GROUP 36

PARKING BRAKES

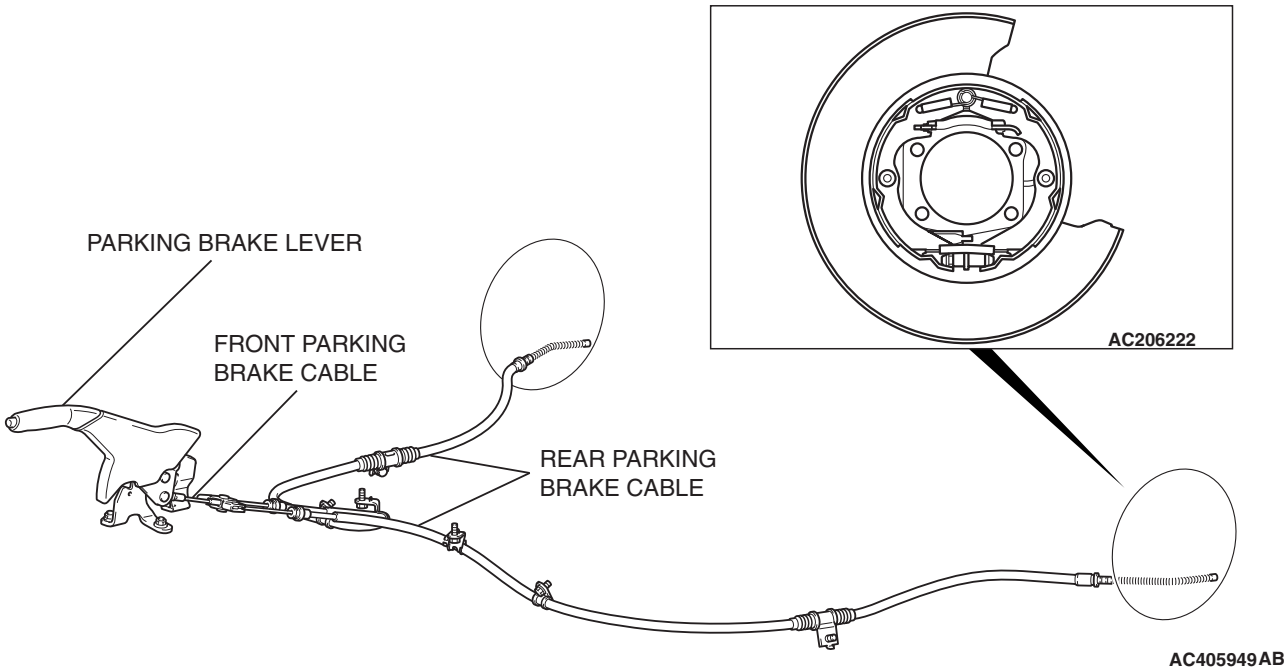
CONTENTS

GENERAL DESCRIPTION

M1361000100559

The parking brakes are a mechanical rear wheel brake design and controlled by a lever.

CONSTRUCTION DIAGRAM



PARKING BRAKE DIAGNOSIS

INTRODUCTION

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If the parking brake is faulty, parking brake effort will become insufficient. The cause may be a malfunction of parking brake parts or the parking brake pedal being out of adjustment.

TROUBLESHOOTING STRATEGY

M1361003800290

Use these steps to plan your diagnostic strategy. If you follow them carefully, you will be sure that you have exhausted most of the possible ways to find a parking brakes fault.

1. Gather Information from the customer.
2. Verify that the condition described by the customer exists.
3. Find the malfunction by following the Symptom Chart.
4. Verify malfunction is eliminated.

SYMPTOM CHART

M1361004100368

SYMPTOM	INSPECTION PROCEDURE	REFERENCE PAGE
Brake drag	–	Refer to GROUP 35A, Basic Brake System Diagnosis –Symptom Chart P.35A-7.
Insufficient parking brake function	1	P.36-3
When the parking brake lever is pulled, the brake warning light does not illuminate.	2	P.36-4
When the parking brake lever is released, the brake warning light does not turn off.	3	P.36-8

SYMPTOM PROCEDURES

INSPECTION PROCEDURE 1: Insufficient Parking Brake Function

DIAGNOSIS

STEP 1. Check the excessive parking brake lever stroke.
Refer to P.36-13.

Q: Is the parking brake lever stroke adjusted properly?
YES : Go to Step 2.
NO : Adjust the parking brake lever stroke or check the parking brake cable routing. Then go to Step 5.

STEP 2. Check the parking brake cable for sticking.

Q: Is the parking brake cable stuck?
YES : Replace the cable. Then go to Step 5.
NO : Go to Step 3.

STEP 3. Check the brake lining and brake drum for wear.
Refer to P.36-21.

Q: Is the brake lining thickness or brake drum inside diameter outside of specification?
YES : Replace the rear brake shoe assembly or rear brake disc (Refer to P.36-18). Then go to Step 5.
NO : Go to Step 4.

STEP 4. Check for oil, water, etc., on the lining contact surfaces.

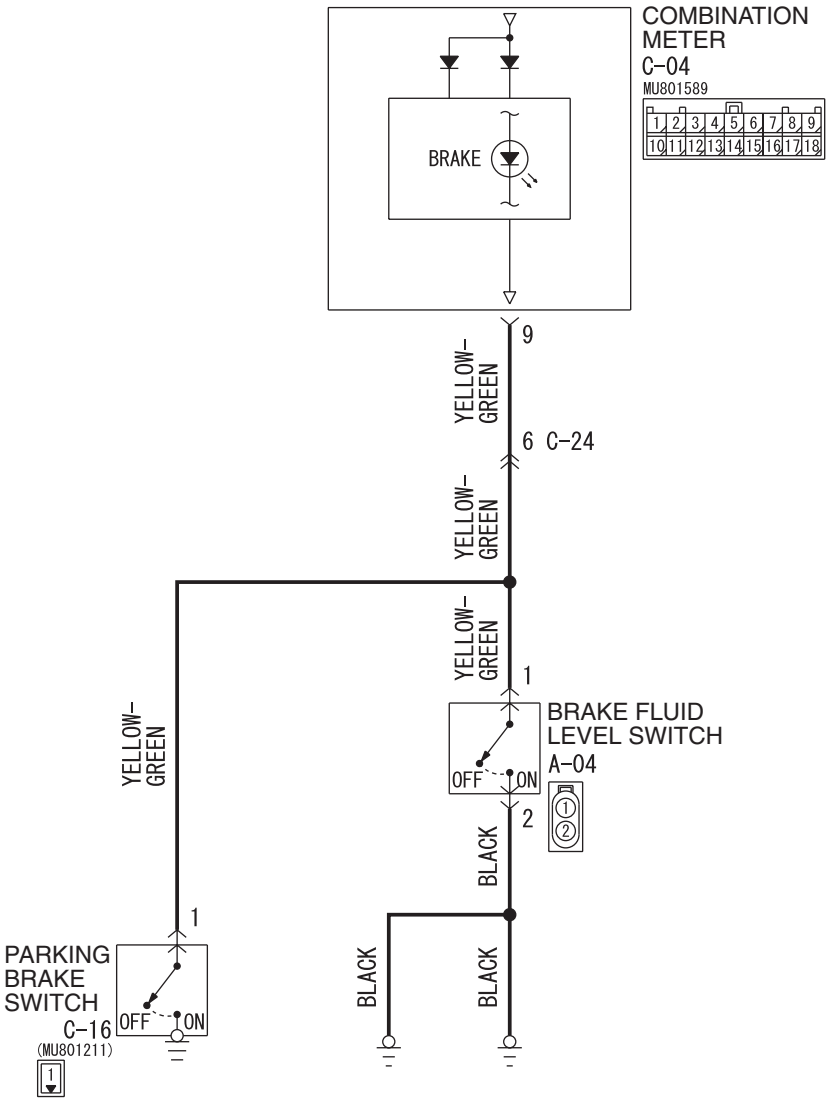
Q: Is oil, water, etc., on the lining contact surface?
YES : Replace the part and determine and repair source/cause of foreign material. Then go to Step 5.
NO : Carry out the parking brake lining seating procedure (Refer to P.36-15) and then go to Step 5.

STEP 5. Retest the system.

Q: Is the malfunction eliminated?
YES : The procedure is complete.
NO : Recheck from Step 1.

INSPECTION PROCEDURE 2: When the Parking Brake Lever is Pulled, the Brake Warning Light does not Illuminate.

Brake Warning Light Circuit



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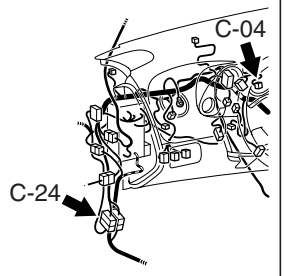
CONNECTORS: C-04, C-24



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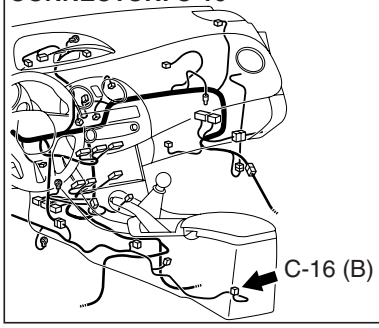
CONNECTOR: C-16



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TECHNICAL DESCRIPTION (COMMENT)

- The parking brake switch turns on and off by operating the parking brake lever, and the brake warning light illuminates and goes out, indicating the operating status of parking brake to a driver.
- The brake fluid level switch is installed to the master cylinder and the switch turns on when the brake fluid reach the lower level. Therefore, the brake warning light illuminates to indicate the status to the driver.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)

- Damaged wiring harness or connector
- Brake fluid level switch defective
- Parking brake switch defective
- Combination meter defective

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: MUT-III USB Cable
  - MB991910: MUT-III Main Harness A

STEP 1. Using scan tool MB991958, check combination meter actuator test.

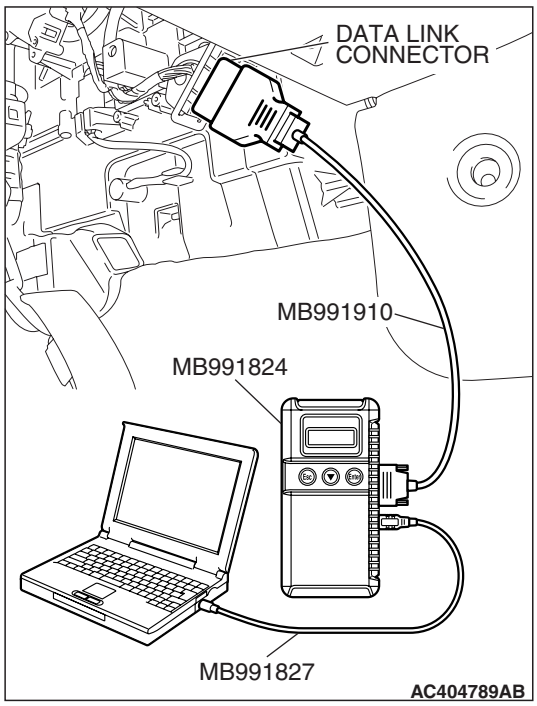
⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Turn the parking brake switch and brake fluid level switch to "OFF" position.
(4) Set scan tool MB991958 to the actuator test mode.
  - Item 20: Indicator lamp 1: ON
    - The brake warning light illuminates..
  - Item 21: Indicator lamp 1: OFF
    - The brake warning light goes out.
(5) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Replace the combination meter (Refer to GROUP 54A, Combination meter assembly P.54A-131).



STEP 2. Check the parking brake switch.

Refer to P.36-14.

Q: Is the parking brake switch normal?

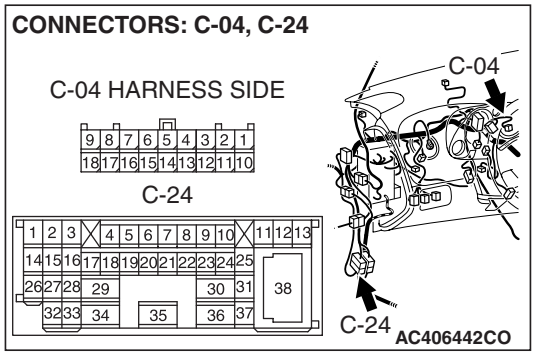
YES : Go to Step 3.
NO : Replace the parking brake switch. then go to Step Step 7.

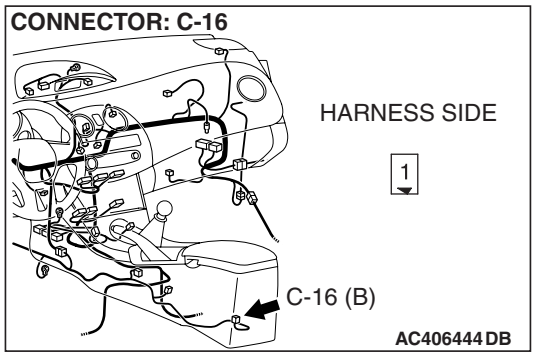
STEP 3. Check parking brake switch connector C-16, intermediate connector C-24 and combination meter connector C-04 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 4.

NO : Repair or replace the faulty connector. (Refer to GROUP 00E, Harness Connector Inspection P.00E-2). Then go to Step 7.



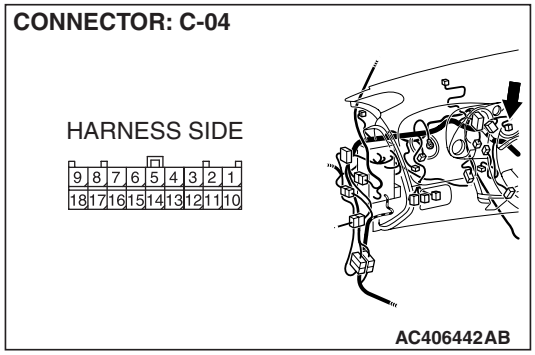


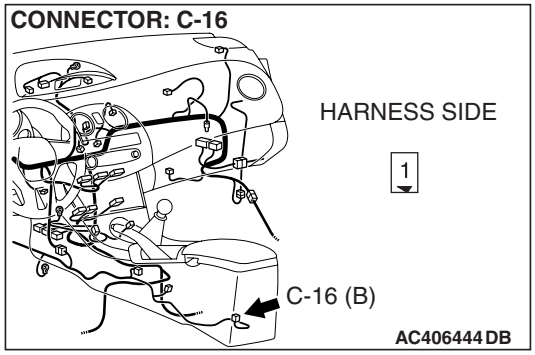
STEP 4. Check the harness wire parking brake switch connector C-16 terminal 1 and combination meter connector C-04 terminal 9 for damage.

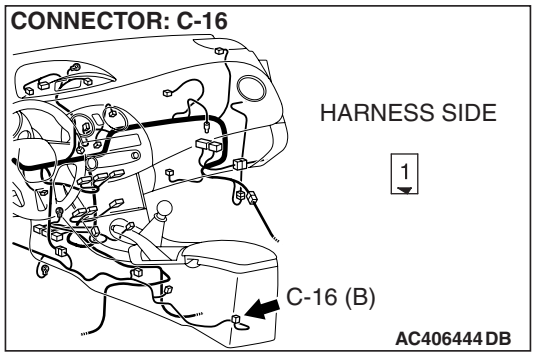
Q: Are the harness wires in good condition?

YES : Go to Step 5.

NO : Repair the damaged harness wire. Then go to Step 7.







STEP 5. Check the parking brake switch ground for damage.

Q: Is the parking brake switch ground in good condition?

YES : Go to Step 6.

NO : Repair the ground or damaged harness wire. Then go to Step 7.

STEP 6. Retest the system.

Q: Does the brake warning light illuminate when the parking brake lever is pull?

YES : It can be assumed that this malfunction is intermittent. (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-14).

NO : Replace the combination meter (Refer to GROUP 54A, Combination meter assembly P.54A-131).

STEP 7. Retest the system

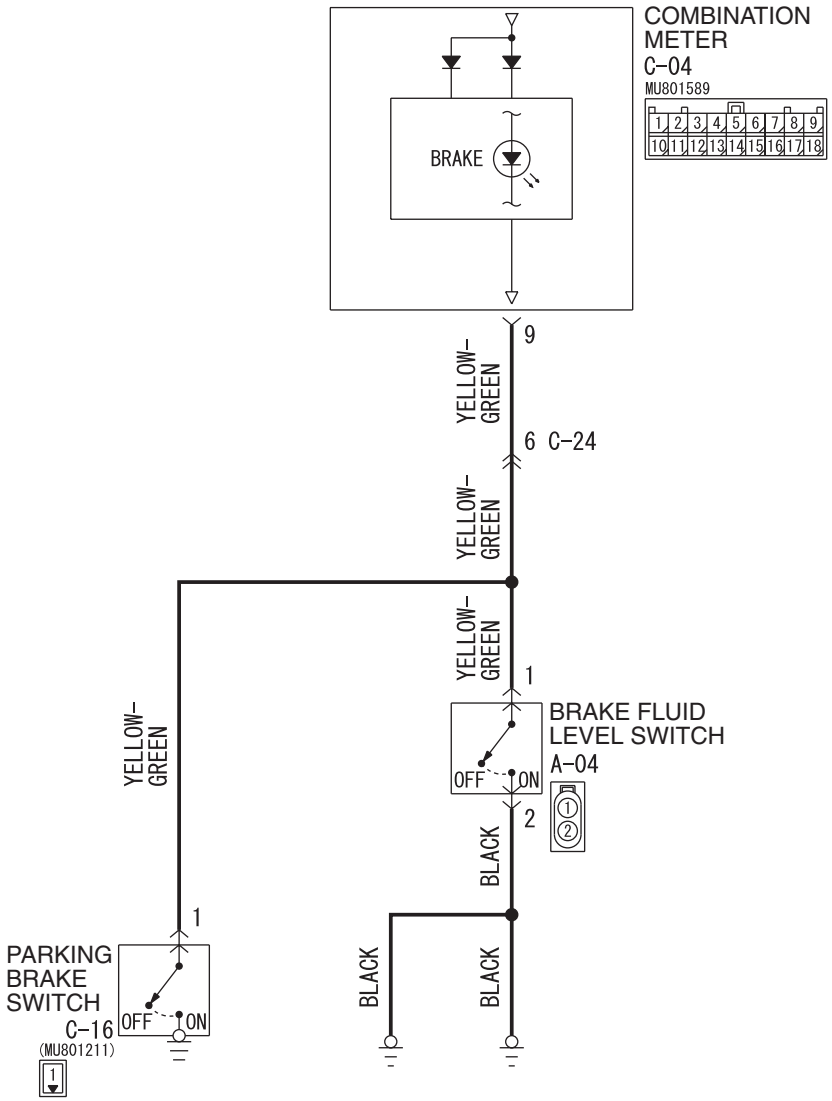
Q: Does the brake warning light illuminate when the parking brake lever is pulled?

YES : The procedure is complete.

NO : Return to Step 1.

INSPECTION PROCEDURE 3: When the Parking Brake Lever is Released, the Brake Warning Light does not Turn Off.

Brake Warning Light Circuit



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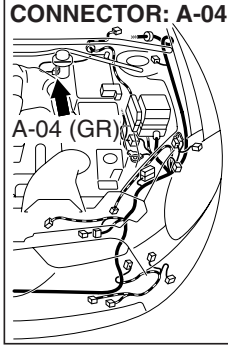
CONNECTOR: A-04



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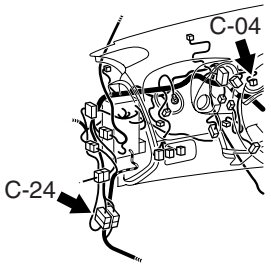
CONNECTORS: C-04, C-24



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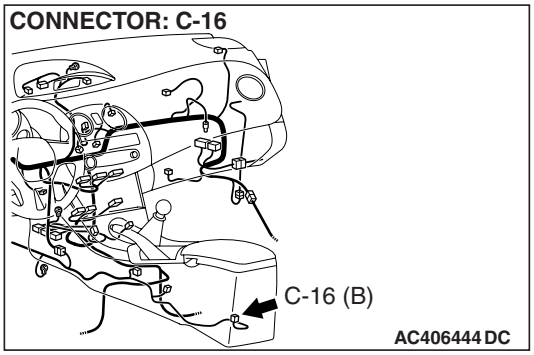

TECHNICAL DESCRIPTION (COMMENT)

- The parking brake switch turns on and off by operating the parking brake lever, and the brake warning light illuminates and goes out, indicating the operating status of parking brake to a driver.
- The brake fluid level switch is installed to the master cylinder and the switch turns on when the brake fluid reach the lower level. Therefore, the brake warning light illuminates to indicate the status to the driver.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)

- Damaged wiring harness or connector
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- Combination meter defective

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: MUT-III USB Cable
  - MB991910: MUT-III Main Harness A

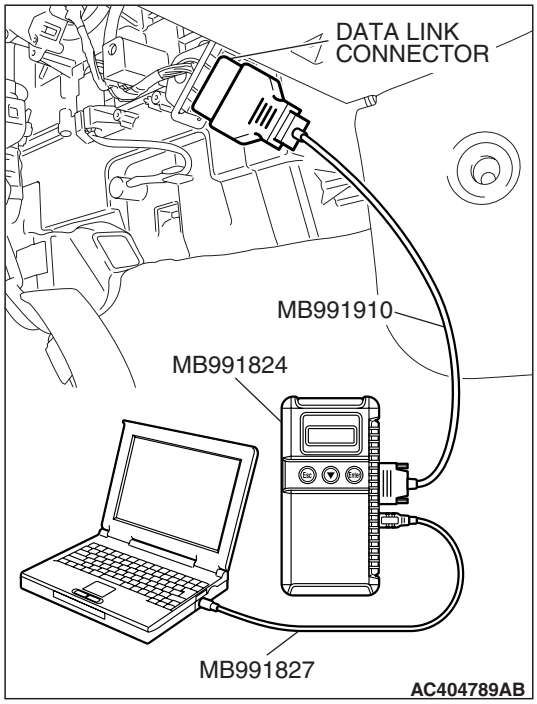
STEP 1. Check the brake fluid level.

Refer to GROUP 35A, On-vehicle Service –Brake Fluid Level Inspection and Bleeding P.35A-17.

Q: Is the brake fluid level within between the lower level and upper level?

YES : Go to Step 2.

NO : Check if the brake pad is worn (Refer to GROUP 35A, On-vehicle service –Disc Brake Pad Check and Replacement P.35A-19). If not, replenish the brake fluid (Refer to GROUP 35A, On-vehicle Service – Brake Fluid Level Inspection and Bleeding P.35A-17). Then go to Step 9.



STEP 2. Using scan tool MB991958, check actuator test.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Turn the parking brake switch and brake fluid level switch to "OFF" position.
(4) Set scan tool MB991958 to the actuator test mode.
- Item 20: Indicator lamp 1: ON
  - The brake warning light illuminates.
- Item 21: Indicator lamp 1: OFF
  - The brake warning light goes out.

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

Q: Is the check result normal?

YES : Go to Step 3.
NO : Replace the combination meter (Refer to GROUP 54A, Combination meter assembly P.54A-131).

STEP 3. Check the parking brake switch.

Refer to P.35A-18.

Q: Is the parking brake switch normal?

YES : Go to Step 4.
NO : Replace the parking brake switch. then go to Step Step 9.

STEP 4. Check the brake fluid level switch.

Refer to GROUP 35A, On-vehicle Service –Brake Fluid Level Switch Check P.35A-18.

Q: Is the parking brake fluid level switch normal?

YES : Go to Step 5.
NO : Replace the brake fluid level switch. then go to Step Step 9.

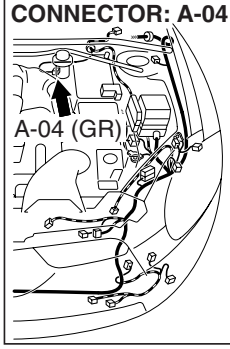
STEP 5. Check parking brake switch connector C-16, brake fluid level switch connector A-04, intermediate connector C-24 and combination meter connector C-04 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 6.

NO : Repair or replace the faulty connector. (Refer to GROUP 00E, Harness Connector Inspection P.00E-2). Then go to Step 9.

CONNECTOR: A-04



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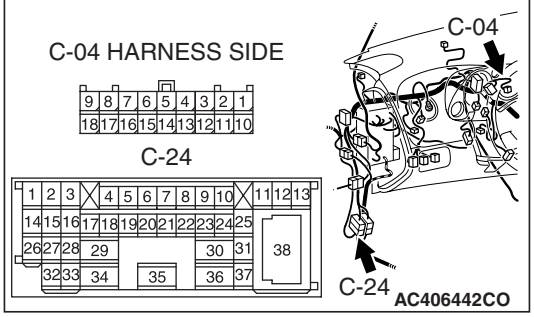
CONNECTORS: C-04, C-24



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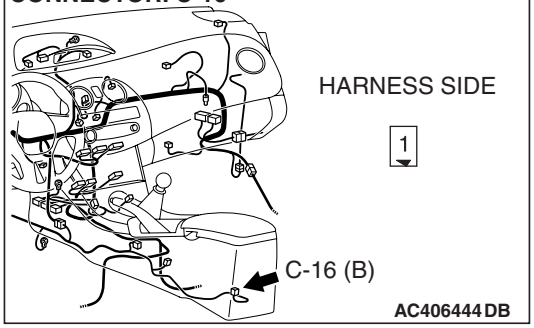
CONNECTOR: C-16



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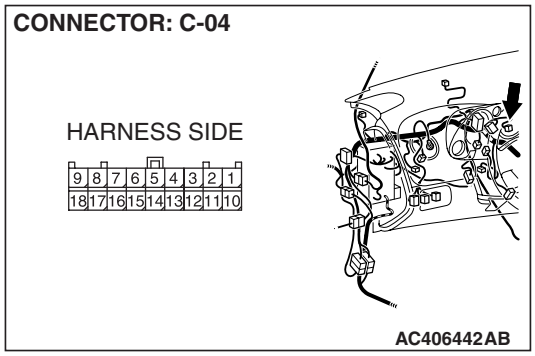
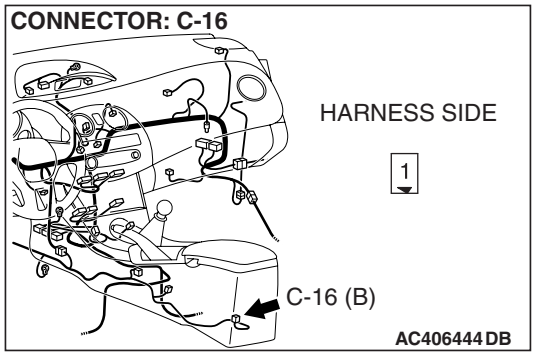
STEP 6. Check the harness wire parking brake switch connector C-16 terminal 1 and combination meter connector C-04 terminal 9 for damage.

Q: Are the harness wires in good condition?

YES : Go to Step 7.

NO : Repair the damaged harness wire. Then go to Step 9.



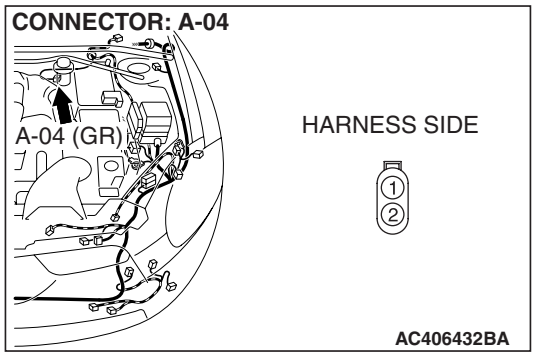


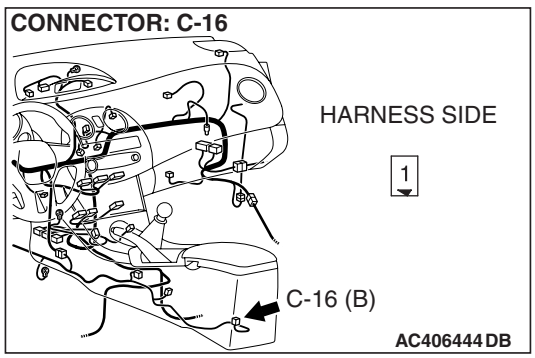
STEP 7. Check the harness wire brake fluid level switch connector A-04 terminal 1 and combination meter connector C-04 terminal 9 for damage.

Q: Are there harness wires in good condition?

YES : Go to Step 8.

NO : Repair the damaged harness wire. Then go to Step 9.





STEP 8. Retest the system

Q: Does the brake warning light turn off when the parking brake lever is release?

YES : It can be assumed that this malfunction is intermittent. (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-14).

NO : Replace the combination meter (Refer to GROUP 54A, Combination meter assembly P.54A-131).

STEP 9. Retest the system

Q: Does the brake warning light turn off when the parking brake lever is released?

YES : The procedure is complete.

NO : Return to Step 1.

ON-VEHICLE SERVICE

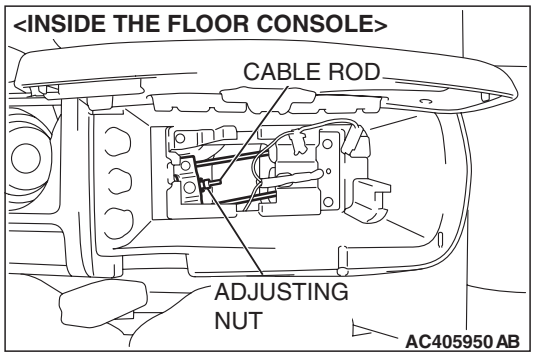
PARKING BRAKE LEVER STROKE CHECK AND ADJUSTMENT

M1361000900533

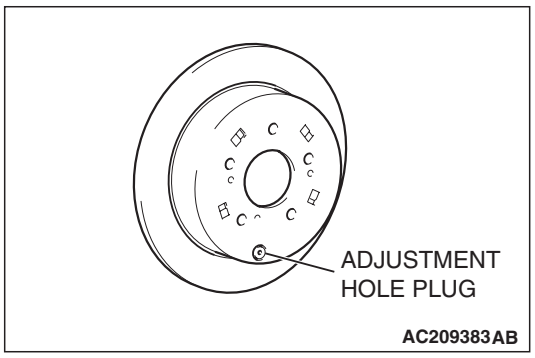
1. Pull the parking brake lever with a force of approximately 200 N (45 pounds) and count the number of notches.

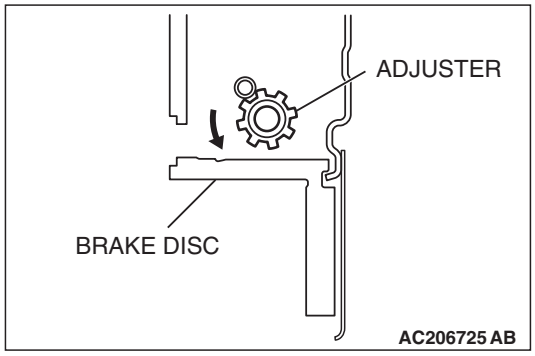
   Standard value: 5 –7 notches

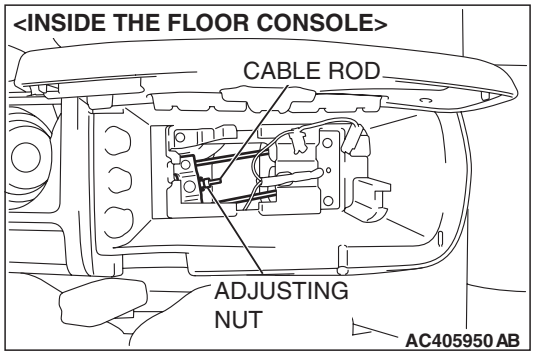
2. If the parking brake lever stroke is not within the standard value, adjust as described below.
   (1) Release the parking brake.
   (2) Remove the console inner box tray and plate (Refer to GROUP 52A, Floor Console Assembly P.52A-28), and then loosen the adjusting nut to move it to the cable rod end so that the cable will be free.

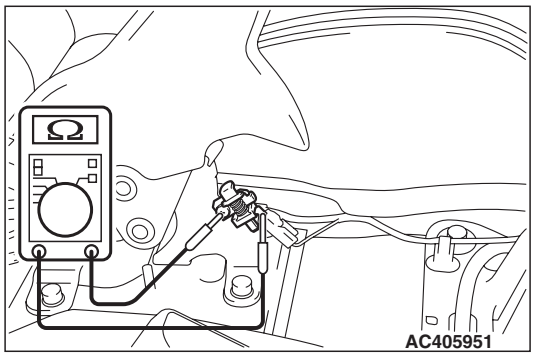


   (3) Remove the rear wheels, and then remove the adjustment hole plug on the brake disc.









(4) Use a flat-tip screwdriver to turn the adjuster in the direction of the arrow (the direction which expands the shoe) so that the disc will not rotate by hand. Return the adjuster five notches in the direction opposite to the direction of the arrow.

(5) Install the rear wheels, and then tighten the wheel nuts to 98 ±10 Nm (73 ±7 ft-lb).

⚠ CAUTION

Be sure that the parking brake lever stroke is within the standard value. If the stroke is too short, brake drag will result.

(6) Turn the adjusting nut to adjust the parking brake lever stroke to the standard value. After adjustment, check that the adjust nut and the cable rod are not loose.

(7) Release the parking brake and turn the rear wheels to check that the rear brakes are not dragging.

3. If either of the parking brake cables is replaced, adjust the parking brake lever stroke as described previously, pull the parking brake lever 10 times with approximately 200 N (45 pounds) to eliminate the initial slack of the cable. Then adjust the parking brake lever stroke again as described previously.

PARKING BRAKE SWITCH CHECK

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1. Remove the floor console (Refer to GROUP 52A, Floor Console P.52A-28).
2. Check for continuity between the parking brake switch terminal and the switch mounting bolt.

When parking brake lever is pulled	2 ohms or less
When parking brake lever is released	Open circuit

PARKING BRAKE LINING SEATING PROCEDURE

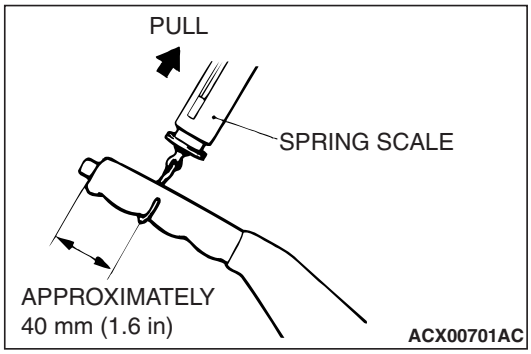
M1361001100392

⚠ CAUTION

Perform lining seating in a place with good visibility, and pay special attention to safety.

Perform lining seating by the following procedure when replacing the parking brake shoe assemblies or the rear brake discs, or when brake performance is insufficient.

1. Adjust the parking brake lever stroke to the standard value (Refer to P.36-13).
2. Hook a spring scale onto the center of the parking brake lever grip and pull it with a force of 98 –147 N (22 –33 pounds) in a direction perpendicular to the handle.
3. Drive the vehicle at a constant speed of 35 –50 km/h (22 –31 mph) for 100 meters (328 feet).
4. Release the parking brake and let the brakes cool for five to ten minutes.
5. Repeat the procedure in steps 2. to 4. four to five times.



PARKING BRAKE LEVER

REMOVAL AND INSTALLATION

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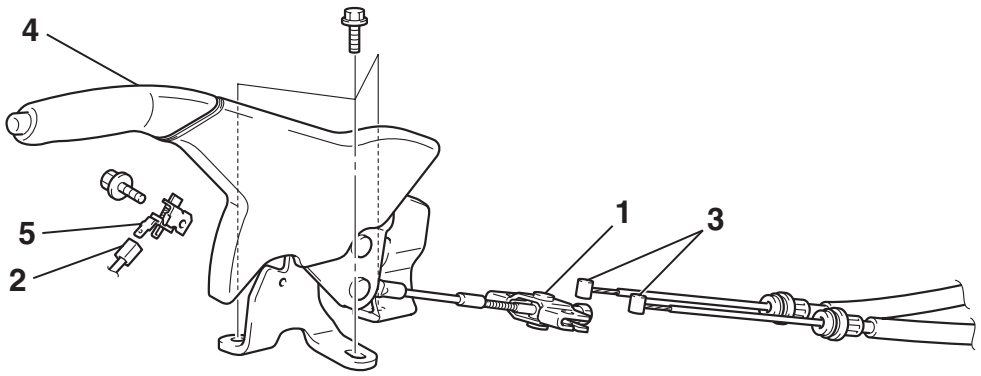
Pre-removal Operation	Post-installation Operation
Rear Floor Console Assembly and Rear Console Bracket Removal (Refer to GROUP 52A, Floor Console P.52A-28).	• Parking Brake Lever Stroke Adjustment (Refer to P.36-13). • Rear Console Bracket and Rear Floor Console Assembly Installation (Refer to GROUP 52A, Floor Console P.52A-28).



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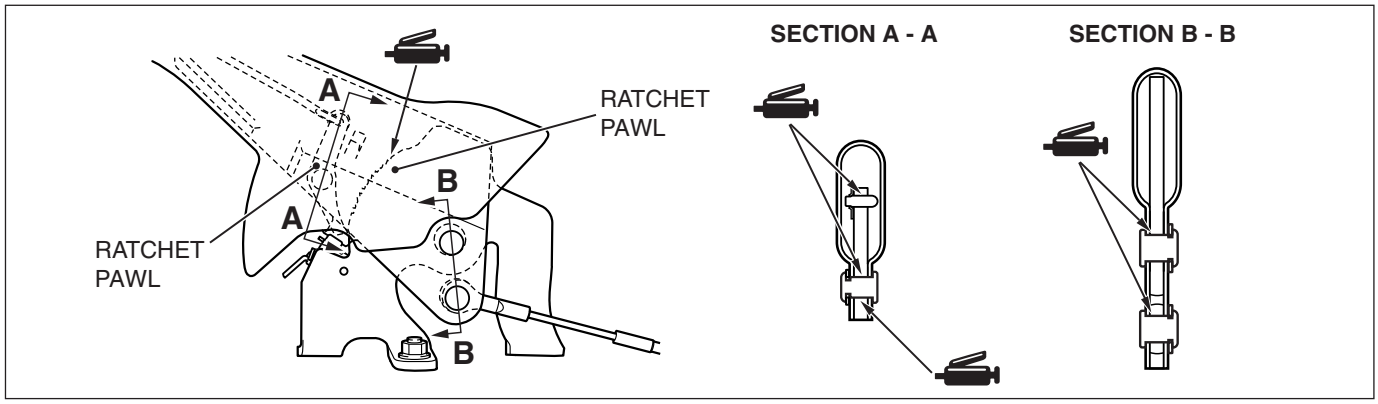

REMOVAL STEPS

1. ADJUSTING NUT
2. PARKING BRAKE SWITCH CONNECTOR
3. PARKING BRAKE CABLE CONNECTION
4. PARKING BRAKE LEVER ASSEMBLY
5. PARKING BRAKE SWITCH

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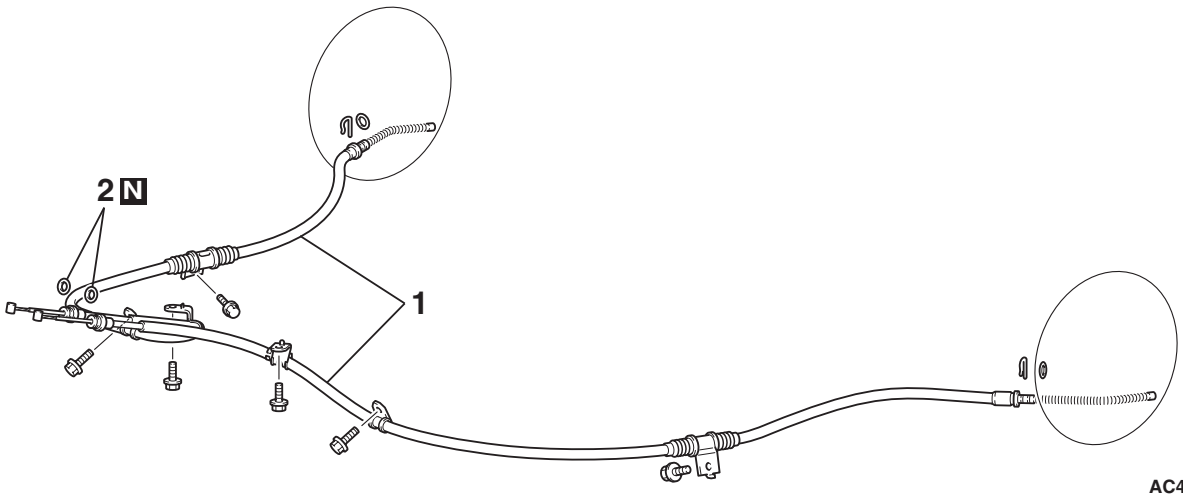
PARKING BRAKE CABLE

REMOVAL AND INSTALLATION

M1361001900893

Pre-removal Operation	Post-installation Operation
• Floor Console Assembly Removal (Refer to GROUP 52A, Floor Console Assembly P.52A-28).	• Floor Console Assembly Installation (Refer to GROUP 52A, Floor Console Assembly P.52A-28). • Parking Brake Lever Stroke Check and Adjustment (Refer to P.36-13).



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REMOVAL STEPS

- SHOE ASSEMBLY (REFER TO P.36-18).
- REAR PARKING BRAKE CABLE TO BACKING PLATE CONNECTION (REFER TO P.36-18).
- FRONT PARKING BRAKE CABLE TO REAR PARKING BRAKE CABLE CONNECTION (REFER TO P.36-16).

1. REAR PARKING BRAKE CABLE
2. O-RING

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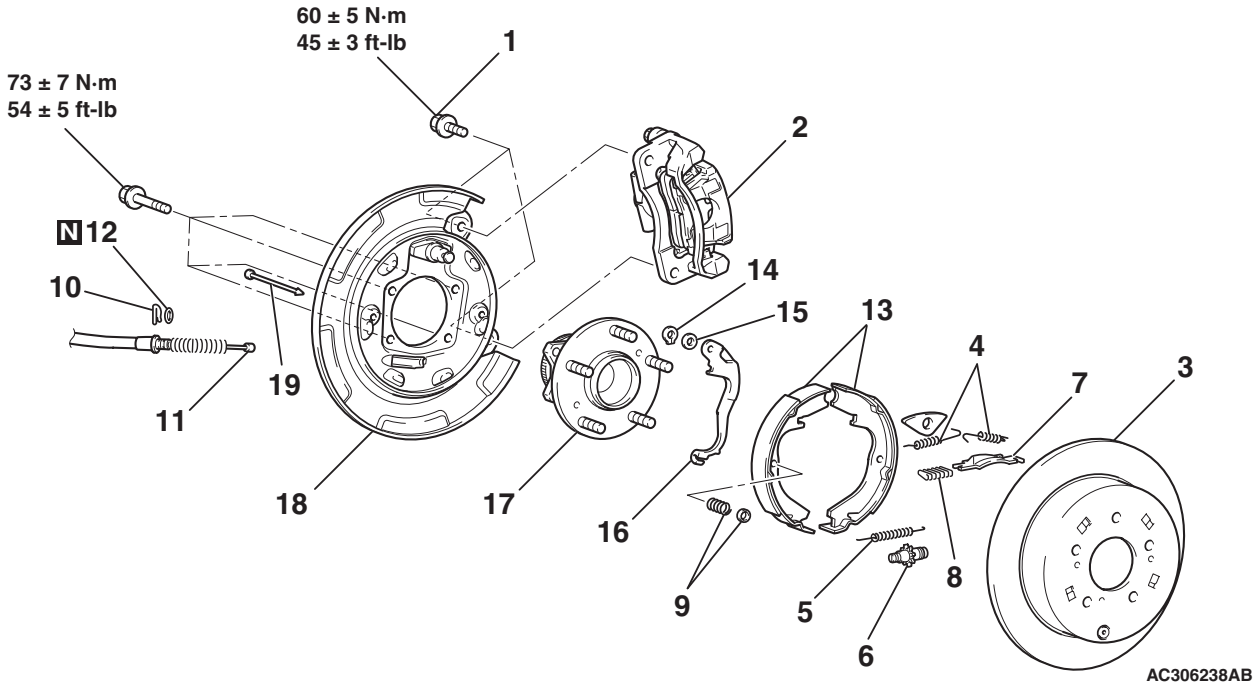
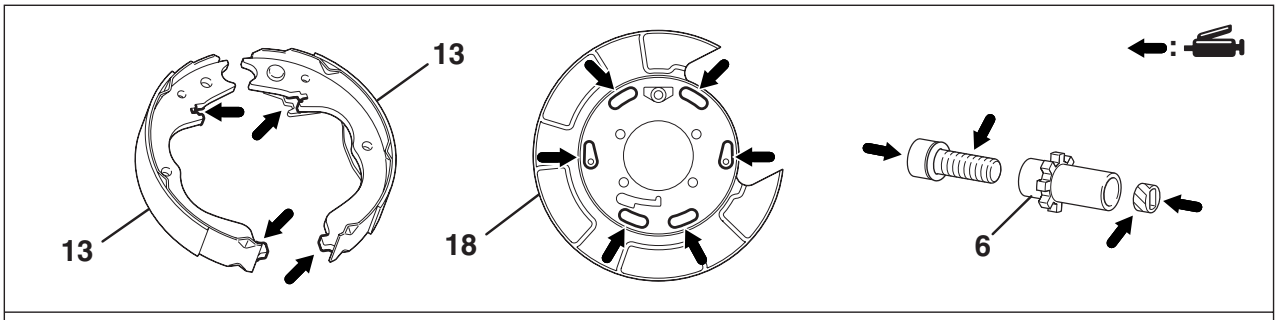
PARKING BRAKE LINING AND DRUM

REMOVAL AND INSTALLATION

M1361002500490

Post-installation Operation
- Parking Brake Lever Stroke Check and Adjustment (Refer to P.36-13).
- Parking Brake Lining Seating (Refer to P.36-15).





REMOVAL STEPS

<<A>> 1. REAR BRAKE BOLT
<<A>> 2. REAR BRAKE CALIPER ASSEMBLY
<<B>> 3. REAR BRAKE DISC
>>C<< 4. SHOE-TO-ANCHOR SPRING
5. ADJUSTING WHEEL SPRING
>>B<< 6. REAR BRAKE SHOE SLACK ADJUSTER
7. PARKING BRAKE OPERATING LEVER STRUT
8. STRUT-TO- SHOE SPRING
9. REAR BRAKE SHOE SPRING CUP AND SHOE HOLD-DOWN SPRING
10. PARKING BRAKE CABLE CLIP

REMOVAL STEPS (Continued)

11. REAR PARKING BRAKE CABLE CONNECTION
12. O-RING
13. REAR BRAKE SHOE ASSEMBLY
<<C>> >>A<< 14. REAR BRAKE CHAMBER RETAINER
15. REAR BRAKE WASHER
16. PARKING BRAKE OPERATING LEVER
- REAR WHEEL SPEED SENSOR (REFER TO GROUP 35B, WHEEL SPEED SENSOR P.35B-145).
17. REAR WHEEL HUB ASSEMBLY
18. BACKING PLATE
19. SHOE HOLD-DOWN PIN

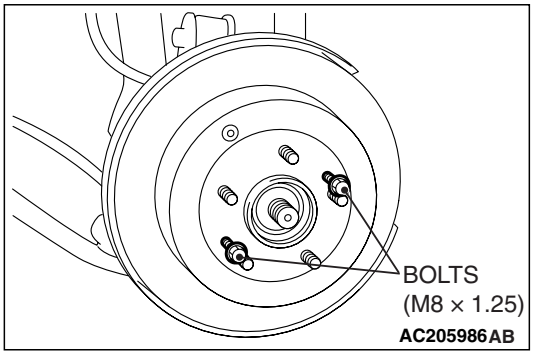
TSB Revision

REMOVAL SERVICE POINTS

<<A>> REAR BRAKE BOLT/REAR BRAKE CALIPER ASSEMBLY REMOVAL

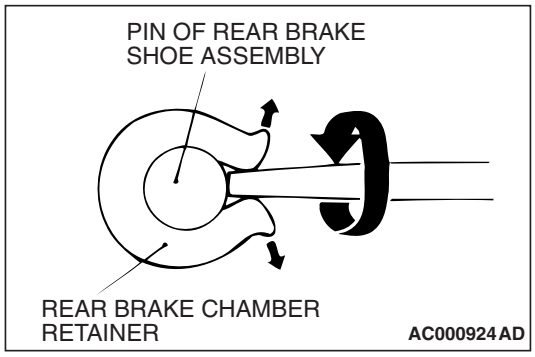
Remove the rear brake caliper assembly and support it with wire or something similar.

<<B>> REAR BRAKE DISC REMOVAL



If the rear brake disc is seized, install M8× 1.25 bolts as shown, and remove the rear brake disc by tightening the bolts evenly and gradually.

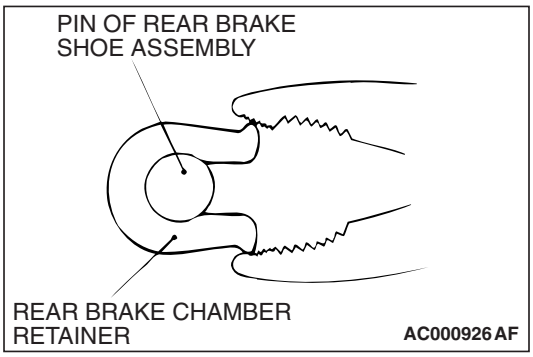
<<C>> REAR BRAKE CHAMBER RETAINER REMOVAL



Use a flat-tipped screwdriver or a similar tool to open up the rear brake chamber retainer joint. Then remove the rear brake chamber retainer.

INSTALLATION SERVICE POINTS

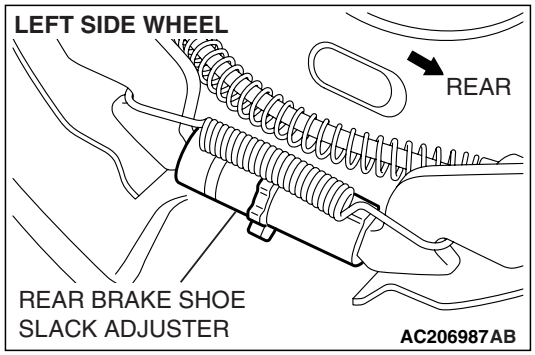
>>A<< REAR BRAKE CHAMBER RETAINER INSTALLATION

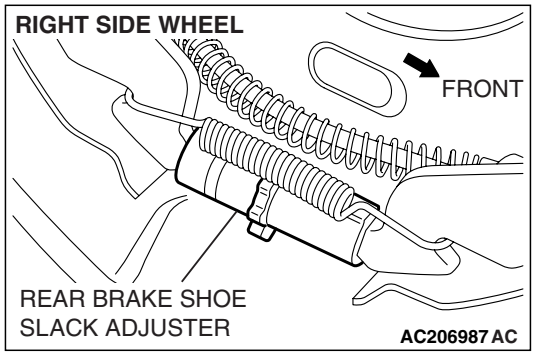


Use pliers or a similar tool to close the rear brake chamber retainer end onto the pin.

>>B<< REAR BRAKE SHOE SLACK ADJUSTER INSTALLATION

Install the rear brake shoe slack adjuster as shown.



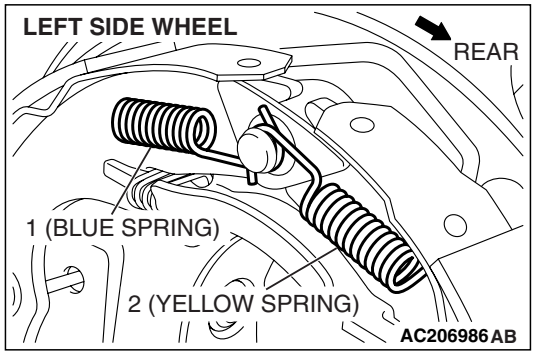


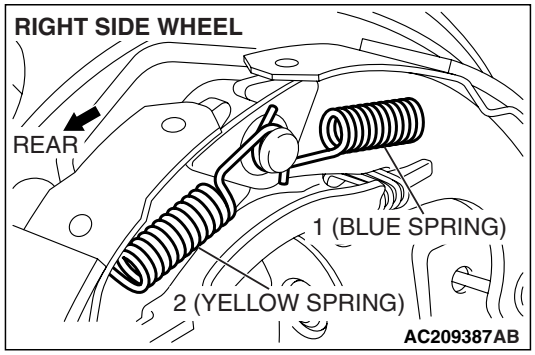
>>C<< SHOE-TO-ANCHOR SPRING INSTALLATION

⚠ CAUTION

The front and rear shoe-to-anchor springs are not interchangeable, so the blue spring must be installed at the front side and the yellow spring must be installed at the rear side.

Install the shoe-to-anchor springs in the order shown in the illustration.

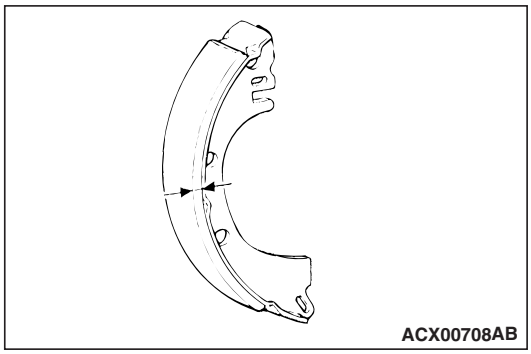




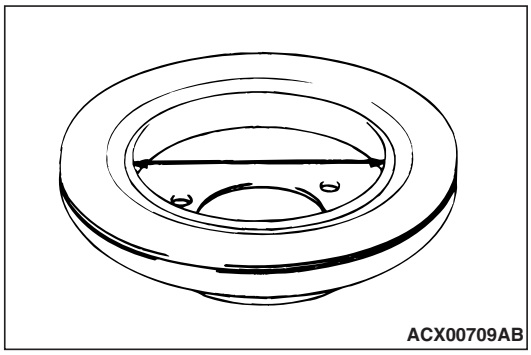
INSPECTION

M1361002600260

PARKING BRAKE LINING AND BRAKE DRUM CHECK


ACX00708AB

1. Measure the thickness of the brake lining at several places.
   Standard value: 2.8 mm (0.11 inch)
   Minimum Limit: 1.0 mm (0.04 inch)
2. If the thickness of the brake lining is below the limit, replace the shoe assemblies on both sides of the vehicle. Never replace only one side.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3. Measure the inside diameter of the brake disc in two places or more.
   Standard value: 168.0 mm (6.61 inches)
   Limit: 169.0 mm (6.65 inches)
4. If the inside diameter exceeds the limit, or if it is excessively worn on one side, replace the brake disc.

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

M1361003500266

ITEM	SPECIFICATION
Parking brake lining and drum	
Rear brake bolt (rear brake caliper assembly mounting bolt)	60 ±5 N· m (45 ±3 ft-lb)
Rear wheel hub assembly mounting bolt	73 ±7 N· m (54 ±5 ft-lb)

SERVICE SPECIFICATIONS

M1361000300650

ITEM	STANDARD VALUE	LIMIT
Parking brake lever stroke [Parking brake lever pull force: Approximately 200 N (45 pounds)]	5 –7 notches	–
Rear brake lining thickness mm (in)	2.8 (0.11)	Minimum 1.0 (0.04)
Brake drum inside diameter mm (in)	168.0 (6.61)	169.0 (6.65)

LUBRICANT

M1361000400301

ITEM	SPECIFIED LUBRICANT
Rear brake shoe slack adjuster	Brake grease SAE J310, NLGI No.1
Backing plate	
Rear brake shoe assembly	