SAFETY INFORMATION

LUBRICANTS

Avoid prolonged and repeated contact with petroleum-based oils. Used oil may irritate the skin, and can cause skin cancer and other skin disorders.
Wash thoroughly after working with oil. We recommend water-soluble hand cleaners. Do not use kerosene, gasoline, or any other solvent to remove oil from your skin.
If repeated or prolonged contact with oil is necessary, wear protective clothing. Soiled clothing, particularly those soiled with used oils and greases containing lead, should be cleaned at regular intervals.

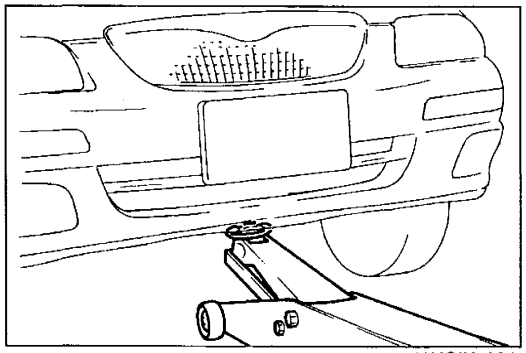
JACKING POSITIONS

Warning

- **Improperly jacking a vehicle is dangerous. The vehicle can slip off the jack and cause serious injury. Use only the correct front and rear jacking positions and block the wheels.**

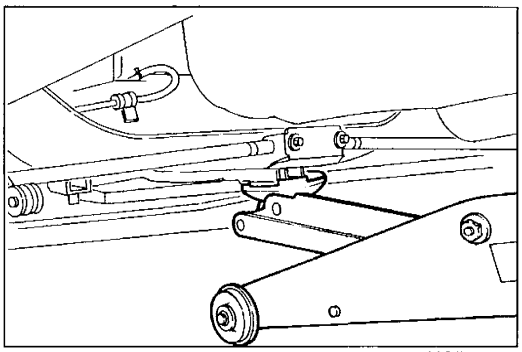
Use safety stands to support the vehicle after it has been lifted.

Front
At the center of the crossmember



46UGIX–004

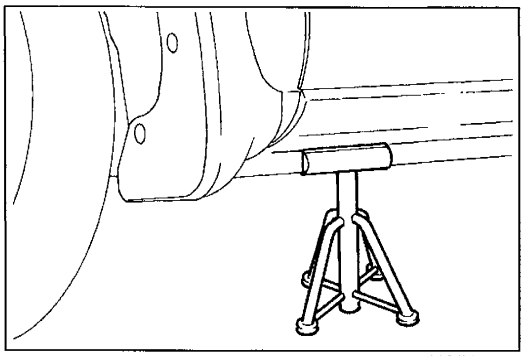
Rear
At the center of the crossmember



46UGIX–005

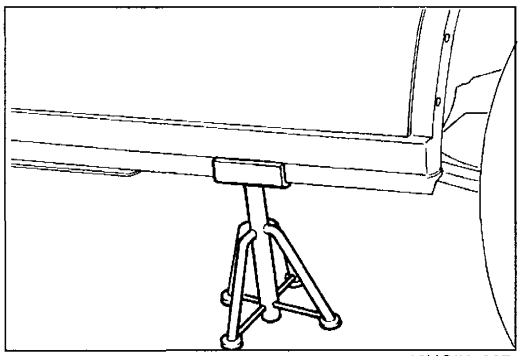
SAFETY STAND POSITIONS

Front
Both sides of the vehicle



46UGIX–006

Rear
Both sides of the vehicle

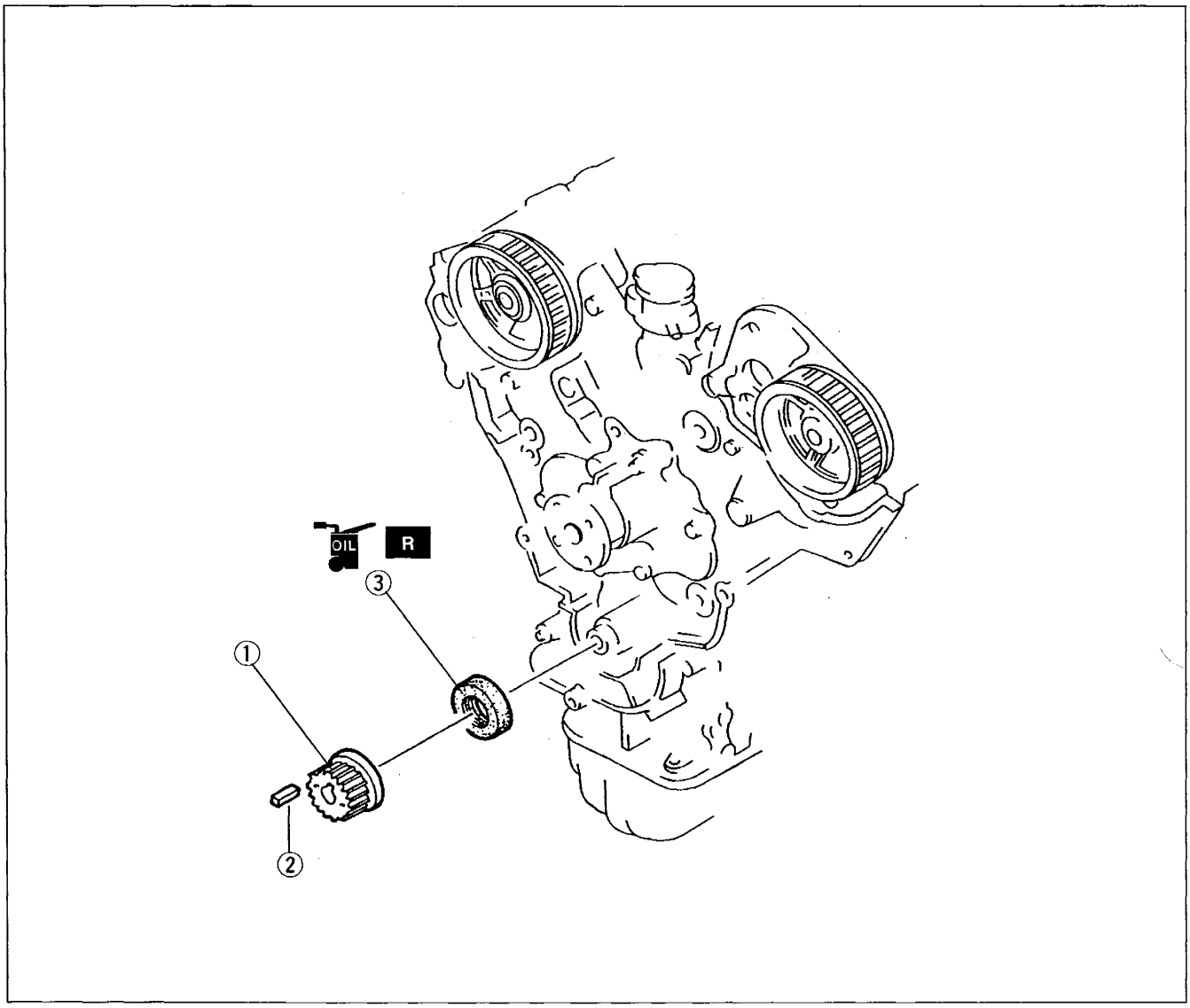


46UGIX–007

FRONT OIL SEAL

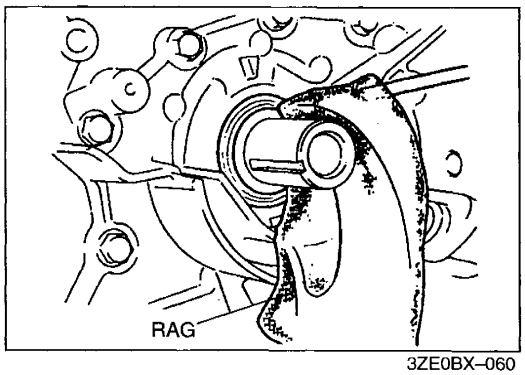
Replacement

1. Disconnect the negative battery cable.
2. Remove the timing belt. (Refer to page B1–6.)
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**.



3ZU0B1–025

1. Timing belt pulley
2. Key
3. Oil seal
   Removal Note ..... below
   Installation Note ..... page B1–23

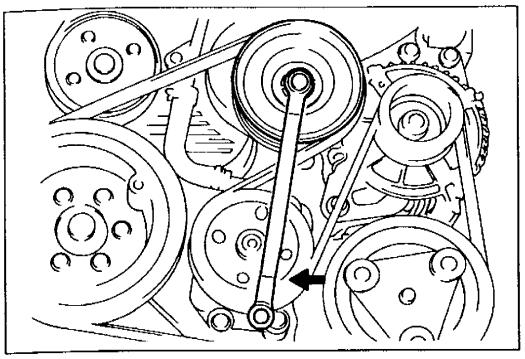


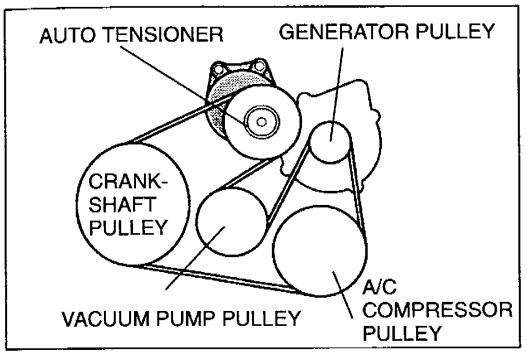
3ZE0BX–060

Removal Note

Oil seal

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



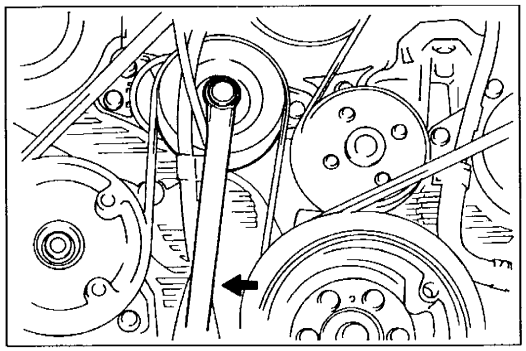


Replacement
Generator drive belt

1. Remove the splash shield (RH) and dust cover. (Refer to page B2–9.)
2. Set the wrench on the tensioner pulley lock bolt as shown.

Caution
- **Do not apply torque over 47 N·m {4.8 kgf·m, 35 ft·lbf} to the lock bolt. It can damage the tensioner.**

3. Using a wrench, turn the tensioner pulley lock bolt clockwise to relieve tension to the drive belt.
4. Remove the drive belt.
5. Reinstall the drive belt or install a new drive belt.
6. Check that the drive belt auto tensioner indicator mark is not exceeding the limit. (Refer to page B2–2.) If exceeded, replace the drive belt.
7. Install the splash shield (RH) and dust cover. (Refer to page B2–9.)

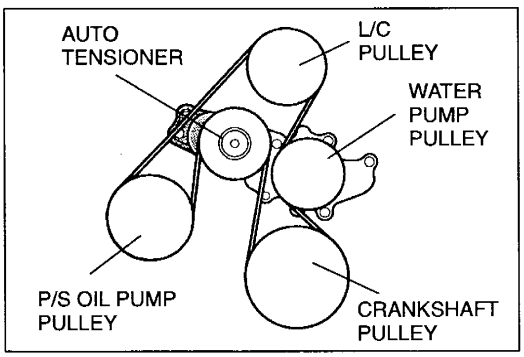


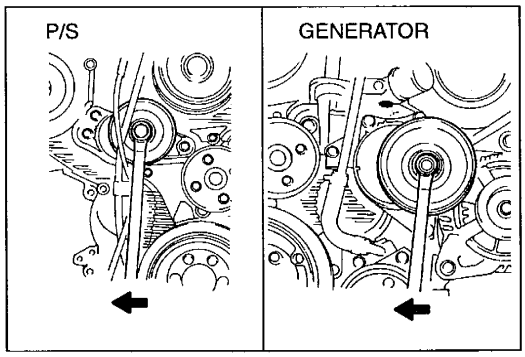
P/S oil pump drive belt

1. Remove the generator drive belt. (Refer to above.)
2. Set the wrench on the tensioner pulley lock bolt as shown.

Caution
- **Do not apply torque over 47 N·m {4.8 kgf·m, 35 ft·lbf} to the lock bolt. It can damage the tensioner.**

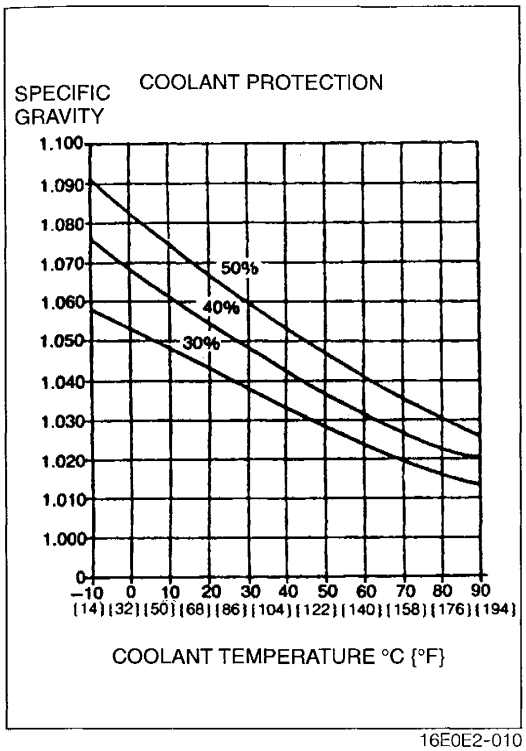
3. Using a wrench, turn the tensioner pulley lock bolt clockwise to relieve tension to the drive belt.
4. Remove the drive belt.
5. Reinstall the drive belt or install a new drive belt.
6. Check that the drive belt auto tensioner indicator mark is not exceeding the limit. (Refer to page B2–2.) If exceeded, replace the drive belt.
7. Install the generator drive belt. (Refer to above.)





Drive belt auto tensioner
Inspection

1. Remove the drive belts. (Refer to above.)
2. Verify that the drive belt auto tensioner moves smoothly in the operational direction. Replace the drive belt auto tensioner if necessary. (Refer to page B2–9.)
3. Turn the drive belt auto tensioner pulley by hand and verify that it rotates smoothly. Replace the drive belt auto tensioner if necessary. (Refer to page B2–9.)
4. Install the drive belts. (Refer to above.)



16E0E2-010

Coolant Protection

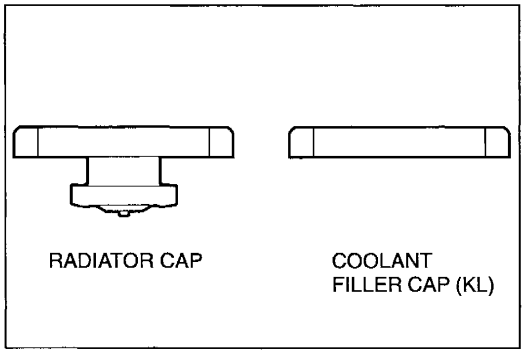
Caution

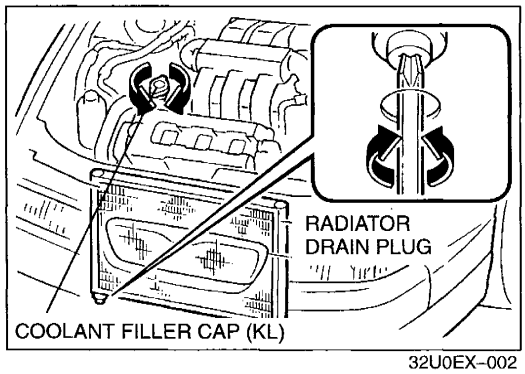
- **The engine has aluminum parts that can be damaged by alcohol or methanol antifreeze. Do not use alcohol or methanol in the cooling system. Use only ethylene-glycol-based coolant.**
- **Use only soft (demineralized) water in the coolant mixture. Water that contains minerals will cut down on the coolant's effectiveness.**

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.
3. If the coolant protection is not proper, add water or coolant if necessary.

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





32U0EX-002

REPLACEMENT

Draining

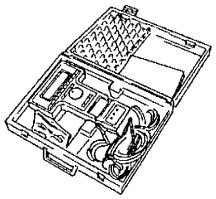
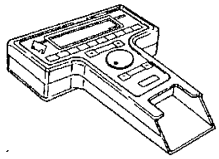
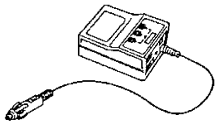
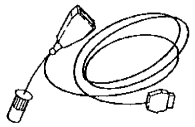
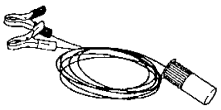
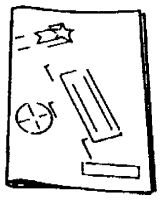
Warning

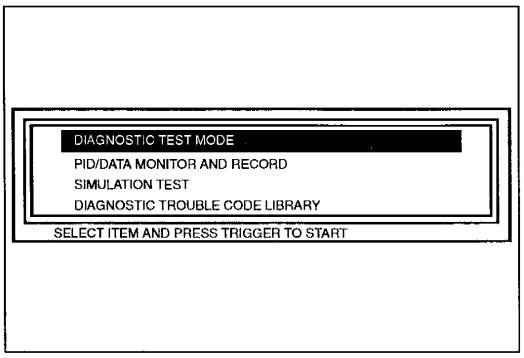
- **Removing the radiator cap or the coolant filler cap while the engine is running, or when the engine and radiator are hot is dangerous. Scalding coolant and steam may shoot out and cause serious injury. It can also damage the engine and cooling system.**
- **Turn off the engine and wait until it is cool. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise to the first stop. Step back while the pressure escapes.**
- **When you're sure all the pressure is gone, press down on the cap—still using a cloth—turn it, and remove it.**

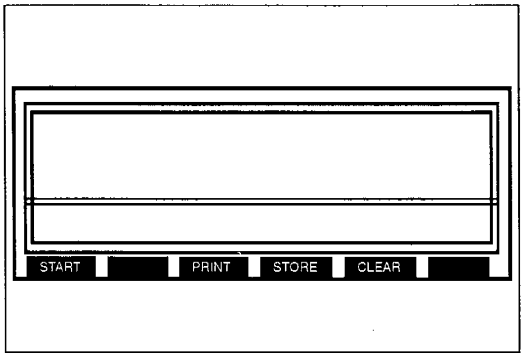
1. Remove the coolant filler cap (KL) and radiator cap and loosen the radiator drain plug.
2. Drain the coolant into a container.

ON-BOARD DIAGNOSTIC SYSTEM

PREPARATION
SST

49 T088 0A0 NGS set 	For diagnosis of PCM and input/output systems	49 T088 001 Control Unit (Part of 49 T088 0A0) 	For diagnosis of PCM and input/output systems
49 T088 002 Vehicle Interface Module (Part of 49 T088 0A0) 	For diagnosis of PCM and input/output systems	49 T088 004 NGS OBDII Adapter (Part of 49 T088 0A0) 	For diagnosis of PCM and input/output systems
49 T088 006 Battery Hookup Adapter (Part of 49 T088 0A0) 	For diagnosis of PCM and input/output systems	49 T088 008A Instruction Manual 	For diagnosis of PCM and input/output systems
49 T088 010B Program Card 	For diagnosis of PCM and input/output systems	—	—





DIAGNOSTIC TROUBLE CODE NUMBER
Inspection

1. Connect the **SSTs** (NGS) to the data link connector 2. (Refer to page F1–59.)
2. Refer to the manufacturer-provided instruction manual for the NGS operation.
3. Select "DIAGNOSTIC TEST MODE" function and press trigger.
4. When "NO CODES RECEIVED/SYSTEM PASSED" is displayed, all systems monitord are judged OK.
5. When any of the diagnostic trouble codes is displayed, carry out troubleshooting according to the code. (Refer to page F1–76.)
6. When "LINK MONITOR ERROR" is displayed, check connection of the NGS.
7. After all problems have been repaired, carry out "After Repair Procedure." (Refer to below.)

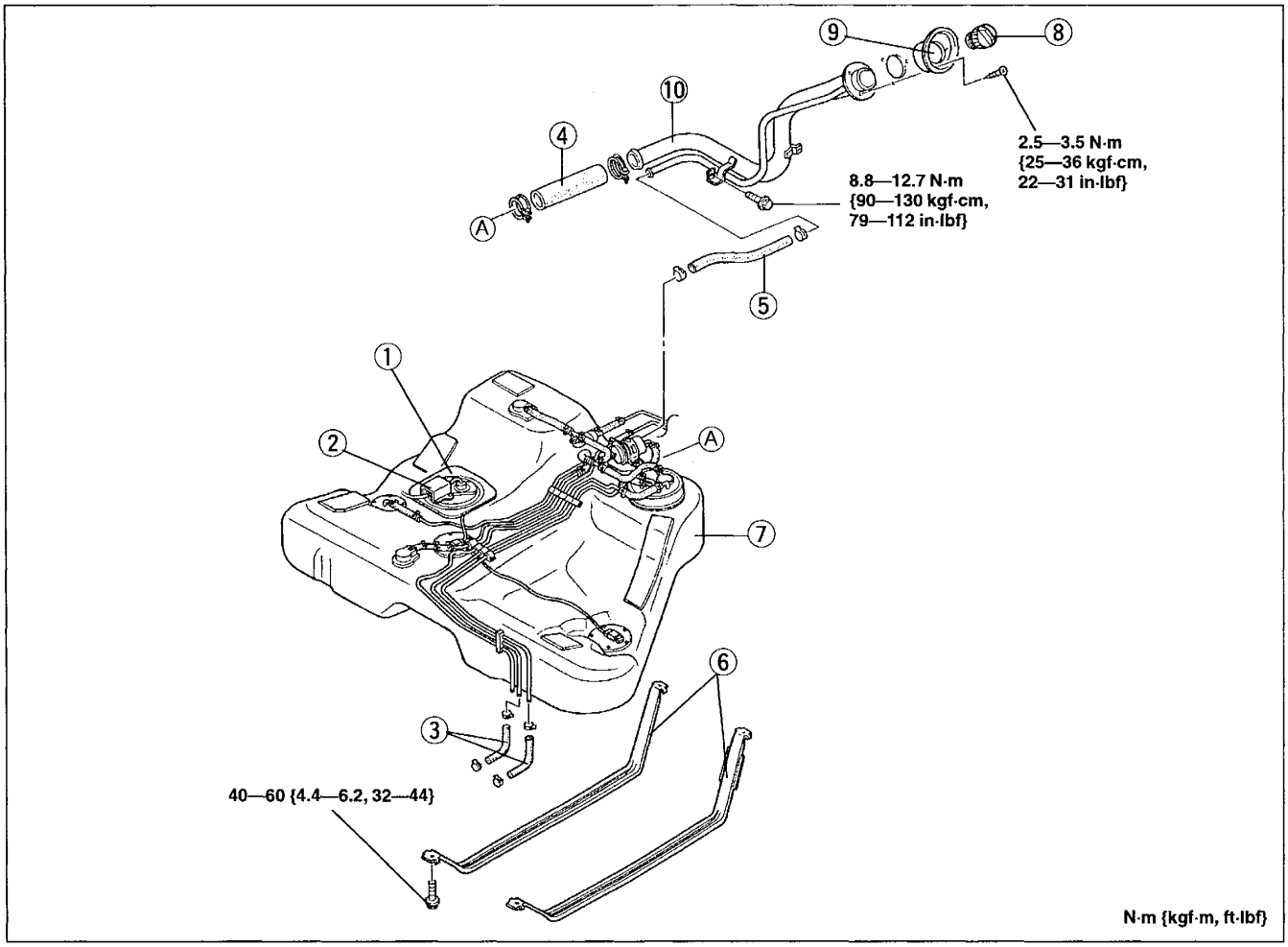
After Repair Procedure

1. After repairs, connect the NGS to the data link connector 2.
2. Select "CLEAR" function and erase diagnostic trouble codes from the NGS memory.
3. Perform diagnostic trouble code inspection again and verify that no diagnostic trouble codes are displayed.

FUEL TANK ASSEMBLY
Removal / Inspection / Installation

Warning
- **Fuel vapor is hazardous. It can very easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.**
- **Fuel line spills and leaks are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "fuel Line Safety Procedures" on page F2–15.**
- **Repairing a fuel tank that has not been properly steam cleaned can be dangerous. Explosion or fire may cause death or serious injury. Always properly steam clean a fuel tank before repairing it.**

1. Disconnect the negative battery cable.
2. Remove the rear seat cushion. (Refer to section S.)
3. Disconnect the fuel pump connector.
4. Suck up the fuel from the fuel tank, referring to **Removal note**.
5. Remove in the order shown in the figure.
6. Inspect all parts and repair or replace as necessary.
7. Install in the reverse order of removal.



3ZE0FX–034

1. Fuel pump cover
2. Fuel pump connector
3. Fuel hose
4. Fuel filler hose
5. Breather hose
6. Fuel tank strap
7. Fuel tank
   Removal note ..... page F2–19
8. Filler cap
9. Reinforcement
10. Fuel filler pipe

Manifold Absolute Pressure Sensor

Circuit	Condition		
	Open circuit	Short circuit	Poor ground
ECM (3A) — Manifold absolute pressure sensor	Code No.P0105 output Lack of power Poor acceleration	Code No.P0105 output Lack of power Poor acceleration	NA
ECM (3U) — Manifold absolute pressure sensor	Code No.P0105 output Lack of power Poor acceleration	Code No.P0105 output Lack of power Poor acceleration	
Manifold absolute pressure sensor — Ground	Code No.P0105 output Poor acceleration	NA	Poor acceleration

Intake Air Temperature Sensor (D/C)

Circuit	Condition		
	Open circuit	Short circuit	Poor ground
ECM (2C) — Intake air temperature sensor (D/C)	Code No.P1110 output No symptom	Code No.P1110 output No Symptom	NA
Intake air temperature sensor (D/C) — Ground	Code No.P1110 output No Symptom	NA	Poor acceleration

Intake Air Temperature Sensor (L/C)

Circuit	Condition		
	Open circuit	Short circuit	Poor ground
ECM (2K) — Intake air temperature sensor	Code No.P1113 output No symptom	Code No.P1113 output No Symptom	NA
Intake air temperature sensor (L/C) — Ground	Code No.P1113 output No Symptom	NA	Poor acceleration

Torque Reduction Request Signal (ABS/TCS Control Unit)

Circuit	Condition		
	Open circuit	Short circuit	Poor ground
ECM (1Q) — ABS/TCS CU	Torque reduction control (TCS) will not operate	Torque reduction control (TCS) will not operate	NA

Rear Window Defroster Switch

Circuit	Condition		
	Open circuit	Short circuit	Poor ground
ECM (1X) — Rear window defroster switch	Idle speed may be low when switch ON	Idle speed may be high at idle	NA

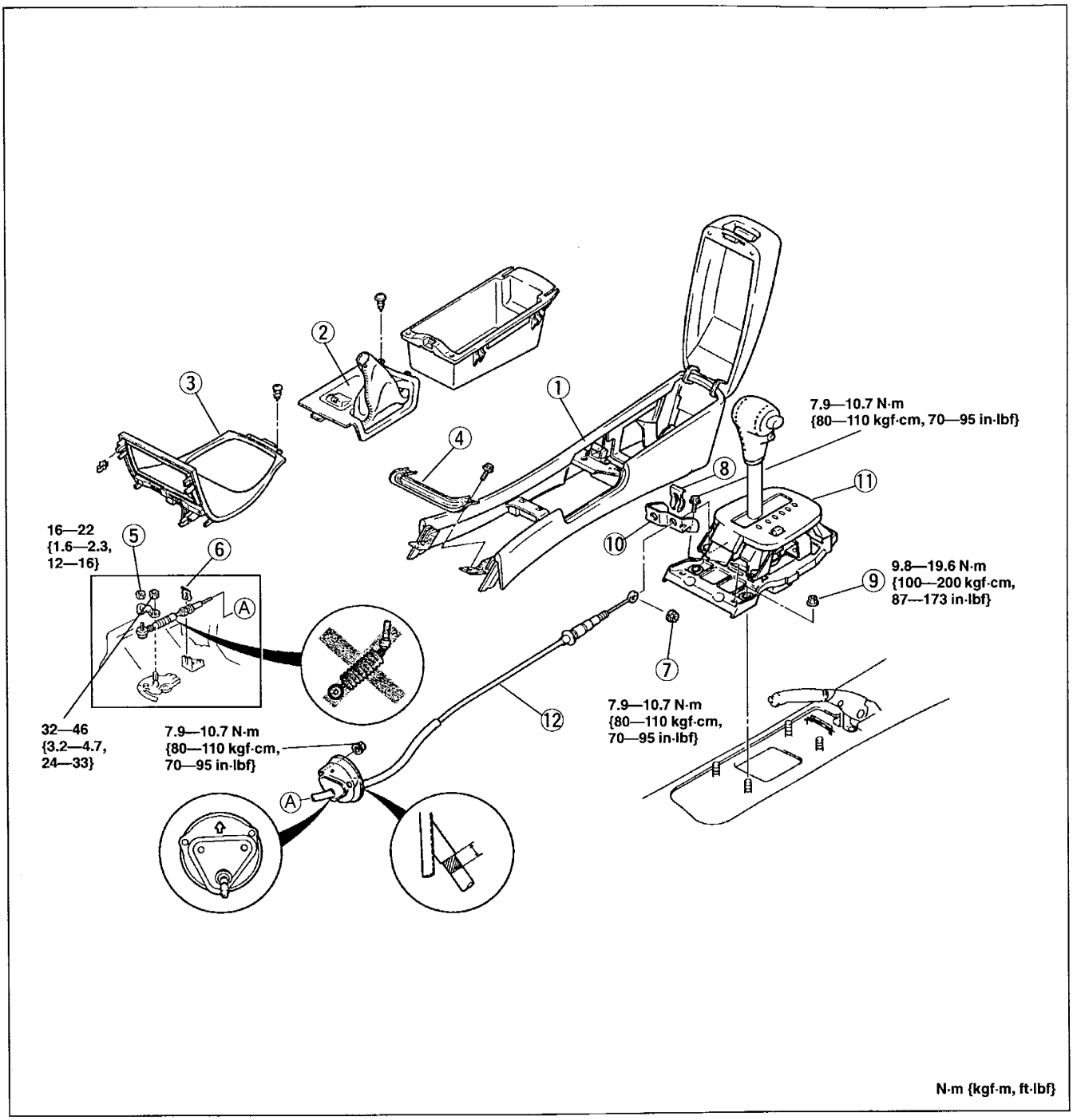
Headlight Switch

Circuit	Condition		
	Open circuit	Short circuit	Poor ground
ECM (1L) — Headlight switch	Idle speed may be low when switch ON	Idle speed may be high at idle	NA

NA: Not applicable

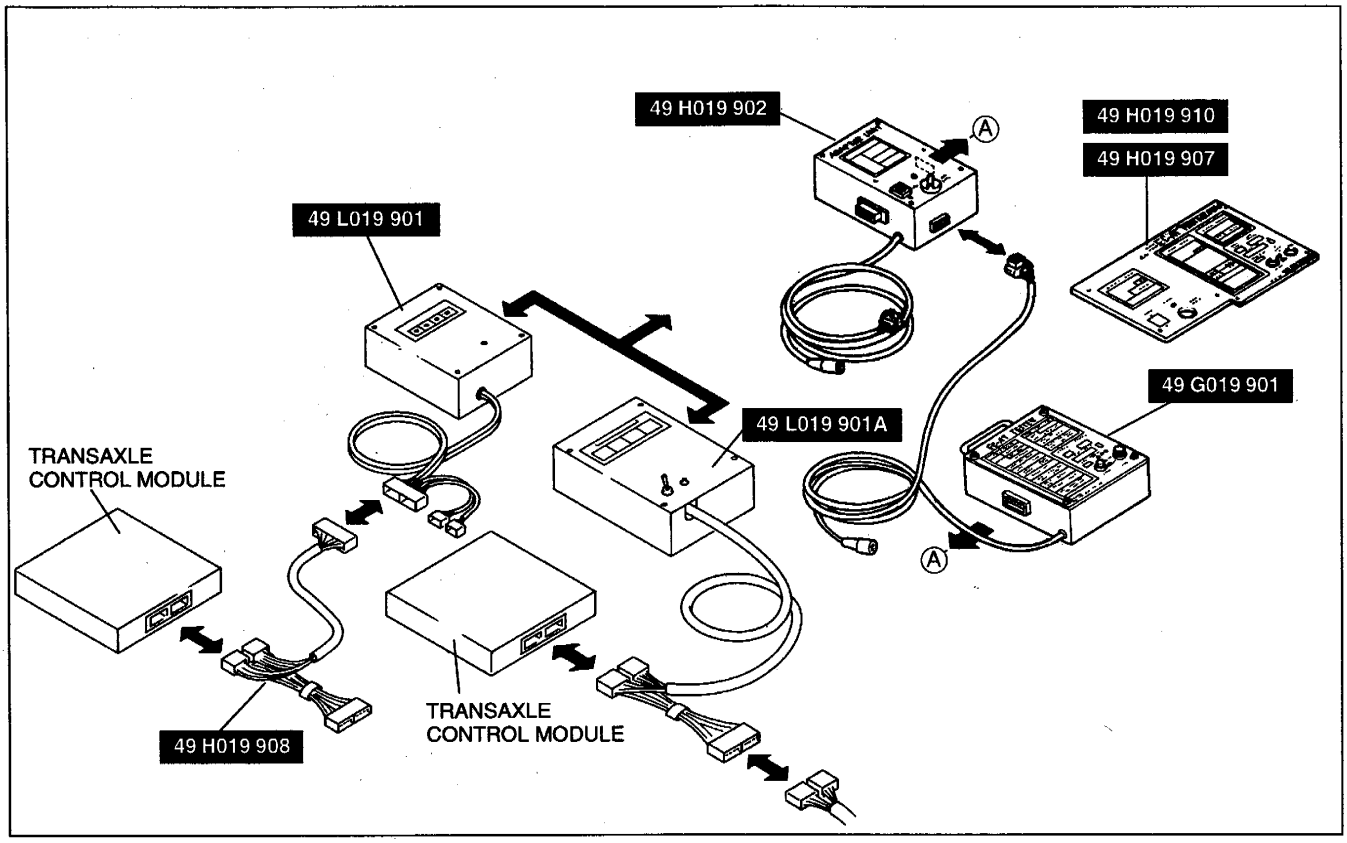
Removal / Inspection / Installation

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

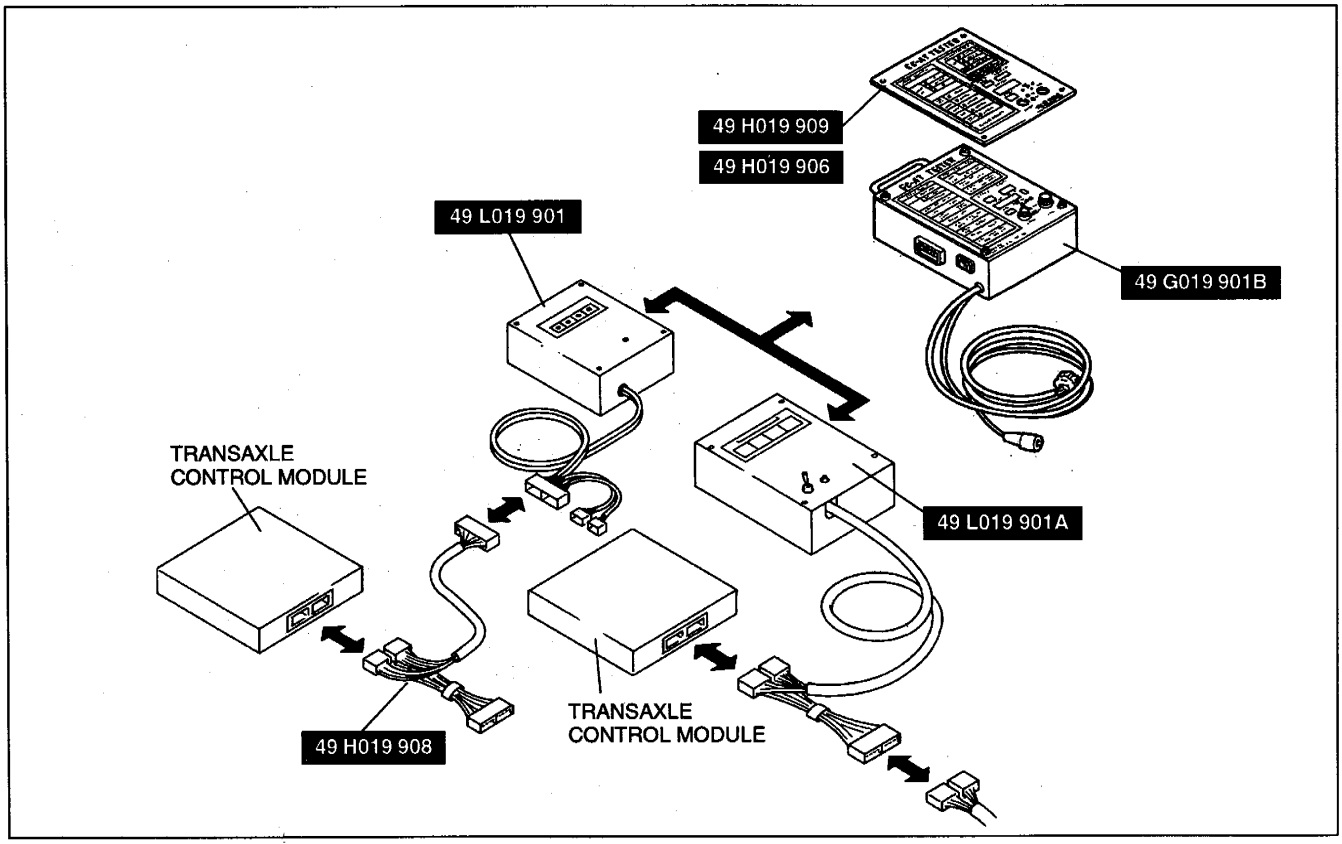


1. Rear console
2. Brake boot panel
3. Center panel
4. Bracket
5. Nut
   - Installation Note ..... page K1–48
6. Clip
   - Installation Note ..... page K1–48
7. Nut
8. Clip
9. Nut
10. Bracket
11. Selector lever
    - Inspection ..... page K1–45
    - Adjustment ..... page K1–46
    - Disassembly / Inspection / Assembly ..... page K1–49
12. Selector cable

ELECTRICAL SIGNAL INSPECTION
Assembly of SST
EC-AT tester (49 G019 901)



EC-AT tester (49 G019 901B)



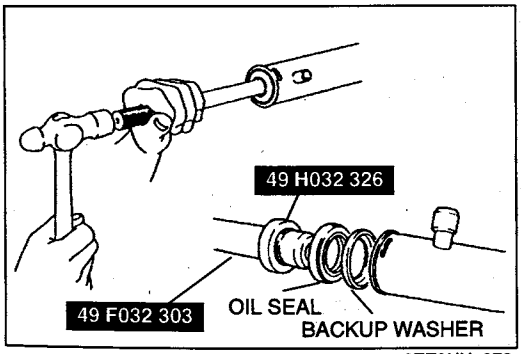
17	EXCESSIVE N POSITION TO D RANGE OR N POSITION TO R POSITION SHIFT SHOCK
DESCRIPTION	• Strong shift shock felt when selecting from N position to D range or R position at idling

[TROUBLESHOOTING HINTS]

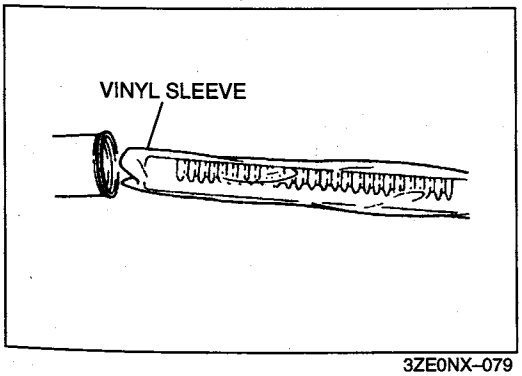
① ATF level low
② Idle speed high
③ Throttle position sensor malfunction or misadjusted
④ Line pressure high
⑤ Control valve stuck (pressure regulator valve, pressure modifier valve, or pilot valve)
⑥ Powertrain slippage
⑦ Pressure control solenoid worn
⑧ Dropping resistor malfunction
⑨ N–D, or 3–4/N–R accumulator worn
⑩ Transaxle range switch worn or misadjusted

STEP	INSPECTION		ACTION
1	Are ATF level and condition OK? ☞ page K2–11	Yes	Go to next step
		No	Problem within transaxle Go to next step, and check for the main cause. When the problem is found, overhaul the transaxle and repair or replace parts as necessary
2	Are ignition timing and idle speed OK? ☞ section F2	Yes	Go to next step
		No	Adjust ignition timing and/or idle speed ☞ section F2
3	Does NGS display "SYSTEM PASSED (No DTCs AVAILABLE)" with ignition switch at ON? ☞ page K2–46	Yes	Go to next step
		No	Diagnostic trouble code(s) displayed • Check for cause of code(s) ☞ page K2–46
4	Is line pressure OK? ☞ page K2–2 **Specified pressure** **kPa {kgf/cm², psi}** Range/position: D, S, L — Idle: 450—510 {4.5—5.3, 64—68} — Stall: 1,210—1,280 {12.3—13.1, 175—186} Range/position: R — Idle: 550—620 {5.6—6.4, 80—91} — Stall: 1,610—1,680 {16.4—17.2, 234—244}	Yes	Go to next step
		No	Go to step 6
5	Is engine stall speed OK? ☞ page K2–4 **Engine stall speed:** **D,S,L range: 2,150—2,450 rpm** **R position: 1,950—2,250 rpm**	Yes	Go to step 8
		No	Overhaul transaxle and repair or replace parts as necessary
6	Are measurements at transaxle control module terminals OK? ☞ page K2–29 TERMINAL: 1F — FUNCTION: Pressure control solenoid TERMINAL: 1H — FUNCTION: Dropping resistor	Yes	Overhaul transaxle and repair or replace parts as necessary
		No	If resistance not OK, check for malfunctioning parts and wiring • Pressure control solenoid ☞ page K2–24 • Dropping resistor ☞ page K2–26 If resistance OK but duty not, go to next step
7	Is input voltage of throttle position sensor at transaxle control module OK? ☞ page K2–29 TERMINAL: 2T — FUNCTION: Throttle position sensor	Yes	Replace transaxle control module ☞ page K2–29
		No	Check throttle position sensor and wiring ☞ section F2
8	Are measurements at transaxle control module terminals OK? ☞ page K2–29 TERMINAL: 2D, 1E, 2B, 2S, 2Q — FUNCTION: Transaxle range switch TERMINAL: 2L — FUNCTION: Ground (Input)	Yes	Overhaul transaxle and repair or replace parts as necessary
		No	Check for malfunctioning parts and wiring • Transaxle range switch ☞ page K2–21

1. Gear housing
2. Backup washer
   Assembly Note ..... below
3. Oil seal (Gear housing)
   Assembly Note ..... below
4. O-ring and seal ring
5. Steering rack
   Assembly Note ..... below
6. Oil seal and O-ring
   Assembly Note ..... page N–22
7. Rack bushing
   Assembly Note ..... page N–22
8. Rack stop
   Assembly Note ..... page N–22
9. Clip
   Assembly Note ..... page N–22
10. Seal ring
    Assembly Note ..... page N–23
11. Oil seal
    Assembly Note ..... page N–23
12. Upper bearing
    Assembly Note ..... page N–23
13. Oil seal
14. Backup washer
15. Ball bearing
    Assembly Note ..... page N–23
16. Snap ring
17. O-ring
18. Pinion shaft assembly
19. Valve housing assembly
20. Bolt
21. Dust cover
22. Support yoke
23. Yoke spring
24. Adjusting cover
    Assembly Note ..... page N–23
25. Locknut
    Assembly Note ..... page N–23
26. Washer
27. Tie rod
    Assembly Note ..... page N–24
28. Boot
    Assembly Note ..... page N–24
29. Boot clamp (inner)
    Assembly Note ..... page N–24
30. Boot clamp (outer)
    Assembly Note ..... page N–24
31. Lock nut
32. Tie-rod end boot
    Assembly Note ..... page N–24
33. Tie-rod end
    Assembly Note ..... page N–24
34. Oil pipe
35. Mounting bracket and mount



3ZE0NX–078

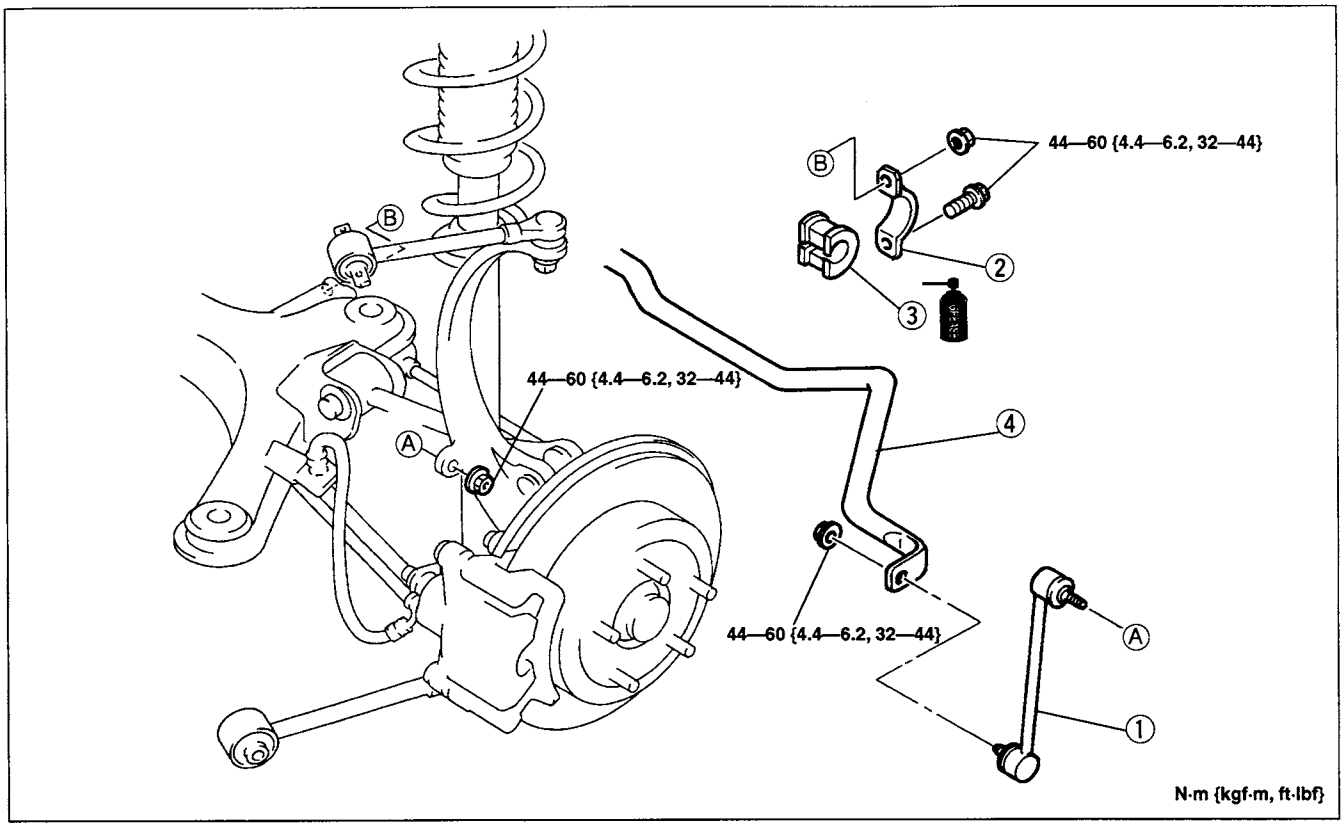


3ZE0NX–079

Assembly note
Backup washer and oil seal (Gear housing)
1. Apply ATF to the new oil seal.
2. Install the backup washer and oil seal by using the **SST**s.
3. After installing, shake the gear housing and verify that the backup washer does not rattle.
4. If it rattles, remove the oil seal and backup washer, and reinstall them.

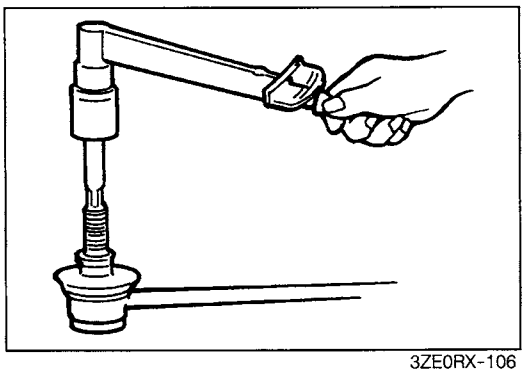
Steering rack
1. Apply ATF to a new O-ring and seal ring.
2. Install the O-ring and seal ring in the piston groove.
3. Apply grease to the friction surface and teeth of the rack.
4. Slide the vinyl sleeve (supplied in the seal kit) over the rack, and slide the rack in from the tube side.
5. Remove the vinyl sleeve.

REAR STABILIZER
Removal / Inspection / Installation

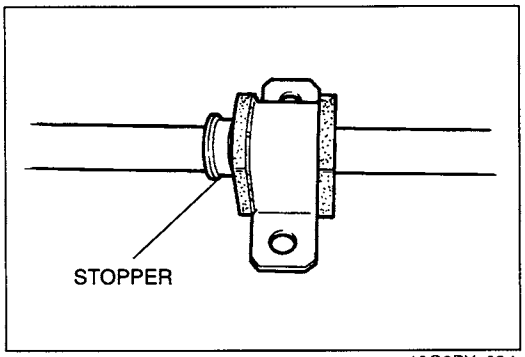


3ZE0RX-105

1. Stabilizer control link
   Inspection ..... below
2. Stabilizer bracket
3. Stabilizer bushing
   Installation Note ..... below
   Inspect for wear and damage
4. Rear stabilizer
   Inspect for bending and damage



3ZE0RX-106



19G0RX-094

Inspection
Stabilizer control link
1. Inspect for bending and damage.
2. Measure the ball joint starting torque.
   (a) Shake the ball joint stud from side to side 10 times.
   (b) Rotate the ball joint stud 10 times.
   (c) Measure the starting torque by using an Allen socket and a torque wrench.

   Starting torque:
   0.1—1.9 N·m {1—20 kgf·cm, 0.9—17 in·lbf}

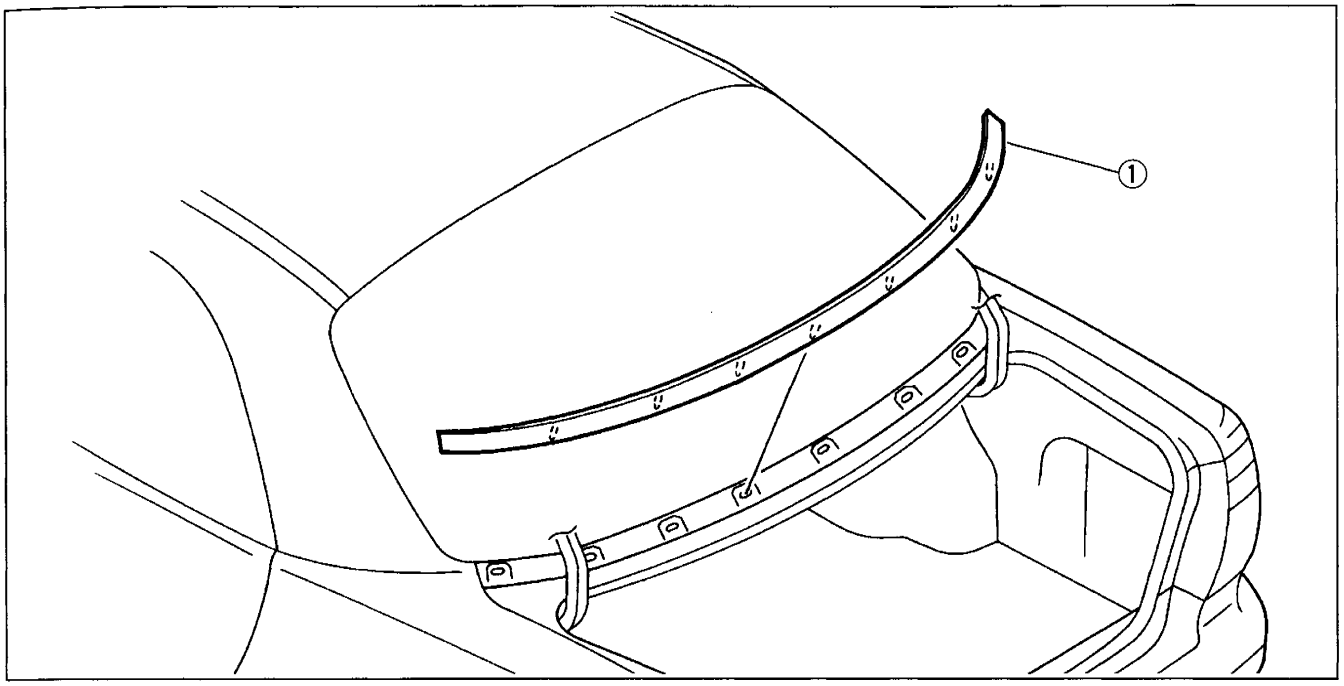
3. If not within the specification, replace the stabilizer control link.

Installation note
Stabilizer bushing
1. Apply rubber grease to the inside surface of the stabilizer bushing.
2. Align the bushing with the stopper on the stabilizer.

REAR WINDOW LOWER MOLDING

Removal / Installation

1. Remove as shown in the figure.
2. Install in the reverse order of removal.



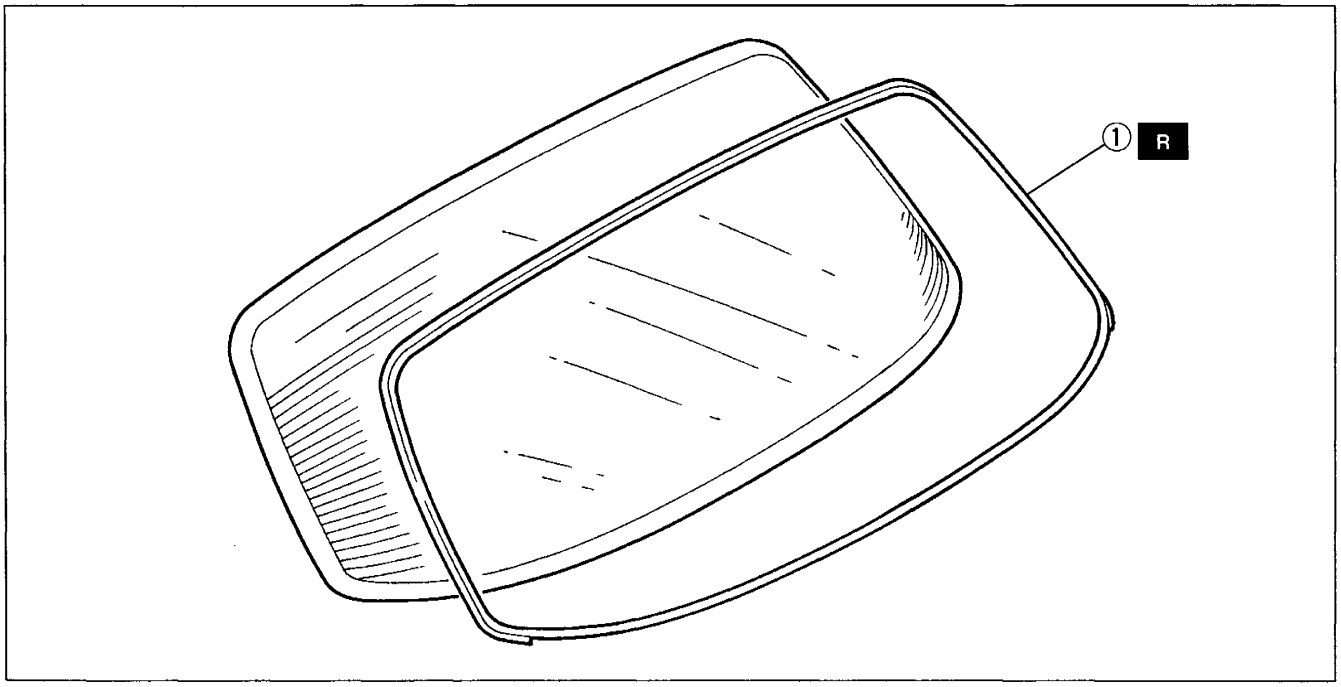
3ZE0SX-074

1. Rear window lower molding

REAR WINDOW MOLDING

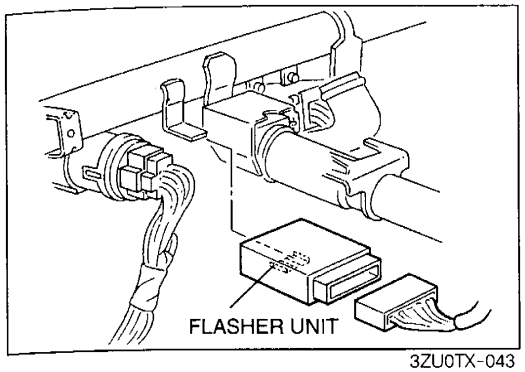
Removal / Installation

1. Remove the rear window glass. (Refer to page S–73.)
2. Remove as shown in the figure.
3. Install in the reverse order of removal.



3ZE0SX-075

1. Rear window molding



3ZU0TX-043

FLASHER UNIT

Removal / Installation

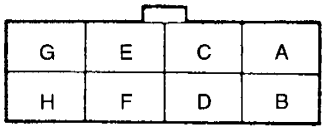
1. Remove the lap louver duct. (Refer to page T–4.)
2. Disconnect the flasher unit connector.
3. Remove the flasher unit.
4. Install in the reverse order of removal.

Inspection

1. Measure the voltage at the flasher unit terminals as indicated below.
2. If not as specified, inspect the parts listed under "Inspection area" and the related wiring harness.
3. If the parts and wiring harness are OK but the system still does not work properly, replace the flasher unit.

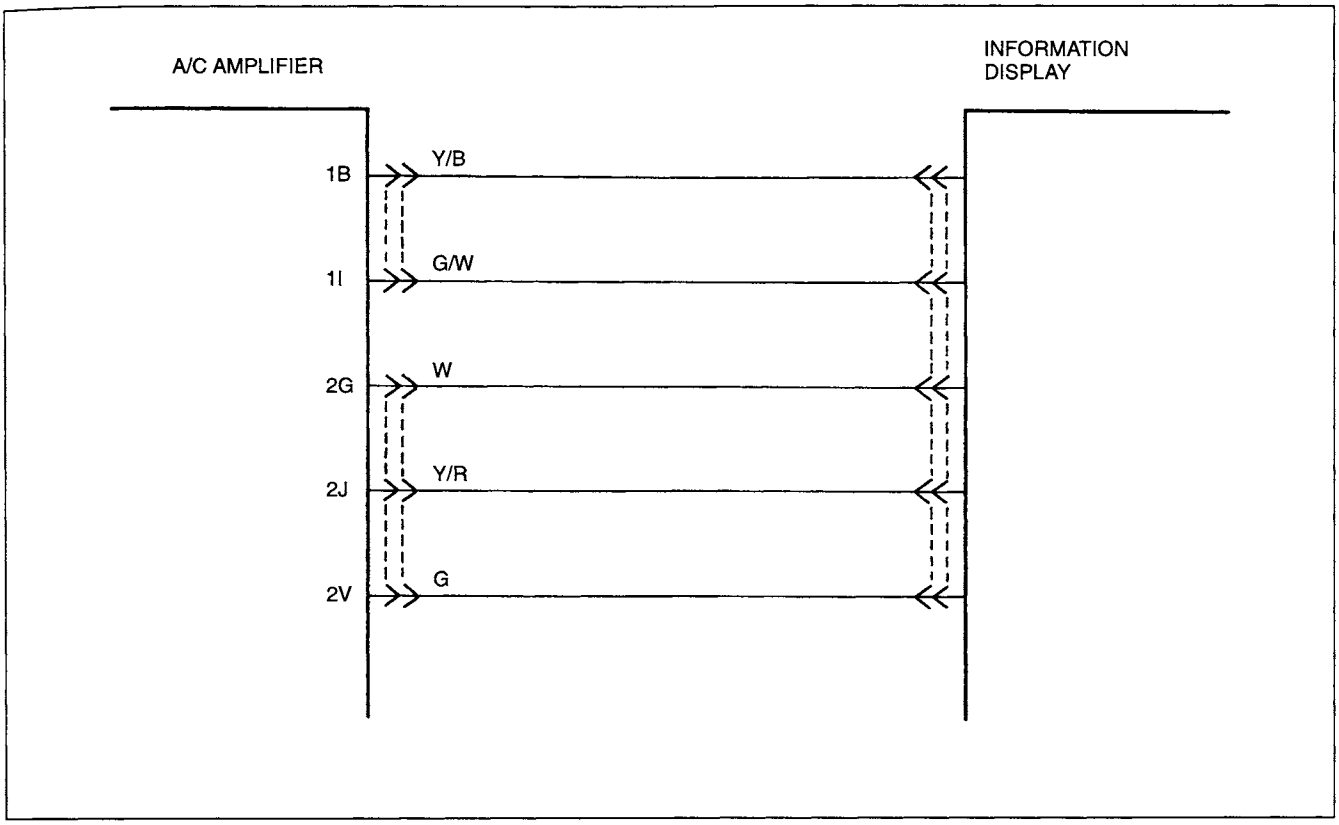
Terminal voltage list (Reference)

B+: Battery positive voltage



Terminal	Signal	Connection	Test condition	Voltage/ Continuity	Inspection area
A	Flasher unit ground	GND	Constant: check for continuity to ground	Yes	Wiring harness (Flasher unit—GND)
B	—	—	—	—	—
C	Hazard warning on	Hazard warning switch	Hazard warning switch: on	0 V	Hazard warning switch
			Hazard warning switch: off	B+	
D	Turn signal flasher (LH)	Turn signal light (LH)	Turn signal light (LH) flashes	Alternates 0 V and B+	Turn signal light (LH)
			Other	0 V	
E	Turn switch on/ off (RH)	Combination switch	Ignition switch and turn switch (RH): on	B+	Combination switch
			Other	0 V	
F	Turn switch on/ off (LH)	Combination switch	Ignition switch and turn switch (LH): on	B+	Combination switch
			Other	0 V	
G	Turn signal flasher (RH)	Turn signal light (RH)	Turn signal light (RH) flashes	Alternates 0 V and B+	Turn signal light (RH)
			Other	0 V	
H	B+	HAZARD 15 A fuse	Constant	B+	HAZARD 15 A fuse

Flowchart No.	Serial communication system inspection	Symptom ..... Information display indications do not illuminate properly
11		Related parts ... A/C amplifier, information display, wiring harness



3ZE0UX-090

Step	Inspection procedure	Terminal	Result	Action
—	In case information display indications do not illuminate, start from Step 3. Otherwise, start from Step 1.	—	—	—
1	1) Disconnect A/C amplifier connector (26-pin) and information display connector. 2) Is there continuity between terminals of A/C amplifier connector (female: 26-pin) and information display connector (female)?	(G/W), (Y/B) wires	YES	Go to Step 2
			NO	Repair wiring harness with no continuity (A/C amplifier — Information display)
2	1) Disconnect A/C amplifier connector (22-pin). 2) Is there continuity between terminals of A/C amplifier connector (female: 22-pin) and information display connector (female)?	(W), (Y/R) wires	YES	Replace A/C amplifier or information display (Refer to page U-96, section T)
			NO	Repair wiring harness with no continuity (A/C amplifier — Information display)
3	Is there continuity between terminal of A/C amplifier connector (female: 22-pin) and ground?	(G) wire (Terminal 2V)	YES	Go to Step 4
			NO	Replace A/C amplifier (Refer to page U-96)
4	1) Disconnect A/C amplifier connector (22-pin) and information display connector. 2) Is there continuity between terminal of A/C amplifier connector (female: 22-pin) and information display connector (female)?	(G) wire (Terminal 2V)	YES	Check information display (Refer to section T)
			NO	Repair (G) wiring harness (A/C amplifier — Information display)