

GROUP 35A

BASIC BRAKE

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SERVICE SPECIFICATIONS

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Item		Standard value	Limit
Brake pedal height mm (in)		293.7 – 298.7 (11.56 – 11.76)	–
Brake pedal free play mm (in)		3 – 8 (0.1 – 0.3)	–
Brake pedal to floor board clearance mm (in) [depressing force; approximately 500 N (112.4lb)]		75 (3.0) or more	–
Fluid pressure generated by brake booster non-servo effect test kPa (psi)	Pedal depression force: 100 N (22.5 lb)	0 – 516 (0.0 – 74.8)	–
	Pedal depression force: 300 N (67.4 lb)	2,080 – 2,780 (301.7 – 403.2)	–
Fluid pressure generated by brake booster servo effect test kPa (psi)	Pedal depression force: 100 N (22.5 lb)	4,380 – 5,780 (635.2 – 838.3)	–
	Pedal depression force: 300 N (67.4 lb)	9,020 – 10,420 (1,308.2 – 1,511.2)	–
Front disc brake	Brake pad thickness mm (in)	9.0 (0.35)	2.0 (0.08)
	Brake disc thickness mm (in)	17.0 (0.67)	15.4 (0.61)
	Brake disc run-out mm (in)	–	0.06 (0.002)
	Brake drag force N (lb)	42 (9.4) or less	–
Rear drum brake	Brake lining thickness mm (in)	3.8 (0.15)	2.0 (0.08)
	Brake drum inside diameter mm (in)	180 (7.1)	181 (7.1)

LUBRICANTS

M1351000401808

Item		Specified lubricant	Quantity
Brake fluid		DOT3 or DOT4	As required
Front disc brake	Caliper body, piston, piston seal	DOT3 or DOT4	As required
	Piston boot	Repair kit grease (color: translucent red), Niglube RX-2 or equivalent	As required
	Guide pin, lock pin, pin boot	Repair kit grease (color: white), Silicone grease G-40M or equivalent	Approx. 0.4 g (0.01oz) [Per pin each]
Rear drum brake	Backing plate, parking brake lever, auto adjuster assembly	Brake grease SAE J310, NLGI No.1 or equivalent	As required
	Boot (wheel cylinder)	Repair kit grease (color: translucent red), Niglube RX-2 or equivalent	Approx. 0.8 g (0.03 oz) [Per boot]
	Wheel cylinder body, piston	DOT3 or DOT4	As required

SEALANT

M1351000500534

Item	Specified sealant	Remark
Hub cap	3M ATD Part No.8663 or equivalent	Semi-drying sealant

BASIC BRAKE SYSTEM DIAGNOSIS

INTRODUCTION TO BASIC BRAKE SYSTEM DIAGNOSIS

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Hydraulic brakes are composed of the brake pedal, master cylinder, brake booster and disc brakes. Malfunctions such as insufficient braking power or the generation of noise may occur due to wear, damage or incorrect adjustment of these components.

BASIC BRAKE SYSTEM DIAGNOSTIC TROUBLESHOOTING STRATEGY

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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 basic brake system 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

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Symptom	Inspection procedure	Reference page
Vehicle pulls to one side when brakes are applied	1	P.35A-3
Insufficient braking power	2	P.35A-5
Increased pedal stroke (Reduced pedal-to-floor board clearance)	3	P.35A-7
Brake drag	4	P.35A-8
Scraping or grinding noise when brake are applied	5	P.35A-9
Squealing, groaning or chattering noise when brake are applied	6	P.35A-10
Squealing noise when brakes are not applied	7	P.35A-11
Groaning, clicking or rattling noise when brakes are not applied	8	P.35A-12

SYMPTOM PROCEDURES

INSPECTION PROCEDURE 1: Vehicle Pulls to One Side when Brakes are Applied

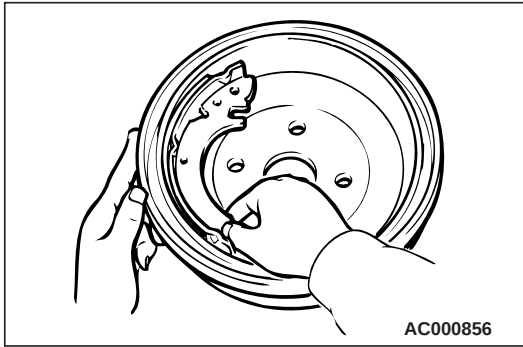
DIAGNOSIS

STEP 1. Check for oil, water, etc., on the pad or lining contact surface of all brakes.

Q: Is oil, water, etc., on the pad or lining contact surface?

YES : Replace the part and determine and repair source/cause of foreign material. Then go to Step 8.

NO : Go to Step 2.



STEP 2. Check the lining and brake drum contact.

Put chalk on the inner surface of the brake drum. Rub the lining against the drum inner surface.

NOTE: Clean off chalk after check.

Q: Does the lining wipe off or smudge the chalk across the full width of the lining?

YES : Go to Step 3.

NO : Replace the shoe and lining assemblies on both sides. Then go to Step 4.

STEP 3. Check the adjuster function.

Check whether the adjuster assembly operates correctly.

Q: Is there fault?

YES : Replace the adjuster assembly or strut-to-shoe spring. Then go to Step 8.

NO : Go to Step 4.

STEP 4. Check the brake drum inside diameter.

Refer to [P.35A-23](#).

Q: Is the brake drum inside diameter outside of specifications?

YES : Replace the part. Then go to Step 8.

NO : Go to Step 5.

STEP 5. Check disc brake pistons for smooth operation.

(1) With engine not running, depress the brake pedal rapidly several times to deplete booster vacuum reserves.

(2) Test each disc brake assembly one at a time.

a. Remove the lower caliper bolt, then remove caliper from mount.

b. Have an assistant slowly depress the brake pedal. Confirm piston(s) extend slowly and smoothly with no jumpiness. Repeat for each disc brake assembly.

Q: Do (does) the piston(s) move correctly?

YES : Go to Step 6.

NO : Disassemble and inspect the brake assembly (Refer to [P.35A-32](#)). Then go to Step 8.

STEP 6. Check brake disc(s) for run out.

Refer to [P.35A-20](#).

Q: Is runout outside of specifications?

YES : Repair and replace the brake disc(s) as necessary. Then go to Step 8.

NO : Go to Step 7.

STEP 7. Check brake discs for correct thickness.

Refer to [P.35A-23](#).

Q: Is the thickness outside of specifications?

YES : Repair or replace the brake discs(s) as necessary.
Then go to Step 8.

NO : Go to Step 8.

STEP 8. Retest the system.

Q: Is the symptom eliminated?

YES : The procedure is complete.

NO : Start over at Step 1. If a new symptom appears, refer to the symptom chart.

INSPECTION PROCEDURE 2: Insufficient Braking Power

DIAGNOSIS

STEP 1. Check whether the brake fluid is low, is the correct fluid (CVT fluid, engine oil, etc.) or is contaminated (debris, sand, etc.).

Q: Is there fault?

YES : Refill or replace with the specified brake fluid DOT 3 or DOT 4. Bleed the brakes if necessary (Refer to [P.35A-17](#)). Then go to Step 9.

NO : Go to Step 2.

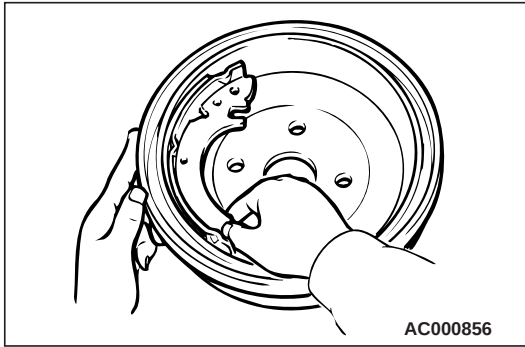
STEP 2. Check for spongy (not firm brakes).

- (1) With engine not running, depress the brake pedal rapidly several times to deplete booster vacuum reserve.
- (2) With the brake pedal fully released, depress the brake pedal slowly until it stops.
- (3) With a measuring stick (ruler, etc.) next to the brake pedal, depress the pedal firmly and measure the distance the pedal traveled.

Q: Is the distance greater than 20 mm (0.8 inch)?

YES : Bleed the brakes to remove air in the fluid (Refer to [P.35A-17](#)). Then go to Step 9.

NO : Go to Step 3.



STEP 3. Check the lining and brake drum contact.

Put chalk on the inner surface of the brake drum. Rub the lining against the drum inner surface.

NOTE: Clean off chalk after check.

Q: Does the lining wipe off or smudge the chalk across the full width of the lining?

YES : Go to Step 4.

NO : Replace the shoe and lining assemblies on both sides. Then go to Step 9.

STEP 4. Check the adjuster function.

Check whether the adjuster assembly operates correctly.

Q: Is there fault?

YES : Replace the adjuster assembly or strut-to-shoe spring. Then go to Step 9.

NO : Go to Step 5.

STEP 5. Check the brake booster function.

Refer to [P.35A-15](#).

Q: Is there fault?

YES : Replace the part. Then go to Step 9.

NO : Go to Step 6.

STEP 6. Check for pinched or restricted brake tube or hose.

Q: Is there pinched or restricted brake tube or hose?

YES : Replace that complete section of brake tube or brake hose. Then go to Step 9.

NO : Go to Step 7.

STEP 7. Check for oil, water, etc., on the pad or lining contact surfaces of all brakes.

Q: Is oil, water, etc., on the pad or lining contact surface?

YES : Replace the part and determine and repair source/cause of foreign material. Retest the system. Then go to Step 9.

NO : The procedure is complete. If condition persists, go to Step 8.

STEP 8. Check the proportioning valve operation.

Refer to [P.35A-17](#).

Q: Is there fault?

YES : Replace the part. Then go to Step 9.

NO : Go to Step 9.

STEP 9. Retest the system.**Q: Is the symptom eliminated?**

YES : The procedure is complete.

NO : Start over at Step 1. If a new symptom surfaces, refer to the symptom chart.

INSPECTION PROCEDURE 3: Increased Pedal Stroke (Reduced Pedal-to-Floor Board Clearance)

DIAGNOSIS

STEP 1. Check for spongy (not firm) brakes.

- (1) With engine not running, depress the brake pedal rapidly several times to deplete booster vacuum reserve.
- (2) With the brake pedal fully released, depress the brake pedal slowly until it stops.
- (3) With a measuring device (ruler, etc.) next to the brake pedal, depress the pedal firmly and measure the distance the pedal traveled.

Q: Is the distance greater than 20 mm (0.8 inch)?

YES : Bleed the brakes to remove air in the fluid (Refer to [P.35A-17](#)). Then go to Step 6.

NO : Go to Step 2.

STEP 2. Check the pad for wear.

Refer to [P.35A-19](#).

Q: Is the pad thickness outside of specifications?

YES : Replace the part. Then go to Step 6.

NO : Go to Step 3.

STEP 3. Check the vacuum hose and check valve for damage.

Refer to [P.35A-17](#).

Q: Is there a damage?

YES : Replace the part. Then go to Step 6.

NO : Go to Step 4.

STEP 4. Check for brake fluid leaks.**Q: Is there a leak?**

YES : Check the connection for looseness, corrosion, etc. Clean and repair as necessary. If leaking in any tube or hose section, replace the complete tube or hose. Then go to Step 6 .

NO : Go to Step 5.

STEP 5. Check the master cylinder assembly.

- (1) Remove the master cylinder assembly (Refer to [P.35A-28](#)).

- (2) Check for brake fluid leaks from the master cylinder assembly seal.

Q: Is a brake fluid leaking from the master cylinder assembly seal present?

YES : Replace the master cylinder assembly and the brake booster assembly (Refer to [P.35A-28](#)). Then go to Step 6.

NO : Go to Step 6.

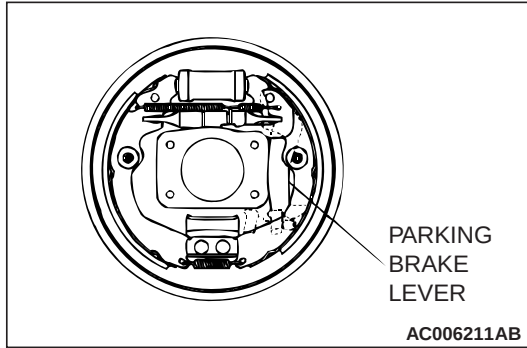
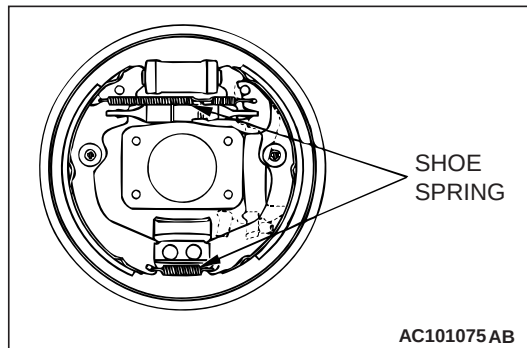
STEP 6. Recheck symptom.**Q: Is the symptom eliminated?**

YES : The procedure is complete.

NO : Start over at Step 1. If a new symptom surfaces, refer to the symptom chart.

INSPECTION PROCEDURE 4: Brake Drag

DIAGNOSIS

**STEP 1. Check the parking brake operating lever return.****Q: Is the operation faulty?****YES :** Repair it. Then go to Step 6.**NO :** Go to Step 2.**STEP 2. Check the brake shoe springs for breakage.****Q: Are the brake shoe springs broken?****YES :** Replace the spring. Then go to Step 6.**NO :** Go to Step 3.**STEP 3. Check the parking brake pull amount.**

Refer to GROUP 36, On-vehicle Service – Parking Brake lever Stroke Check and Adjustment [P.36-5](#).

Q: Is there a fault?**YES :** Adjust it. Then go to Step 6.**NO :** Go to Step 4.**STEP 4. Check port for clogging.****Q: Is the port clogged?****YES :** Repair it. Then go to Step 6.**NO :** Go to Step 5.**STEP 5. Check disk brake pistons for sticking.**

Depress the brake pedal, then release. Confirm each wheel spins freely.

Q: Does any wheel stick?**YES :** Inspect that brake assembly. Then go to Step 6.**NO :** Go to Step 6.

STEP 6. Recheck symptom.

Q: Is the symptom eliminated?

YES : The procedure is complete.

NO : Start over at Step 1. If a new symptom surfaces, refer to the symptom chart.

INSPECTION PROCEDURE 5: Scraping or Grinding Noise when Brakes are Applied

DIAGNOSIS

STEP 1. Check the front brakes, then rear brakes, for metal-to-metal condition.

Q: Is the metal-to-metal contact evident?

YES : Repair or replace the components. Then go to Step 6.

NO : Go to Step 2.

STEP 2. Check for interference between the caliper and wheel.

Q: Is there interference?

YES : Repair or replace the part. Then go to Step 6.

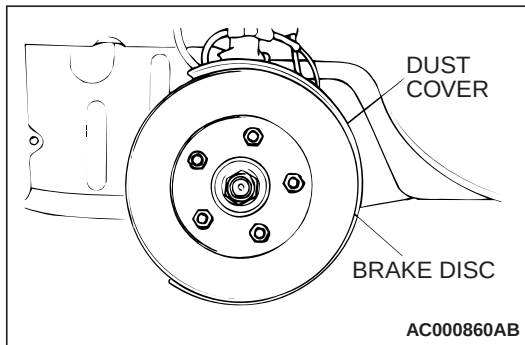
NO : Go to Step 3.

STEP 3. Check for interference between the dust cover and brake disc.

Q: Is there interference?

YES : Repair or replace the part. Then go to Step 6.

NO : Go to Step 4.

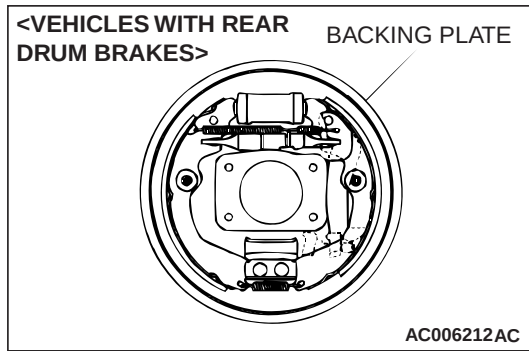


STEP 4. Check the brake drums or discs for cracks.

Q: Are there cracks?

YES : Repair or replace the part. Then go to Step 6.

NO : Go to Step 5.

**STEP 5. Check for bent backing plate(s).****Q: Is (Are) the backing plate(s) bent?****YES :** Repair or replace the part. Then go to Step 6.**NO :** Go to Step 6.**STEP 6. Retest the system.****Q: Is the symptom eliminated?****YES :** The procedure is complete.**NO :** Start over at Step 1. If a new symptom surfaces, refer to the symptom chart.**INSPECTION PROCEDURE 6: Squealing, Groaning or Chattering Noise when Brakes are Applied****DIAGNOSIS****STEP 1. Check the brake drums and lining or brake disc and pads for wear or cutting.****Q: Is there wear or cutting?****YES :** Repair or replace the part. Then go to Step 7.**NO :** Go to Step 2.**STEP 2. Check the calipers for rust.****Q: Is there rust?****YES :** Remove the rust. Then go to Step 7.**NO :** Go to Step 3.**STEP 3. Check the lining parts for damage.****Q: Is there damage?****YES :** Repair or replace the part. Then go to Step 7.**NO :** Go to Step 4.**STEP 4. Check whether the lining is dirty or greasy.****Q: Is the lining dirty or greasy?****YES :** Clean or replace the part. Then go to Step 7.**NO :** Go to Step 5.**STEP 5. Check whether the shoe hold-down springs are weak or the shoe-hold-down pins and springs are loose or damaged.****Q: Is there fault?****YES :** Repair or replace the part. Then go to Step 7.**NO :** Go to Step 6.**STEP 6. Adjust the brake pedal or brake booster pushrod.**Refer to [P.35A-13](#) or [P.35A-28](#).**Q: Are the brake pedal and the brake booster pushrod adjusted correctly?****YES :** Adjust the brake pedal and the brake booster pushrod. Then go to Step 7.**NO :** Go to Step 7.**STEP 7. Retest the system.****Q: Is the symptom eliminated?****YES :** The procedure is complete.**NO :** Start over at Step 1. If a new symptom surfaces, refer to the symptom chart.

INSPECTION PROCEDURE 7: Squealing Noise when Brakes are not Applied

DIAGNOSIS

STEP 1. Check whether the backing plate is bent or loose and interfering with the drum.

Q: Is there a fault?

YES : Replace the part. Then go to Step 9.

NO : Go to Step 2.

STEP 2. Check whether the drum is damaged due to interference with the backing plate or shoe.

Q: Is there any damage?

YES : Replace the part. Then go to Step 9.

NO : Go to Step 3.

STEP 3. Check the brake drum for wear and the shoe spring for damage.

Q: Is there any wear or damage?

YES : Replace the part. Then go to Step 9.

NO : Go to Step 4.

STEP 4. Check the brake discs for rust.

Q: Are the brake discs rusted?

YES : Remove the rust by using sand paper. If still rusted, turn the rotors with an on-the-car brake lathe. Then go to Step 9.

NO : Go to Step 5.

STEP 5. Check the brake pads for correct installation.

Q: Are the pads installed incorrectly?

YES : Repair the pads. Then go to Step 9.

NO : Go to Step 6.

STEP 6. Check the calipers for correct installation.

Q: Are the calipers installed incorrectly?

YES : Repair the calipers. Then go to Step 9.

NO : Go to Step 7.

STEP 7. Check the wheel bearings for end play.

Refer to GROUP 26 – On-vehicle Service, Wheel bearing end play check [P.26-7](#) <Front>, GROUP 27 – On-vehicle Service, Wheel bearing end play check [P.27-4](#) <Rear>.

Q: Does the measured end play exceed the limit?

YES : Replace the faulty hub assembly. Then go to Step 9.

NO : Go to Step 8.

STEP 8. Adjust the brake pedal.

Refer to [P.35A-13](#).

Q: Is the brake pedal adjusted correctly?

YES : Go to Step 9.

NO : Adjust the brake pedal. Then go to Step 9.

STEP 9. Recheck symptom.**Q: Is the symptom eliminated?**

YES : The procedure is complete.

NO : Start over at Step 1. If a new symptom surfaces, refer to the symptom chart.

INSPECTION PROCEDURE 8: Groaning, Clicking or Rattling Noise when Brakes are not Applied.

DIAGNOSIS

STEP 1. Check whether foreign material has entered the wheel covers.**Q: Is there any foreign material?**

YES : Remove it. Then go to Step 5.

NO : Go to Step 2.

STEP 2. Check for looseness of the wheel nuts.**Q: Are the wheel nuts loose?**

YES : Tighten to 98 ± 10 N·m (73 ± 7 ft·lb). Then go to Step 5.

NO : Go to Step 3.

STEP 3. Check for looseness of the caliper installation bolt.**Q: Is the caliper installation bolt loose?**

YES : Tighten to 105 ± 5 N·m (77 ± 4 ft·lb) for the front caliper. Then go to Step 5.

NO : Go to Step 4.

STEP 4. Check the wheel bearings for end play.

Refer to GROUP 26 – On-vehicle Service, Wheel bearing end play check [P.26-7](#) <Front>, GROUP 27 – On-vehicle Service, Wheel bearing end play check [P.27-4](#) <Rear>.

Q: Does the measured end play exceed the limit?

YES : Replace the faulty hub assembly. Then go to Step 5.

NO : Go to Step 5.

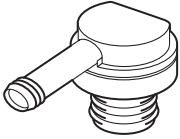
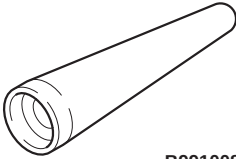
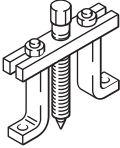
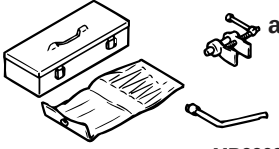
STEP 5. Recheck symptom.**Q: Is the symptom eliminated?**

YES : The procedure is complete.

NO : Start over at Step 1. If a new symptom surfaces, refer to the symptom chart.

SPECIAL TOOLS

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Tool	Number	Name	Use
 MB992146	MB992146	Booster test adapter	Inspection using a simplified tester
 B991008	MB991008	piston cup Installer	Installation of the drum brake wheel cylinder piston cup
 B990241	MB991292	Axle shaft puller	Rear wheel hub assembly removal
 MB990964	MB990964 a: MB990520	Brake tool set a: Disc brake piston expander	Pushing-in of the disc brake piston

ON-VEHICLE SERVICE

BRAKE PEDAL CHECK AND ADJUSTMENT

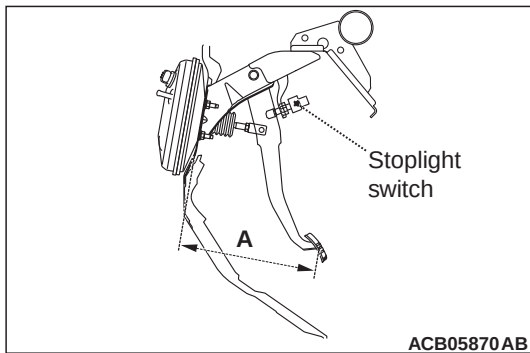
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CAUTION

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.

BRAKE PEDAL HEIGHT

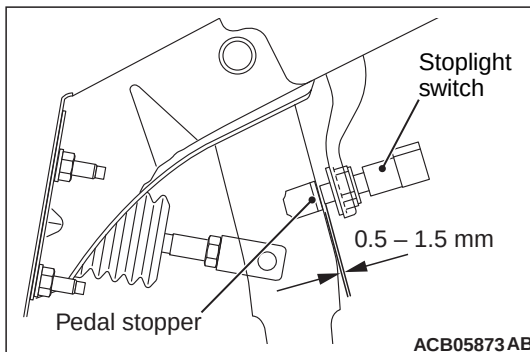
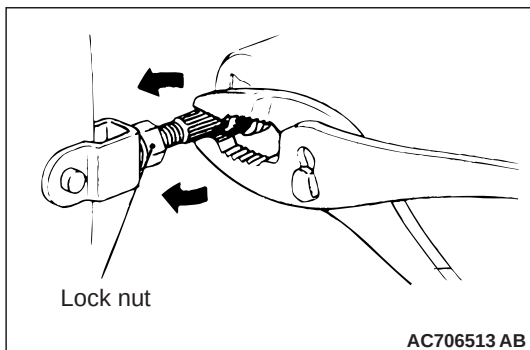
1. Turn up the floor carpet under the brake pedal.
2. Remove the stoplight switch (Refer to [P.35A-25](#)).



3. Use a needle or similar tool to measure the dimension (distance from the dash panel pad surface to the dash panel).
4. Measure the dimension (distance from the pedal pad surface to the dash panel pad surface).
5. Make sure that the total of the dimension measured in Steps 3 and 4 (brake pedal height) is within the standard value.

Standard value (A): 293.7 – 298.7 mm (11.56 – 11.76 inch)

6. When the brake pedal height is not within the standard value, adjust the brake pedal in the following procedure.
 - (1) Disconnect the stoplight switch connector.
 - (2) Loosen the stoplight switch by turning it counterclockwise by approximately 1/4 turn.
 - (3) Loosen the lock nut of operating rod, then turn the serrated section of operating rod using the pliers to adjust the brake pedal height to the standard value.



- (4) Press in the stoplight switch until the thread section of stoplight switch comes in contact with the pedal stopper. Then, secure the stoplight switch by turning it clockwise by approximately 1/4 turn. While doing this, pull and hold the brake pedal by hand.
- (5) Check that the clearance between the stoplight switch and the pedal stopper is as shown in the figure.

⚠ CAUTION

Make sure that the stoplight is not illuminated when the brake pedal is not depressed.

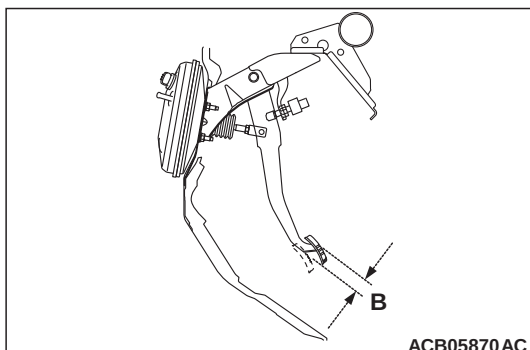
- (6) Connect the stoplight switch connector.
7. Return the carpet, etc.

BRAKE PEDAL FREE PLAY

1. Turn the ignition switch to the "LOCK" (OFF) position, depress the brake pedal two or three times. After eliminating the vacuum in the brake booster, press the pedal down by hand, and confirm that the amount of movement before resistance is met (free play) is within the standard value range.

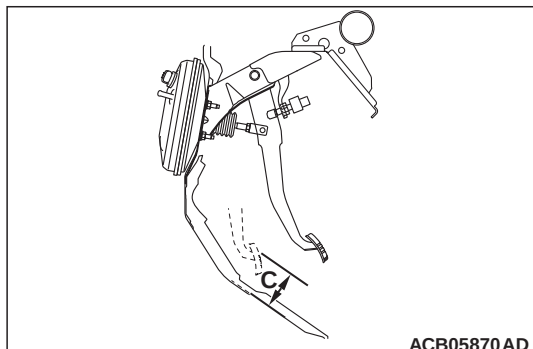
Standard value (B): 3 – 8 mm (0.1 – 0.3 inch)

2. If the brake pedal play is not within the standard value, check the following, and adjust or replace if necessary:
 - Excessive play between the brake pedal and the clevis pin, or between the clevis pin and the brake booster operating rod



- Brake pedal height
- Installation position of the stoplight switch, etc.

CLEARANCE BETWEEN BRAKE PEDAL AND FLOOR BOARD



1. Turn up the carpet, etc. under the brake pedal.
2. Start the engine, depress the brake pedal with approximately 500 N of force, and measure the clearance between the brake pedal and the floor board.

Standard value (C): 75 mm (3.0 inch) or more

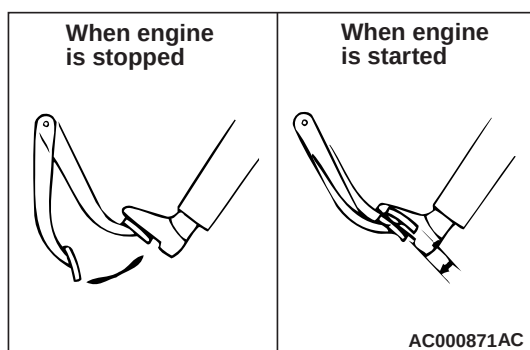
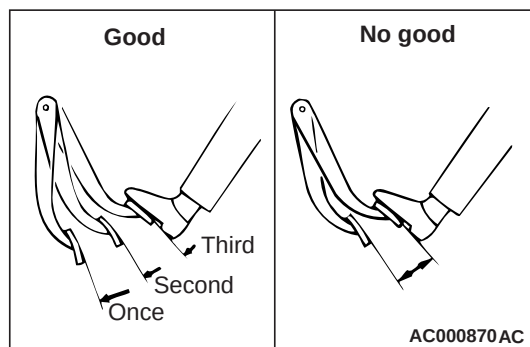
3. If the clearance between the brake pedal and the floor is not within the standard value, check the brake lines for air-lock, the disc brake pad thickness or the drum brake lining thickness, and the parking brake for dragging. Adjust or replace defective part(s) if necessary.
4. Return the carpet etc. to its original position.

BRAKE BOOSTER OPERATION CHECK

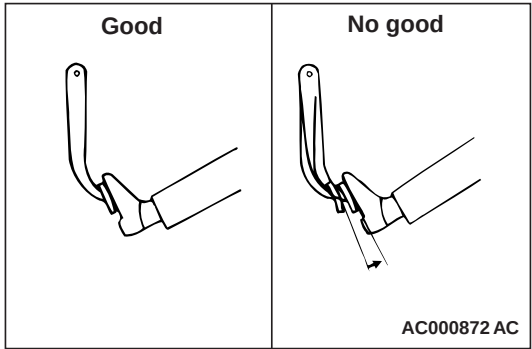
M1351001001405

INSPECTION WITHOUT USING TESTER

1. Carry out the simplified brake booster operation check in the following procedure:

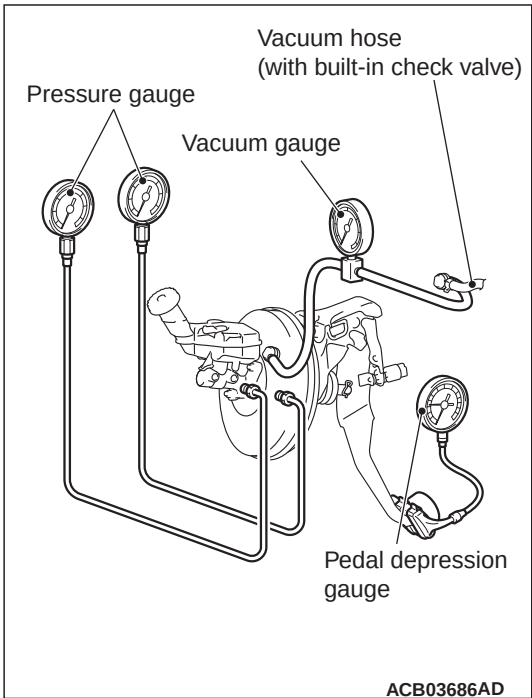


- (1) Run the engine for 1 to 2 minutes, and then stop.
Depress the brake pedal with normal depression force. The result is judged as "Good" when the pedal stroke is great at the first depression, and becomes smaller as you repeat depressing the pedal. If the pedal stroke does not change, the result is judged as "No Good".
- (2) With the engine stopped, depress the brake pedal several times. Keep the brake pedal depressed and start the engine. At this time, when the pedal moves down slightly, the result is judged as "Good". The result is judged as "No Good" if the pedal does not move down.



- (3) With the engine running, depress the brake pedal. Stop the engine in this condition. The result is judged as "Good" when the pedal height does not change for approximately 30 seconds. The result is judged as "No Good" if the pedal moves up.
2. The brake booster is judged as normal when the results of all the above checks are "Good". When one or more of the above check results are "No Good", then the check valve, vacuum hose, or brake booster is suspected faulty.

INSPECTION USING SIMPLIFIED TESTER



1. Before starting this inspection, remove the brake booster check valve from the vehicle and check its operation (Refer to P.35A-28).
2. Connect a vacuum gauge between the vacuum hose (incorporating the check valve) and the brake booster.
3. Connect a pressure gauge and a pedal depression force gauge as shown. Air-bleed the pressure gauge and then follow the procedure below:
- (1) Airtightness test with no load
Start the engine, and stop it when the vacuum gauge indicator has reached approximately -67 kPa (-148 lb). The result is judged as "Good" when the drop of the vacuum approximately 15 seconds after the engine was stopped is within -3.3 kPa (-7 lb).
- (2) Airtightness test with load
Start the engine and depress the brake pedal with 200 N . Stop the engine when the vacuum gauge indicator reached approximately -67 kPa (-148 lb). The result is judged as "Good" when the drop of the vacuum approximately 15 seconds after the engine was stopped is within -3.3 kPa (-7 lb).
- When one or more of the above check results are judged as "No Good," the vacuum hose or brake booster is suspected faulty.
- (3) Brake booster characteristics test
Perform this test after the above (1) and (2) were performed.
- a. Non-servo effect test
With the engine stopped, make sure that the vacuum gauge reading is 0 kPa (0 lb). Depress the brake pedal with 100 N (22.5 lb) and 300 N (67.4 lb), and measure the fluid pressure generated.

Standard value:

Item	Pedal depression force	
	100 N (22.5 lb)	300 N (67.4 lb)
Generated fluid pressure kPa (psi)	0 – 516 (0.0 – 74.8)	2,080 – 2,780 (301.7 – 403.2)

b. Servo effect test

Start the engine. Depress the brake pedal with 100 N and 300 N when the vacuum gauge indicator reached approximately -67 kPa, and measure the fluid pressure generated.

Standard value:

Item	Pedal depression force	
	100 N (22.5 lb)	300 N (67.4 lb)
Generated fluid pressure kPa (psi)	4,380 – 5,780 (635.2 – 838.3)	9,020 – 10,420 (1,308.2 – 1,511.2)

CHECK VALVE OPERATION CHECK

M1351009001238

⚠ CAUTION

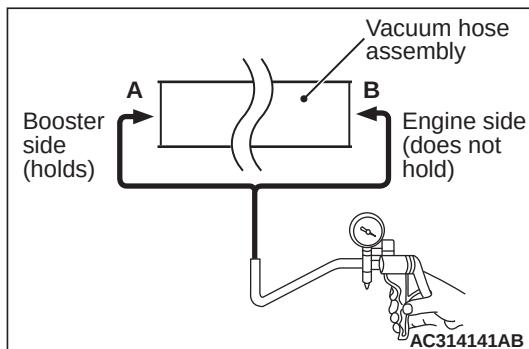
The check valve should not be removed from the vacuum hose.

1. Remove the vacuum hose (Refer to [P.35A-28](#)).

⚠ CAUTION

If the check valve is defective, replace it as an assembly unit together with the vacuum hose.

2. Check the operation of the check valve by using a vacuum pump.



Vacuum pump connection	Accept/reject criteria
Connection at the brake booster side (A)	A negative pressure (vacuum) is created and held.
Connection at the intake manifold side (B)	A negative pressure (vacuum) is not created.

BLEEDING

M1351014700100

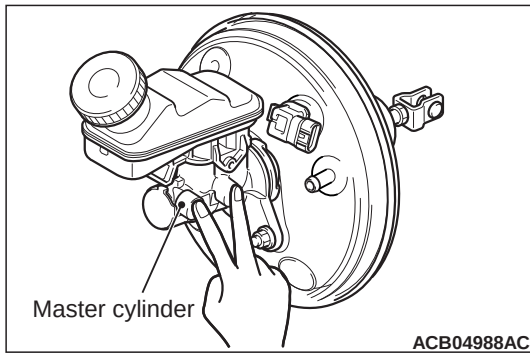
⚠ CAUTION

Use only brake fluid DOT 3 or DOT 4. Never mix the specified brake fluid with other fluid as it will influence the braking performance significantly.

BLEEDING OF MASTER CYLINDER

The master cylinder used has no check valve, so if bleeding is carried out by the following procedure, bleeding of air from the brake pipeline will become easier (When brake fluid is not contained in the master cylinder).

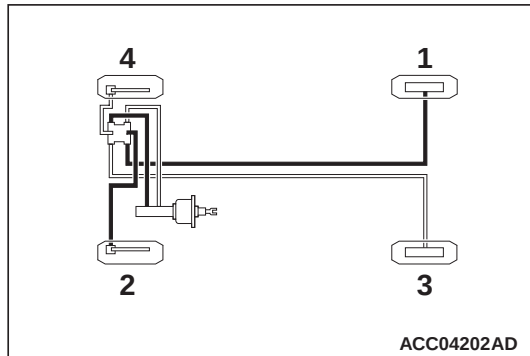
1. Fill the reserve tank with brake fluid.
2. Keep the brake pedal depressed.



3. Have another person cover the master cylinder outlet with a finger.
4. With the outlet still closed, release the brake pedal.
5. Repeat Steps 2 – 4 three or four times to fill the inside of the master cylinder with brake fluid.

BLEEDING OF BRAKE PIPELINE

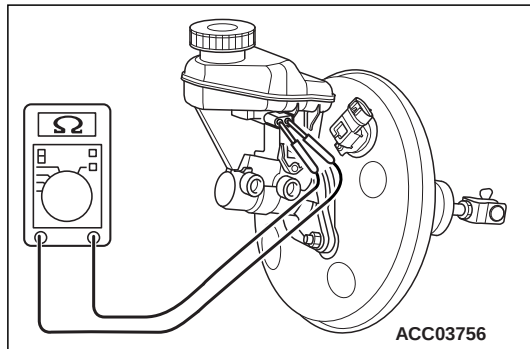
Perform the bleeding in the order shown in the figure.



BRAKE FLUID LEVEL SENSOR CHECK

M1351009101020

The brake fluid level sensor is in good condition if there is no continuity when the float surface is above "MIN" and if there is continuity when the float surface is below "MIN".



BRAKE PAD CHECK

M1351017300792

CAUTION

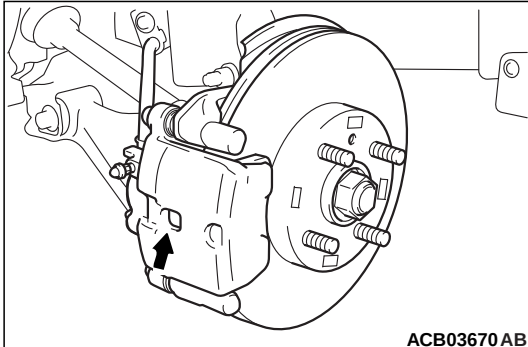
If there is a significant difference in thickness between the brake pads at right and left, check the sliding area and the run-out of the brake disc (Refer to [P.35A-20](#)).

1. Visually check the thickness of brake pad from the inspection hole of the caliper body.

Standard value: 9.0 mm (0.35 inch)

Limit: 2.0 mm (0.08 inch)

2. If the brake pad thickness is less than the limit value, replace the brake pad (Refer to [P.35A-19](#)).



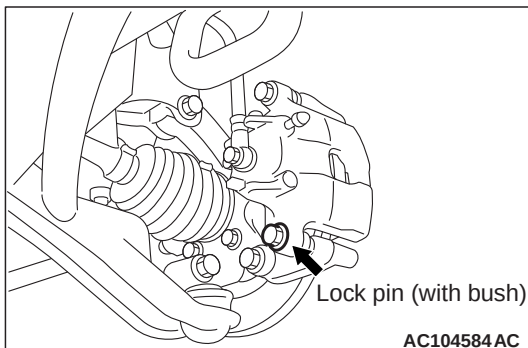
BRAKE PAD REPLACEMENT

M1351017401004

CAUTION

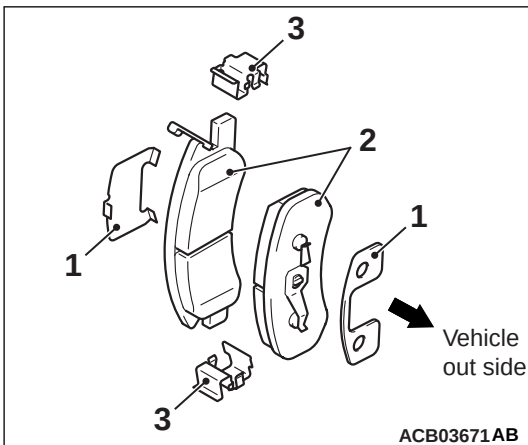
When replacing, replace both brake pads (right and left) as a set.

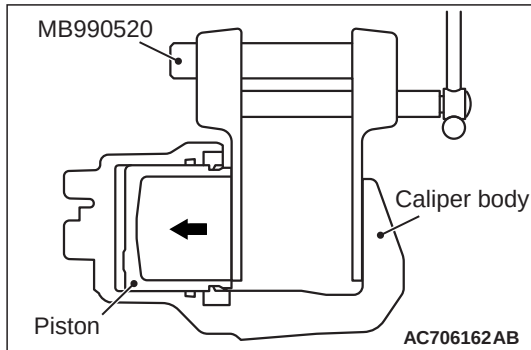
1. Remove the lock pin indicated in the figure, swivel the caliper body upward and retain it with a wire or similar tool.



2. Remove the following parts from the caliper support.

- (1) Shim
- (2) Brake pad assembly
- (3) Clip



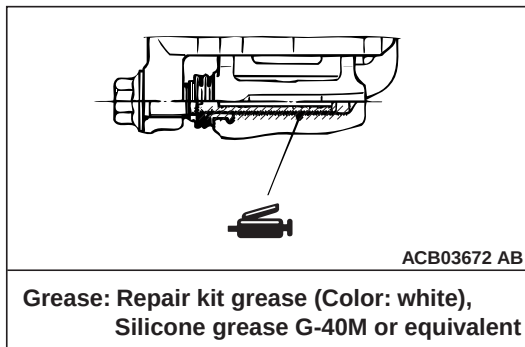
**⚠ CAUTION**

Keep grease or other soiling off the pad and brake disc friction surfaces.

3. Clean the piston part, and press the piston into the cylinder using the special tool piston expander (MB990520).
4. Assemble the shim, brake pad assembly and clip to the caliper support, and tighten the lock pin to the specified torque.

Tightening torque: 44 ± 5 N·m (32 ± 4 ft·lb)

NOTE: Install the brake pad assembly (with wear indicator) to the inner side of the brake disc, making sure that the wear indicator is located on the top.

LUBRICATION POINT**BRAKE DISC CHECK**

M1351018600439

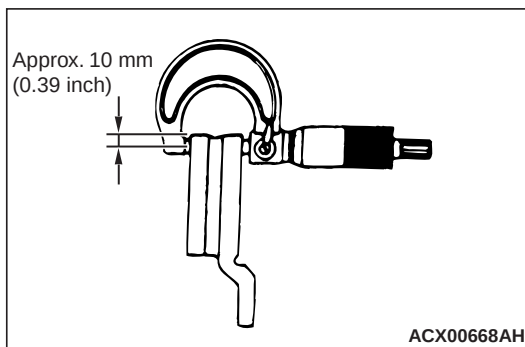
BRAKE DISC THICKNESS CHECK

1. Remove contaminants or corrosion from the brake disc surface.
2. Use a micrometer to measure the brake disc thickness at minimum eight points which are 10 mm inward from its circumference.

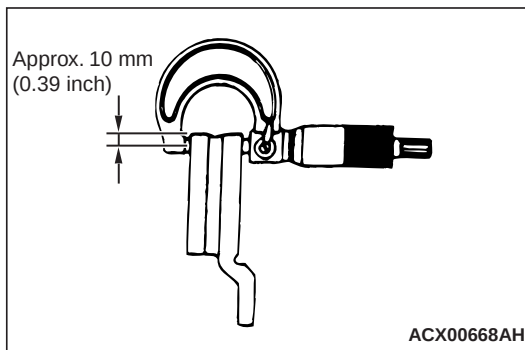
Standard value: 17.0 mm (0.67 inch)

Limit: 15.4 mm (0.61 inch)

3. If the brake disc thickness is worn beyond the limit value at more than one point, replace the brake disc. Then rephase the brake disc so that the minimum brake disc run-out is obtained, or grind the disc while in place on the vehicle so that its run-out is below the limit value.

**BRAKE DISC THICKNESS UNEVENNESS CHECK AND CORRECTION**

1. Remove contaminants or corrosion from the brake disc surface.



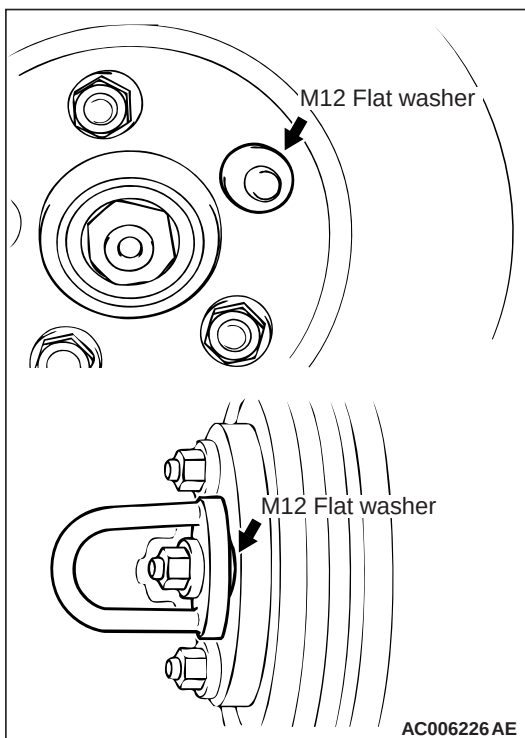
2. Use a micrometer to measure the brake disc thickness at minimum eight points which are 10 mm (0.39 inch) inward from its circumference. Then record the measurements.
3. If the brake disc thickness unevenness (the difference between the maximum and minimum values measured above) is 0.015 mm (0.0006 inch) or less, it is within the standard value.
4. If the brake disc thickness unevenness exceeds the standard value, grind it according to the procedure below while it is mounted on the vehicle.

NOTE: If it is suspected that the brake disc thickness will become less than the limit value after the grinding, replace the brake disc. Then rephase the brake disc run-out is obtained, or grind the disc while in place on the vehicle so that its run-out is below the limit value.

- (1) Check for wheel bearing looseness in the axial direction (Refer to GROUP 26 – On-vehicle Service, Wheel bearing end play check [P.26-7](#)).

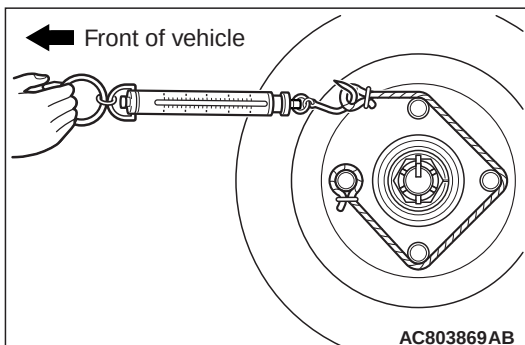
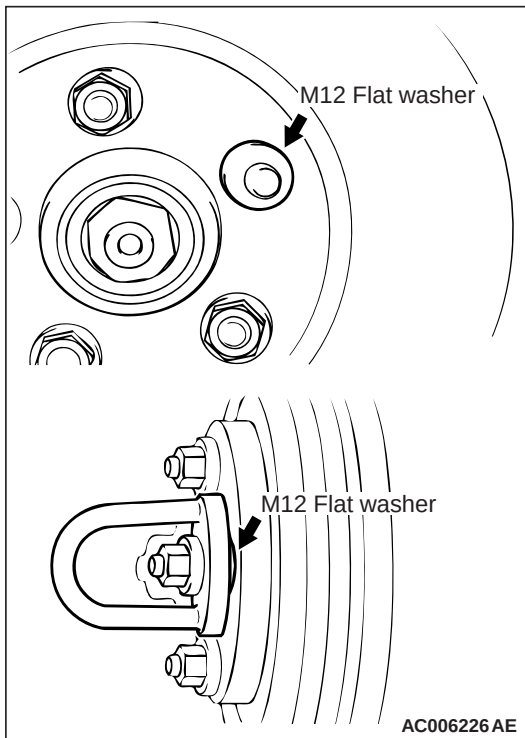
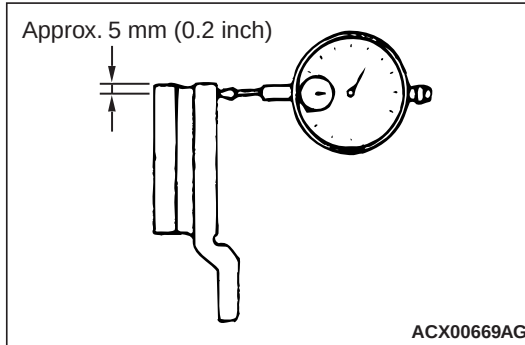
⚠ CAUTION

- Insert M12 plain washer and then install the adapter as shown before grinding. Failure to use the M12 plain washer will cause the brake disc to be deformed and ground incorrectly.
 - To grind the brake disc, ensure that all the nuts [M12 × 1.5 mm (M12 × 0.06 inch)] are tightened evenly and in a diagonal sequence to the specified torque [100 N·m (74 ft-lb)]. Failure to use all the nuts [M12 × 1.5 mm (M12 × 0.06 inch)], excessive or uneven tightening torque will cause the brake disc to deform or judder.
- (2) Correct the brake disc uneven thickness by grinding it while in place on the vehicle.



BRAKE DISC RUN-OUT CHECK AND CORRECTION

1. Check for wheel bearing looseness in the axial direction (Refer to GROUP 26 – On-vehicle Service, Wheel bearing end play check [P.26-7](#)).



- If the end play is within the limit value, secure the brake disc by tightening the nut (M12 X 1.5) evenly to the specified torque [100 N·m (74 ft-lb)]. If the end play still exceeds the limit value, replace the wheel bearing. Then secure the brake disc by tightening the nut (M12 X 1.5) evenly to the specified torque [100 N·m (74 ft-lb)].
- Place a dial gauge ca. 5 mm (0.2 inch) inward from the circumference of the brake disc to measure its run-out.

Limit: 0.06 mm (0.002 inch)

- If the brake disc run-out exceeds the limit value, rephase the brake disc to the hub so that the minimum brake disc run-out is obtained.

⚠ CAUTION

- Insert M12 plain washer and then install the adapter as shown before grinding. Failure to use the M12 plain washer will cause the brake disc to be deformed and ground incorrectly.
 - To grind the brake disc, ensure that all the nuts [M12 × 1.5 mm (M12 × 0.06 inch)] are tightened evenly and in a diagonal sequence to the specified torque [100 N·m (74 ft-lb)]. Failure to use all the nuts [M12 × 1.5 mm (M12 × 0.06 inch)], excessive or uneven tightening torque will cause the brake disc to deform or judder.
- If the brake disc run-out exceeds the limit value after rephasing, grind the disc while in place on the vehicle so that the brake disc run-out is within the limit value.

NOTE: If it is suspected that the brake disc thickness will be below the limit value, replace the brake disc. Then rephase the brake disc so that the minimum brake disc run-out is obtained, or grind the disc while in place on the vehicle so that its run-out is below the limit value.

BRAKE DRAG FORCE CHECK

M1351017200643

- Remove the brake pad, shim and clip (Refer to [P.35A-19](#)).
- Using a spring scale, measure the hub sliding torque in the forward direction with the brake pad, shim and clip removed.
- Install the brake pad, shim and clip (Refer to [P.35A-19](#)).
- Start the engine, and depress the brake pedal lightly two or three times. Then stop the engine [Depressing force: approximately 50 – 100 N (11.2 – 22.5 lb)]
- Turn the brake disc 10 times in the forward direction.
- Using a spring scale, measure the hub sliding torque in the forward direction with the brake pad, shim and clip installed.

7. Obtain the disc brake drag force (difference between measured values of item 2 and item 6).

Standard value: 42 N (9.4 lb) or less

8. If the brake drag force exceeds the standard value, disassemble the brake caliper assembly to check for fouling/rust on the piston sliding section and piston seal deterioration, and confirm whether the guide pin and lock pin slide properly (Refer to [P.35A-32](#)).

BRAKE LINING THICKNESS CHECK

M1351003000787

CAUTION

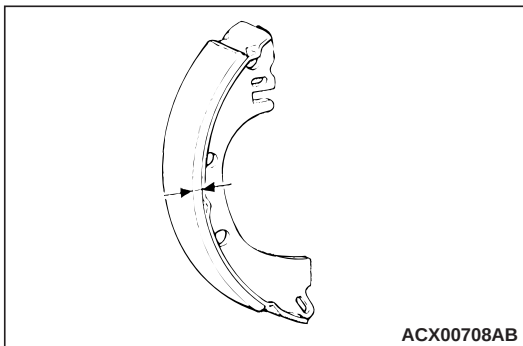
- Whenever the shoe and lining assembly is replaced, replace both RH and LH assemblies as a set to prevent the car from pulling to one side when braking.
- If there is a significant difference in the thickness of the shoe and lining assemblies on the left and right sides, check the sliding condition of the piston.

1. Remove the brake drum.
2. Measure the thickness of the brake lining at the area with the most wear.

Standard value: 3.8 mm (0.15 inch)

Limit: 2.0 mm (0.08 inch)

3. Replace the shoe and lining assembly if the brake lining thickness is less than the limit or if it is not worn evenly. For installation procedures for the shoe and lining assembly, refer to [P.35A-36](#).



REAR WHEEL HUB ASSEMBLY INSIDE DIAMETER CHECK

M1351003200888

CAUTION

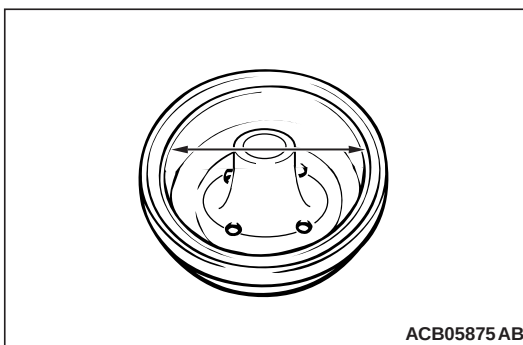
- The vehicle speed detection encoder collects any metallic particle easily, because it is magnetized. Make sure that the encoder should not collect any metallic particle.
- Always keep magnetic substances away from the vehicle speed detection encoder.

1. Remove the rear wheel hub assembly.
2. Measure the inside diameter of the rear wheel hub assembly at two or more locations.

Standard value: 180 mm (7.1 inch)

Limit: 181 mm (7.1 inch)

3. Replace the rear wheel hubs, shoe and lining assembly when wear exceeds the limit value or is badly imbalanced.

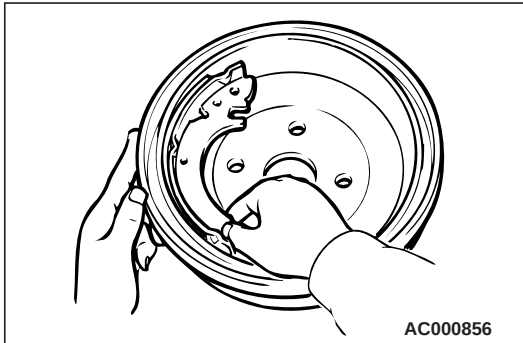


**BRAKE LINING AND BRAKE DRUM CONTACT
CHECK**

M1351003100698

1. Remove the brake drum.
2. Remove the shoe and lining assembly (Refer to [P.35A-36](#)).
3. Chalk the inner surface of the brake drum and rub with the shoe and lining assembly.
4. Replace the shoe and lining assembly or brake drums if there are any irregular contact areas.

NOTE: Clean off chalk after check.



BRAKE PEDAL

REMOVAL AND INSTALLATION

M1351003401700

⚠ CAUTION

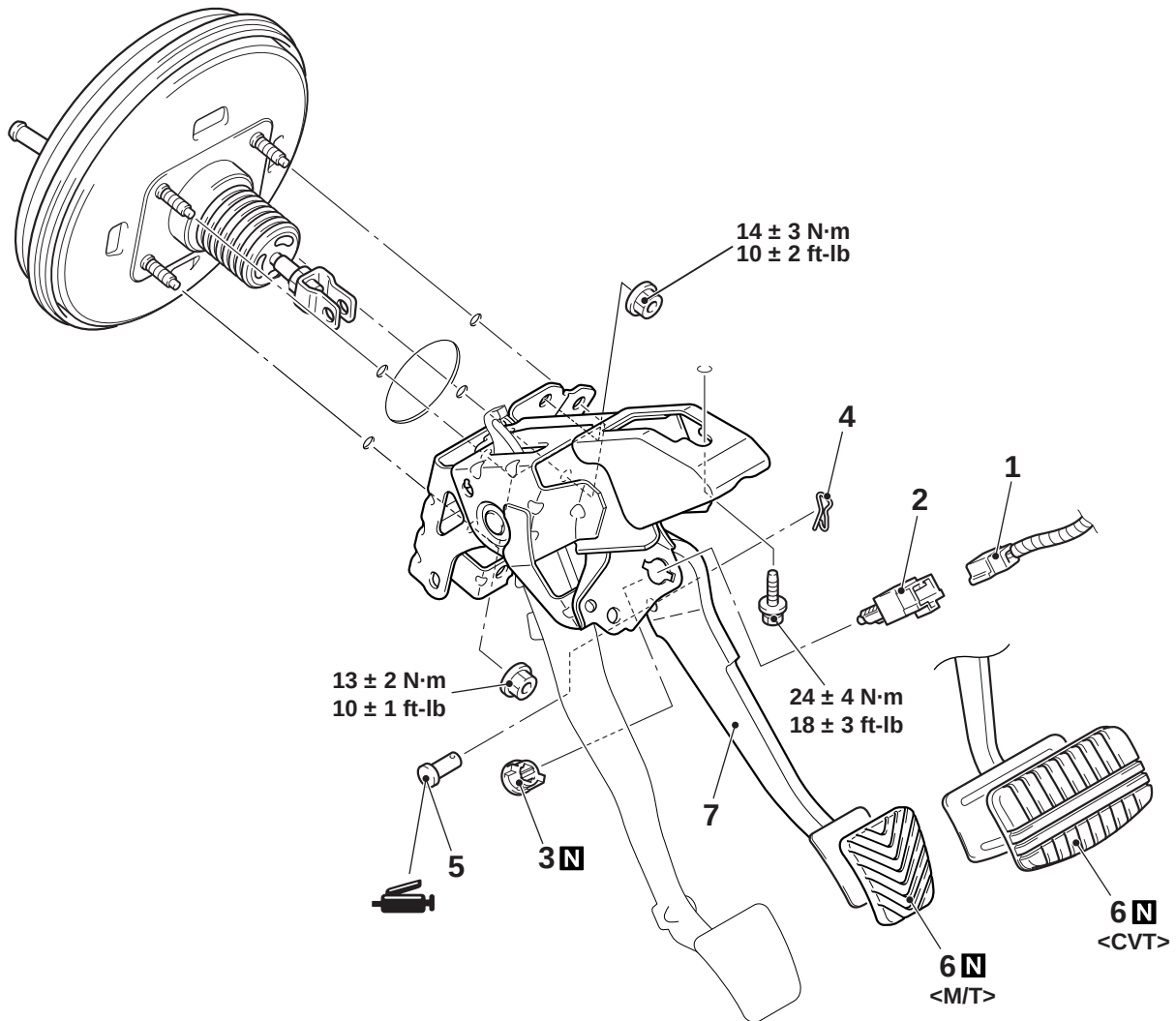
Do not apply grease or lubricant to the switch and the switch installation section to avoid malfunction of the switch. In addition, do not use gloves which have grease on them.

Pre-removal Operation

Clutch Cable Connection Removal (Refer to GROUP 21A – Clutch Control [P.21A-5](#)).

Post-installation Operation

- Clutch Cable Connection Installation (Refer to GROUP 21A – Clutch Control [P.21A-5](#)).
- Brake Pedal Adjustment (Refer to [P.35A-13](#)).



ACC03221AB

Removal steps

1. Stoplight switch connector
2. Stoplight switch
3. Pedal clip
4. Snap pin

Removal steps (Continued)

5. Clevis pin
6. Pedal pad
7. Brake pedal assembly

INSPECTION

STOPLIGHT SWITCH CHECK

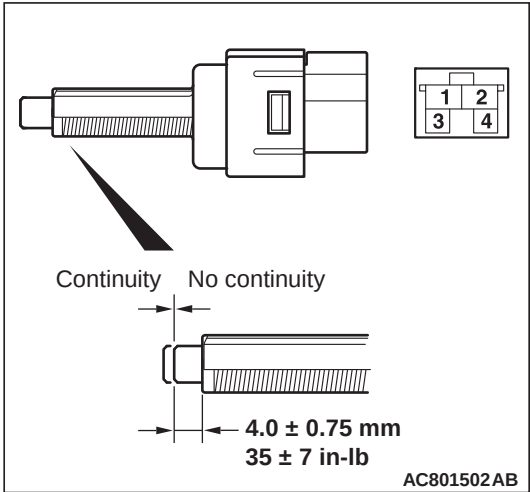
M1351008900730

<M/T>

⚠ 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.

Check for continuity between the terminals of the switch.



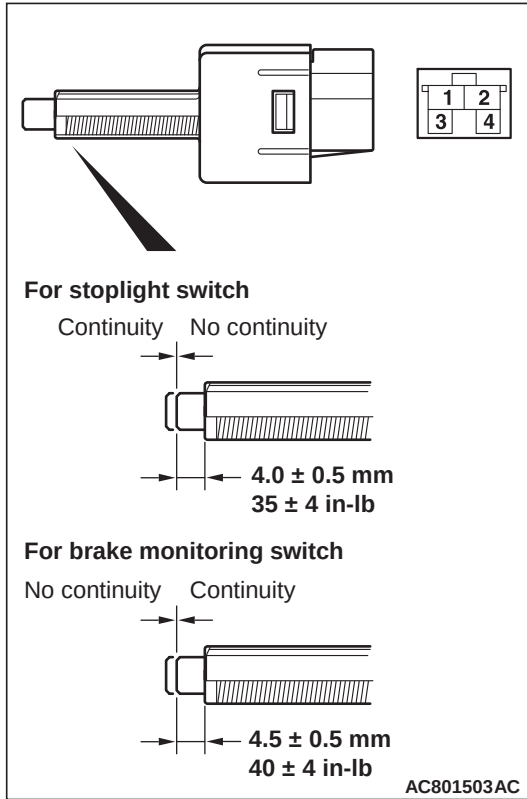
Check condition	Terminal connector of tester	Normal condition
At free position	1 – 2	Continuity exists (2 Ω or less)
Press the plunger from the edge of the outer case by the dimension shown in the figure.	1 – 2	No continuity

<CVT>

⚠ 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.

Check for continuity between the terminals of the switch.



Check condition	Terminal connector of tester	Normal condition
At free position	1 – 2 (for stoplight switch)	Continuity exists (2 Ω or less)
	3 – 4 (for brake monitoring switch)	No continuity
Press the plunger from the edge of the outer case by the dimension shown in the figure.	1 – 2 (for stoplight switch)	No continuity
	3 – 4 (for brake monitoring switch)	Continuity exists (2 Ω or less)

Removal steps (Continued)

6. Reservoir assembly
7. Reservoir seal
8. Brake fluid level switch
9. Brake master cylinder assembly
10. O-ring
11. Brake vacuum sensor connector
12. Brake vacuum sensor
13. Grommet
14. Hose clip
15. Clip
- >>A<< 16. Vacuum hose (with built-in check valve)
17. Hose clip
18. Vacuum hose
19. Cable band
20. Vacuum pipe
21. Snap pin
22. Clevis pin
- <<A>> 23. Brake booster assembly
24. Sealer

REMOVAL SERVICE POINT

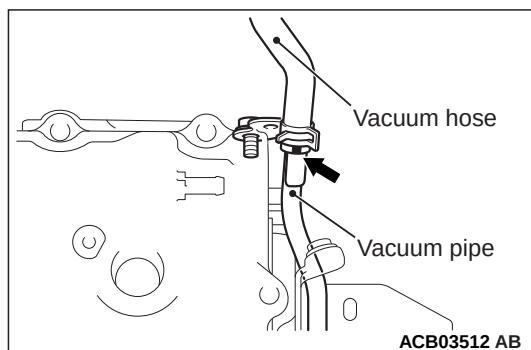
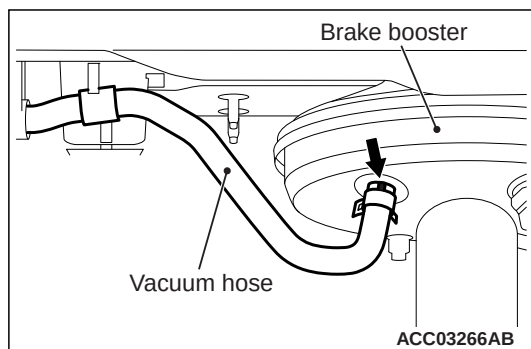
<<A>> BRAKE BOOSTER ASSEMBLY REMOVAL

Disconnect the engine from the engine mounting. Lower the front of the engine to remove its.

INSTALLATION SERVICE POINT

>>A<< VACUUM HOSE (WITH BUILT-IN CHECK VALVE) CONNECTION

Install the vacuum hose (with built-in check valve) with its marking located as shown in the figure.

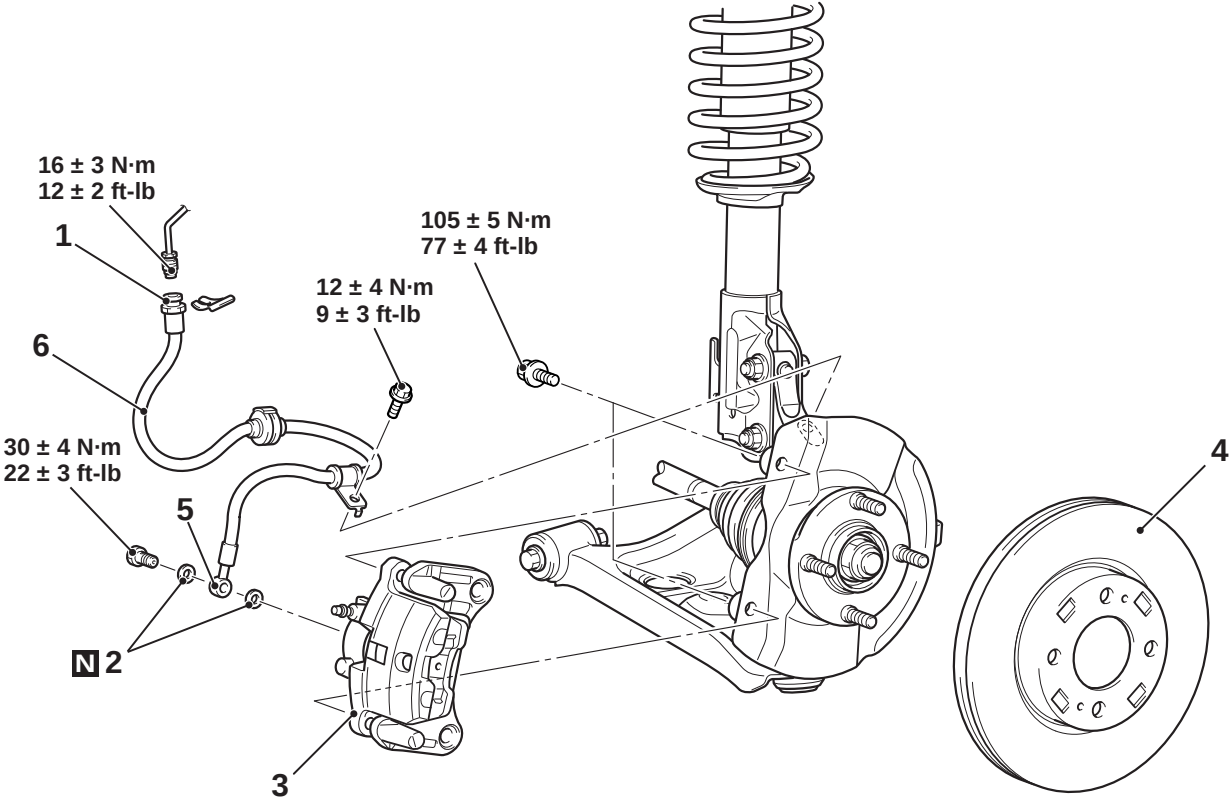


FRONT DISC BRAKE ASSEMBLY

REMOVAL AND INSTALLATION

M1351006001938

Pre-removal Operation Brake Fluid Draining	Post-installation Operation Brake Fluid Refilling and Air Bleeding (Refer to P.35A-17).
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ACB03508 AB

Removal steps

1. Connection between brake hose and brake caliper
2. Gasket
3. Brake caliper assembly

<<A>>

Removal steps (Continued)

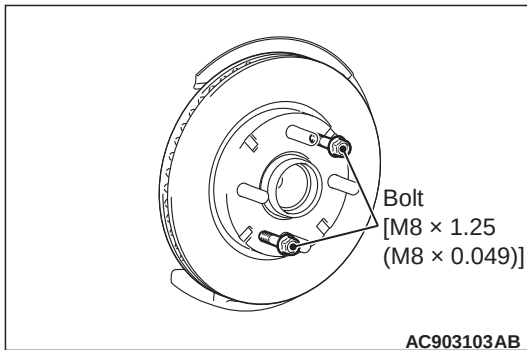
- Brake disc run-out check and correction (only at installation) (Refer to [P.35A-20](#)).
- 4. Brake disc
- 5. Brake hose connection
- 6. Brake hose

>>A<<

REMOVAL SERVICE POINTS

<<A>> BRAKE DISC REMOVAL

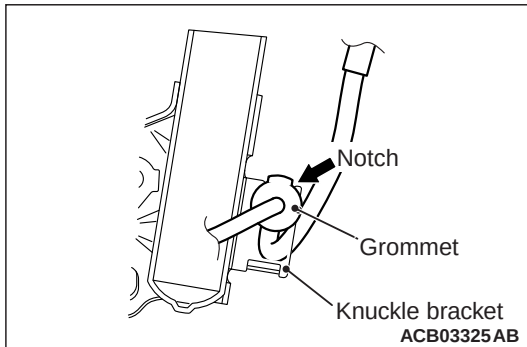
If the brake disc removal is difficult, install bolts [M8 x 1.25 mm (M8 x 0.049 inch)] shown in the figure, and tighten them evenly and gradually to remove the brake disc.



INSTALLATION SERVICE POINT

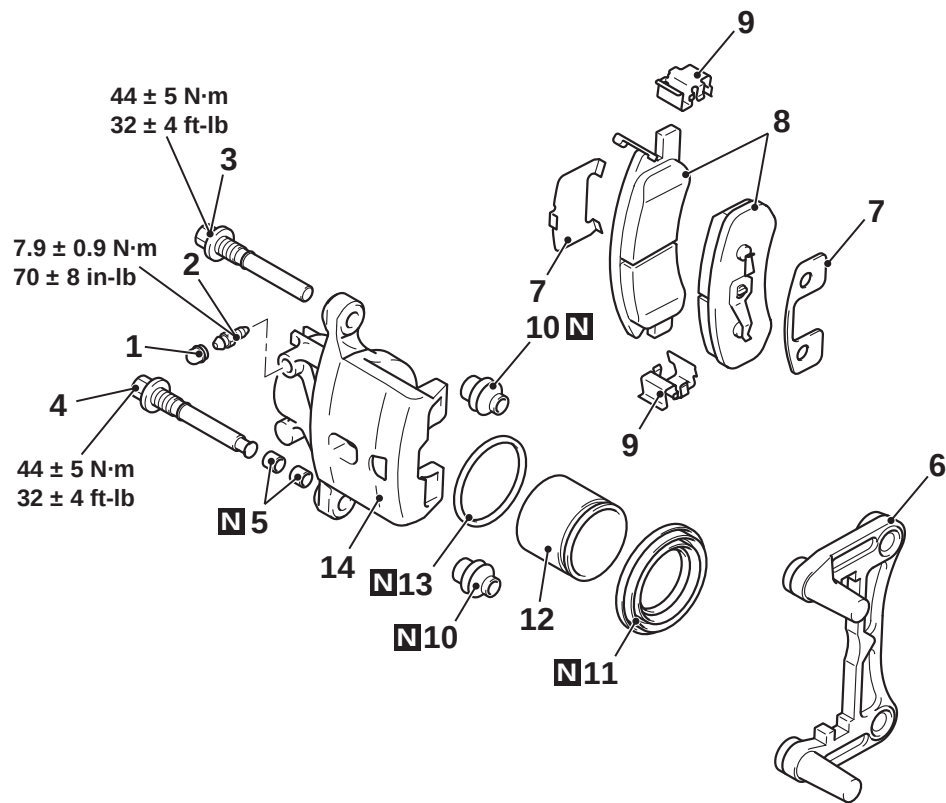
>>A<< BRAKE HOSE INSTALLATION

Insert grommet to knuckle bracket securely as shown. The notch of grommet must be coincided with the top end of knuckle bracket.

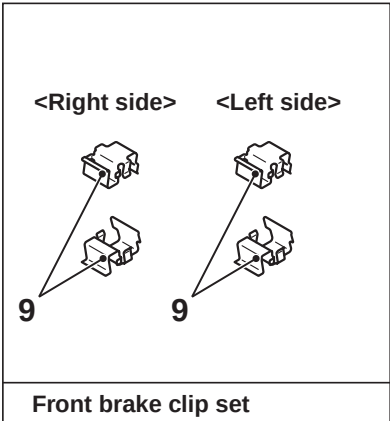
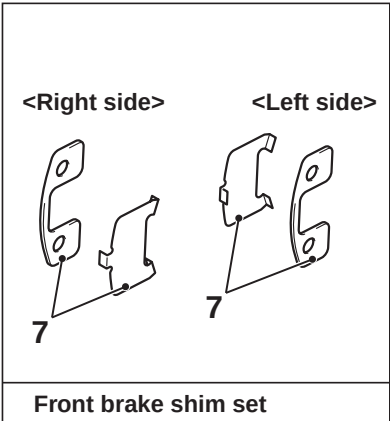
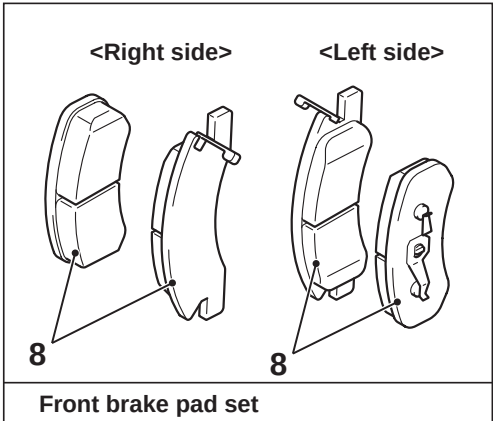
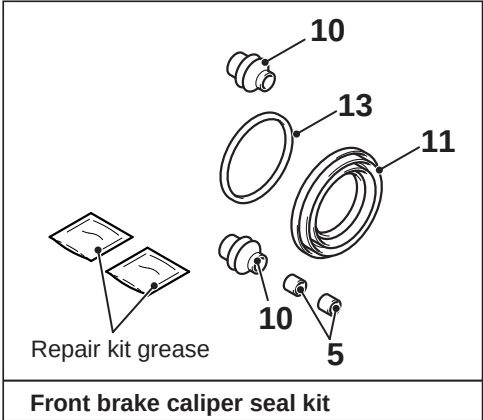
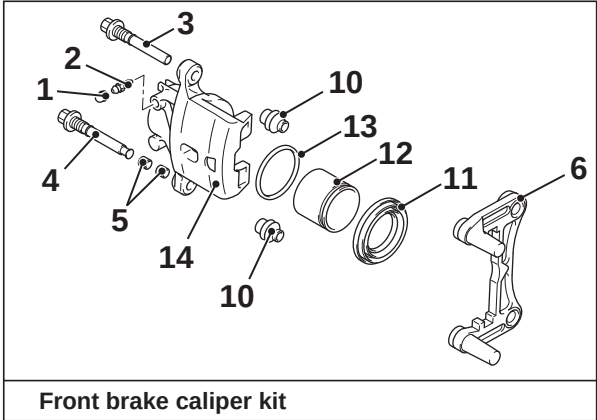


DISASSEMBLY AND REASSEMBLY

M1351006202515



ACC01015 AC



Disassembly steps

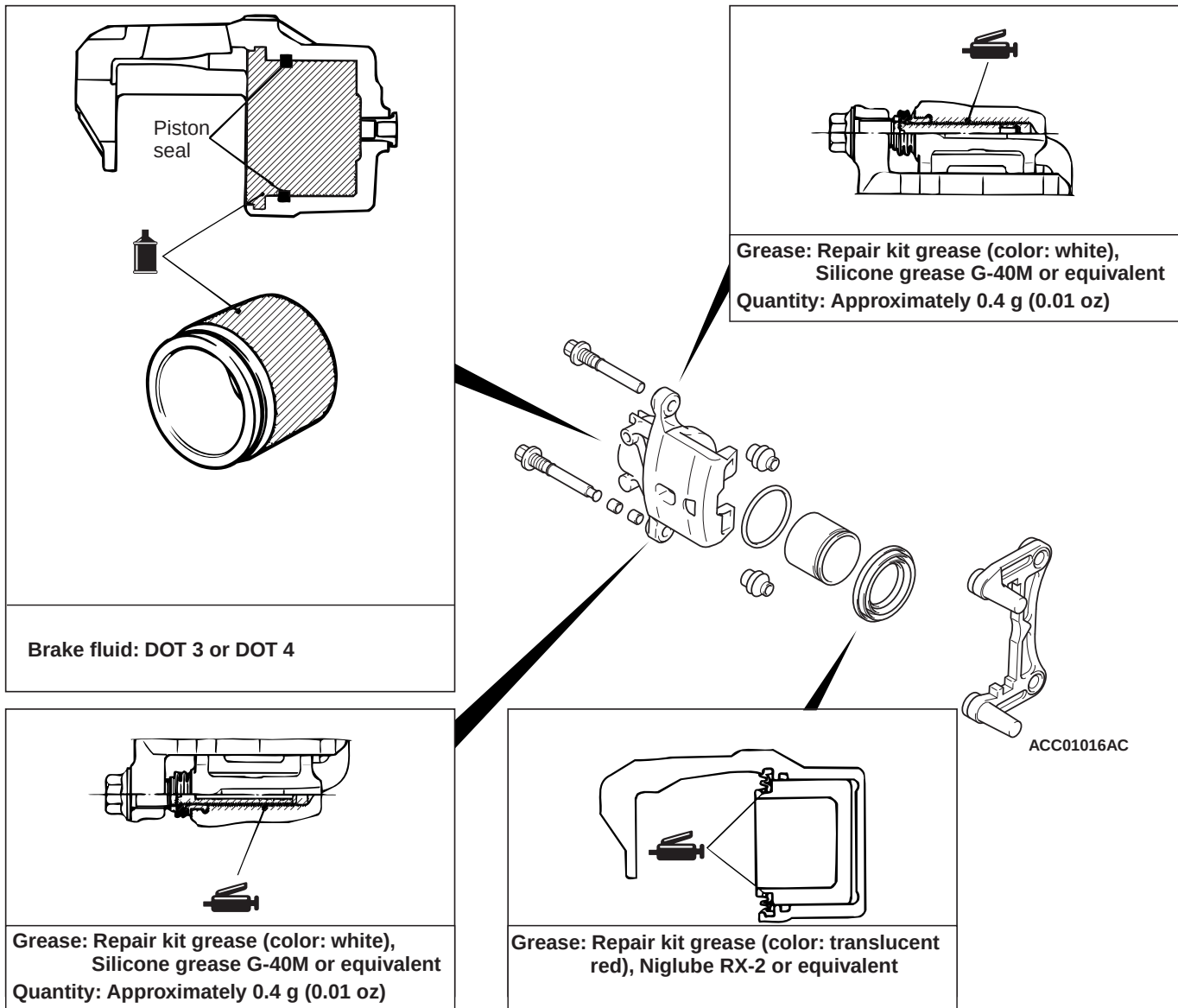
1. Bleeder cap
2. Bleeder
3. Guide pin
4. Lock pin
5. Bushing
6. Caliper support
(including brake pad, clip, and shim)
7. Shim
8. Brake pad assembly
9. Clip

Disassembly steps (Continued)

- | | |
|--|---|
| <p><<A>></p> <p><<A>></p> <p><></p> | <p>10. Pin boot</p> <p>11. Piston boot</p> <p>12. Piston</p> <p>13. Piston seal</p> <p>14. Caliper body</p> |
|--|---|

NOTE: Install the brake pad assembly (with wear indicator) to the inner side of the brake disc, making sure that the wear indicator is located on the top.

LUBRICATION POINTS



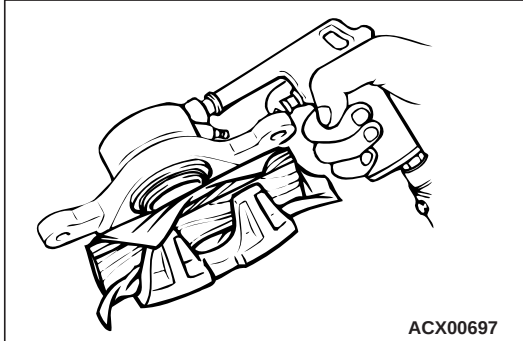
DISASSEMBLY SERVICE POINTS

<<A>> PISTON BOOT/PISTON REMOVAL

 CAUTION

Blow air little by little to remove the pistons. The pistons will rush out if a force of air is applied suddenly.

Cover the caliper body outer side with a cloth or similar materials. Blow compressed air through the brake hose installation area to remove the piston and piston boot.



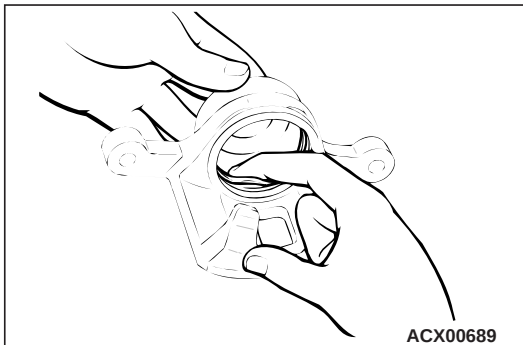
<> PISTON SEAL REMOVAL

 CAUTION

Do not use a flat-tipped screwdriver or similar tool to remove the piston seal. These may damage the inner side of the cylinder.

1. Remove the piston seal with your finger tip.
2. Clean the piston surface and cylinder inner face with alcohol or specified brake fluid.

Brake fluid: DOT3 or DOT4



INSPECTION

M1351015001174

BRAKE PAD WEAR INSPECTION

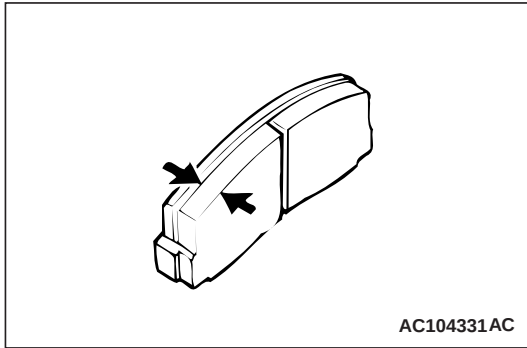
CAUTION

- When replacing, replace both brake pad assembly (right and left) as a set.
- If there is a significant difference in thickness between the brake pads at right and left, check the sliding area of the brake caliper.

Measure the brake pad thickness at the most worn area. If the brake pad thickness is less than the limit value, replace the brake pad.

Standard value: 9.0 mm (0.35 inch)

Limit: 2.0mm (0.08 inch)



REAR DRUM BRAKE

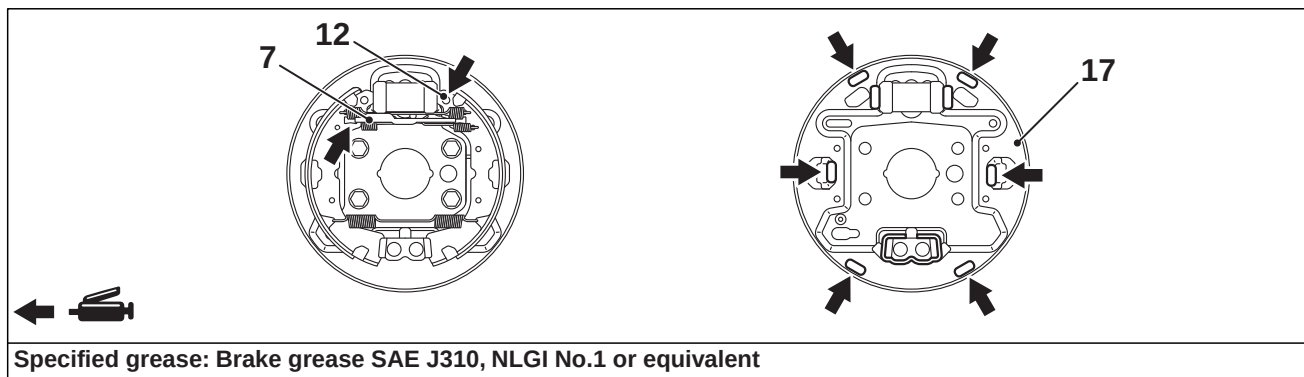
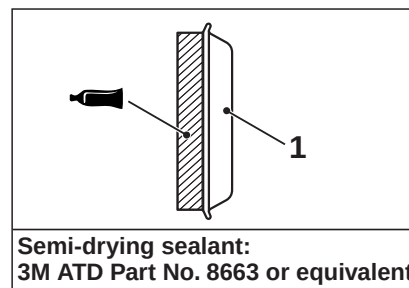
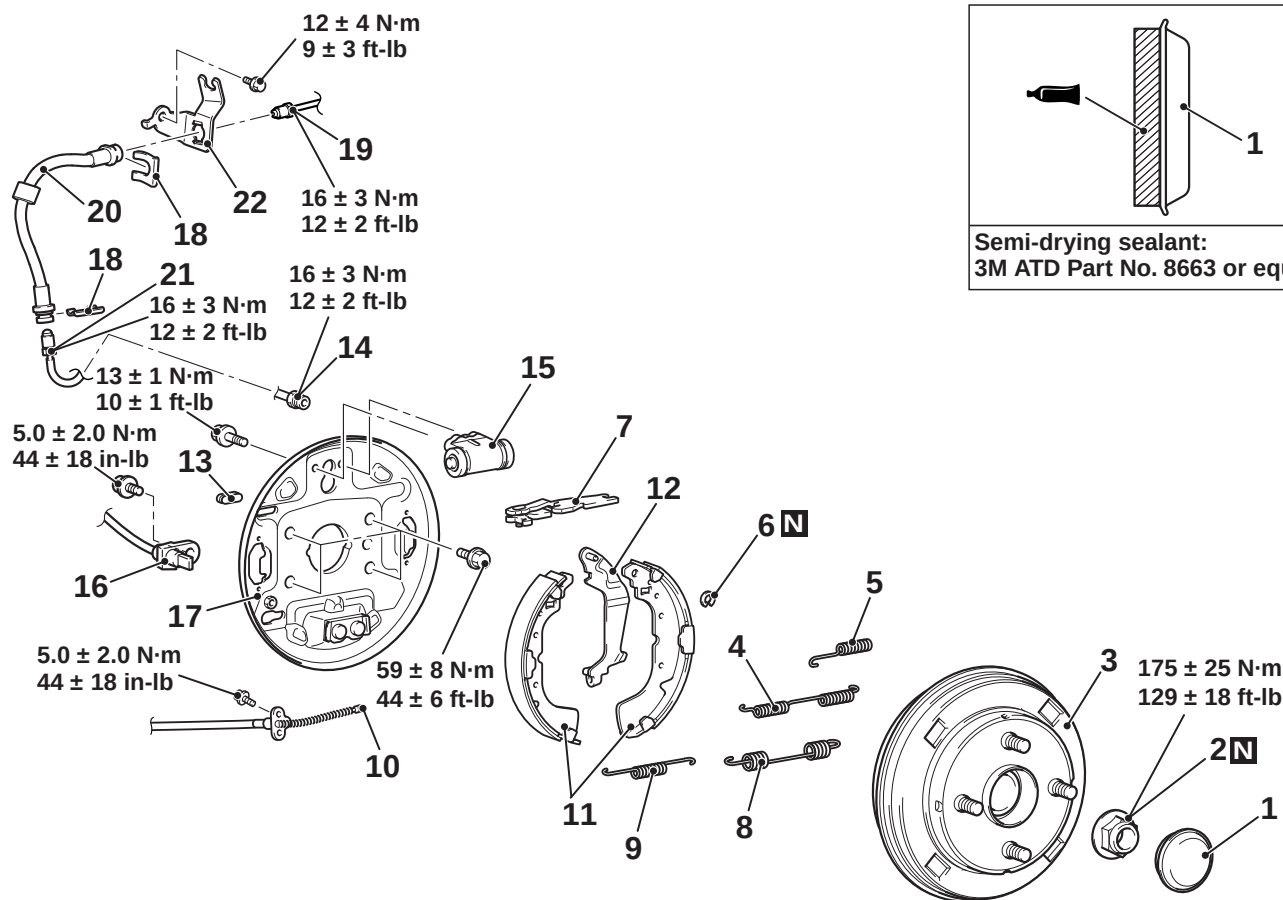
REAR DRUM BRAKE REMOVAL AND INSTALLATION

M1351007501174

 CAUTION

- The vehicle speed detection encoder collects any metallic particle easily, because it is magnetized. Make sure that the encoder should not collect any metallic particle. Check that there is not any trouble prior to reassembling it.
- Always keep magnetic substances away from the vehicle speed detection encoder.
- When the rear wheel speed sensor is removed and installed, make sure that its pole piece does not contact with surrounding parts to avoid damage.

Pre-removal Operation • Brake Fluid Draining	Post-installation Operation • Brake Fluid Filling and Air Bleeding (Refer to P.35A-17). • Parking Brake Lever Stroke Adjustment (Refer to GROUP 36, On-vehicle Service – Parking Brake Lever Stroke Check and Adjustment P.36-5).
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Removal steps

- <<A>> >>B<<
<>
1. Hub cap
 2. Self-locking nut
 3. Rear wheel hub assembly
 4. Shoe-to-shoe spring
 5. Strut-to-shoe spring
 6. Snap ring
 7. Adjuster assembly
 8. Retainer spring
 9. Retainer spring
 - >>A<< 10. Parking brake rear cable connection
 11. Shoe and lining assembly
 12. Parking lever
 13. Adjusting hole cover
 14. Brake pipe connection

Removal steps (Continued)

15. Wheel cylinder assembly
16. Rear wheel speed sensor
17. Backing plate
18. Hose clip
19. Brake tube connection (body side)
20. Brake hose
21. Brake tube connection (brake hose side)
22. Bracket

Required Special Tools:

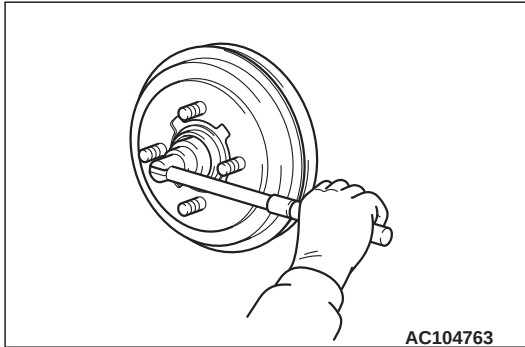
- MB991292: Axle shaft puller

REMOVAL SERVICE POINTS

<<A>> SELF-LOCKING NUT REMOVAL

 CAUTION

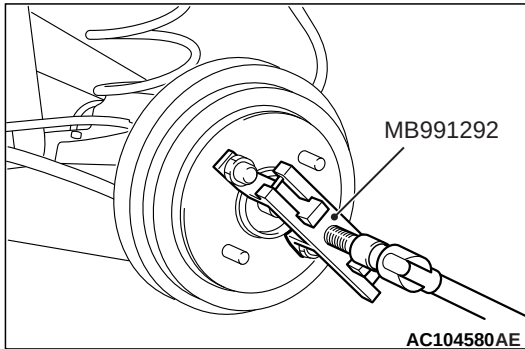
- Do not apply the vehicle weight to the wheel bearing while loosening the self-locking nut, or the wheel bearing will be damaged.
- Use an manual tool only to remove the self-locking nut. (Do not use an electric or air tool).
- Do not loosen the self-locking nut more than eight turns per one minute.



<> REAR WHEEL HUB ASSEMBLY REMOVAL

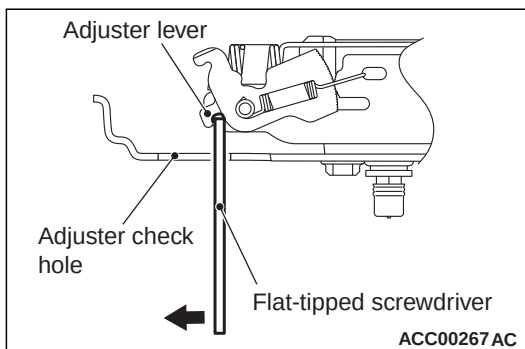
Use the following special tools to remove the rear wheel hub assembly.

- Axle shaft puller (MB991292)



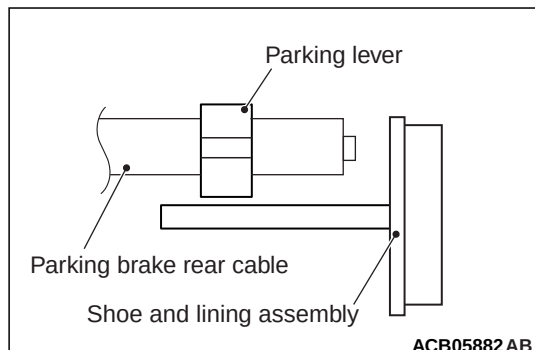
<<C>> ADJUSTER ASSEMBLY RELEASE

Procedure of releasing adjuster as follows, insert flat-tipped screwdriver into adjuster check hole. Hook the tip of flat-tipped screwdriver on projection of adjuster lever. Release the engagement by moving the adjuster lever to arrow direction.



INSTALLATION SERVICE POINTS

>>A<< PARKING BRAKE REAR CABLE CONNECTION



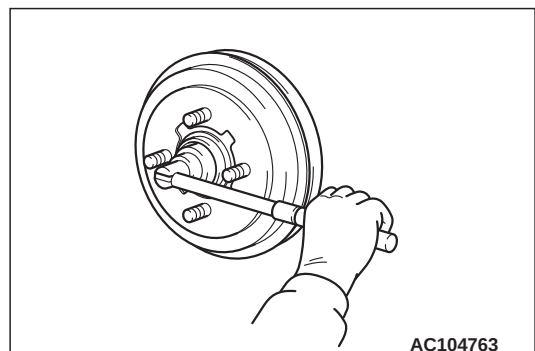
After installing a parking brake rear cable in the parking lever, pull a parking brake rear cable and confirm that it does not come out from parking lever.

>>B<< SELF-LOCKING NUT INSTALLATION

CAUTION

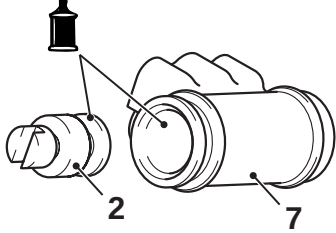
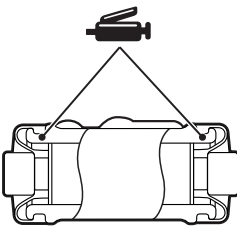
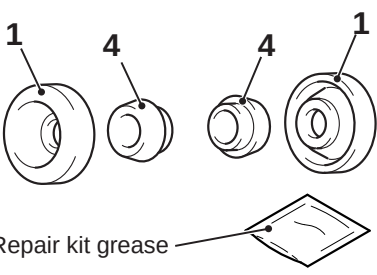
- Before securely tightening the self-locking nuts, make sure there is no load on the wheel bearings. Otherwise the wheel bearing will be damaged.
- Use an manual tool only to tighten the self-locking nut. (Do not use an electric or air tool).
- Do not tighten the self-locking nut more than eight turns per one minute.

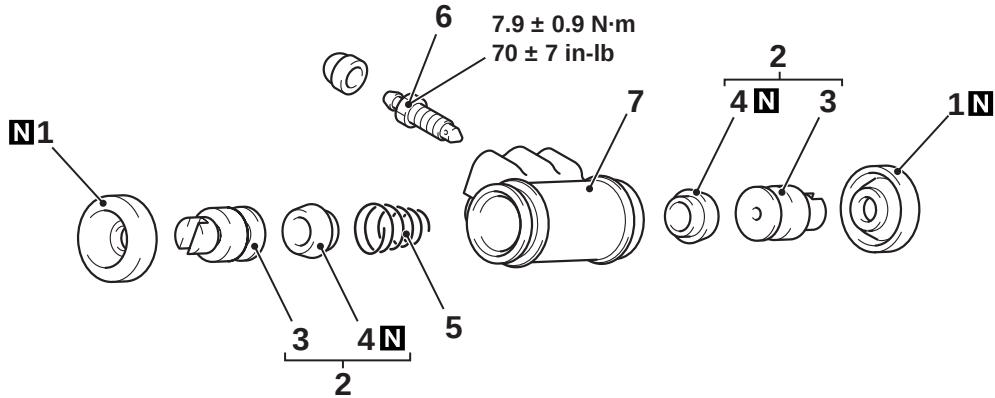
Tighten the self-locking nut to the specified torque.



WHEEL CYLINDER ASSEMBLY DISASSEMBLY AND REASSEMBLY

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Brake fluid: DOT 3 or DOT 4	Grease: Repair kit grease (Color: Translucent red), Niglube RX-2 or equivalent Quantity: Approximately 0.8 g (0.03 oz)	Wheel cylinder repair kit



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Disassembly steps

- 1. Boots
- 2. Piston assembly
- 3. Piston
- 4. Piston cup

Disassembly steps

- 5. Spring
- 6. Bleeder screw
- 7. Wheel cylinder body

ASSEMBLY SERVICE POINT

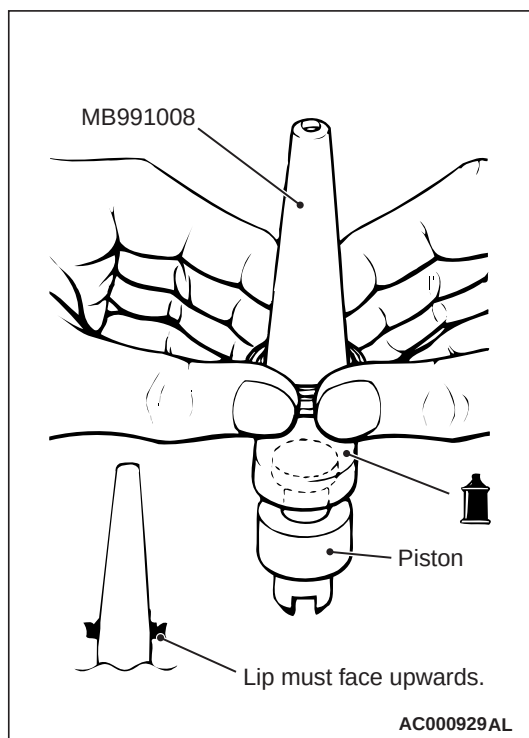
>>A<< PISTON CUP AND PISTON INSTALLATION

- 1. Use brake fluid DOT 3 or DOT 4 to clean the wheel cylinder and the piston.

⚠ CAUTION

In order to keep the piston cup from becoming twisted or slanted, slide the piston cup down special tool MB991008 slowly and carefully, without stopping.

2. Apply brake fluid DOT 3 or DOT 4 to the piston cups and special tool installer (MB991008).
3. Set the piston cup on special tool MB991008 with the lip of the cup facing up. Fit the cup onto special tool, and then slide it down the outside of special tool into the piston groove.



NOTES