

GROUP 36

PARKING BRAKES

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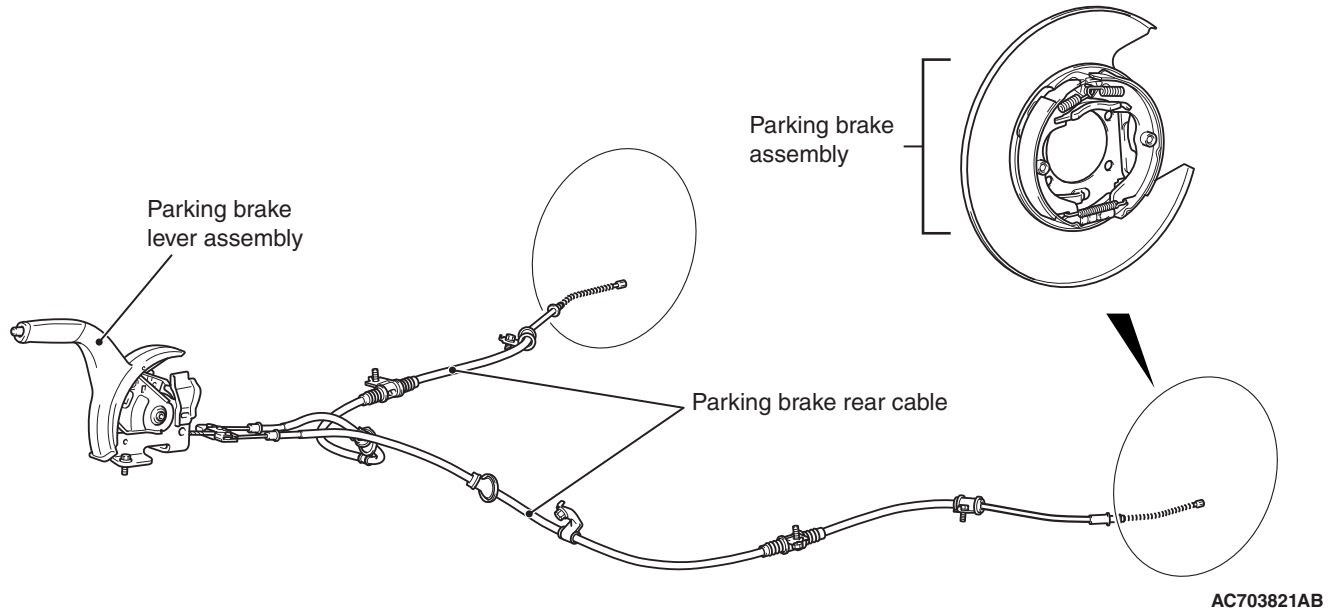
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GENERAL INFORMATION

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

CONSTRUCTION DIAGRAM



SERVICE SPECIFICATIONS

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Item	Standard value	Limit
Parking brake lever stroke [Control force: approximately 200 N (45 pounds)]	3 to 5 notches	–
Brake lining thickness mm (in)	2.8 (0.11)	1.0 (0.04)
Brake drum inside diameter mm (in)	190.0 (7.48)	191.0 (7.52)

PARKING BRAKE DIAGNOSIS

INTRODUCTION

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 lever being out of adjustment.

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TROUBLESHOOTING STRATEGY

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.

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SYMPTOM CHART

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Symptom	Inspection procedure	Reference page
Brake drag	–	Refer to GROUP 35A, Basic Brake System Diagnosis –Symptom Chart P.35A-4 .
Brake warning light stays ON with the parking brake lever released.	–	Refer to GROUP 35C, ASC Diagnosis –Symptom Chart P.35C-234 .
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

SYMPTOM PROCEDURES

INSPECTION PROCEDURE 1: Insufficient Parking Brake Function

DIAGNOSIS

STEP 1. Check the excessive parking brake lever stroke.

Refer to [P.36-8](#).

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 (Refer to [P.36-8](#)). Then go to Step 5.

STEP 2. Check the parking brake rear cable for sticking.

Q: Is the parking brake rear cable stuck?

YES : Replace the parking brake rear cable (Refer to [P.36-12](#)). Then go to Step 5.

NO : Go to Step 3.

STEP 3. Check the brake lining and brake drum for wear.

Refer to [P.36-17](#).

Q: Is the brake lining thickness or brake drum inside diameter outside of specification?

YES : Replace the rear brake shoe assembly or rear brake disk (Refer to [P.36-14](#)). 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.36-9](#)) and then go to Step 5.

STEP 5. Retest the system.

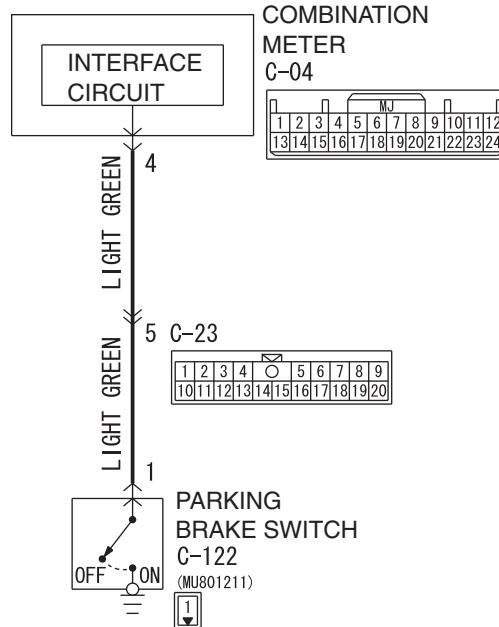
Q: Is the malfunction eliminated?

YES : The procedure is complete.

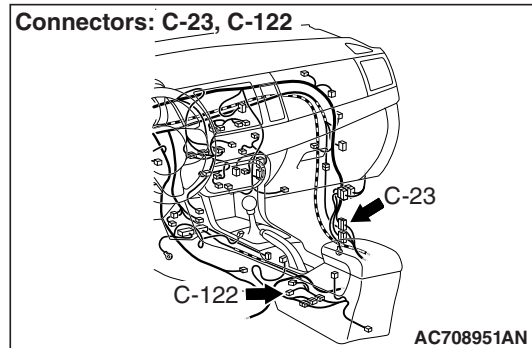
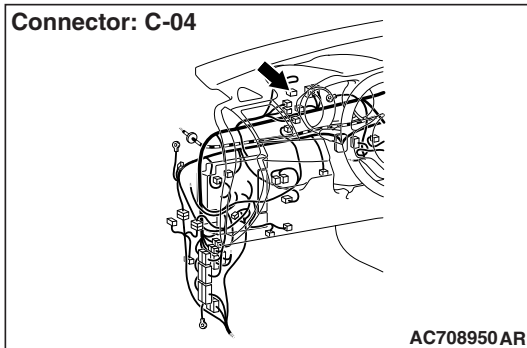
NO : Recheck from Step 1.

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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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.

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

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

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
 - MB991824: Vehicle Communication Interface (V.C.I.)
 - MB991827: M.U.T.-III USB Cable
 - MB991910: M.U.T.-III Main Harness A

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

⚠ CAUTION

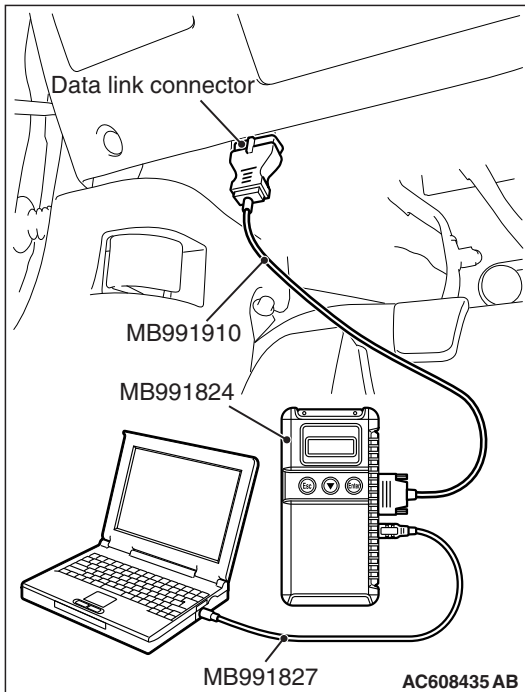
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (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 13: Indicator4: ON
 - The brake warning light illuminates.
 - Item 13: Indicator4: 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-110).



STEP 2. Check the parking brake switch.

Refer to P.36-9.

Q: Is the parking brake switch normal?

YES : Go to Step 3.

NO : Replace the parking brake switch (Refer to P.36-10). Then go to Step 6.

STEP 3. Connector check: C-122 parking brake switch connector, C-23 intermediate connector and C-04 combination meter connector

Q: Is the check result normal?

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 6.

STEP 4. Check the wiring harness for an open circuit between C-122 parking brake switch connector terminal No.1 and C-04 combination meter connector terminal No.4.

- (1) Disconnect C-122 parking brake switch connector from C-04 combination meter connector, and measure at the wiring harness side connector.
- (2) Measure the resistance between C-122 parking brake switch connector terminal No.1 and C-04 combination meter connector terminal No.4.

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?

YES : Go to Step 5.

NO : A open circuit may be present in the wiring harness between C-122 parking brake switch connector terminal No.1 and C-04 combination meter connector terminal No.4. Repair the wiring harness if necessary, and then go to Step 6.

STEP 5. 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.00-15](#)).

NO : Replace the combination meter (Refer to GROUP 54A, Combination meter assembly [P.54A-110](#)).

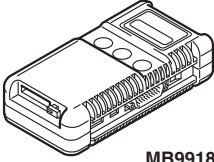
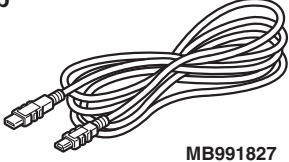
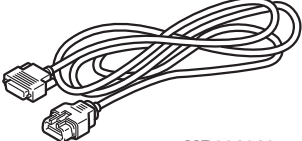
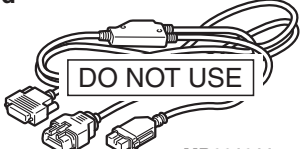
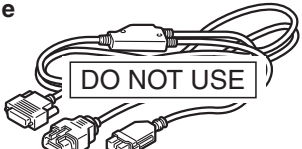
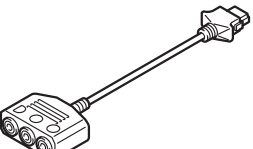
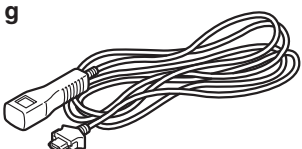
STEP 6. Retest the system.**Q: Does the brake warning light illuminate when the parking brake lever is pulled?**

YES : The procedure is complete.

NO : Return to Step 1.

SPECIAL TOOL

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Tool	Tool number and name	Supersession	Application
<p>a</p>  <p>MB991824</p> <p>b</p>  <p>MB991827</p> <p>c</p>  <p>MB991910</p> <p>d</p>  <p>MB991911</p> <p>e</p>  <p>MB991914</p> <p>f</p>  <p>MB991825</p> <p>g</p>  <p>MB991826 MB991958</p>	<p>MB991958</p> <p>a. MB991824 b. MB991827 c. MB991910 d. MB991911 e. MB991914 f. MB991825 g. MB991826</p> <p>M.U.T.-III sub assembly</p> <p>a. Vehicle communication interface (V.C.I.) b. M.U.T.-III USB cable c. M.U.T.-III main harness A (Vehicles with CAN communication system) d. M.U.T.-III main harness B (Vehicles without CAN communication system) e. M.U.T.-III main harness C (for Daimler Chrysler models only) f. M.U.T.-III measurement adapter g. M.U.T.-III trigger harness</p>	<p>MB991824-KIT</p>	<p>⚠ CAUTION M.U.T.-III main harness A (MB991910) should be used. M.U.T.-III main harness B and C should not be used for this vehicle. Actuator test check</p>

ON-VEHICLE SERVICE**PARKING BRAKE LEVER STROKE CHECK AND ADJUSTMENT**

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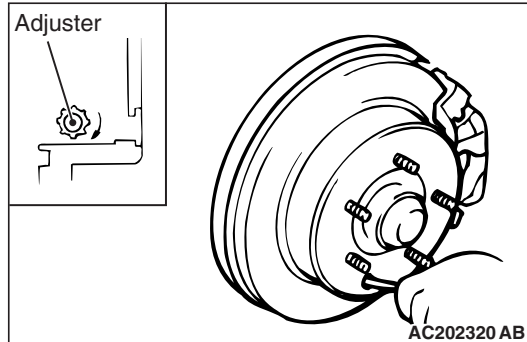
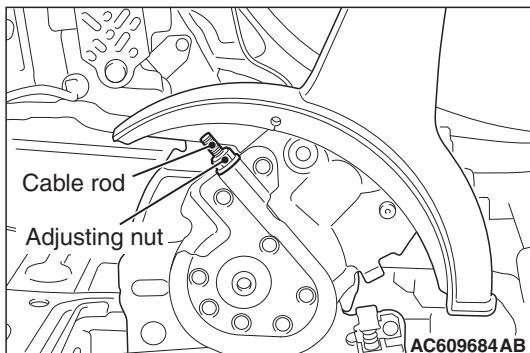
**STROKE CHECK [CONTROL FORCE:
APPROXIMATELY 200 N (45 POUNDS)]**

Standard value: 3 to 5 notches

STROKE ADJUSTMENT

If the parking brake lever stroke is out of the standard range, adjust as described below:

1. Remove the floor console box cup holder (Refer to GROUP 52A –Floor Console Assembly P.52A-10).
2. Loosen the adjusting nut to the end of the cable rod in order to allow slack in the cables.



3. Remove the rear brake disk adjusting hole plug. Then insert a flat-tipped screwdriver to turn the adjuster to the arrow direction (to expand the shoe) until the parking brake shoe makes contact and the disk can no longer be turned. Back off the adjuster to the opposite direction by five notches.

CAUTION

Be careful that the parking brake lever notch number should be within the standard range. If the notch number is too low, rear brake dragging can be caused.

4. Adjust the parking brake lever stroke to the standard value by turning the adjusting nut. After adjustment, check that there is no free play between the adjusting nut and the parking brake lever.
5. After adjusting the parking brake lever stroke, release the parking brake. Then turn the rear wheels to check that the rear brakes are not dragging.
6. Install the floor console box cup holder. (Refer to GROUP 52A –Floor Console Assembly P.52A-10.)

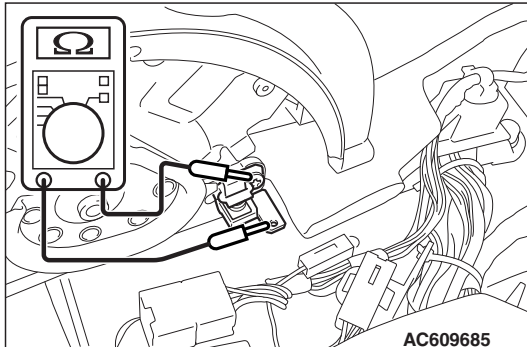
PARKING BRAKE SWITCH CHECK

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⚠ CAUTION

Do not apply grease or lubricant to the switch and the switch installation section to avoid malfunction of the switch. In addition, do not use gloves which have grease on them.

1. Remove the floor console assembly (Refer to GROUP 52A – Floor Console [P.52A-10](#)).
2. Check for continuity between the parking brake switch terminal and the switch mounting bolt.



Check condition	Normal condition
When parking brake lever is pulled.	Continuity exists (2 Ω or less)
When parking brake lever is released.	No continuity

3. After the check, install the floor console assembly. (Refer to GROUP 52A –Floor Console [P.52A-10](#).)

PARKING BRAKE LINING SEATING PROCEDURE

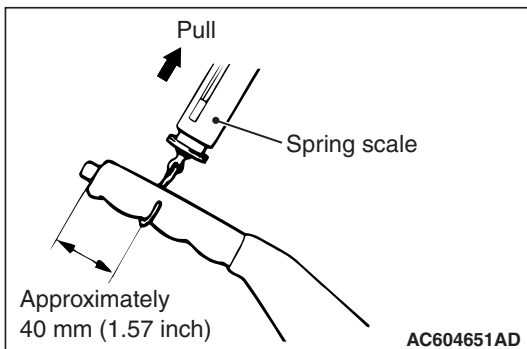
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⚠ CAUTION

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 disks, or when brake performance is insufficient.

1. Adjust the parking brake lever stroke to the standard value (Refer to [P.36-8](#)).
2. Set a spring scale to the center of the parking brake lever grip. Then, pull the parking brake lever to the vertical direction of the lever with a force of approximately 100 N (22 pounds).
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 or five times.



PARKING BRAKE LEVER

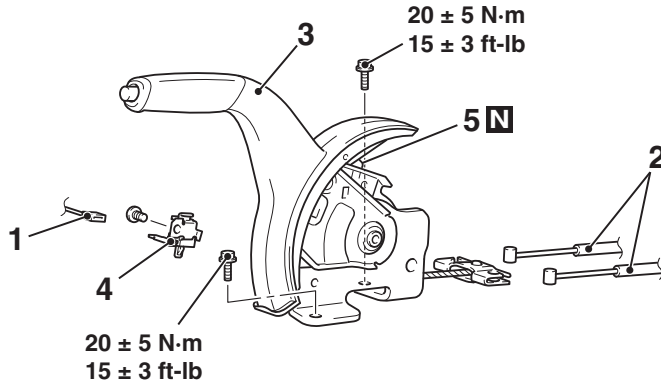
REMOVAL AND INSTALLATION

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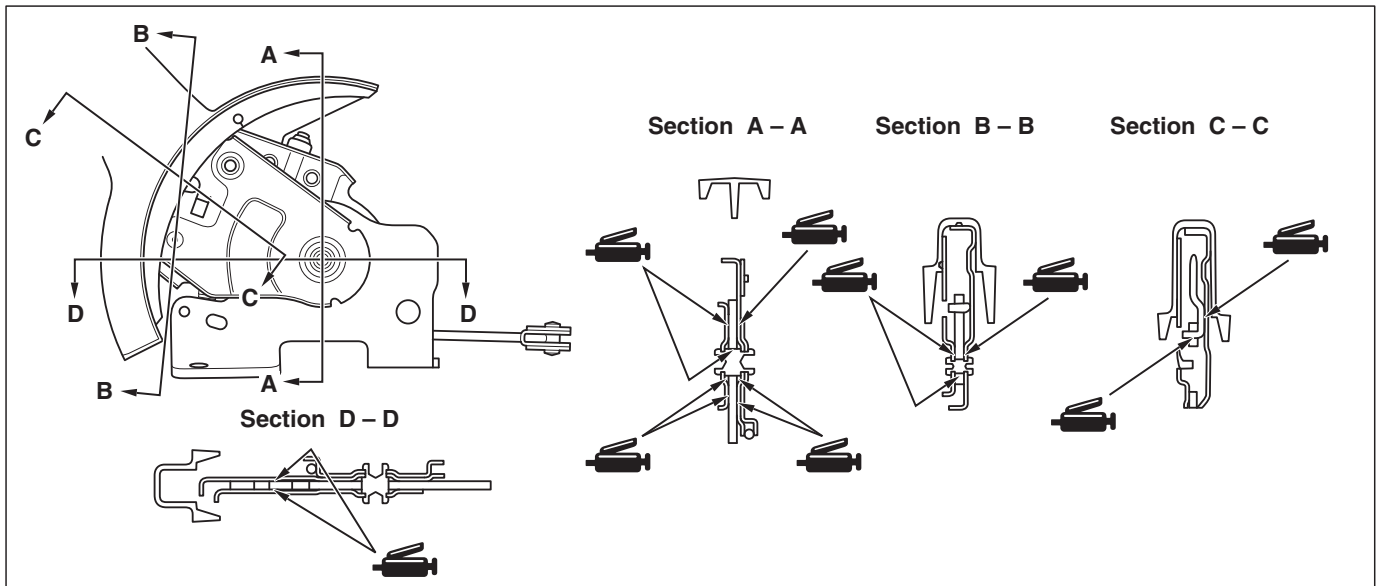
CAUTION

Do not apply grease or lubricant to the switch and the switch installation section to avoid malfunction of the switch. In addition, do not use gloves which have grease on them.

<p>Pre-removal operation Floor console assembly removal (Refer to GROUP 52A – Floor Console Assembly P.52A-10).</p>	<p>Post-installation operation</p> <ul style="list-style-type: none"> • Parking brake lever stroke check and adjustment (Refer to P.36-8). • Floor console assembly installation (Refer to GROUP 52A –Floor Console Assembly P.52A-10).
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- Removal steps**
- Release the parking brake lever.
 - Loosen the adjusting nut.
1. Parking brake switch connector connection

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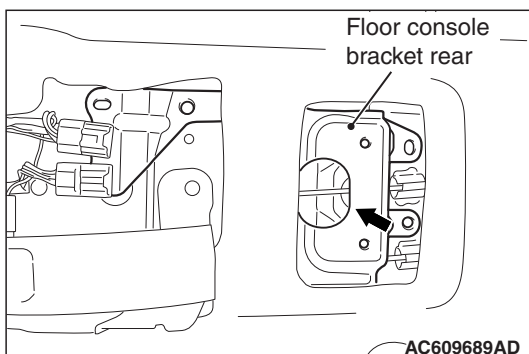
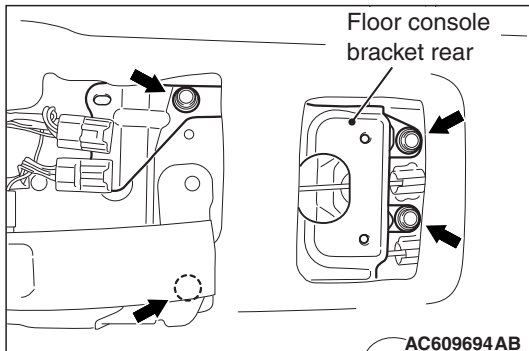
- Removal steps (Continued)**
2. Parking brake rear cable connection
 3. Parking brake lever assembly
 4. Parking brake switch
 5. Adjusting nut

REMOVAL SERVICE POINT

<<A>> PARKING BRAKE REAR CABLE DISCONNECTION

Disconnect the parking brake rear cable according to the procedure below.

1. Release the parking brake, and loosen the adjusting nut.
2. Remove the floor console bracket rear mounting bolts.



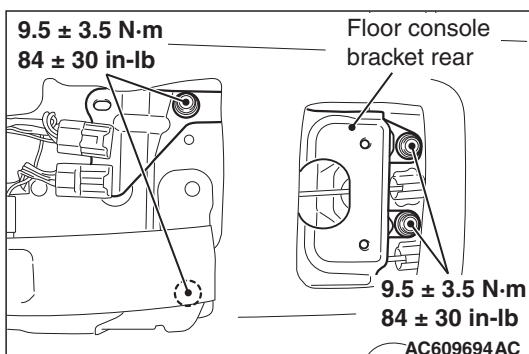
3. Slide the floor console bracket rear, and disconnect the parking brake rear cable from the hole shown by the arrows.

INSTALLATION SERVICE POINT

>>A<< PARKING BRAKE REAR CABLE CONNECTION INSTALLATION

Install the parking brake rear cable connection, and then tighten the floor console bracket rear mounting bolts to the specified torque.

Tightening torque: 9.5 ± 3.5 N·m (84 ± 30 in-lb)

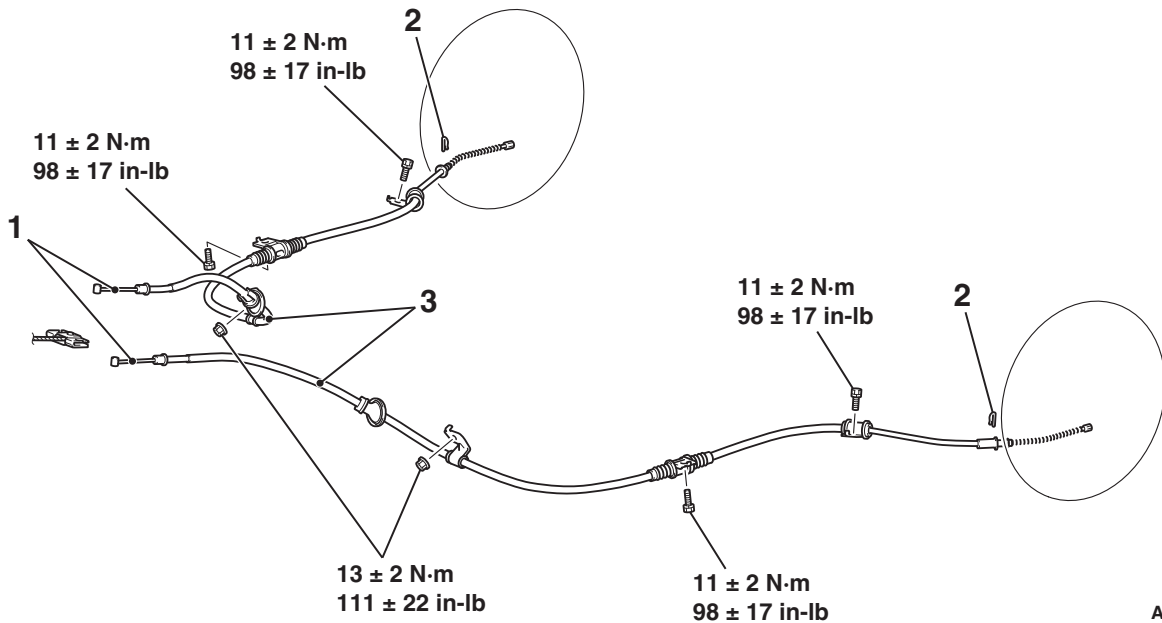


PARKING BRAKE CABLE

REMOVAL AND INSTALLATION

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<p>Pre-removal operation</p> <ul style="list-style-type: none"> • Floor console assembly removal (Refer to GROUP 52A – Floor Console Assembly P.52A-10). • Rear seat cushion assembly removal (Refer to GROUP 52A –Rear Seat Assembly P.52A-27). • Shoe and lining assembly removal (Refer to P.36-14). • Front floor under cover removal (Refer to GROUP 51 – Under Cover P.51-15). 	<p>Post-installation operation</p> <ul style="list-style-type: none"> • Front floor under cover installation (Refer to GROUP 51 – Under Cover P.51-15). • Shoe and lining assembly installation (Refer to P.36-14). • Rear seat cushion assembly installation (Refer to GROUP 52A –Rear Seat Assembly P.52A-27). • Floor console assembly installation (Refer to GROUP 52A –Floor Console Assembly P.52A-10). • Parking brake lever stroke adjustment (Refer to P.36-8). • Parking brake lining seating procedure (Refer to P.36-9).
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- <<A>> >>A<< 1. **Removal steps**
1. Parking brake rear cable connection

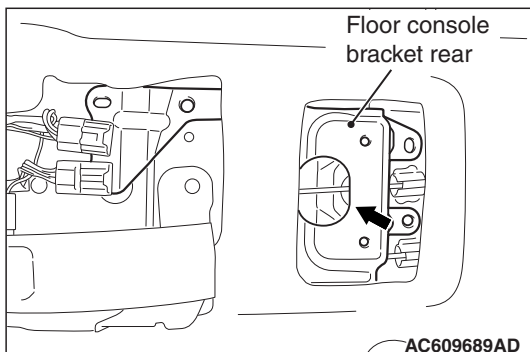
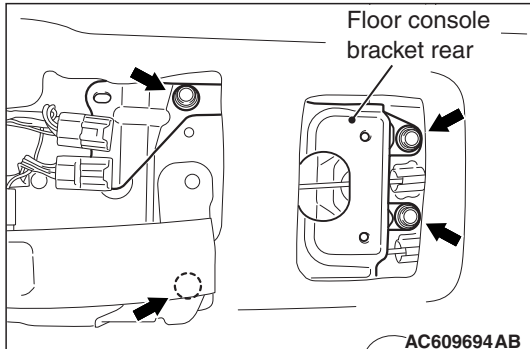
- Removal steps (Continued)**
2. Clip
 3. Parking brake rear cable

REMOVAL SERVICE POINT

<<A>> PARKING BRAKE REAR CABLE CONNECTION REMOVAL

Disconnect the parking brake rear cable according to the procedure below.

1. Release the parking brake, and loosen the adjusting nut.
2. Remove the floor console bracket rear mounting bolt.



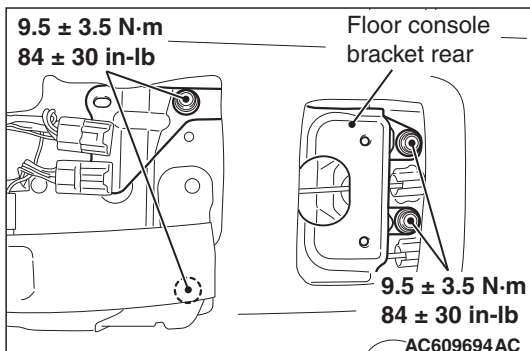
3. Slide the floor console bracket rear, and disconnect the parking brake rear cable through the hole indicated with an arrow in the figure.

INSTALLATION SERVICE POINT

>>A<< PARKING BRAKE REAR CABLE CONNECTION INSTALLATION

Connect the parking brake rear cable, and tighten the floor console bracket rear mounting bolt to the specified torque.

Tightening torque: 9.5 ± 3.5 N·m (84 ± 30 in-lb)



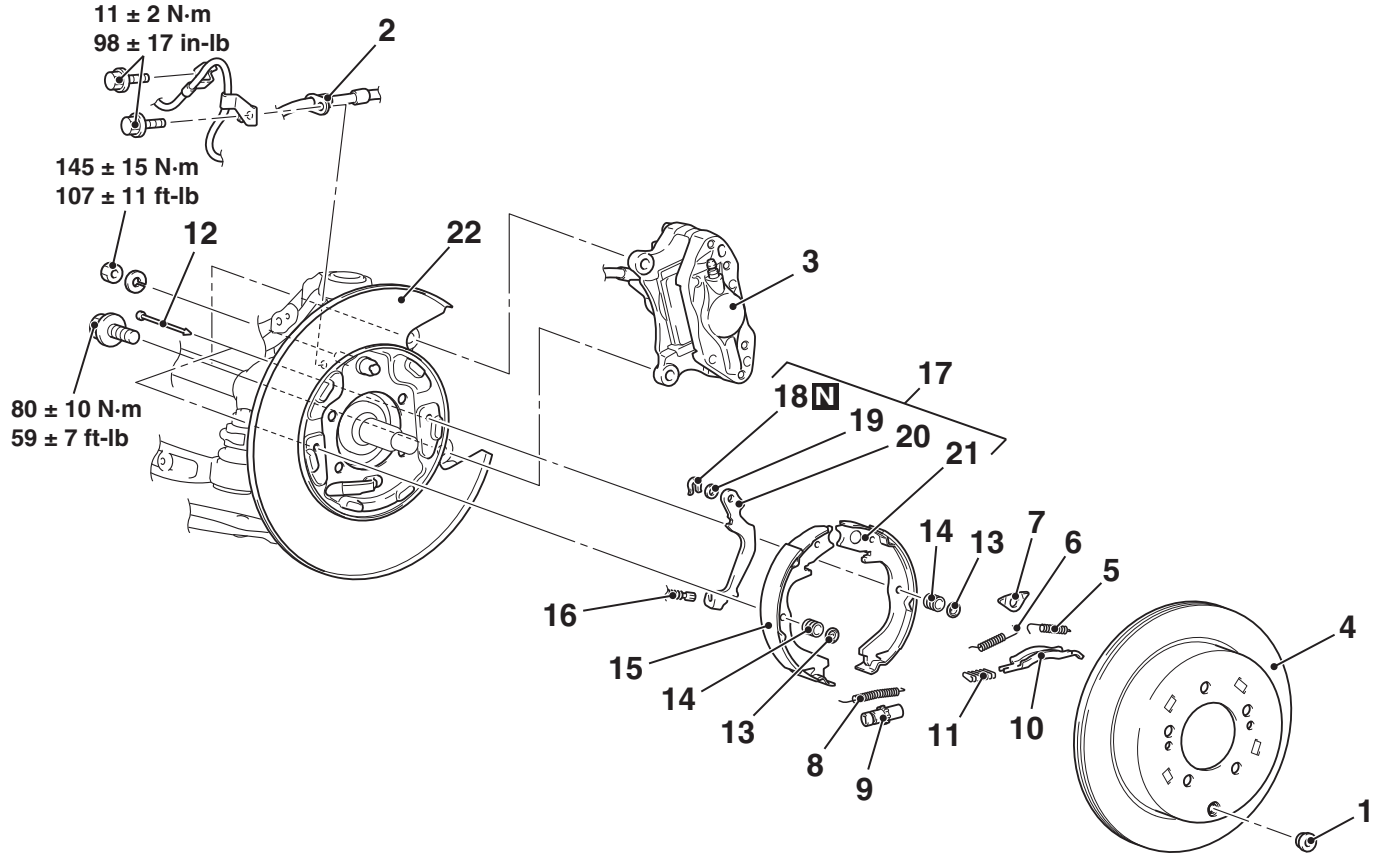
PARKING BRAKE LINING AND DRUM

REMOVAL AND INSTALLATION

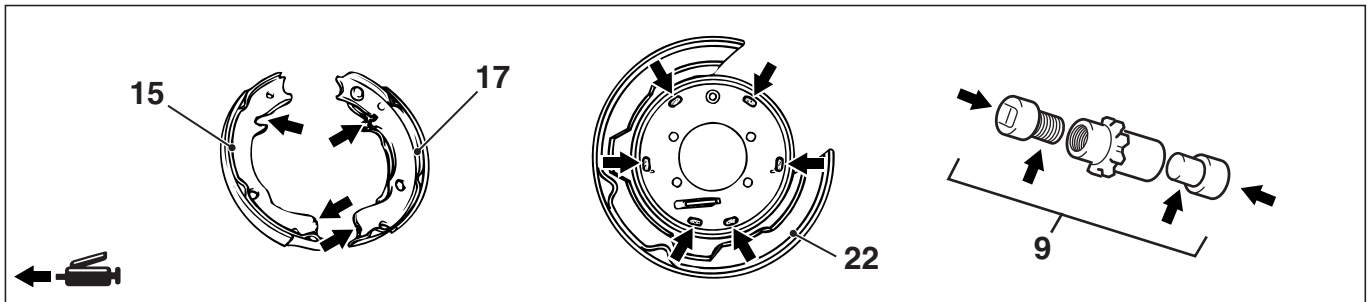
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Post-installation Operation

- Parking brake lever stroke adjustment (Refer to P.36-8).
- Parking brake lining seating procedure (Refer to P.36-9).



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Removal steps

- Release the parking brake lever.
- 1. Adjusting hole plug
- 2. Brake hose bracket connection
- 3. Rear brake caliper assembly
- 4. Rear brake disk
- 5. Shoe-to-anchor spring
- 6. Shoe-to-anchor spring
- 7. Shoe guide plate
- 8. Adjusting wheel spring
- 9. Adjuster assembly
- 10. Strut
- 11. Strut shoe-to-spring

Removal steps (Continued)

- 12. Shoe hold down pin
- 13. Shoe hold down cup
- 14. Shoe hold down spring
- 15. Shoe and lining assembly
- 16. Parking brake rear cable connection
- 17. Shoe and lever assembly
- 18. Chamber retainer
- 19. Washer
- 20. Parking brake operating lever
- 21. Shoe and lining assembly

<<A>>

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>>D<<

>>D<<

>>C<<

>>B<<

>>A<<

Removal steps (Continued)

- Rear wheel hub assembly (Refer to GROUP 27 –Rear Axle Hub Assembly P.27-35.)
22. Backing plate

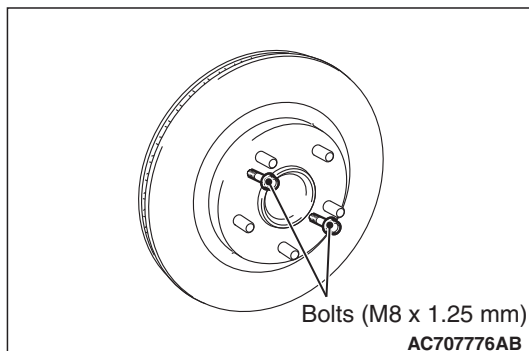
REMOVAL SERVICE POINTS

**<<A>> REAR BRAKE CALIPER ASSEMBLY
REMOVAL**

1. Remove the rear brake caliper assembly with the brake hose kept attached.
2. Secure the removed rear brake caliper assembly with a wire or other similar material at a position where it will not interfere with the removal and installation works.

<>REAR BRAKE DISK REMOVAL

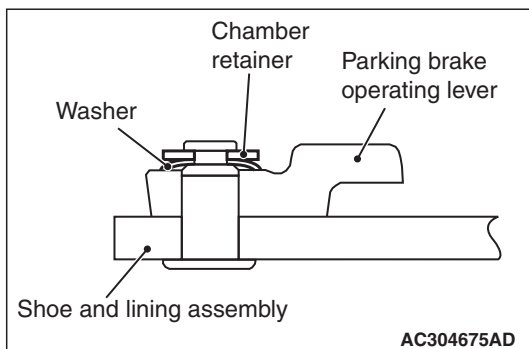
If the rear brake disk removal is difficult, install bolts (M8 x 1.25 mm) shown in the figure, and tighten them evenly and gradually to remove the rear brake disk.



INSTALLATION SERVICE POINTS

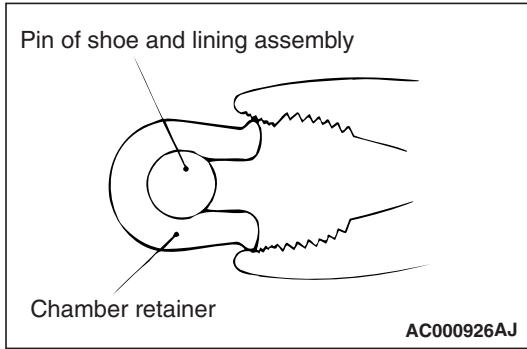
>>A<< WASHER INSTALLATION

Install the washer in the direction shown in the illustration.

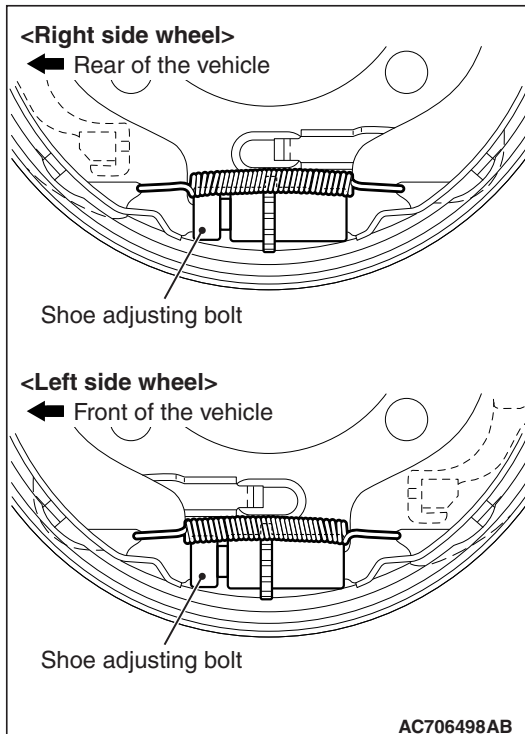


>>B<< CHAMBER RETAINER INSTALLATION

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

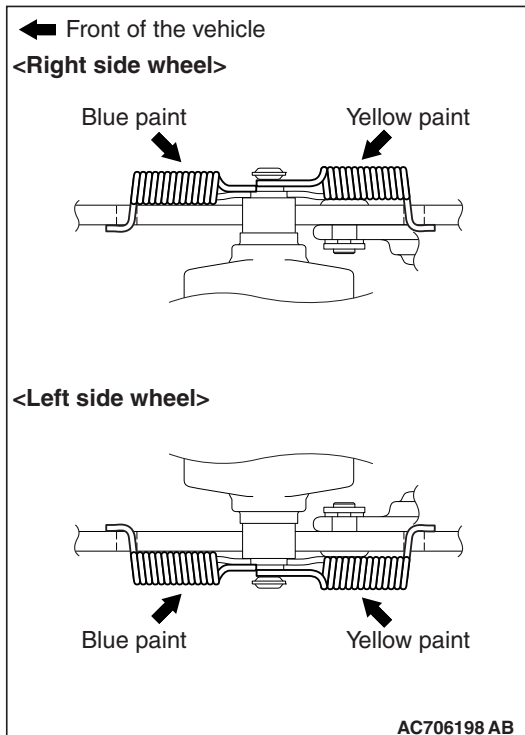
**>>C<< ADJUSTER ASSEMBLY INSTALLATION**

Install the adjuster assembly so that the shoe adjusting bolt is positioned at the rear of the vehicle for the left side, and at the front of the vehicle for the right side.



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

The shoe-to-anchor springs are not interchangeable because their spring loads are different. The one with blue paint must be installed to the vehicle front, and the other with yellow paint to the vehicle rear.



INSPECTION

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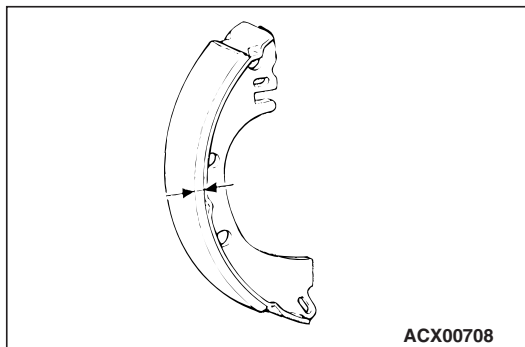
BRAKE LINING THICKNESS CHECK

1. Measure the lining thickness at the most worn area.

Standard value: 2.8 mm (0.11 inch)

Limit: 1.0 mm (0.04 inch)

2. If the thickness is less than the limit value, replace the right and left shoe and lining assemblies as a set.



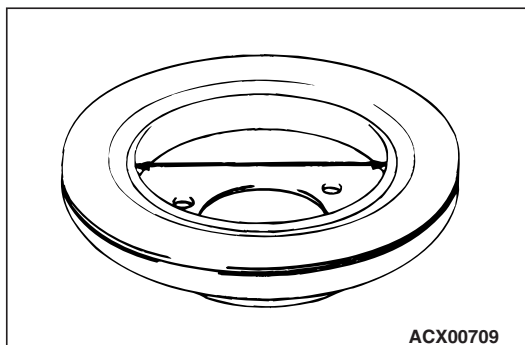
BRAKE DRUM INSIDE DIAMETER CHECK

1. Measure the inside diameter of the brake drum at two positions or more.

Standard value: 190.0 mm (7.48 inch)

Limit: 191.0 mm (7.52 inch)

2. If the inside diameter is more than limit value or if there is excessive wear, replace the brake disc.



NOTES