Indicates the group title.

Indicates the section title.

Indicates the group number.

Indicates the page number.

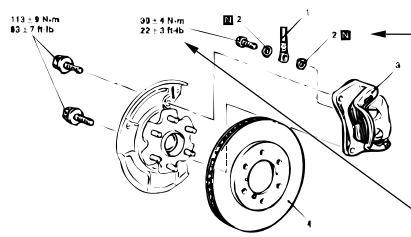
BASIC BRAKE SYSTEM
FRONT DISC BRAKE ASSEMBLY

35A-81

FRONT DISC BRAKE ASSEMBLY

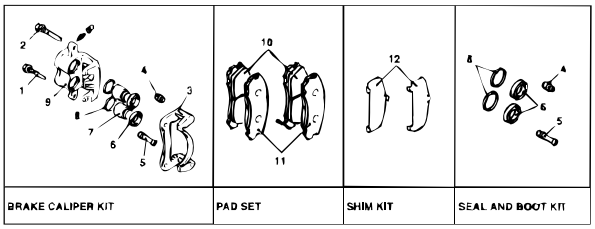
REMOVAL AND INSTALLATION

Pre-removal Operation	Post-installation Operation
• Brake Fluid Draining	• Brake Fluid Supplying and Air Bleeding (Refer to .)



Mark N denotes non-reusable part.

Denotes tightening torque. If there is no indication of tightening torque, refer to tightening torque .



BRAKE CALIPER KIT	PAD SET	SHIM KIT	SEAL AND BOOT KIT

Repair kit or set parts are shown. (Only very frequently used parts are shown.)

REMOVAL STEPS
1. BRAKE HOSE CONNECTION
2. GASKET

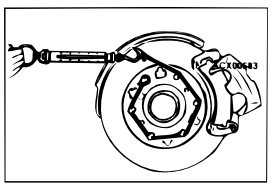
REMOVAL STEPS (continued)
>>A<< 3. DISC BRAKE ASSEMBLY
4. BRAKE DISC

Required Special Tool:
- MB990520: Disc Brake Piston Expander

INSTALLATION SERVICE POINT

Operating procedures, cautions, etc. On removal, installation, disassembly and assembly are described.

>>A<< DISC BRAKE ASSEMBLY INSTALLATION



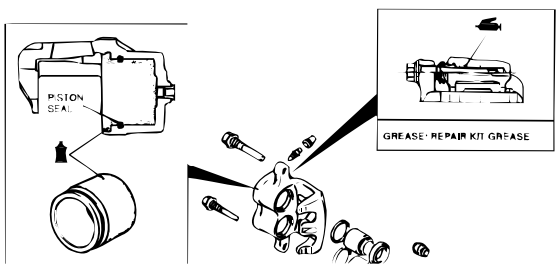
1. To check the brake drag force after mounting the pad, measure the hub torque in the advancing direction using a spring balance with the pad is removed.

⚠ CAUTION
Do not allow any oil, grease or other contamination to contact the friction surfaces of the pads and brake discs.

2. After re-installing the caliper support to the knuckle, install the pad clips and the pads to the caliper support.

The title of the page (following the page on which the diagram of component parts is presented) indicating the locations of lubrication and sealing procedures.

LUBRICATION AND SEALING POINTS



Indicates (by symbols) where lubrication is necessary.

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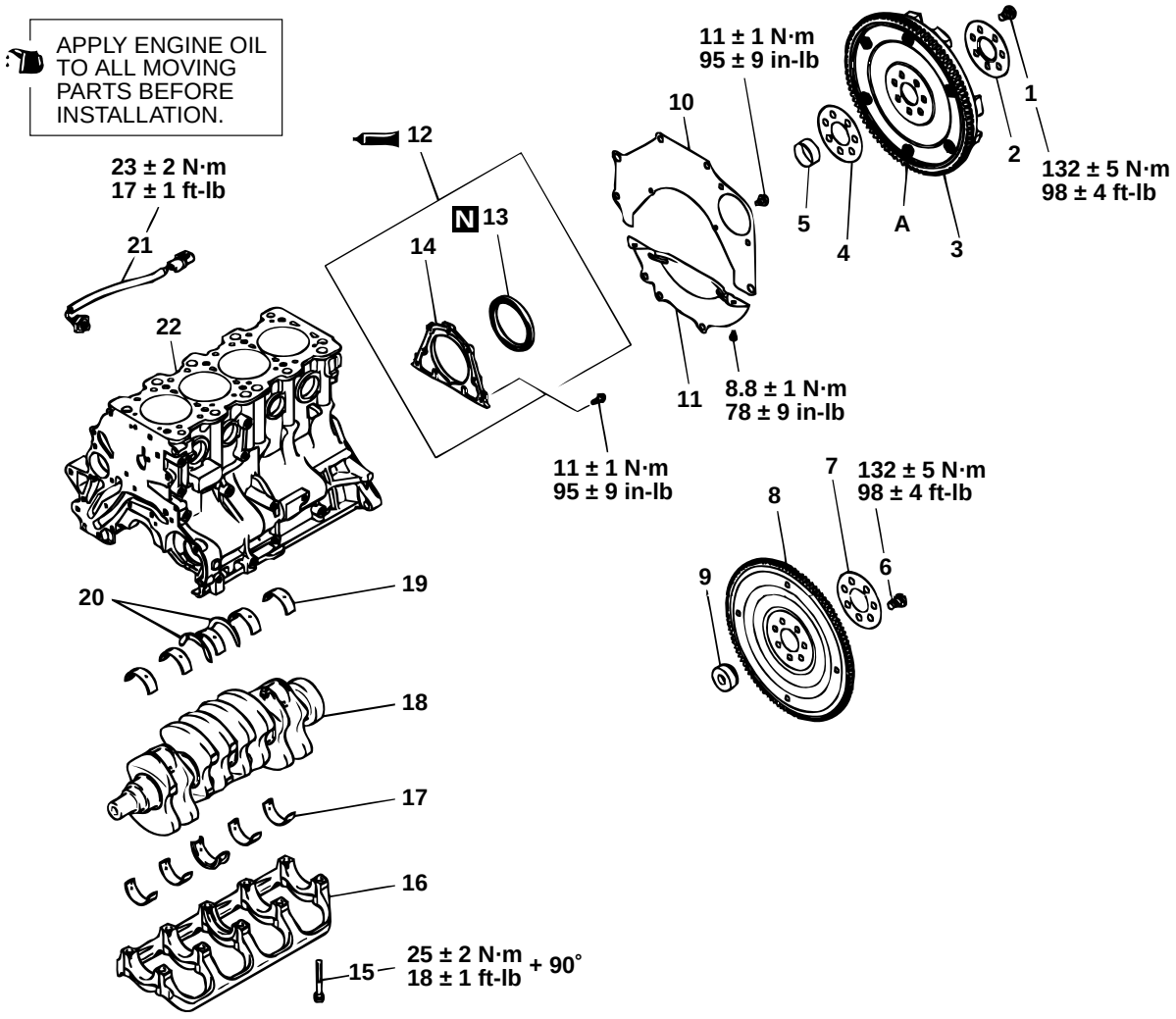
CRANKSHAFT AND CYLINDER BLOCK

REMOVAL AND INSTALLATION

M1113008700057

⚠ CAUTION

On the flexible flywheel equipped engines, do not remove any of the bolts "A" of the flywheel shown in the illustration. The balance of the flexible flywheel is adjusted in an assembled condition. Removing the bolt, therefore, can cause the flexible flywheel to be out of balance giving and resulting in damage.



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REMOVAL STEPS

1. FLYWHEEL BOLT <M/T>
2. ADAPTER PLATE <M/T>
3 FLYWHEEL <M/T>
4. ADAPTER PLATE <M/T>
5. CRANKSHAFT BUSHING <M/T>
6. DRIVE PLATE BOLT <A/T>
7. ADAPTER PLATE <A/T>
8. DRIVE PLATE <A/T>
9. CRANKSHAFT BUSHING <A/T>
10. REAR PLATE
11. BELL HOUSING COVER

REMOVAL STEPS (Continued)

>>E<< 12. OIL SEAL CASE ASSEMBLY
>>D<< 13. OIL SEAL
14. OIL SEAL CASE
>>C<< 15. BEARING CAP BOLT
>>C<< 16. BEARING CAP
>>B<< 17. CRANKSHAFT BEARING (LOWER)
18. CRANKSHAFT
>>B<< 19. CRANKSHAFT BEARING (UPPER)
>>A<< 20. CRANKSHAFT THRUST BEARING
21. KNOCK SENSOR
22. CYLINDER BLOCK

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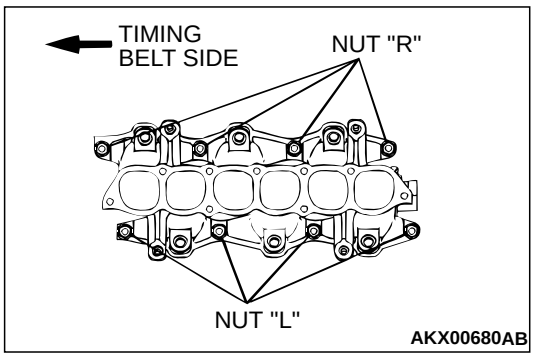
REMOVAL STEPS (Continued)
11. CONED DISC SPRING
>>A<< 12. INTAKE MANIFOLD
13. INTAKE MANIFOLD GASKET



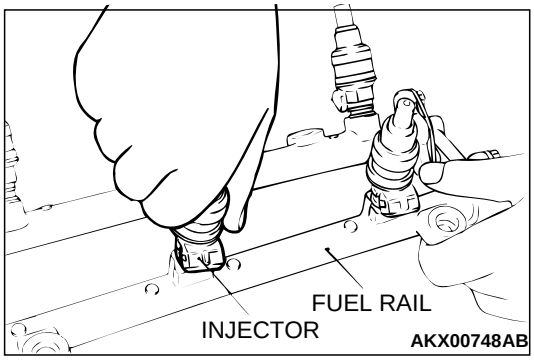
INSTALLATION SERVICE POINTS

>>A<< INTAKE MANIFOLD INSTALLATION

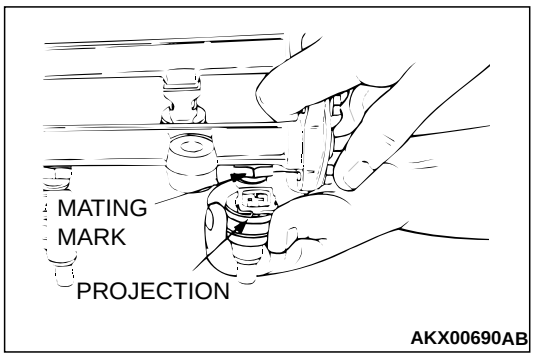
1. Tighten the nuts "R" to 6.4 ± 1.5 N·m (57 ± 13 in-lb).
2. Tighten the nuts "L" to the specified torque.
   Tightening torque: 22 ± 1 N·m (16 ± 1 ft-lb)
3. Tighten the nuts "R" to the specified torque.
   Tightening torque: 22 ± 1 N·m (16 ± 1 ft-lb)
4. Tighten the nuts "L" to the specified torque.
   Tightening torque: 22 ± 1 N·m (16 ± 1 ft-lb)
5. Tighten the nuts "R" to the specified torque.
   Tightening torque: 22 ± 1 N·m (16 ± 1 ft-lb)

>>B<< INJECTOR INSTALLATION

⚠ CAUTION
Use care not to let engine oil enter the fuel rail.



1. Apply clean engine oil to the O-ring.
2. Insert the injector into the fuel rail.
3. Make sure the injector rotates smoothly. If not, remove the injector to check the O-ring for damage, and replace the O-ring if necessary. Then reinsert the injector and check that it rotates smoothly.



4. Align the projection on the injector connector with the mating mark on the fuel rail.

>>C<< FUEL PRESSURE REGULATOR INSTALLATION

⚠ CAUTION
Do not let engine oil enter the fuel rail.

1. Apply clean engine oil to the O-ring.
2. Insert the fuel pressure regulator into the fuel rail.
3. Make sure the regulator rotates smoothly. If not, remove the fuel pressure regulator to check the O-ring for damage, and replace the O-ring if necessary. Then reinsert the fuel pressure regulator and check that it rotates smoothly.
4. Tighten the two bolts to the specified torque.

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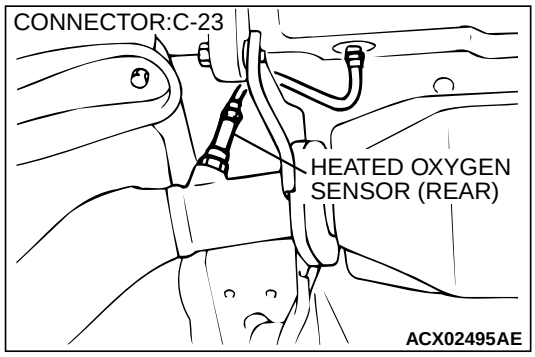

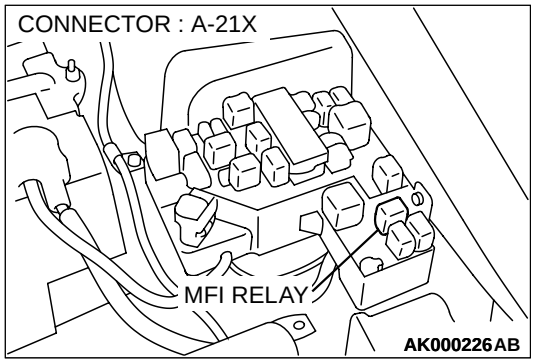

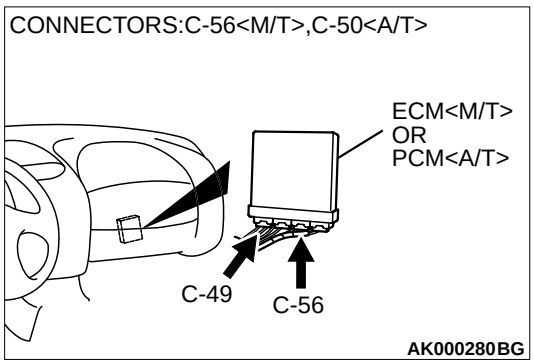

CIRCUIT OPERATION

- Power is supplied from the MFI relay (terminal 1) to the heated oxygen sensor (rear) heater.
- The ECM (terminal 54) <M/T> or PCM (terminal 26) <A/T> controls continuity to the heated oxygen sensor (rear) heater by turning the power transistor in the ECM <M/T> or PCM <A/T> "ON" and "OFF."

BACKGROUND

- The ECM <M/T> or PCM <A/T> checks whether the heater current is within a specified range when the heater is energized.

DTC SET CONDITIONS

Check Conditions

- Engine coolant temperature is higher than 20° C (68° F).
- While the heated oxygen sensor (rear) heater is on.
- Battery positive voltage is at between 11 and 16 volts.

Judgment Criteria

- Heater current of the heated oxygen sensor (rear) heater has continued to be lower than 0.2 ampere or higher than 3.5 ampere for 6 seconds.
- Only one monitor during one drive cycle

TROUBLESHOOTING HINTS (The most likely causes for this code to be set are:)

- Open or shorted heated oxygen sensor (rear) heater circuit.
- Open circuit in heated oxygen sensor (rear) heater.
- ECM failed. <M/T>
- PCM failed. <A/T>

DIAGNOSIS

Required Special Tools

MB991658: Test Harness

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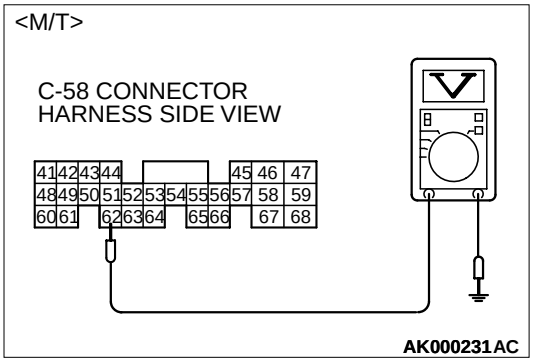
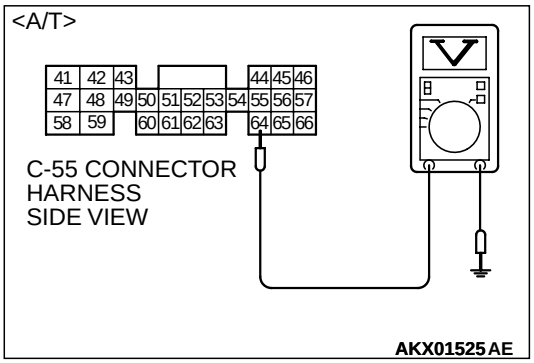




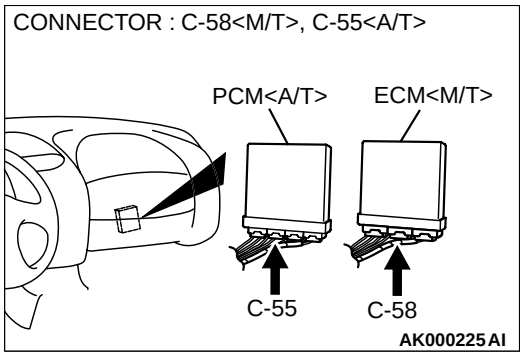
STEP 8. Check the sensor supply voltage at ECM connector C-58 <M/T> or PCM connector C-55 <A/T> by backprobing.

(1) Do not disconnect the ECM connector C-58 <M/T> or PCM connector C-55 <A/T>.
(2) Disconnect the intake air temperature sensor connector B-14.
(3) Turn the ignition switch to the "ON" position.
(4) Measure the voltage between terminal 62 <M/T> or 64 <A/T> and ground by backprobing.
- Voltage should be between 4.5 and 4.9 volts.

(5) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the voltage normal?

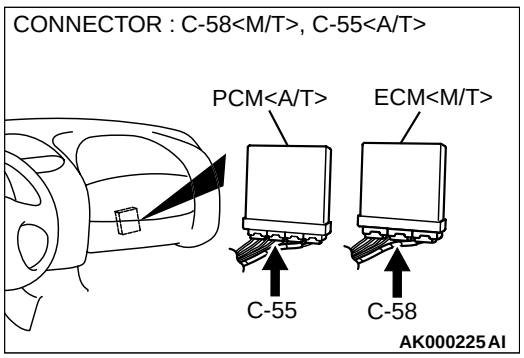
YES : Go to Step 9.
NO : Go to Step 10.



STEP 9. Check connector C-58 at ECM <M/T> or connector C-55 at PCM <A/T> for damage.

Q: Is the connector in good condition?

YES : Repair harness wire between intake air temperature sensor connector B-14 terminal 6 and ECM connector C-58 terminal 62 <M/T> or PCM connector C-55 terminal 64 <A/T> because of open circuit. Then go to Step 19.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection (P.00E-2). Then go to Step 19.



STEP 10. Check connector C-58 at ECM <M/T> or connector C-55 at PCM <A/T> for damage.

Q: Is the connector in good condition?

YES : Go to Step 11.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection (P.00E-2). Then go to Step 19.

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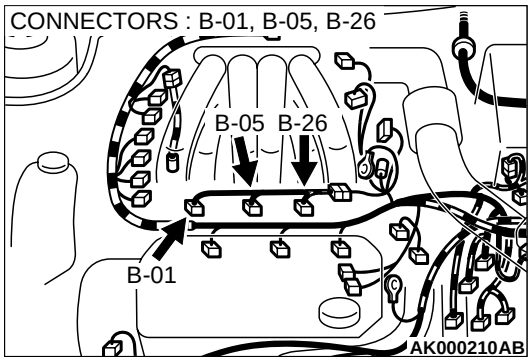
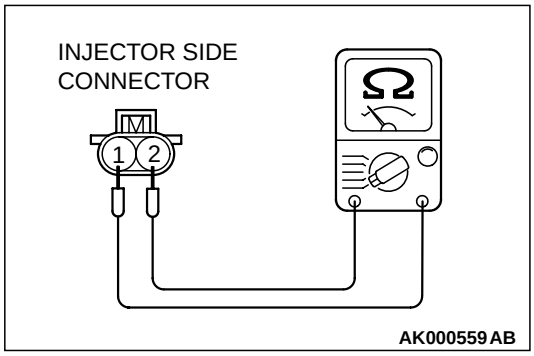




STEP 5. Check the injector.

(1) Disconnect the injector connector B-01 <No.1 cylinder> or B-05 <No.3 cylinder> or B-26 <No.5 cylinder>.
(2) Measure the resistance between injector side connector terminal 1 and 2.

Standard value: 13 – 16 ohm [at 20° C (68° F)]

Q: Is the resistance standard value?

YES : Repair harness wire between injector intermediate connector and injector connector because of open circuit or short circuit to ground or harness damage.

a. Repair harness wire between injector intermediate connector B-48 terminal 1 and injector connector B-01 terminal 1 and harness wire between injector connector B-01 terminal 2 and injector intermediate connector B-48 terminal 2 when checking No.1 cylinder.
b. Repair harness wire between injector intermediate connector B-48 terminal 1 and injector connector B-05 terminal 1 and harness wire between injector connector B-05 terminal 2 and injector intermediate connector B-48 terminal 3 when checking No.3 cylinder.
c. Repair harness wire between injector intermediate connector B-48 terminal 1 and injector connector B-26 terminal 1 and harness wire between injector connector B-26 terminal 2 and injector intermediate connector B-48 terminal 4 when checking No.5 cylinder.

Then go to Step 12.

NO : Replace the injector. Then go to Step 12.

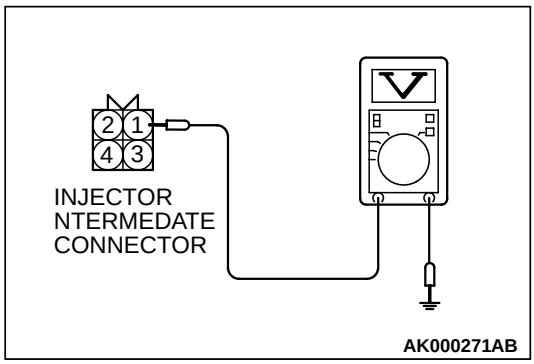
STEP 6. Check the power supply voltage at injector intermediate connector B-48.

(1) Disconnect the connector B-48 and measure at the female connector side.
(2) Turn the ignition switch to the "ON" position.
(3) Measure the voltage between terminal 1 and ground.
- Voltage should be battery positive voltage.

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the voltage normal?

YES : Go to Step 8.
NO : Go to Step 7.



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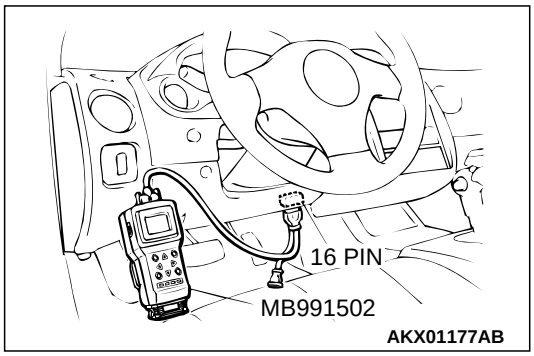


STEP 5. Using scan tool MB991502, check data list item 24: Vehicle Speed Sensor.

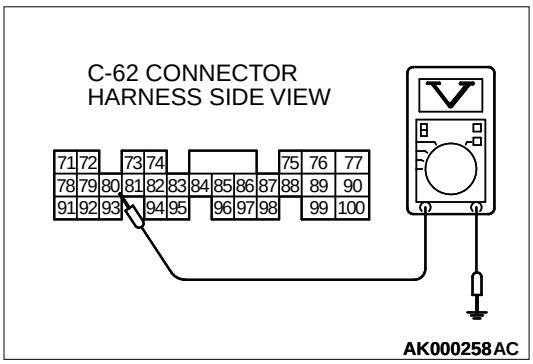
⚠ CAUTION
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(1) Connect scan tool MB991502 to the data link connector.
(2) Start the engine.
(3) Set scan tool MB991502 to the data reading mode for item 24, Vehicle Speed Sensor.
- Check that the speedometer and MUT-II display speed match when traveling at a vehicle speed of 40km/h (25mph).

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor operating properly?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 0, How to Use Troubleshooting/ Inspection Service Points (P.00-6).
NO : Replace the ECM. Then go to Step 17.



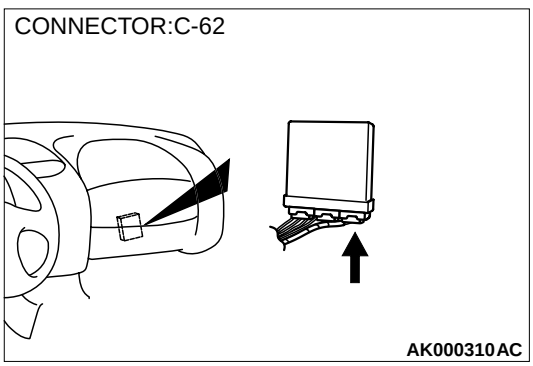
STEP 6. Check the sensor supply voltage at ECM connector C-62 by backprobing

(1) Do not disconnect the ECM connector C-62.
(2) Disconnect the vehicle speed sensor connector B-39.
(3) Turn the ignition switch to the "ON" position.
(4) Measure the voltage between terminal 80 and ground by backprobing.
- Voltage should be between 4.8 and 5.2 volts.

(5) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the voltage normal?

YES : Go to Step 7.
NO : Replace the ECM. Then go to Step 17.



STEP 7. Check connector C-62 at ECM for damage.
Q: Is the connector in good condition?

YES : Check connector B-36 at intermediate connector for damage, and repair or replace as required. Refer to GROUP 00E, Harness Connector Inspection (P.00E-2). If intermediate connector is in good condition, repair harness wire between vehicle speed sensor connector B-39 terminal 3 and ECM connector C-62 terminal 80 because of open circuit. Then go to Step 17.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection (P.00E-2). Then go to Step 17.

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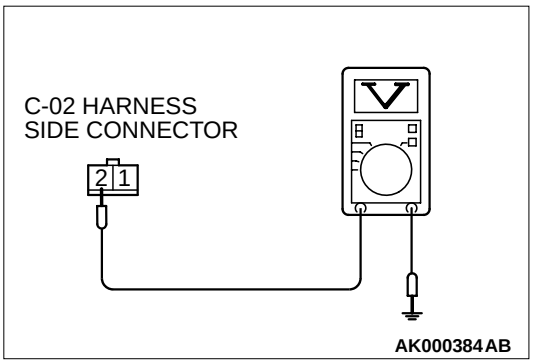


STEP 8. Check the power supply voltage at interlock switch connector C-02.

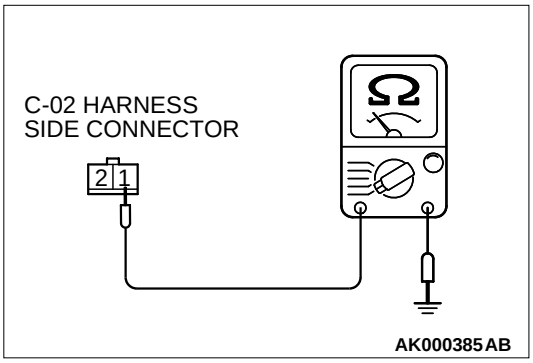
(1) Disconnect the connector C-02 and measure at the harness side.
(2) Turn the ignition switch to the "START" position.
(3) Measure the voltage between terminal 2 and ground.
- Voltage should be battery positive voltage.

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the voltage normal?

YES : Go to Step 9.

NO : Check connector C-07 at intermediate connector for damage, and repair or replace as required. Refer to GROUP 00E, Harness Connector Inspection (P.00E-2). If intermediate connectors is in good condition, repair harness wire between starter relay connector A-18X terminal 1 and interlock switch connector C-02 terminal 2 because of open circuit. Then confirm that the malfunction symptom is eliminated.



STEP 9. Check the continuity at interlock switch harness side connector C-02.

(1) Disconnect the connector C-02 and measure at the harness side.
(2) Check for the continuity between terminal 1 and ground.
- Should be less than 2 ohm.

Q: Is the continuity normal?

YES : Replace the ECM. Then confirm that the malfunction symptom is eliminated.

NO : Repair harness wire between interlock switch connector C-02 terminal 1 and ground because of open circuit or harness damage. Then confirm that the malfunction symptom is eliminated.

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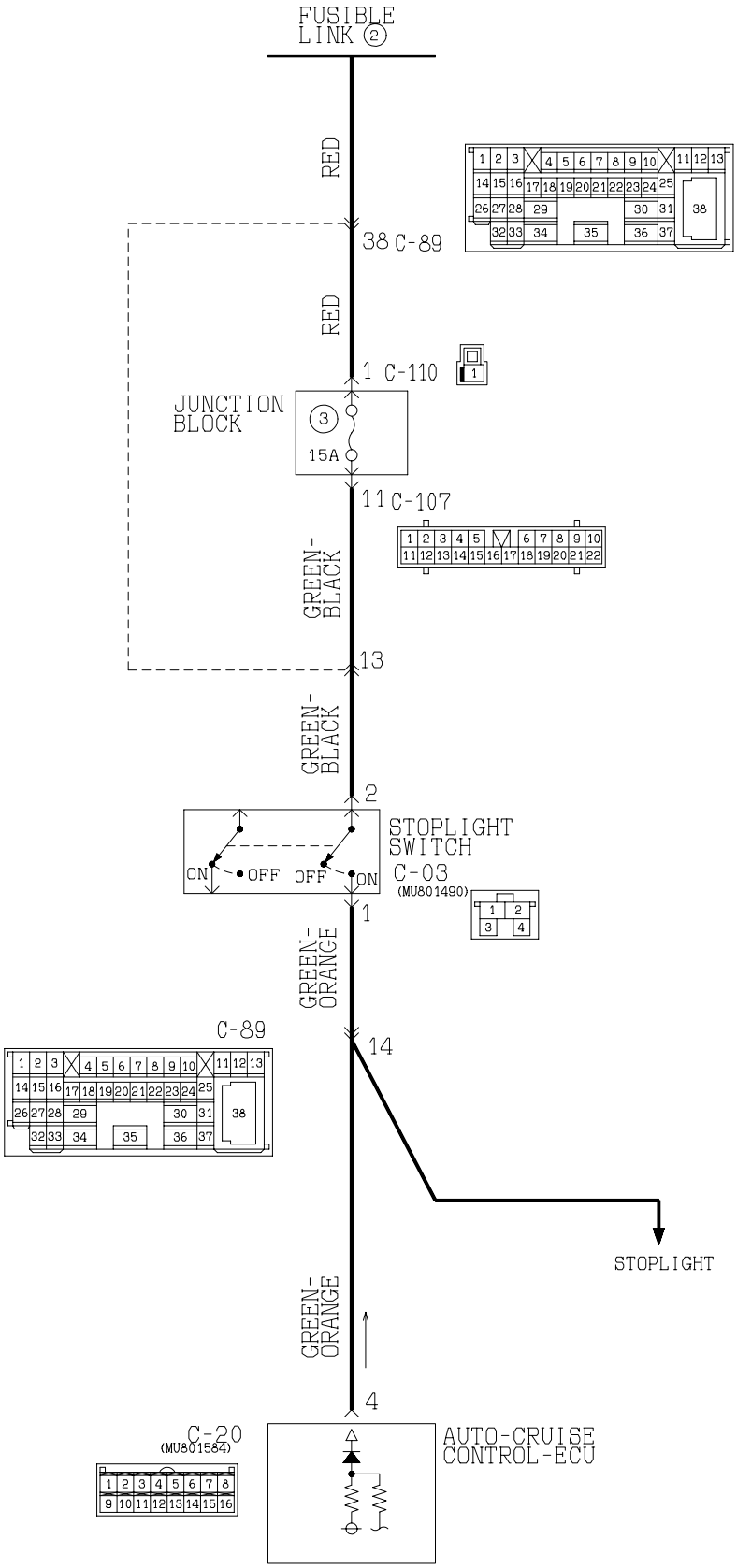
INSPECTION PROCEDURE 2: When the Brake Pedal is Depressed, Auto-cruise Control is not Cancelled.

Stoplight Switch Circuit



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TSB Revision

TRANSAXLE ASSEMBLY

REMOVAL AND INSTALLATION <2.4L ENGINE>

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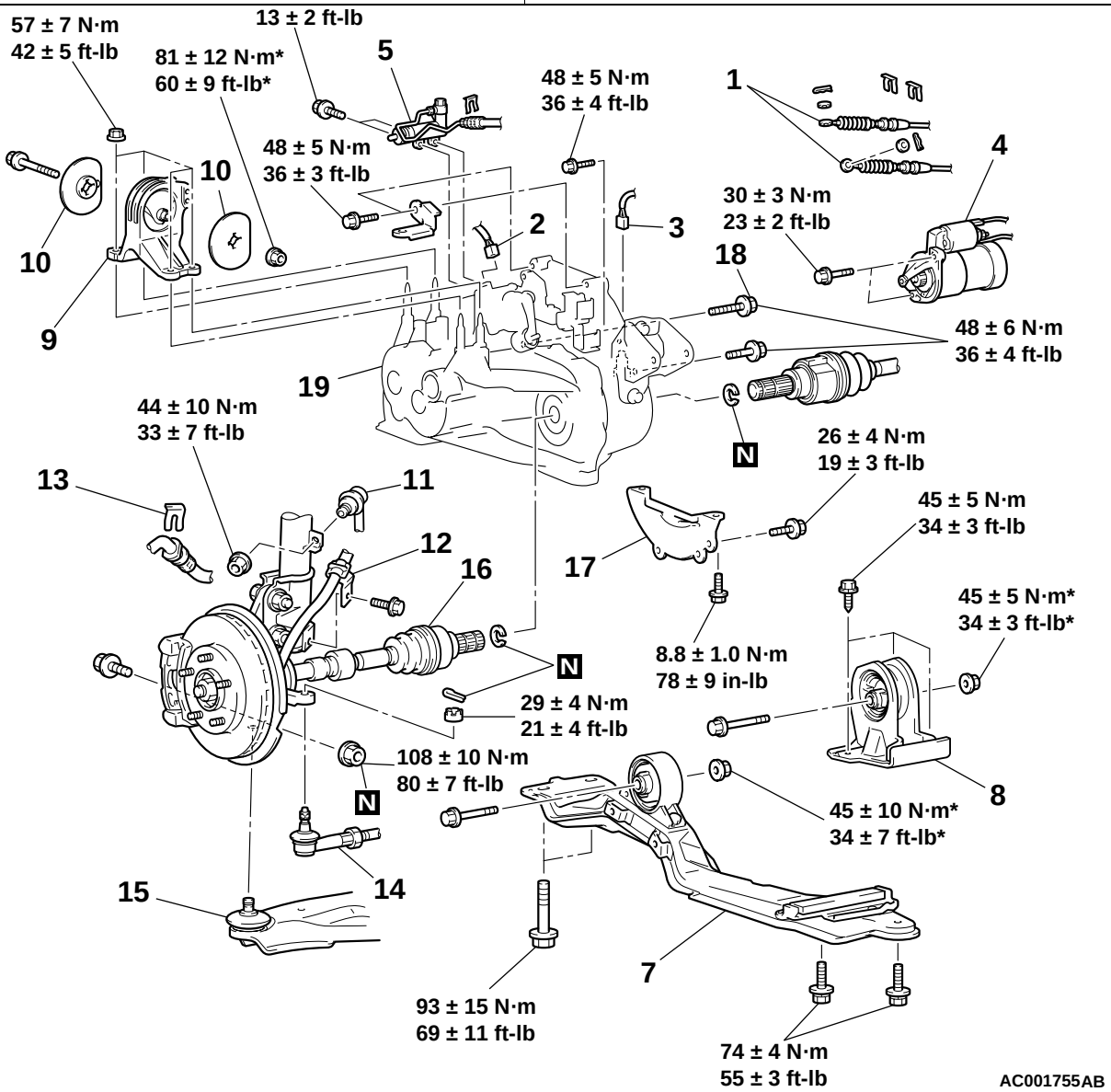
⚠ CAUTION

***: Indicates parts which should be temporarily tightened, and then fully tightened after placing the vehicle fully on the ground and loading the full weight of the engine on the vehicle body.**

Pre-removal Operation	Post-installation Operation
• Transaxle Oil Draining (Refer to P.22A-9.) • Battery and Battery Tray Removal (Refer to GROUP 54A, Battery P.54A-8.) • Air Cleaner Assembly Removal (Refer to GROUP 15, Air Cleaner P.15-5.)	• Air Cleaner Assembly Installation (Refer to GROUP 15, Air Cleaner P.15-5.) • Battery and Battery Tray Installation (Refer to GROUP 54A, Battery P.54A-8.) • Transaxle Oil Refilling (Refer to P.22A-9.) • Check the Dust Cover for Cracks or Damage by Pushing it with Finger • Shift Lever Operation Check • Speedometer Operation Check • Wheel Alignment Adjustment (Refer to GROUP 33, On-vehicle Service – Wheel Alignment Check and Adjustment P.33A-6.)



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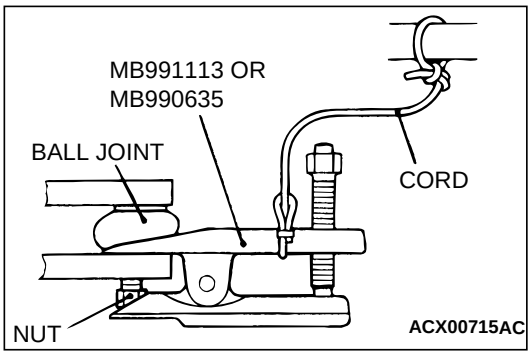


<<E>> TIE ROD END/LOWER ARM BALL JOINT DISCONNECTION

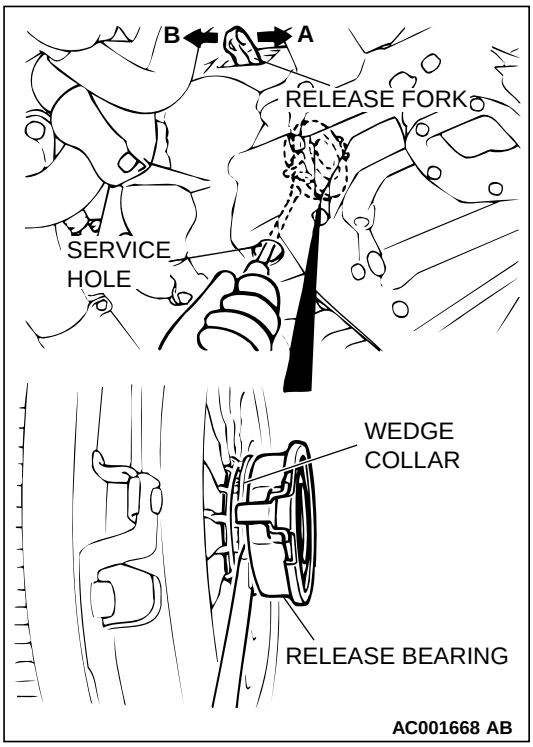
⚠ CAUTION

Use special tool MB991113 to loosen the tie rod end mounting nut. Only loosen the nut; do not remove it from the ball joint.

⚠ CAUTION

Support special tool MB991113 with a cord, etc., to prevent it from coming off.

<<F>> CLUTCH RELEASE BEARING DISENGAGEMENT



1. Remove the service hole plug at the clutch housing.
2. Insert a flat-tipped screwdriver into space between the release bearing and the wedge collar while pushing the release fork to the "A" direction by hand slightly.

⚠ CAUTION

Do not insert the screwdriver before pushing the release fork to the "A" direction.

3. Disengage the wedge collar from the release bearing by using the flat-tipped screwdriver to pry gently (twisting the screwdriver handle 90 degree).

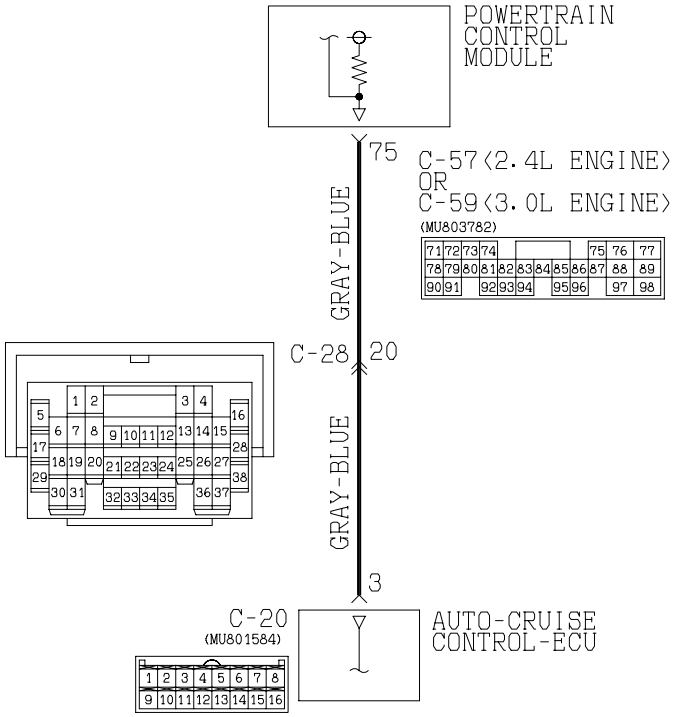
   NOTE: If the release bearing is disengaged, the release fork will move fully to the

⚠ CAUTION

If the screwdriver cannot be twisted easily (the release bearing cannot be disengaged), remove the screwdriver, and push the release fork to the "A" direction two or three times to try again. If the clutch release bearing is pried forcibly, it will be damaged.

INSPECTION PROCEDURE 16: Transaxle won't Downshift under Load with Auto-cruise Engaged.

Auto-cruise Signal Line System Circuit



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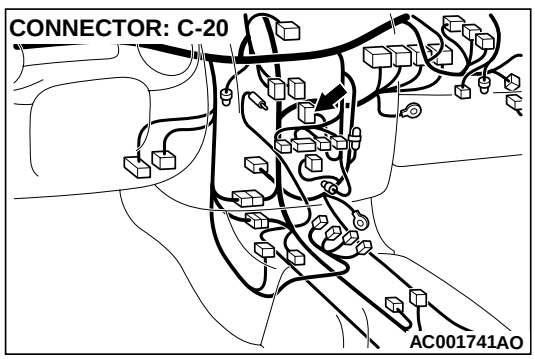

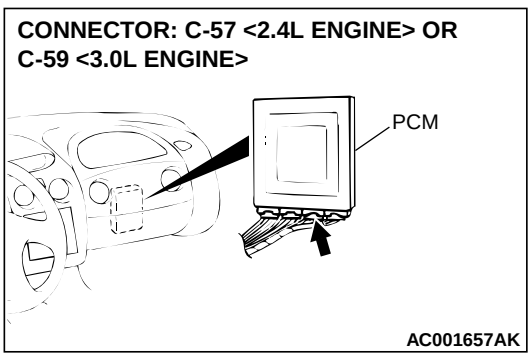

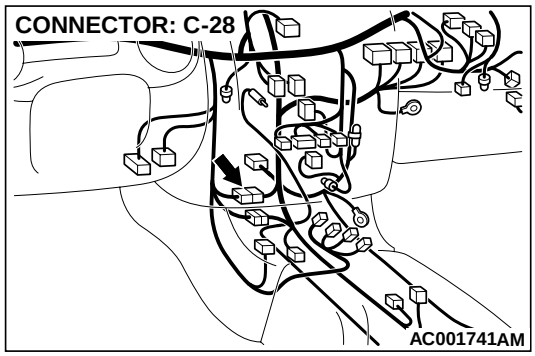

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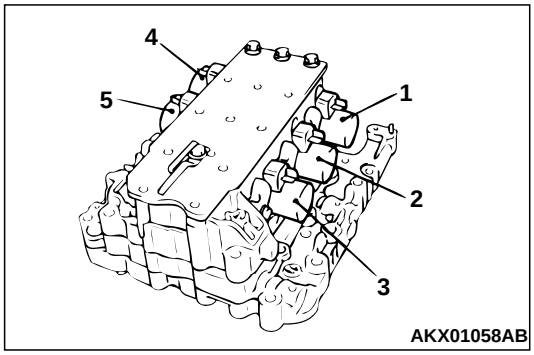
DISASSEMBLY SERVICE POINT

<<A>> SOLENOID VALVES REMOVAL

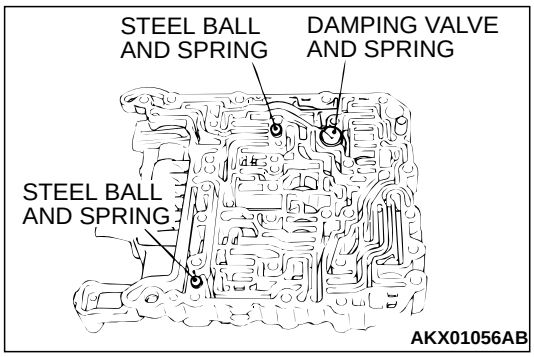
Mark the solenoid valves with white paint to make assembly easier.



ASSEMBLY SERVICE POINTS

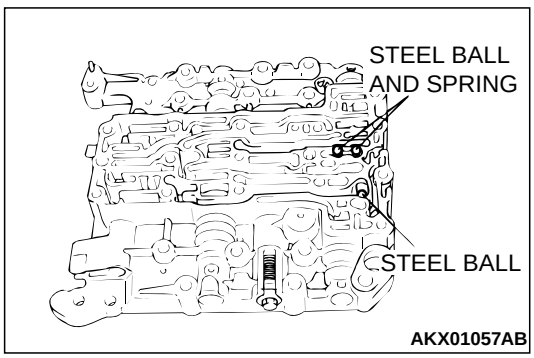
>>A<< SPRING, STEEL BALL, DAMPING VALVE AND DAMPING VALVE SPRING INSTALLATION

1. Install the two steel balls and two springs to the inside valve body as shown.
2. Install the damping valve and spring to the inside valve body as shown.



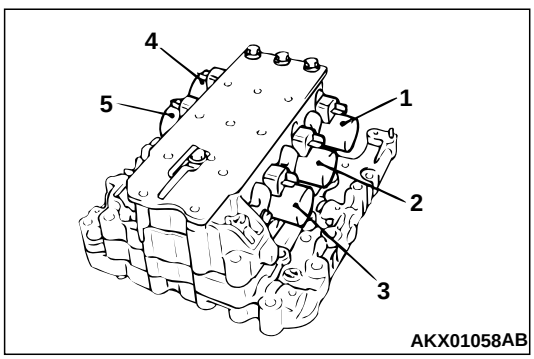
>>B<< SPRING AND STEEL BALL INSTALLATION

Install the three steel balls and two springs to the inside valve body as shown.



>>C<< SOLENOID VALVES INSTALLATION

1. Apply ATF or petroleum jelly (Vaseline) to the O-ring and install carefully.
2. Install the solenoid valves by referring to the marks applied during disassembly.



NO.	NAME
1	Underdrive solenoid valve
2	Second solenoid valve

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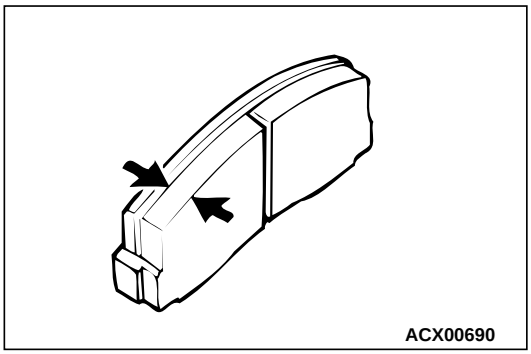

ACX00690

PAD WEAR CHECK

⚠ *WARNING*

- ***Always replace both brake pads on each wheel as a set (both front wheels or both rear wheels). Failure to do so will result in uneven braking, which may cause unreliable brake operation.***
- ***If there is significant difference in the thickness of the pads on the left and right sides, check the sliding condition of the piston, lock pin and guide pin.***

Measure thickness at the thinnest and most worn area of the pad.

Replace the pad assembly if pad thickness is less than the limit value.

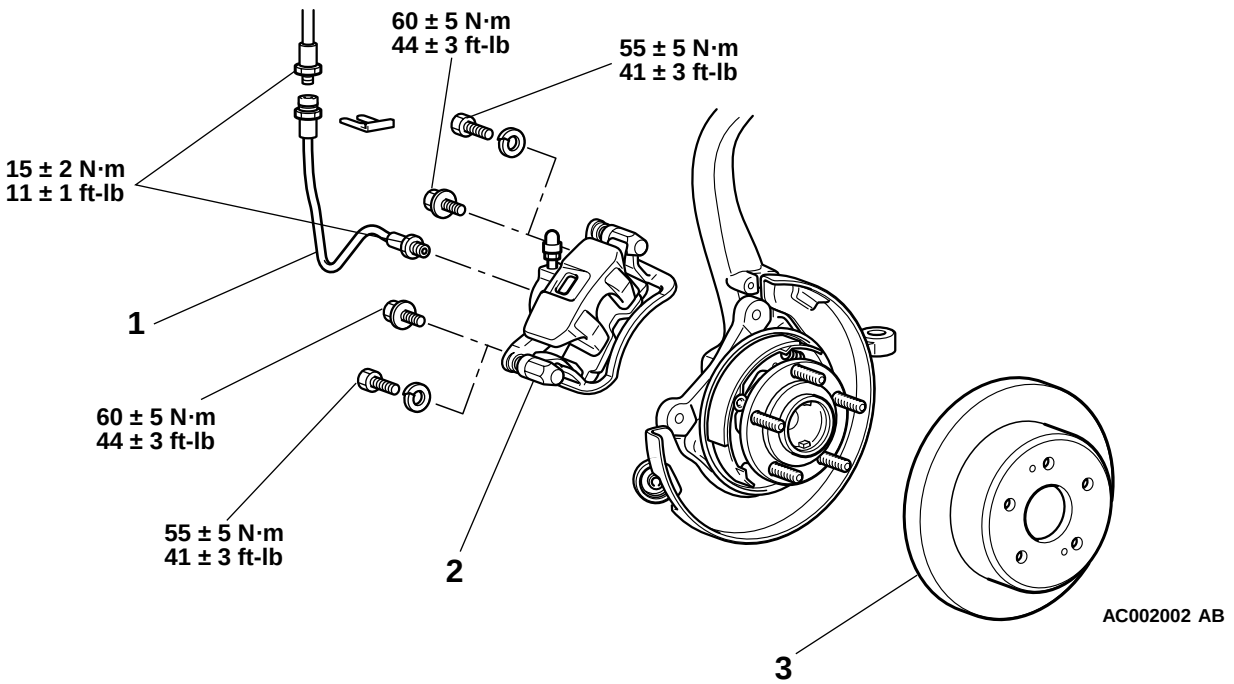
Standard value: 10 mm (0.39 inch)
Minimum limit: 2.0 mm (0.08 inch)

REAR DISC BRAKE ASSEMBLY

REMOVAL AND INSTALLATION

M1351007000068

Pre-removal Operation	Post-installation Operation
• Brake Fluid Draining	• Brake Fluid Supplying • Brake Line Bleeding (Refer to P.35A-22.)



REMOVAL STEPS

1. BRAKE HOSE
>>A<< 2. REAR BRAKE ASSEMBLY
3. BRAKE DISC

Required Special Tool:

- MB990520: Disc Brake Piston Expander

TSB Revision

POWER STEERING GEAR BOX ASSEMBLY

REMOVAL AND INSTALLATION

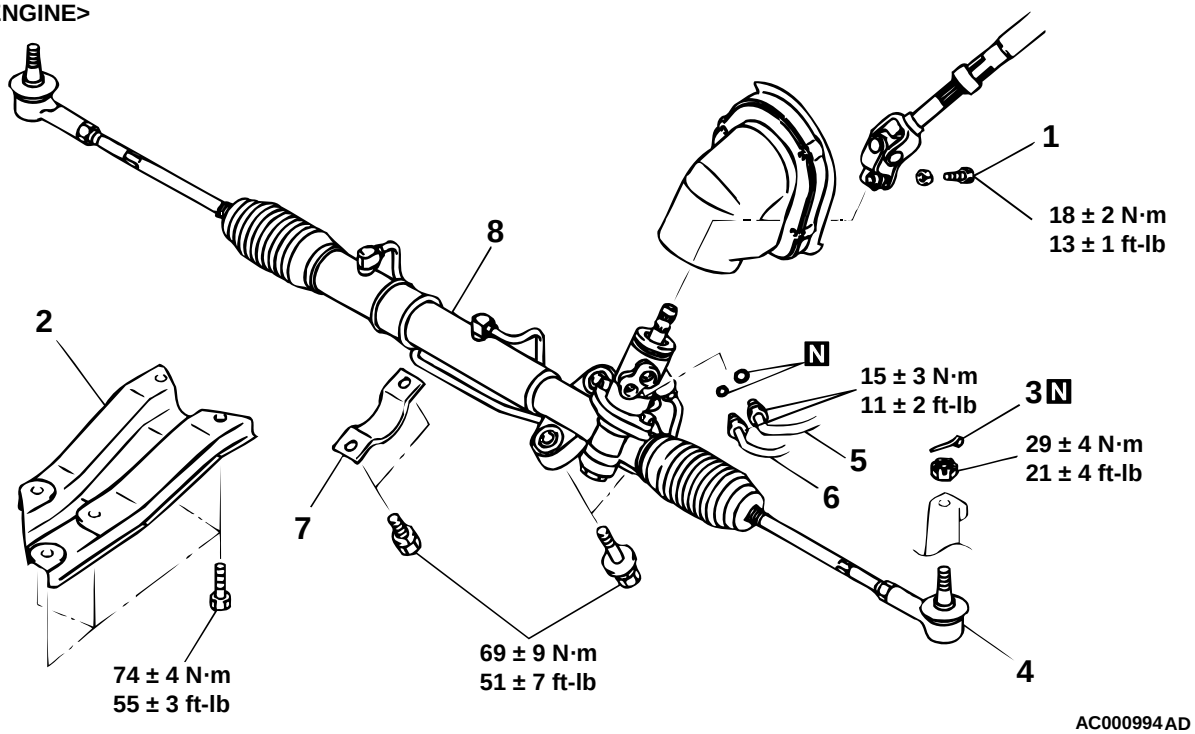
M1372003900075

⚠ WARNING

Before removing the steering gear box, refer to GROUP 52B. Center the front wheels and remove the ignition key. Failure to do so may damage the SRS clock spring and render the SRS system inoperative, risking serious injury.

Pre-removal Operation	Post-installation Operation
• Power Steering Fluid Draining (Refer to P.37A-16.) • Center Member Removal (Refer to GROUP 32, Engine Roll Stopper, Centermember P.32-9.) • Front Exhaust Pipe Removal (2.4L Engine: Refer to GROUP 15, Exhaust Pipe and Main Muffler P.15-19, 3.0L Engine: Refer to GROUP 15, Exhaust Pipe and Main Muffler P.15-21.) • Stabilizer Bar Removal <2.4L Engine> (Refer to GROUP 33A, Stabilizer Bar P.33A-17.)	• Check the Dust Cover for Cracks or Damage by Pushing it with Finger. • Stabilizer Bar Installation <2.4L Engine> (Refer to GROUP 33A, Stabilizer Bar P.33A-17.) • Front Exhaust Pipe Installation (2.4L Engine: Refer to GROUP 15, Exhaust Pipe and Main Muffler P.15-19, 3.0L Engine: Refer to GROUP 15, Exhaust Pipe and Main Muffler P.15-21.) • Center Member Installation (Refer to GROUP 32, Engine Roll Stopper, Centermember P.32-9.) • Power Steering Fluid Supplying (Refer to P.37A-16.) • Power Steering Fluid Line Bleeding (Refer to P.37A-17.) • Checking Steering Wheel Position with Wheels Straight Ahead. • Front Wheel Alignment Adjustment (Refer to GROUP 33A, On-vehicle Service – Front Wheel Alignment Check and Adjustment P.33A-6.)

<2.4L ENGINE>



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