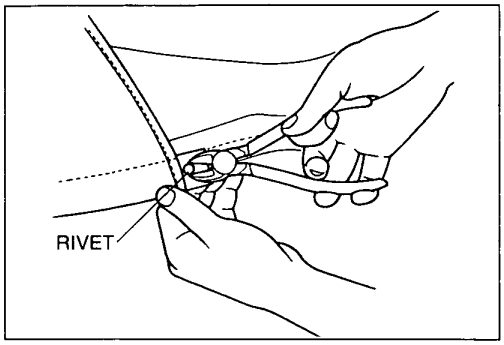
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95A0SX-067

10. Remove the rivets from the rain rail with a cutter, and remove the rain rail from the convertible top.

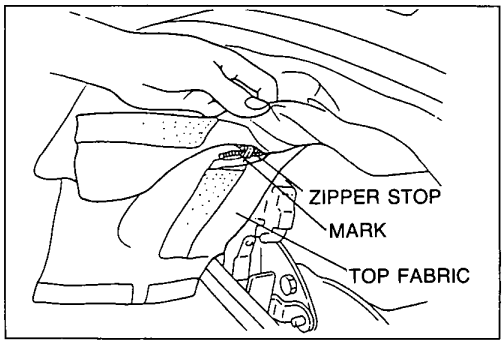
Note
- **Do not damage the rain rail.**



95A0SX-068

11. Remove the rivets from the rear window with a cutter.

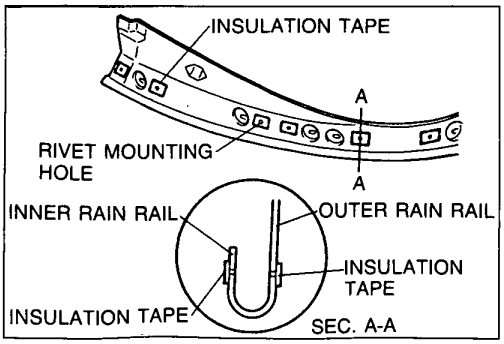
Note
- **Do not damage the rear window.**



95A0SX-069

12. Peel apart the Velcro.
13. Carefully remove the zipper stops from the rear window and top fabric, and remove the rear window.

Note
- **Save the zipper stops for reuse.**
- **Mark the zipper stops and top fabric with paint for proper reassembly.**



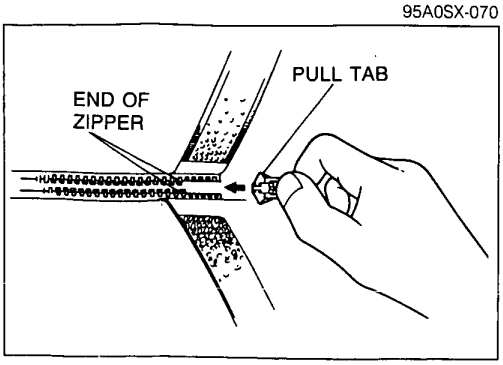
95A0SX-070

Installation Note
Rear window

Note
- **Cover the rear package trim installation area with thick cloth to protect rear window.**

1. Degrease the rain rail with ethyl alcohol.
2. Install insulation tape to the rivet mounting holes of the rain rail.

Insulation tape
Width : 20mm (0.79 in)
Length: 20mm (0.79 in)

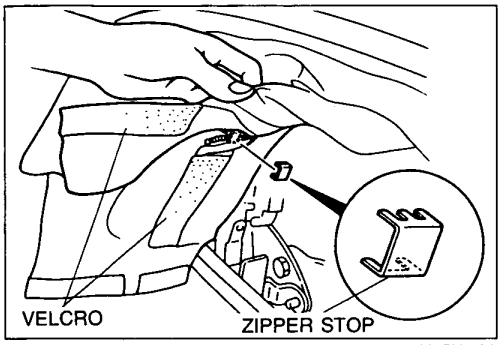


95A0SX-071

3. Align the ends of the zipper, and install the zipper pull tab.
4. Zip the rear window into place.

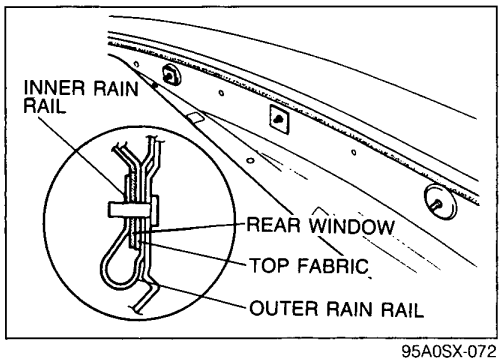
Note
- **If there is any sagging of the top fabric, remove the pull tab and realign the zipper.**

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05U0SX-096

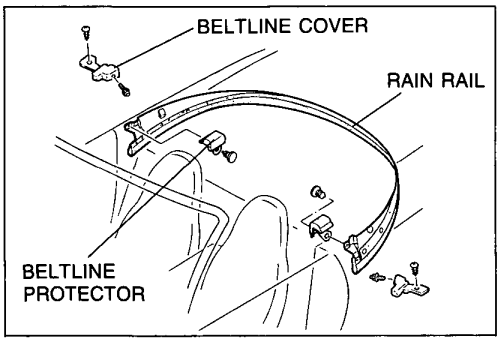
5. Install the zipper stops to the rear window and the top fabric.
6. Affix the rear window to the top fabric with the Velcro.



95A0SX-072

7. Insert the outer rain rail into the beltline molding lip, and mount it over the studs.
8. Mount the top fabric over the studs.
9. Mount the rear window over the studs.
10. Mount the inner rain rail over the studs.
11. Loosely install the set plates.

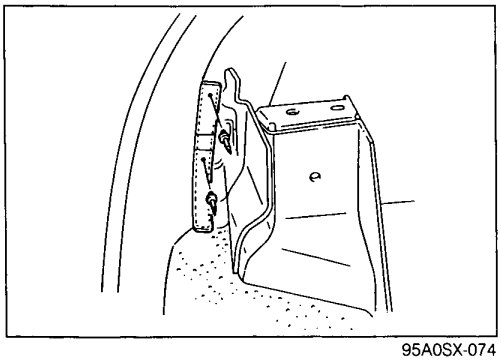
Note
- **Install the set plates beginning at the left side.**



95A0SX-073

Note
- **Unzip the rear window, and lower the convertible top fully.**

12. Install the beltline protectors with the fasteners.
13. Install the beltline cover.



95A0SX-074

Note
- **Raise the convertible top fully, and lock the top latch assemblies.**
- **Zip the rear window into place.**

14. Tighten the set plate mounting nuts.

Tightening torque:
8.8—12 N·m (90—120 cm-kg, 78—104 in-lb)

15. Rivet the top fabric to the link assembly.
16. Install the rear package trim.
17. It there is any sagging of the top fabric, remove the pull tab and realign the zipper.

95A0SX-075

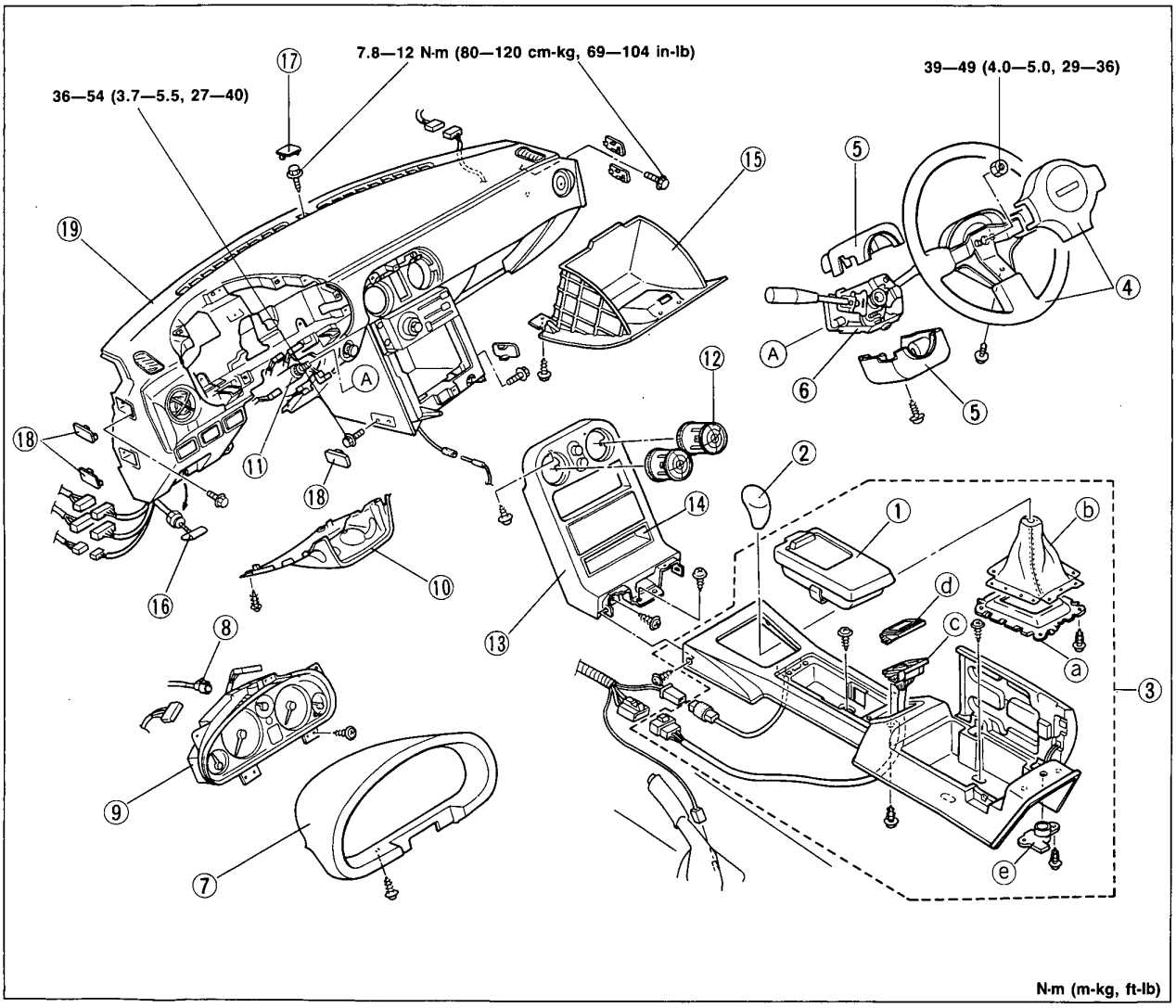
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DASHBOARD AND CONSOLE

COMPONENTS
Removal / Installation

Note
- **Remove the control wires of the heater unit and blower unit for removal of the dashboard.**

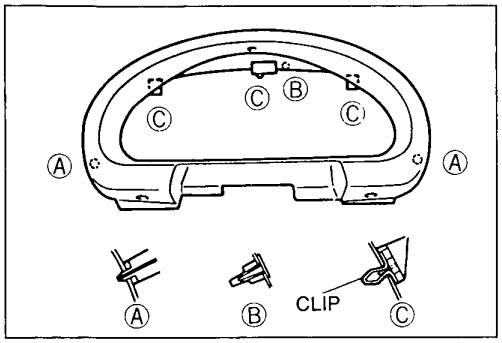
1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure, referring to **Installation Note**.
3. Install in the reverse order of removal, referring to **Removal Note**.



95E0SX-024

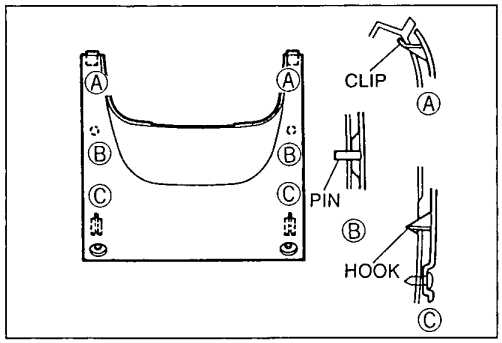
1. Ashtray
2. Shift lever knob
3. Rear console assembly
   a. Boot plate
   b. Shift lever boot
   c. Power window switch
   d. Cover (Without power windows)
   e. Console lock assembly
4. Horn cap and steering wheel
5. Column cover
6. Combination switch
7. Meter hood assembly
   Removal Note .. page S–57
8. Speedometer cable
9. Instrument cluster
10. Center lower panel assembly
    Removal Note .. page S–57
11. Steering shaft
12. Center louver
    Removal Note .. page S–57
13. Center panel assembly
    Removal Note .. page S–57
14. Box
15. Glove box assembly
16. Bonnet release knob
17. Center hole cover
    Removal Note .. page S–58
18. Side cover
    Removal Note .. page S–57
19. Dashboard
    Installation Note page S–58

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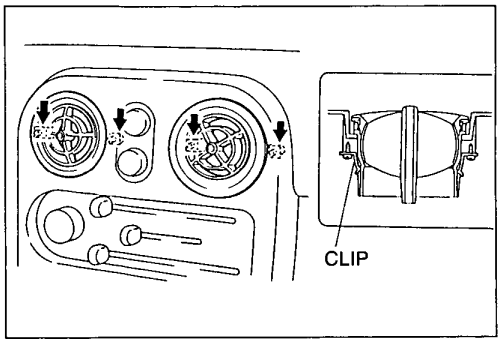
95A0SX-077

Removal Note
Meter hood assembly
1. Remove the meter hood assembly mounting screws.
2. Pull the meter hood assembly forward to remove it.



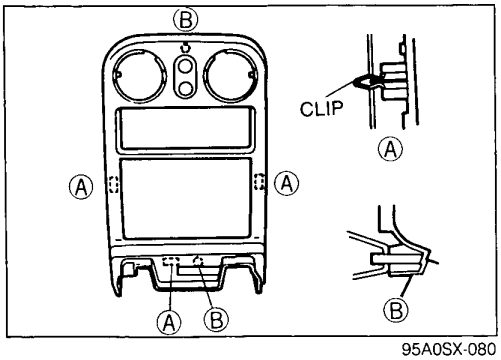
95A0SX-078

Center lower panel assembly
1. Remove the center lower panel assembly mounting screws.
2. Pull the center lower panel assembly forward to remove it.



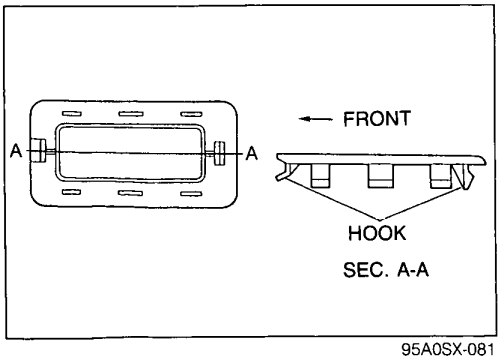
95A0SX-079

Center louver
1. Remove the center louver with a protected screwdriver.



95A0SX-080

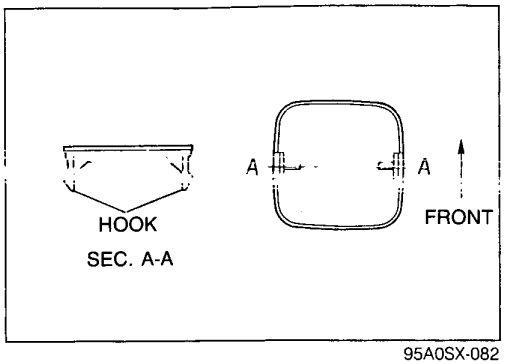
Center panel assembly
1. Remove the center louver. (See above.)
2. Remove the center panel assembly mounting screws.
3. Pull the center panel assembly forward to remove it.



95A0SX-081

Side cover
1. Unhook the side cover from the dashboard with a protected screwdriver.

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95A0SX-082

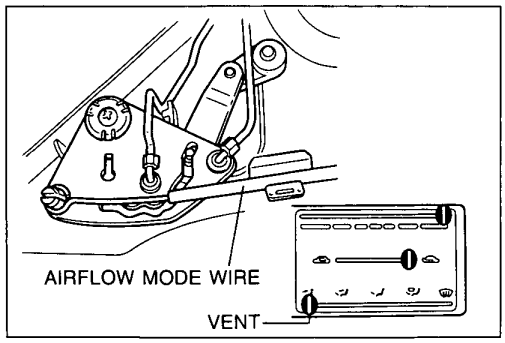
Center hole cover

1. Unhook the cover from the dashboard with a protected screwdriver.

Installation Note
Dashboard

1. Install the control wires to the heater unit and blower unit as described below after installing the dashboard.

95A0SX-083



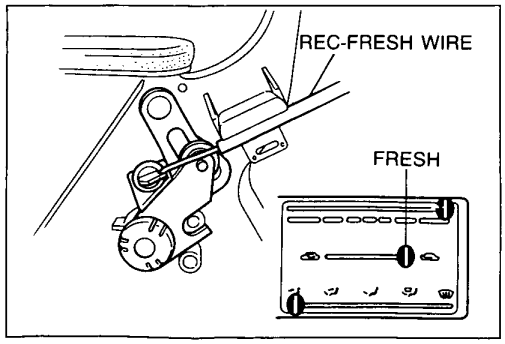
95A0SX-084

Airflow mode wire

1. Set the airflow mode control lever to Vent position.
2. Connect and clamp the wire with the shutter lever on the heater unit at its closest point.

Caution

- **After installation, move the airflow mode control lever to verify that the wire is securely attached, and that it moves the full stroke from Defrost to Vent.**



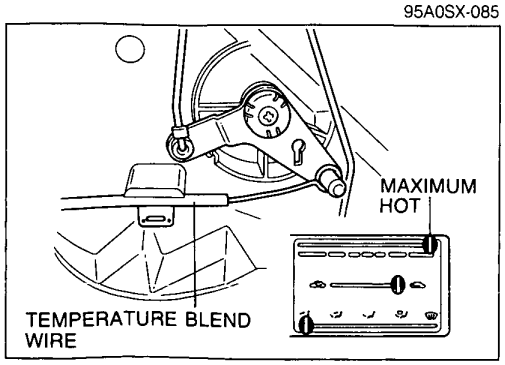
95A0SX-085

REC-FRESH wire

1. Set the selector lever to Fresh position.
2. Connect and clamp the wire with the shutter lever on the blower unit at its closest point.

Caution

- **After installation, move the Rec-Fresh lever to verify that the wire is securely attached, and that it moves the full stroke from Recirculation to Fresh.**



95A0SX-086

Temperature blend wire

1. Set the temperature blend lever to Max-Hot position.
2. Connect and clamp the wire with the shutter lever on the heater unit fully to the right.

Caution

- **After installation, move the temperature blend lever to verify that the wire is securely attached, and that it moves the full stroke from Hot to Cold.**

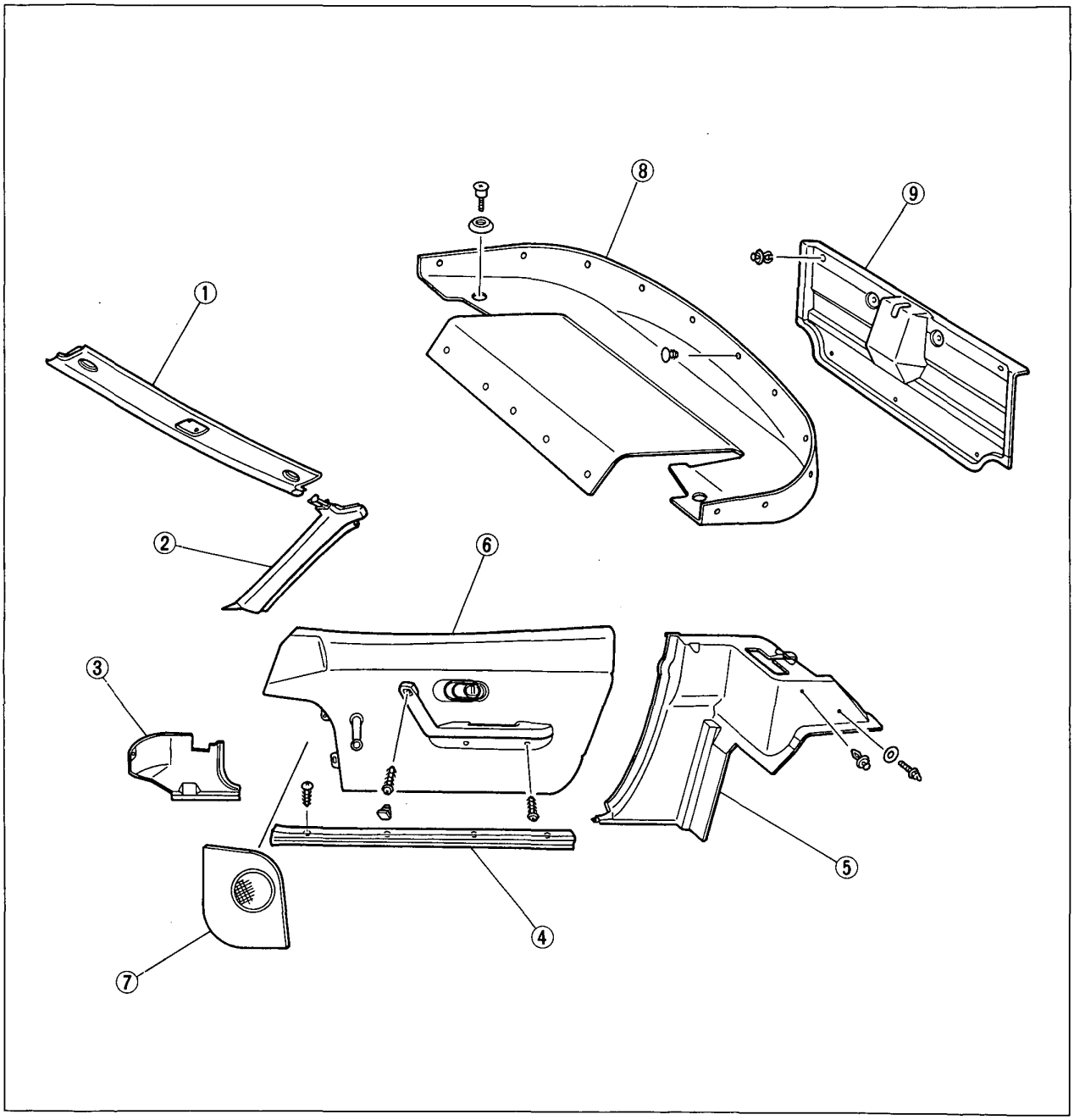
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TRIM

COMPONENTS

Removal / Installation

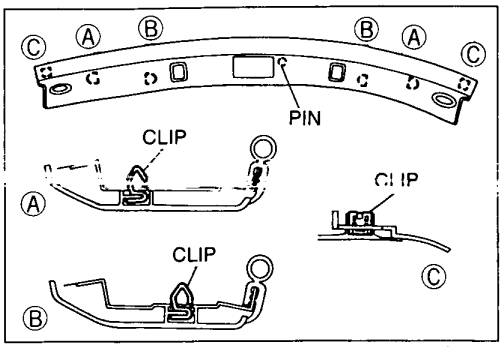
1. Remove the trim clips and fasteners, and remove in the order shown in the figure, referring to **Remove Note**.
2. Install in the reverse order of removal.



95E0SX-025

1. Front header trim
   Removal Note..... page S–60
2. A-pillar trim
   Removal..... page S–60
3. Front side trim
   Removal Note..... page S–60
4. Scuff plate
   Removal Note..... page S–60
5. Quarter trim
   Removal Note..... page S–60
6. Door trim
   Removal Note..... page S–61
7. Speaker grille
   Removal Note..... page S–61
8. Rear package trim
9. Trunk end trim

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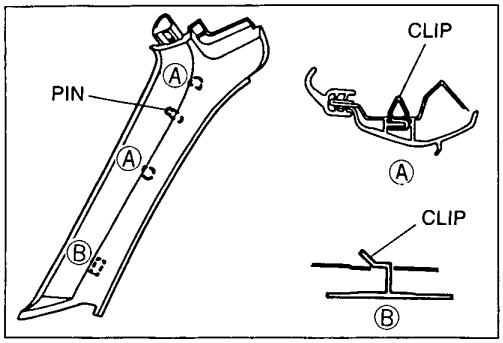


95A0SX-088

Removal Note

Front header trim

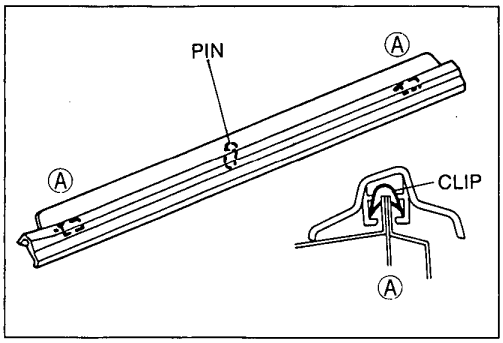
1. Remove the rearview mirror and sunvisors.
2. Pull the front header trim downward to remove it.



95A0SX-089

A-pillar trim

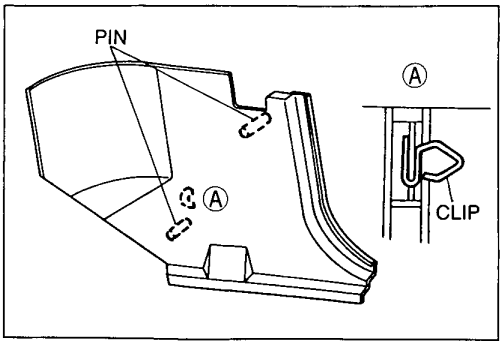
1. Remove the front header trim. (See above.)
2. Remove the weatherstrip.
3. Pull the A-pillar trim forward, and remove clips Ⓐ from the body.
4. Pull the A-pillar trim upward to remove it.



95A0SX-090

Scuff plate

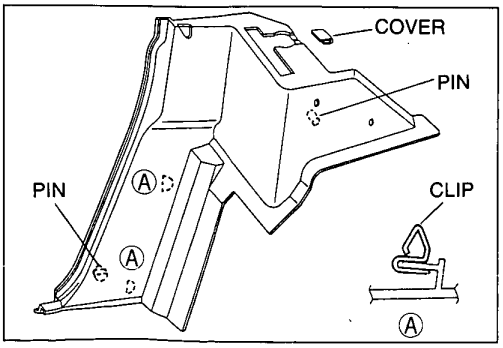
1. Remove the scuff plate mounting screws.
2. Pull the scuff plate upward to remove it.



95A0SX-091

Front side trim

1. Remove the scuff plate. (See above.)
2. Remove the weatherstrip.
3. Pull the front side trim forward to remove it.

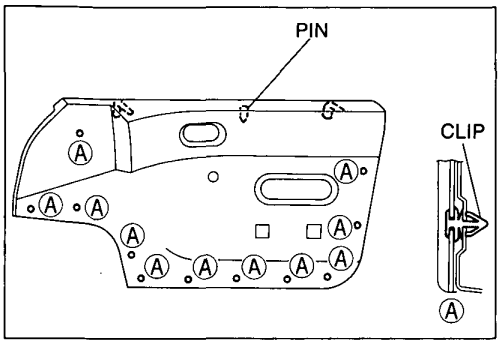


95A0SX-092

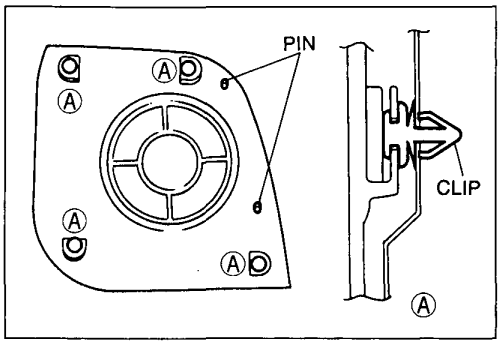
Quarter trim

1. Remove the scuff plate. (See above.)
2. Remove the quarter trim mounting screw and fastener.
3. Remove the side latch striker. (If equipped)
4. Remove the beltline cover.
5. Remove the seaming welt.
6. Pull the quarter trim inward, and remove the cover.
7. Remove the seat belt from the quarter trim, and remove the quarter trim.

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95A0SX-093



95A0SX-094

Speaker grille

1. Pull the speaker grille forward to remove it.

Door trim

1. Remove the speaker grille. (See above.)
2. Remove the armrest and inner handle cover.
3. Pull the door trim forward, and remove the fasteners from the body.
4. Lift up the door trim to remove it.

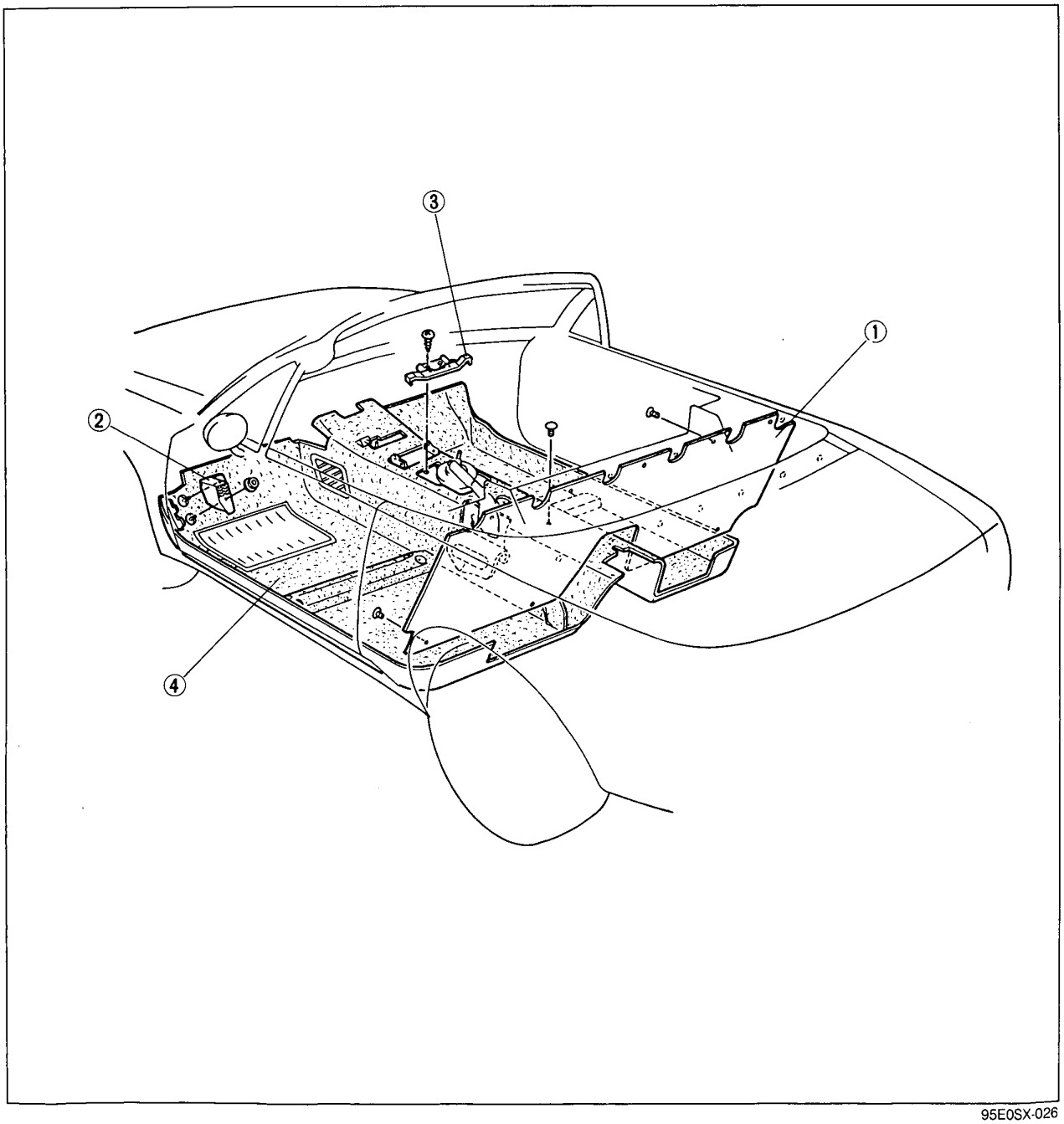
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FLOORMAT

COMPONENTS

Removal / Installation

1. To remove the floormat, first remove the following:
   a) Seats. (Refer to page S-65.)
   b) Dashboard. (Refer to page S-56.)
   c) Heater unit. (Refer to Section U.)
   d) Front side trim, scuff plates, quarter trim, and rear package trim. (Refer to page S-59.)
   e) Front seat belts and buckles. (Refer to page S-63.)
2. Remove the remaining parts in the order shown in the figure.
3. Install in the reverse order of removal.



95E0SX-026

1. Rear end mat
2. Foot rest
3. Bracket
4. Front floormat

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SEAT BELT

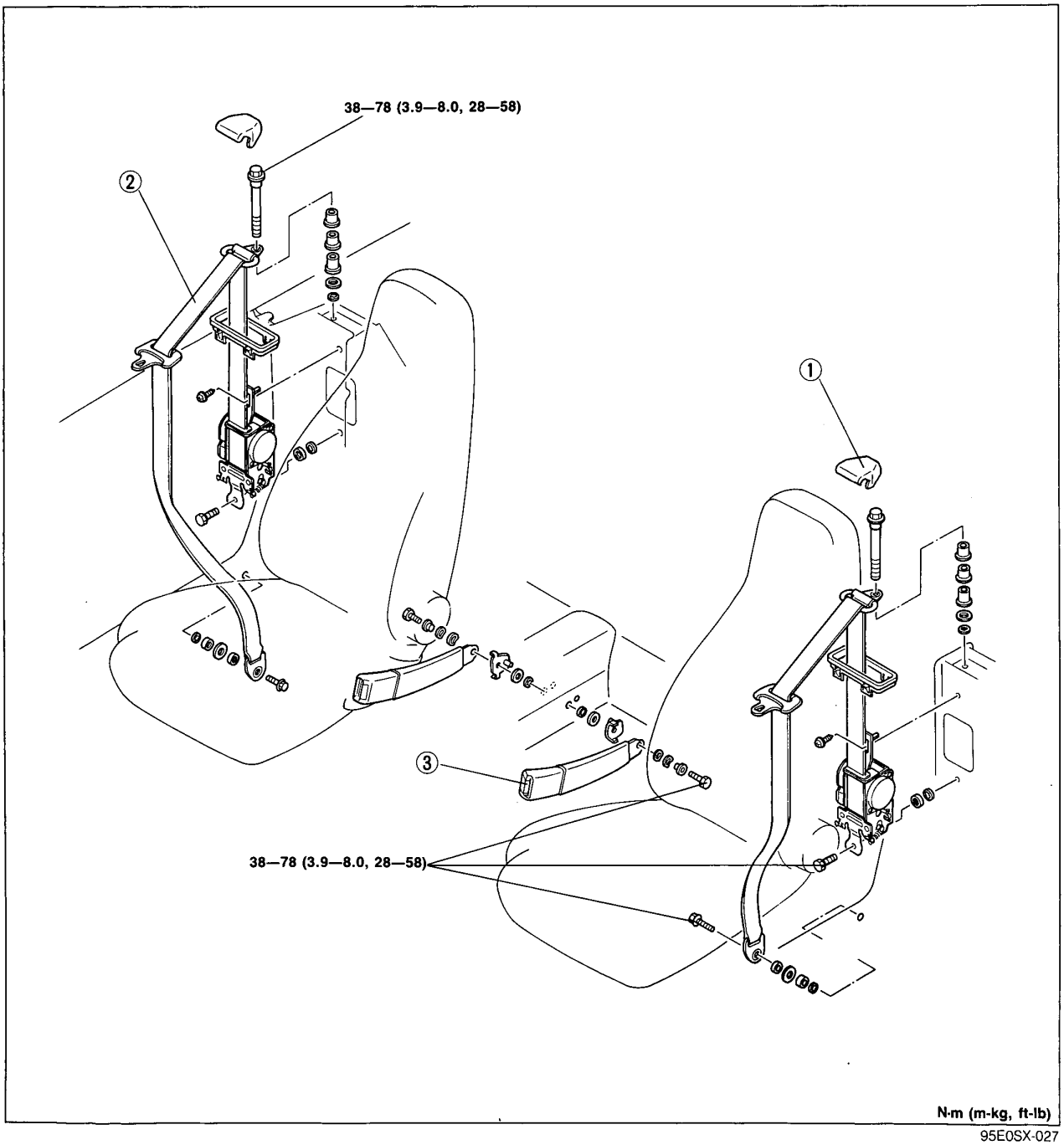
COMPONENTS

Removal / Installation

1. Remove the quarter trim for removal of the seat belt. (Refer to page S–60.)
2. Remove in the order shown in the figure.
3. Install in the reverse order of removal.

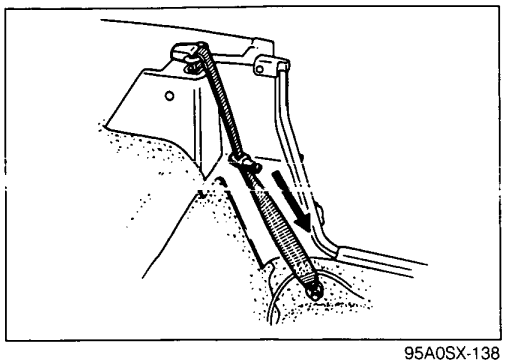
Caution

- **Do not disassemble the buckle or retractor assembly.**

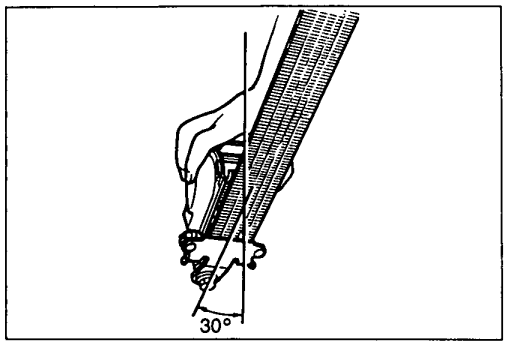


1. Anchor cover
2. Seat belt
   Inspection ..... page S–64
3. Buckle

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95A0SX-138



95G0SX-146

EMERGENCY LOCKING RETRACTOR

Inspection

1. Verify that the belt can be pulled out smoothly, and that it moves smoothly when worn.
2. Verify that the retractor locks when the belt is quickly pulled.
3. Remove the retractor.
4. Hold the retractor as it would be installed.
5. Slowly incline the retractor while pulling out the belt.
6. Verify that the retractor locks at **approx. 30 degrees** inclination.
7. If not as specified, replace the seat belt assembly.

WEBBING

Inspection

1. Inspect the webbing for scars, tears, and wear and for deformation of the fittings.
2. If any problem is found, replace the seat belt assembly.

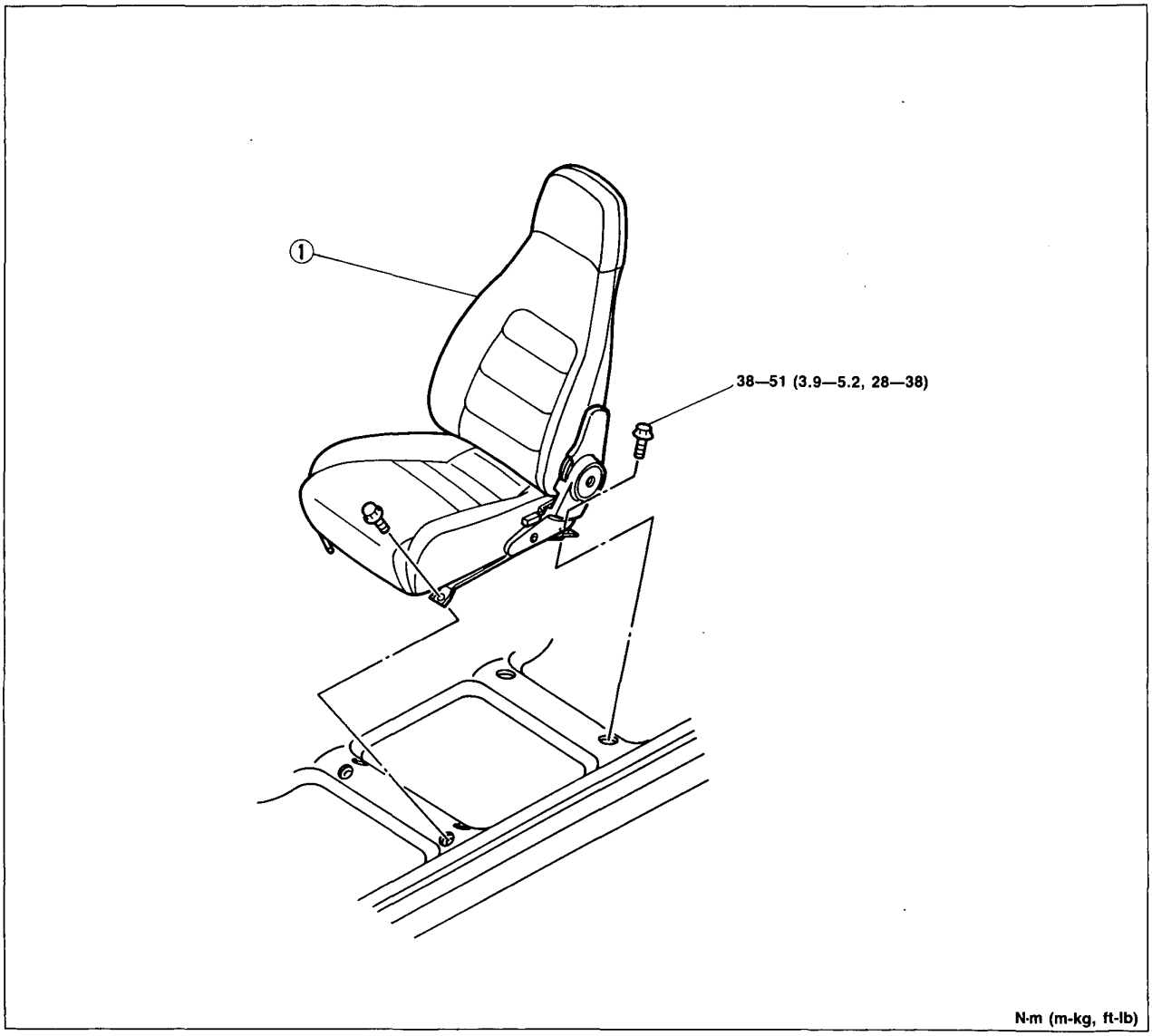
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SEAT

COMPONENTS

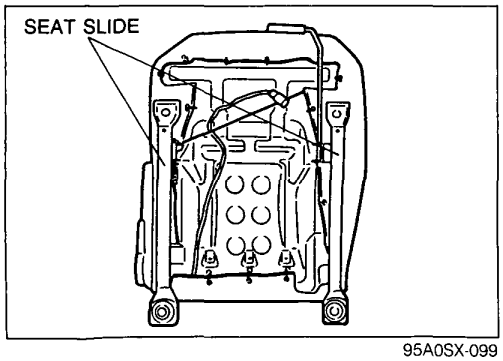
Removal / Installation

1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.



95A0SX-098

1. Front seat
   Inspection..... below



95A0SX-099

SEAT

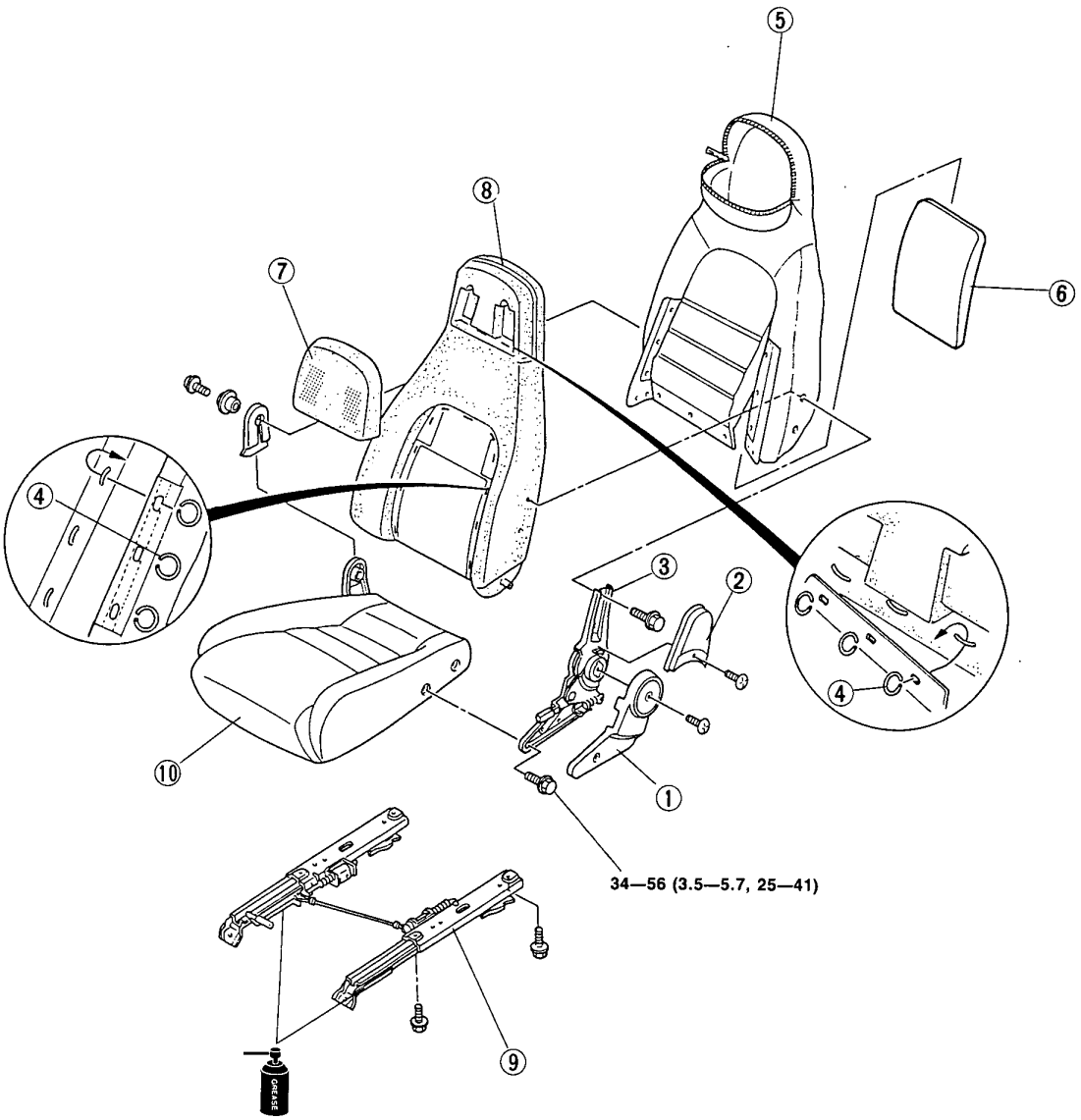
Inspection

1. Verify that the seat adjuster lever and recliner knuckle move smoothly.
2. Check the adjustment lever for wear.
3. Check the front seat mounting bolts for looseness.
4. Check for presences of grease on the seat slides.

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Disassembly / Assembly

1. Disassemble in the order shown in the figure.
2. Assemble in the reverse order of disassembly.



95A0SX-100

1. Recliner knuckle cover
2. Side cover
3. Recliner knuckle
4. Hog ring
5. Seatback trim
6. Pad
7. Speaker cover
8. Back frame
9. Seat slide
10. Seat cushion

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CONVERTIBLE TOP

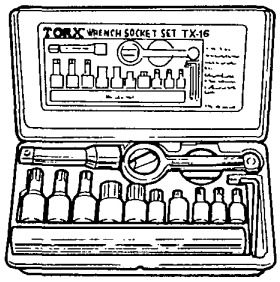
PREPARATION

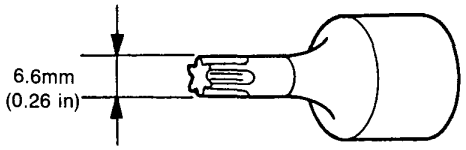
TORX TOOL (T40)	For installation and removal of top latch striker

95A0SX-101

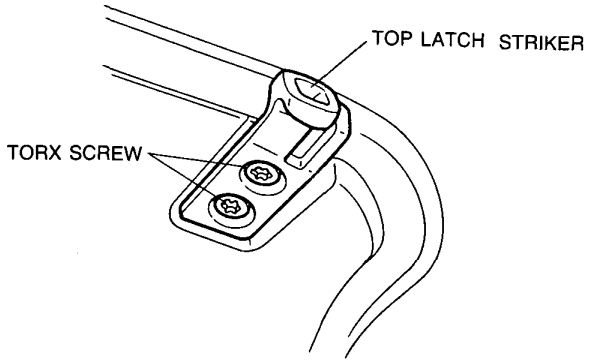
TORX TOOL (T40)

1. ILLUSTRATION





2. LOCATION TORX TOOL MUST BE USED



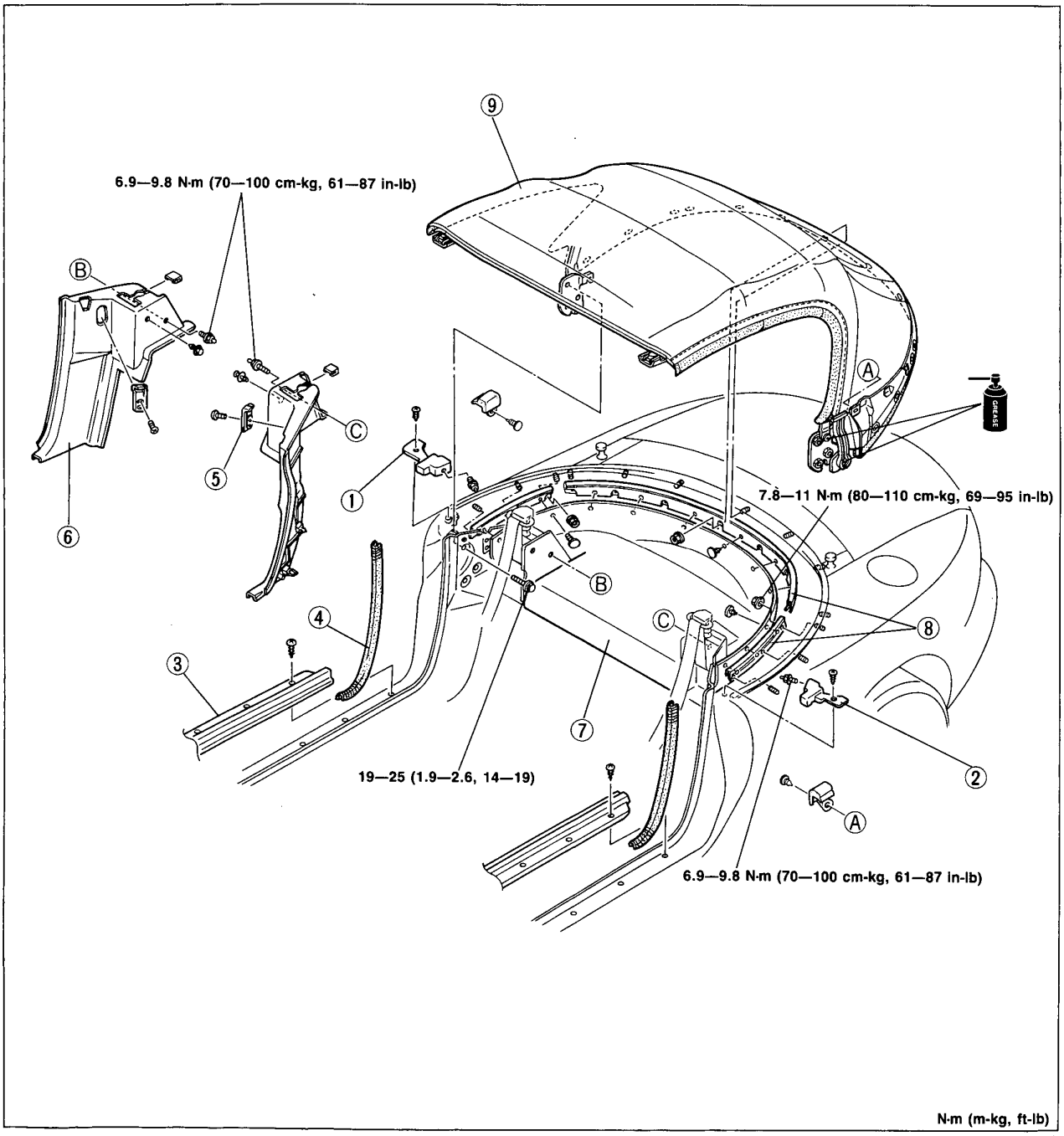
95A0SX-102

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COMPONENTS
Removal / Installation

Note
- **Cover both sides of the rear window with thick cloth to protect it.**

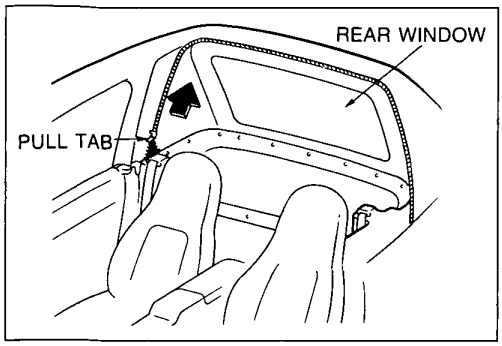
1. Remove in the order shown in the figure, referring to **Removal Note**.
2. Install in the reverse order of removal, referring to **Installation Note**.



95E0SX-028

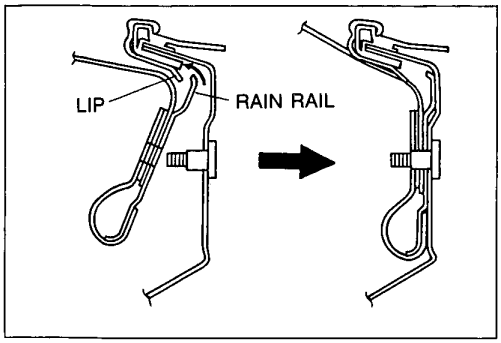
1. Beltline cover
2. Beltline protector
3. Scuff plate
   Removal Note .. page S–60
4. Seaming welt
5. Striker (If equipped)
   Removal / Installation
   ..... page S–82
6. Quarter trim
   Removal Note .. page S–60
7. Rear package trim
8. Set plate
9. Convertible top
   Removal Note .. page S–69
   Installation Note page S–69

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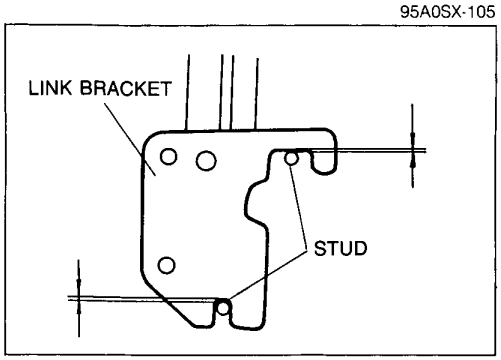
95A0SX-104

Removal Note
Convertible top
1. Unlock the top latch assemblies.
2. Unzip the rear window, and lower the convertible top fully.



95A0SX-105

Installation Note
Convertible top
1. Insert the rain rail into the beltline molding lip, and mount it over the studs.



95A0SX-106

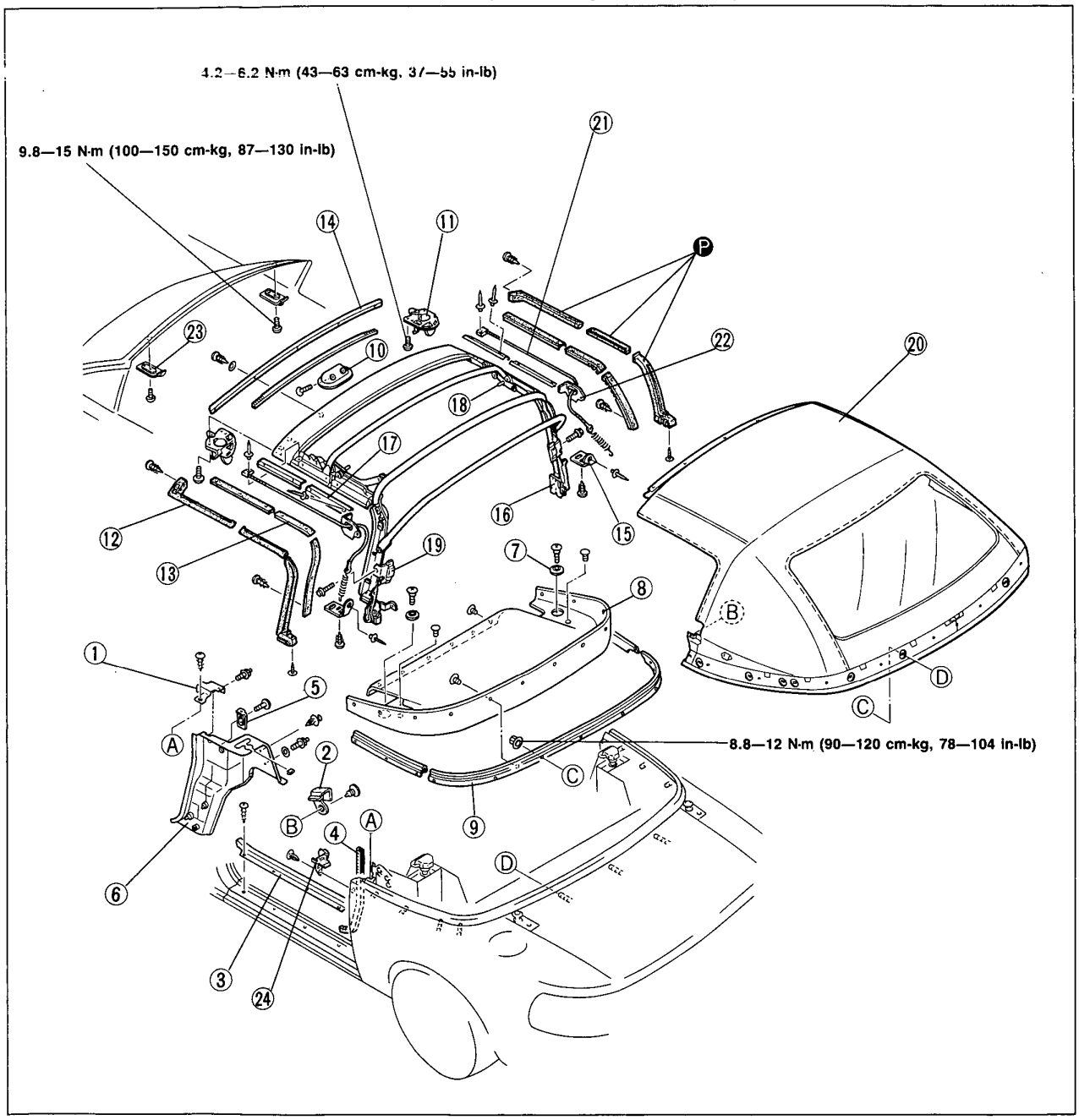
2. Align and install the link bracket over the studs with no clearance between the studs and the bracket.
3. Tighten the bolts to the specified torque.

Tightening torque:
19—25 N·m (1.9—2.6 m-kg, 14—19 ft-lb)

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Disassembly / Assembly

1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Assemble in the reverse order of disassembly, referring to **Assembly Note**.



1. Beltline cover
2. Beltline protector
3. Scuff plate
4. Seaming welt
5. Striker (If equipped)
   Removal / Installation ..... page S–82
6. Quarter trim
7. Stop
8. Rear package trim
9. Set plate
10. Top handle
11. Top latch assembly
    Adjustment ..... page S–84
12. Weatherstrip
    Adjustment ..... page S–86
13. Retainer
14. Set plate
15. End plate
16. Link assembly
17. Protector
18. Link stop
19. Open stop
20. Top fabric
    Disassembly Note ..... page S–71
    Assembly Note. page S–75
21. Cable
22. Cable guide
23. Striker
    Removal / Installation ..... page S–67
24. Cab side weatherstrip

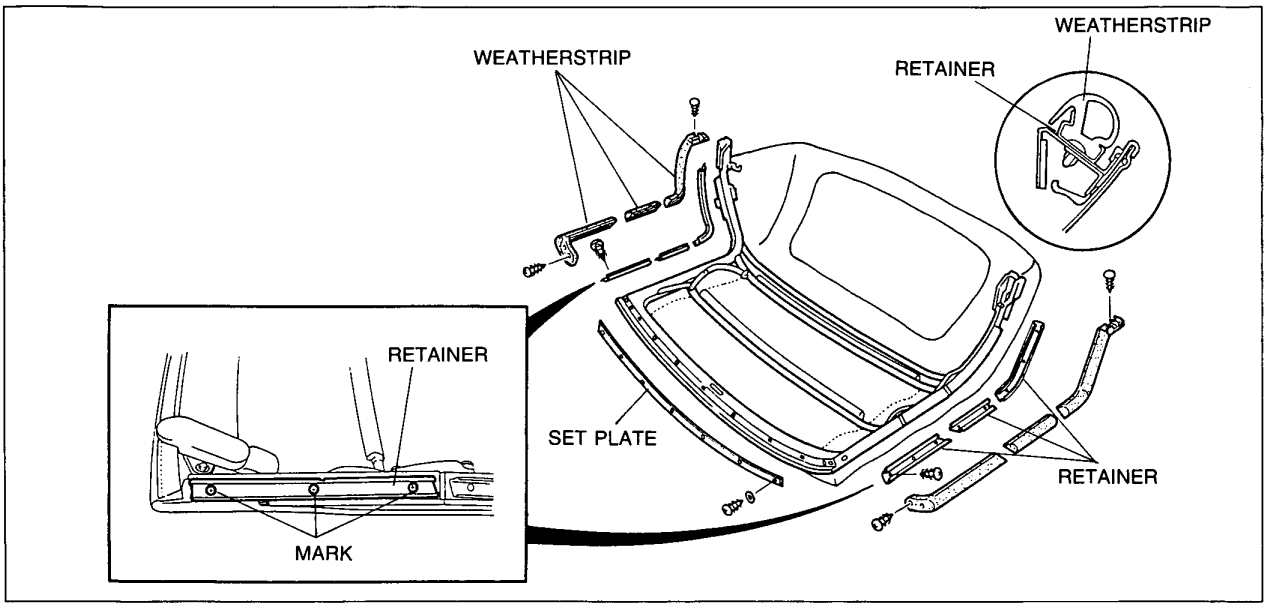
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Disassembly Note
Top fabric

1. Remove the convertible top from the body. (Refer to page S–68.)

Note
- **Set the convertible top upside down on a work bench covered with clean, thick cloth.**
- **Mark around the retainer mounting screws with paint before removing them.**

2. Remove the set plate, weatherstrips, and retainers.

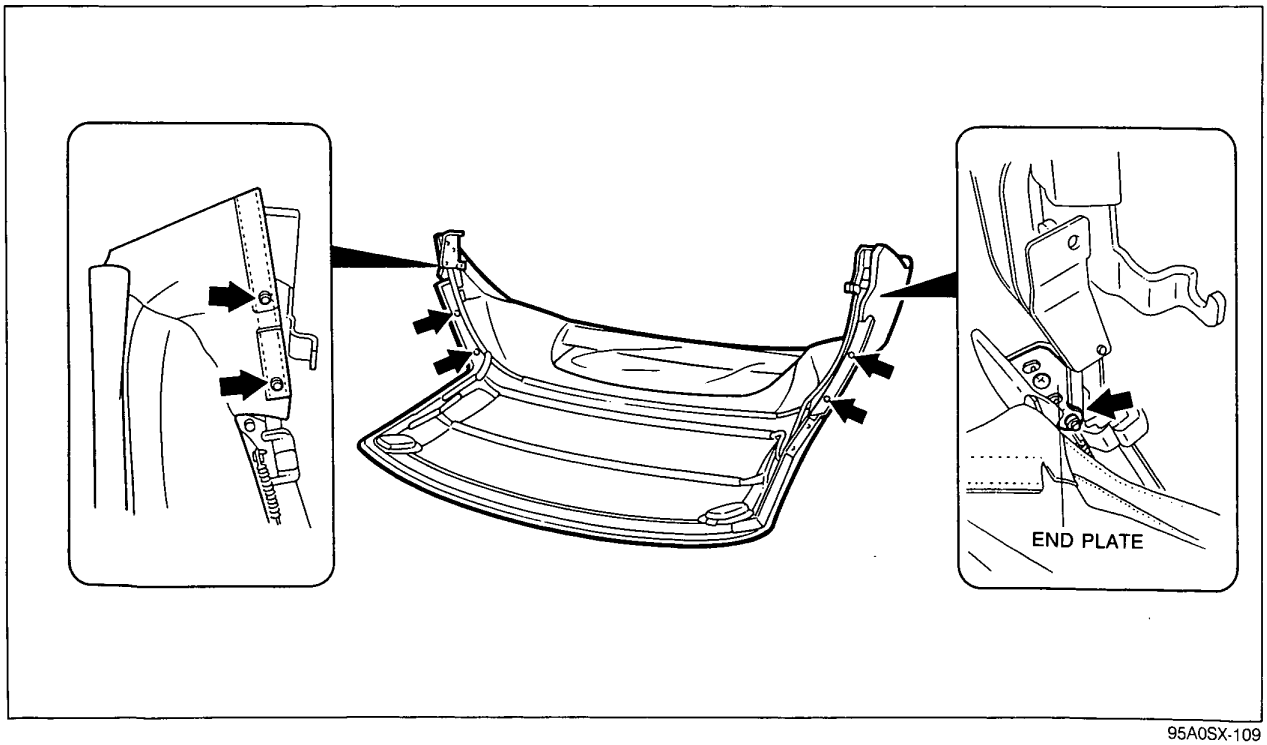


95E0SX-030

3. Remove the rivets (10 pieces) from the link assembly with a drill.

Drill size: ϕ4.0mm (ϕ0.16 in)

4. Remove the screws and remove the end plates from the link assembly.

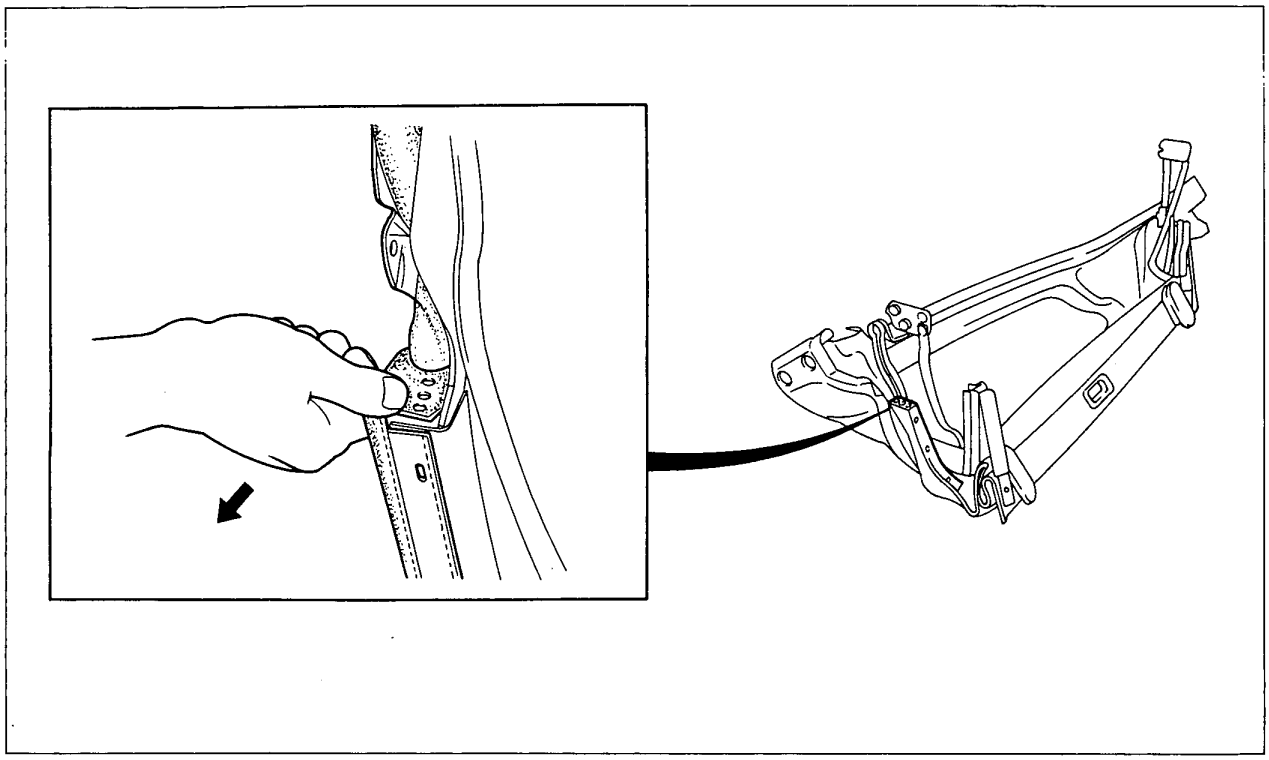


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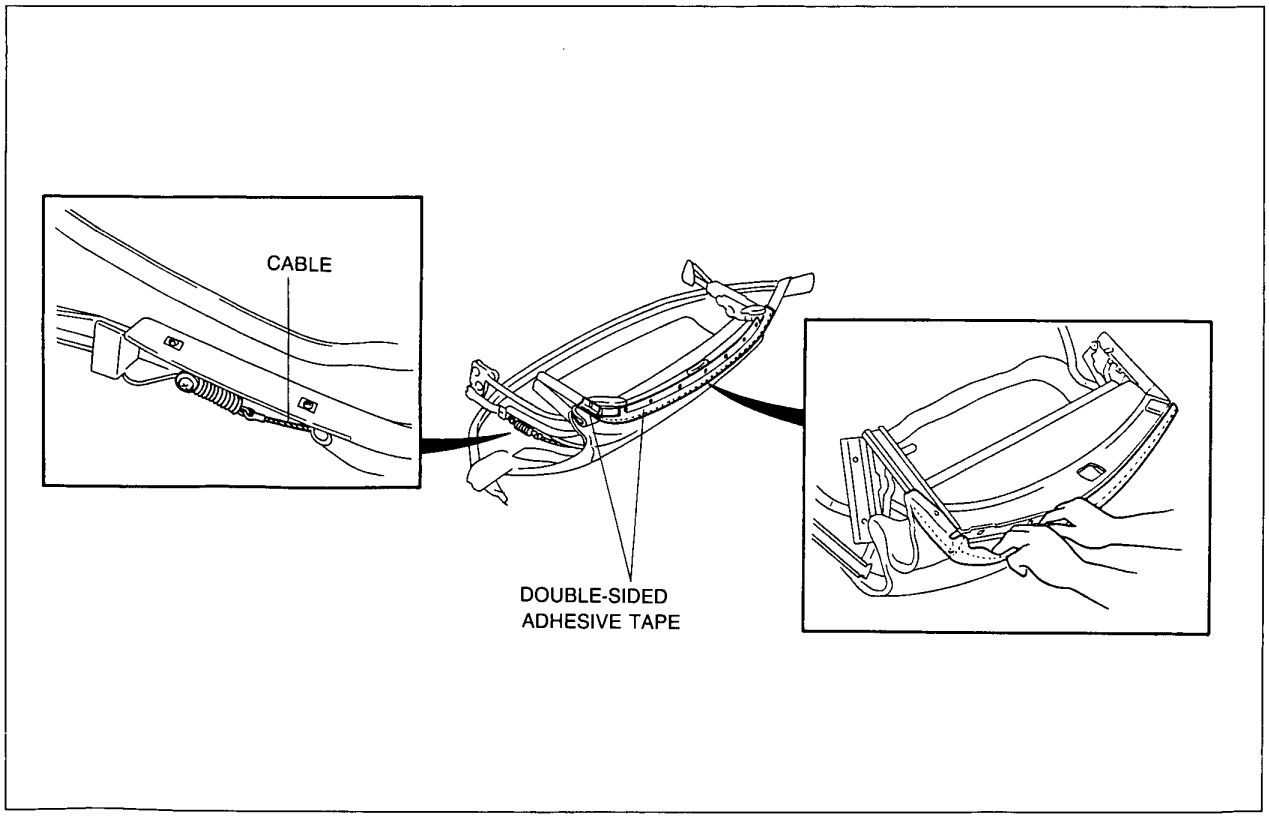
Note
- **Unzip the rear window, and fold the convertible top.**

5. Remove the top fabric from the link assembly.



95A0SX-110

6. Peel back the top fabric from the front header.
7. Remove the screws, and disconnect the cables from the rear of the link assembly.



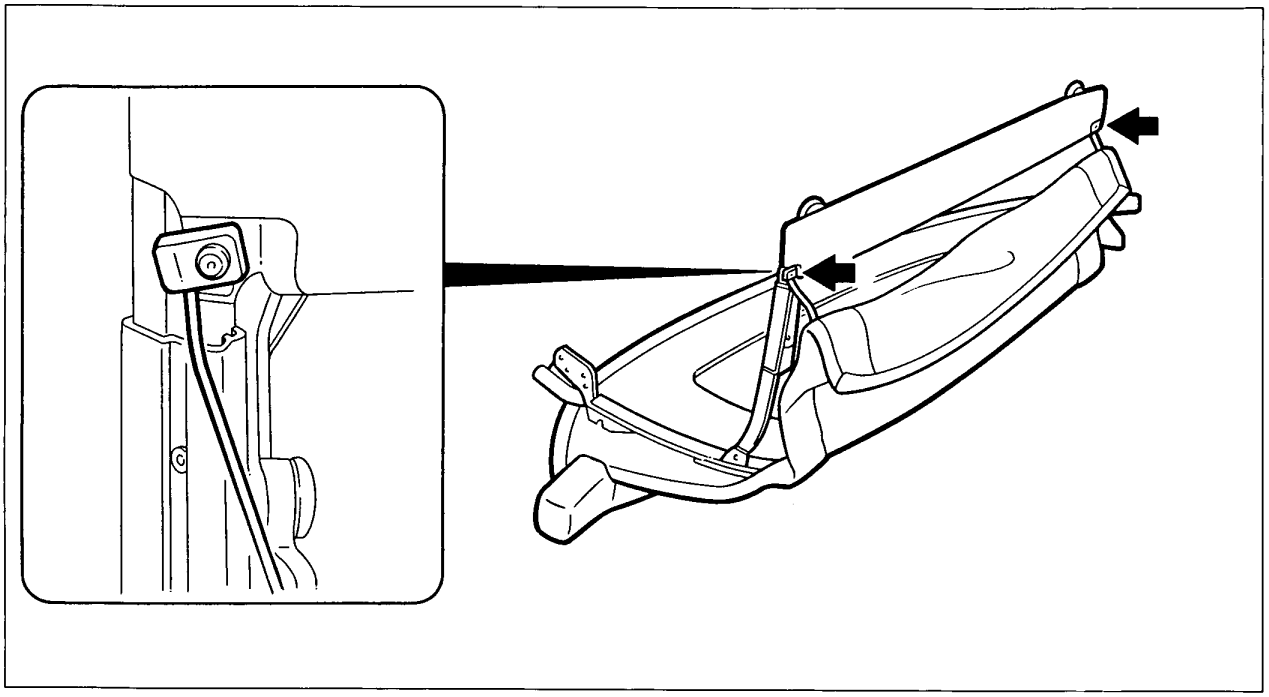
95A0SX-111

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Note
- **Unfold the convertible top, and set it upright.**

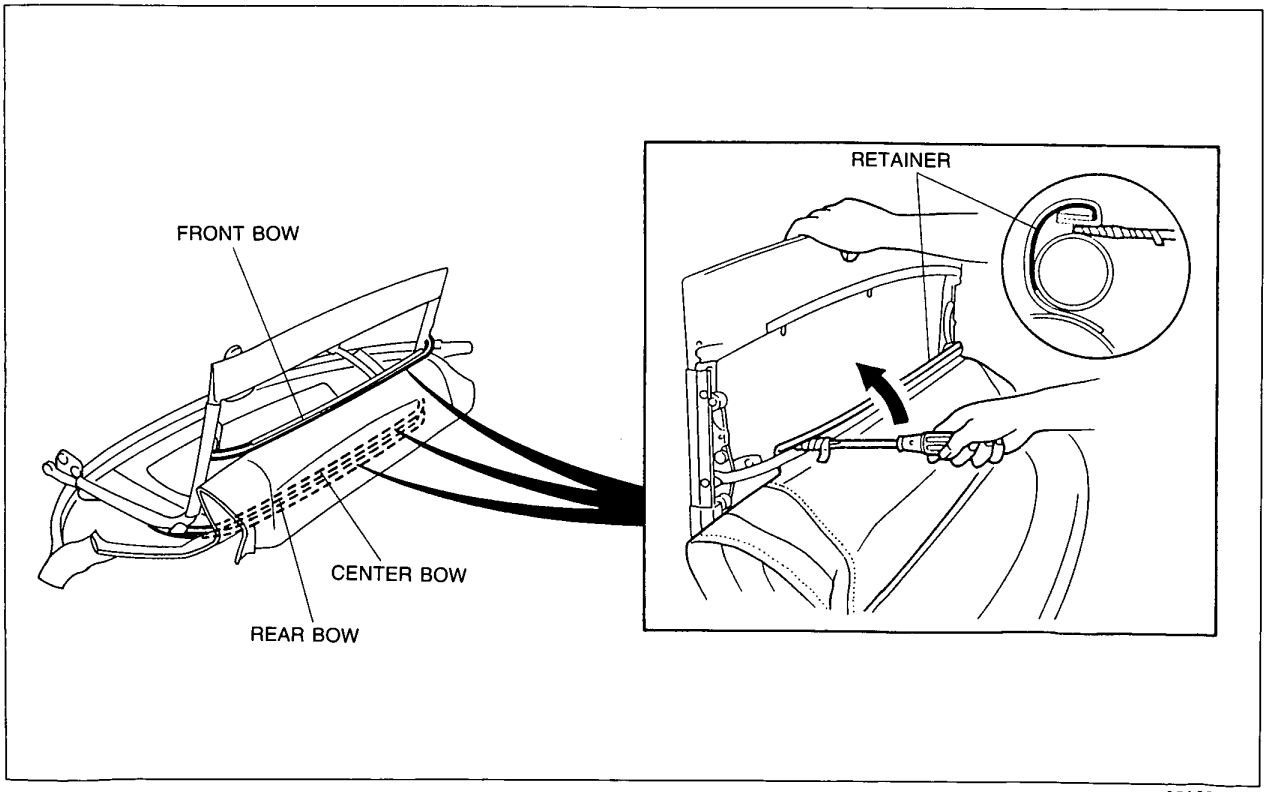
8. Remove the rivets from the link assembly with a drill.

Drill size: ϕ4.0mm (ϕ0.16 in)



95A0SX-112

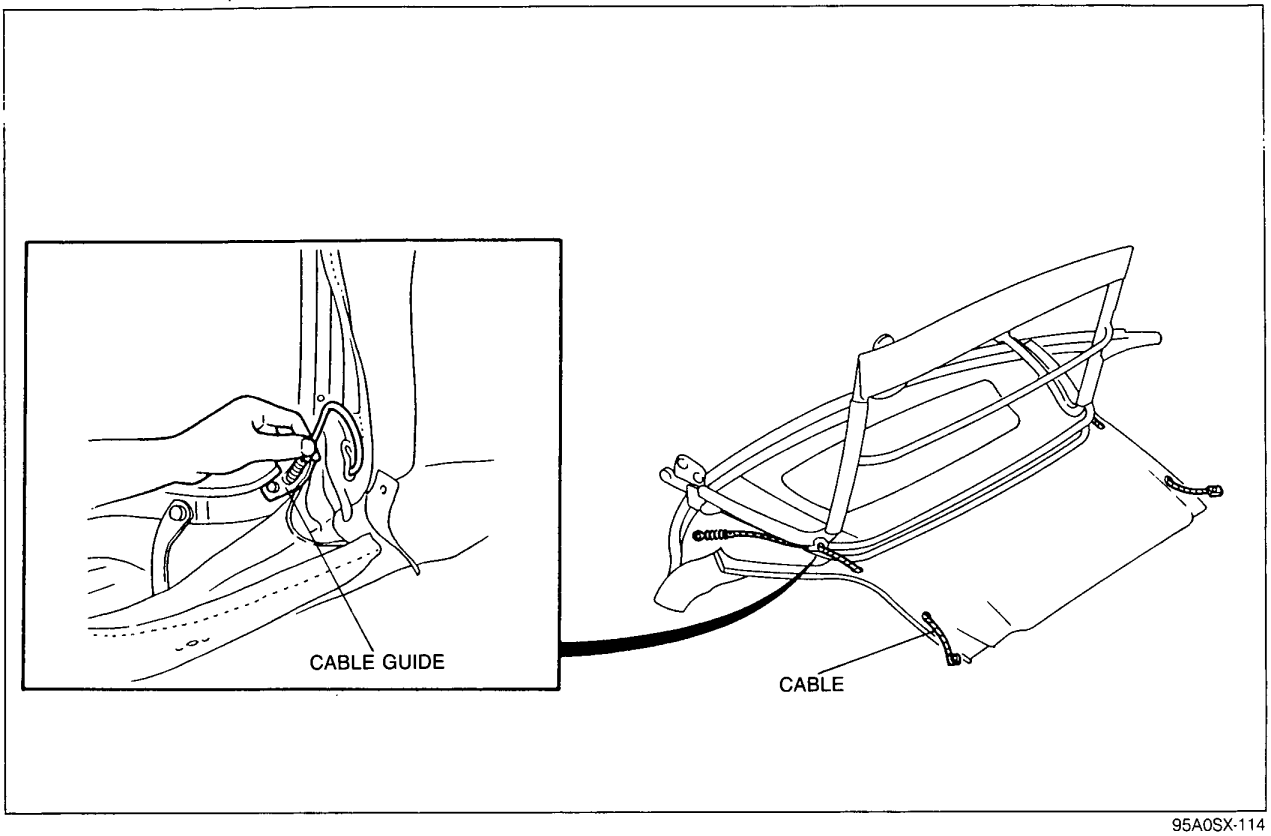
9. Peel off the Velcro at the rear bow.
10. Pry back the bow retainers with a protected screwdriver.
11. Remove the top fabric from the bow retainer.



95A0SX-113

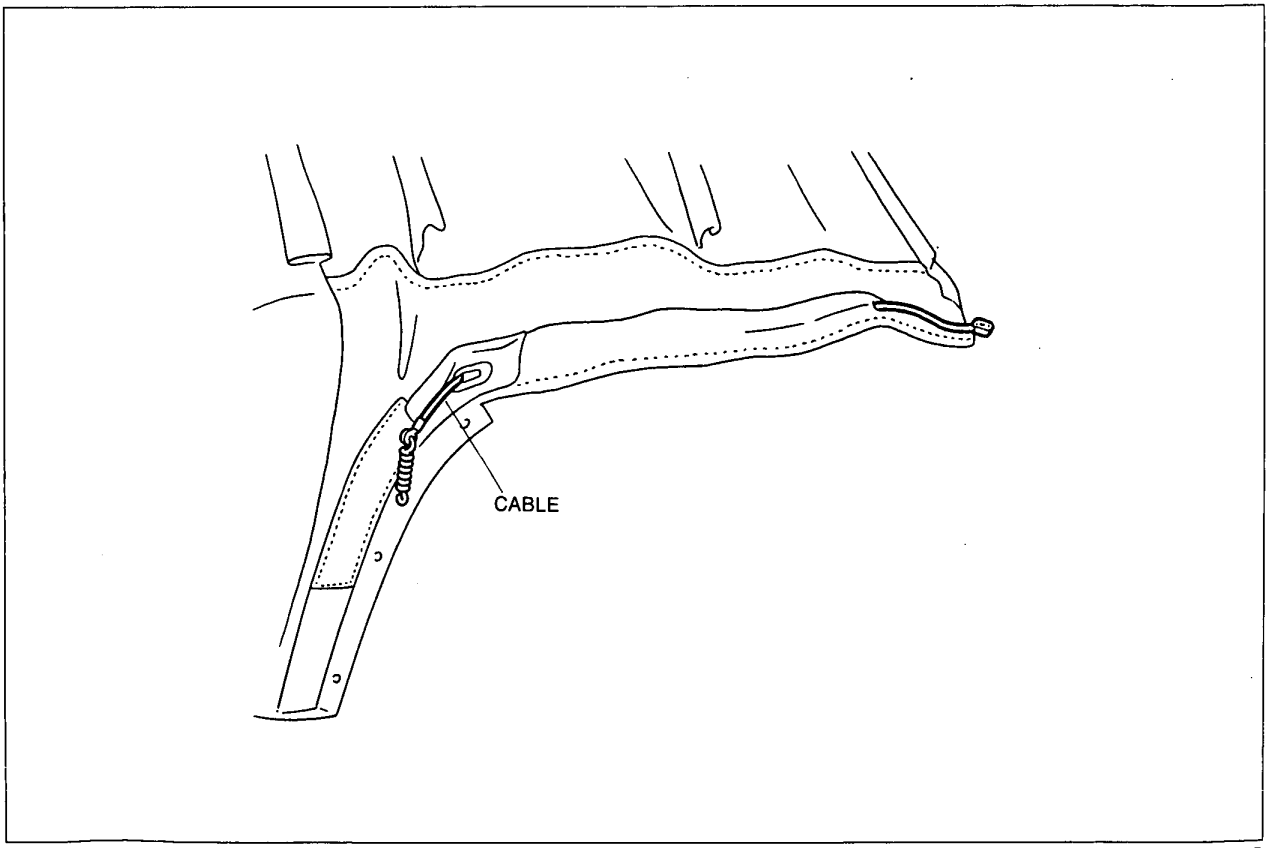
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12. Remove the cables from the cable guides.
13. Remove the top fabric and cables from the link assembly.



95A0SX-114

14. Remove the cables from the top fabric.



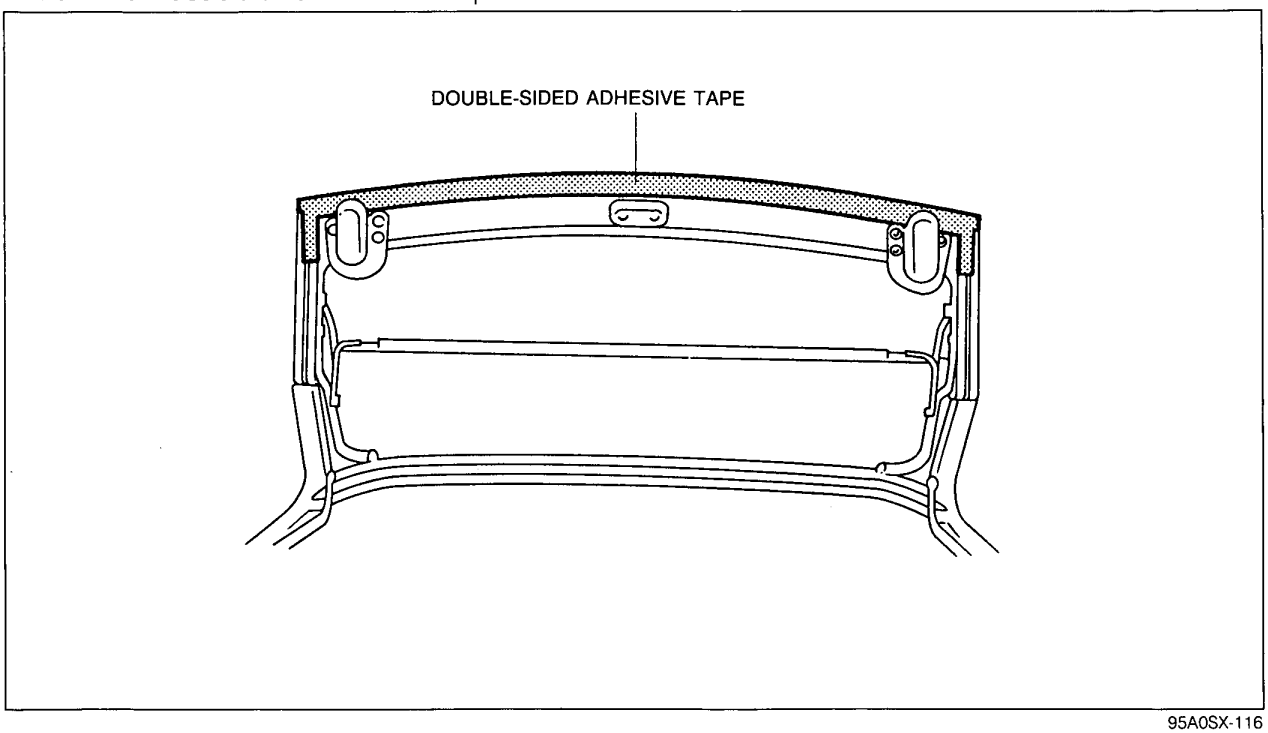
95A0SX-115

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Assembly Note
Top fabric

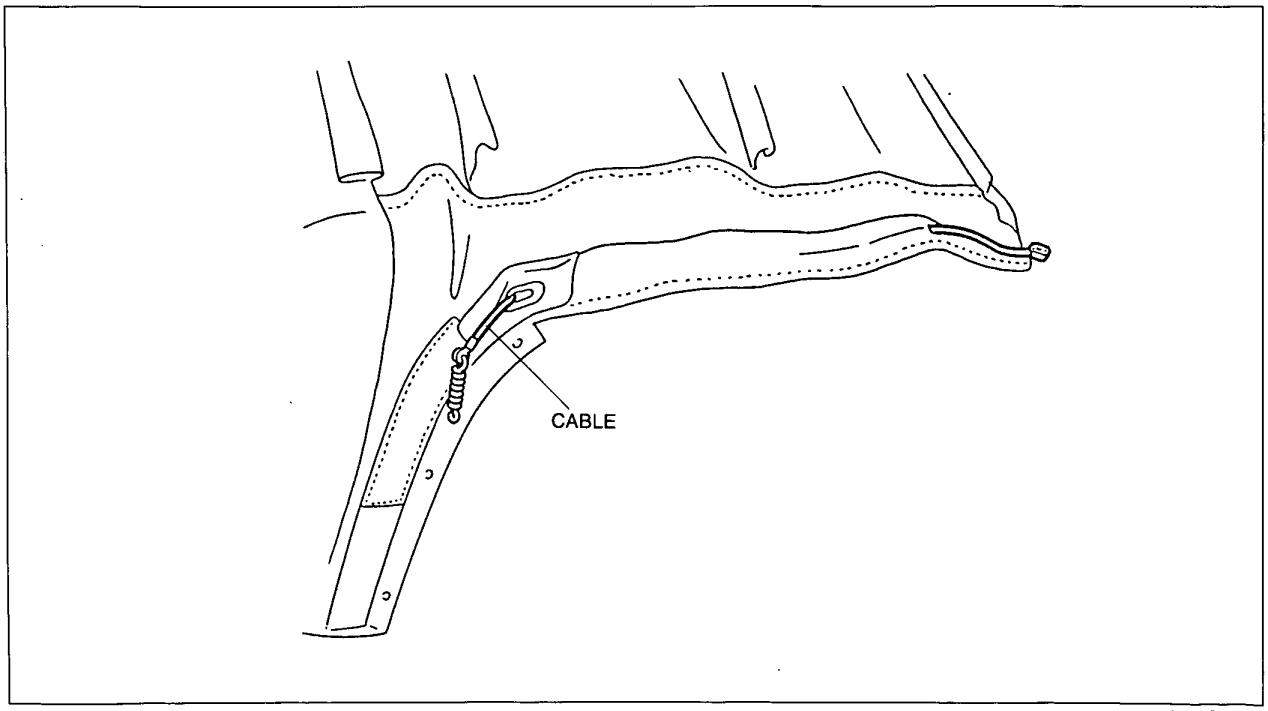
Note
- **Cover the work bench with thick cloth to prevent damaging the top fabric and rear window.**
- **Do not damage or crimp the rear window during the work.**

1. Remove the original double-sided adhesive tape from the front header.
2. Degrease the front header with ethyl alcohol.
3. Install new double-sided adhesive tape onto the front header.



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4. Thread the cables into the top fabric.



95A0SX-117

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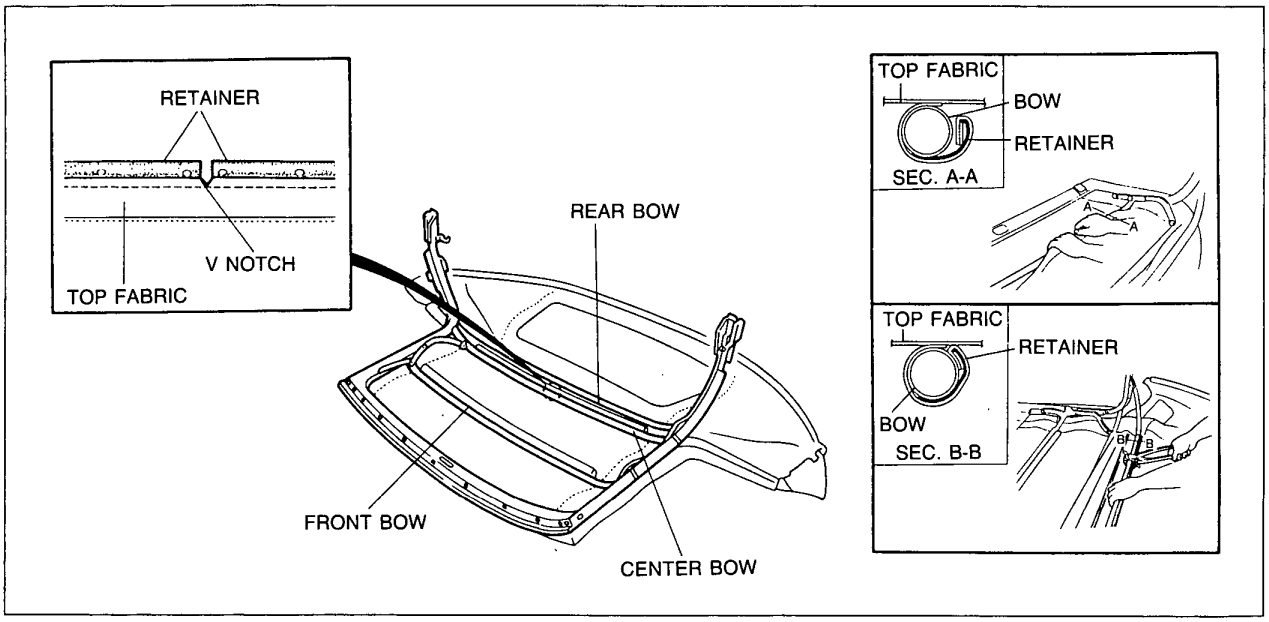
5. Place the link assembly onto the top fabric.

Note
- **Install the top fabric to the bows, beginning from the rear bow. Perform Steps 6, 7, and 8.**

6. Align the center of the retainer and the V notch in the top fabric, and roll the top fabric over the bow retainer.
7. Hang the end of the top fabric on the bow retainer.
8. Clamp the top fabric to the bow with protected water pump pliers.

Note
- **Pull the top fabric by hand to verify that it is held securely.**

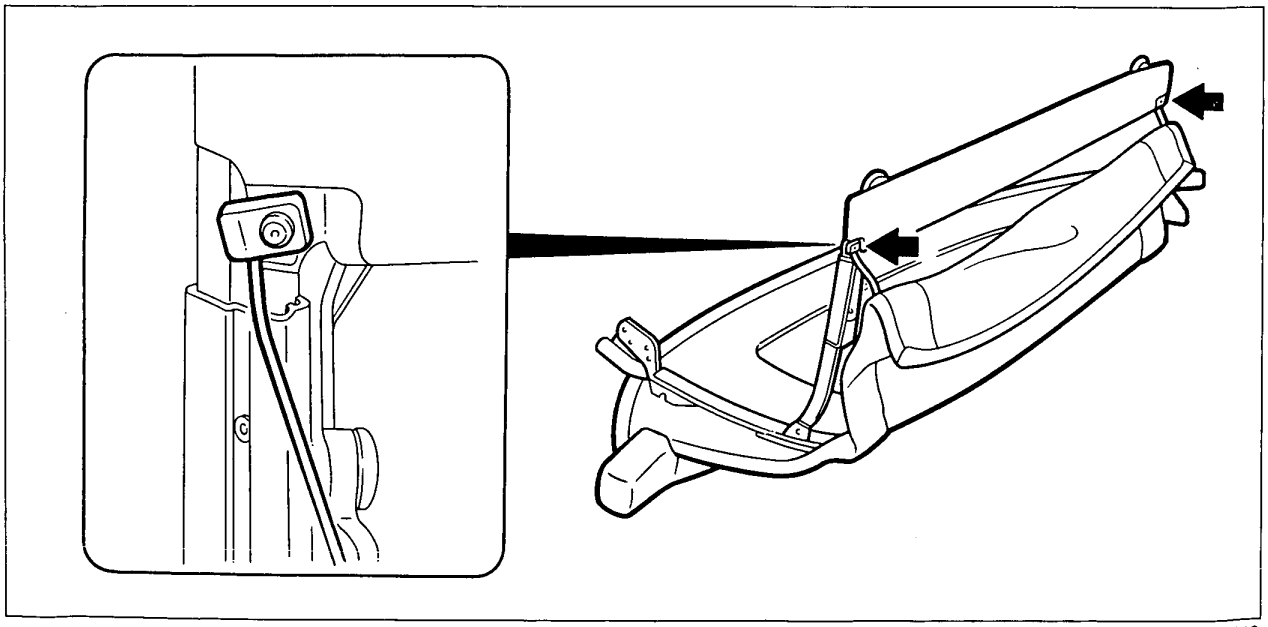
9. Affix the top fabric to the rear bow with the Velcro.



95A0SX-118

Note
- **Set the convertible top upright.**

10. Rivet the cables to the front of the link assembly.



95A0SX-119

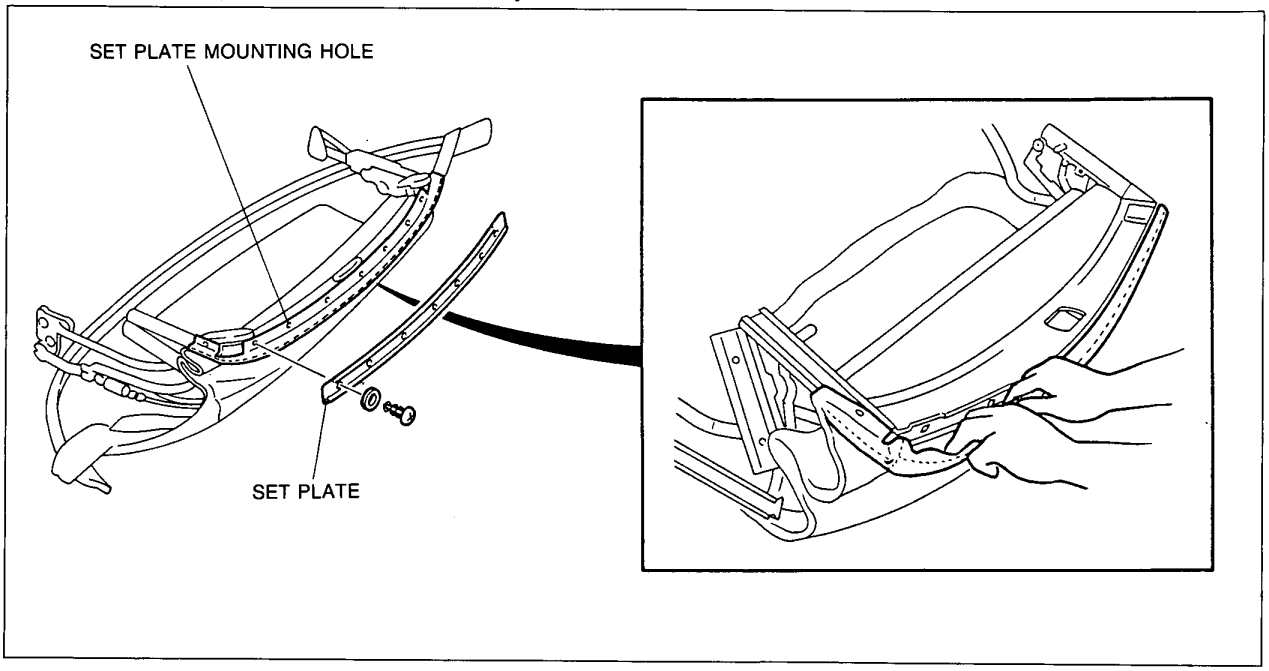
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Note
- **Turn the convertible top over and fold it.**

11. Install the front of the top fabric to the front header.

Note
- **Align the set plate and top fabric with the set plate mounting holes.**

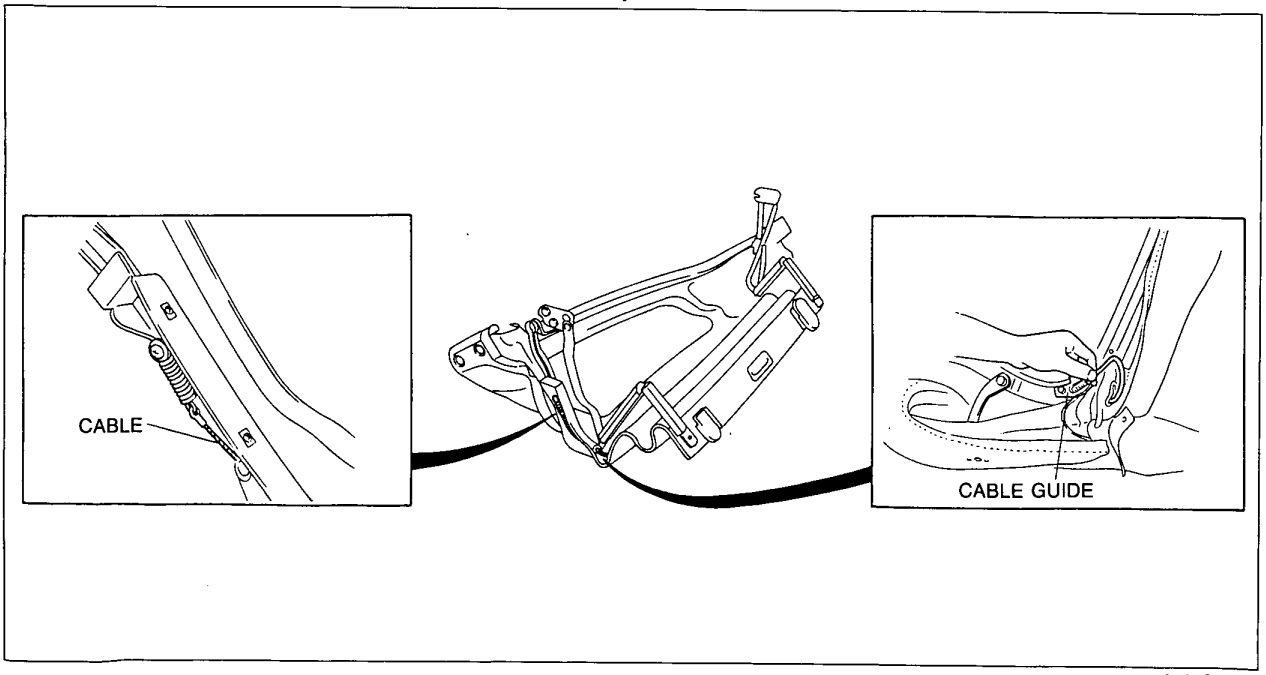
12. Install the set plate to the link assembly.



95A0SX-120

Note
- **Unfold the convertible top half-way.**

13. Pass the cables through the cable guides.
14. Install the cables to the rear of the link assembly.

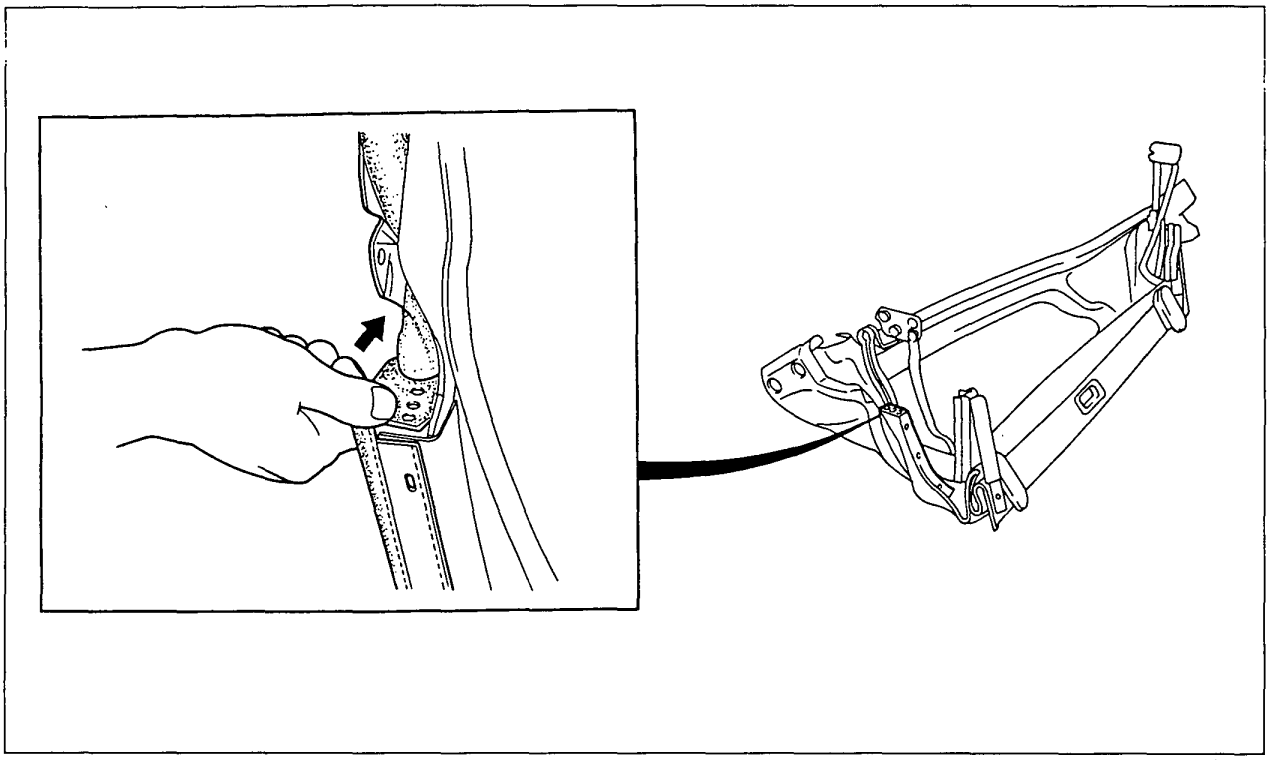


95A0SX-121

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Note
- **Fold the convertible top.**

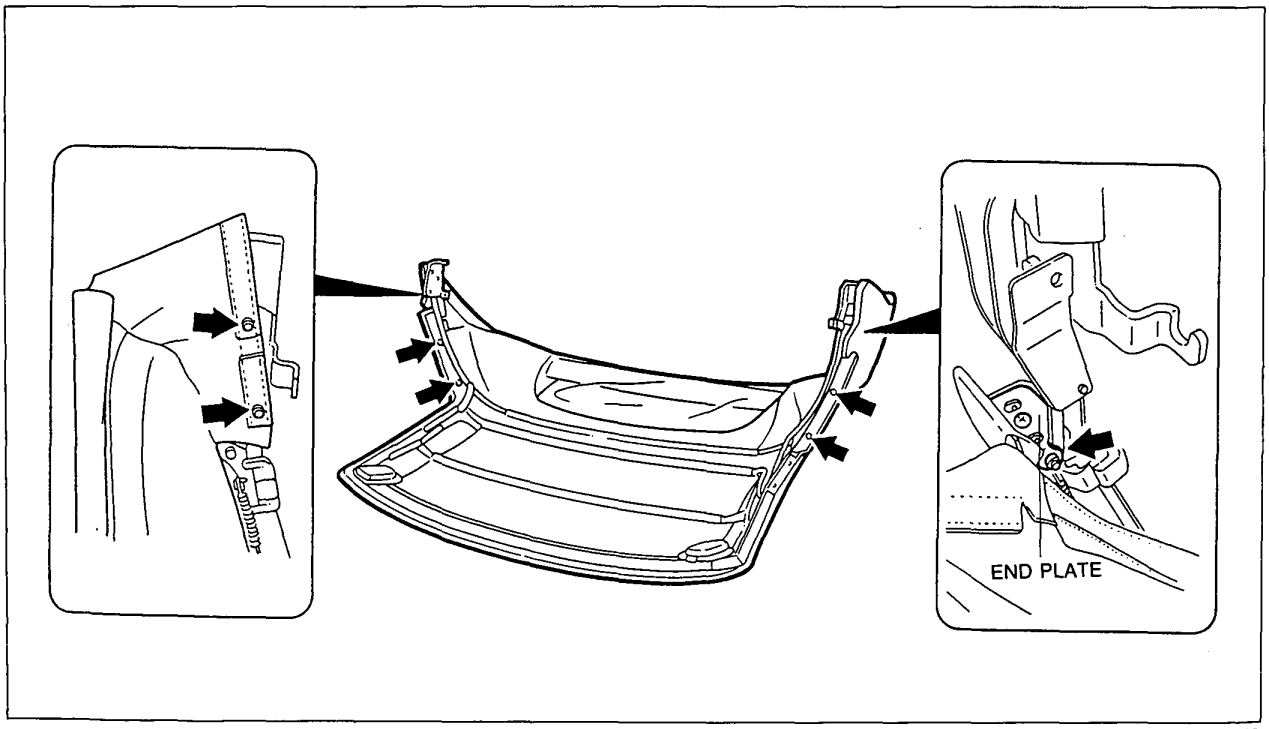
15. Install the top fabric to the link assembly.



95A0SX-122

Note
- **Unfold the convertible top.**

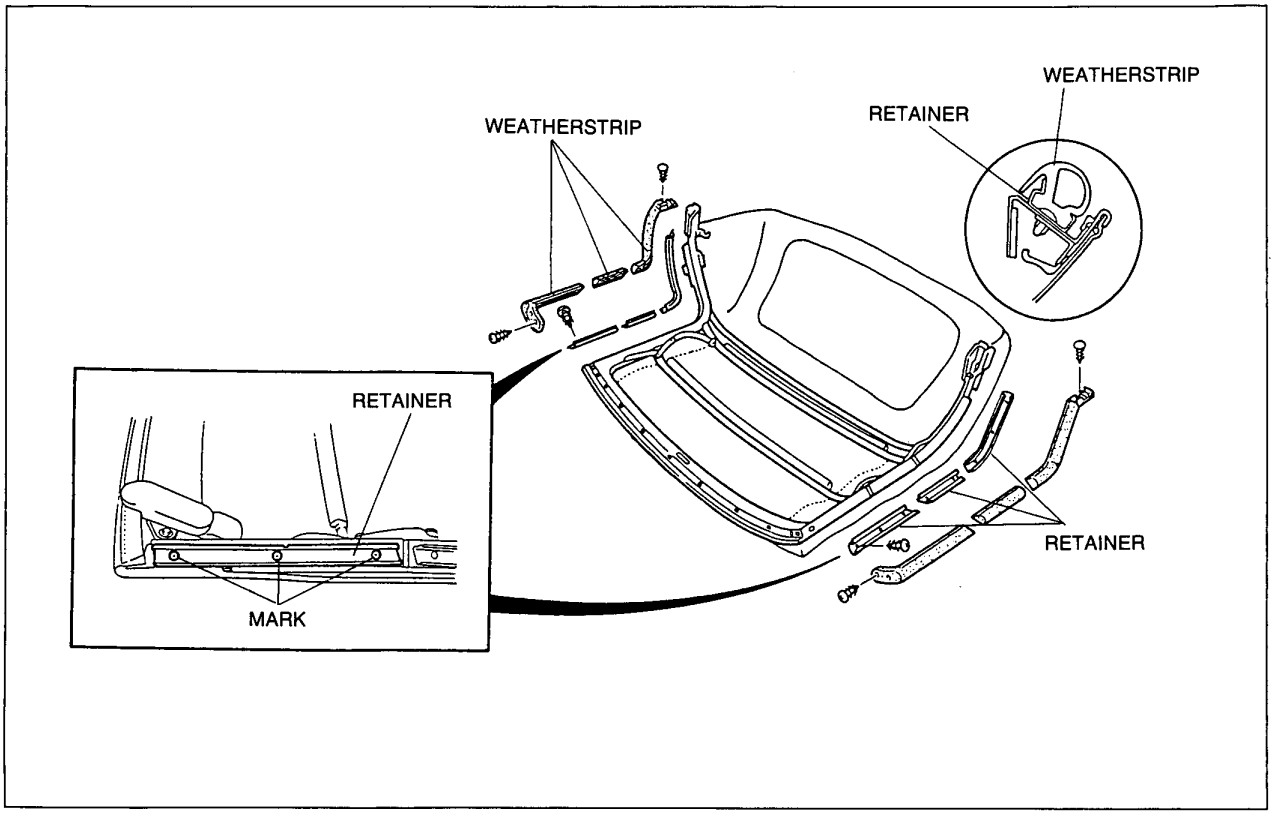
16. Install the end plates to the link assembly.
17. Rivet the top fabric and the end plates to the link assembly.



95A0SX-123

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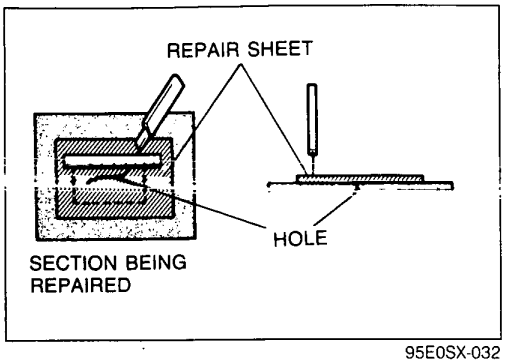
18. Install the retainers to the link assembly, aligning the retainer marks with the retainer mounting screws.
19. Install the weatherstrips to the link assembly.
20. Install the convertible top to the body. (Refer to page S–68.)



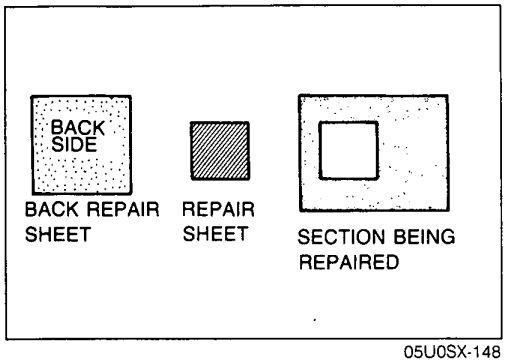
95E0SX-031

21. After installtion, verify the points below.
- Operation of convertible top.
- Damage or crimping of rear window.
- Fit with door glass.

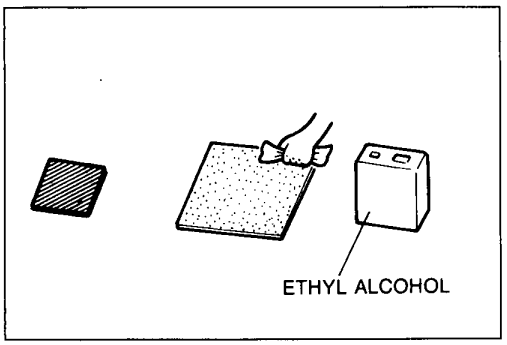
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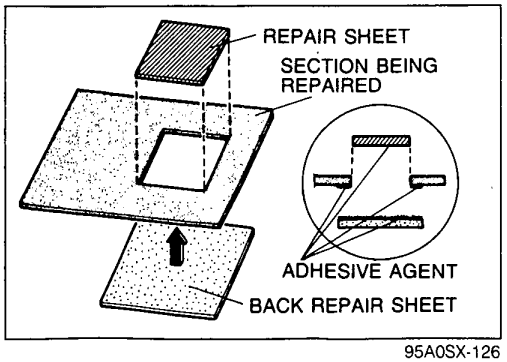
95E0SX-032



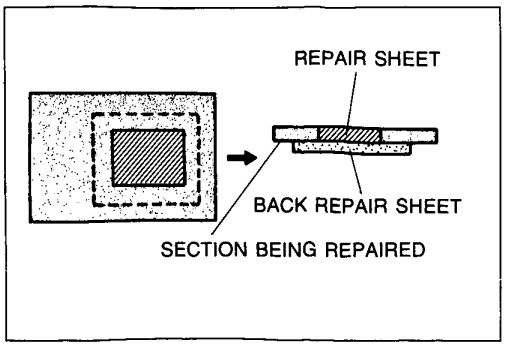
05U0SX-148



77A14X-028



95A0SX-126



95G0SX-147

REPAIR OF TOP FABRIC

Note
- **Repairing a hole in the top fabric differs from repairing a tear in the fabric. Refer to page S–81 for tear repair.**

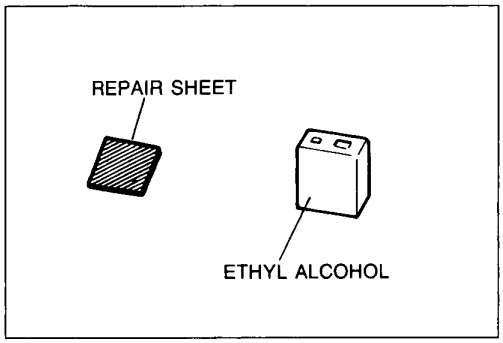
Repair of Hole in Top Fabric

1. Place the **repair sheet** (NAY1 R1 211) over the damaged section. Cut both the top fabric and the repair sheet with a razor knife and a straightedge.
2. Cut another piece of repair sheet larger than the first for use as a back repair sheet.
3. Trim the top fabric and the repair sheets with scissors.
4. Degrease the repair sheets with ethyl alcohol.
5. Apply **adhesive agent** (K180 W0 313) or equivalent to the section being repaired, the repair sheet, and the back repair sheet.

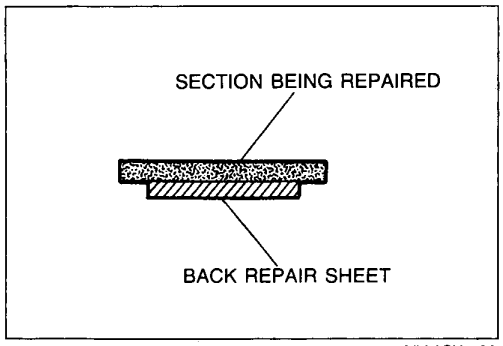
Note
- **Apply a substantial amount of the adhesive agent to the cloth.**
- **Let stand for a few minutes.**

6. Insert the repair sheet squarely into the section of the top fabric being repaired. Then install the back repair sheet from the underside of the top.
7. Press the repair sheets firmly together.
8. Let the top fabric stand until the adhesive agent is fully dry.

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95A0SX-128

Repair of Tear in Top Fabric

1. Cut a piece of **repair sheet** (NAY1 R1 211) larger than the damaged section for use as a back repair sheet.
2. Degrease the repair sheet with ethyl alcohol.
3. Apply **adhesive agent** (K180 W0 313) or equivalent to the section being repaired and the back repair sheet.

Note

- **Apply a substantial amount of the adhesive agent to the cloth.**
- **Let stand for a few minutes.**

4. Install the back repair sheet from the underside of the top.
5. Press the repair sections firmly together.
6. Let the top fabric stand until the adhesive agent is fully dry.

TOOLS FOR REPAIR AND REPLACEMENT CONVERTIBLE TOP

Adhesive agent K180 W0 313	For repairing top fabric	Drill ϕ4.0mm (ϕ0.16 in)	For removing rivet
Repair sheet NAYI R1 211	For repairing top fabric	Double-sided adhesive tape	For installing top fabric
Hand riviter	For installing top fabric	Ethyl alcohol	For cleaning repaired parts
Aluminum rivet ϕ4.0mm (ϕ0.16 in)	For installing top fabric		

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DETACHABLE HARD TOP

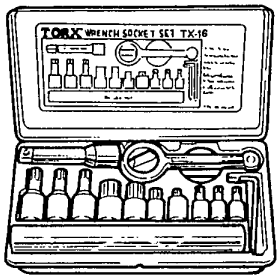
PREPARATION

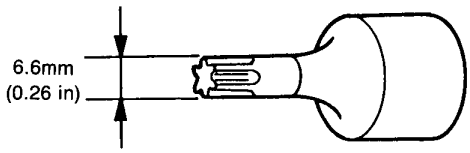
TORX TOOL (T40)	For installation and removal of top latch and side latch striker

95A0SX-130

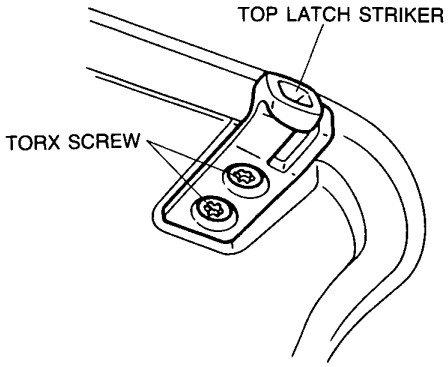
TORX TOOL (T40)

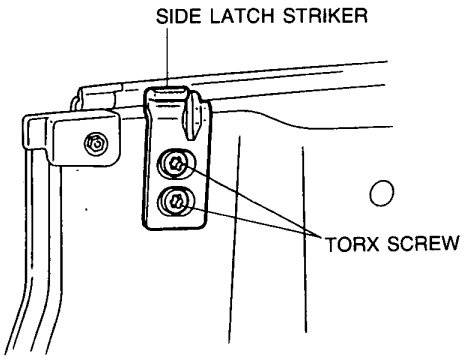
1. ILLUSTRATION





2. LOCATION TORX TOOL MUST BE USED





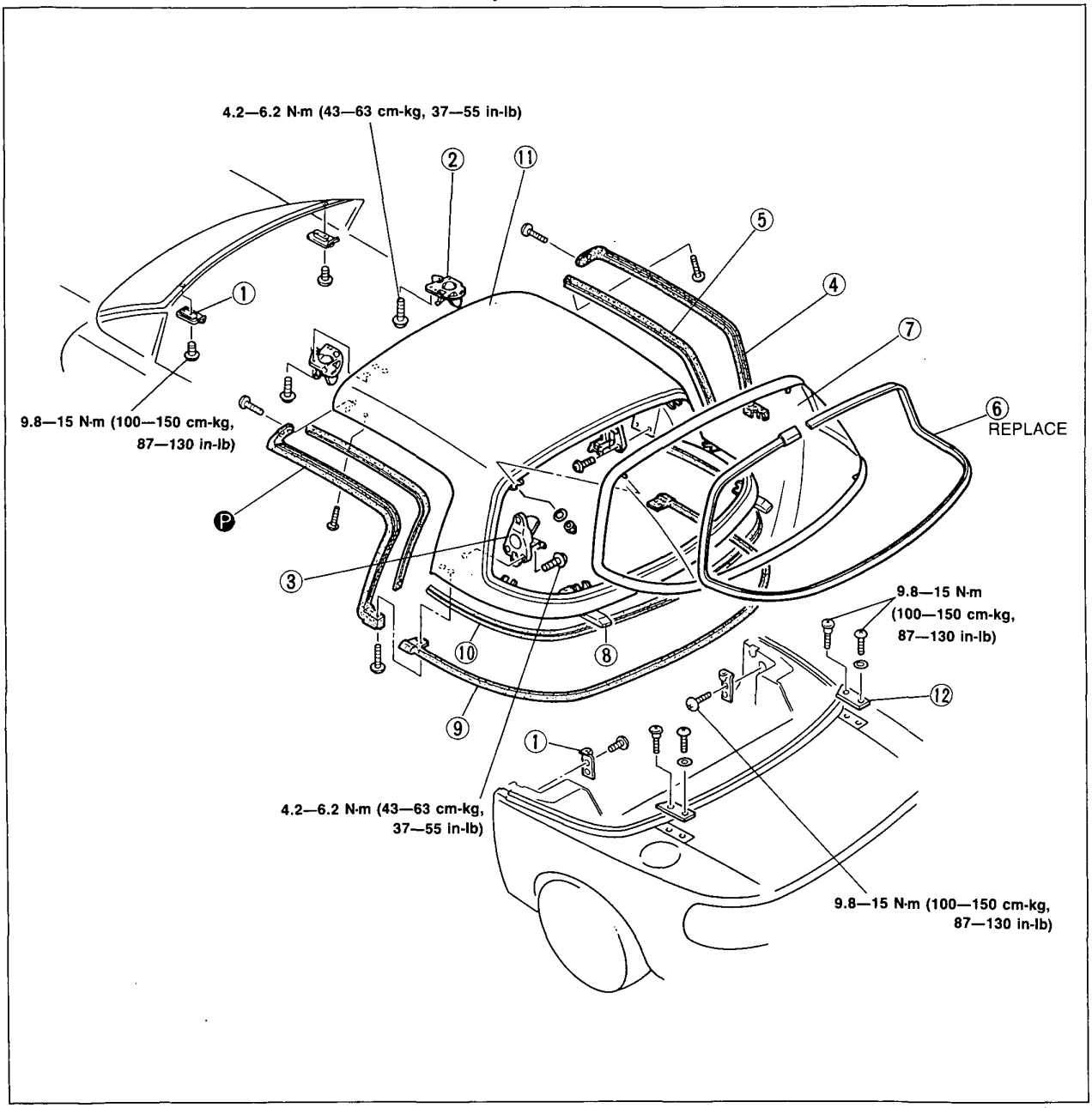
95A0SX-131

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COMPONENTS

Disassembly / Assembly

1. Disassemble in the order shown in the figure.
2. Assemble in the reverse order of disassembly.



95E0SX-033

1. Striker
   Removal / Installation ..... page S–82
2. Top latch assembly
   Adjustment ..... page S–84
3. Side latch assembly
   Adjustment ..... page S–84
4. Weatherstrip
   Adjustment ..... page S–86
5. Retainer
6. Rear window molding
   Installation ..... page S–31
7. Rear window glass
   Removal / Insallation ..... page S–48
8. Rear deck latch assembly
   Adjustment ..... page S–85
9. Rear weatherstrip
10. Edge protector
11. Detachable hard top
12. Rear deck plate

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CONVERTIBLE TOP/DETACHABLE HARD TOP

Adjustment

Top latch assembly (Convertible top/Detachable hard top)

The alignment of either top to the windshield header may be adjusted up, down, fore, and aft by turning the respective top latch assembly adjusting nut.

Adjustment procedure

1. Fold the protector away from the adjusting nut.
2. When the adjusting nut is turned clockwise:
   Clearance (A) and height (B) of the top become less.
3. When the adjusting nut is turned counterclockwise:
   Clearance (A) and height (B) of the top become greater.

Caution

- **Secure the adjusting nut with the protector after completing any adjustment.**

Side latch assembly (Detachable hard top)

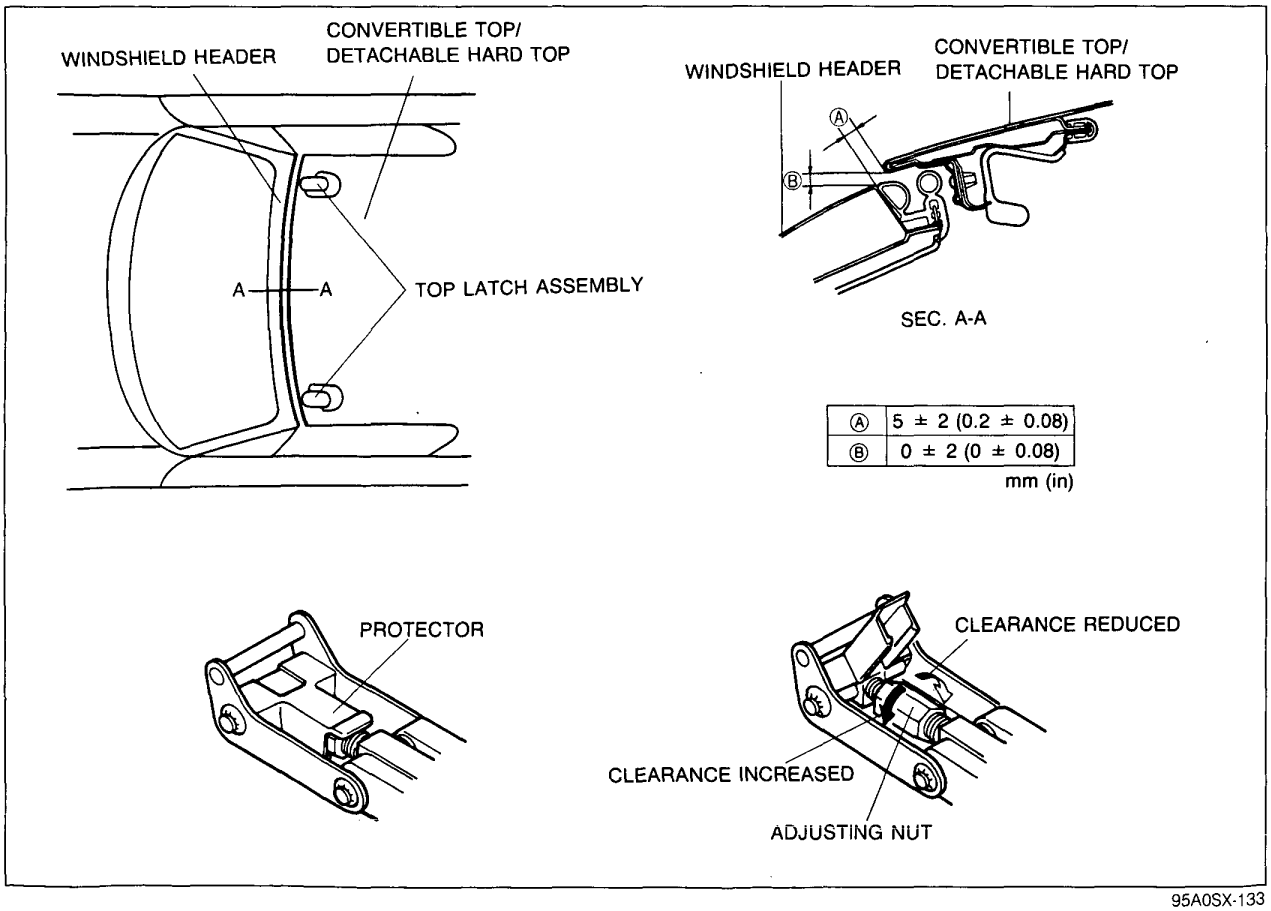
If engagement of the striker and the side latch assembly is incorrect, adjustment is made through the latch assembly adjusting nut.

Adjustment procedure

1. Fold the protector away from the adjusting nut.
2. When the adjusting nut is turned clockwise:
   Engagement of the striker and the side latch assembly becomes tighter.
3. When the adjusting nut is turned counterclockwise:
   Engagement of the striker and the side latch assembly becomes looser.

Caution

- **Secure the adjusting nut with the protector after completing any adjustment.**



95A0SX-133

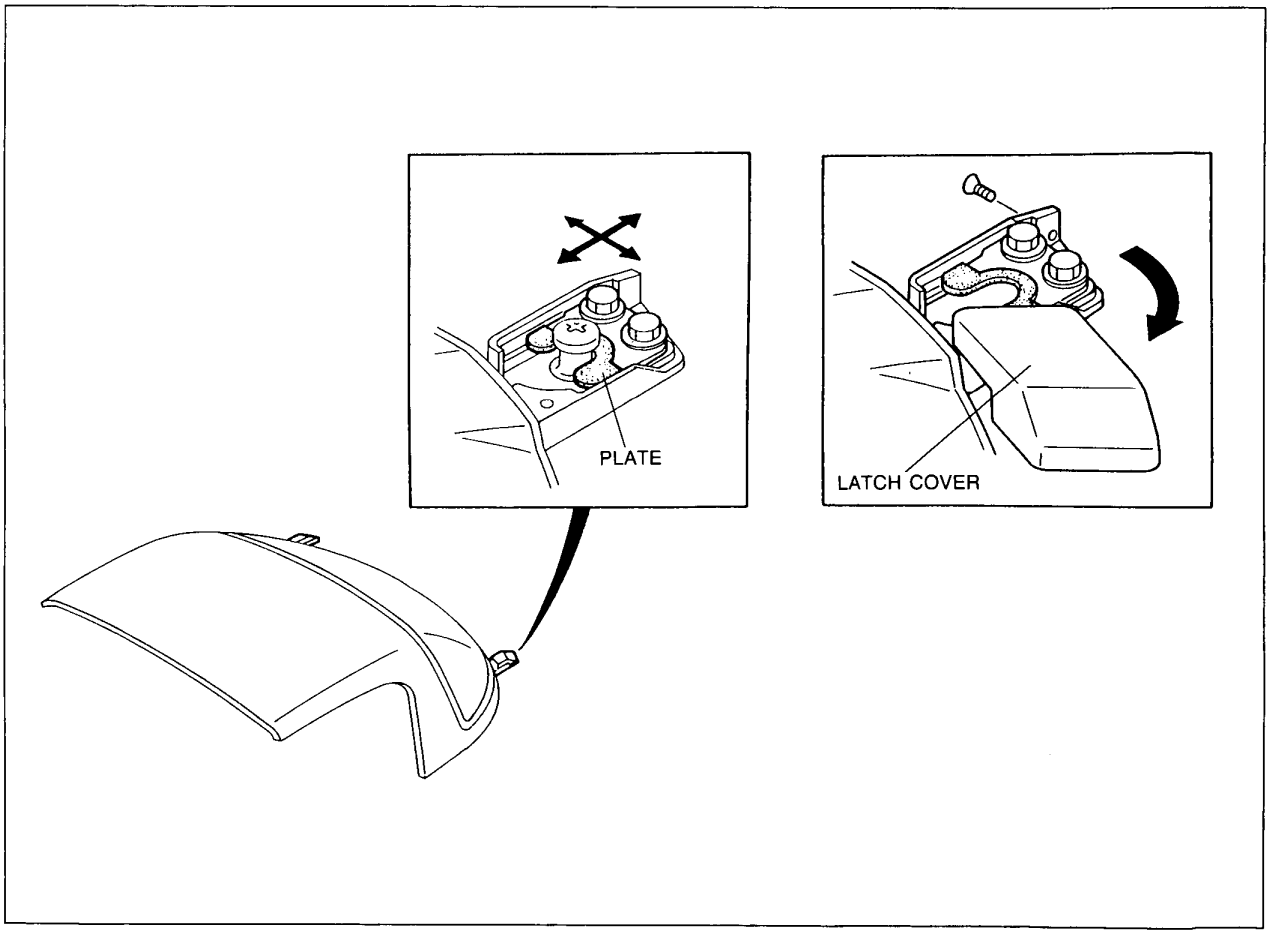
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Rear deck latch assembly (Detachable hard top)
If engagement of the rear deck stud and the rear deck latch assembly is incorrect, adjustment is made through the rear deck latch assembly plate.

Adjustment procedure
1. Remove the screw, and open the latch cover.
2. Loosen the plate mounting bolts.
3. Install the detachable hard top to the body.
4. Adjust by moving the plate right, left, fore, or aft until it is tight.
5. Tighten the plate mounting bolts.

Tighten torque:
18—26 N·m (1.8—2.7 m-kg, 13—20 ft-lb)

6. Close the latch cover, and install the screw.
7. Recheck the engagement.

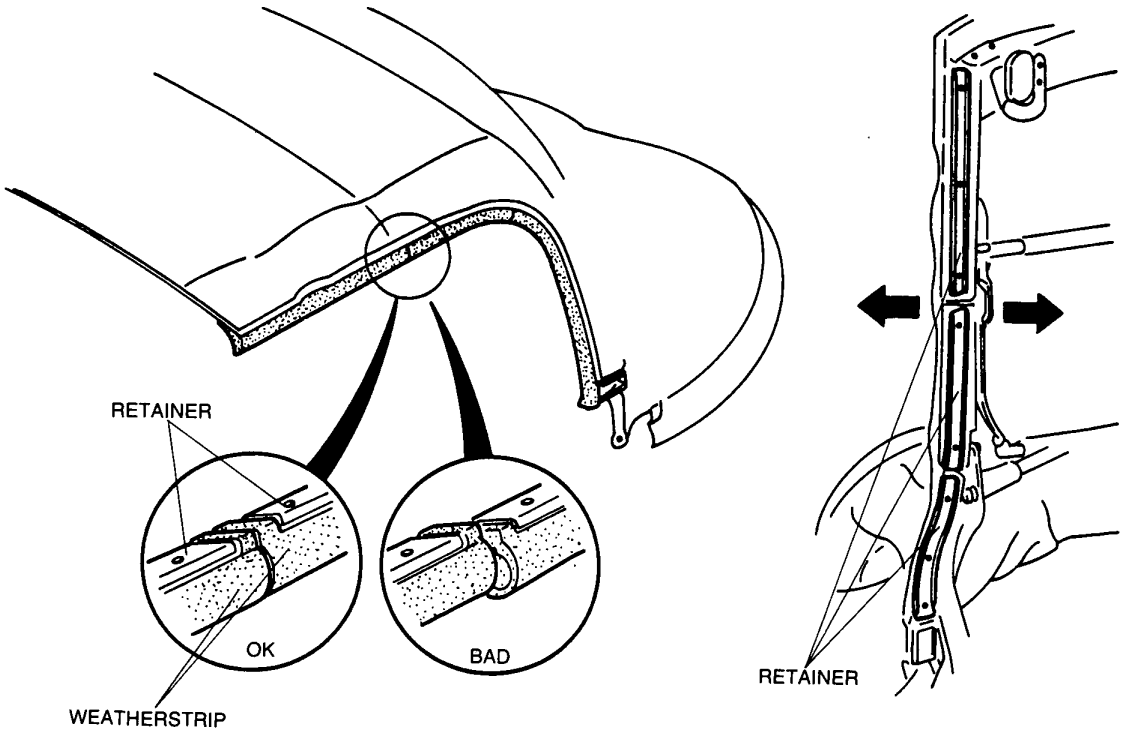


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Weatherstrip (Convertible top/Detachable hard top)
If there is any misalignment (lateral or vertical), adjust by following the steps below.

Adjustment procedure
1. Remove the weatherstrip in question.
2. Loosen the retainer screws and adjust the retainer as necessary.
3. Tighten the screws, and reinstall the weatherstrip.
4. Recheck the alignment.



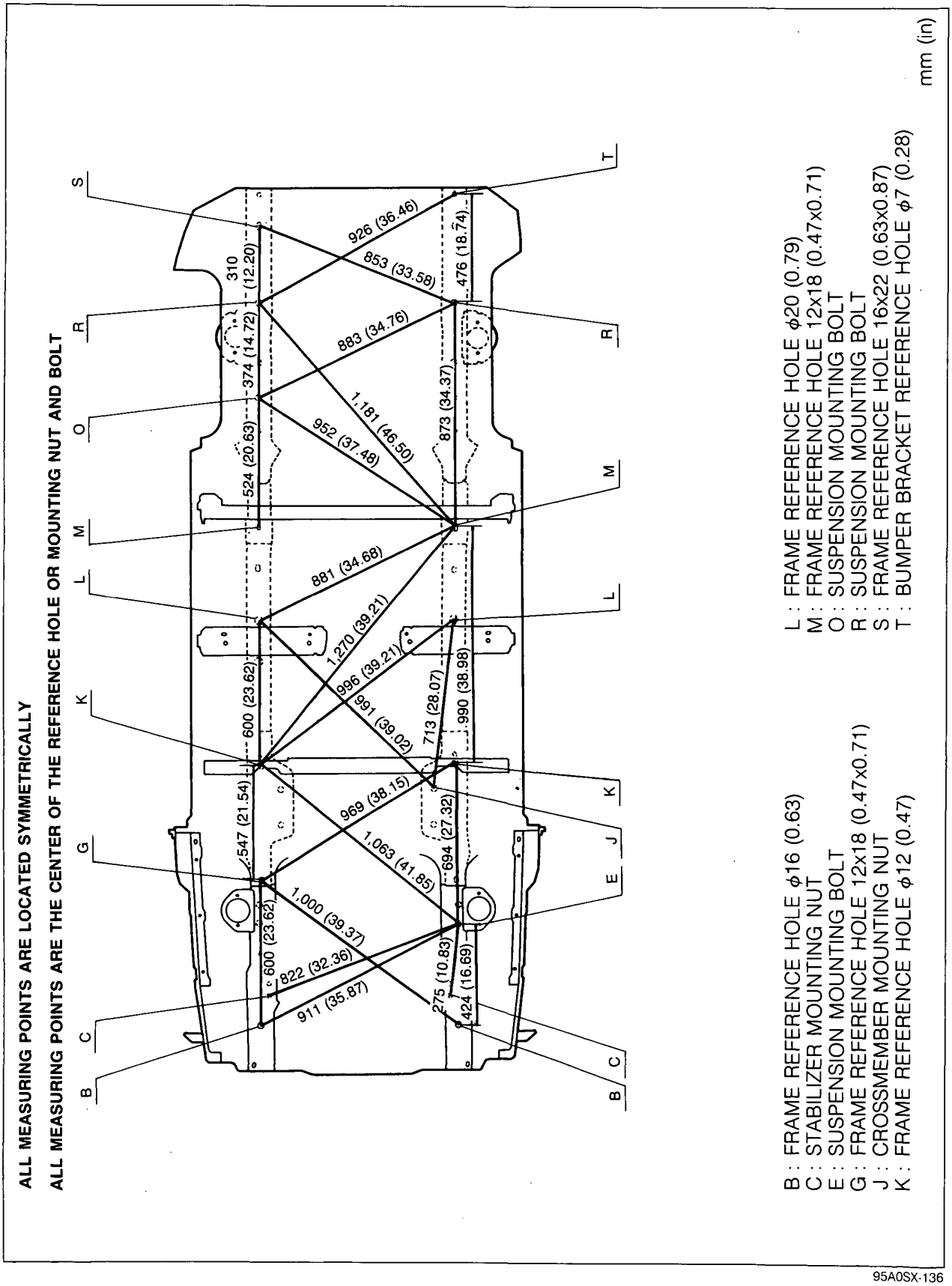
WEATHERSTRIP INSTALLATION

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UNDERBODY DIMENSIONS

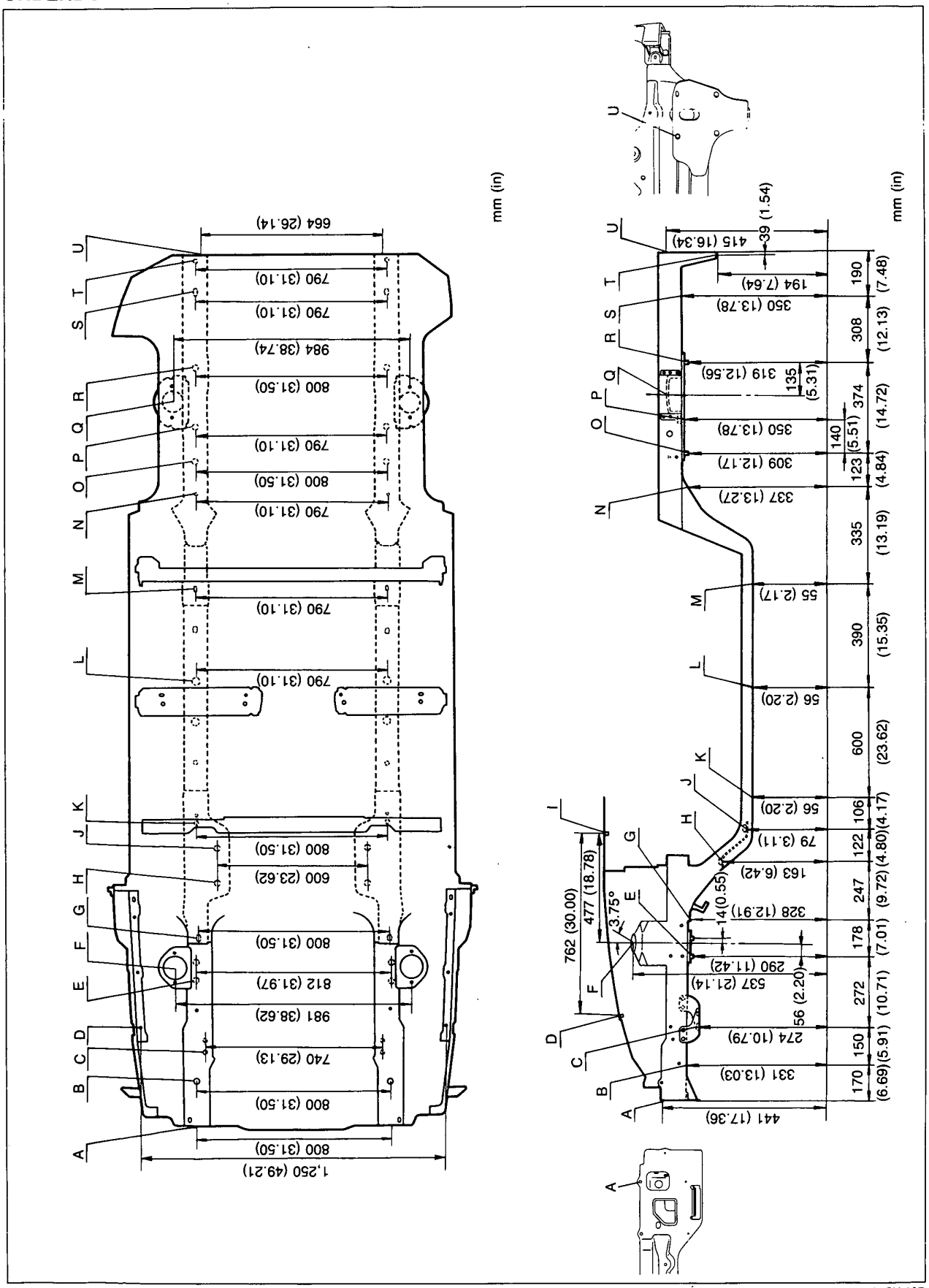
UNDERBODY STRAIGHT-LINE DIMENSIONS



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UNDERBODY PROJECTED DIMENSIONS



95A0SX-137

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A : BUMPER BRACKET MOUNTING NUT
B : FRAME REFERENCE HOLE ϕ16 (0.63)
C : STABILIZER MOUNTING NUT
D : FRONT FENDER PANEL MOUNTING NUT
E : SUSPENSION MOUNTING BOLT
F : FRONT MOUNTING BLOCK
G : FRAME REFERENCE HOLE 12x18 (0.47x0.71)
H : CROSSMEMBER MOUNTING NUT
I : FRONT FENDER PANEL MOUNTING NUT
J : CROSSMEMBER MOUNTING NUT
K : FRAME REFERENCE HOLE ϕ12 (0.47)
L : FRAME REFERENCE HOLE ϕ20 (0.79)
M : FRAME REFERENCE HOLE 12x18 (0.47x0.71)
N : FRAME REFERENCE HOLE ϕ12 (0.47)
O : SUSPENSION MOUNTING BOLT
P : SUSPENSION MOUNTING NUT
Q : REAR MOUNTING BLOCK
R : SUSPENSION MOUNTING BOLT
S : FRAME REFERENCE HOLE 16x22 (0.63x0.87)
T : BUMPER BRACKET REFERENCE HOLE ϕ7 (0.28)
U : BUMPER MOUNTING HOLE 12x14 (0.47x0.55)

mm (in)

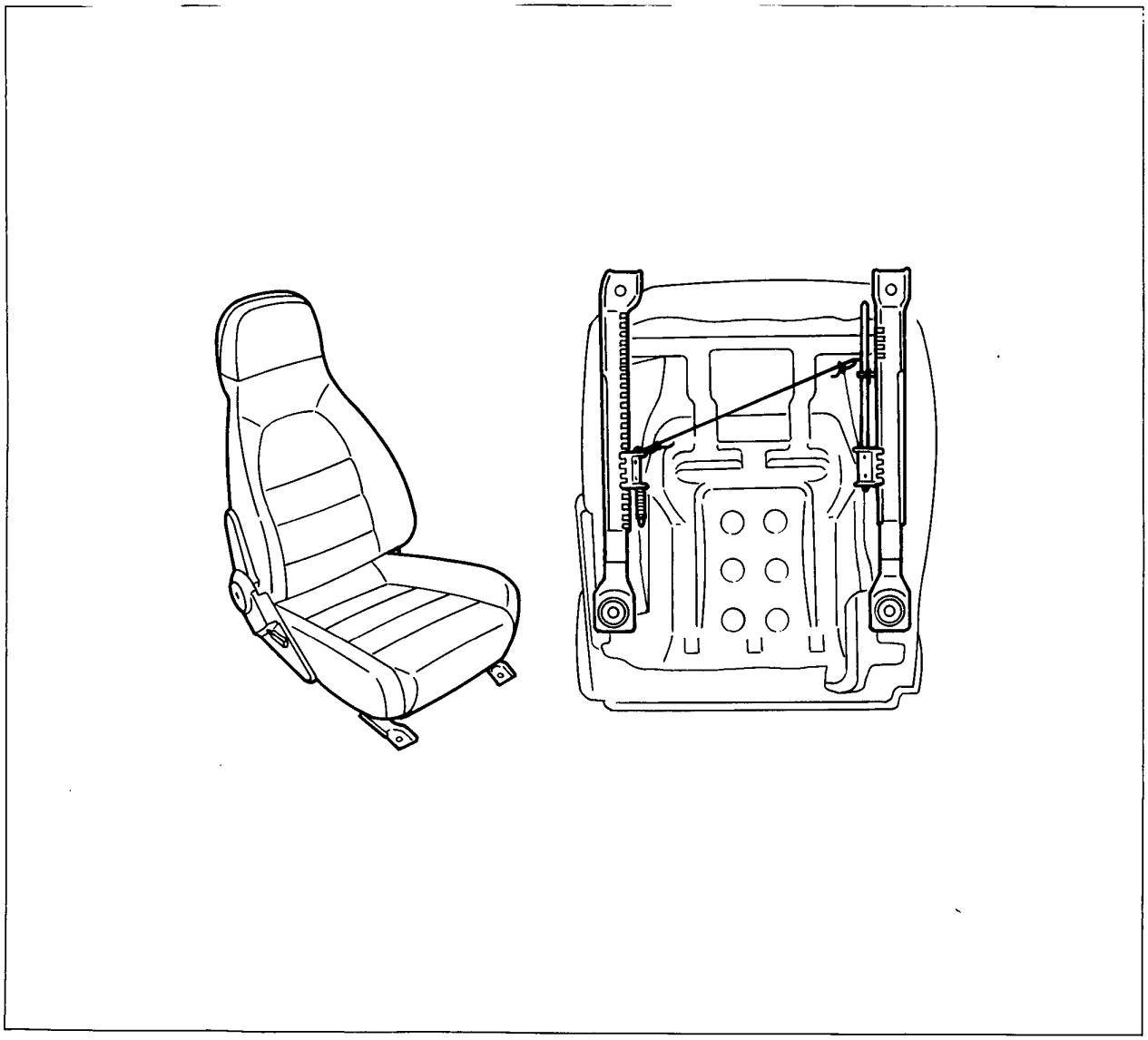
05U0SX-158

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SEAT

OUTLINE

Austria specification MX-5 models are equipped with nonsliding passenger seat to comply with Austrian motor vehicle regulations. Although the seat slide mechanism is in place, there is no provision for external release of the lock mechanism, and the seat is factory set at the rearmost position.

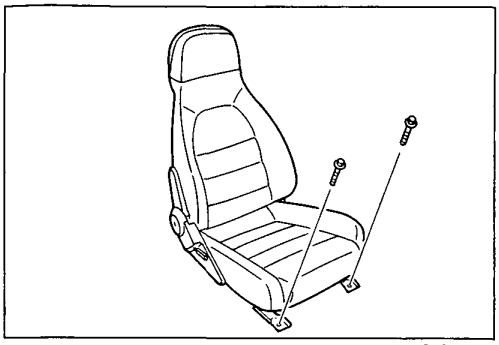


95E0SX-400

Note

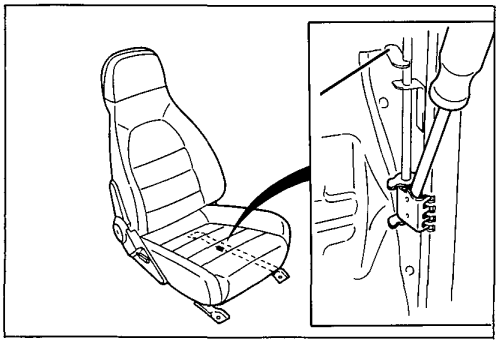
- **Verify that the seat is set in the rearmost position after service.**

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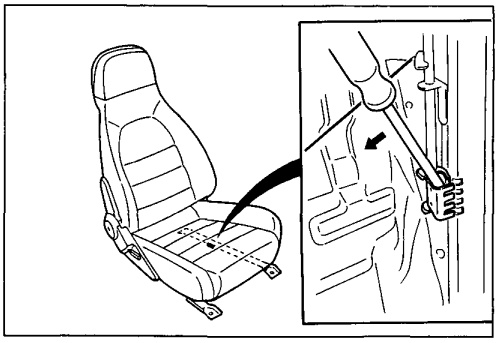

95E0SX-401

Removal

1. Remove the front seat slide mounting bolts.


95E0SX-402

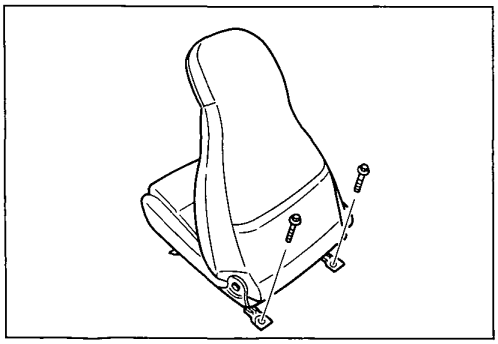
2. Insert a screwdriver to the lock plate from the front of the seat.


95E0SX-403

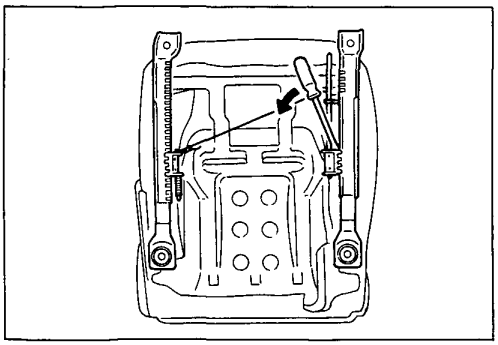
3. Release the lock plate and slide the seat fully forward.
4. Remove the screwdriver and lock the seat in the frontmost position.

Note

- **Verify that the seat is firmly locked.**


95E0SX-404

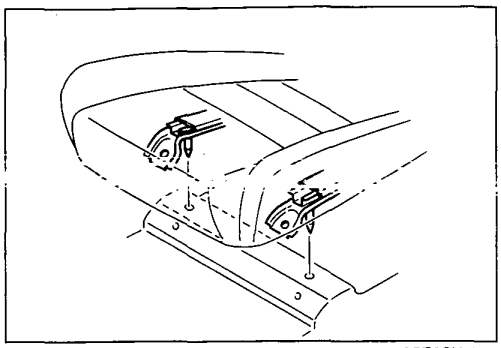
5. Tilt the seat back forward and remove the rear seat slide mounting bolts.
6. Carefully lift the seat out of the vehicle.


95E0SX-405

Installation

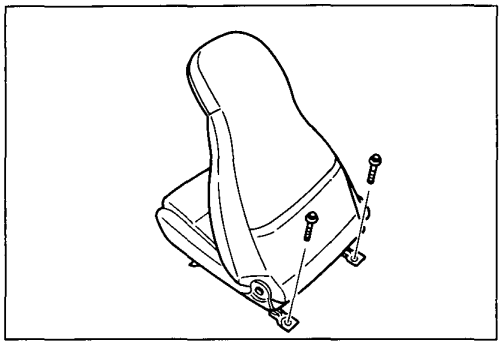
1. Insert a screwdriver to the lock plate.
2. Release the lock plate and slide the seat fully forward.
3. Remove the screwdriver and lock the seat in the frontmost position.

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95E0SX-406

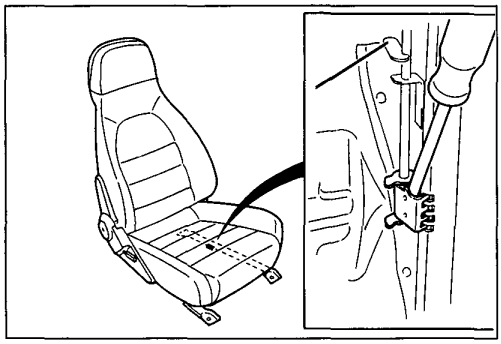
4. Tilt the seat back forward and carefully set the seat into the vehicle.
5. Align the seat alignment pins with the holes in the body.



95E0SX-407

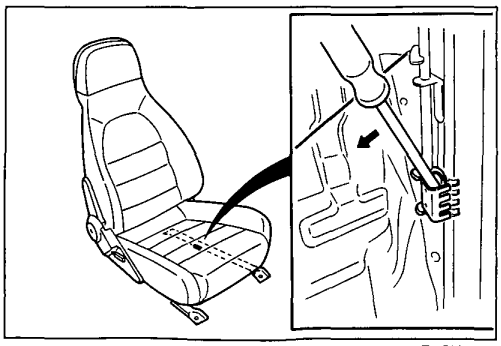
6. Install and tighten the rear seat slide mounting bolts as shown.

Tightening torque:
38—51 N·m (3.9—5.2 m-kg, 28—38 ft-lb)



95E0SX-408

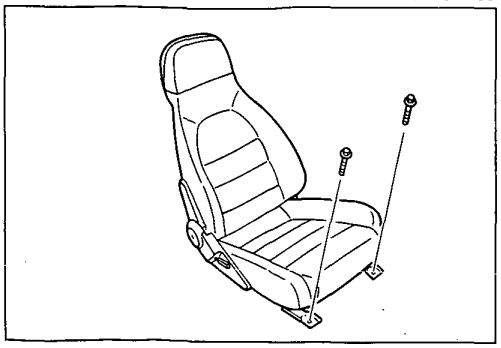
7. Insert a screwdriver to the lock plate from the front of the seat.



95E0SX-409

8. Release the lock plate and slide the seat fully rearward.
9. Remove the screwdriver and lock the seat in the rearmost position.

Note
- **Verify that the seat is firmly locked.**



95E0SX-410

10. Install and tighten the front seat slide mounting bolts as shown.

Tightening torque:
38—51 N·m (3.9—5.2 m-kg, 28—38 ft-lb)

Note
- **Verify that the seat is set in the rearmost position after service.**

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BODY ELECTRICAL SYSTEMS

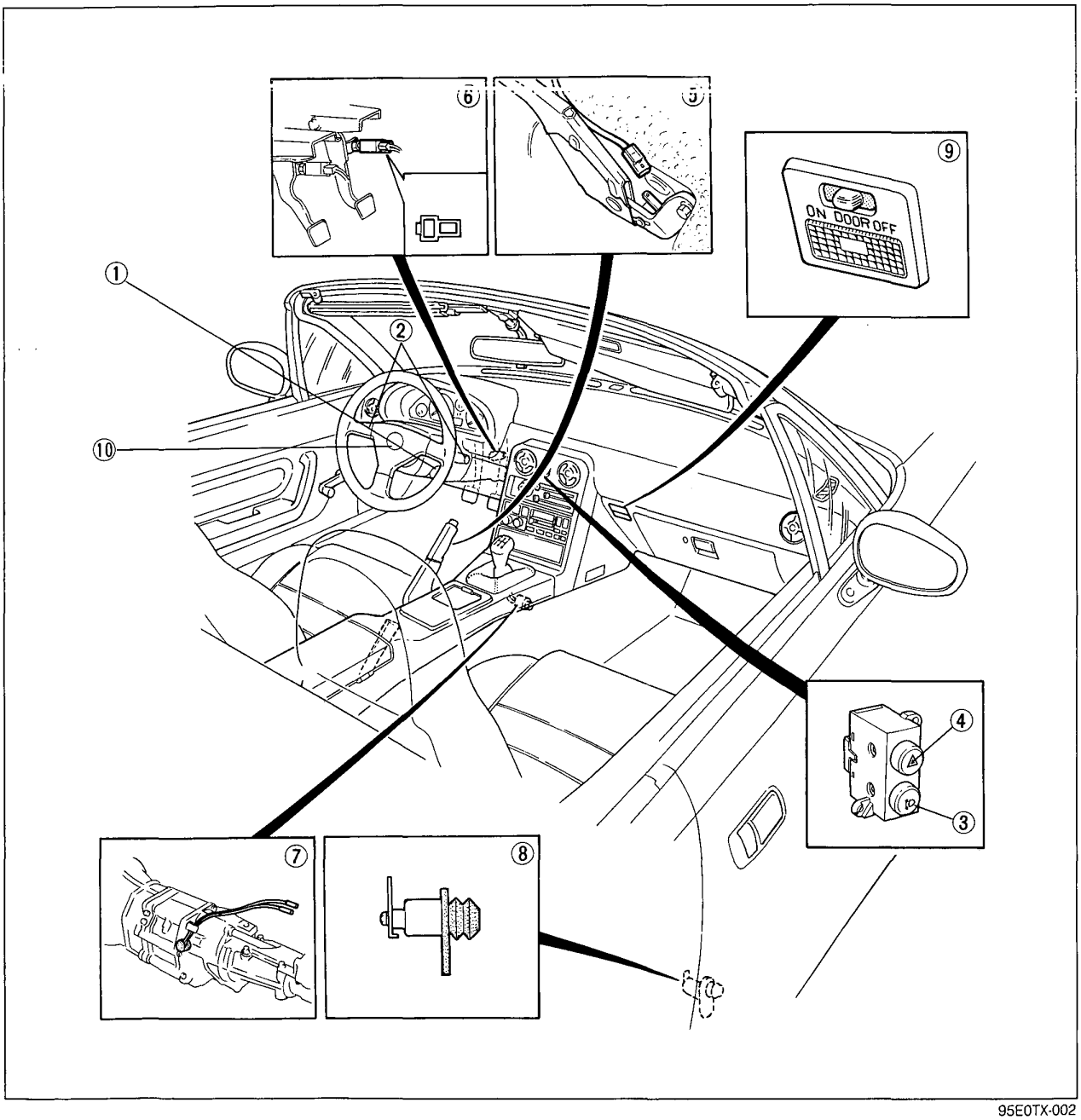
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95E0TX-001

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SWITCHES

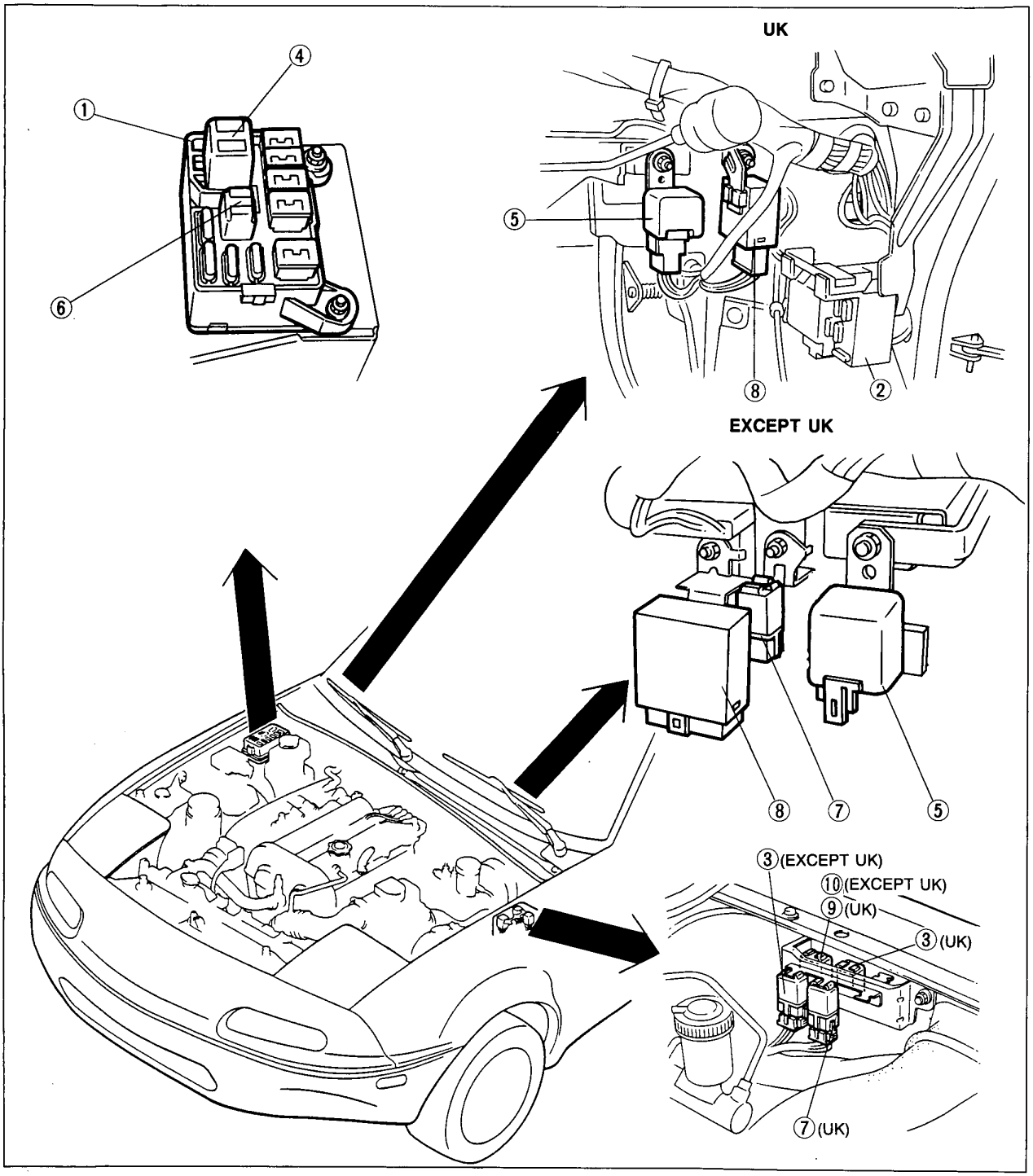


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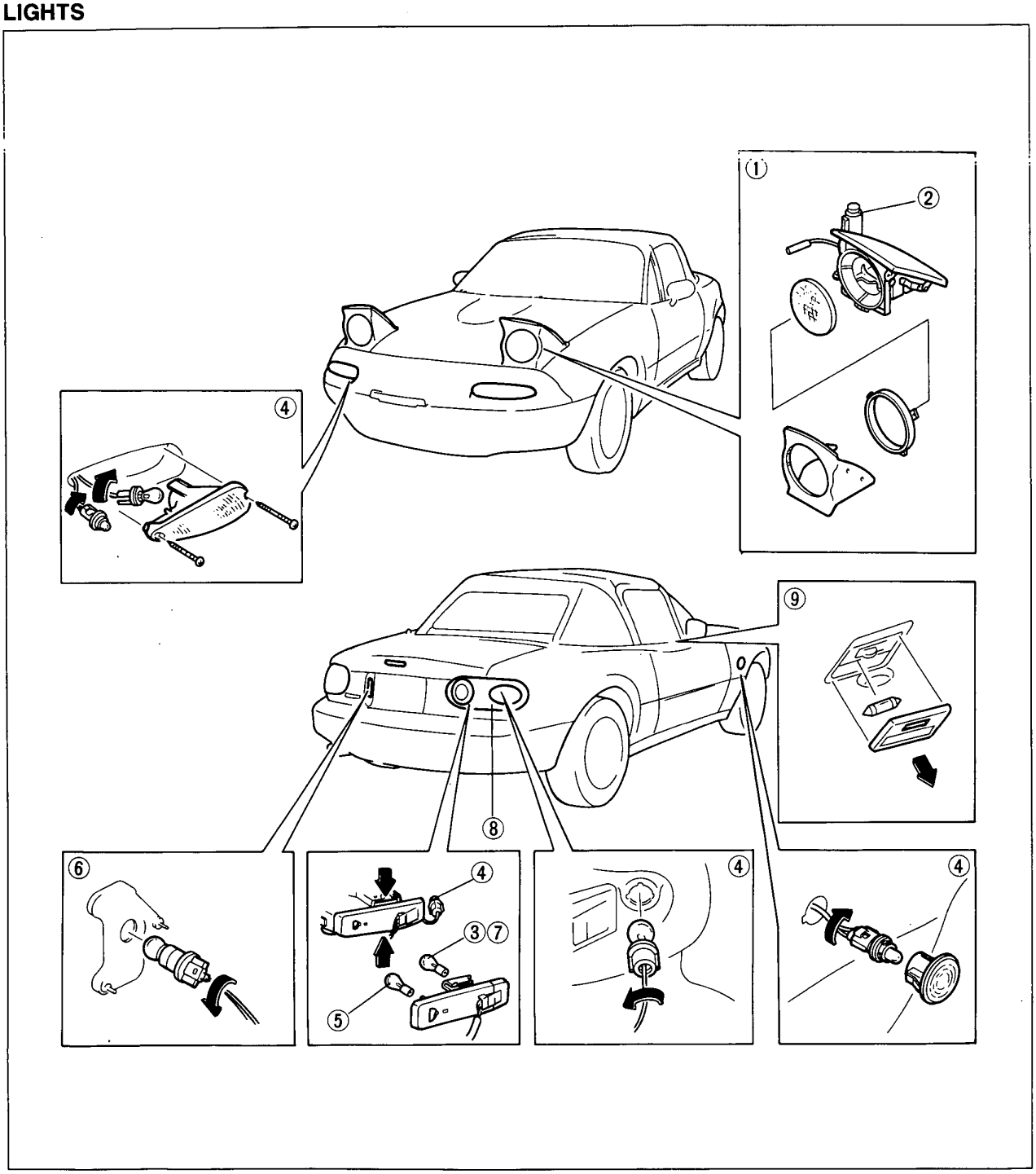


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TROUBLESHOOTING

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	• Water temperature gauge does not operate	T–25
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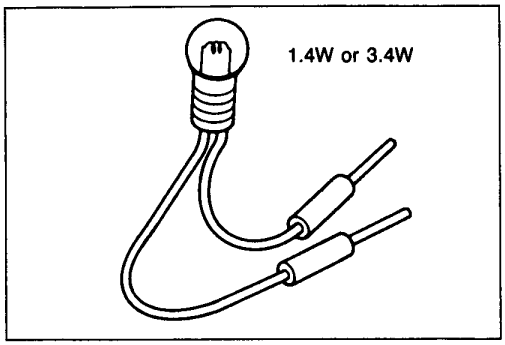
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OUTLINE

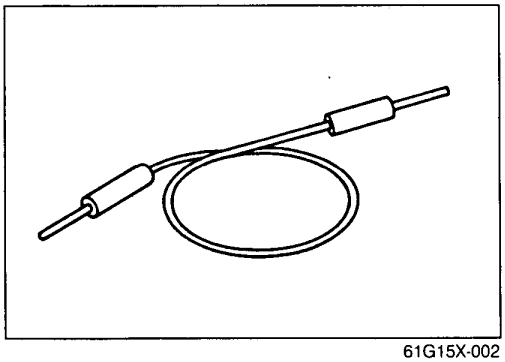
HOW TO USE THIS SECTION

Information regarding removal and installation of electrical equipment is given in **SECTION S**.
Understanding will be easier if this section is used in conjunction with the **WIRING DIAGRAMS**.

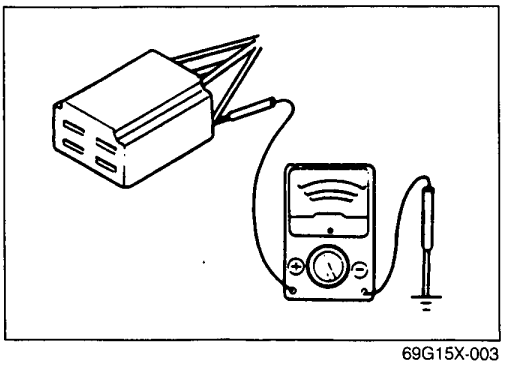
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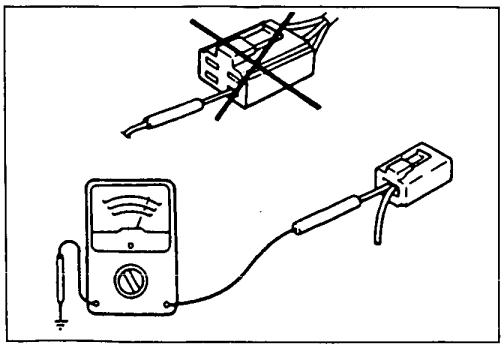
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ELECTRICAL TROUBLESHOOTING TOOLS

Test Light

The test light, as shown in the figure, uses a 12V bulb. The two leads should be connected to probes. The test light is used for simple voltage checks and to check for open circuits.

Caution

- **When checking a control unit, never use a bulb over 3.4W.**

Jumper Wire

The jumper wire is used for testing by short-circuiting switch terminals and for verifying the condition of ground connections.

Caution

- **Do not connect the jumper wire between a power source line and body ground because this may cause burning or other damage to harnesses or electronic components.**

Voltmeter

The DC voltmeter is used for measuring circuit voltage. A voltmeter with a range of 15V or more is used by connecting the positive (+) probe (red lead) to the point where voltage is to be measured and the negative (–) probe (black lead) to the body ground.

Ohmmeter

The ohmmeter is used to measure the resistance between two points in a circuit, and is also used to check for continuity and diagnosis of short circuits.

Caution

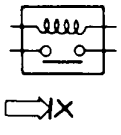
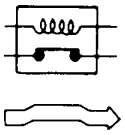
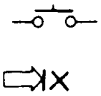
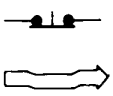
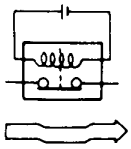
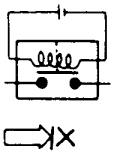
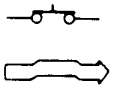
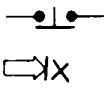
- **Do not attempt to connect the ohmmeter to any circuit to which voltage is applied because this may burn or otherwise damage the ohmmeter.**

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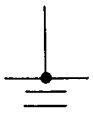
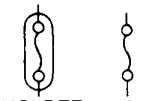
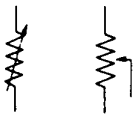
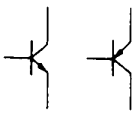
ELECTRICAL SYMBOLS

Switches and Relays

There is an NC (normally closed) and NO (normally open) indication for switches and relays that shows when no change of operation conditions has occurred.

	Relay		Switch	
	NO type relay	NC type relay	NO switch	NC switch
Not in operation (No power supply)	 STOP	 FLOW	 STOP	 FLOW
In operation (Power supply)	 FLOW	 STOP	 FLOW	 STOP

Other Electrical Symbols

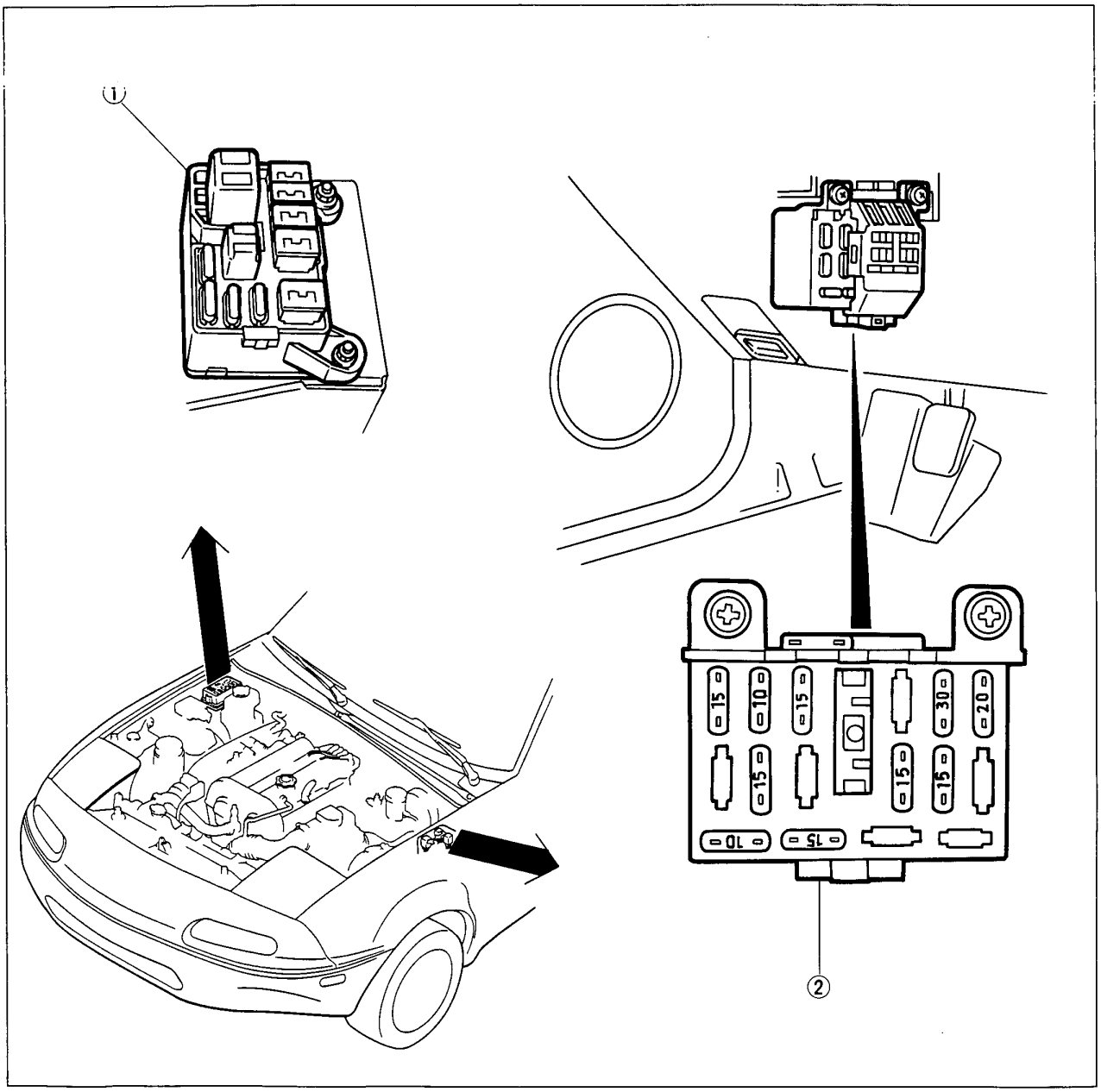
		 HOLDER BOX	
BATTERY	BODY GROUND	FUSE	FUSIBLE LINK
			
MOTOR	COIL, SOLENOID	RESISTOR	VARIABLE RESISTOR
			
THERMISTER	DIODE	CONDENSER	LIGHT
			
TRANSISTOR	SPEAKER	CIGARETTE LIGHTER	HEATER

69G15X-009

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FUSE

STRUCTURAL VIEW



05U0TX-010

1. Main fuse block
2. Fuse box

DESCRIPTION

Main Fuse Block

The main fuse block is located on the right side of the engine compartment and it contains nine fuses and two relays.

Fuse Box

The fuse box is located above the dead pedal (left hand drive) or accelerator pedal (right hand drive) of the driver side. The fuse box cover shows the specified fuse locations.
A circuit breaker is contained in the fuse box for protection of the heater blower motor circuit.

95E0TX-072

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SPECIFICATIONS
Fuse Box
Right hand drive

Fuse	Amperes	Protected circuit
ENGINE	15A	EGI main relay, Cooling fan relay
METER	10A	Instrument cluster, Turn signal switch
(POWER WIND)	30A	Power window switch
WIPER	20A	Blower switch, Wiper switch
TAIL	10A	Taillights, License plate lights, ECU, Position lights
STOP	10A	Stoplight switch, Horn switch
HAZARD	10A	Turn and hazard warning flasher unit
ROOM	10A	ECU
CIGAR	15A	Cigarette lighter

95E0TX-006

Left hand drive

Fuse	Amperes	Protected circuit
ENGINE	15A	EGI main relay, Cooling fan relay
METER	10A	Instrument cluster, Turn signal switch
(POWER WIND)	30A	Power window switch
WIPER	20A	Blower switch, Wiper switch, Wiper motor, Washer switch
(HEAD CLEANER)	20A	Headlight cleaner relay, Headlight cleaner switch, Headlight cleaner motor
(HORN)	10A	Horn switch, Harn relay, Horn
(R. FOG)	10A	Rear fog light switch, Headlight leveling actuator, Retractor relay
ROOM	10A	ECU, Interior lamps, Door switch
CIGAR	15A	Cigarette lighter
TAIL LH	10A	Taillight (LH), Panel light control switch, Position lights, ECU
TAIL RH	10A	Lisence plate lights, Taillight (RH)
MAIN LH	10A	Headlight (High beam: LH), Passing light (LH)
MAIN RH	10A	Headlight (High beam: RH), Passing light (RH)
DIM LH	10A	Headlight (Low beam: LH)
DIM RH	10A	Headlight (Low beam: RH)

95E0TX-007

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Main Fuse Block
Right hand drive

Fuse	Amperes	Protected circuit
HEAD	30A	Headlight switch
FUEL INJ	30A	Alternator
MAIN	80A	Except circuits protected in main fuse block: FUEL INJ 30A, HEAD 30A, RETRACTOR 30A
BTN	40A	Headlight switch
COOLING FAN	30A	EGI main relay, Cooling fan relay
(AD FAN)	20A	—
ST SIGN	10A	Circuit-opening relay
RETRACTOR	30A	Retractable headlight motors

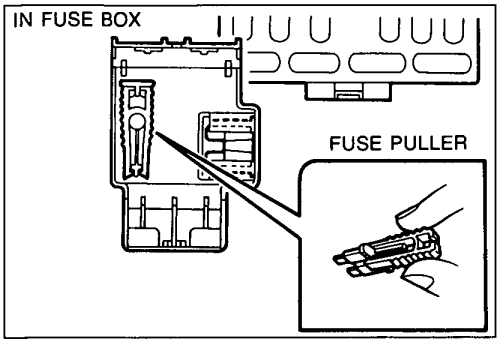
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Left hand drive

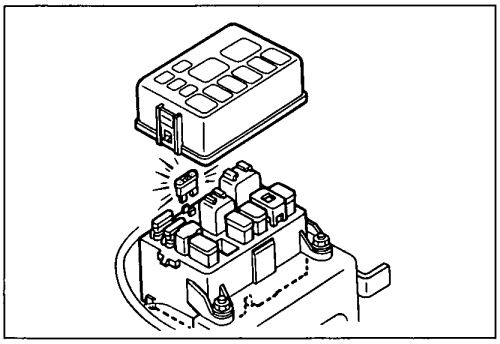
Fuse	Amperes	Protected circuit
HAZARD	30A	Turn and hazard warning flasher unit
FUEL INJ	30A	EGI main relay
MAIN	80A	Except circuits protected in main fuse block: FUEL INJ 30A, HAZARD 30A, RETRACTOR 30A
BTN	30A	Retractor switch, Alternator
COOLING FAN	30A	Cooling fan relay
ST SIGN	10A	Circuit-opening relay, ECU
RETRACTOR	30A	Headlight retractor motors
STOP	10A	Stoplight switch, Stoplights

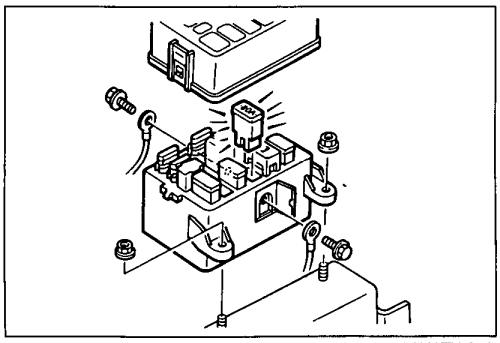
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05U0TX-013


05U0TX-014


05U0TX-015

REPLACEMENT

Note
- **If a fuse again fails after it has been replaced, there is probably a short in the circuit.**
- **Check the circuit which is protected by the failed fuse, referring to the specifications table.**

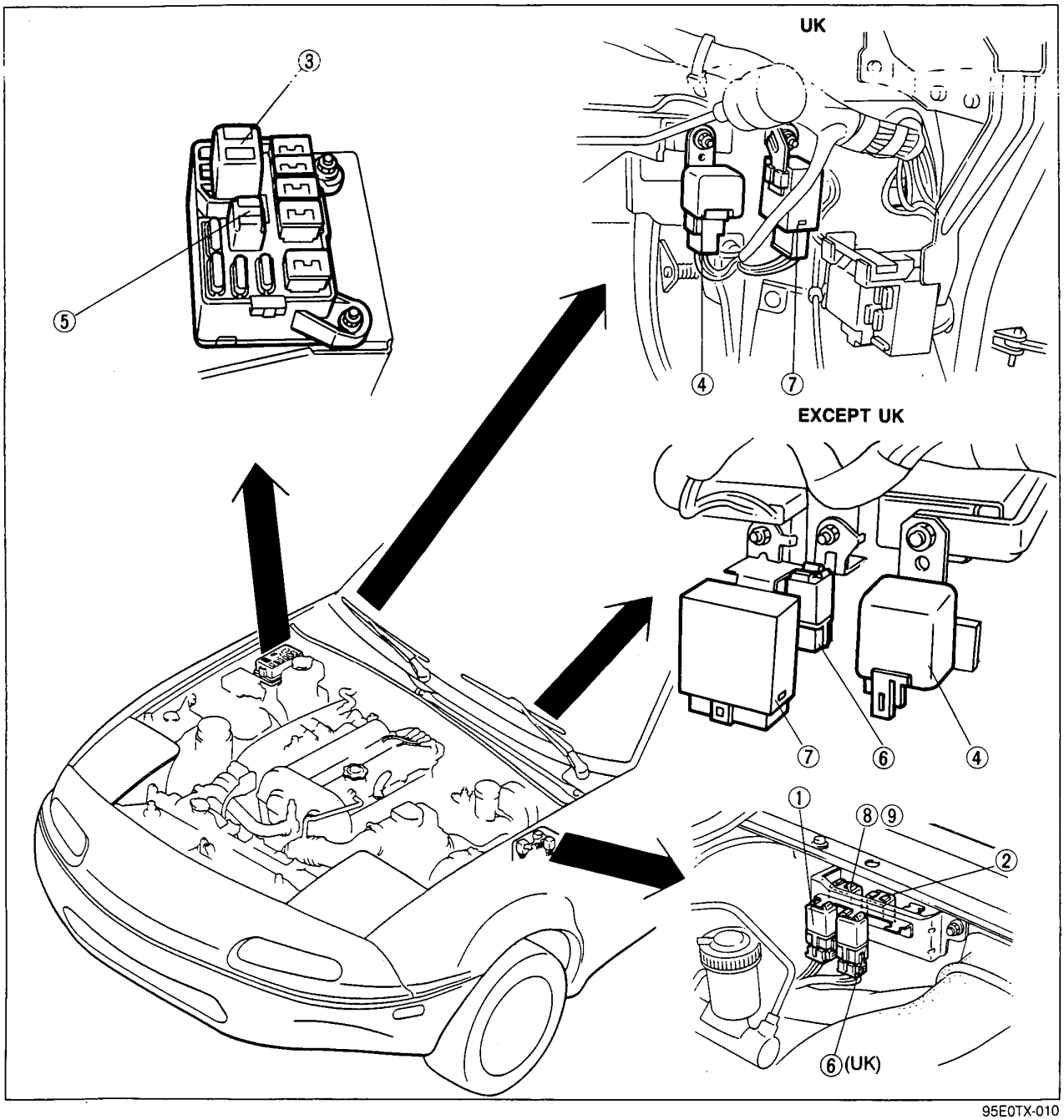
Plate Type
1. Disconnect the negative battery cable.
2. Using the fuse puller supplied in the fuse box, removed replace the failed fuse.
3. Reconnect the negative battery cable.

Cartridge Type
80A fuse (Black)
1. Disconnect the negative battery cable.
2. Remove the fuse block mounting nuts, and remove the service cover.
3. Remove the fuse installation bolts, and pull out the fuse.
4. Install the new fuse and the fuse installation bolts.
5. Install the main fuse block.
6. Reconnect the negative battery cable.

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RELAY

STRUCTURAL VIEW



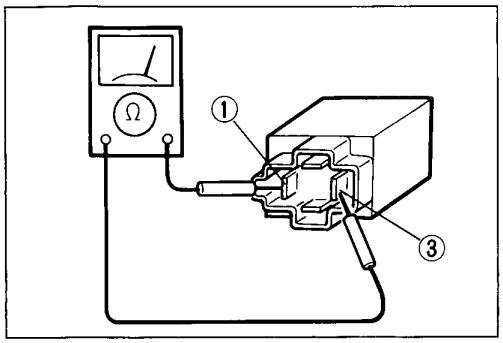
95E0TX-010

1. Retractor relay (Except UK)
2. Retractor relay (UK)
3. EGI main relay
4. Circuit-opening relay
5. Cooling fan relay
6. Horn relay
7. Turn and hazard warning flasher unit
8. Dim dip relay (UK)
9. Headlight cleaner relay (if equipped)

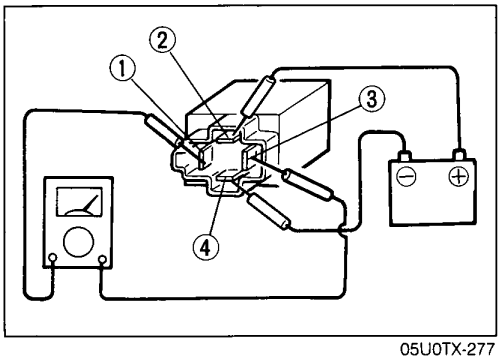
Note

- **For inspection of the following relays, refer to specified Section.**
  - **EGI main relay..... Refer to Section F**
  - **Circuit-opening relay..... Refer to Section F**
  - **Cooling fan relay..... Refer to Section E**

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95A0TX-013



05U0TX-277

HORN RELAY

Inspection

1. Check continuity between terminals 1 and 3.

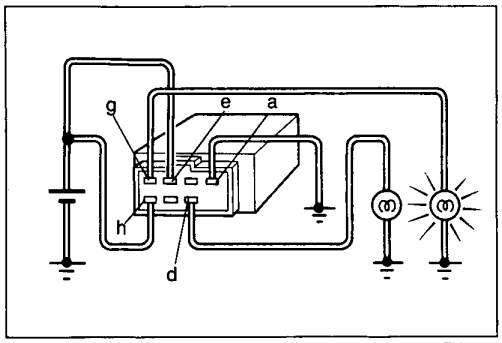
Terminal	Continuity
1—3	No

2. If not as specified, replace the relay.
3. If correct, go to Step 4.

4. Apply 12V to terminal 2 and ground terminal 4. Check for continuity between terminals 1 and 3.

Terminal	Continuity
1—3	Yes

5. If not as specified, replace the relay.

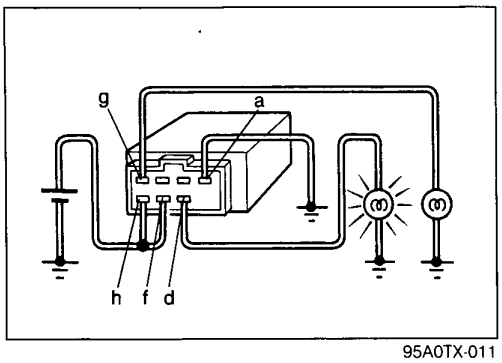


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TURN AND HAZARD WARNING FLASHER UNIT

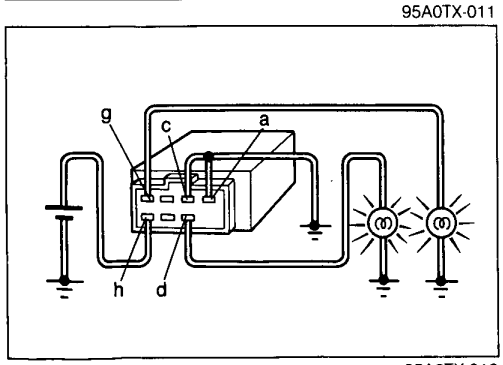
Inspection

1. Connect the test lamps (23W) to terminal d and g.
2. Apply 12V to terminal h and ground terminal a.
3. Check that the test lamp which is connected to terminal g flashes when appling 12V to terminal e.
   If the test lamp does not flash, replace the unit.



95A0TX-011

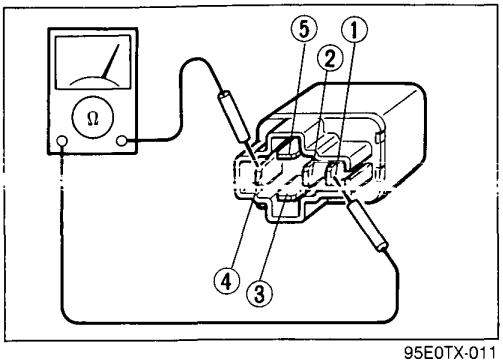
4. Check that the test lamp which is connected to terminal d flashes when appling 12V to terminal f.
   If the test lamp does not flash, replace the unit.



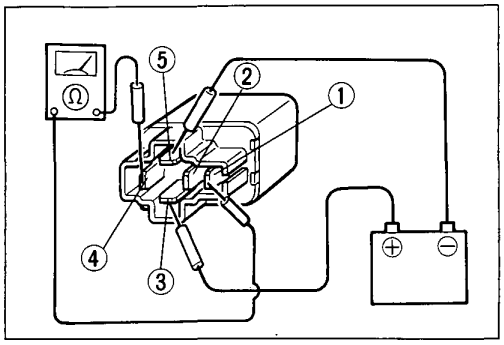
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5. Check that both test lamps flashes, when grounding terminal c.
   If the test lamps do not flash, replace the unit.

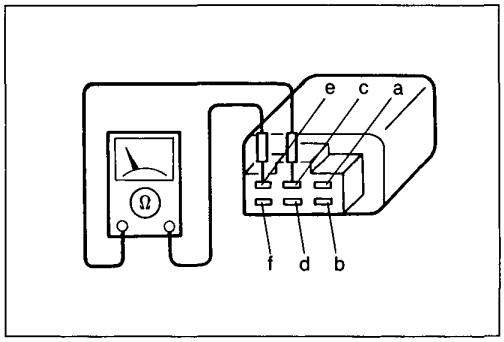
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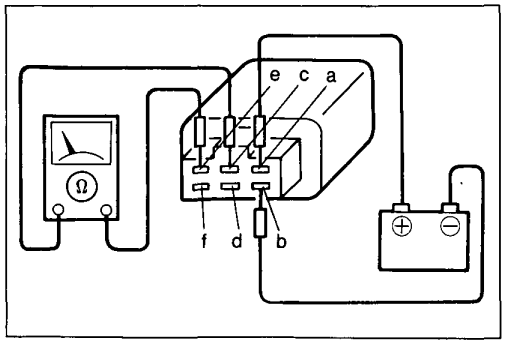
95E0TX-011



05U0TX-019



95E0TX-012



95E0TX-013

RETRACTOR RELAY (EXCEPT UK)

Inspection

1. Check continuity between terminals of the relay.

Terminal	Continuity
1—4	Yes
2—4	No
3—5	Yes

2. If not as specified, replace the retractor relay.
3. If correct, go to Step 4.
4. Apply 12V to terminal 3 and ground terminal 5. Check continuity between terminals of the relay.

Terminal	Continuity
1—4	No
2—4	Yes

5. If not as specified, replace the retractor relay.

DIM DIP RELAY AND RETRACTOR RELAY (UK)

Inspection

1. Check continuity between terminals of the relay.

Terminals					
a	b	c	d	e	f
○	○				
○		◀	○		
		○			○

○—○: indicates continuity

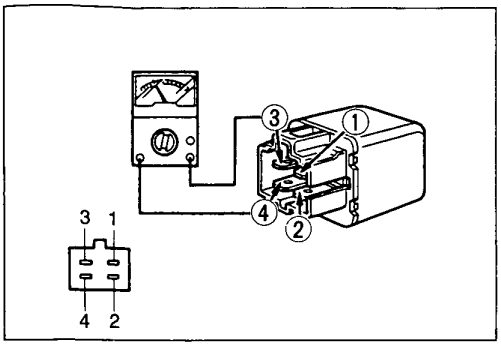
2. If not as specified, replace the relay.
3. If correct, go to Step 4.
4. Apply 12V to terminal a and ground terminal b. Check continuity between terminals of the relay.

Terminals		
c	e	f
○	○	

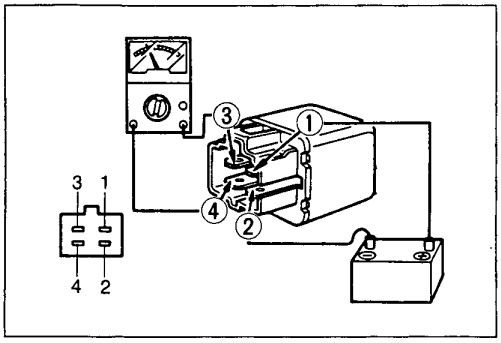
○—○: indicates continuity

5. If not as specified, replace the relay.

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95E0TX-014



95E0TX-015

HEADLIGHT CLEANER RELAY (EXCEPT UK)

Inspection

1. Check continuity between terminals of the relay.

Terminal	Continuity
1—2	Yes
3—4	No

2. If not as specified, replace the relay.
3. If correct, go to Step 4.

4. Apply 12V to terminal 1 and ground terminal 2. Check continuity between terminals of the relay.

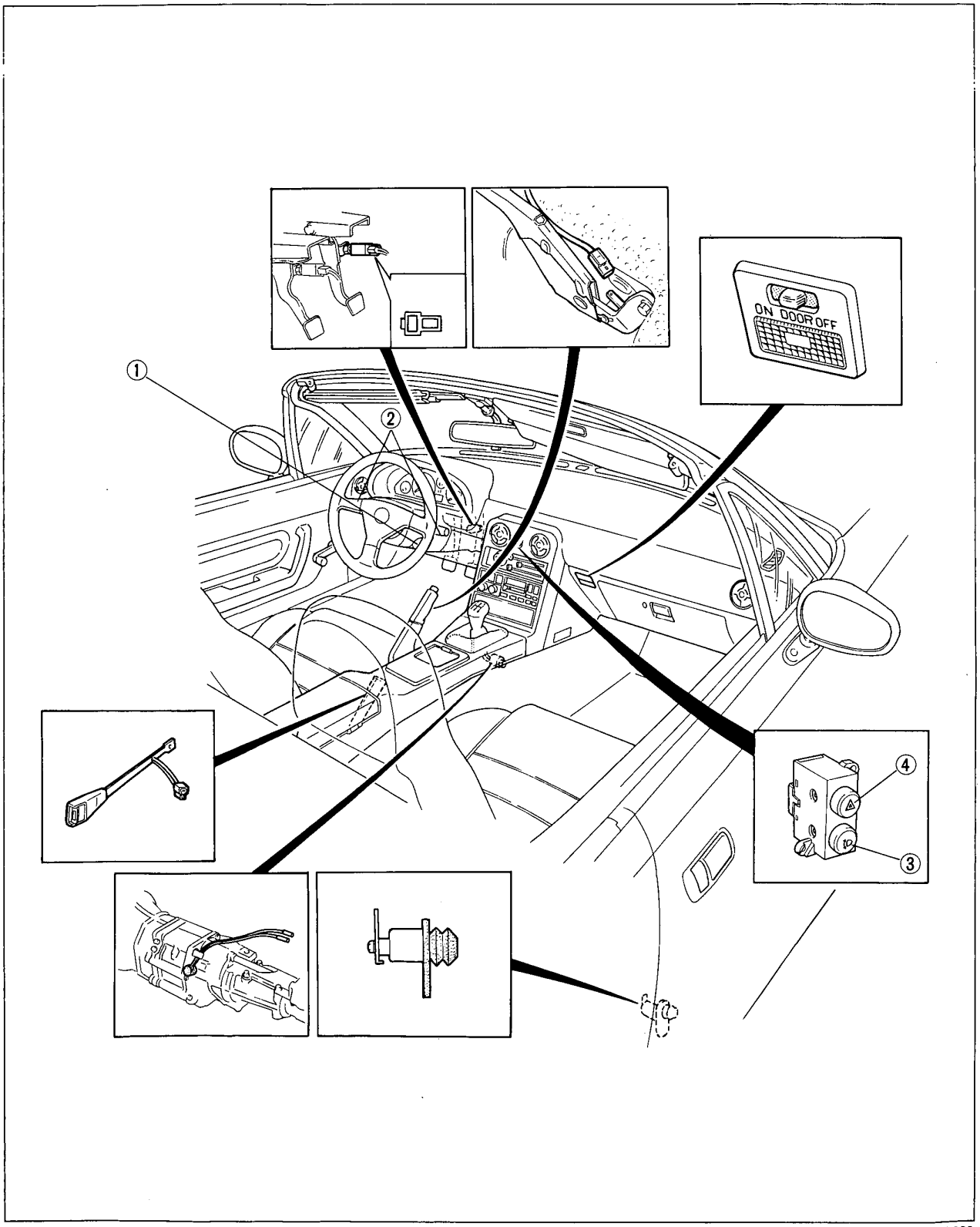
Terminal	Continuity
3—4	Yes

5. If not as specified, replace the relay.

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SWITCH

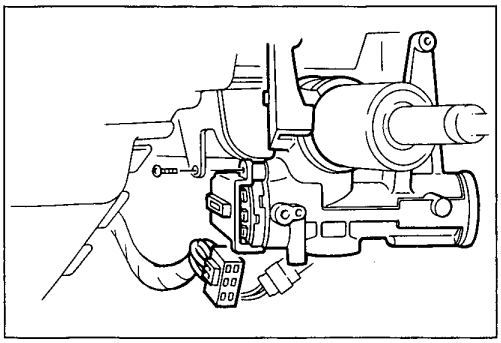
STRUCTURAL VIEW



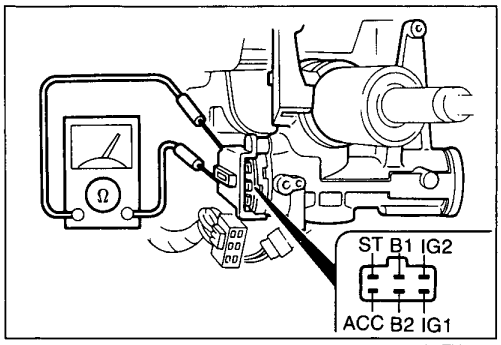
05U0TX-030

1. Ignition switch
2. Combination switch
3. Headlight retractor switch
4. Hazard warning switch

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95E0TX-016



95A0TX-014

STEERING LOCK (IGNITION SWITCH)

Replacement

1. Disconnect the negative battery cable.
2. Remove the column covers.
3. Remove the screw and the ignition switch.
4. Install in the reverse order of removal.

Inspection

1. Check continuity between terminals of the switch.

Position	Terminal					
	B1	B2	ACC	IG1	IG2	ST
LOCK						
ACC	○		○			
ON	○	○	○	○	○	
START	○	○		○		○

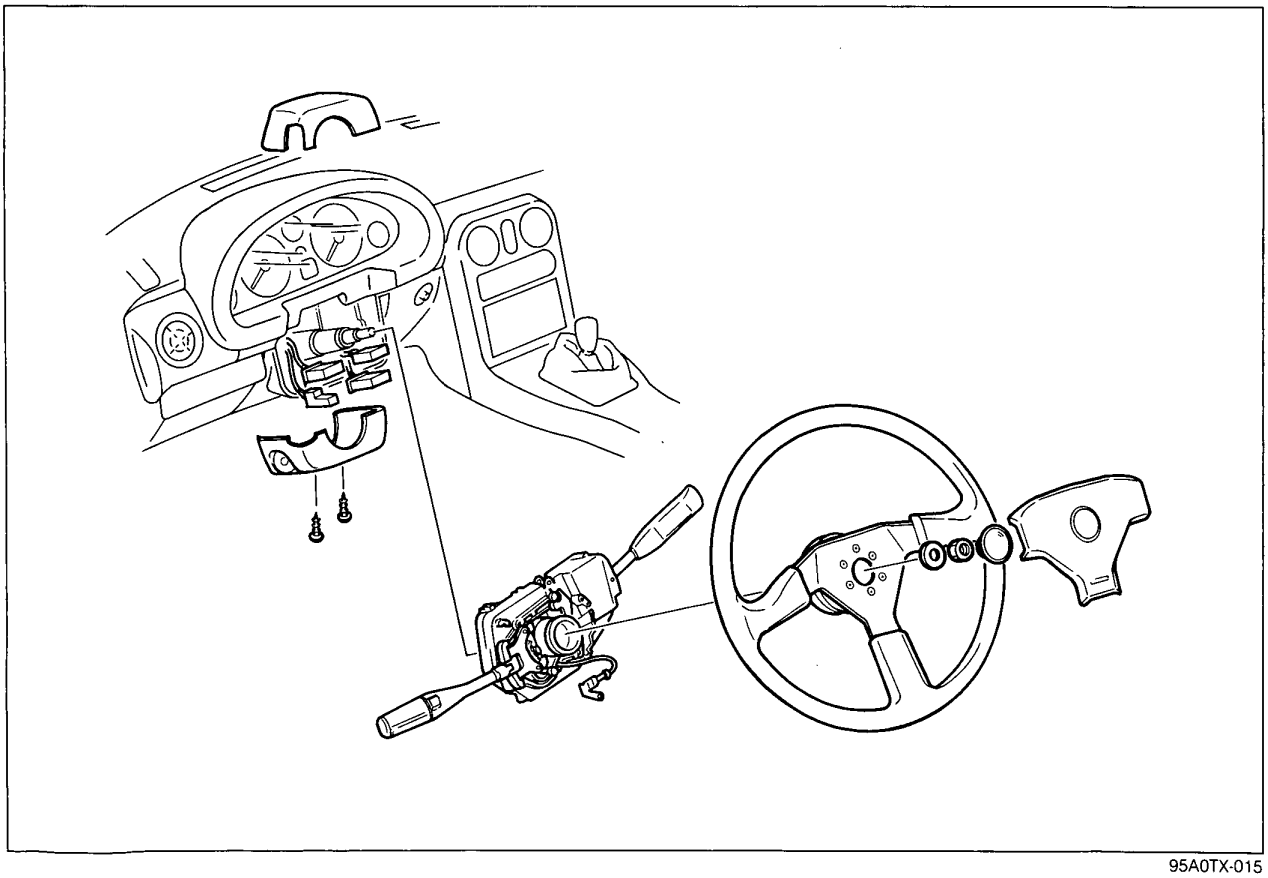
○——○: Indicates continuity

2. If not as specified, replace the combination switch.

COMBINATION SWITCH

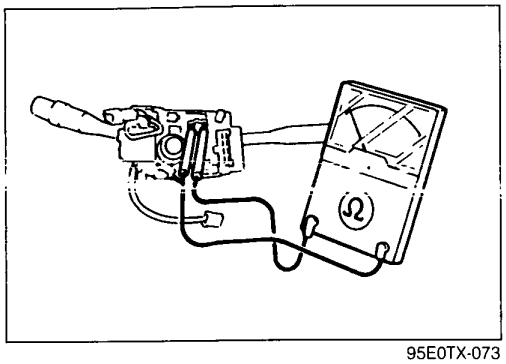
Removal / Installation

Remove and install as shown in the figure.

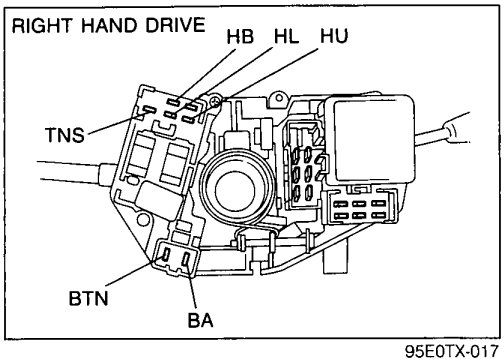


95A0TX-015

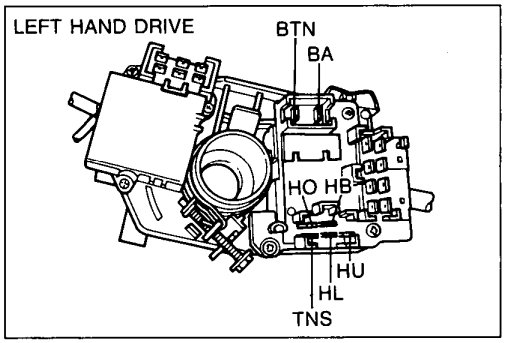
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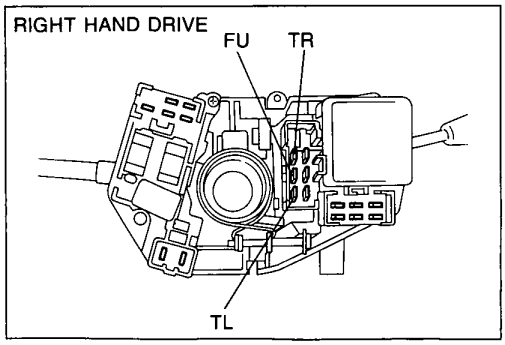
95E0TX-073



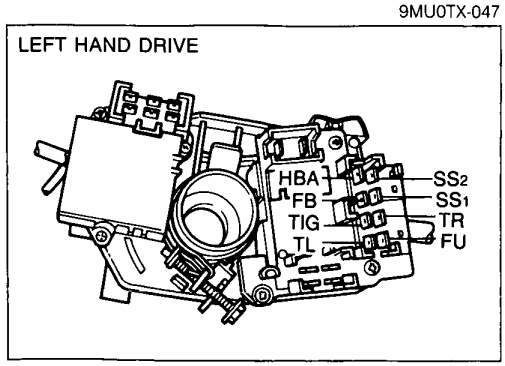
95E0TX-017



95E0TX-018



9MU0TX-047



Inspection

1. Check the continuity between the terminals described.
2. If the continuity or resistance is not as specified, replace the combination switch.

Lights, dimmer, and passing switch
Right hand drive

Position \ Terminal		HB	HL	HU	BA	BTN	TNS
Headlight	Low beam	○	○		○	○	○
	High beam	○		○	○	○	○
Passing				○	○		
Tail, Parking						○	○

○—○: Indicates continuity

Left hand drive

Position \ Terminal		HB	HL	HU	BA	BTN	TNS
Headlight	Low beam	○ ○	○		○	○	○
	High beam	○ ○		○	○	○	○
Passing				○	○		
Tail, Parking						○	○

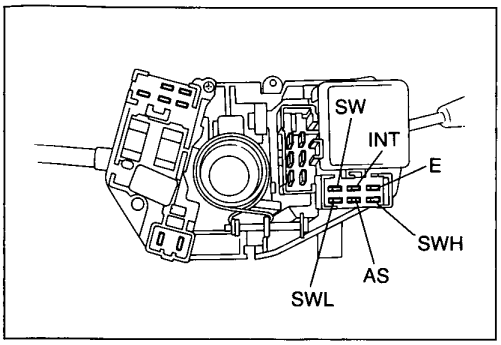
○—○: Indicates continuity

Turn signal switch

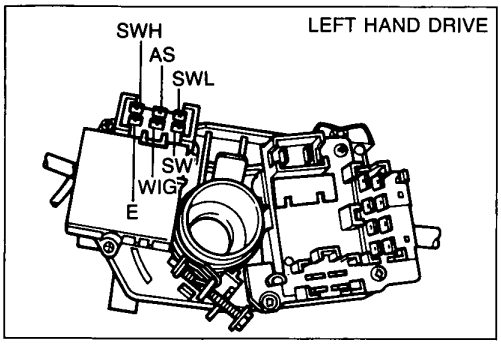
Position \ Terminal	FU	TL	TR
Left	○	○	
Right	○		○

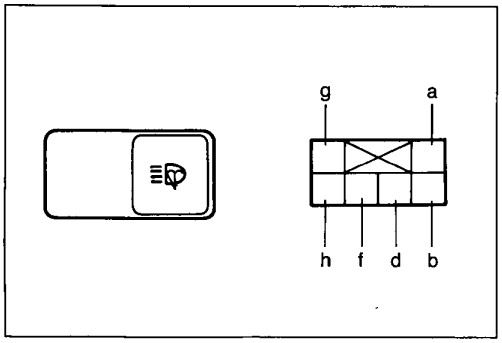
○—○: Indicates continuity

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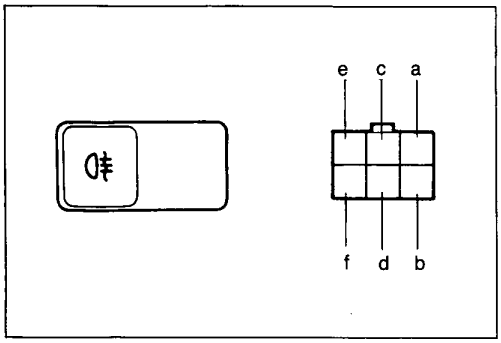


05U0TX-044

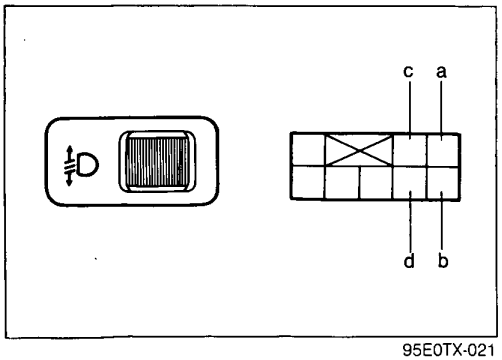




95E0TX-019



95E0TX-020



95E0TX-021

Windshield wiper and washer switch

Position		One touch	AS	WIG	SWL	SWH	E	SW
Wiper switch	OFF	OFF	○——○		○——○			
		ON			○——○		○——○	
	INT				○——○		○——○	
	I (Low)				○——○		○——○	
	II (High)					○——○	○——○	
Washer switch ON							○——○	○——○

○——○: Indicates continuity

HEADLIGHT CLEANER SWITCH (IF EQUIPPED)

1. Check the continuity between terminals of the switch.

Switch	Terminals					
	a	b	d	f	g	h
ON	○——○		○——○			
OFF	○——○					

○——○: Indicates continuity

2. If not as specified, replace the switch

REAR FOG LIGHT SWITCH (UK)

1. Check the continuity between terminals of the switch.

Switch	Terminals					
	a	b	c	d	e	f
ON	○——○		○——○			
OFF	○——○					

○——○: Indicates continuity

2. If not as specified, replace the switch.

HEADLIGHT LEVELING SWITCH (WEST GERMANY)

1. Check the continuity or resistance between terminals of the switch.

Switch	Terminal			
	a	b	c	d
0	○——○		○——○	
1	○——○		○—/\/\—○	300Ω
2	○——○		○—/\/\—○	560Ω
3	○——○		○—/\/\—○	1.6 kΩ

○——○: Indicates continuity
○-/\/\-○: Indicates resistance

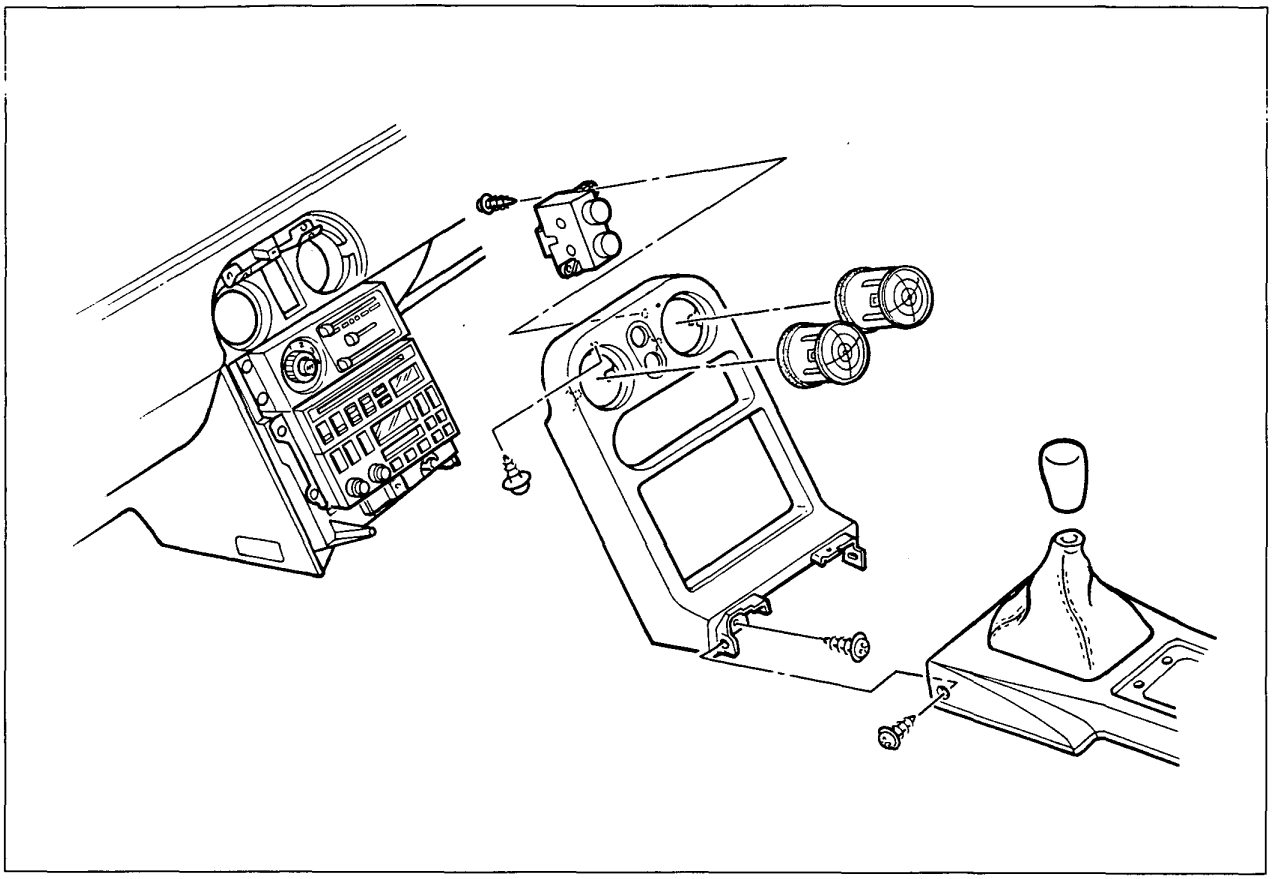
2. If not as specified, replace the switch.

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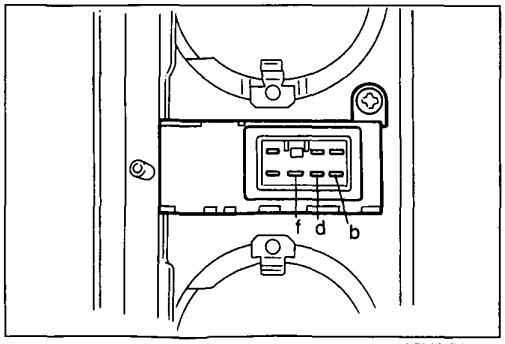
HEADLIGHT RETRACTOR SWITCH AND HAZARD WARNING SWITCH ASSEMBLY

Removal / Installation

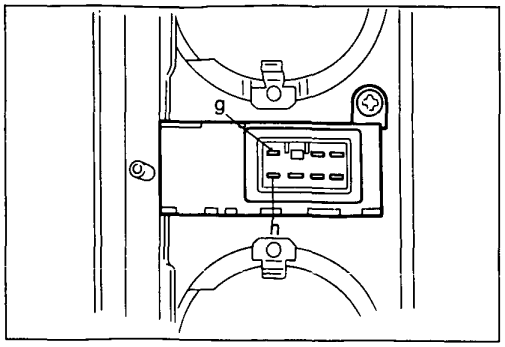
Remove and install as shown in the figure



05U0TX-046



05U0TX-047



05U0TX-048

Inspection

Headlight retractor switch

1. Remove the retractor switch.
2. Check for continuity between terminals of the switch.

Switch	Terminal		
	b	d	f
OFF	○		○
ON		○	○

○—○: Indicates continuity

3. If not as specified, replace the retractor and hazard switch as an assembly.

Hazard warning switch

1. Remove the hazard switch.
2. Check continuity between terminals of the switch.

Switch	Terminal	
	g	h
ON	○	○
OFF		

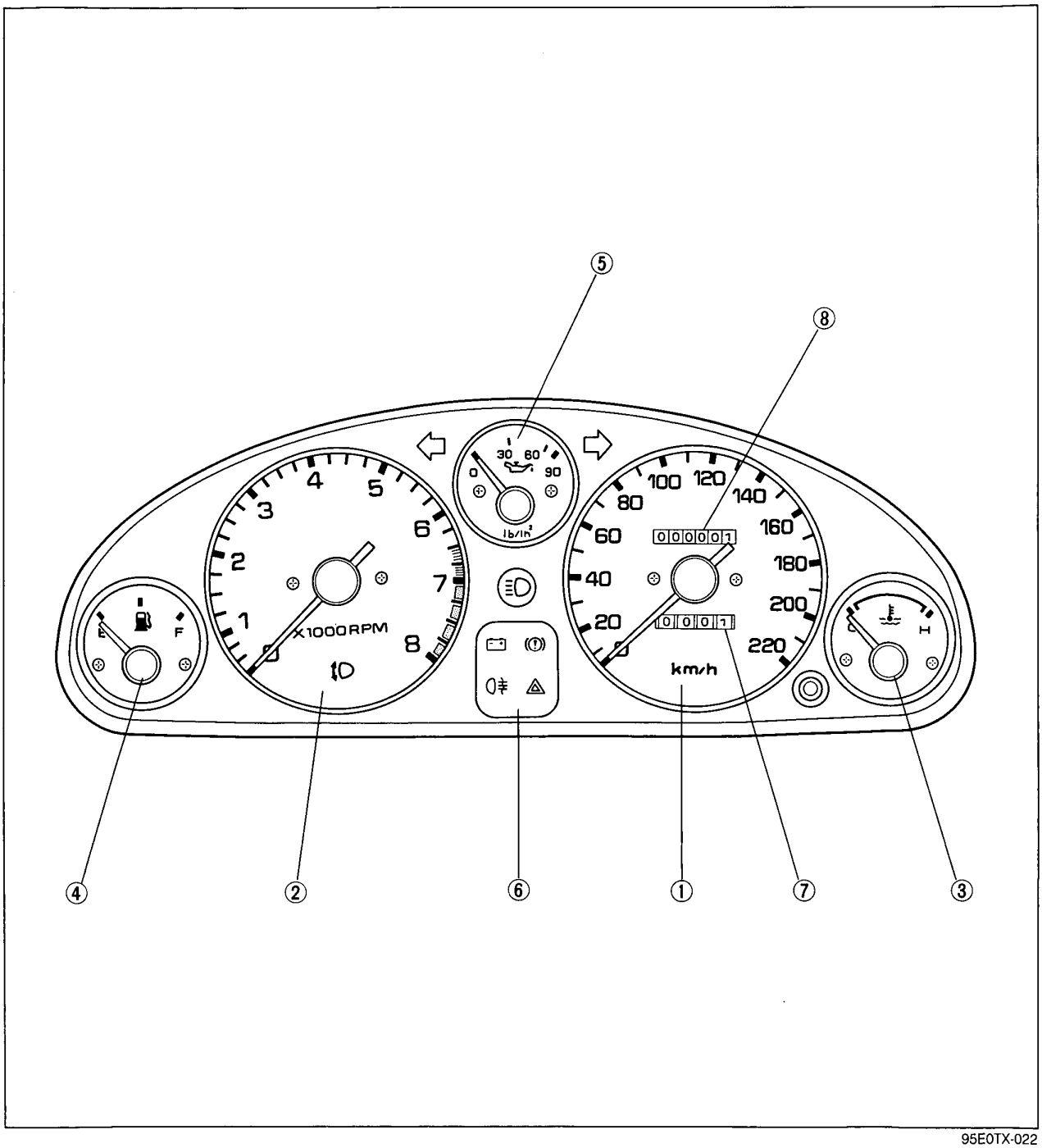
○—○: Indicates continuity

3. If not as specified, replace the hazard and retractor switch as an assembly.

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INSTRUMENT CLUSTER (METER)

STRUCTURAL VIEW

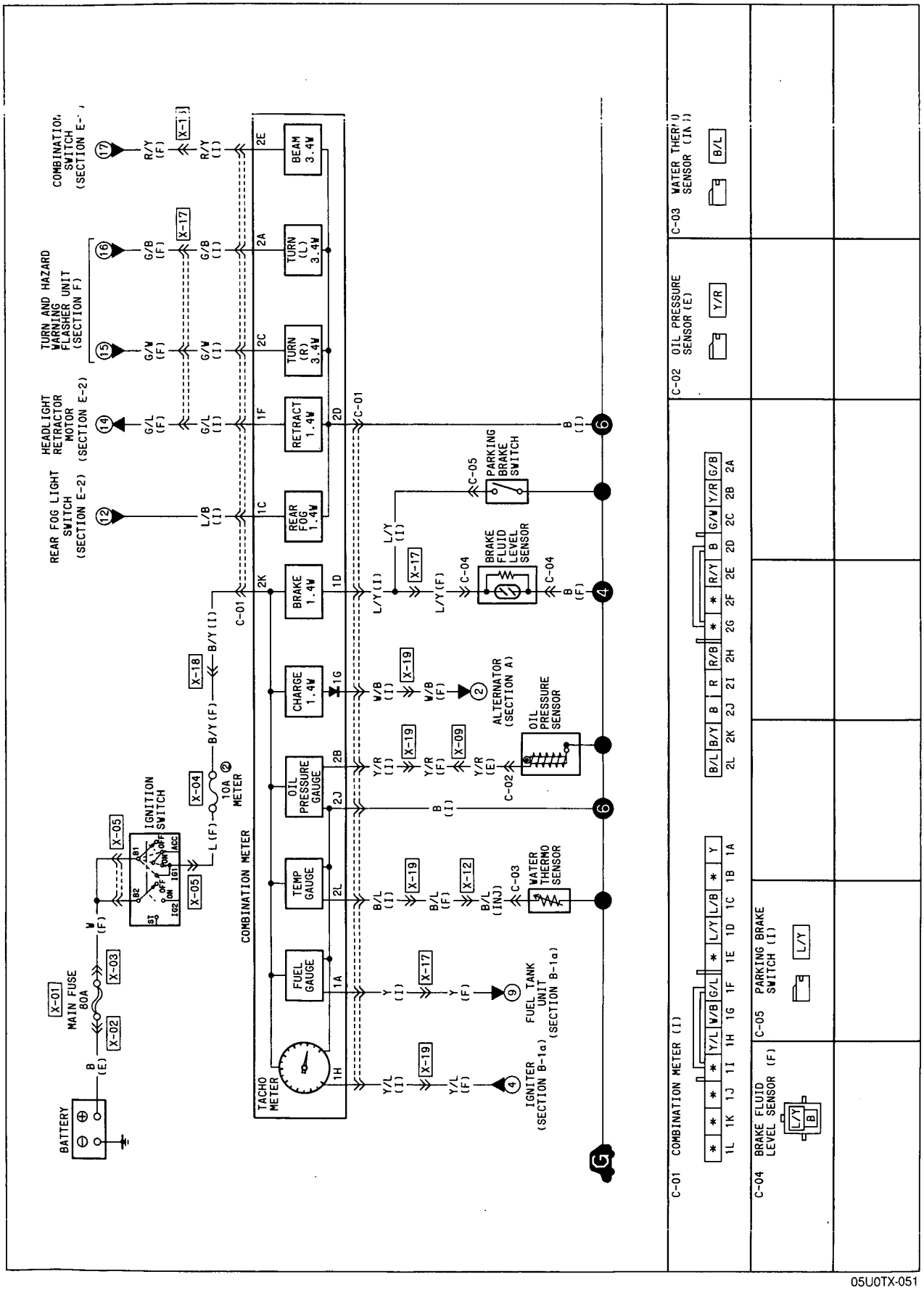


95E0TX-022

1. Speedometer
   - Troubleshooting ..... page T–23
   - Inspection ..... page T–29
2. Tachometer
   - Troubleshooting ..... page T–24
   - Inspection ..... page T–29
3. Water temperature gauge
   - Troubleshooting ..... page T–25
   - Inspection ..... page T–29
4. Fuel gauge
   - Troubleshooting ..... page T–26
   - Inspection ..... page T–30
5. Oil pressure gauge
   - Troubleshooting ..... page T–27
   - Inspection ..... page T–30
6. Warning and indicator lamps
7. Trip meter
8. Odometer

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CIRCUIT DIAGRAM



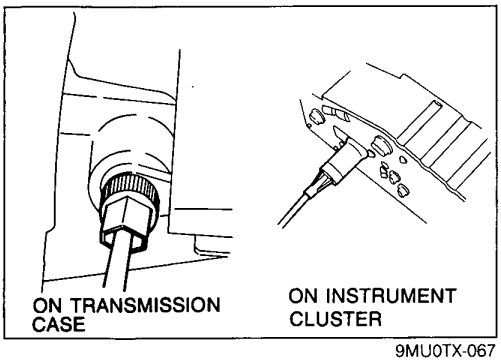
05U0TX-051

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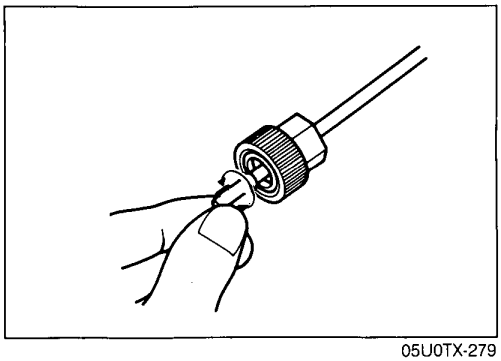
TROUBLESHOOTING

Symptom: Speedometer does not operate or indication is incorrect.

05U0TX-278



9MU0TX-067



05U0TX-279

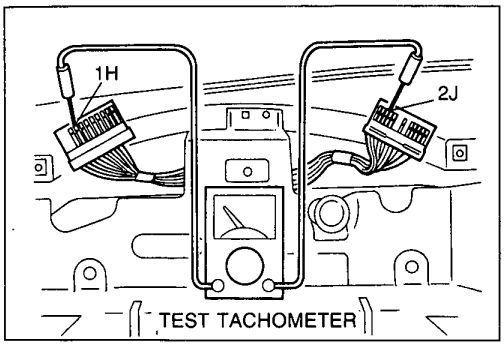
Step 1
1. Verify that the speedometer cable is connected properly.
2. If the connections are OK, go to Step 2.

Step 2 — Check speedometer cable
1. Disconnect the speedometer cable from the instrument cluster and transmission case.
2. Verify that the cable and gear spin easily when turned by hand.
3. If the cable or gear is stiff, replace as necessary.
4. If the speedometer cable and gear are OK, replace the speedometer.

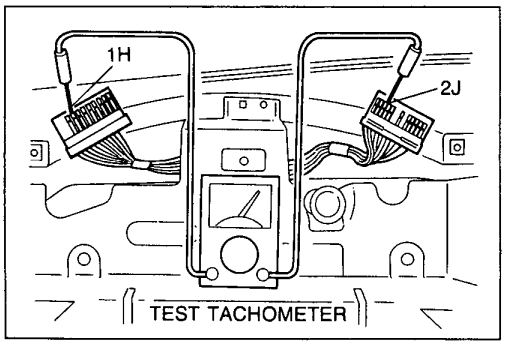
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Symptom: Tachometer does not operate.

9MU0TX-069



95E0TX-023



9MU0TX-071

Step 1 — Preparation

1. Remove the instrument cluster. (Refer to page T–28.)
2. Connect a test tachometer between terminals 1H and 2J of the harness side connector.

Step 2

1. Start the engine.
2. Check that the test tachometer indicates engine speed.

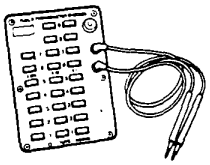
Indicates rpm	Action
Yes	Replace tachometer
No	Repair wiring harness (Instrument cluster — Igniter)

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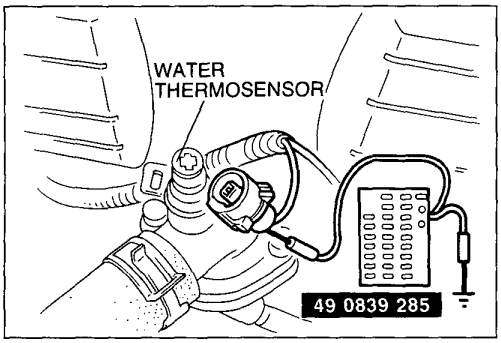
Symptom: Water temperature gauge does not operate.

05U0TX-466

Preparation
SST

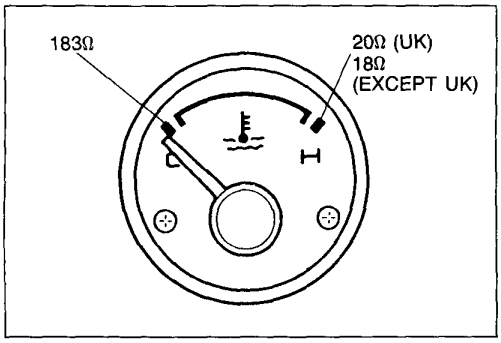
49 0839 285 Checker, fuel and thermometer		For inspection of gauges

05U0TX-052



05U0TX-456

Step 1
1. Disconnect the connector from the water thermosensor.
2. Connect the red lead of the **SST** to the connector, and the black lead to a body ground.



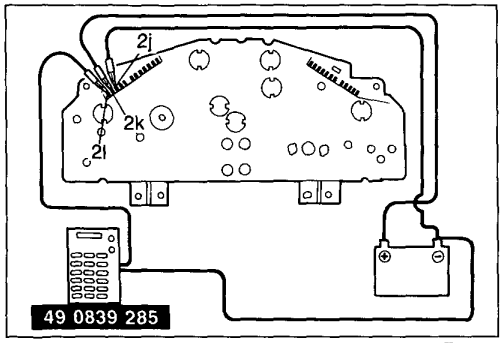
95E0TX-074

3. Set the **SST** to the resistance values shown in the figure.
4. Turn the ignition switch ON, and check that the needle indicates the correct values.

Gauge displays correct	Action
Yes	Replace water thermosensor
No	Go to Step 2

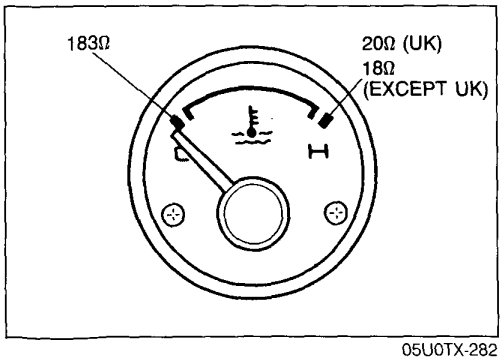
Caution
- **Continue the above checks for at least two minutes each to correctly judge the condition.**
- **The allowable indication error is twice the width of the needle.**

Step 2
1. Remove the instrument cluster. (Refer to page T–28.)
2. Apply 12V to terminal 2k and ground terminal 2j.
3. Connect the red lead of the **SST** to terminal 2l and the black lead to a ground.



95E0TX-024

4. Set the **SST** to the resistance values shown in the figure.
5. Verify that the needle indicates the correct values.



05U0TX-282

Indicates correct	Action
Yes	Repair wiring harness (Instrument cluster — Water thermosensor)
No	Replace water temperature gauge

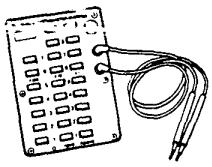
Caution
- **Continue the above checks for at least two minutes each to correctly judge the condition.**
- **The allowable indication error is twice the width of the needle.**

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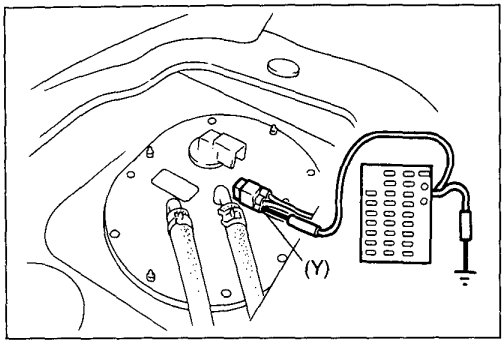
Symptom: Fuel gauge does not operate.

05U0TX-467

Preparation
SST

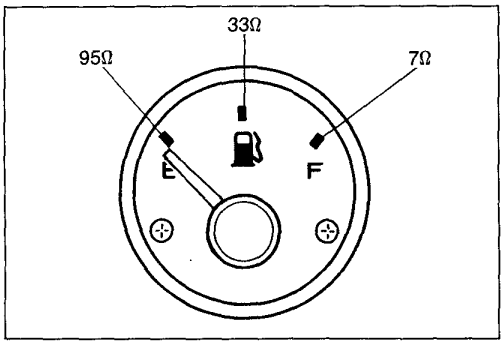
49 0839 285 Checker, fuel and thermometer		For inspection of gauges

05U0TX-052



05U0TX-283

Step 1
1. Disconnect the connector from the fuel tank sender unit.
2. Connect the red lead of the **SST** to terminal-wire (Y) and the black lead to a body ground.

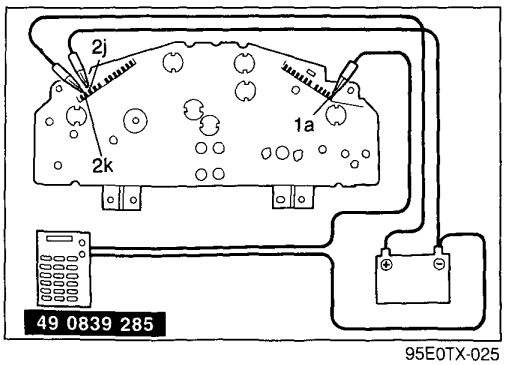


9MU0TX-079

3. Set the **SST** to the resistance values shown in the figure.
4. Turn the ignition switch ON, and verify that the needle indicates the correct values.

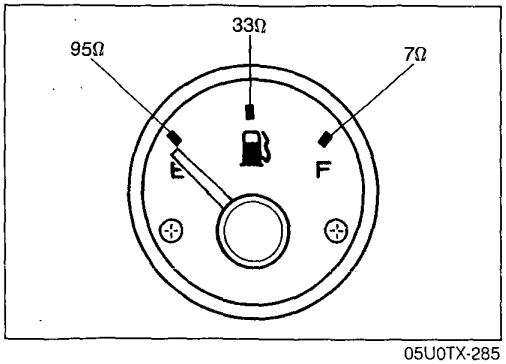
Indicates correct	Action
Yes	Replace fuel gauge sender unit (in fuel tank)
No	Go to Step 2

Caution
- **Continue the above checks for at least two minutes each to correctly judge the condition.**
- **The allowable indication error is twice the width of the needle.**



95E0TX-025

Step 2
1. Remove the instrument cluster. (Refer to page T–28.)
2. Apply 12V to terminal 2k and ground terminal 2j.
3. Connect the red lead of the **SST** to terminal 1a and the black lead to a ground.



05U0TX-285

4. Set the **SST** to the resistance values shown in the figure.
5. Verify that the needle indicates the correct values.

Indicates correct	Action
Yes	Repair wiring harness (Instrument cluster — fuel gauge sender unit)
No	Replace fuel gauge

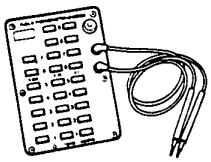
Caution
- **Continue the above checks for at least two minutes each to correctly judge the condition.**
- **The allowable indication error is twice the width of the needle.**

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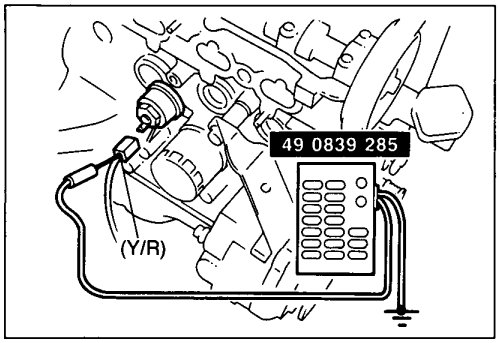
Symptom: Oil pressure gauge does not operate.

05U0TX-468

Preparation
SST

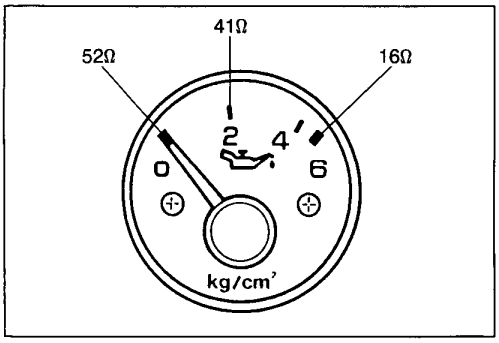
49 0839 285 Checker, fuel and thermometer		For inspection of gauges

05U0TX-052



05U0TX-055

Step 1
1. Disconnect the connector from the oil pressure sensor.
2. Connect the red lead of the **SST** to terminal-wire (Y/R) and the black lead to a body ground.

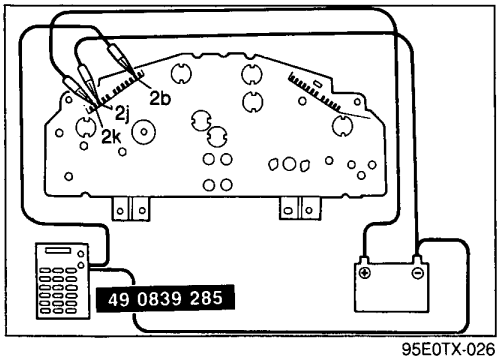


05U0TX-056

3. Set the **SST** to the resistance values shown in the figure.
4. Turn the ignition switch ON, and verify that the needle indicates the correct values.

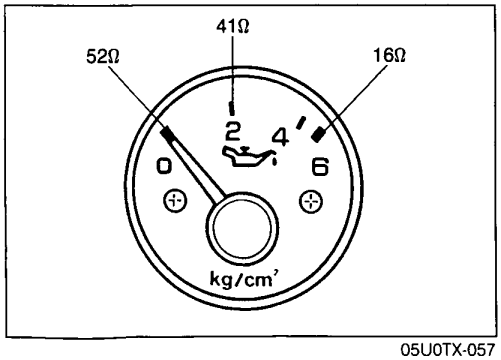
Indicates correct	Action
Yes	Replace oil pressure sensor
No	Go to Step 2

Caution
- **Continue the above checks for at least two minutes each to correctly judge the condition.**
- **The allowable indication error is twice the width of the needle.**



95E0TX-026

Step 2
1. Remove the instrument cluster. (Refer to page T–28.)
2. Apply 12V to terminal 2k and ground terminal 2j.
3. Connect the red lead of the **SST** to terminal 2b and the black lead to a ground.



05U0TX-057

4. Set the **SST** to the resistance values shown in the figure.
5. Verify that the needle indicates the correct values.

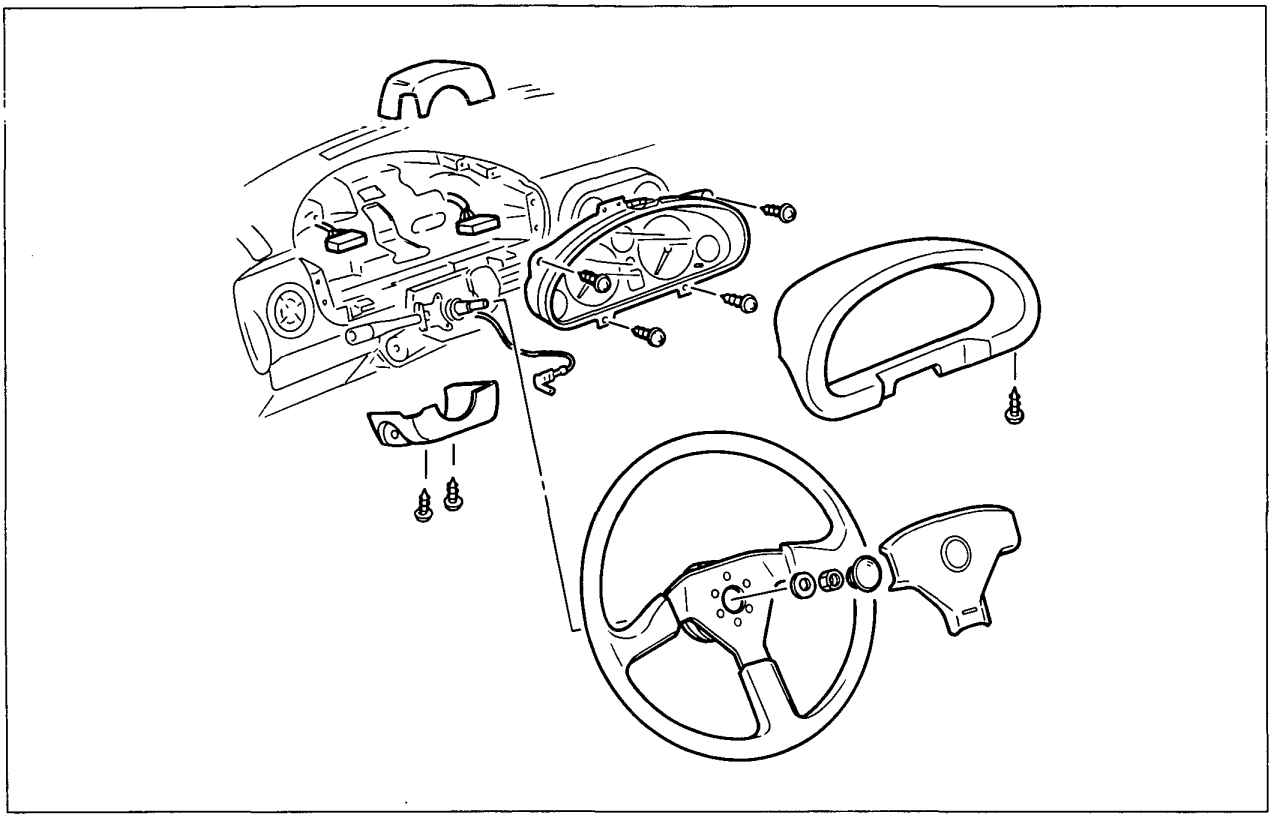
Indicates correct	Action
Yes	Repair wiring harness (Instrument cluster — oil pressure sensor)
No	Replace oil pressure gauge

Caution
- **Continue the above checks for at least two minutes each to correctly judge the condition.**
- **The allowable indication error is twice the width of the needle.**

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REMOVAL / INSTALLATION

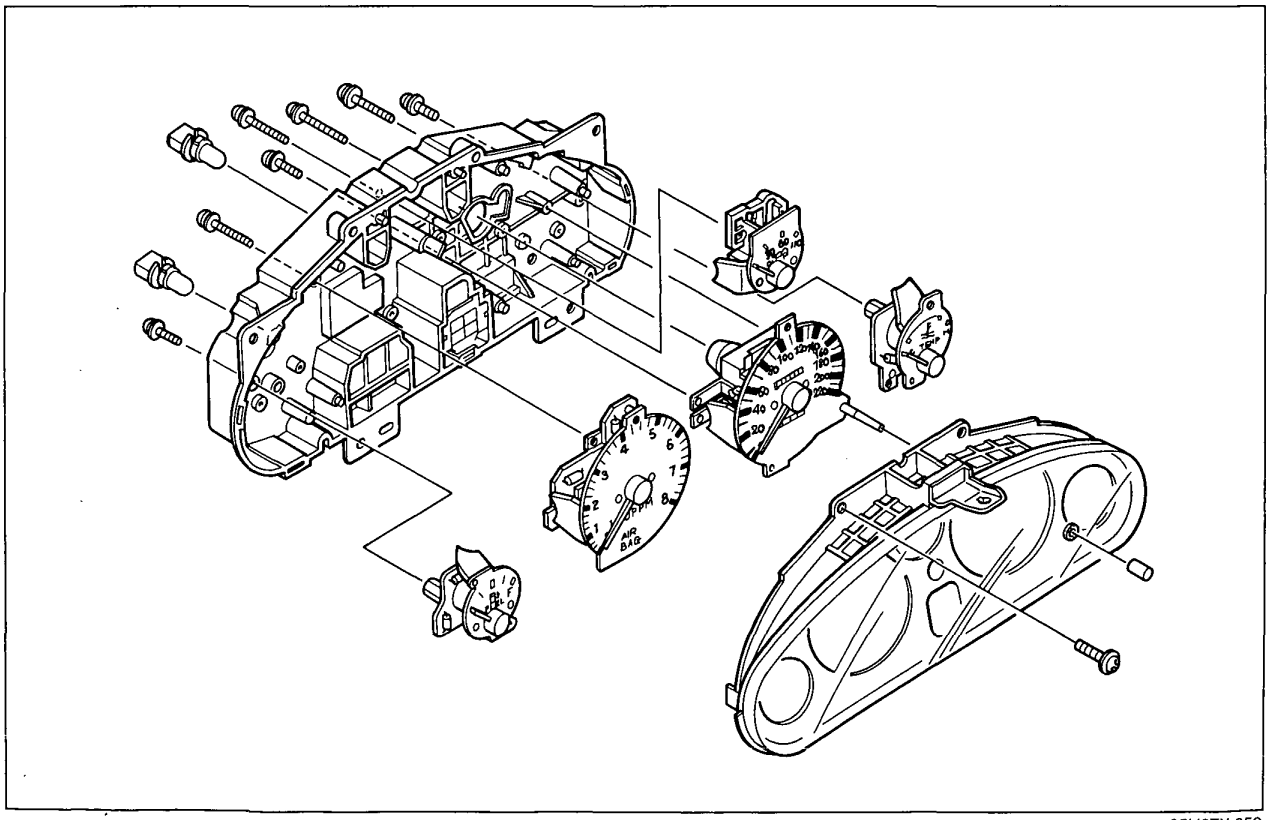
Remove and install as shown in the figure.



05U0TX-058

DISASSEMBLY / ASSEMBLY

Disassemble and assemble as shown in the figure.



05U0TX-059

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Standard indication (km/h)	Allowable range (km/h)
40	40— 43
80	80— 84
120	120—126

Standard indication (mph)	Allowable range (mph)
30	30—32
50	50—53
80	80—84

05U0TX-060

Standard Indication (rpm)	Allowable range (rpm)
2,000	1,850—2,150
3,000	2,760—3,280
4,000	3,700—4,300
5,000	4,640—5,360

05U0TX-061

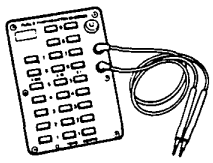
SPEEDOMETER
Inspection
1. Using a speedometer tester, check the speedometer for allowable indication error, and check the operation of the odometer. Replace if necessary.
2. Check the speedometer for fluctuation and/or abnormal noise.

Caution
- **If significant fluctuation occurs or the speedometer does not move at all, remove the speedometer cable. If it is normal, replace the speedometer assembly.**
- **Tire wear and improper inflation will increase speedometer error.**

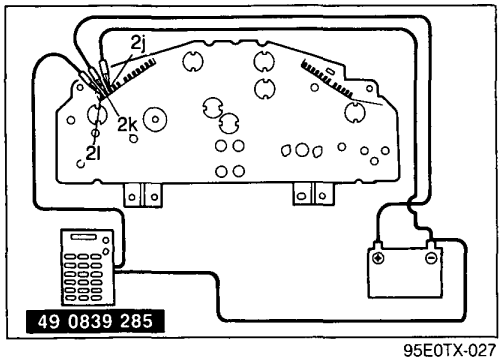
TACHOMETER
Inspection
1. Connect a test tachometer to the engine, and start the engine.
2. Check the tachometer for allowable indication error. Replace if necessary.

Caution
- **When removing or installing the tachometer, do not drop it or subject it to sharp shocks.**

WATER TEMPERATURE GAUGE
Inspection
Preparation
SST

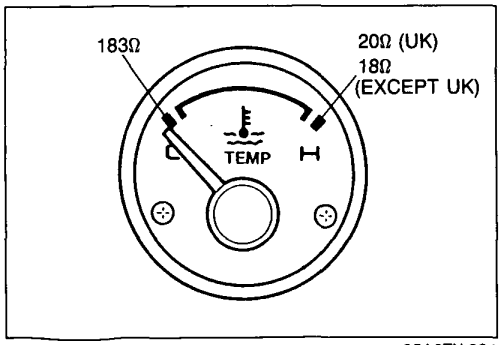
49 0839 285 Checker, fuel and thermometer		For inspection of gauges

05U0TX-062



95E0TX-027

1. Remove the instrument cluster. (Refer to page T–28.)
2. Apply 12V to terminal 2k and ground terminal 2j.
3. Connect the red lead of the **SST** to terminal 2l and the black lead to a ground.



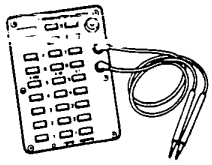
95A0TX-024

4. Set the **SST** to the resistance values shown in the figure.
5. Turn the ignition switch ON, and verify that the needle indicates the correct values.

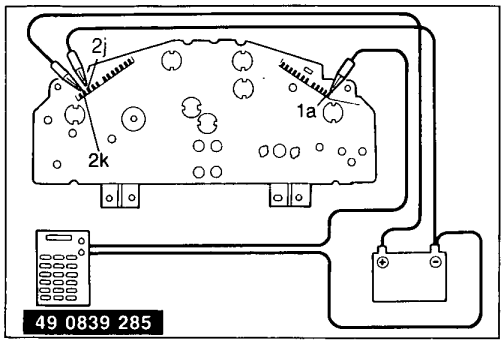
Caution
- **Continue the above checks for at least two minutes each to correctly judge the condition.**
- **The allowable indication error is twice the width of the needle.**

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FUEL GAUGE
Inspection
Preparation
SST

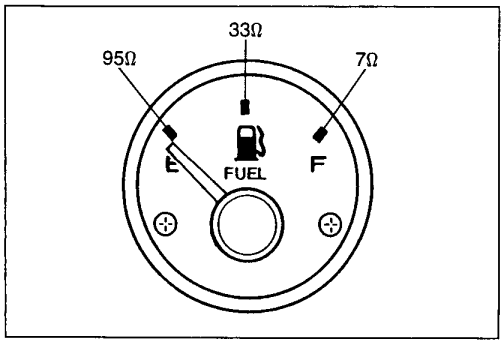
49 0839 285 Checker, fuel and thermometer		For inspection of gauges

05U0TX-064



95E0TX-028

1. Remove the instrument cluster. (Refer to page T–28.)
2. Apply 12V to terminal 2k and ground terminal 2j.
3. Connect the red lead of the **SST** to terminal 1a and the black lead to a ground.

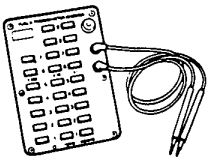


9MU0TX-087

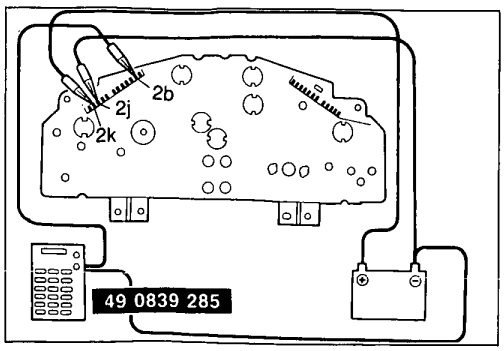
4. Set the **SST** to the resistance values shown in the figure.
5. Verify that the needle indicates the correct values.

Caution
- **Continue the above checks for at least two minutes each to correctly judge the condition.**
- **The allowable indication error is twice the width of the needle.**

OIL PRESSURE GAUGE
Inspection
Preparation
SST

49 0839 285 Checker, fuel and thermometer		For inspection of gauges

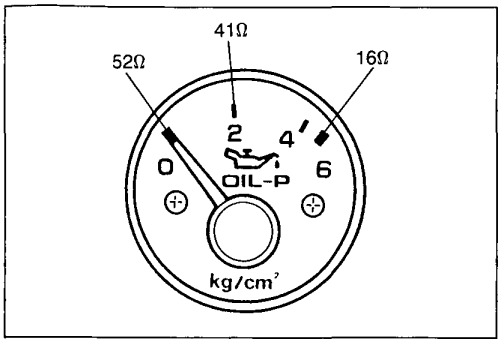
05U0TX-066



95E0TX-029

1. Remove the instrument cluster. (Refer to page T–28.)
2. Apply 12V to terminal 2k and ground terminal 2j.
3. Connect the red lead of the **SST** to terminal 2b and the black lead to a ground.

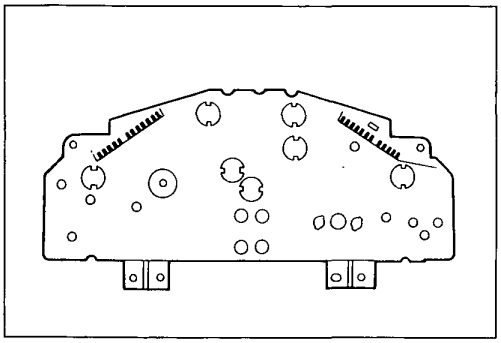
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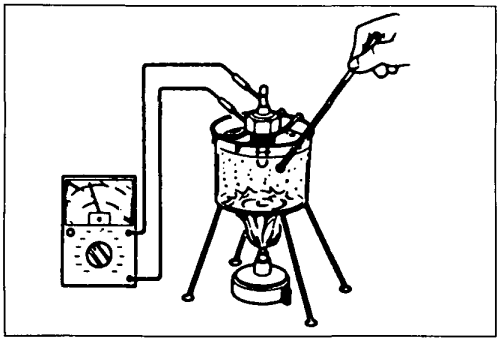
9MU0TX-087

4. Set the **SST** to the resistance values shown in the figure.
5. Verify that the needle indicates the correct values.

Caution
- **Continue the above checks for at least two minutes each to correctly judge the condition.**
- **The allowable indication error is twice the width of the needle.**

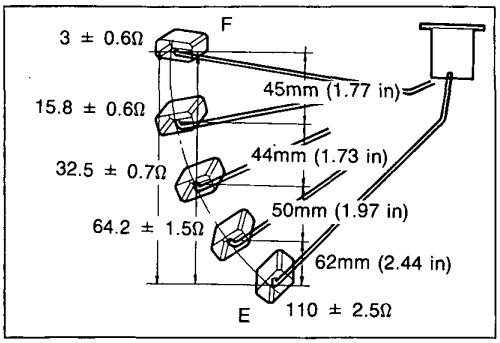

95E0TX-030

PRINTED CIRCUIT
Inspection
1. Remove the instrument cluster. (Refer to page T–28.)
2. Check the printed circuit for damage or oxidization.
3. If necessary, replace the printed circuit.


05U0TX-069

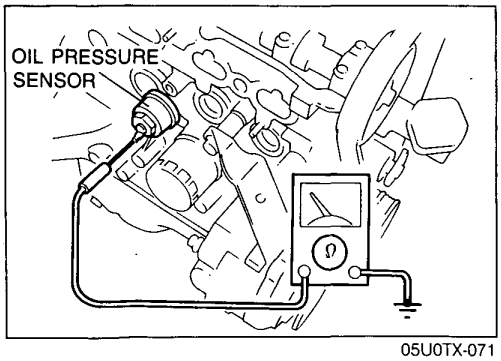
WATER THERMOSENSOR
Inspection
1. Remove the sensor.
2. Place the sensor and a thermometer in water.
3. Heat the water gradually, and measure the resistance of the sensor with an ohmmeter.
4. If the resistance is not as specified, replace the sensor.

Resistance: 190—260Ω at 50°C (122°F)



05U0TX-070

FUEL GAUGE SENDER UNIT (IN FUEL TANK)
Inspection
1. Remove the fuel tank gauge sender unit. (Refer to Section F.)
2. Disconnect the fuel gauge sender unit connector.
3. Check resistance between terminals a and b while slowly moving the unit arm from point F to point E.
4. If not correct, replace the fuel gauge sender unit.



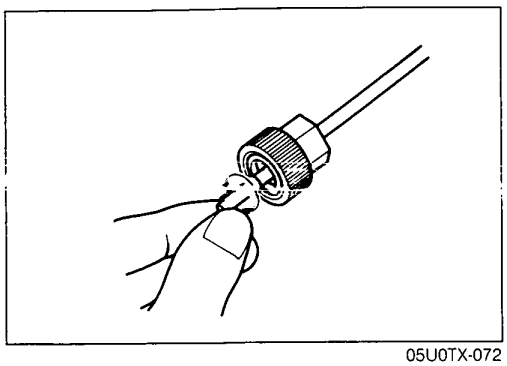
05U0TX-071

OIL PRESSURE SENSOR
Inspection
1. Disconnect the oil pressure sensor connector.
2. Measure resistance between the oil pressure sensor and a body ground as shown.

Condition	Resistance
Engine stopped	110—130Ω
Engine running	13— 55Ω

3. If not as specified, replace the oil pressure sensor.

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05U0TX-072

SPEEDOMETER CABLE

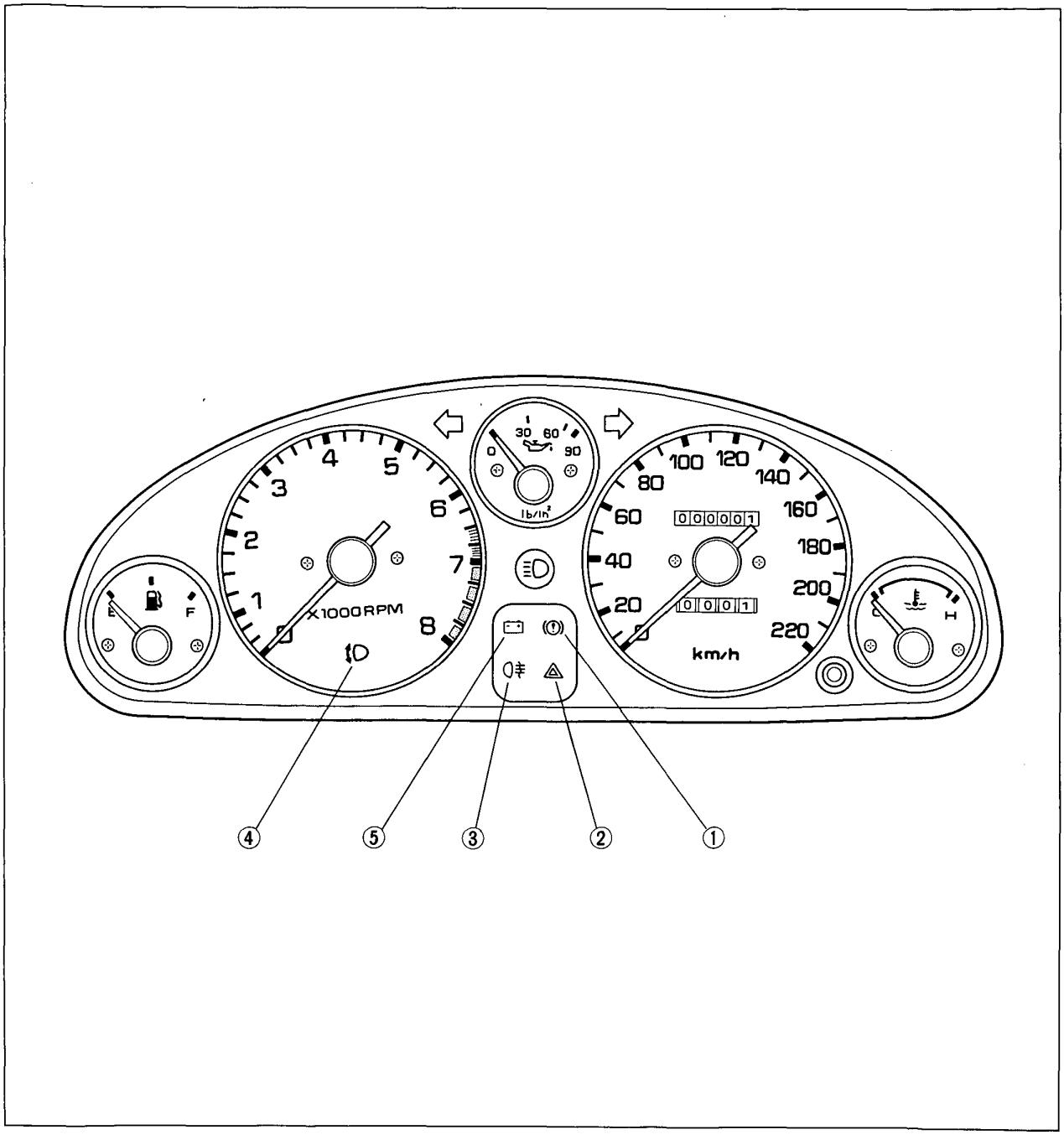
Inspection

1. Disconnect the speedometer cable from the instrument cluster and transmission case.
2. Verify that the cable and gear spin easily when turned by hand.
3. If the cable or gear is stiff, replace as necessary.

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WARNING LAMP AND SENDER UNIT

STRUCTURAL VIEW



95E0TX-031

1. Brake warning lamp
2. Hazard warning indicator lamp
3. Rear fog light indicator lamp
4. Headlight retractor motor indicator lamp
5. Alternator warning lamp

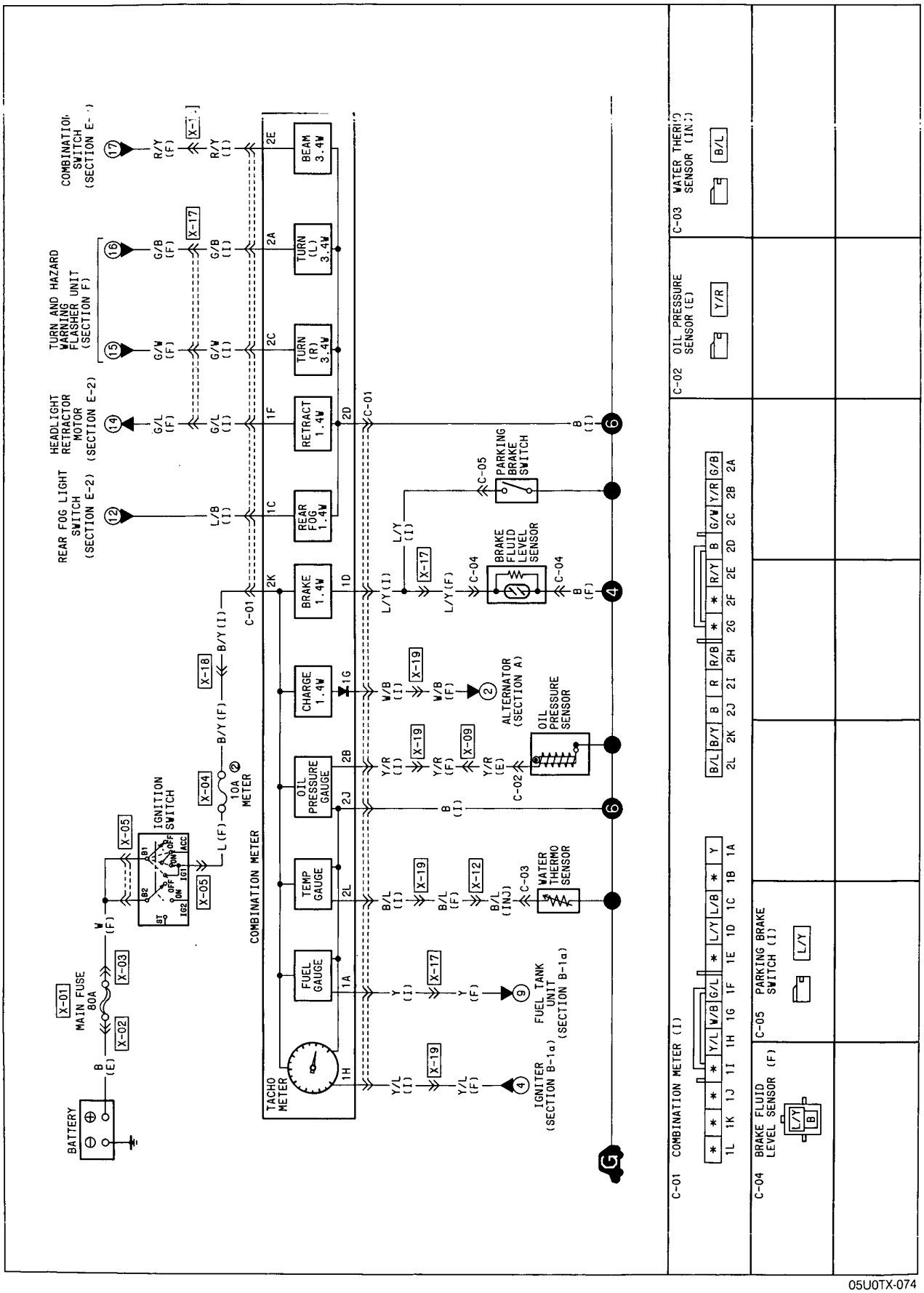
Note

- **Refer to the following tables concerning warning lamps information.**

Warning indicator lamp	Reference page and Section
Headlight retractor	T–48
Alternator	Section G

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CIRCUIT DIAGRAM



05U0TX-074

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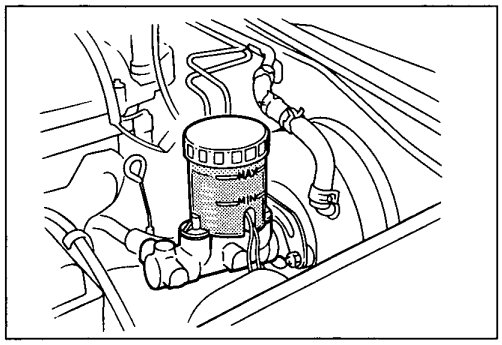
TROUBLESHOOTING

Note
- **Check the METER 10A fuse in the fuse box before troubleshooting. If normal, refer to the following troubleshooting.**

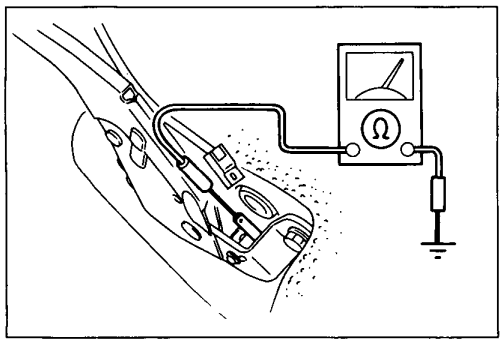
Brake Warning Lamp

Symptom: Brake warning lamp remains illuminated.

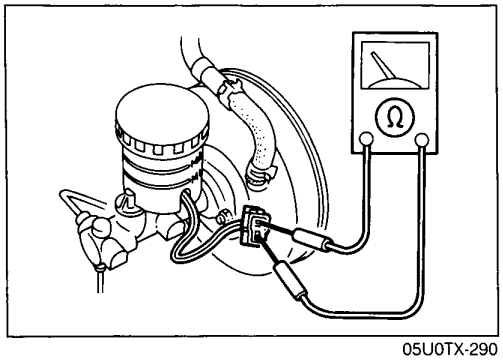
05U0TX-288



05U0TX-289



05U0TX-075



05U0TX-290

Step 1 — Check brake fluid level
Check brake fluid level.

Brake fluid level	Action
Below MIN	Check brake system (Refer to Section P)
Above MIN	Go to Step 2

Step 2 — Check parking brake switch
1. Disconnect the parking brake switch connector.
2. Check continuity between the terminal of the switch and a body ground.

Lever	Continuity
Pulled one notch	Yes
Released	No

3. If not as specified, adjust or replace the parking brake switch. (Refer to Section P.)
4. If the switch is OK, go to Step 3.

Step 3 — Check brake fluid level sensor
1. Check continuity of the sensor.

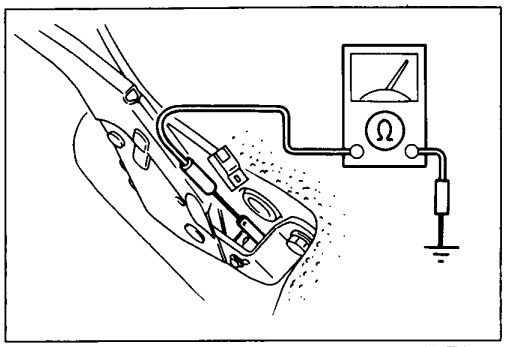
Brake fluid level	Continuity
Below MIN	Yes
Above MIN	No

2. If not as specified, replace the level sensor.
3. If the sensor is OK, repair the wiring harness.

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Symptom: Brake warning lamp does not come on when parking brake on. (Ignition switch ON.)

9MU0TX-101



05U0TX-291

Remedy

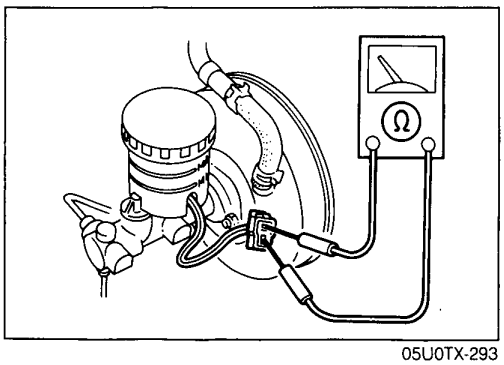
1. Disconnect the parking brake switch connector.
2. Check continuity between the terminal of the switch and a body ground.

Lever	Continuity
Pulled one notch	Yes
Released	No

3. If not as specified, adjust or replace the parking brake switch.
4. If the switch is OK, repair the wiring harness.

Symptom: Brake warning lamp does not come on when brake fluid in reservoir tank below MIN.

05U0TX-292



05U0TX-293

Remedy

1. Disconnect the brake fluid level sensor connector.
2. Check continuity of the brake fluid level sensor.

Brake fluid level	Continuity
Below MIN	Yes
Above MIN	No

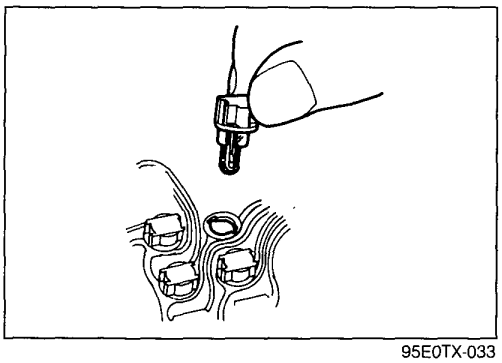
3. If not as specified, replace the level sensor.
4. If the sensor is OK, repair the wiring harness.

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Hazard Warning Indicator Lamp

Symptom: Hazard warning indicator lamp does not flash when hazard switch ON. (Hazard warning function operates normally)

95E0TX-032



95E0TX-033

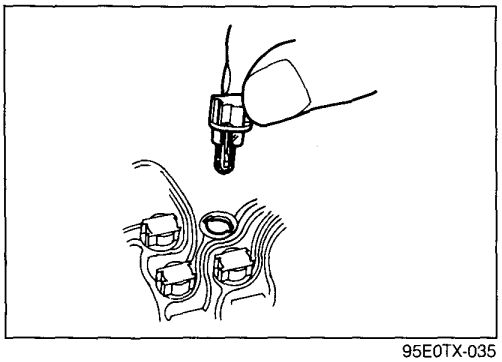
Remedy

1. Remove the instrument cluster. (Refer to page T–28.)
2. Check the bulb of the hazard warning indicator lamp.
3. If the bulb is burned out, replace it.
4. If the bulb is OK, repair wiring harness.
   (Turn and hazard warning flasher unit—Instrument cluster)

Rear Fog Light Indicator Lamp

Symptom: Rear fog light indicator lamp does not came on when rear fog light switch ON. (Rear fog light system operates normally)

95E0TX-034

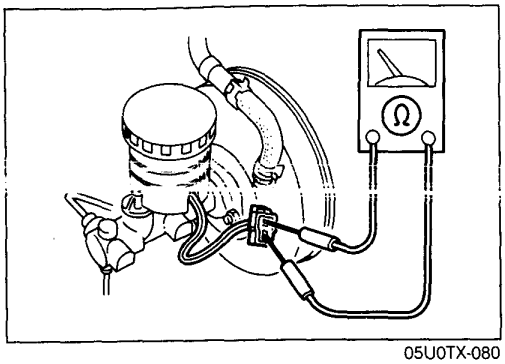


95E0TX-035

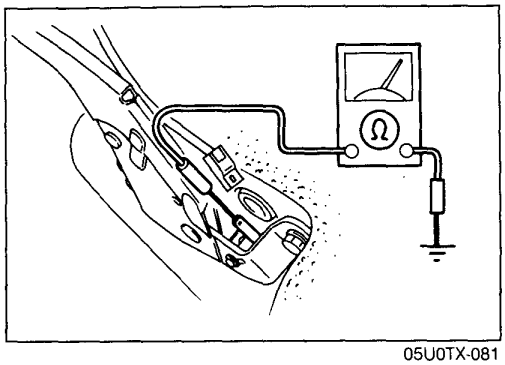
Remedy

1. Remove the instrument cluster. (Refer to page T–28.)
2. Check the bulb of the rear fog light indicator lamp.
3. If the bulb is burned out, replace it.
4. If the bulb is OK, repair wiring harness.
   (Rear fog light switch—Instrument cluster)

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05U0TX-080



05U0TX-081

BRAKE FLUID LEVEL SENSOR

Inspection

1. Check continuity of the sensor.

Float level	Continuity
Below MIN	Yes
Above MIN	No

2. If continuity is not as specified, replace the level sensor.

PARKING BRAKE SWITCH

Inspection

1. Disconnect the parking brake switch connector.
2. Check for continuity between the switch connector and a body ground.

Lever	Continuity
Pulled one notch	Yes
Released	No

3. If continuity is not as specified, adjust or replace the parking brake switch.

TURN AND HAZARD WARNING FLASHER UNIT

Inspection: Refer to page T–13.

REAR FOG LIGHT SWITCH

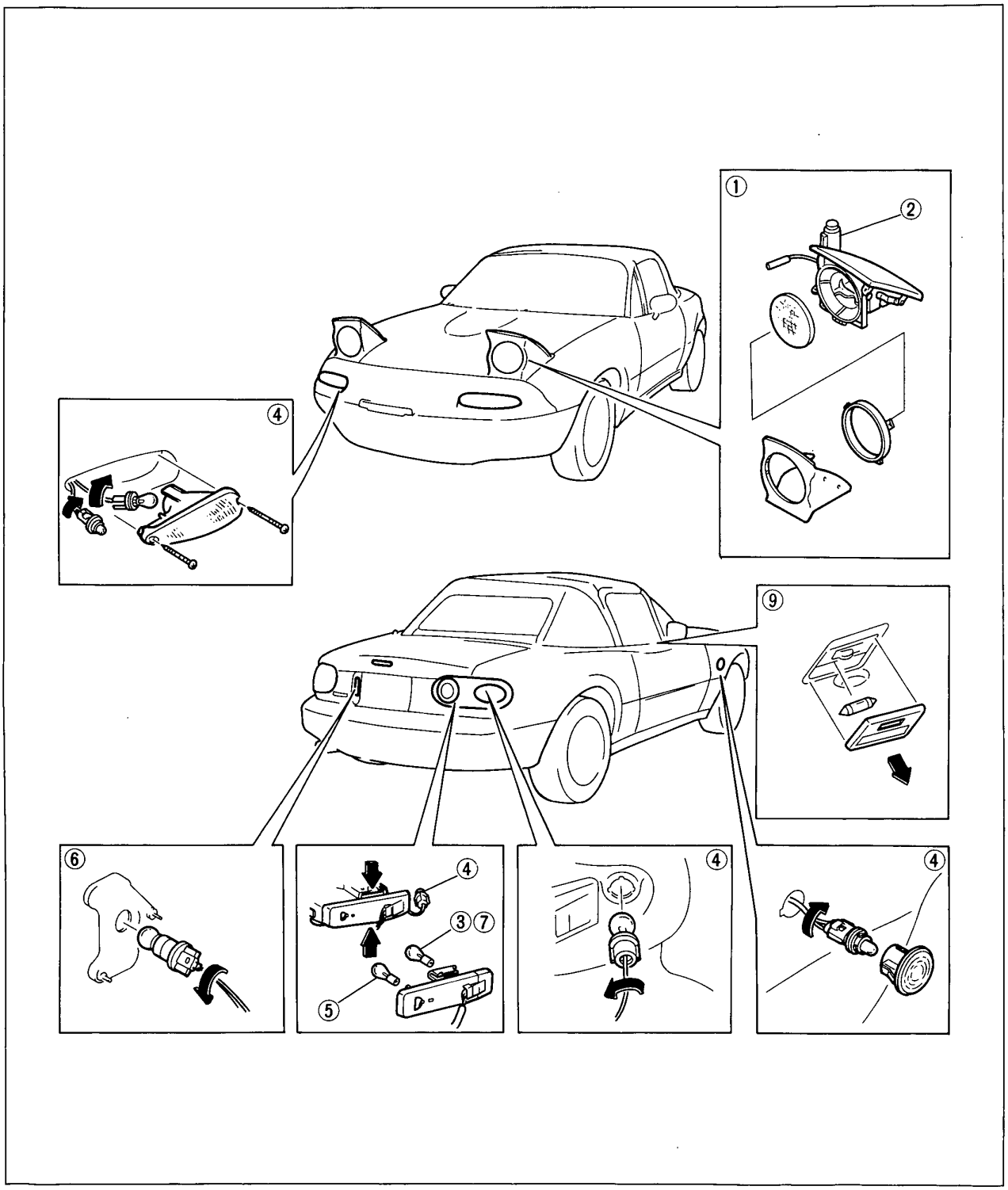
Inspection: Refer to page T–19.

95E0TX-036

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LIGHTING SYSTEM

STRUCTURAL VIEW



95E0TX-075

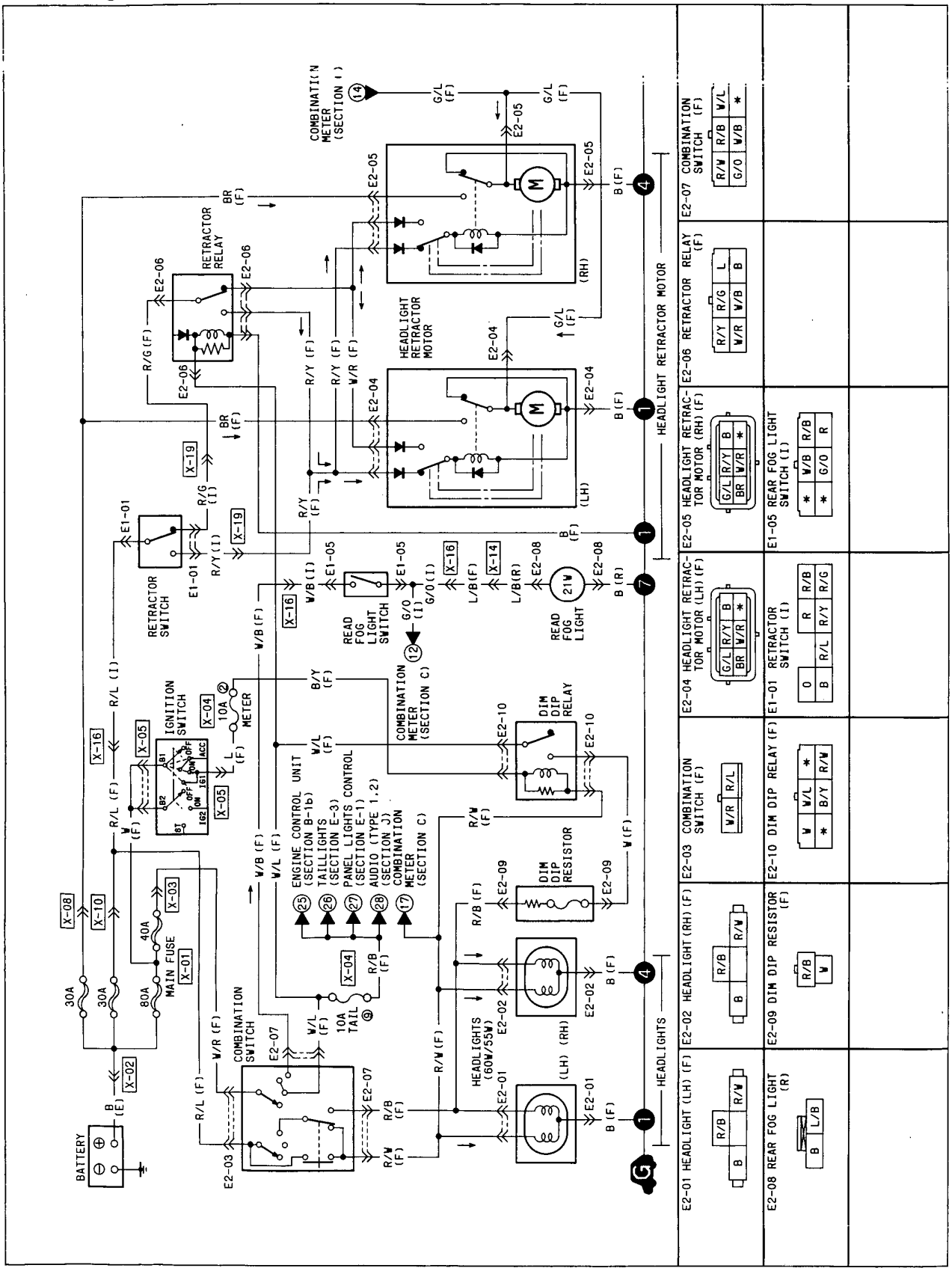
1. Retractable headlight
2. Headlight retractor motor
3. Stoplight
4. Turn and hazard warning light
5. Back-up light
6. License plate light
7. Taillight
8. Rear combination light lens
9. Interior lamp

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TROUBLESHOOTING

Headlights, Dim-Dip Light, Passing Light, Headlight Leveling System and Rear Fog Light

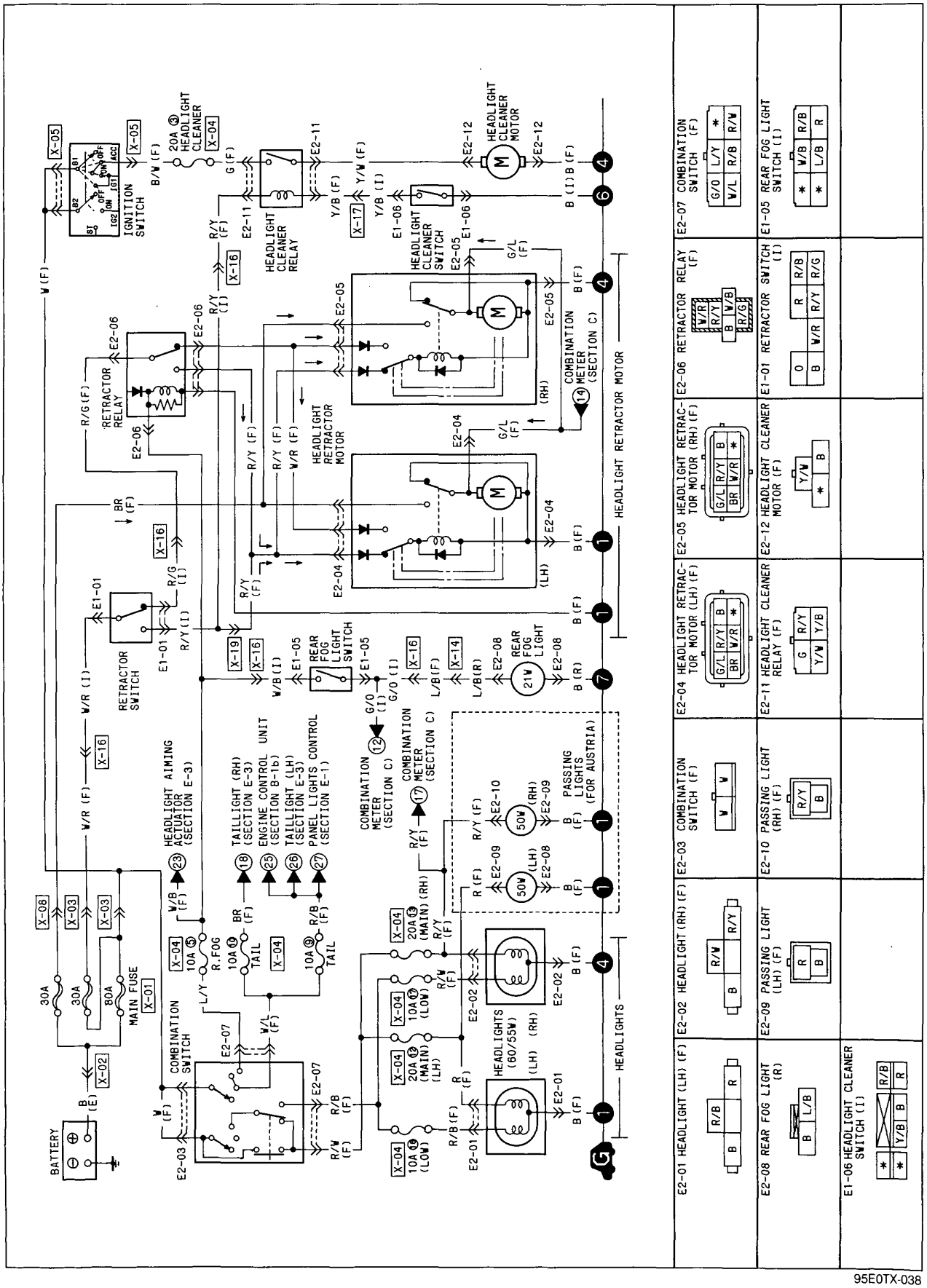
Circuit diagram (Right hand drive)



95E0TX-037

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Circuit diagram (Left hand drive)



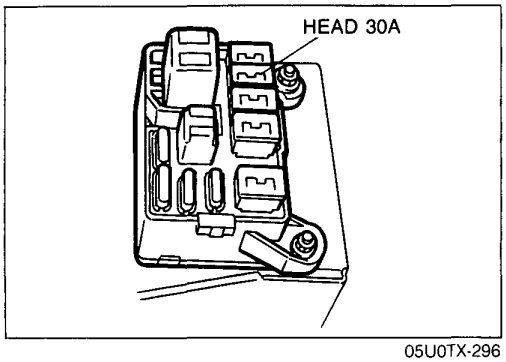
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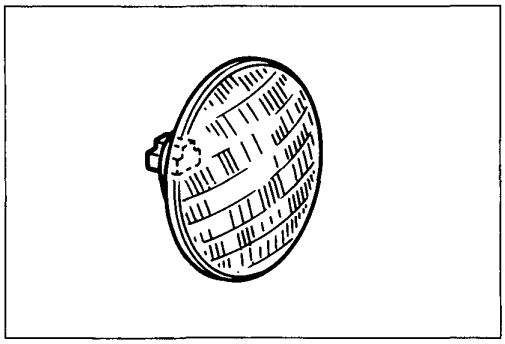
Headlight
Right hand drive

Symptom: Headlights do not operate.

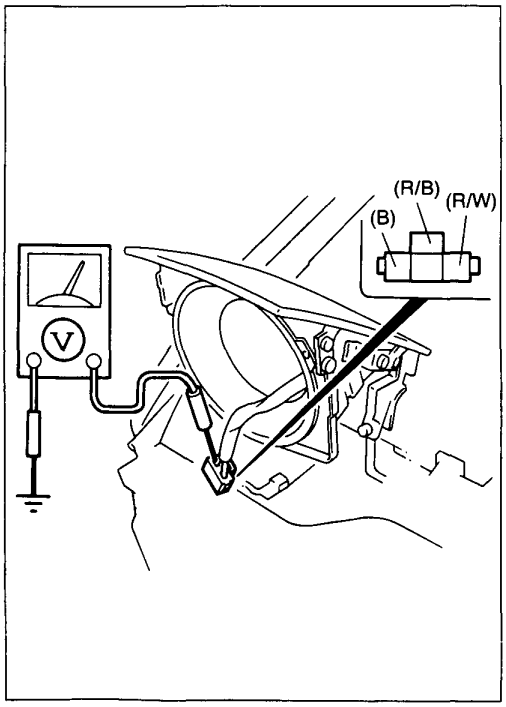
95E0TX-039



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05U0TX-297



05U0TX-298

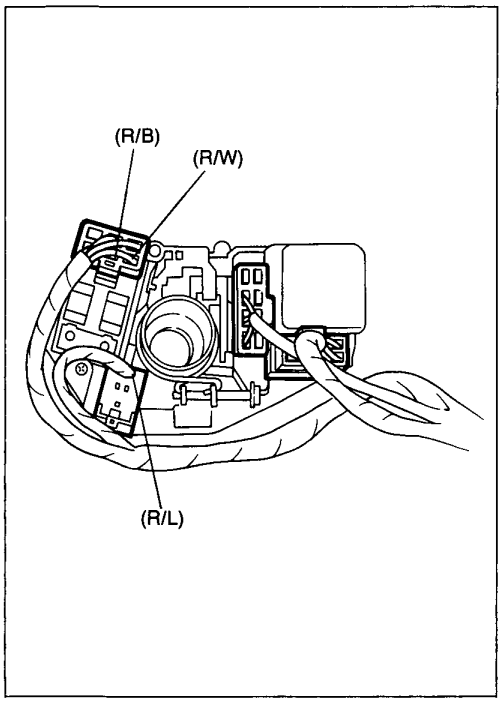
Step 1
1. Check HEAD 30A fuse in the main fuse block.
2. If the fuse is burned, replace it. Check and repair the wiring harness, if necessary.
3. If the fuse is OK, go to Step 2.

Step 2
1. Check the headlight bulbs.
2. If a bulb is burned, replace it.
3. If the bulbs are OK, go to Step 3.

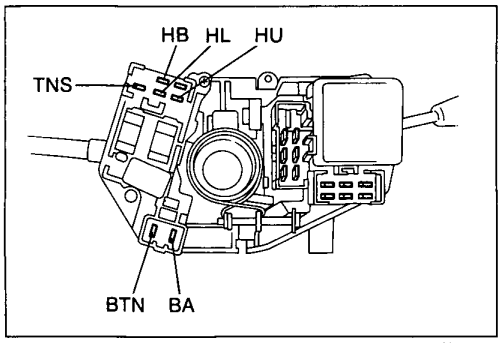
Step 3
1. Turn the headlight switch ON.
2. Disconnect the headlight connector, and measure the voltage at the following terminal-wires as shown.

Headlight	Wire	Headlight switch	Voltage	Action
Left	(R/W)	High beam	12V	Next, check wire (R/B)
			0V	Go to Step 4
	(R/B)	Low beam	12V	Next, check wire (B)
			0V	Go to Step 4
	(B)	Any position	0V	Next, check right side
			12V	Repair ground wire (B)
Right	(R/W)	High beam	12V	Next, check wire (R/B)
			0V	Go to Step 4
	(R/B)	Low beam	12V	Next, check wire (B)
			0V	Go to Step 4
	(B)	Any position	0V	Check for poor connection of headlight connector
			12V	Go to Step 4

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95E0TX-040

Step 4

1. Reconnect the headlight connector.
2. Remove the column cover.
3. Measure the voltage at the following terminal-wires of the headlight switch connectors (in the combination switch) as shown.

Wire	Headlight switch	Voltage	Action
(R/L)	Any position	12V	Next, check wire (R/W)
		0V	Repair wire (R/L) (HEAD 30A fuse—Headlight switch)
(R/W)	ON (High beam)	12V	Next, check wire (R/B)
		0V	Go to Step 5
(R/B)	ON (Low beam)	12V	Check for poor connection of headlight switch connector
		0V	Go to Step 5

Step 5 — Headlight switch inspection

1. Disconnect the headlight switch connectors.
2. Check for continuity between terminals as shown with an ohmmeter.

Position		Terminal					
		HB	HL	HU	BA	BTN	TNS
Headlight	Low beam	○	○		○	○	○
	High beam	○		○	○	○	○
Parking				○	○		
Tail, Parking						○	○

○—○: Indicates continuity

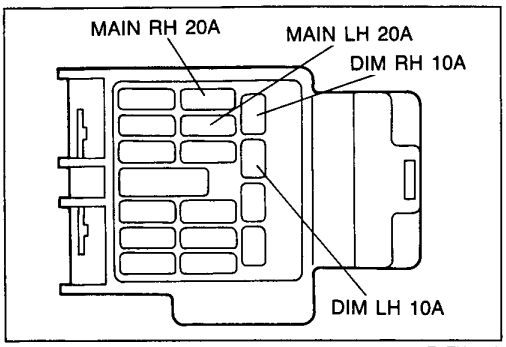
3. If not as specified, replace the headlight switch.
4. If correct, check for a poor connection in the system.

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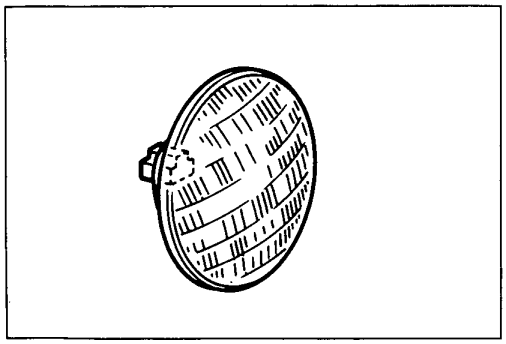
Left hand drive

Symptom: Headlights do not operate.

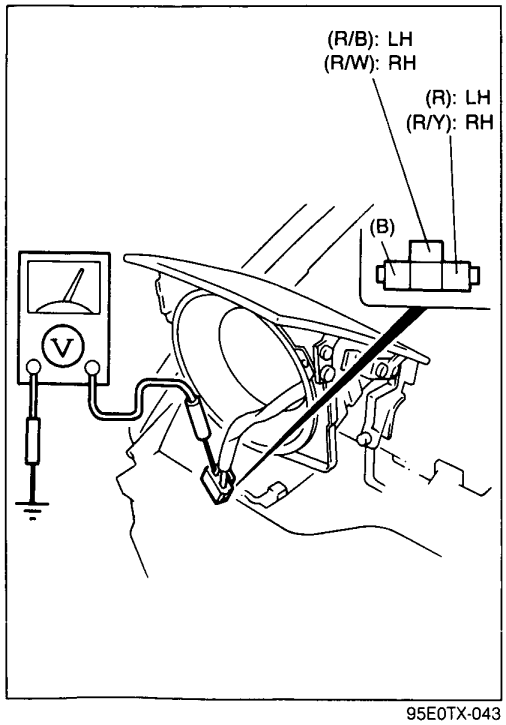
95E0TX-041



95E0TX-042



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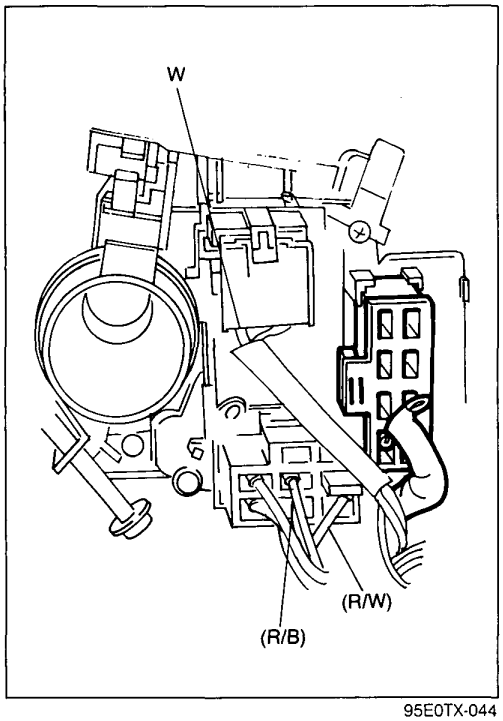
Step 1
1. Check the following fuses in the fuse box.
   MAIN RH 20A
   MAIN LH 20A
   DIM RH 10A
   DIM LH 10A
2. If the fuse is burned, replace it. Check and repair the wiring harness, if necessary.
3. If the fuse is OK, go to Step 2.

Step 2
1. Check the headlight bulbs.
2. If a bulb is burned, replace it.
3. If the bulbs are OK, go to Step 3.

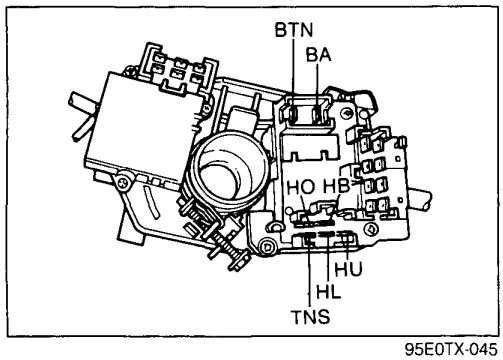
Step 3
1. Turn the headlight switch ON.
2. Disconnect the headlight connector, and measure the voltage at the following terminal-wires as shown.

Headlight	Wire	Headlight switch	Voltage	Action
Left	(R)	High beam	12V	Next, check wire (R/B)
			0V	Go to Step 4
	(R/B)	Low beam	12V	Next, check wire (B)
			0V	Go to Step 4
	(B)	Any position	0V	Next, check right side
			12V	Repair ground wire (B)
Right	(R/Y)	High beam	12V	Next, check wire (R/B)
			0V	Go to Step 4
	(R/W)	Low beam	12V	Next, check wire (B)
			0V	Go to Step 4
	(B)	Any position	0V	Check for poor connection of headlight connector
			12V	Go to Step 4

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95E0TX-044



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Step 4

1. Reconnect the headlight connector.
2. Remove the column cover.
3. Measure the voltage at the following terminal-wires of the headlight switch connectors (in the combination switch) as shown.

Wire	Headlight switch	Voltage	Action
(W)	Any position	12V	Next, check wire (R/W)
		0V	Repair wire (W) (MAIN 80A fuse—Headlight switch)
(R/W)	ON (High beam)	12V	Next, check wire (R/B)
		0V	Go to Step 5
(R/B)	ON (Low beam)	12V	Check for poor connection of headlight switch connector
		0V	Go to Step 5

Step 5 — Headlight switch inspection

1. Disconnect the headlight switch connectors.
2. Check for continuity between terminals as shown with an ohmmeter.

Position		Terminal					
		HB	HL	HU	BA	BTN	TNS
Headlight	Low beam	○—○			○	○—○	
	High beam	○		○	○	○—○	
Parking				○—○			
Tail, Parking						○—○	

○—○: Indicates continuity

3. If not as specified, replace the headlight switch.
4. If correct, check for a poor connection in the system.

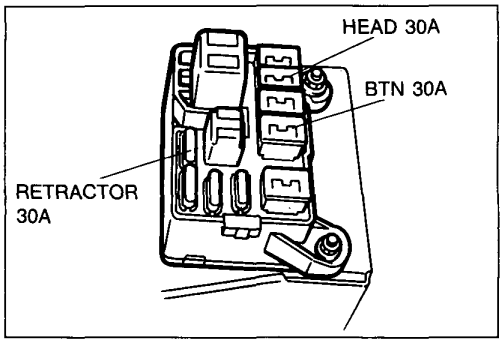
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Symptom: Headlight retractor motors do not operate (both sides).

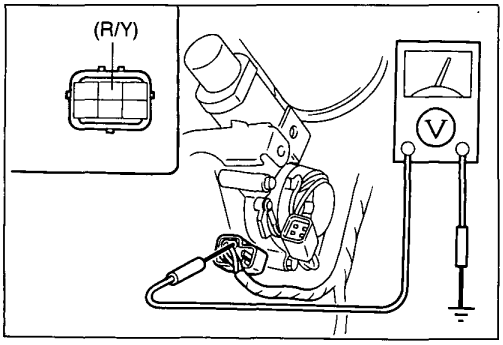
Note
- **Before troubleshooting verify the symptom by activating the headlight switch and retractor switch.**
- **Check the system using the appropriate troubleshooting below.**

Switch	Retractor motor(s) operate	Action
Headlight switch ON	Yes	Begin troubleshooting from Step 5
	No	Next, turn ON retractor switch
Retractor switch ON	Yes	Begin troubleshooting from Step 4
	No	Begin troubleshooting from Step 1

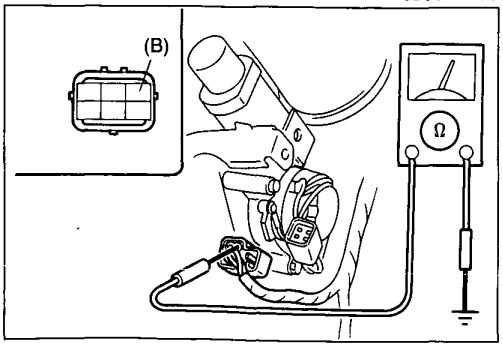
05U0TX-096



95E0TX-076



05U0TX-098



95E0TX-046

Step 1
1. Check the following fuses in the main fuse block.
   Right hard drive
   - RETRACTOR 30A
   - HEAD 30A

   Left head drive
   - RETRACTOR 30A
   - BTN 30A
2. If a fuse is burned, replace it. Check and repair the wire harness, if necessary.
3. If the fuses are OK, go to Step 2.

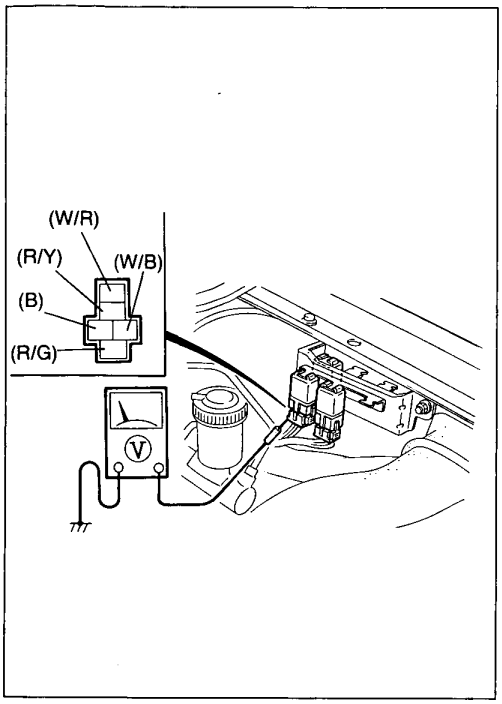
Step 2
1. Retract the headlights fully using the manual knobs.
2. Disconnect the retractor motor connectors.
3. Turn on the headlight switch and retractor switch.
4. Measure the voltage at the following terminal-wires of the retractor motor connectors.

Retractor motor	Wire	Voltage	Action
Left and Right	(R/Y)	12V	Go to Step 3
		0V	Go to Step 4

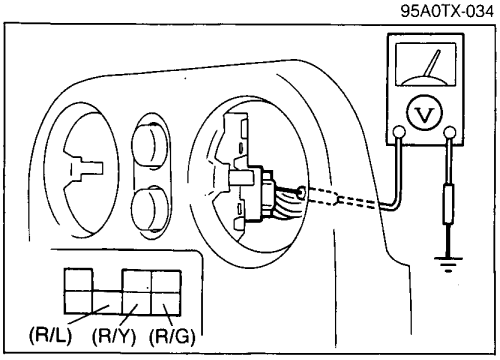
Step 3
1. Disconnect the retractor motor connectors.
2. Check for continuity between terminal-wire (B) of the retractor motor connectors and a body ground.

Retractor motor	Continuity	Action
Left and Right	No	Repair wire (B)
	Yes	Check retractor motor (Refer to page T–74)

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95A0TX-034



95A0TX-035

Step 4

1. Turn off the retractor switch.
2. Turn on the headlight switch.
3. Measure the voltage at the following terminal-wires of the retractor relay connector.

Wire	Voltage	Action
(R/G)	12V	Next check wire (W/R)
	0V	Go to Step 5
(W/R)	12V	Next check wire (B)
	0V	Repair wire (W/R) (Headlight switch—Retractor relay)
(B)	12V	Repair ground wire (B)
	0V	Next check wire (R/Y)
(R/Y)	12V	Repair wire (R/Y) (Retractor relay—Retractor motor)
	0V	Replace retractor motor

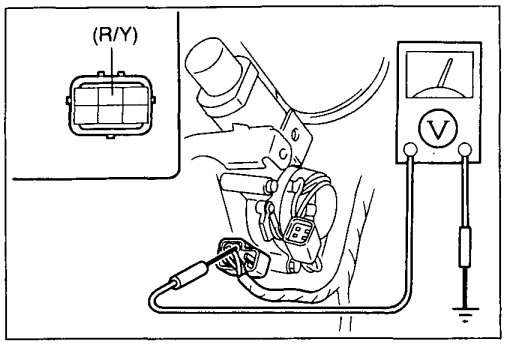
Step 5

Measure the voltage at the terminal-wires of the retractor switch.

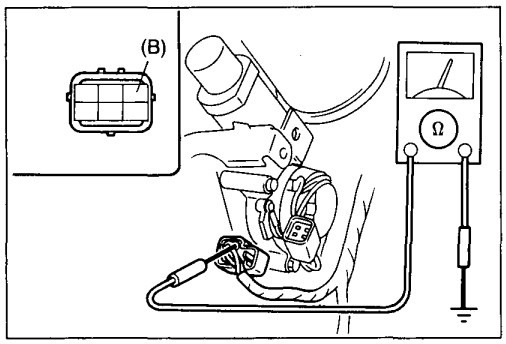
Wire	Retractor switch	Voltage	Action
(R/L)	Any position	12V	Next check wire (R/G) and (R/Y)
		0V	Repair wire (R/L) (RETRACTOR 30A—Retractor switch)
(R/G)	OFF	12V	Repair wire (R/G) (Retractor switch—Retractor motor)
		0V	Replace retractor switch
(R/Y)	ON	12V	Repair wire (R/Y) (Retractor switch—Retractor motor)
		0V	Replace retractor switch

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Symptom: Headlight retractor motor does not operate (one side).



05U0TX-103



95E0TX-047

Step 1

1. Retract the not working headlight fully using the manual knob.
2. Disconnect the retractor motor connector of the faulty side.
3. Turn on the headlight switch and retractor switch.
4. Check the voltage at the following terminal-wires of the retractor motor connector.

Wire	Voltage	Action
(R/Y)	12V	Go to Step 2
	0V	Repair wire (R/Y) (Retractor relay—Retractor motor)

Step 2

Check for continuity between terminal-wire (B) of the faulty retractor motor connector and a body ground.

Continuity	Action
No	Repair wire (B)
Yes	Check retractor motor *(Refer to page T–74)*

Note

- **A retractor indicator lamp is included in the instrument cluster. The indicator lamp illuminates when the retractor motor is operating and should go out when the headlights are fully raised or retracted.**
  If the indicator lamp remains on, it may be due to pebbles, pieces of ice, etc. lodged between the headlight and the vehicle body. This should be corrected by the following procedure.

1. Turn the ignition switch OFF.
2. Disconnect the negative battery cable or remove RETRACTOR 30A fuse in the main fuse block.
3. Raise or lower the headlight by turing the emergency retractor knob.
4. Remove the obstruction.
5. After verifying that the headlight switch and the retractor switch are OFF, reconnect the negative battery cable.
6. Verify operation of the headlight retractor and the retractor indicator lamp.

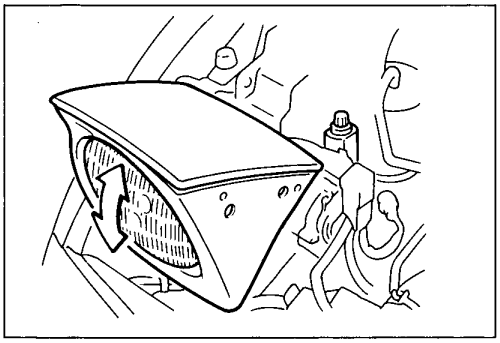
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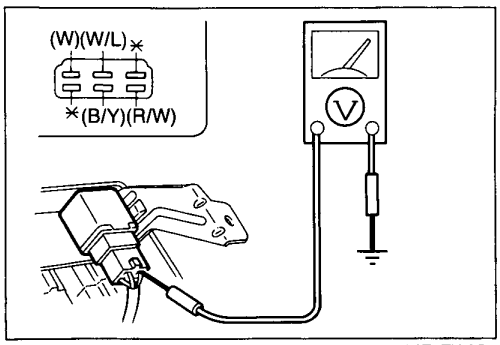
Dim-dip Light (UK)

Symptom: Dim-dip light system does not operate.

95E0TX-048



95E0TX-049

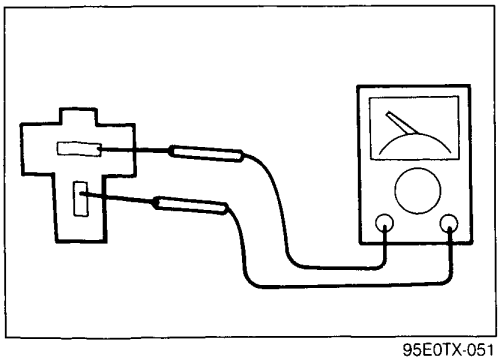


95E0TX-050

Step 1
1. Turn the headlight switch to ON, and check if the retractor headlight system operates normally.
2. If the retractor motors do not operate, problem is in the retractor motor circuit. (Refer to page T–46.)
3. If the headlights do not come on, problem is in the headlights circuit. (Refer to page T–42.)
4. If the retractor headlight system operates normally, go to Step 2.

Step 2
1. Turn the ignition switch ON.
2. Turn the headlight switch to first click position and check the voltage at the terminal-wires of the dim-dip relay connector.

Wire	Voltage	Action
(B/Y)	12V	Next, check wire (W/L)
	0V	Repair wire (B/Y) (METER 10A fuse—Dim-dip relay)
(W/L)	12V	Next, check wire (W)
	0V	Repair wire (W/L) (Headlight switch—Dim-dip relay)
(W)	12V	Go to Step 3
	0V	Check dim-dip relay If dim-dip relay is OK, repair wire (R/W) (Dim-dip relay—Headlight)



95E0TX-051

Step 3
1. Disconnect the dim-dip resistor connector.
2. Check the resistance of the dim-dip resistor.

   Resistance: Approx. 1Ω

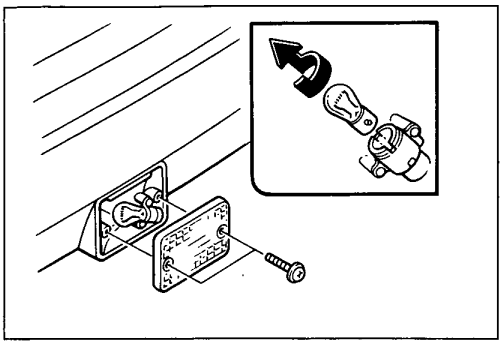
3. If not as specified, replace the dim-dip resistor.
4. If the resistance is correct, repair wire harness. (Dim-dip relay—Dim-dip resistor—Headlight.)

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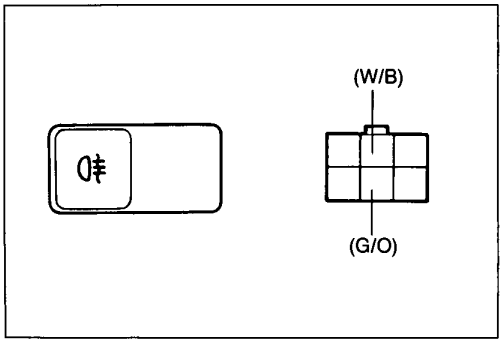
Rear Fog Light

Symptom: Rear fog light does not operate.

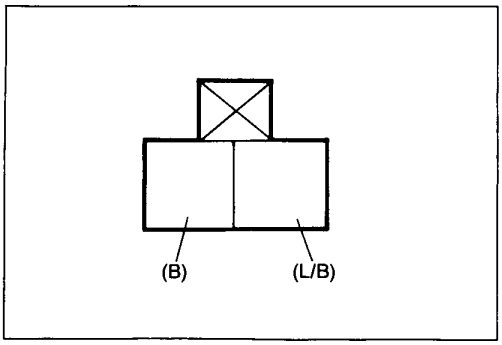
95E0TX-052



5E0TX-053



95E0TX-054



95E0TX-055

Step 1
1. Check the rear fog light bulb.
2. If the bulb is burned, replace it.
3. If the bulb is OK, go to Step 2.

Step 2
1. Turn the headlight switch and rear fog light switch ON.
2. Check the voltage at the terminal-wires of the rear fog light switch connector.

Wire	Voltage	Action
(W/B)	12V	Next, check wire (G/O)
	0V	Repair wire (W/B) (Headlight switch—Rear fog light switch)
(G/O)	12V	Go to Step 3
	0V	Replace rear fog light switch

Step 3
1. Turn the headlight switch and rear fog light switch ON.
2. Check the voltage at terminal-wire (L/B) of the rear fog light connector.

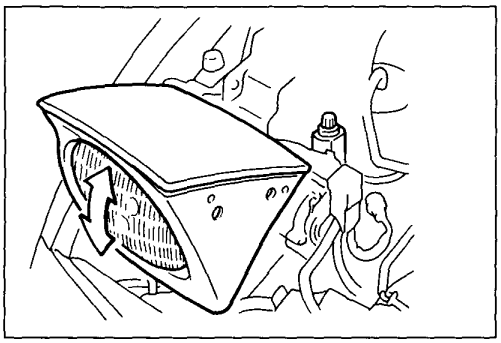
Wire	Voltage	Action
(L/B)	12V	Repair wire (B) (Rear fog light—Body ground)
	0V	Repair wire (L/B) (Rear fog light switch—Rear fog light)

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Passing Light

Symptom: Passing light(s) do not illuminate.

95E0TX-056



95E0TX-057

Remedy

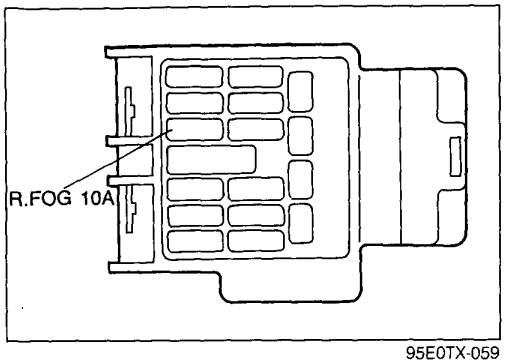
1. Raise the retractable headlights.
2. Check if the high beam bulbs illuminate when the passing switch is on position.
3. If the high beam does not illuminate, trouble is in the headlight circuit. (Refer to page T–44.)
4. If the high beam illuminates, check the bulbs of passing lights.
   If the bulbs are OK, repair wire harness.
   (Headlight switch—Passing lights—Body ground)

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Headlight Leveling System (West Germany)

Symptom: Headlight leveling system does not operate.

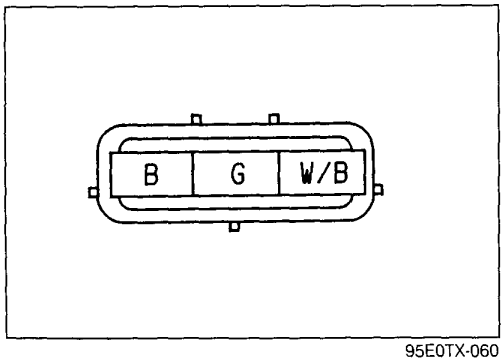
95E01X-058



95E0TX-059

Step 1

1. Check R. FOG 10A fuse in the fuse box.
2. If the fuse is burned, replace it.
   Check and repair the wire harness, if necessary.
3. If the fuse are OK, go to Step 2.

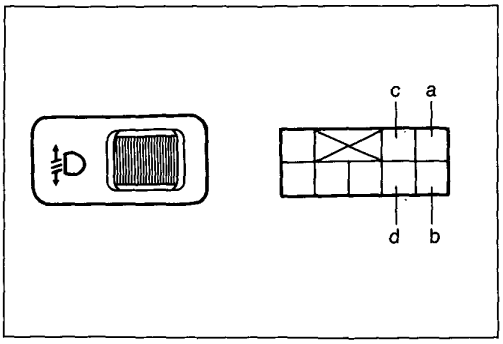


95E0TX-060

Step 2

1. Turn the headlight switch ON.
2. Check the voltage at the terminal-wires of the headlight leveling actuator connector.

Wire	Voltage	Action
(W/B)	12V	Next, check wire (B)
	0V	Repair wire (W/B) (R. FOG 10A—Headlight leveling actuator)
(B)	12V	Repair wire (B) (Headlight leveling actuator—Body ground)
	0V	Go to Step 3



95E0TX-061

Step 3

1. Remove the headlight leveling switch.
2. Check the continuity or resistance between terminals of the switch.

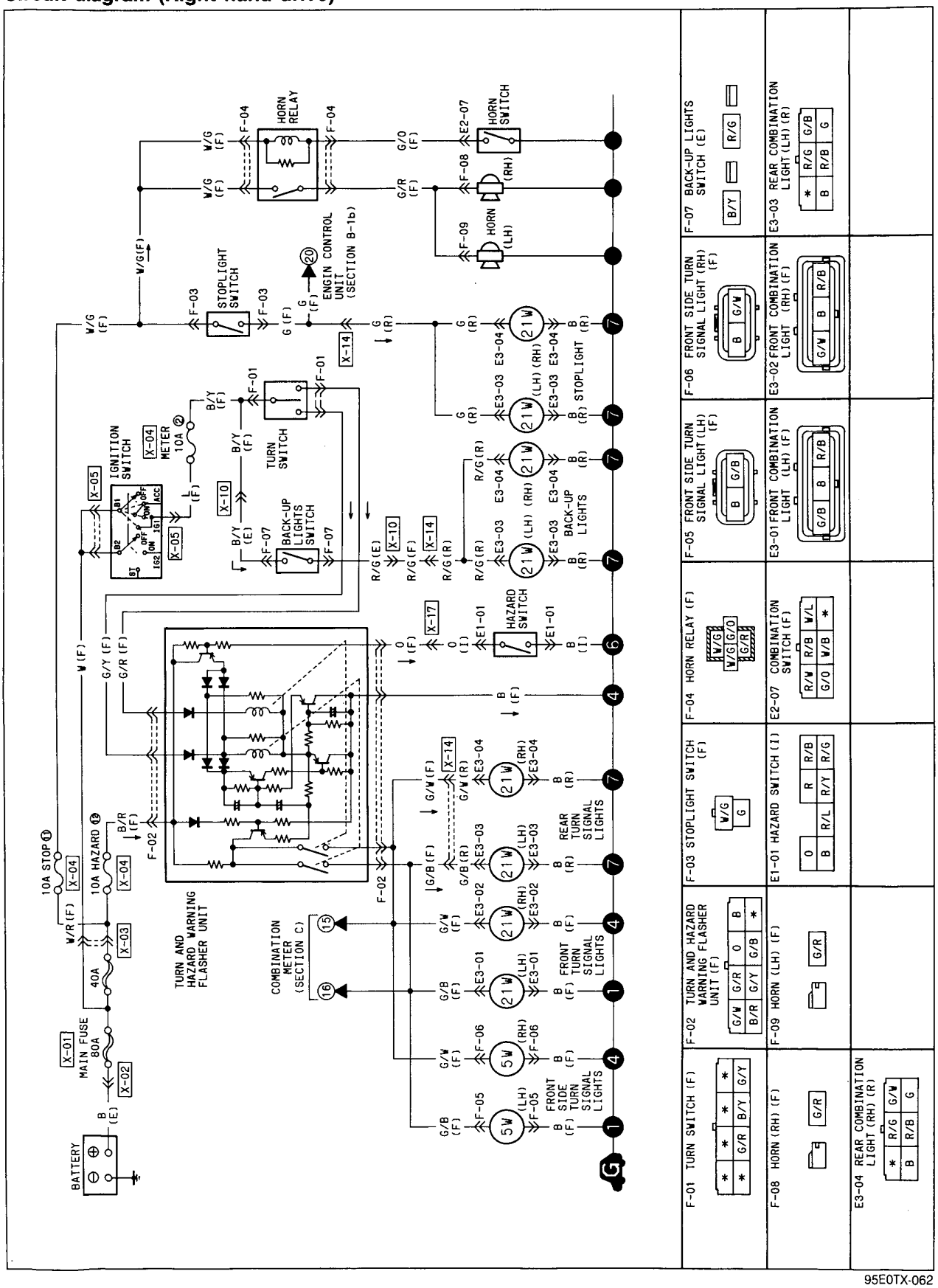
Switch	Terminal			
	a	b	c	d
0	○—○		○—○	
1	○—○		○—∿—○ 300Ω	
2	○—○		○—∿—○ 560Ω	
3	○—○		○—∿—○ 1.6 kΩ	

○—○: Indicates continuity
○-∿-○: Indicates resistance

3. If not as specified, replace the switch.
4. If correct check wires (G) and (B).
   If the wires are OK, replace the headlight levering actuator.

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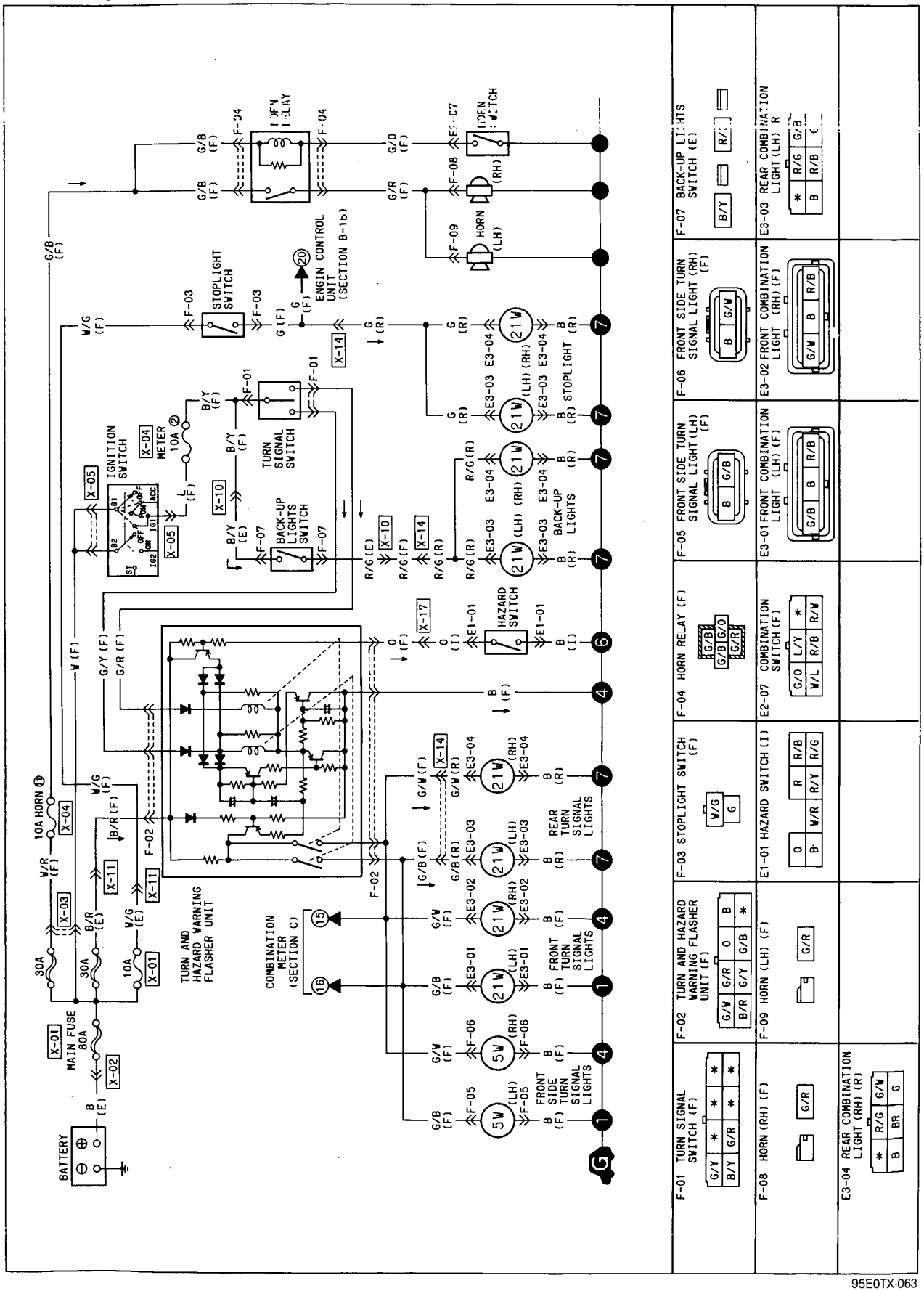
Stoplights, Turn and Hazard Warning Lights and Back-up Lights
Circuit diagram (Right hand drive)



95E0TX-062

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Circuit diagram (Left hand drive)

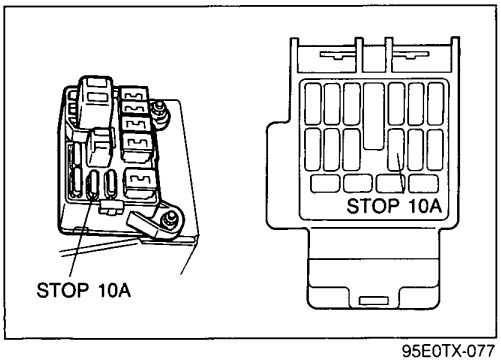


95E0TX-063

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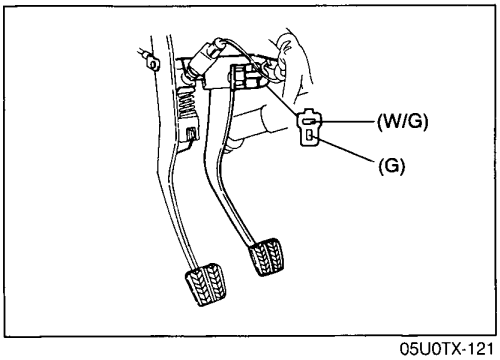
Symptom: Stoplights do not operate (all).

95A0TX-039



95E0TX-077

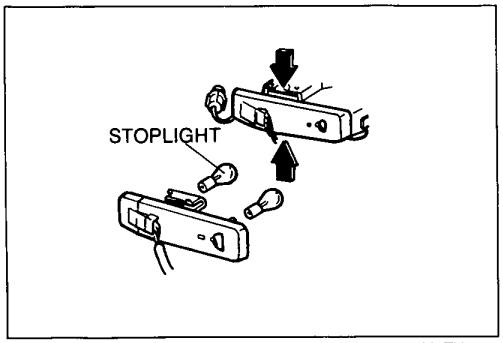
Step 1
Check STOP 10A fuse.
If the fuse is burned, replace it. Check and repair the wire harness, if necessary.
If the fuse is OK, go to Step 2.



05U0TX-121

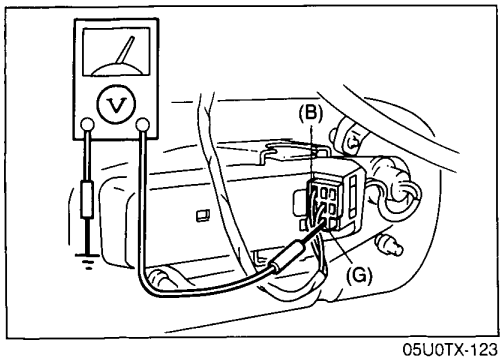
Step 2
Measure the voltage at the following terminal-wires of the stoplight switch connector.

Inspection condition	Wire	Voltage	Action
Constant	(W/G)	12V	Next check wire (G)
		0V	Repair wire (W/G) (STOP 15A fuse—Stoplight switch)
Brake pedal depressed	(G)	12V	Go to Step 3
		0V	Check stoplight switch



05U0TX-122

Step 3
Check the stoplight bulbs.
If a bulb is burned replace it.
If the bulbs are OK, go to Step 4.



05U0TX-123

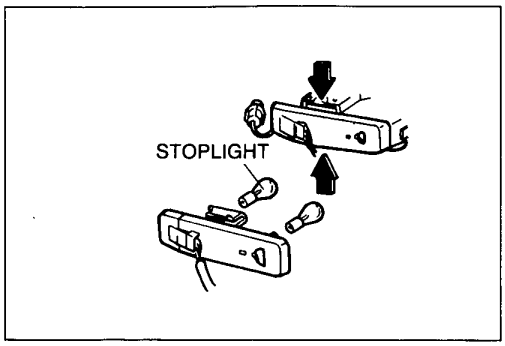
Step 4
Measure the voltage at the following terminal-wires of the right and left stoplight connectors.

Inspection condition	Wire	Voltage	Action
Brake pedal depressed	(G)	12V	Next check wire (B)
		0V	Repair wire (G) (Stoplight switch—Stoplight)
	(B)	12V	Repair ground wire (B)
		0V	Check for poor connection of connectors

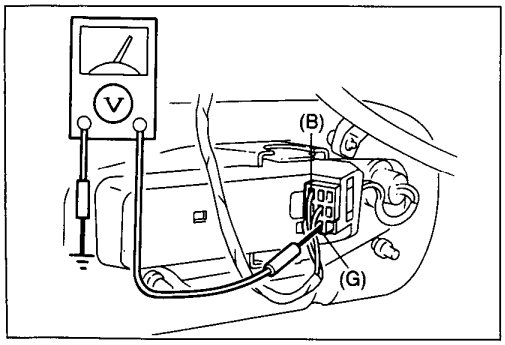
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Symptom: Stoplights does not operate (one only).

05U0TX-124



05U0TX-125



05U0TX-126

Step 1
Check the stoplight bulb of the faulty side.
If a bulb is burned replace it.
If the bulb is OK, go to Step 2.

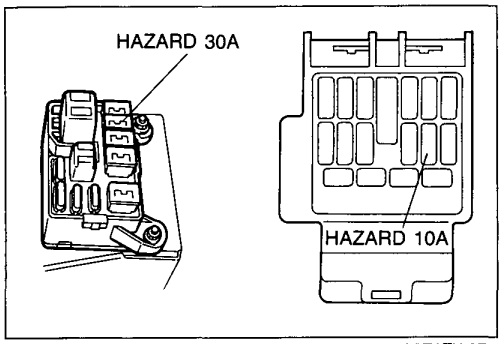
Step 2
Measure the voltage at the following terminal-wires of the faulty stoplight connector.

Inspection condition	Wire	Voltage	Action
Brake pedal depressed	(G)	12V	Next check wire (B)
		0V	Repair wire (G) (Stoplight switch—Stoplight)
	(B)	12V	Repair ground wire (B)
		0V	Check for poor connection of connectors

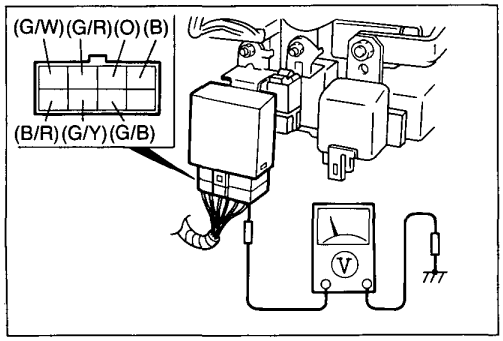
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Symptom: Turn and hazard warning lights do not operate.

95A0TX-042



95E0TX-078



95A0TX-044

Step 1

1. Check the following fuse.
   Right hand drive
   - HAZARD 10A

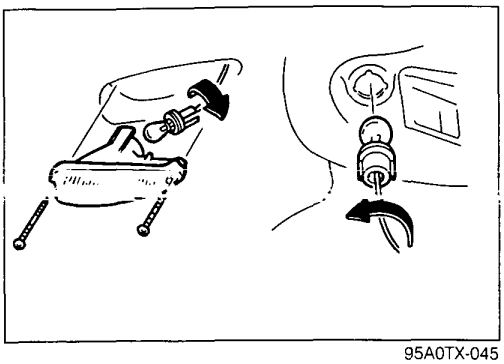
   Left hand drive
   - HAZARD 30A
2. If the fuse is burned, replace it. Check and repair the wire harness, if necessary.
3. If the fuse is OK, go to Step 2.

Step 2

1. Measure the voltage at the terminal-wires of the turn and hazard warning flasher unit connector.

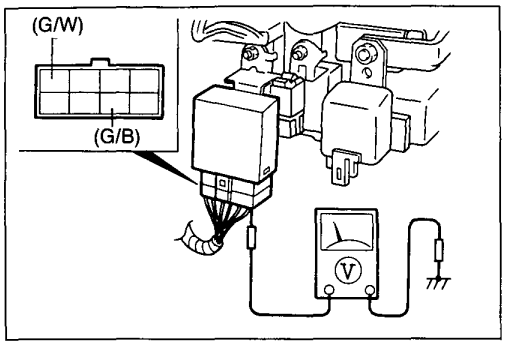
Wire	Condition	Voltage	Action
(B/R)	Constant	12V	Next, check wire (B)
		0V	Repair wire (B/R) (HAZARD 10A fuse—Turn and hazard warning flasher unit)
(B)	Constant	12V	Repair wire (B) (Turn and hazard warning flasher unit—Body ground)
		0V	Next, check wire (O)
(O)	Hazard warning switch: ON	12V	Go to Step 6
		0V	Next, check wire (G/Y)
(G/Y)	Turn signal switch: Left	12V	Next, check wire (G/R)
		0V	Go to Step 5
(G/R)	Turn signal switch: Right	12V	Next, check wires (G/B) and (G/W)
		0V	Go to Step 5
(G/B)	Turn signal switch: Left	Appear 12V and 0V mutually	Go to Step 3
		0V	Replace turn and hazard warning flasher unit
		12V	
(G/W)	Turn signal switch: Right	Appear 12V and 0V mutually	Go to Step 3
		0V	Replace turn and hazard warning flasher unit
		12V	

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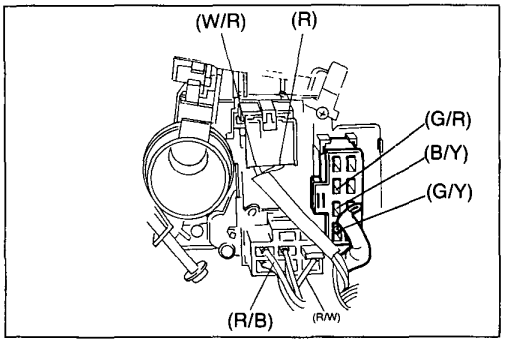


95A0TX-045

Step 3
1. Check the bulbs.
2. If a bulb is burned, replace it.
3. If the bulbs are OK, go to Step 4.



95A0TX-046



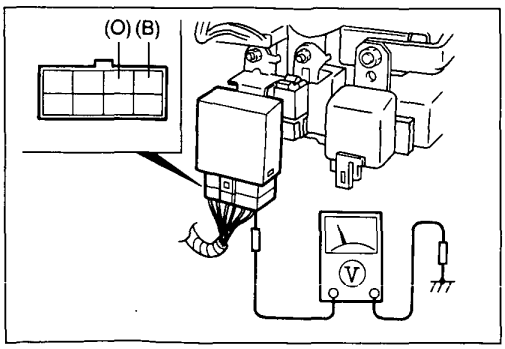
95A0TX-047

Step 4
1. Turn the hazard warning switch ON.
2. Measure the voltage at the terminal-wires of the turn and hazard warning flasher unit connector.

Light	Wire	Voltage	Action
Front LH Side LH Rear LH	(G/B)	Appear 12V and 0V mutually	Repair wire (B) (Turn and hazard warning flasher unit—Body ground)
		0V	Repair wire (G/B) (Turn and hazard warning flasher unit—Bulb)
Front RH Side RH Rear RH	(G/W)	Appear 12V and 0V mutually	Repair wire (B) (Turn and hazard warning flasher unit—Body ground)
		0V	Repair wire (G/W) (Turn and hazard warning flasher unit—Bulb)

Step 5
1. Remove the column cover.
2. Measure the voltage at the terminal-wires of the turn signal switch connector.

Wire	Condition	Voltage	Action
(B/Y)	Constant	12V	Next, check wires (G/Y) and (G/R)
		0V	Repair wire (B/Y) (HAZARD 10A fuse—Turn signal switch)
(G/Y)	Turn signal switch: Left	12V	Repair wire (G/Y) (Turn signal switch—Turn and hazard flasher unit)
		0V	Replace combination switch
(G/R)	Turn signal switch: Right	12V	Repair wire (G/R) (Turn signal switch—Turn and hazard flasher unit)
		0V	Replace combination switch



95A0TX-048

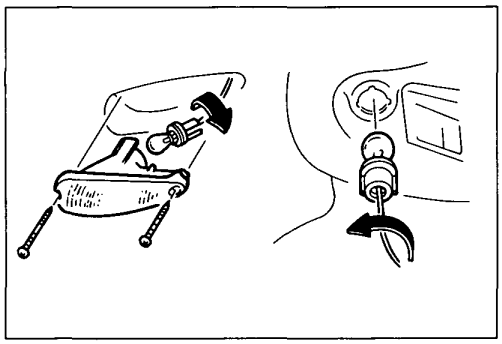
Step 6
Measure the voltage at the terminal-wires of the turn and hazard flasher unit connector.

Wire	Condition	Voltage	Action
(B)	Hazard warning switch: ON	12V	Repair wire (B) (Hazard warning switch—Body ground)
		0V	Next, check wire (O)
(O)		12V	Replace hazard warning switch
		0V	Repair wire (O) (Turn and hazard warning flasher unit—Hazard warning switch)

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Symptom: Turn signal(s) flashes rapidly.

9MU0TX-175



9MU0TX-176

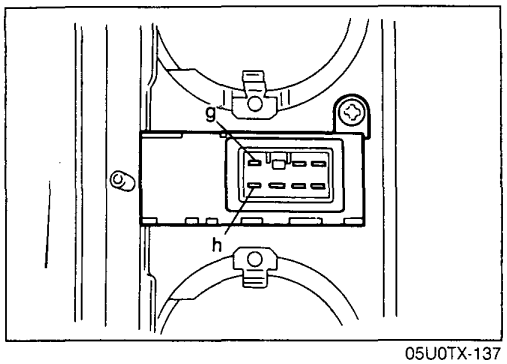
Remedy
Check the bulbs and the wiring harness between each bulb and the body ground (rapidly flashing side).

Note
- **Rapid flashing is a flasher unit function to warn of a bad bulb or an open circuit.**

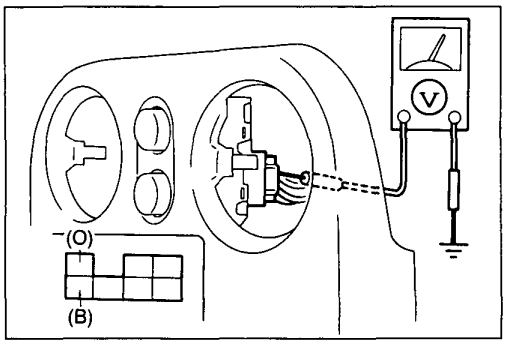
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Symptom: Hazard warning function does not operate.
(Turn signals function normally.)

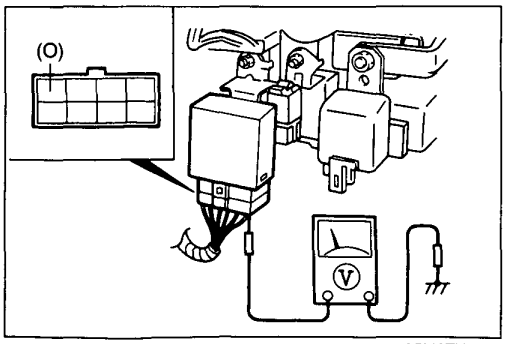
05U0TX-310



05U0TX-137



05U0TX-272



05U0TX-138

Step 1 — Check hazard warning switch.
1. Remove the hazard warning switch.
2. Check continuity between terminals of the switch.

Switch	Terminal	
	g	h
ON	○———	———○
OFF		

○——○: Indicates continuity

3. If not as specified, replace the right cluster switch assembly.
4. If the cluster switch is OK, go to Step 2.

Step 2
Measure the voltage at the terminal-wires of the hazard warning switch connector as shown.

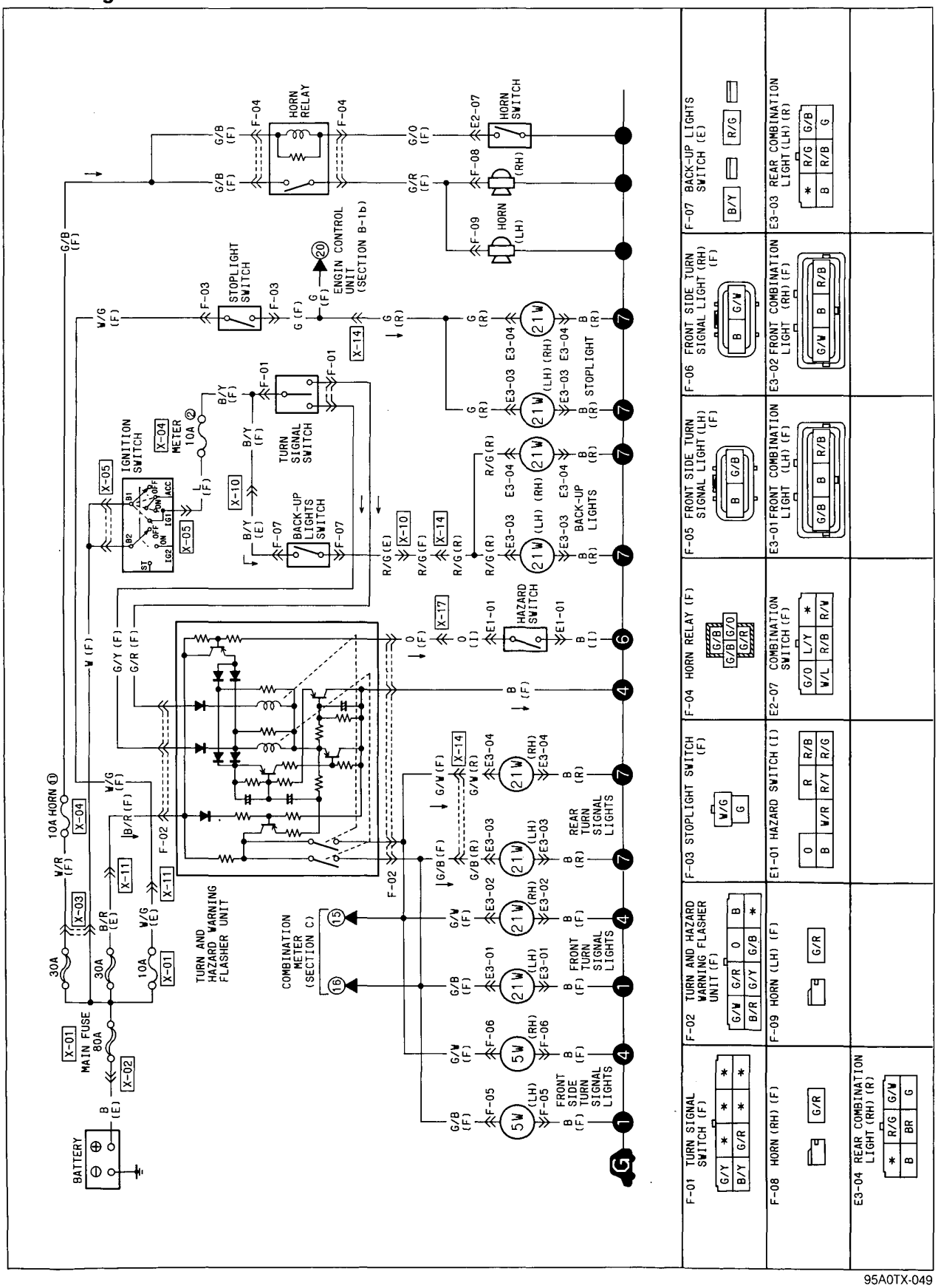
Wire	Voltage	Action
(O)	12V	Next, check wire (B)
	0V	Go to Step 3
(B)	12V	Repair wire harness (Hazard warning switch — Body ground)
	0V	Replace turn and hazard flasher unit

Step 3
Check the voltage at terminal-wire (O) of the turn and hazard flasher unit connector.

Wire	Voltage	Action
(O)	12V	Repair wire harness (Flasher unit — Hazard warning switch)
	0V	Replace turn and hazard flasher unit

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Back-up Lights
Circuit diagram

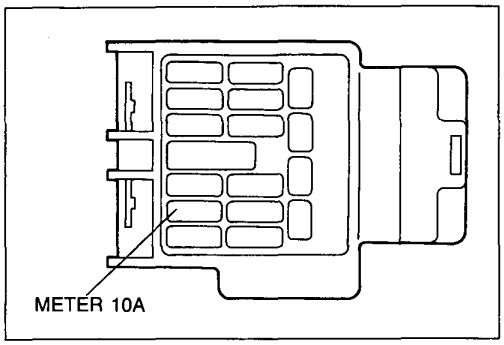


95A0TX-049

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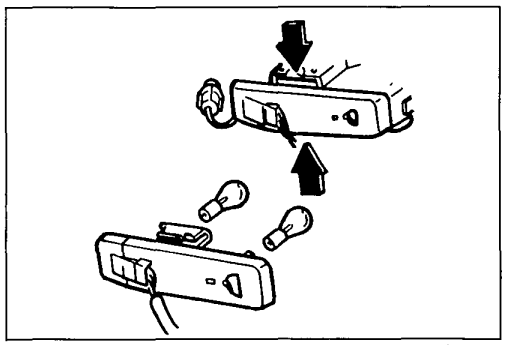
Symptom: Back-up light(s) does not operate.

05A0TX-050



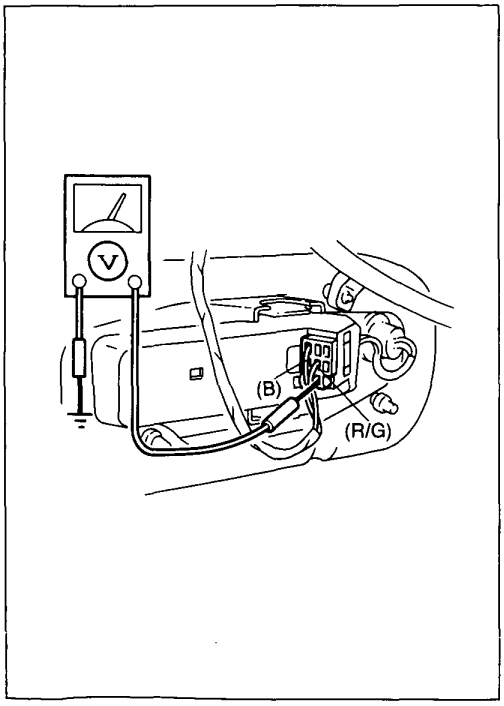
05U0TX-311

Step 1
Check METER 10A fuse.
If the fuse is burned, replace it. Check and repair the wire harness, if necessary.
If the fuse is OK, go to Step 2.



05U0TX-313

Step 2
Check the back-up light bulbs.
If a bulb is burned, replace it.
If the bulbs are OK, go to Step 3.

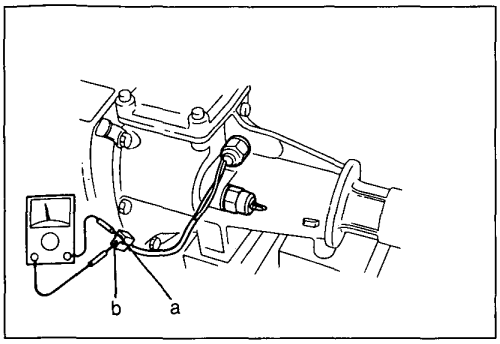


05U0TX-313

Step 3
1. Turn the ignition switch ON, and shift the transmission to reverse.
2. Measure the voltage at the terminal-wires of the back-up light connectors.

Back-up light	Wire	Voltage	Action
Left	(R/G)	12V	Next, check wire (B)
		0V	Go to Step 4
	(B)	12V	Repair ground wire (B)
		0V	Check for poor connection of back-up light connector
Right	(R/G)	12V	Next, check wire (B)
		0V	Go to Step 4
	(B)	12V	Repair ground wire (B)
		0V	Check for poor connection of back-up light connector

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05U0TX-145

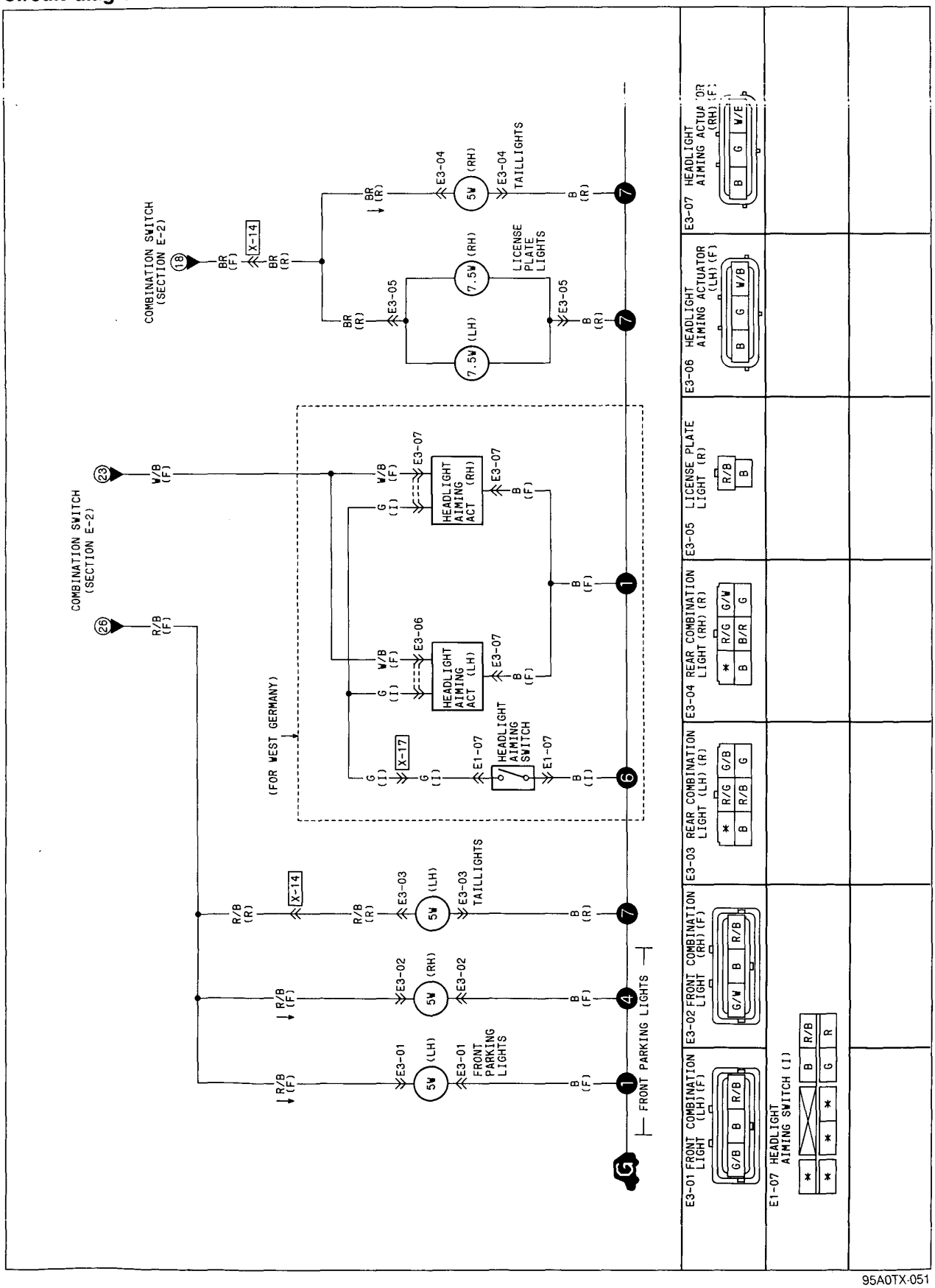
Step 4

1. Disconnect the back-up light switch connectors.
2. Check continuity between terminals of the switch with the transmission in reverse.

Continuity	Action
Yes	Repair wire harness (METER 10A fuse — Back-up light switch — Back-up light)
No	Replace switch

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Taillights, Parking Lights and License Plate Lights
Circuit diagram

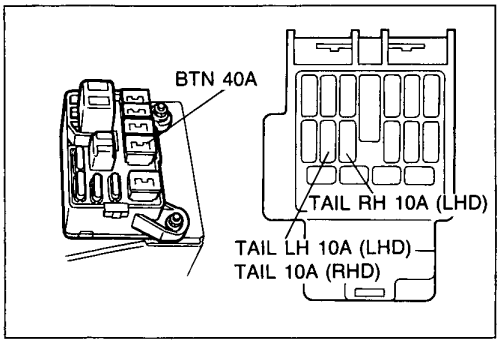


95A0TX-051

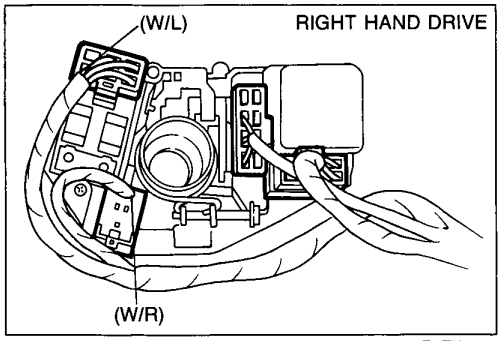
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Symptom: No lights illuminate (taillights parking lights and license plate lights).

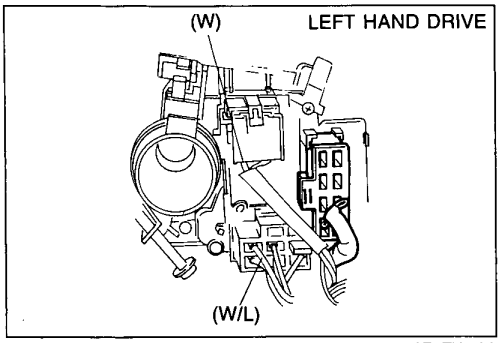
95E0TX-079



95E0TX-080



95E0TX-081



96E0TX-082

Step 1

1. Check the following fuse.
   Right hand drive
   - TAIL 10A
   - BTN 40A

   Left hand drive
   - TAIL LH 10A
   - TAIL RH 10A
2. If the fuse is burned, replace it. Check and, if necessary, repair the wiring harness.
3. If the fuses are OK, go to Step 2.

Step 2

1. Turn the headlight switch ON.
2. Measure the voltage at the following terminal-wires of the combination switch connector.

Right hand drive

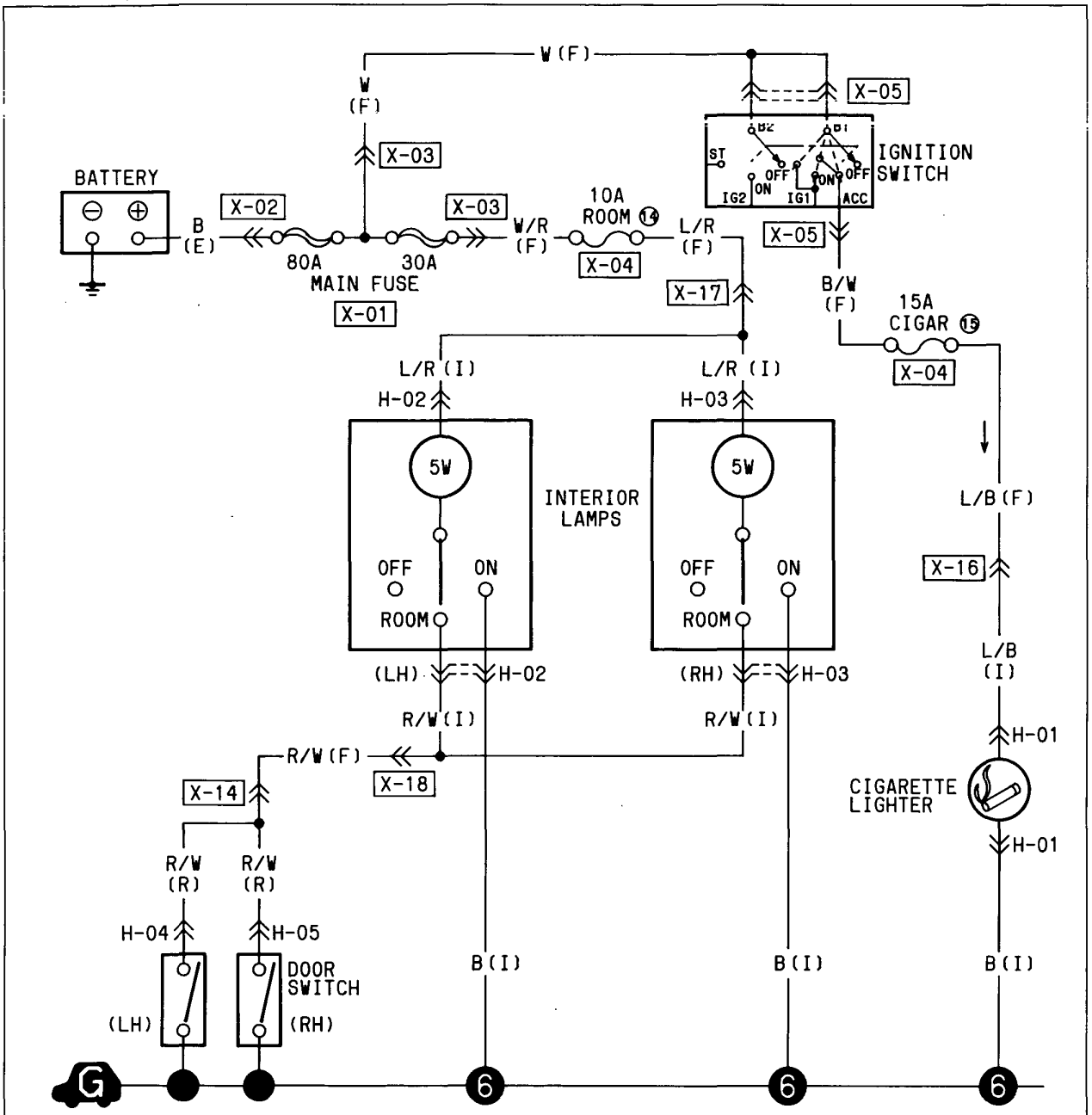
Wire	Voltage	Action
(W/R)	12V	Next check wire (W/L)
	0V	Repair wire (W/R) (BTN 40A fuse — combination switch)
(W/L)	12V	Repair the wiring harness (Combination switch — body ground of each light)
	0V	Replace headlight switch

Left hand drive

Wire	Voltage	Action
(W)	12V	Next check wire (W/L)
	0V	Repair wire (W/R) (MAIN 80A fuse — combination switch)
(W/L)	12V	Repair the wiring harness (Combination switch — body ground of each light)
	0V	Replace headlight switch

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Interior Lamps
Circuit diagram



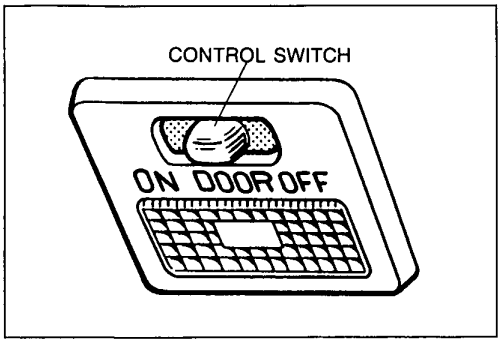
H-01 CIGARETTE LIGHTER (I) L/B / B	H-02 INTERIOR LAMP (LH) (I) L/R / B / R/W	H-03 INTERIOR LAMP (RH) (I) L/R / B / R/W	H-04 DOOR SWITCH (LH) (R) R/W
H-05 DOOR SWITCH (RH) (R) R/W			

95A0TX-055

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Symptom: Interior lamp(s) do not illuminate.

95A0TX-056



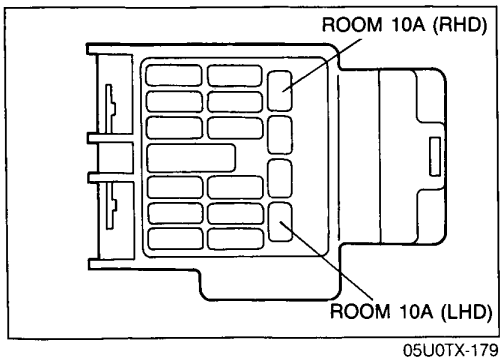
05U0TX-177

Step 1

Verify the trouble symptom by operating the control switch and opening the doors. Go to the specified Step.

Symptom	Go to
Interior lamp(s) do not illuminate when control switches are in any position	Step 2
Interior lamp(s) illuminate when control switches are in ON position, but do not illuminate with door open when switches are in DOOR position	Step 5
Interior lamp(s) illuminate when control switches are in DOOR position, but do not illuminate when switches are in ON position	Step 7

05U0TX-178

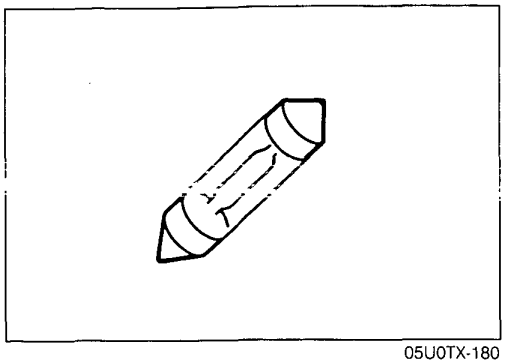


05U0TX-179

Step 2

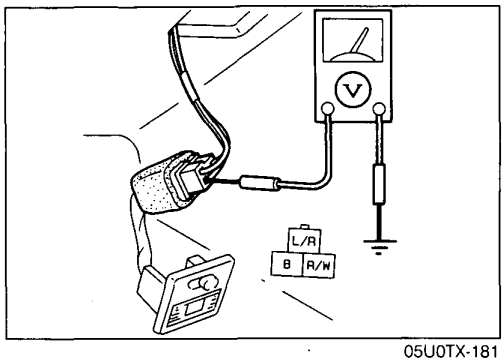
1. Check the ROOM 10A fuse.
2. If the fuse is burned, replace it. Check and repair the wire harness if necessary.
3. If the fuse is OK, go to Step 3.

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05U0TX-180

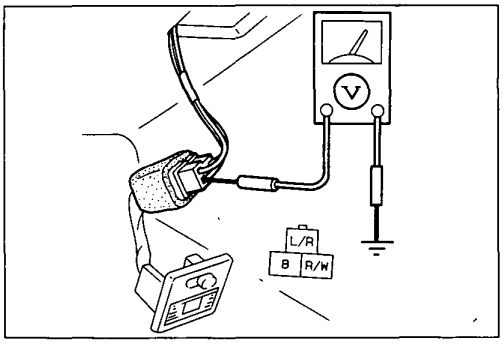
Step 3
1. Check the bulb of each lamp.
2. If a bulb is burned, replace it.
3. If the bulbs are OK, go to Step 4.



05U0TX-181

Step 4
1. Set the control switches to ON position.
2. Measure the voltage at the following terminal-wires of each interior lamp connector.

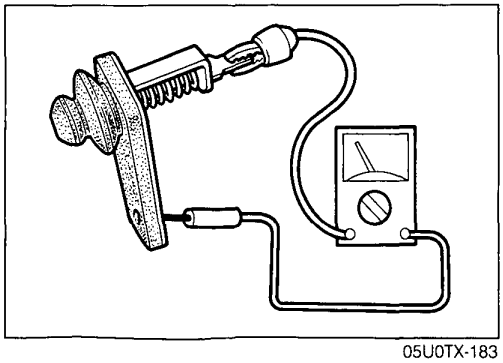
Wire	Voltage	Action
(L/R)	12V	Next check wire (B)
	0V	Repair wire (L/R) (ROOM 10A fuse—Interior lamp)
(B)	12V	Repair wire (B) (Interior lamp—Body ground)
	0V	Replace interior lamp assembly



05U0TX-182

Step 5
1. Open both doors, and set the control switches to DOOR position.
2. Measure the voltage at terminal-wire (R/W) of each interior lamp connector.

Wire	Voltage	Action
(R/W)	12V	Go to Step 6
	0V	Replace interior lamp assembly

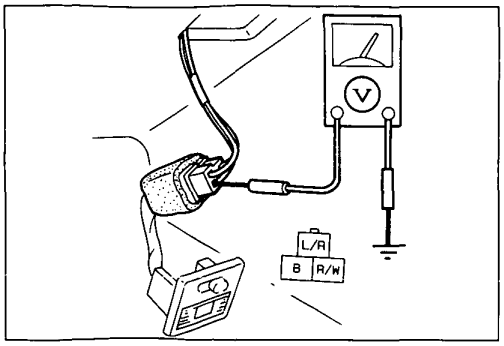


05U0TX-183

Step 6
1. Disconnect the door switch connector, and check continuity of each switch.

Switch	Continuity
Pushed	No
Released	Yes

2. If not as specified, replace the door switch.
3. If the switches are OK, repair wire (R/W). (Interior lamp-Door switch)



05U0TX-184

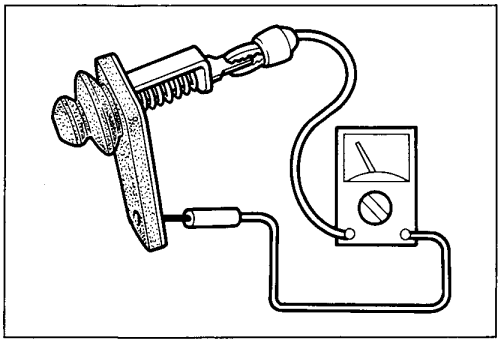
Step 7
1. Set the control switches to ON position.
2. Measure the voltage at terminal-wire (B) of the interior lamp connector.

Wire	Voltage	Action
(B)	12V	Repair wire (B) (Interior lamp—Body ground)
	0V	Replace interior lamp assembly

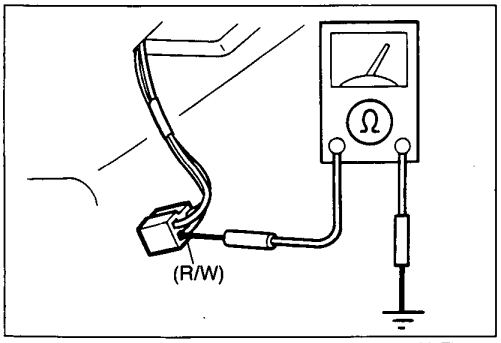
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**Symptom: Interior lamp(s) remains illuminated with doors closed.
(Control switch: DOOR position)**

05U0TX-185



05U0TX-186



05U0TX-187

Step 1

1. Disconnect the door switch connectors, and check continuity of each switch as shown.

Switch	Continuity
Pushed	No
Released	Yes

2. If not as specified, replace the door switch.
3. If the switches are OK go to Step 2.

Step 2

1. Close both doors.
2. Disconnect the interior lamp connectors, and check continuity between terminal-wire (R/W) and a body ground.

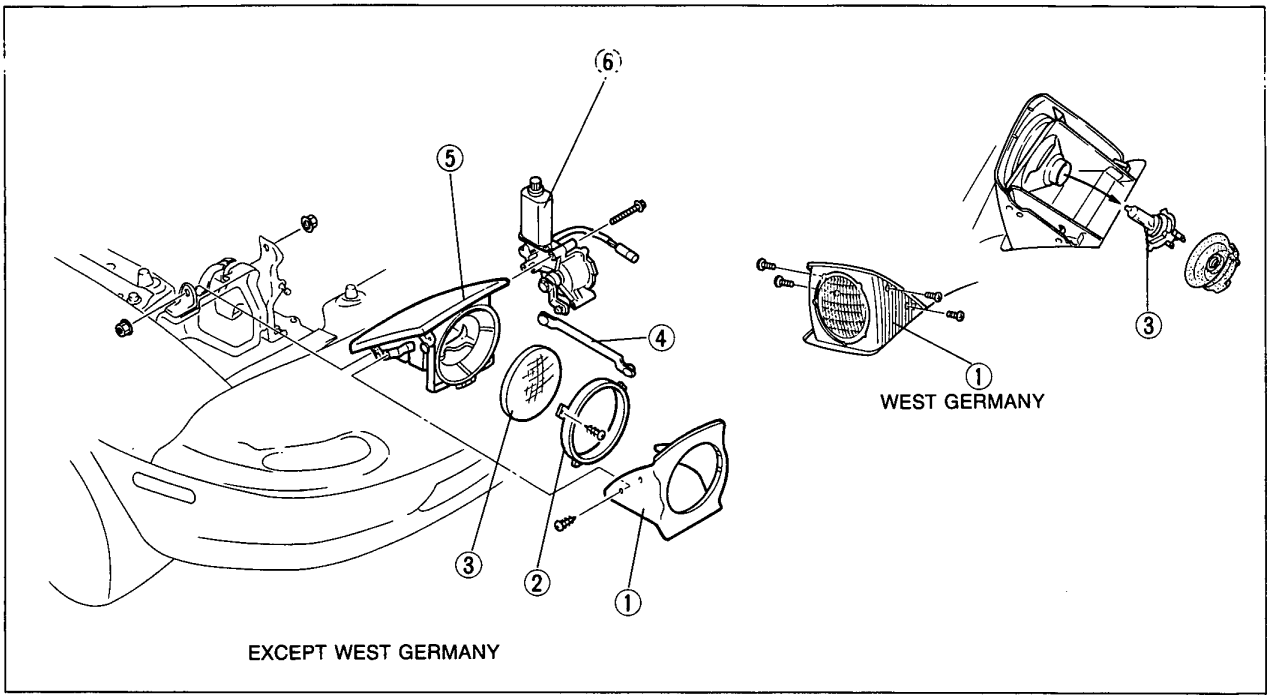
Wire	Continuity	Action
(R/W)-Body ground	Yes	Repair wire (R/W) (Interior lamp—Door switch)
	No	Replace interior lamp assembly

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REMOVAL / INSTALLATION

Remove and install as shown in the figure.

Headlight



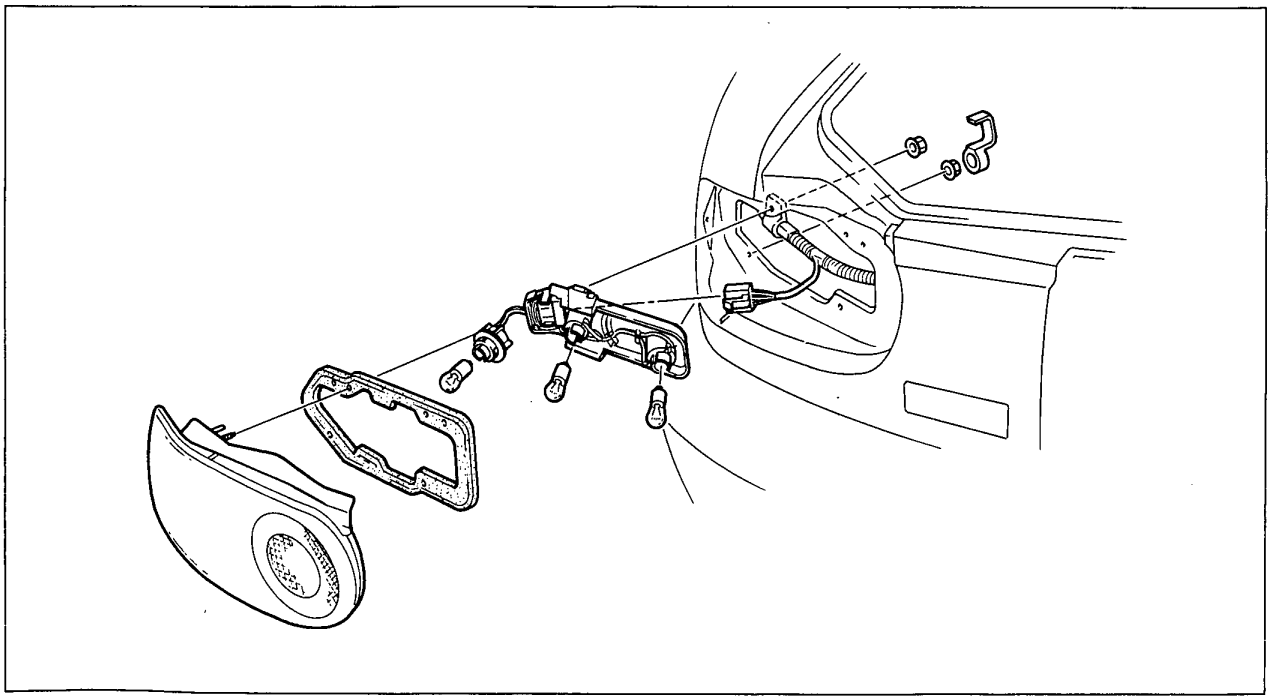
95A0TX-057

1. Bezel
2. Headlight housing
3. Headlight
4. Motor link
5. Retractor hinge
6. Retractor motor

Caution

- **Do not turn the adjusting screws during removal and installation.**

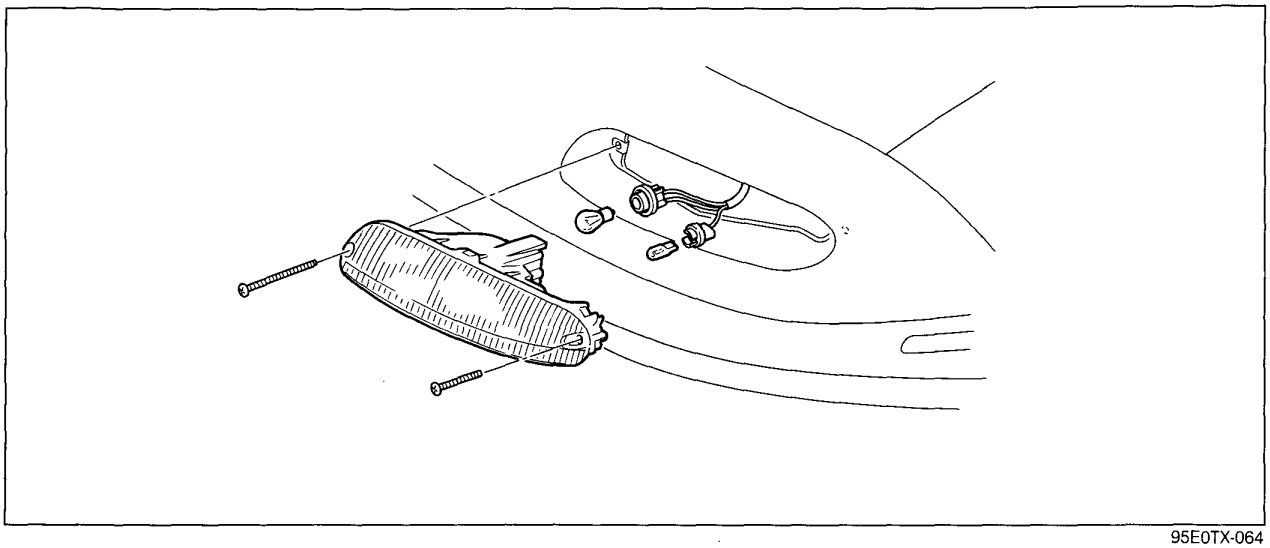
Rear Combination Light



95A0TX-058

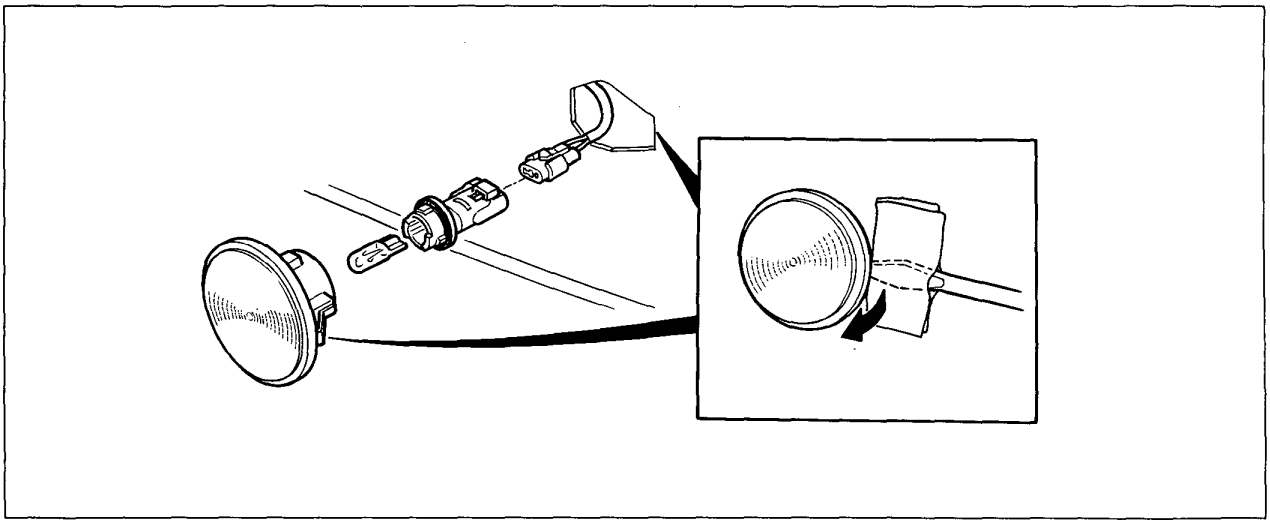
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Front Combination Light



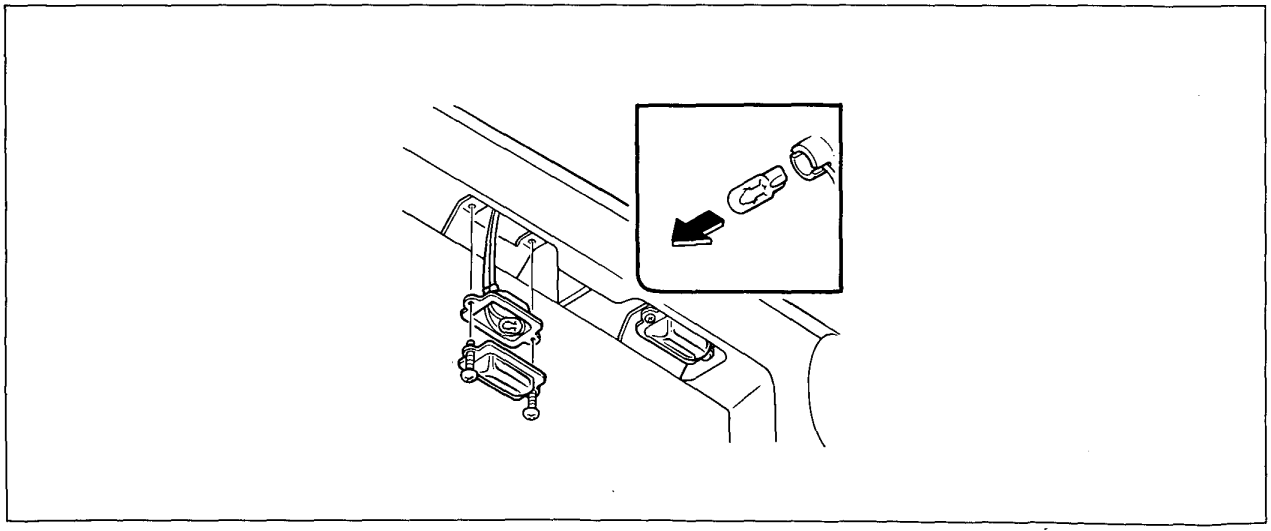
95E0TX-064

Side Turn Signal Light



95E0TX-065

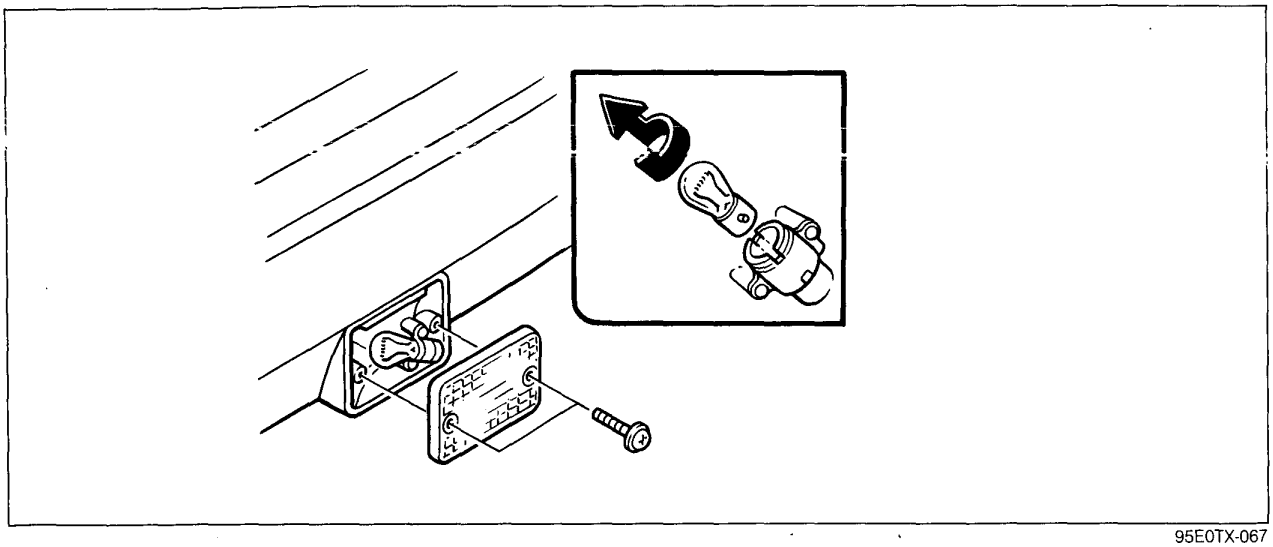
License Plate Light



95E0TX-066

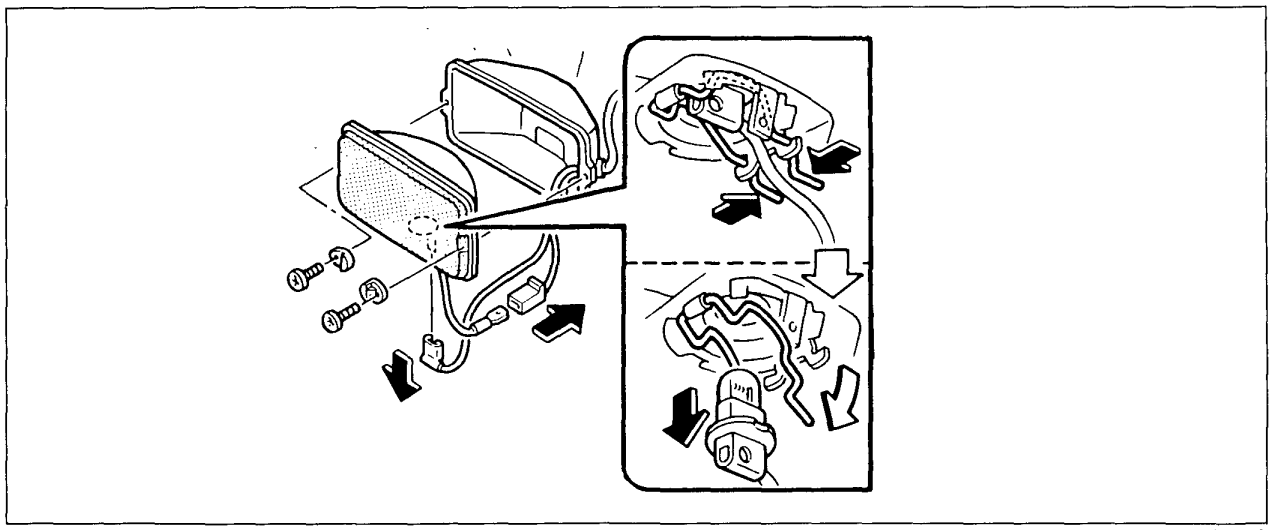
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Rear Fog Light



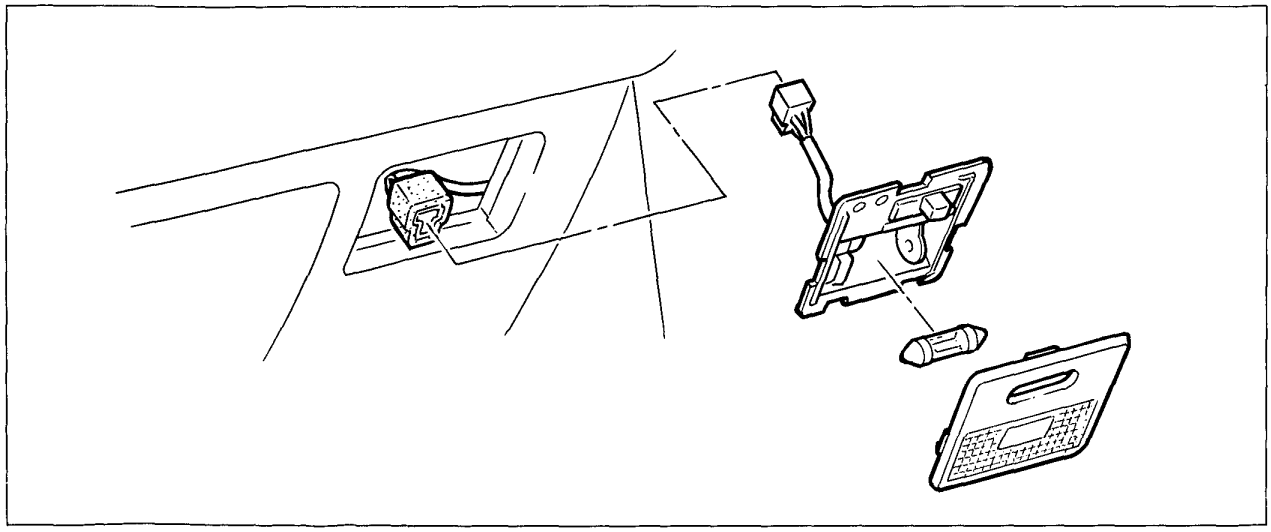
95E0TX-067

Passing Light



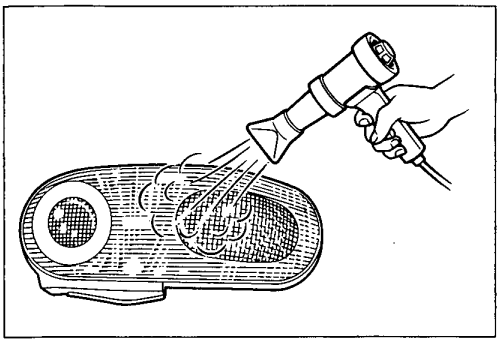
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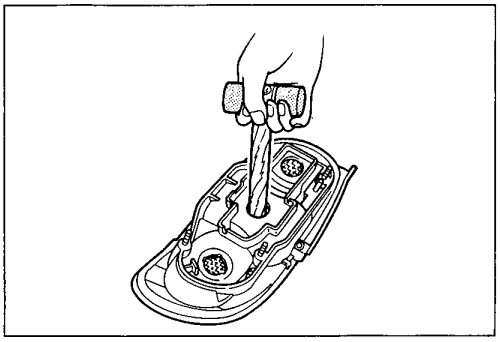
Interior Lamp

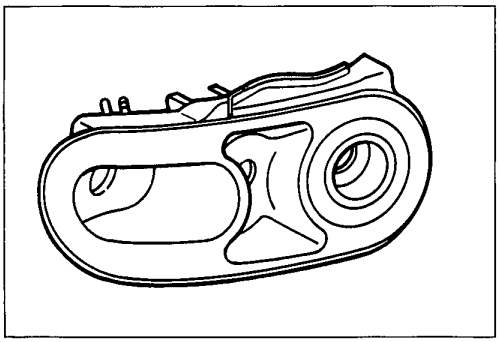


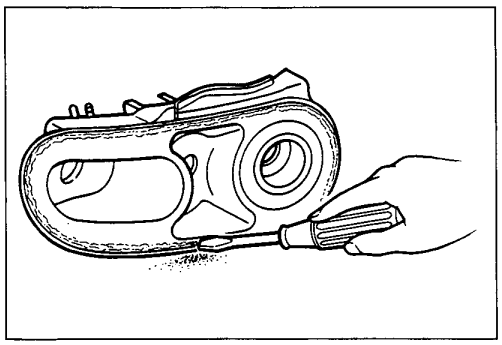
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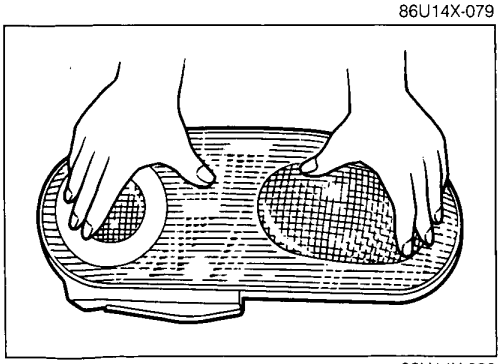
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86U14X-079


86U14X-080

REPLACEMENT

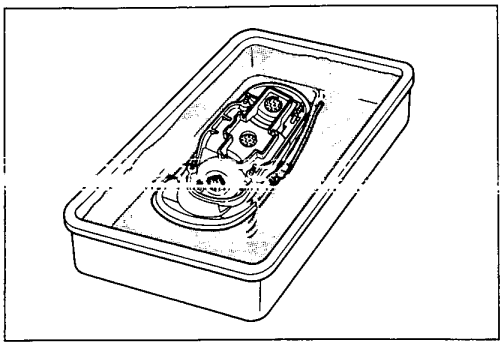
Rear Combination Light Lens

1. Use a hot air blower to soften the "hot melt" (bonding agent) around the lens.
2. Remove the lens from the light housing by pushing the rear of the lens with a hammer handle or round bar.
3. Heat the light housing, and remove the "hot melt" and any fragments of the lens.

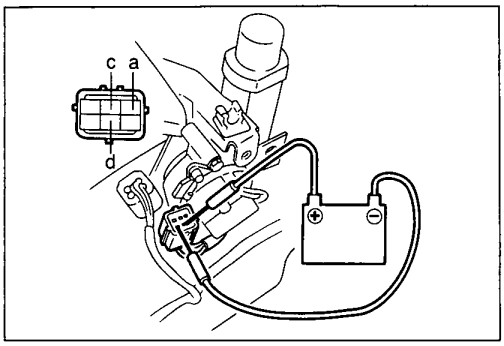
Note
- **The "hot melt" should be reused if possible.**
- **If the "hot melt" can be reused, the Step 4 is unnecessary.**

4. Put **Uni-sealer** (8531 77 739) adhesive in the light housing groove.
5. Fit the new lens onto the light housing. Press the lens firmly so that it will adhere.

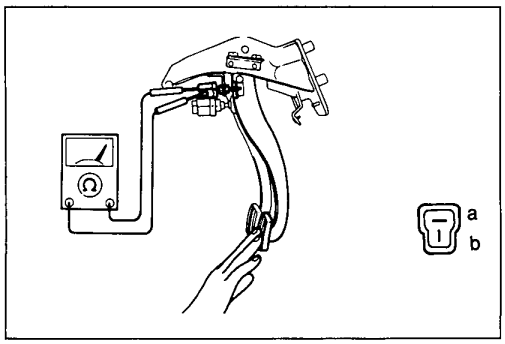
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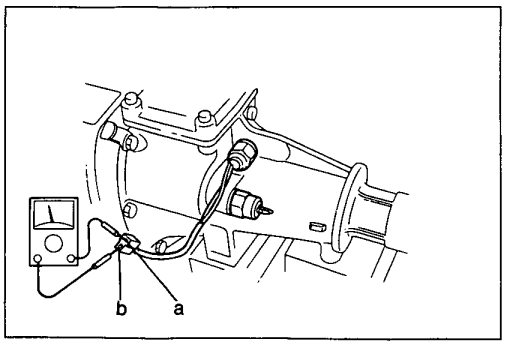
76U14X-038



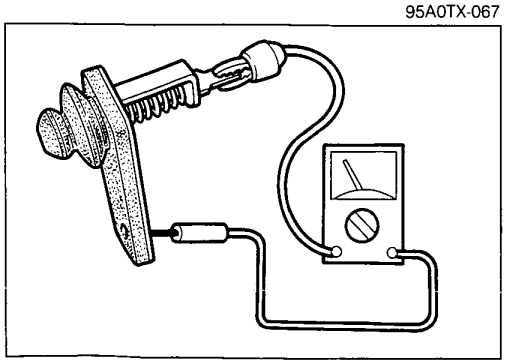
95A0TX-065



95A0TX-066



95A0TX-067



95A0TX-068

6. Immerse the combination light in water to check for leaks.

INSPECTION

Retractor Motor

1. Disconnect the motor link.
2. Disconnect the retractor motor connector.
3. Connect 12V to terminal f and ground terminal a of the motor connector.
4. Check the motor operation when connecting 12V as shown.

Terminal		Motor operation
12V	Ground	
c	a	Motor rotates to raised position
d	a	Motor rotates to retracted position

5. If not as specified, replace the retractor motor.

Stoplight Switch

1. Disconnect the stoplight switch connector.
2. Check continuity between terminals of the switch.

Inspection condition	Terminal	
	a	b
Brake pedal depressed	O———	———O
Brake pedal released		

O——O: Indicates continuity

3. If not as specified, replace the stoplight switch.

Back-up Light Switch

1. Disconnect the back-up light switch connectors.
2. Check continuity between terminals of the switch as shown.

Transmission	Continuity
Reverse	Yes
Others	No

3. If not as specified, replace the switch.

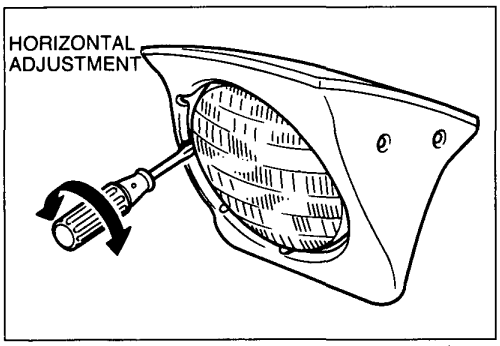
Door Switch

1. Disconnect the door switch connector, and check continuity of the switch as shown.

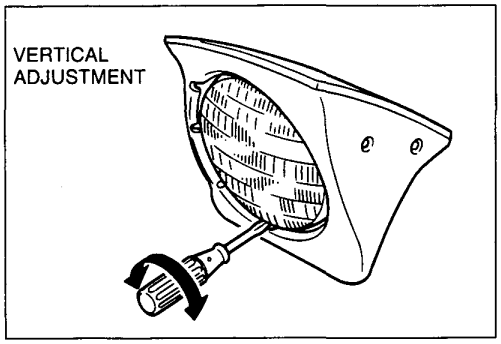
Switch	Continuity
Pushed	No
Released	Yes

2. If not as specified, replace the door switch.

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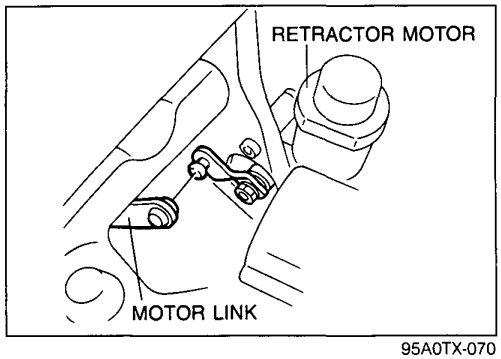
95E0TX-071



ADJUSTMENT

Headlight Aiming

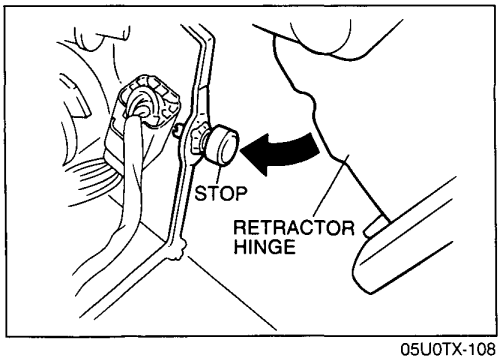
1. Adjust the tire air pressure to specification.
2. Turn on the retractor switch to raise the retractable headlights.
3. Set the headlight leveling switch to O position. (West Germany)
4. Position the unloaded vehicle on a flat, level surface.
5. Adjust the headlights to meet local regulations by turning the two adjusting screws.



95A0TX-070

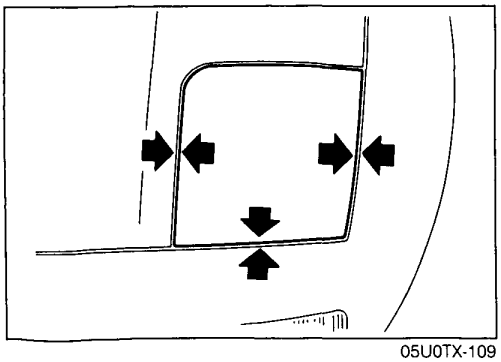
Retractor Hinge

1. Begin with the headlights fully retracted.
2. Disconnect the negative battery cable.
3. Disconnect the motor link.



05U0TX-108

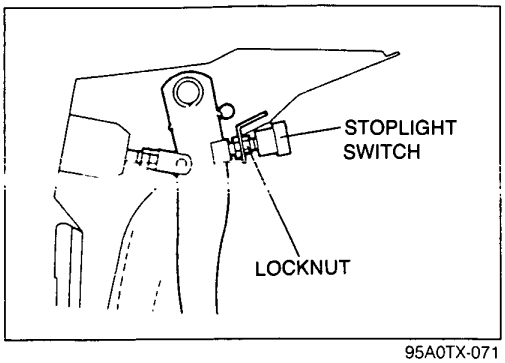
4. Lower the retractor hinge until the hinge is stopped by the stop.



05U0TX-109

5. Adjust the stop so that the headlight lid is flush with the fender and hood.

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95A0TX-071

Stoplight Switch

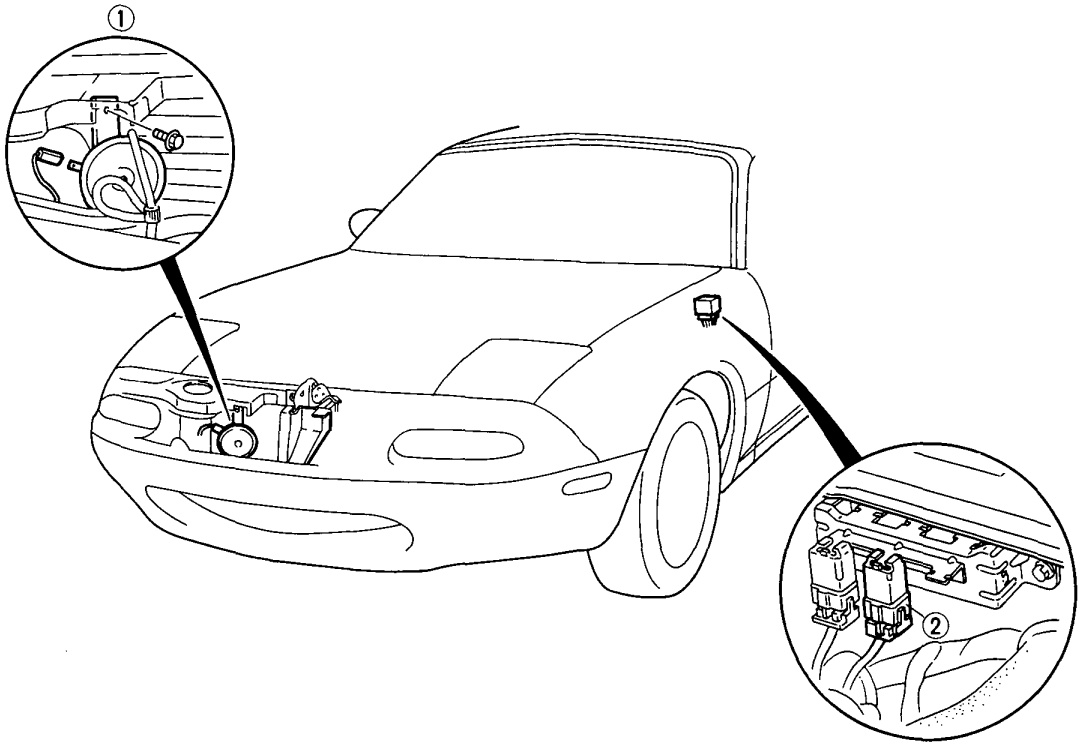
1. Adjust the brake pedal height. (Refer to Section P.)
2. Disconnect the stoplight switch connector.
3. Loosen the stoplight switch locknut.
4. Turn the stoplight switch until it contacts the pedal arm. Turn an additional 1/2 turn.
5. Tighten the locknut.

Locknut tightening torque:
14—18 N·m (1.4—1.8 m-kg, 120—156 in-lb)

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HORN

STRUCTURAL VIEW

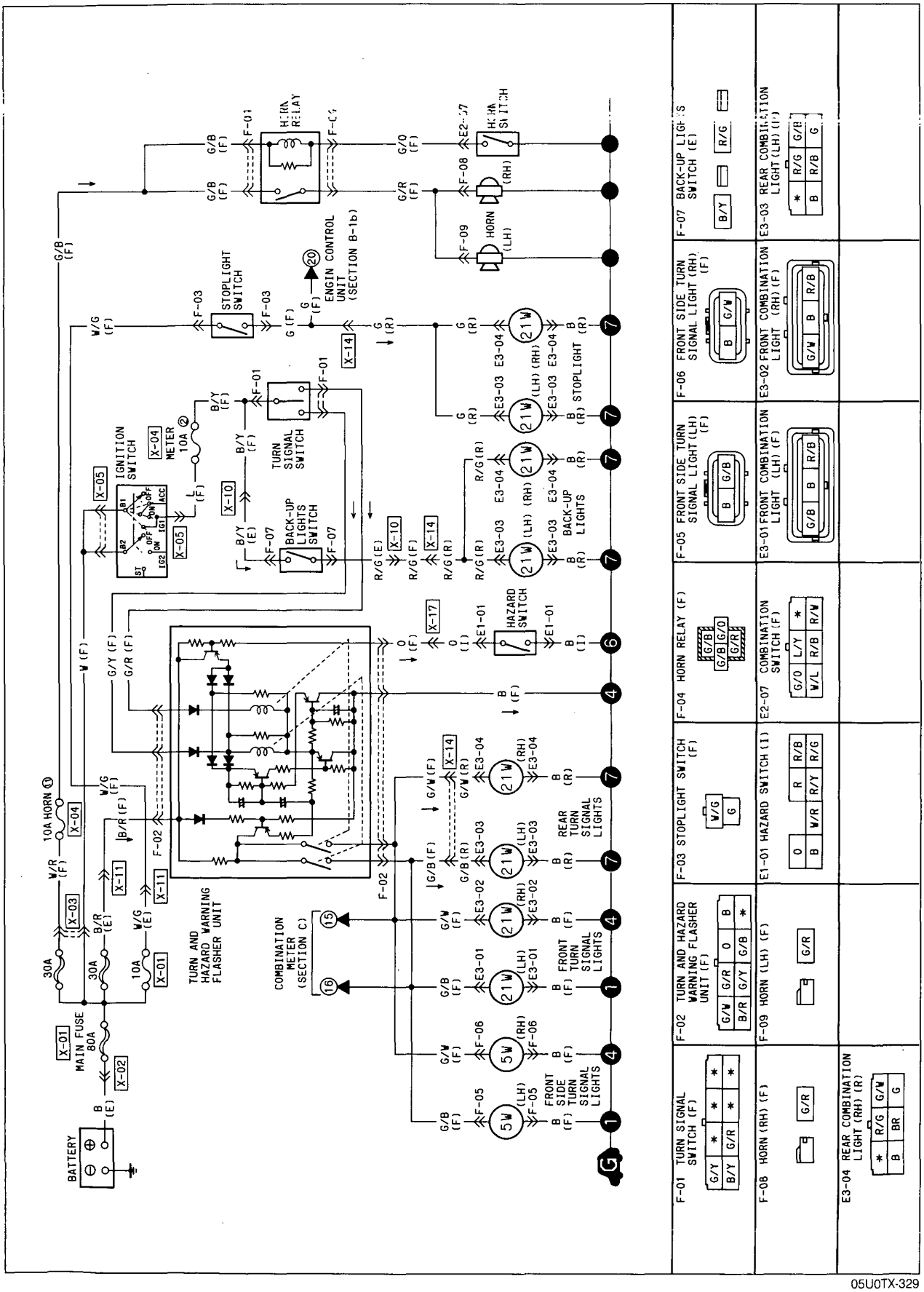


05U0TX-328

1. Horn
2. Horn relay
3. Horn switch

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CIRCUIT DIAGRAM



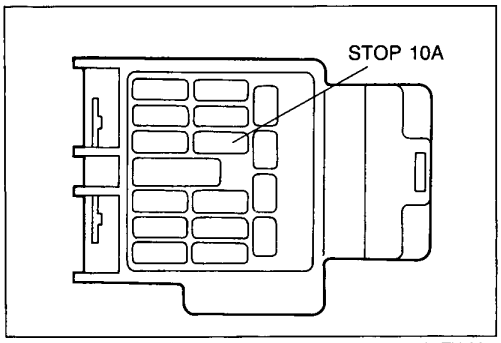
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TROUBLESHOOTING

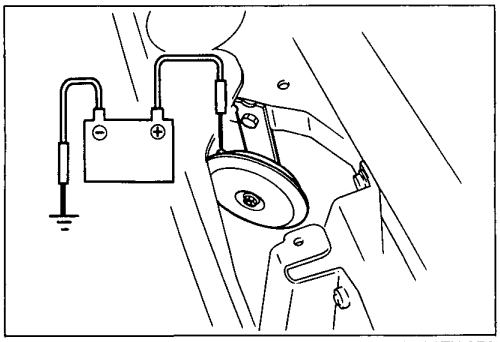
Symptom: Horn does not sound.

05U0TX-191



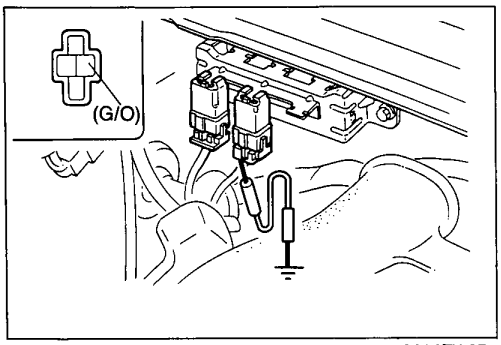
95A0TX-072

Step 1
1. Check the STOP 10A fuse.
2. If the fuse is burned, replace it. Check and repair the wire harness, if necessary.
3. If the fuse is OK, go to Step 2.



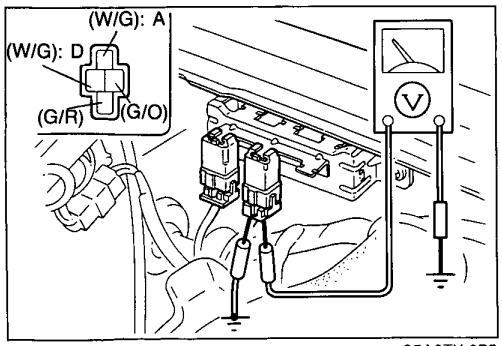
95A0TX-073

Step 2
1. Disconnect the horn connector.
2. Apply 12V to the horn, and check if the horn sounds.
3. If the horn sounds, go to Step 3.
4. If the horn does not sound, replace the horn.



95A0TX-074

Step 3
1. Check if the horn sounds, when grounding the terminal-wire (G/O) of the horn relay connector.
2. If the horn sounds, repair wire (G/O). (Horn relay—Horn switch)
3. If the horn does not sound, go to Step 4.

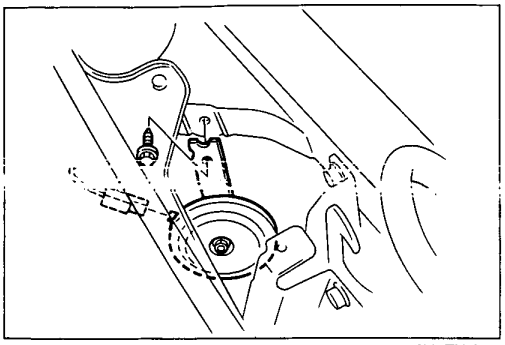


95A0TX-075

Step 4
1. Ground the terminal wire (G/O) of the horn relay connector.
2. Measure the voltage at the following terminal wires of the horn relay connector.

Wire	Voltage	Action
(W/G) Terminal A	12V	Next check wire (W/G) of terminal D
	0V	Repair wire (W/G) (STOP 10A fuse — Horn relay)
(W/G) Terminal D	12V	Next check wire (G/R)
	0V	Repair wire (W/G) (STOP 10A fuse — Horn relay)
(G/R)	12V	Repair wire (G/R) (Horn relay — Horn)
	0V	Replace horn relay

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05U0TX-203

REMOVAL / INSTALLATION

Horn

Remove and install as shown in the figure.

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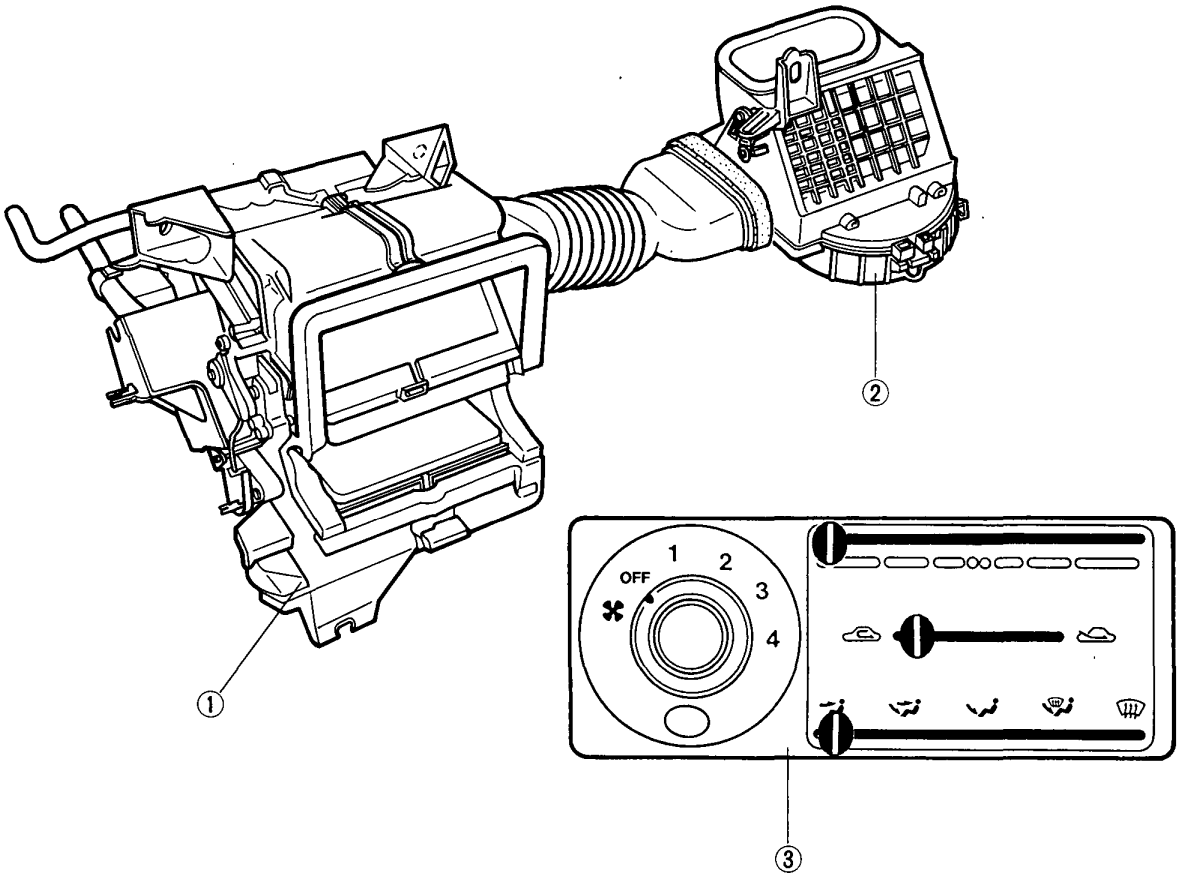
HEATER AND AIR CONDITIONER SYSTEMS

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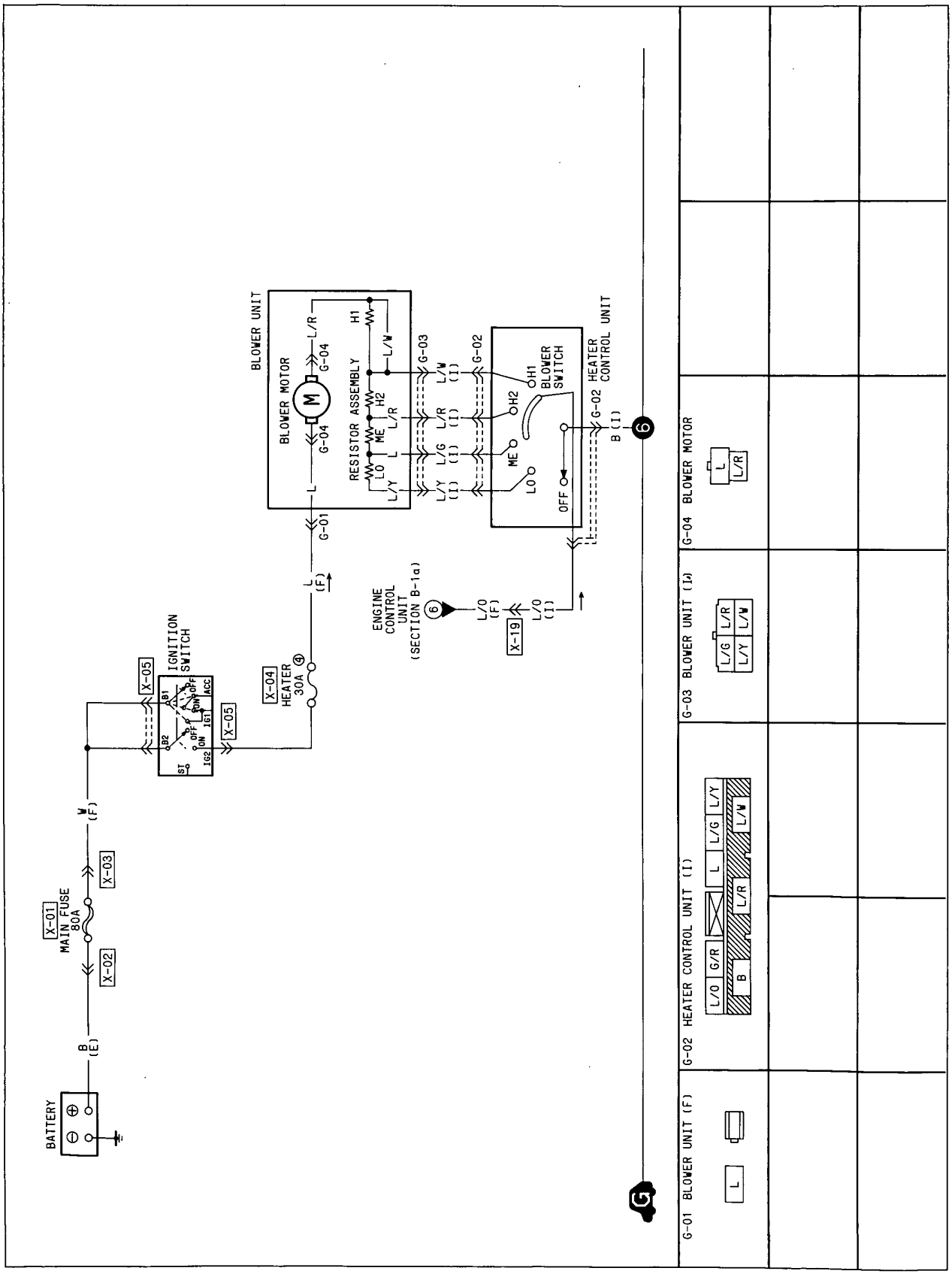
95E0UX-002

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Disassembly / Assembly..... page U– 9
Heater core (in heater unit)
Inspection..... page U– 9
2. Blower unit
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Blower motor (in blower unit)
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Resistor assembly (in blower unit)
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3. Heater control switch assembly
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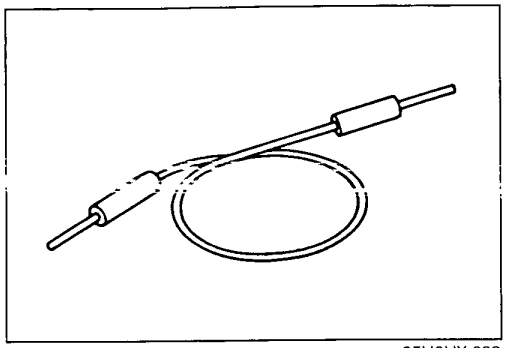
TROUBLESHOOTING GUIDE

CIRCUIT DIAGRAM

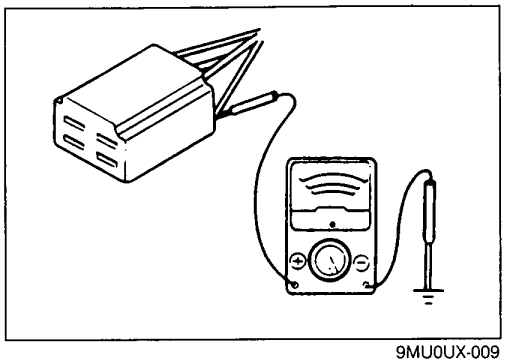


05U0UX-004

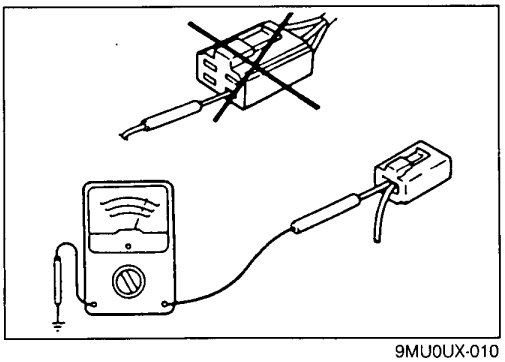
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05U0UX-083



9MU0UX-009



9MU0UX-010

ELECTRICAL TROUBLESHOOTING TOOLS

Jumper Wire

The jumper wire is used for testing by short-circuiting switch terminals and to verify the condition of ground connections.

Caution

- **Do not connect the jumper wire between a power source and a body ground. Doing so may cause burning or other damage to harnesses and electronic components.**

Voltmeter

The DC voltmeter is used for measurement of circuit voltage. A voltmeter with a range of 15V or more must be used. It is used by connecting the positive (+) probe (red lead) to the point where voltage is to be measured and connecting the negative (–) probe (black lead) to a body ground.

Ohmmeter

The ohmmeter is used to measure the resistance between two points in a circuit, to check for continuity, and to diagnose short circuits.

Caution

- **Never connect the ohmmeter to any circuit to which voltage is applied. Doing so may burn or otherwise damage the ohmmeter.**

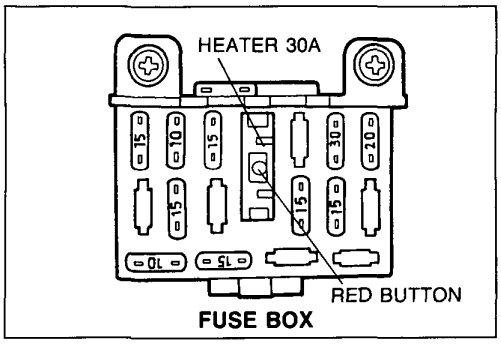
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Symptom: Blower motor does not operate.

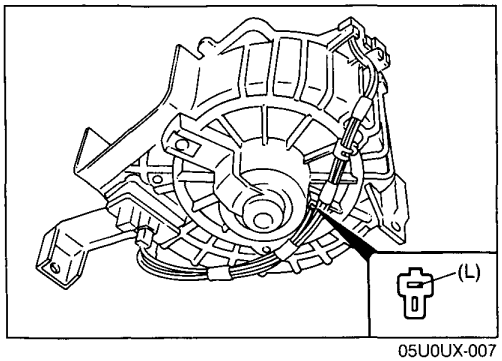
Normal operation of blower motor

Blower motor speed is controlled by the blower switch and a resistor assembly in the blower unit. When the blower switch is in the OFF position, the motor ground circuit is open and the blower motor does not operate. When the switch is in the first (Low) position, current flow from the blower motor is restricted by the three resistors in the resistor assembly, and the blower motor turns at low speed. Changing the blower switch to the second (Mid), third (High), or fourth (Super-high) position causes the circuit resistance to decrease, and the blower motor speed becomes correspondingly faster.

05U0UX-006



05U0UX-082



05U0UX-007

Step 1

1. Check the circuit breaker.

Circuit breaker	Amperage	Location
HEATER	30A	Fuse box

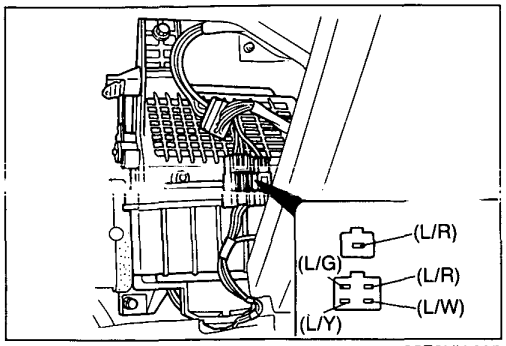
2. If the reset button is not out, go to Step 2.
3. If the reset button is out, check for a short circuit in the harness. Repair as necessary; then depress the reset button to reset the circuit breaker.

Step 2

1. Turn the ignition switch ON.
2. Turn the blower switch to the fourth position.
3. Measure the voltage at terminal-wire (L) of the blower motor connector.

Wire	Voltage	Action
(L)	12V	Go to Step 3
	0V	Repair wire harness (Circuit breaker—Blower motor)

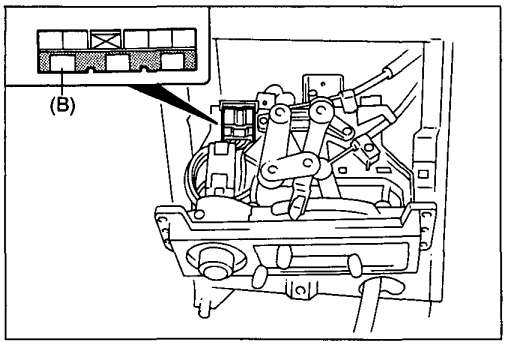
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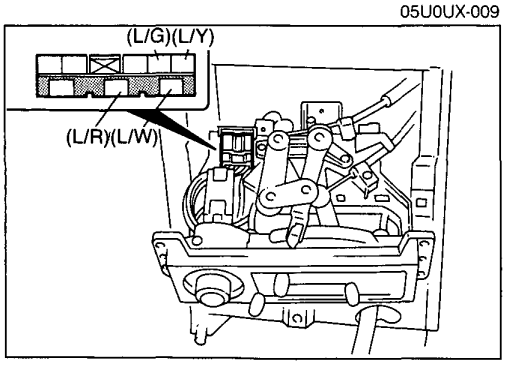
95E0UX-005

Step 3
1. Turn the ignition switch ON.
2. Turn the blower switch OFF.
3. Measure the voltage at the terminal-wires of the resistor assembly.

Wire	Voltage	Action
(L/R) (1-pin connector)	12V	Next, check wire (L/W)
	0V	Replace blower motor
(L/W)	12V	Next, check wire (L/R)
	0V	Replace resistor assembly
(L/R) (4-pin connector)	12V	Next, check wire (L/G)
	0V	Replace resistor assembly
(L/G)	12V	Next, check wire (L/Y)
	0V	Replace resistor assembly
(L/Y)	12V	Go to Step 4
	0V	Replace resistor assembly



05U0UX-009



95E0UX-006

Step 4
1. Turn the ignition switch ON.
2. Turn the blower switch to the fourth position.
3. Measure the voltage at terminal-wire (B) of the blower switch connector.

Wire	Voltage	Action
(B)	0V	Go to Step 5
	12V	Repair wire harness (Blower switch—Body ground)

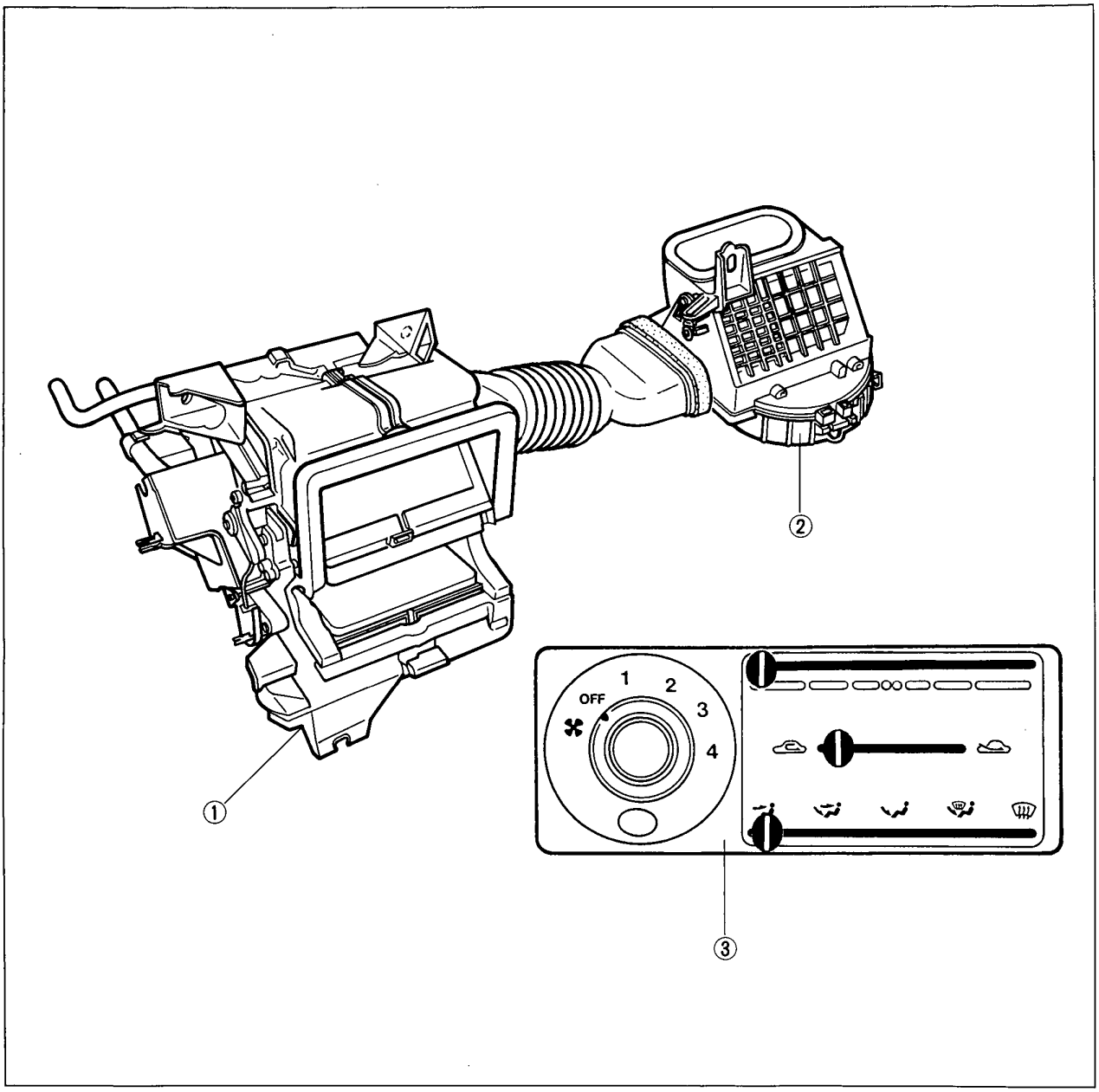
Step 5
1. Turn the ignition switch ON.
2. Turn the blower switch OFF.
3. Measure the voltage at the terminal-wires of the blower switch connector.

Wire	Voltage	Action
(L/W)	0V	Repair wire harness (Resistor assembly—Blower switch)
	12V	Next, check wire (L/R)
(L/R)	0V	Repair wire harness (Resistor assembly—Blower switch)
	12V	Next, check wire (L/G)
(L/G)	0V	Repair wire harness (Resistor assembly—Blower switch)
	12V	Next, check wire (L/Y)
(L/Y)	0V	Repair wire harness (Resistor assembly—Blower switch)
	12V	Replace blower switch

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HEATER

STRUCTURAL VIEW



95E0UX-003

1. Heater unit
Removal / Installation..... page U– 8
Disassembly / Assembly..... page U– 9
Heater core
Inspection..... page U– 9
2. Blower unit
Removal / Installation..... page U–10
Disassembly / Assembly..... page U–11
Blower motor
Inspection..... page U–11
Resistor assembly
Inspection..... page U–11
3. Heater control switch assembly
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Adjustment..... page U–14

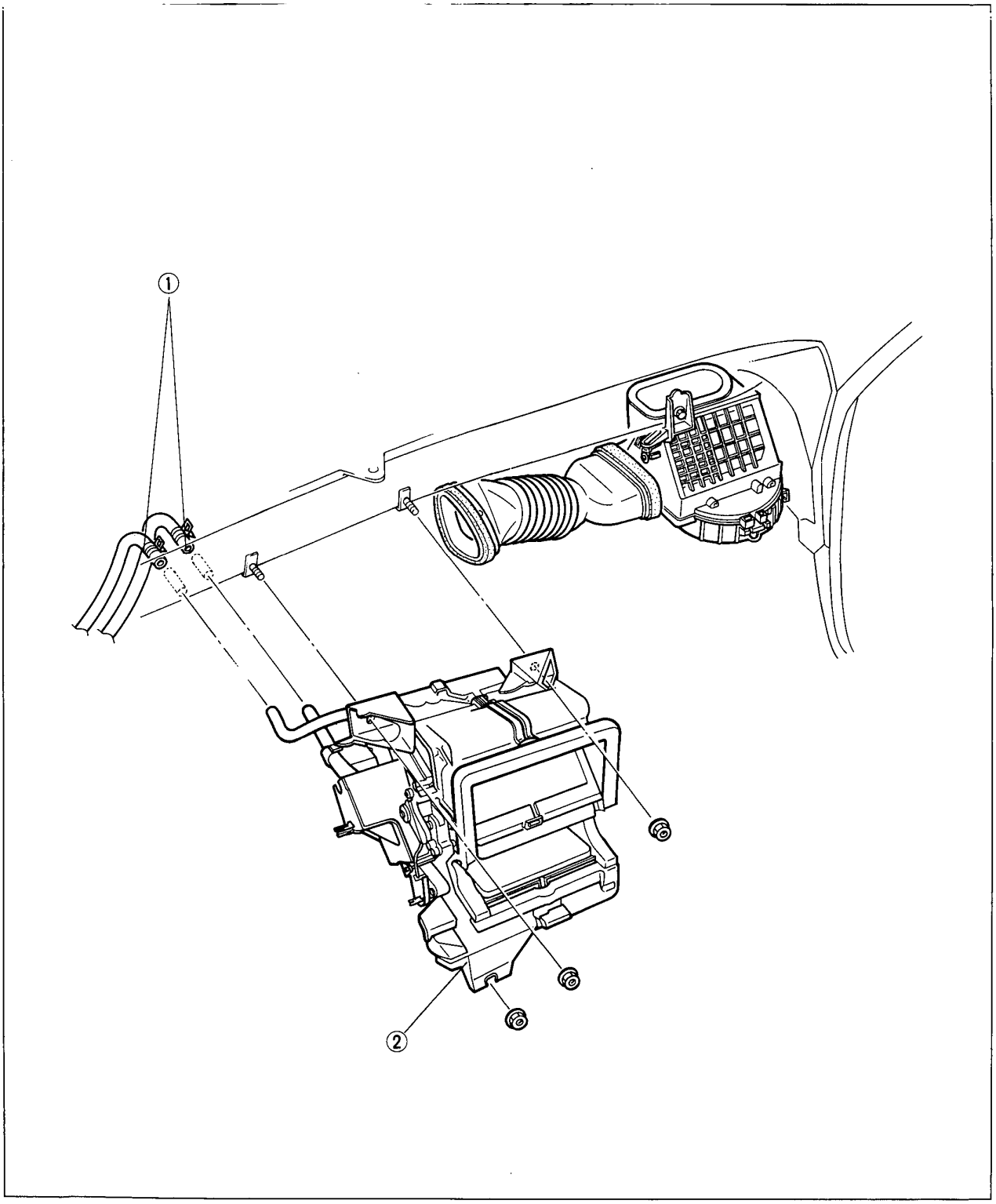
Note
- **Refer to Section E for engine coolant flow.**

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HEATER UNIT

Removal / Installation

1. Remove the dashpanel. (Refer to Section S.)
2. Remove the heater unit as shown in the figure.
3. Install the heater unit in the reverse order of removal.
4. Install the dashpanel.



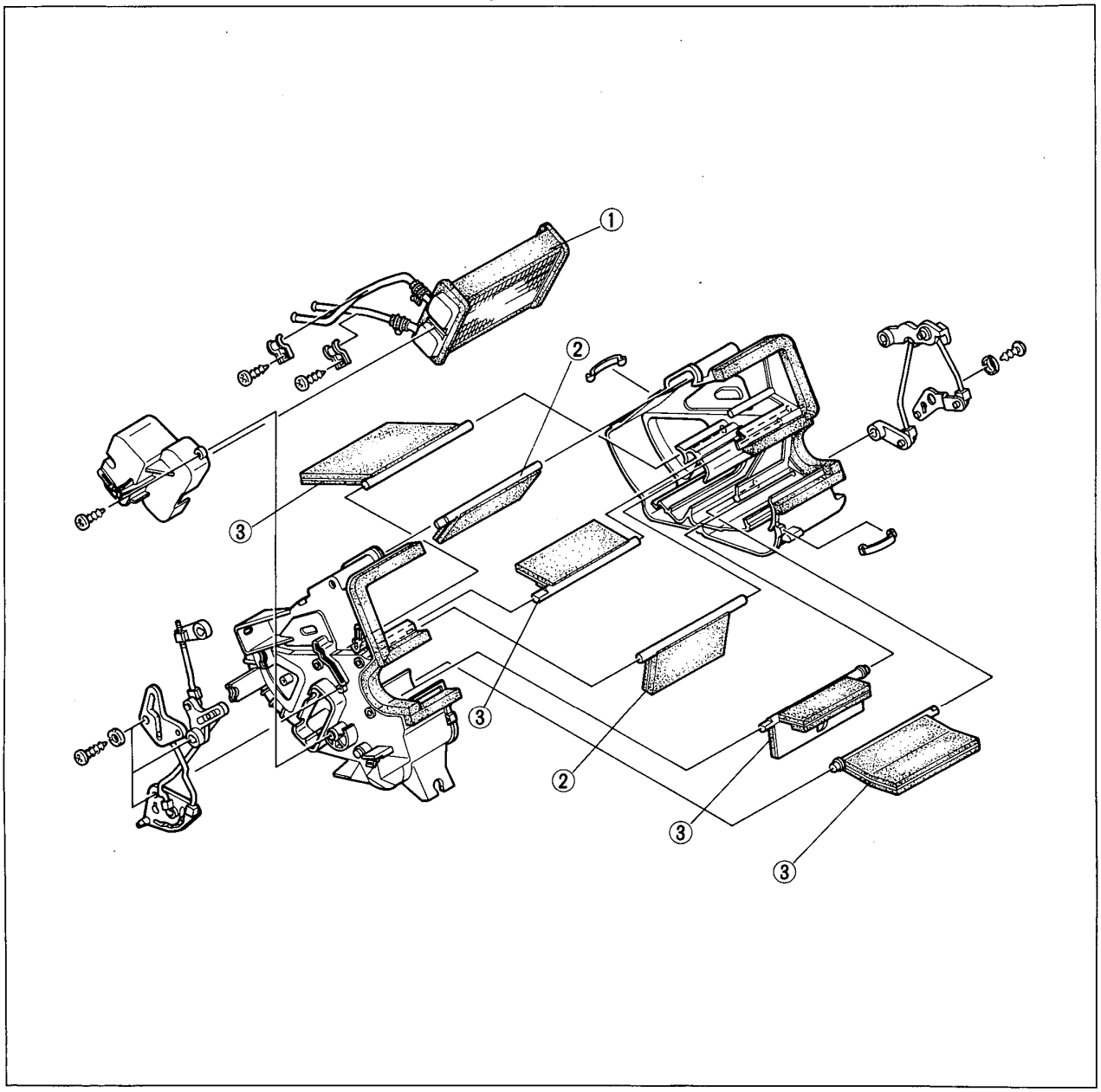
05U0UX-033

1. Heater hose
2. Heater unit

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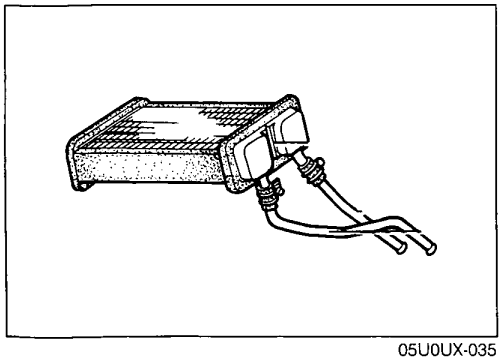
Disassembly / Assembly

Disassemble and assemble as shown in the figure.



05U0UX-034

1. Heater core
2. Temperature blend door
3. Airflow mode door



05U0UX-035

Inspection

Heater core

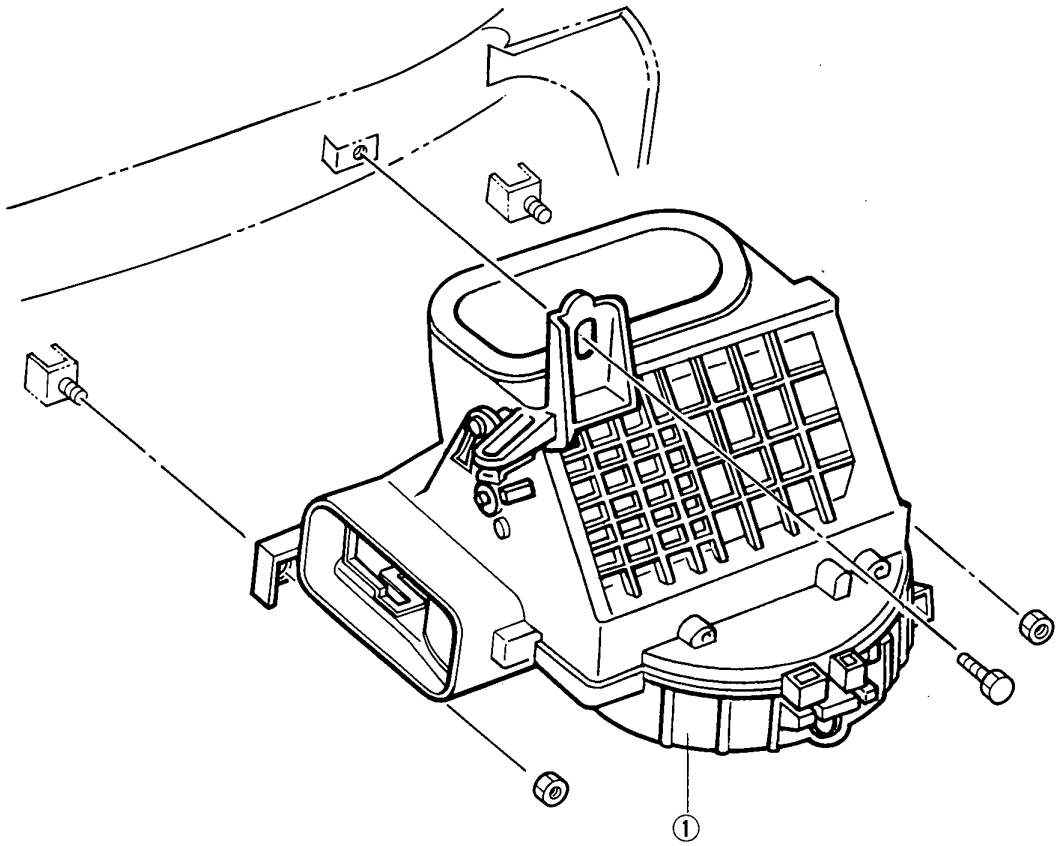
1. Check the heater core fins for blockage.
2. If the fins are clogged, clean them.
3. Check the fittings for cracks or other damage. Replace the heater core if necessary.

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BLOWER UNIT

Removal / Installation

1. Remove the glove box.
2. Remove the blower unit as shown in the figure.
3. Install the blower unit in the reverse order of removal.
4. Install the glove box.



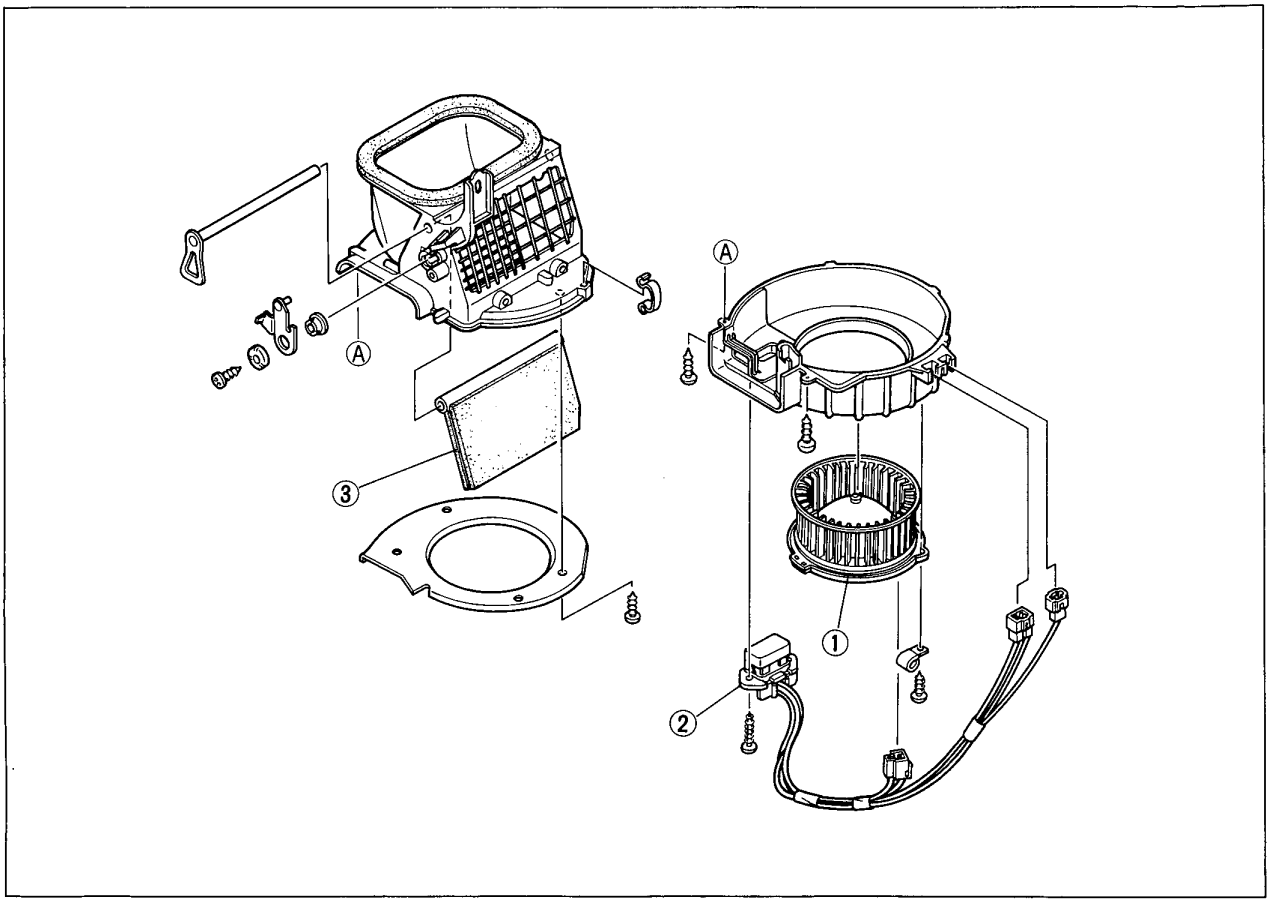
05U0UX-036

1. Blower unit

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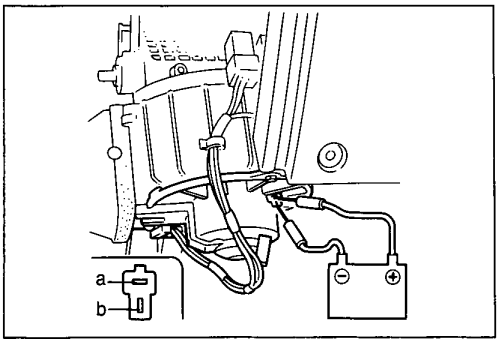
Disassembly / Assembly

Disassemble and assemble as shown in the figure.

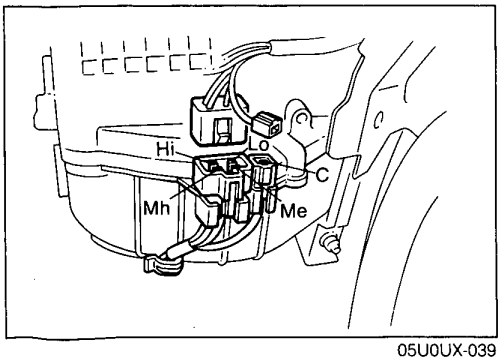


05U0UX-037

1. Blower motor
2. Resistor assembly
3. REC-FRESH door



05U0UX-038



05U0UX-039

Inspection

Blower motor

1. Verify that the blower motor runs when connecting 12V to terminal a and grounding terminal b.
2. If the blower motor does not run, replace it.

Resistor assembly

1. Check for continuity between terminals of the resistor assembly.

Terminals	Continuity
C—Lo	Yes
C—Me	Yes
C—Mh	Yes
C—Hi	Yes

Note

- **Set the ohmmeter to the x1,000 range.**

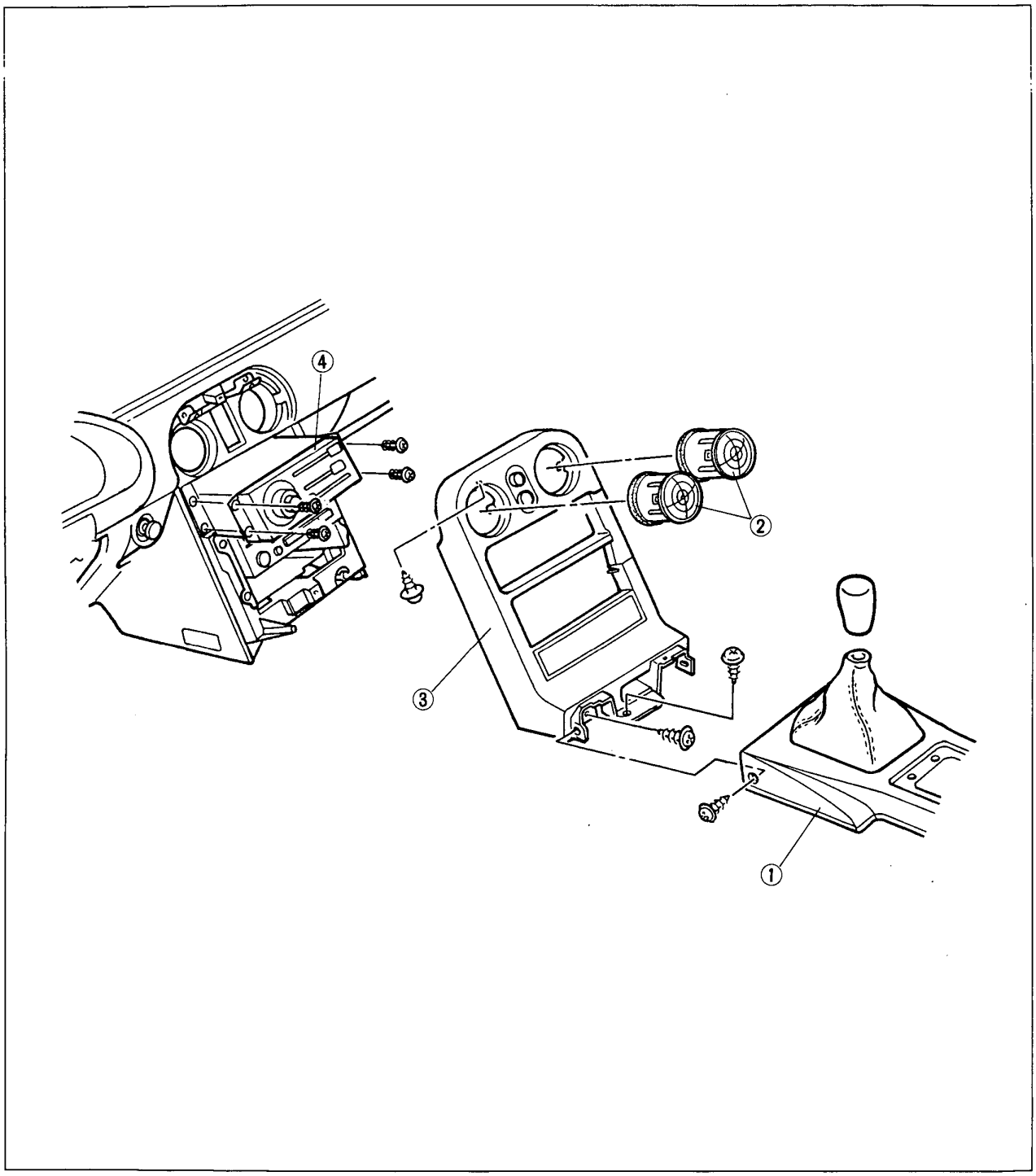
2. If not as specified, replace the resistor assembly.

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HEATER CONTROL SWITCH ASSEMBLY

Removal / Installation

Remove and install as shown in the figure.



95E0UX-004

1. Center console
2. Vent outlet
3. Switch panel
4. Rec-Fresh wire

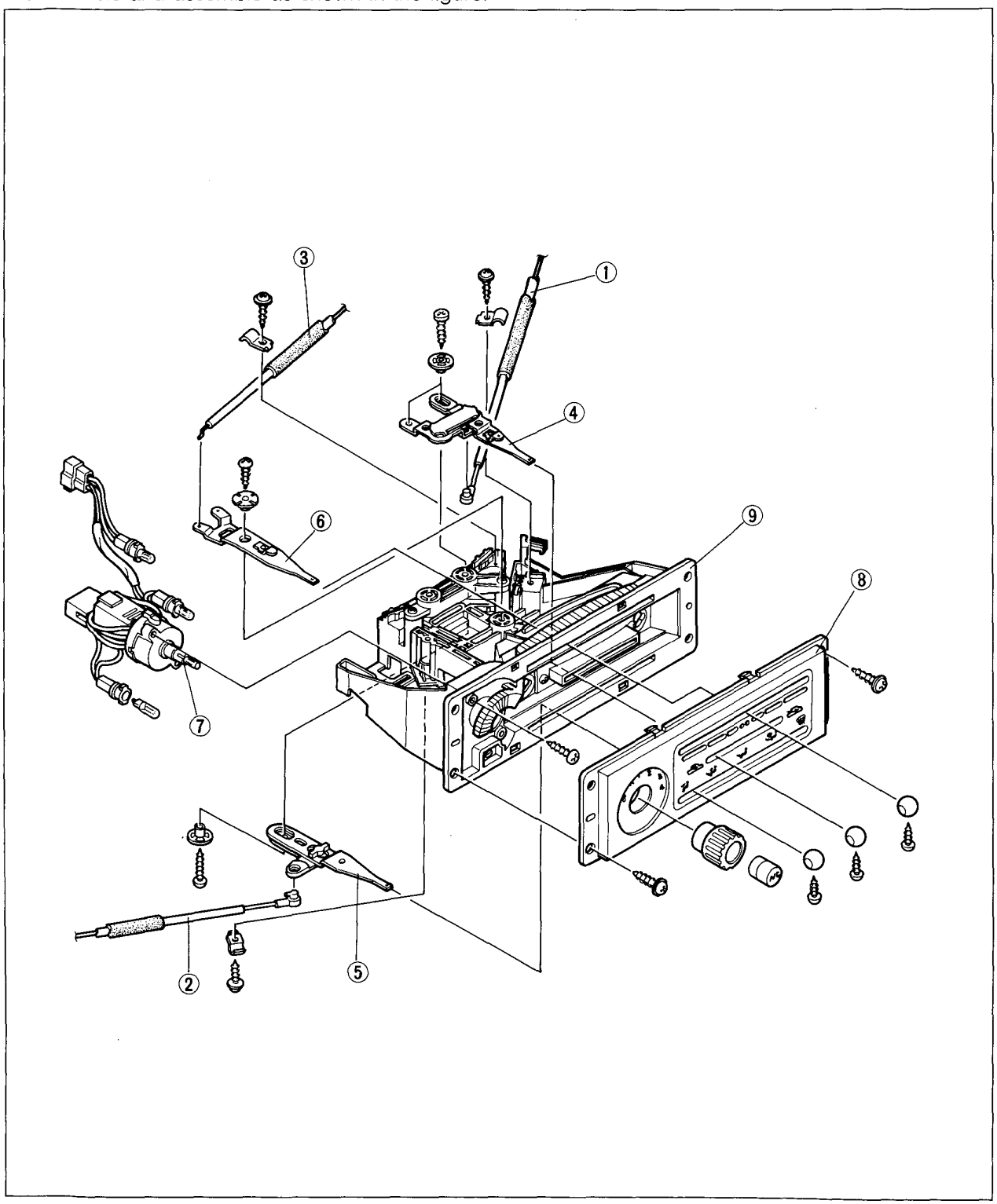
Installation note

- **When installing the heater control switch assembly adjust the airflow mode, temperature blend, and Rec-Fresh wires. (Refer to page U–14.)**

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Disassembly / Assembly

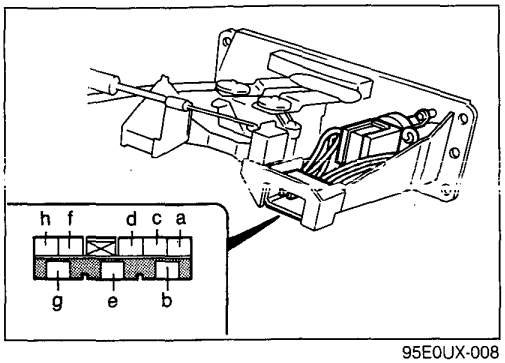
Disassemble and assemble as shown in the figure.



95E0UX-007

1. Rec-Fresh wire
2. Airflow mode wire
3. Temperature blend wire
4. Rec-Fresh lever
5. Airflow mode lever
6. Temperature blend lever
7. Blower
8. Panel
9. Switch body

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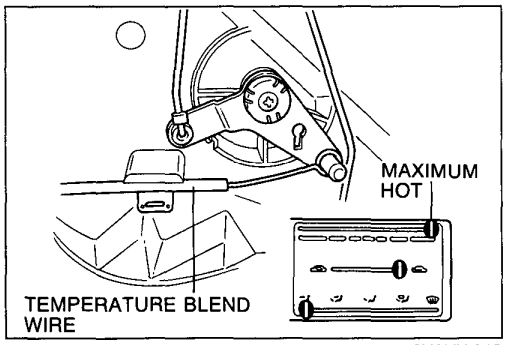
95E0UX-008

Inspection
Blower and A/C switch
1. Check continuity between terminals of the switch.

Position		Terminal							
		a	b	c	d	e	f	g	h
Blower switch	OFF								
	First	○						○	
	Second			○				○	○
	Third					○		○	○
	Fourth		○					○	○

○—○ : Indicates continuity
○—○ : Indicates diode

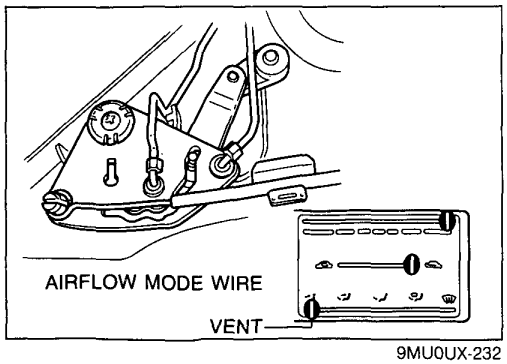
2. If not as specified, replace the switch.



05U0UX-043

Adjustment
Temperature blend wire
1. Set the temperature blend lever to maximum hot position.
2. Connect and clamp the wire with the shutter lever on the heater unit all the way to the right.

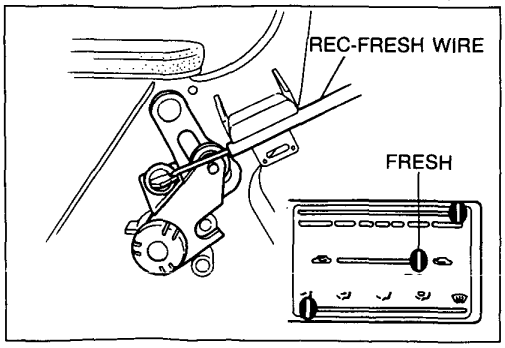
Caution
- **After installation, move the temperature blend lever to be sure the wire is securely attached and that it moves the full stroke from HOT to COLD.**



9MU0UX-232

Airflow mode wire
1. Set the airflow mode control lever to VENT position.
2. Connect and clamp the wire with the shutter lever on the heater unit at its closest point.

Caution
- **After installation, move the airflow mode control lever to be sure the wire is securely attached and that it moves the full stroke from DEF to VENT.**



05U0UX-044

Rec-Fresh wire
1. Set the Rec-Fresh lever to FRESH position.
2. Connect and clamp the wire with the shutter lever on the blower unit at its closest point.

Caution
- **After installation, move the Rec-Fresh lever to be sure the wire is securely attached and that it moves the full stroke from REC to FRESH.**

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TECHNICAL DATA

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FUEL AND EMISSION CONTROL SYSTEMS TD– 6
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STANDARD BOLT AND NUT TIGHTENING TORQUE TD–12

05UTDX-001

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A. MEASUREMENTS

Item			Measurements
Overall length		mm (in)	3,948 (155.4)
Overall width		mm (in)	1,676 (65.9)
Overall height		mm (in)	1,224 (48.2)
Wheelbase		mm (in)	2,266 (89.2)
Tread	Front	mm (in)	1,410 (55.5)
	Rear	mm (in)	1,428 (56.2)

B. ENGINE

Item \ Engine			B6 DOHC
Type			Gasoline, 4-cycle
Cylinder arrangement and number			In-line, 4-cylinders
Combustion chamber			Pentroof
Valve system			DOHC, belt-driven 16 valves
Bore x Stroke		mm (in)	78.0 x 83.6 (3.07 x 3.29)
Total piston displacement		cc (cu in)	1,597 (97.42)
Compression ratio			9.4
Compression pressure kPa (kg/cm^2, psi)-rpm	Standard		1,324 (13.5, 192)-300
	Minimum		932 (9.5, 135)-300
	Maximum difference between each cylinder		196 (2.0, 28)
Valve timing	IN	Open BTDC	5°
		Close ABDC	51°
	EX	Open BBDC	53°
		Close ATDC	15°
Valve clearance		mm (in)	IN: 0: Maintenance-free
			EX: 0: Maintenance-free
Cylinder head			
Height		mm (in)	133.8—134.0 (5.268—5.276)
Distortion		mm (in)	0.15 (0.006) max.
Grinding		mm (in)	0.20 (0.008) max.
Cylinder head-to-HLA clearance		mm (in)	Standard: 0.025—0.066 (0.0010—0.0026)
			Maximum: 0.18 (0.0071)
Valve and valve guide			
Valve head diameter		mm (in)	IN: 30.9—31.1 (1.217—1.224)
			EX: 26.1—26.3 (1.028—1.035)
Valve head margin thickness		mm (in)	IN: 1.0 (0.039)
			EX: 1.0 (0.039)
Valve face angle			IN: 45°
			EX: 45°
Valve length mm (in)	IN	Standard	105.29 (4.1452)
		Minimum	104.79 (4.1256)
	EX	Standard	105.39 (4.1492)
		Minimum	104.89 (4.1295)
Valve stem diameter		mm (in)	IN: 5.970—5.985 (0.2350—0.2356)
			EX: 5.965—5.980 (0.2348—0.2354)
Guide inner diameter		mm (in)	6.01—6.03 (0.2366—0.2374)
Valve stem-to-guide clearance		mm (in)	IN: 0.025—0.060 (0.0010—0.0024)
			EX: 0.030—0.065 (0.0012—0.0026)
			Maximum: 0.20 (0.008)
Guide projection (Height "A")		mm (in)	IN: 16.8—17.4 (0.661—0.685)
			EX: 16.8—17.4 (0.661—0.685)
Valve seat			
Seat angle			IN: 45°
			EX: 45°

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Item / Engine			B6 DOHC
Seat contact width		mm (in)	0.8—1.4 (0.031—0.055)
Seat sinking	mm (in)	Standard	43.5 (1.713)
		Maximum	45.0 (1.772)
Valve spring			
Free length mm (in)	IN	Standard	48.0 (1.890)
		Minimum	47.0 (1.850)
	EX	Standard	48.3 (1.902)
		Minimum	47.3 (1.862)
Out-of-square	mm (in)	IN	1.68 (0.0661) max.
		EX	1.69 (0.0665) max.
Setting load/height	N (kg, lb)/mm (in)	IN	217—246 (22.1—25.1, 48.6—55.2)/40.0 (1.575)
		EX	174—196 (17.7—20.0, 38.9—44.0)/40.0 (1.575)
Camshaft			
Cam height mm (in)	IN	Standard	40.888 (1.6098)
		Minimum	40.688 (1.6019)
	EX	Standard	40.889 (1.6098)
		Minimum	40.689 (1.6019)
Journal diameter	mm (in)	Standard (No.1—No.5)	25.940—25.965 (1.0213—1.0222)
		Out-of-round	0.05 (0.002) max.
Camshaft bearing oil clearance	mm (in)	Standard (No.1—No.5)	0.035—0.081 (0.0014—0.0032)
		Maximum	0.15 (0.006)
Camshaft runout		mm (in)	0.03 (0.0012) max.
Camshaft end play	mm (in)	Standard	0.07—0.19 (0.0028—0.0075)
		Maximum	0.20 (0.008)
Cylinder block			
Height		mm (in)	221.5 (8.720)
Distortion		mm (in)	0.15 (0.006) max.
Grinding		mm (in)	0.20 (0.008) max.
Cylinder bore diameter mm (in)	Standard size		78.006—78.013 (3.0711—3.0714)
	0.25 (0.010) oversize		78.256—78.263 (3.0809—3.0812)
	0.50 (0.020) oversize		78.506—78.513 (3.0908—3.0911)
Cylinder bore taper and out-of-round		mm (in)	0.019 (0.0007) max.
Piston			
Piston diameter Measured at 90° to pin bore axis and 16.5mm (0.650 in) below oil ring groove mm (in)	Standard size		77.954—77.974 (3.0690—3.0698)
	0.25 (0.010) oversize		78.211—78.217 (3.0792—3.0794)
	0.50 (0.020) oversize		78.461—78.467 (3.0890—3.0892)
Piston-to-cylinder clearance	mm (in)	Standard	0.039—0.052 (0.0015—0.0020)
		Maximum	0.15 (0.006)
Piston ring			
Thickness	mm (in)	Top	1.465—1.480 (0.0577—0.0583)
		Second	1.47—1.49 (0.0579—0.0587)
End gap (Measured in cylinder)	mm (in)	Top	0.15—0.30 (0.006—0.012)
		Second	0.15—0.30 (0.006—0.012)
		Oil (rail)	0.20—0.70 (0.008—0.028)
		Maximum	1.0 (0.039)
Ring groove width in piston	mm (in)	Top	1.520—1.535 (0.0598—0.0604)
		Second	1.52—1.54 (0.0598—0.0606)
		Oil	4.02—4.04 (0.1583—0.1591)
Piston ring-to-ring groove clearance	mm (in)	Top	0.04—0.07 (0.0016—0.0028)
		Second	0.03—0.07 (0.0012—0.0028)
		Maximum	0.15 (0.006)
Piston pin			
Diameter		mm (in)	19.987—19.993 (0.7869—0.7871)
Piston-to-piston pin clearance		mm (in)	−0.005—0.013 (−0.0002—0.0005)
Connecting rod bush-to-piston pin clearance		mm (in)	0.010—0.027 (0.0004—0.0011)

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Item \ Engine			B6 DOHC
Connecting rod and connecting rod bearing			
Length (Center to center)		mm (in)	132.85—132.95 (5.230—5.234)
Bending		mm (in)	0.075 (0.0030) max./50 (1.97)
Small end bore (Bush inner diameter)		mm (in)	20.003—20.014 (0.7875—0.7880)
Big end bore		mm (in)	48.000—48.016 (1.8898—1.8904)
Big end width		mm (in)	21.838—21.890 (0.8598—0.8618)
Connecting rod side clearance		mm (in)	Standard: 0.110—0.262 (0.0043—0.0103)
			Maximum: 0.30 (0.012)
Crankshaft			
Crankshaft runout		mm (in)	0.04 (0.0016) max.
Main journal diameter	Standard size	mm (in)	Standard: 49.938—49.956 (1.9661—1.9668)
			Minimum: 49.904 (1.9647)
	0.25 (0.010) undersize		Standard: 49.704—49.708 (1.9568—1.9570)
			Minimum: 49.652 (1.9548)
	0.50 (0.020) undersize		Standard: 49.454—49.458 (1.9470—1.9472)
			Minimum: 49.402 (1.9450)
	0.75 (0.030) undersize		Standard: 49.204—49.208 (1.9372—1.9373)
			Minimum: 49.152 (1.9351)
Main journal taper and out-of-round		mm (in)	0.05 (0.0020) max.
Crankpin diameter	Standard size	mm (in)	Standard: 44.940—44.956 (1.7693—1.7699)
			Minimum: 44.908 (1.7680)
	0.25 (0.010) undersize		Standard: 44.690—44.706 (1.7594—1.7601)
			Minimum: 44.658 (1.7582)
	0.50 (0.020) undersize		Standard: 44.440—44.456 (1.7496—1.7502)
			Minimum: 44.408 (1.7483)
	0.75 (0.030) undersize		Standard: 44.190—44.206 (1.7398—1.7404)
			Minimum: 44.158 (1.7385)
Crankpin taper and out-of-round		mm (in)	0.05 (0.0020) max.
Main bearing			
Main journal bearing oil clearance		mm (in)	Standard: 0.018—0.036 (0.0007—0.0014)
			Maximum: 0.10 (0.004)
Available undersize bearing		mm (in)	0.25 (0.010), 0.50 (0.020), 0.75 (0.030)
Crankpin bearing			
Crankpin bearing oil clearance		mm (in)	Standard: 0.028—0.068 (0.0011—0.0027)
			Maximum: 0.10 (0.004)
Available undersize bearing		mm (in)	0.25 (0.010), 0.50 (0.020), 0.75 (0.030)
Thrust bearing			
Crankshaft end play		mm (in)	Standard: 0.080—0.282 (0.0031—0.0111)
			Maximum: 0.30 (0.012)
Bearing width	Standard size	mm (in)	2.500—2.550 (0.0984—0.1004)
	0.25 (0.010) oversize		2.625—2.675 (0.1033—0.1053)
	0.50 (0.020) oversize		2.750—2.800 (0.1083—0.1102)
	0.75 (0.030) oversize		2.875—2.925 (0.1132—0.1152)
Timing belt			
Belt deflection		mm (in)/98 N (10 kg, 22 lb)	9.0—11.5 (0.35—0.45)

D. LUBRICATION SYSTEM

Item \ Engine		B6 DOHC
Lubricating method		Force-fed
Oil pump		
Type		Trochoid gear
Relief pressure	kPa (kg/cm², psi)	343—441 (3.5—4.5, 50—64)
Oil pressure kPa (kg/cm², psi)	1,000 rpm	196—294 (2.0—3.0, 28—43)
	3,000 rpm	294—392 (3.0—4.0, 43—57)

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Item		Engine	B6 DOHC
Inner rotor tooth tip to outer rotor clearance mm (in)		Standard	0.02—0.16 (0.0008—0.0063)
		Maximum	0.20 (0.0079)
Outer rotor to body clearance mm (in)		Standard	0.09—0.18 (0.0035—0.0071)
		Maximum	0.22 (0.0087)
Side clearance mm (in)		Standard	0.03—0.11 (0.0012—0.0043)
		Maximum	0.14 (0.0055)
Oil filter			
Type			Full-flow, paper element
Relief pressure differential kPa (kg/cm², psi)			78—118 (0.8—1.2, 11—17)
Engine oil			
Capacity liters (US qt, Imp qt)		Total (dry engine)	3.6 (3.8, 3.2)
		Oil pan	3.2 (3.4, 2.8)
		Oil filter	0.17 (0.18, 0.15)
Grade			API Service SF or SG
Viscosity number	Above 30°C (86°F)		SAE 40
	0°C—40°C (32°F—104°F)		SAE 30
	−10°C—20°C (14°F—68°F)		SAE 20W-20
	Above −10°C (14°F)		SAE 20W-40 or 20W-50
	−25°C—30°C (−13°F—86°F)		SAE 10W-30
	Above −25°C (−13°F)		SAE 10W-40 or 10W-50
	Below 0°C (32°F)		SAE 5W-30
	Below −20°C (−4°F)		SAE 5W-20

E. COOLING SYSTEM

Item	Engine	B6 DOHC
Cooling method		Water-cooled, forced circulation
Water pump		
Type		Centrifugal, V-belt driven
Impeller diameter mm (in)		75 (2.95)
Number of impeller blades		6
Speed ratio		1 : 1.05
Water seal type		Unified mechanical seal
Thermostat		
Type		Wax
Opening temperature °C (°F)		80.5—83.5 (177—182)
Full-open temperature °C (°F)		95 (203)
Full-open lift mm (in)		8.5 (0.33) min.
Radiator		
Type		Corrugated fin
Cap valve opening pressure kPa (kg/cm², psi)		74—103 (0.75—1.05, 11—15)
Cooling circuit checking pressure kPa (kg/cm², psi)		103 (1.05, 15)
Cooling fan		
Type		Electric
Number of blades		5
Outer diameter mm (in)		320 (12.6)
Switching temperature OFF → ON °C (°F)		97 (207)
Capacity W-V		70-12
Current A		5.3—6.5
Coolant		
Capacity liters (US qt, Imp qt)		6.0 (6.3, 5.3)

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Item \ Engine		B6 DOHC		
	Coolant protection	Volume percentage %		Specific gravity at 20°C (68°F)
		Water	Coolant	
Antifreeze solution	Above −16°C (3°F)	65	35	1.054
	Above −28°C (−18°F)	55	45	1.066
	Above −40°C (−40°F)	45	55	1.078

F. FUEL AND EMISSION CONTROL SYSTEMS

Item			Specification
Idle speed	rpm		850 ± 50*
Ignition timing	BTDC		10° ± 1°*
Throttle body			
Type			Horizontal draft
Throat diameter	mm (in)		55 (2.2)
Dashpot			
Adjustment speed	rpm		2,500 ± 150
Airflow meter			
Resistance	Ω	E_2 ↔ Vs	Fully closed: 200—600
			Fully open: 20—1,000
		E_2 ↔ Vc	200—400
		E_2 ↔ THA_A (Intake air thermosensor)	−20°C (−4°F): 13,600—18,400
			20°C (68°F): 2,210—2,690
			60°C (140°F): 493—667
		E_1 ↔ Fc	Fully closed: ∞
			Fully open: 0
Fuel pump			
Type			Impeller (in-tank)
Output pressure	kPa (kg/cm², psi)		441—589 (4.5—6.0, 64—85)
Fuel filter			
Type		Low-pressure side	Nylon element
		High-pressure side	Paper element
Pressure regulator			
Type			Diaphragm
Regulating pressure	kPa (kg/cm², psi)		265—314 (2.7—3.2, 38—46)
Injector			
Type			High-ohmic
Type of drive			Voltage
Resistance	Ω		12—16 (at 20°C, 68°F)
ISC valve (Solenoid valve [Idle speed control])			
Solenoid resistance	Ω		11—13 (at 20°C, 68°F)
Circuit opening relay			
Resistance	Ω	STA — E_1	21—43
		B — Fc	109—226
		B — F_P	∞
Solenoid valve (Purge control)			
Solenoid resistance	Ω		23—27 (at 20°C, 68°F)
Crank angle sensor			
Type			Optical pickup
Water thermosensor			
Resistance	kΩ	−20°C (−4°F)	14.6—17.8
		20°C (68°F)	2.2—2.7
		80°C (176°F)	0.29—0.35
Air valve			
Opening temperature	°C (°F)		Below 40 (104)
Fuel tank			
Capacity	liters (US gal, Imp gal)		45 (11.9, 9.9)

*....TEN terminal in diagnosis connector grounded.

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Item	Specification
Air cleaner	
Element type	Oil permeated
Accelerator cable	
Free play mm (in)	1—3 (0.039—0.118)
Fuel	
Specification	Unleaded (RON 90 or higher)

G. ENGINE ELECTRICAL SYSTEM

Item \ Engine model			B6 DOHC
Battery	Voltage V		12, Negative ground
	Type and capacity (5-hour rate)		S46A24L(S) (32Ah) Maintenance-free
Dark current* mA			20.0
Alternator	Type		A.C.
	Output V-A		12-60
	Regulator type		*Transistorized (built-in IC regulator)*
	Regulated voltage		14.1—14.7
	Brush length mm (in)	Standard	21.5 (0.85)
		Minimum	8 (0.31)
	Drive belt tension mm (in)	New	8—9 (0.31—0.35)
		Used	9—10 (0.35—0.39)
Starter	Type		Conventional
	Output V-kW		12-0.95 (Others)
	Brush length mm (in)	Standard	17.0 (0.67)
		Minimum	11.5 (0.45)
Ignition system	Type		Electronic spark advance (ESA)
	Spark advance control		Engine control unit controls sparks advance
Ignition timing BTDC			10° ± 1° (Test connector grounded)
Ignition coil	Type		Molded
	Primary coil winding kΩ		0.78—0.94
	Secondary coil winding kΩ		11.2—15.2
Spark plug	Type		NGK: BKR5E-11, BKR6E-11, BKR7E-11 Nippon Denso: K16PR-U11, K20PR-U11, K22PR-U11
	Plug gap mm (in)		1.0—1.1 (0.039—0.043)
	Firing order		1—3—4—2

* Dark current is the constant flow of current while the ignition switch is OFF.
(i.e. engine control unit, audio etc.)

H. CLUTCH

Item \ Engine model		B6 DOHC
Clutch control		Hydraulic
Clutch pedal		
Type		Suspended
Pedal ratio		6.13
Full stroke mm (in)		120 (4.72)
Height (with carpet) mm (in)		175—185 (6.89—7.28)
Free play mm (in)		0.6—3.1 (0.02—0.12)
Distance to carpet when clutch fully disengaged mm (in)	Minimum	68 (2.68)
Flywheel		
Runout limit mm (in)		0.2 (0.008)
Clutch disc		
Type		Single dry plate

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Item / Engine model			B6 DOHC
Runout limit		mm (in)	0.7 (0.028)
Wear limit		mm (in)	0.3 (0.012) from rivet head
Outer diameter		mm (in)	200 (7.87)
[illegible]		mm (in)	130 (5.12)
Facing thickness mm (in)	Flywheel side		3.5 (0.14)
	Pressure plate side		3.5 (0.14)
Clutch cover			
Type			Diaphragm spring
Set load		N (kg, lb)	4,022 (410, 902)

J. MANUAL TRANSMISSION

Item / Transmission model			M-type (M5M-D)
Gear ratio	1st		3.136
	2nd		1.888
	3rd		1.330
	4th		1.000
	5th		0.814
	Reverse		3.758
Oil capacity		liters (US qt, Imp qt)	2.0 (2.1, 1.8)
Mainshaft	Runout mm (in)	Maximun	0.03 (0.0012)
	Clearance between mainshaft and gear (or bush) mm (in)	Wear limit	0.15 (0.006)
Reverse idle gear	Clearance between reverse idle gear bushing and shaft mm (in)	Wear limit	0.15 (0.006)
Shift fork and rod	Clearance between shift fork and clutch sleeve mm (in)	Wear limit	0.5 (0.020)
	Clearance between shift rod gate and control lever mm (in)	Wear limit	0.8 (0.031)
Synchronizer ring	Clearance between synchronizer ring and side of gear when fitted mm (in)	Standard	1.5 (0.059)
		Wear limit	0.8 (0.031)
Shift rod (5th/Reverse) spring	Free length	mm (in)	75 (2.953)
Detent ball spring (1st/2nd)	Free length	mm (in)	22.5 (0.886)
Detent ball spring (3rd/4th)	Free length	mm (in)	22.5 (0.886)
Detent ball spring (5th/Reverse)	Free length	mm (in)	17.0 (0.669)
Lubricant	Above 10°C (50°F)		API Service GL-4 or GL-5 SAE 80W-90
	All seasons		API Service GL-4 or GL-5 SAE 75W-90

L. PROPELLER SHAFT

Item		Specification
Max. permissible run-out	mm (in)	0.4 (0.016)

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M. FRONT AND REAR AXLES

Item \ Transmission model				M5M-D	
Front axle	Type			Double-wishbone	
	Bearing			Angular ball bearing	
	Wheel bearing play mm (in)		Maximum	0.05 (0.002)	
Rear axle	Type			Double-wishbone	
	Bearing			Angular ball bearing	
	Wheel bearing play mm (in)		Maximum	0.05 (0.002)	
Differential	Type			Standard	Viscous L.S.D.
	Reduction gear			Hypoid gear	
	Reduction ratio			4.300	
	Differential gear			Straight-bevel gear	
	Ring gear size mm (in)			162.16 (6.38)	
	Oil	Grade		API service GL-5	
		Viscosity		Above −18°C (0°F): SAE 90 Below −18°C (0°F): SAE 80W	
		Capacity liters (Us qt, Imp qt)		0.65 (0.69, 0.57)	
	Drive pinion preload (without oil seal) N·m (cm-kg, in-lb)			0.3—0.7 (3—7, 2.6—6.1)	
	Backlash mm (in)	Side gear and pinion gear		0—0.1 (0—0.004)	
		Final gear		0.09—0.11 (0.0035—0.0043)	
	Length (Pilot section to pilot section) mm (in)			150.137—150.200 (5.9105—5.9130)	

Viscous L.S.D.: Viscous Limited Slip Differential

N. STEERING SYSTEM

Item \ Type		Manual steering	Power steering
Steering wheel			
Outer diameter	mm (in)	370 (14.6)	
Free play	mm (in)	0—30 (0—1.18)	
Wheel effort	N (kg, lb)	4.9—29.4 (0.5—3.0, 1.1—6.6)	23.5—35.3 (2.4—3.6, 5.3—8.0)
Lock-to-lock	turns	3.36	2.8
Steering Shaft			
Shaft type		Collapsible, non-tilt	
Joint type		2-cross joint	
Power steering system			
Power assist type		Engine speed sensing	
Gear type		Rack-and-pinion	
Gear ratio		∞ (infinite)	
Rack stroke	mm (in)	121.0 (4.76)	
Power steering fluid		ATF DEXRON-II or M-III	
Fluid capacity	liter (Us qt, Imp qt)	0.8 (0.85, 0.70)	
Fluid pressure	kPa (kg/cm^2, psi)	7,603—8,339 (77.5—85.0, 1,102—1,209)	

P. BRAKING SYSTEM

Item			Specifications
Brake pedal	Height (with carpet)	mm (in)	171—181 (6.73—7.13)
	Free play	mm (in)	4—7 (0.16—0.28)
	Reserve travel (without carpet, clearance when pedal is depressed at 589 N (60 kg, 132 lb))	mm (in)	95 (3.74)
Master cylinder	Type		Tandem
	Bore	mm (in)	22.22 (0.87)
	Fluid type		SAEJ1703 or FMVSS116, DOT-3

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Item			Specifications
Front brake (Disc)	Type		Disc
	Thickness of pad mm (in)	Standard	9.5 (0.37)
		Limit	1.0 (0.04)
	Thickness of disc plate mm (in)	Standard	18.0 (0.71)
		Limit	16.0 (0.63)
	Disc plate runout mm (in)		0.1 (0.004) max.
	Wheel cylinder bore mm (in)		51.1 (2.01)
Rear brake (Disc)	Type		DISC
	Thickness of pad mm (in)	Standard	8.0 (0.31)
		Limit	1.0 (0.04)
	Thickness of disc plate mm (in)	Standard	9 (0.35)
		Limit	7 (0.28)
	Wheel cylinder bore mm (in)		31.75 (1.25)
Parking brake	Lever notches [Pulled at 98 N (10 kg, 22 lb)]		5—7
Power brake unit	Type		Single diaphragm
	Diameter mm (in)		214 (8.0)
	Push rod-to-piston clearance mm (in)		When vacuum applied to the unit is approx. 500 mmHg (19.7 inHg) 0.1—0.3mm (0.004—0.012 in)
	Fluid pressure per treading force kPa (kg/cm^2, psi)/N (kg, lb)		1,079—1,177 (11—12, 156—171)/196 (20, 44) at 0 mmHg (0 inHg) min. 5,199—5,494 (53—56, 754—796)/196 (20, 44) at 500 mmHg (19.7 inHg) min.
Rear wheel hydraulic control system	Type		PBV
	Bend portion (Rear brake pressure) kPa (kg/cm^2, psi)		2,943 (30, 427)

Q. WHEELS AND TIRES

Item \ Type			Standard	Temporary spare
Wheel	Size		14 x 5 1/2-JJ	14 x 4T
	Offset mm (in)		45 (1.77)	
	Pitch circle diameter mm (in)		100 (3.94)	
	Material		Steel or aluminum alloy	Steel
Tire	Size		185/60R14 82H	T115/70D14
	Air pressure kPa (kg/cm^2, psi)		177 (1.8, 26)	412 (4.2, 60)
Wheel and tire	Runout limit mm (in)	Horizontal	2.0 (0.079)	
		Vertical	1.5 (0.059)	
	Maximum unbalance (at rim edge) g (oz)		10 (0.35)	

R. SUSPENSION

Item			Specifications
Front suspension			
Type			Double-wishbone
Stabilizer	Type		Torsion bar
	Diameter mm (in)		19 (0.75)
Shock absorbers			Cylindrical double-acting, low-pressure gas charged
Coil springs	Identification color		Red
	Wire diameter mm (in)		10.8 (0.43)
	Coil inner diameter mm (in)		83 (3.27)
	Free length mm (in)		282.5 (11.12)
	Coil number		5.91

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Item			Specifications
Rear suspension			
Type			Double-wishbone
Stabilizer	Type		Torsion bar
	Diameter	mm (in)	12 (0.47)
Shock absorbers			Cylindrical double-acting, low-pressure gas charged
Coil springs	Identification color		Blue
	Wire diameter	mm (in)	10.1 (0.40)
	Coil inner diameter	mm (in)	83 (3.27)
	Free length	mm (in)	339.5 (13.37)
	Coil number		7.68
Wheel alignment			
Front wheel alignment (Unladed*1)	Total toe-in	mm (in)	3 ± 3 (0.12 ± 0.12)
		degree	0°18' ± 18'
	Maximum steering angle	Inner	37°23' ± 2°
		Outer	32°32' ± 2°
	Camber angle		0°24' ± 45'*2
	Caster angle		4°30' ± 45'*3
	King pin angle		11°20'
Rear wheel alignment (Unladed*1)	Total toe-in	mm (in)	3 ± 3 (0.12 ± 0.12)
		degree	0°18' ± 18'
	Camber angle		−0°43' ± 30'*2

*1 Fuel tank full; radiator coolant and engine oil at specified level, and spare tire, jack, and tools in designated position.
*2 Difference between left and right must not exceed 1°.
*3 Difference between left and right must not exceed 1°30'.

T. BODY ELECTRICAL SYSTEM

Item	Wattage (Bulb trade number)
Instrument cluster lamps	
Beam	3.4
Turn (LH and RH)	3.4
Illumination	3.4
Brake	1.4
Charge	1.4
Hazard	1.4
Rear fog	1.4
Retractor	1.4
Exterior lights	
Head lights	60/55
Front turn signal	21
Side turn signal lights	5
License plate lights	5
Rear turn signal lights	21
Stop/taillights	21/5
Back-up lights	21
High-mount stoplight	18.4
Interior lamps	5
Illumination lamps	
Ash tray	3.4
Heater control switch panel	1.4
Hazard switch	1.4

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STANDARD BOLT AND NUT TIGHTENING TORQUE

Diameter mm (in)	Pitch mm (in)	4T			6T			8T		
		N·m	m-kg	ft-lb	N·m	m-kg	ft-lb	N·m	m-kg	ft-lb
6 (0.236)	1 (0.039)	4.2—6.2	0.43—0.63	3.1—4.6	6.9—9.8	0.7—1.0	5.0—7.2	7.8—11.8	0.8—1.2	5.8—8.8
8 (0.315)	1.25 (0.049)	9.8—14.7	1.0—1.5	7.2—10.8	16—23	1.6—2.3	12—17	18—26	1.8—2.7	13—20
10 (0.394)	1.25 (0.049)	20—28	2.0—2.9	14—21	31—46	3.2—4.7	23—34	36—54	3.7—5.5	27—40
12 (0.472)	1.5 (0.059)	34—50	3.5—5.1	25—37	55—80	5.6—8.2	41—59	63—93	6.4—9.5	46—69
14 (0.551)	1.5 (0.059)	—	—	—	75—103	7.7—10.5	56—76	102—137	10—14	75—101
16 (0.630)	1.5 (0.059)	—	—	—	116—157	12—16	85—116	156—211	16—22	115—156
18 (0.709)	1.5 (0.059)	—	—	—	167—225	17—23	123—166	221—299	23—31	163—221
20 (0.787)	1.5 (0.059)	—	—	—	231—314	24—32	171—231	308—417	31—43	227—307
22 (0.866)	1.5 (0.059)	—	—	—	314—423	32—43	231—312	417—564	43—58	307—416
24 (0.945)	1.5 (0.059)	—	—	—	475—546	41—56	298—403	536—726	55—74	396—536

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SPECIAL TOOLS

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DIFFERENTIAL ..... ST– 5
FRONT AND REAR AXLES ..... ST– 6
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FRONT AND REAR SUSPENSIONS ..... ST– 8
CHECKERS AND OTHER EQUIPMENT ..... ST– 9

95ASTX-001

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GENERAL INFORMATION

The letters A and B in the priority column indicate the degree of importance of each tool.
A.....Indispensable
The tools ranked A in this list are indispensable for performing operations satisfactorily, easily, safely, and efficiently. It is, therefore, advisable that all service shops have these tools.
B.....Selective
The tools ranked B are not as necessary as tools ranked A, but all service shops should have them to perform repairs more easily and efficiently.

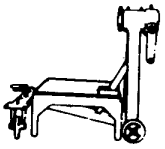
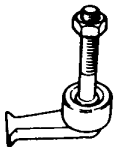
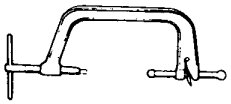
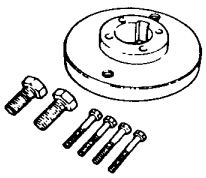
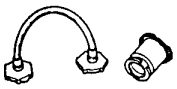
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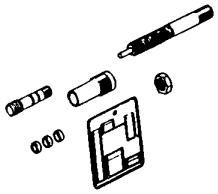
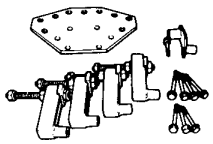
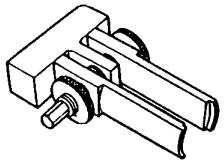
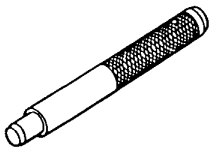
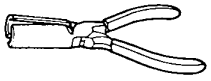
- **When ordering tool sets that consist of several tools, check the List in the Parts Catalogue to make sure that some tools are not duplicated in other sets you may already have. If they are, instead of ordering the set, order only those new tools that are needed.**

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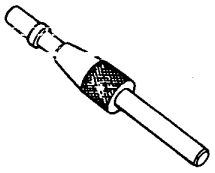
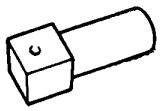
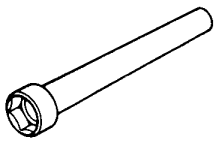
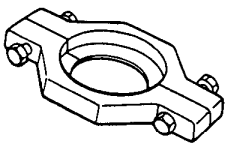
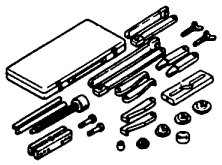
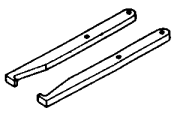
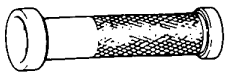
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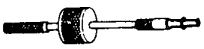
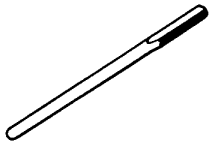
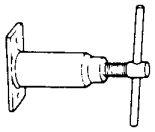
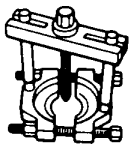
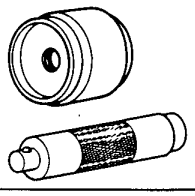
TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 0107 680A Engine stand	A	
49 E301 060 Brake, ring gear	A	
49 0636 100A Arm, valve spring lifter	A	
49 B011 102 Lock tool, crankshaft	A	
49 S120 710 Holder, coupling flange	A	
49 9200 145 Adapter set, radiater cap tester	A	
49 G014 001 Wrench, oil filtter	A	

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 L012 0A0 Installer set, valve seal & valve guide	A	
49 L010 1A0 Hanger set, engine stand	A	
49 B012 0A2 Pivot	A	
49 B012 005 Remover & installer, valve guide	A	
49 0221 061A Remover & installer, piston pin	B	
49 S120 170 Remover, valve seal	A	
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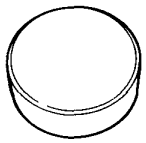
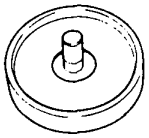
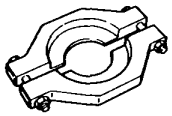
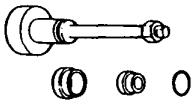
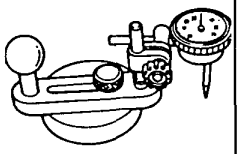
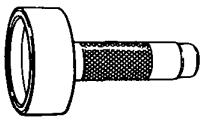
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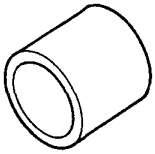
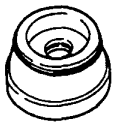
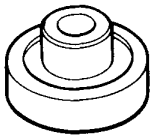
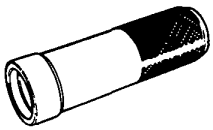
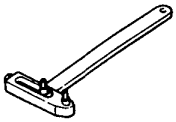
TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 S501 310 Centering tool, clutch disc	A	
49 0259 440 Holder, mainshaft	A	
49 1243 465A Wrench, main-shaft locknut	A	
49 0636 145 Puller, fan pulley boss	A	
49 0839 425C Puller set, bearing	A	
49 H017 101 Hook	A	
49 0180 321A Installer, main drive gear bearing	A	

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 1285 071 Puller, bearing	A	
49 0187 451A Guide, interlock pin assembly	B	
49 0862 350 Guide, shift fork assembly	B	
49 0500 330 Installer, bearing	A	
49 0305 430 Pusher, main drive shaft	A	
49 0710 520 Puller, bearing	A	
49 B025 0A0 Installer, dust seal	A	

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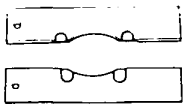
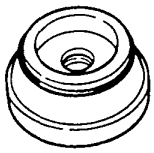
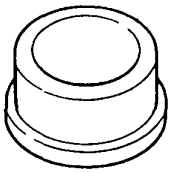
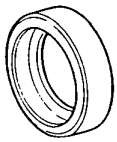
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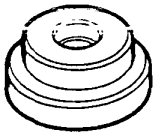
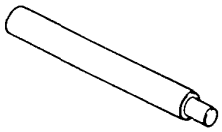
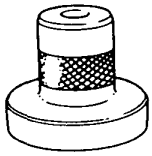
TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 N027 001 Gauge block **NEW SST**	A	
49 N034 213 Installer, rubber bush **NEW SST**	A	
49 M005 561 Hanger, diff. carrier	A	
49 H027 002 Remover, bearing	A	
49 8531 565 Pinion model	A	
49 0727 570 Gauge body, pinion height	A	
49 B001 795 Installer, oil seal	A	

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 U027 003 Installer, oil seal	A	
49 F027 005 Attachment ϕ62	A	
49 H033 101 Remover, bearing	A	
49 F401 331 Body	A	
49 F401 336B Attachment B	A	
49 F401 337A Attachment C	A	
49 0259 720 Adjustment wrench, side bearing	B	

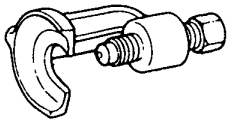
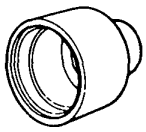
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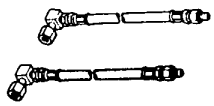
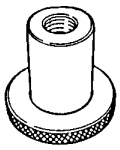
FRONT AND REAR AXLES

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 F026 102 Puller, wheel hub	A	
49 F027 007 Attachment ϕ72	A	
49 F027 009 Attachment ϕ68 & ϕ77	A	
49 G033 107 Installer, dust cover	A	

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 G030 727 Attachment A	A	
49 G033 102 Handle	A	
49 V001 795 Installer, oil seal	A	
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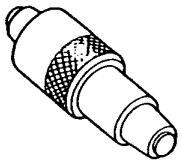
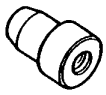
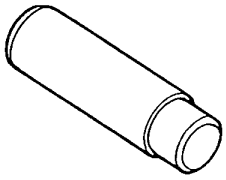
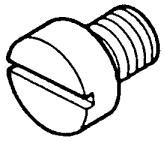
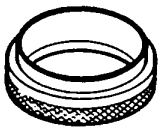
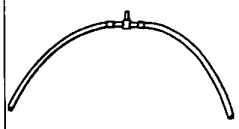
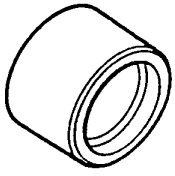
STEERING SYSTEM

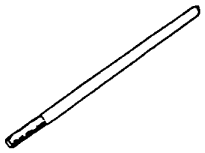
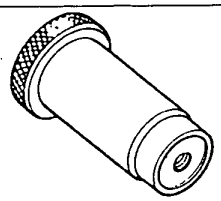
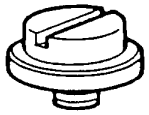
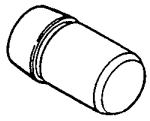
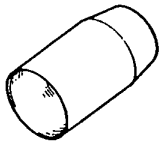
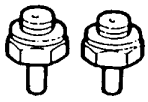
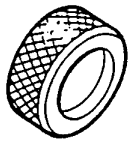
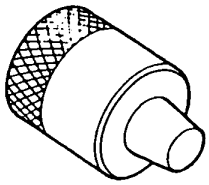
TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 0118 850C Puller, ball joint	B	
49 1243 785 Installer, dust boot	A	
49 B032 302 Adapter	A	

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 1232 670A Gauge set, power steering	A	
49 H002 671 Adapter	A	
49 B001 605 Caster camber gauge adapter	A	

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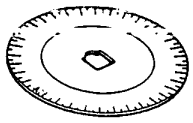
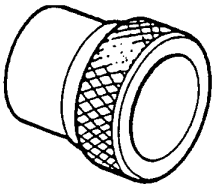
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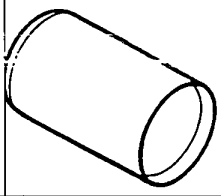
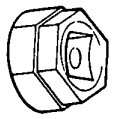
TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 D032 304 Installer, oil seal & bearing	A	
49 N032 303 Remover body, backup ring & oil seal **NEW SST**	A	
49 D032 307 Remover, oil seal & bearing	A	
49 D032 303 Attachment	A	
49 N032 301 Protector body, oil seal **NEW SST**	A	
49 N032 305 Protector, backup ring & oil seal **NEW SST**	A	
49 G032 317 Hose	A	
49 D032 306 Support block	A	

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 F032 303 Handle	A	
49 D032 301 Installer body, oil seal & bearing	A	
49 D032 302 Attachment	A	
49 N032 302 Guide, oil seal **NEW SST**	A	
49 N032 304 Protector, oil seal **NEW SST**	A	
49 G032 319 Adapter	A	
49 D032 313 Seal ring former	A	
49 D032 305 Remover, oil seal & bearing	A	

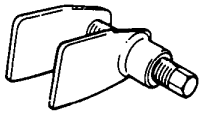
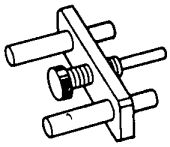
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TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 D032 316 Protractor	A	
49 D032 315 Seal ring former & guide	A	

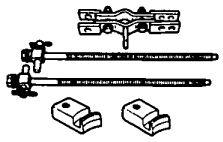
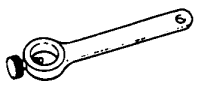
TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 D032 310 Protector, pinion shaft	A	
49 H032 321A Hexagon wrench	A	

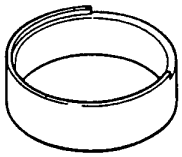
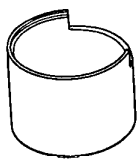
BRAKING SYSTEM

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 0221 600C Expand tool, disc brake	B	
49 F043 001 Adjust gauge	A	

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 0259 770B Wrench, flare nut	A	
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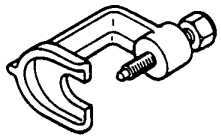
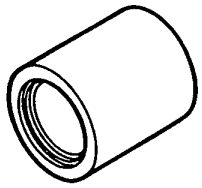
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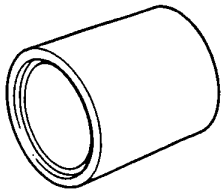
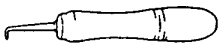
TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 G034 1A0 Compressor, coil spring	A	
49 0180 510B Preload, attachment	B	

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 N028 201 Support block **NEW SST**	B	
49 B034 201 Support block	B	

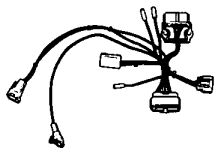
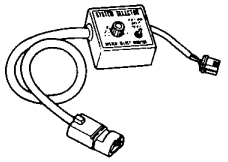
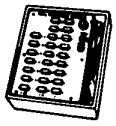
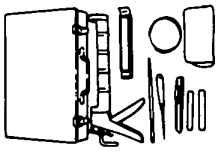
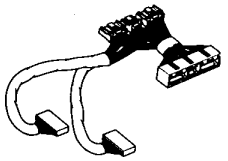
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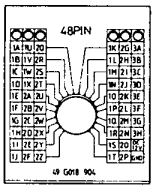
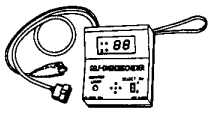
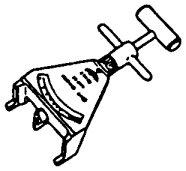
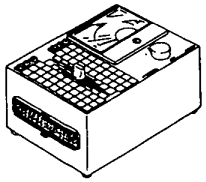
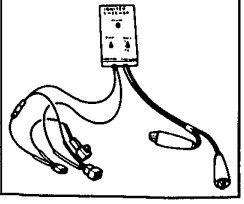
FRONT AND REAR SUSPENSIONS (CONT'D)

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 0727 575 Puller, ball joint	B	
49 H028 301 Installer, dust boot	A	

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 N034 201 Installer, dust boot **NEW SST**	A	
49 0208 701A Air out tool, boot	B	

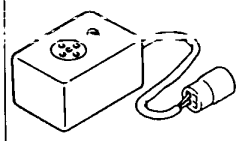
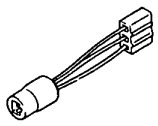
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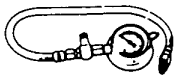
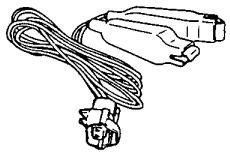
TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 N018 001 Adapter harness (Igniter checker)	A	
49 B019 9A0 System selector	A	
49 0839 285 Checker, fuel and thermometer	A	
49 0305 870A Tool set, window	A	
49 G018 903 Adapter harness (Engine Signal Monitor)	A	

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 G018 904 Sheet (Engine Signal Monitor)	A	
49 H018 9A1 Self-Diagnosis Checker	A	
49 9200 020 Tension gauge, V-ribbed belt	B	
49 9200 162 Engine Signal Monitor	A	
49 F018 002 Igniter Checker	A	

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CHECKERS AND OTHER EQUIPMENT (CONT'D)

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 9200 165 Tester, throttle sensor	A	
49 9200 166 Adapter, throttle sensor	A	

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 0187 280 Gauge, oil pressure	B	
49 L018 901 Injector checker	A	

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