GROUP 35A

BASIC BRAKE SYSTEM

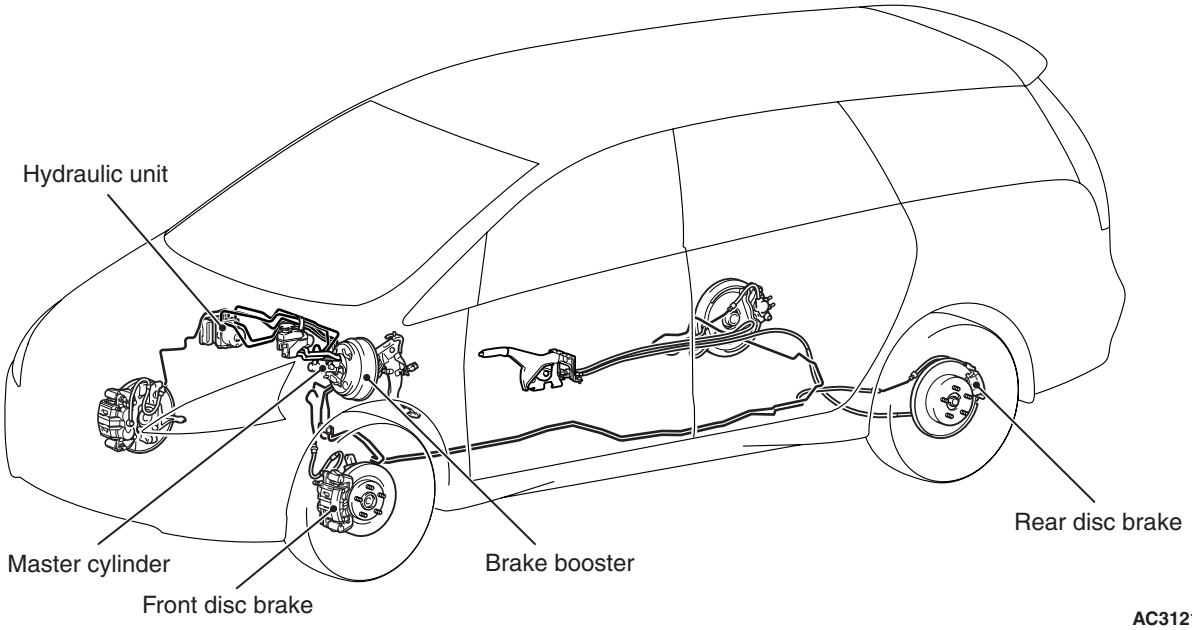
CONTENTS

GENERAL INFORMATION

M1351000100547

The brake system has been designed to give greater reliability and durability and to provide excellent braking performance.

CONFIGURATION DIAGRAM



AC312153AC

SPECIFICATIONS

Item		Specification
Master cylinder	Type	Tandem type
	I.D. mm	25.4
Brake booster	Type	Vacuum type, tandem
	Effective dia. of power cylinder mm	205 + 230
	Boosting ratio	8.5 (pedal pressure: 60 N) 10.5 (pedal pressure: 110 N)
Rear wheel hydraulic control method		Electronic brake-force distribution (EBD)
Front brakes	Type	Floating caliper, 2 piston, ventilated disc
	Disc effective dia. × thickness mm	241 × 26
	Wheel cylinder I.D. mm	45.4 × 2
	Pad thickness mm	10.0
	Clearance adjustment	Automatic

Item		Specification
Rear disc brakes	Type	Floating caliper, 1 piston, solid disc
	Disc effective dia. × thickness mm	258 × 10
	Wheel cylinder I.D. mm	38.1
	Pad thickness mm	10.0
	Clearance adjustment	Automatic
Brake fluid		DOT3 or DOT4

SERVICE SPECIFICATIONS

M1351000300585

Item		Standard value	Limit
Brake pedal height mm		211 – 214	–
Brake pedal free play mm		3 – 8	–
Brake pedal to floor board clearance mm		140 or more	–
Disc brake pad thickness mm		10.0	2.0
Disc brake disc thickness mm	Front	26.0	24.4
	Rear	10.0	8.4
Disc brake disc run-out mm	Front	–	0.03
	Rear	–	0.04
Disc brake drag force N	Front/Rear	68 or less	–
Wheel bearing axial play mm	Front/Rear	–	0.05
Brake booster push rod protruding length mm (When applying negative pressure of 66.7 kPa to the brake booster)		11.3 – 11.7	–

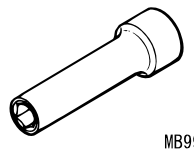
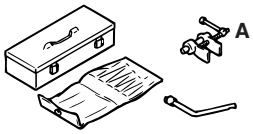
LUBRICANTS

M1351000400515

Item	Specified lubricant	Quantity
Brake fluid	DOT3 or DOT4	As required
Primary piston assembly, secondary piston assembly, master cylinder body, caliper body, piston, piston seal		
Guide pin, lock pin, bushing, pin boot, piston boot, boot ring	Repair kit grease	As required

SPECIAL TOOLS

M1351000600445

Tool	Number	Name	Use
 MB991568	MB991568	Push rod adjusting socket	Adjustment of the brake booster push rod protrusion amount
 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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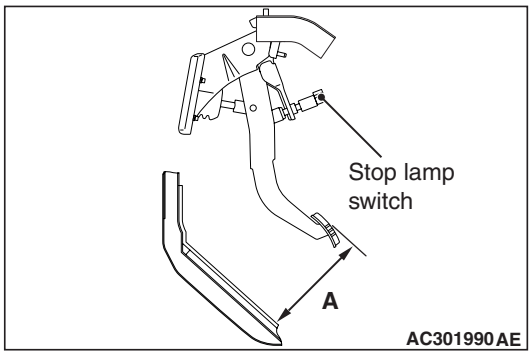
BRAKE PEDAL HEIGHT

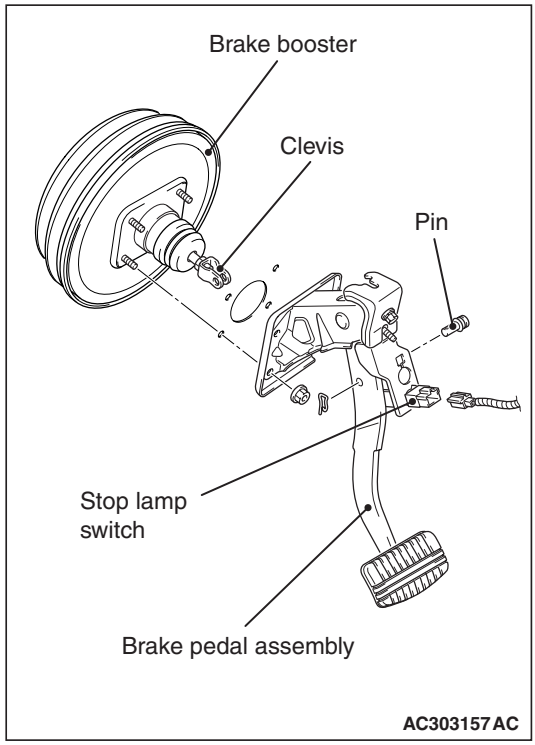
1. Turn up the carpet, etc. under the brake pedal.



2. Measure the brake pedal height as illustrated.

   Standard value (A): 211 – 214 mm
   [From the surface of dash panel to the face of pedal pad]

3. If the brake pedal height is not within the standard value, follow the procedure below.
   (1) Disconnect the stop lamp switch connector.
   (2) Loosen the stop lamp switch by turning it approximately one quarter of a turn anticlockwise.
   (3) Remove the brake pedal assembly (Refer to P.35A-12).

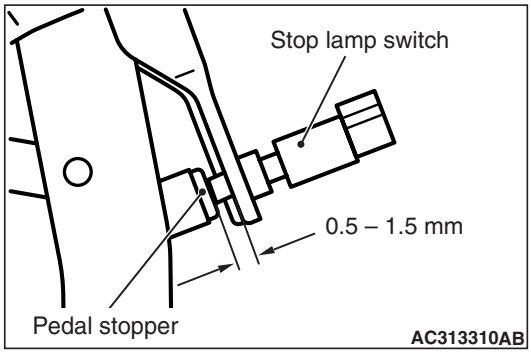


   (4) Adjust the brake pedal height by turning the clevis of brake booster.

   NOTE: When the clevis is turned 180°, the pedal height is changed approximately 2 mm.

   (5) Install the brake pedal assembly (Refer to P.35A-12).
   (6) Screw in the stop lamp switch until its thread contacts the stopper, and fix the stop lamp switch by turning it approximately one quarter of a turn clockwise.

(7) Measure the brake pedal height, and ensure that the measured value is within the standard value. When it is out of the standard value, repeat Step (3) - (6).



(8) Check that the clearance between the stop lamp switch and the stopper is as shown.

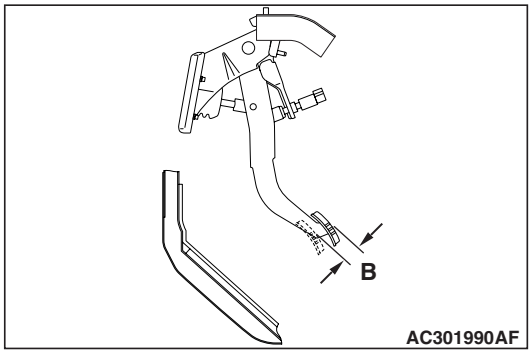
⚠ CAUTION

Check that the stop lamp does not illuminate when the brake pedal is not depressed.

(9) Connect the connector at the stop lamp switch.

4. For vehicles with A/T, check the key interlock/shift lock mechanism (Refer to GROUP 23A, On-vehicle service – key interlock/shift lock mechanism check and adjustmentP.23A-139).
5. Return the carpet, etc.

BRAKE PEDAL FREE PLAY



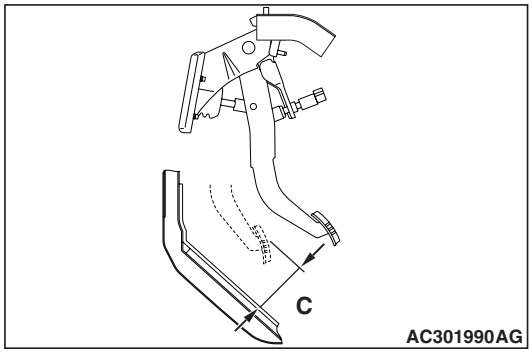
1. Turn the ignition switch to the "LOCK" (OFF) position, depress the brake pedal two or three times. After eliminating the vacuum in the brake booster, press the pedal down by hand, and confirm that the amount of movement before resistance is met (free play) is within the standard value range.

   Standard value: 3 – 8 mm

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 stop lamp 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.

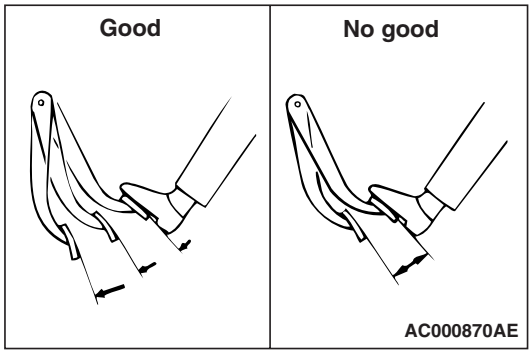
   Standard value (C): 140 mm or more [From the surface of floor board to the face of pedal pad]

3. If the clearance is outside the standard value, check for air trapped in the brake line, thickness of the disc brake pad, clearance between the lining and the drum and dragging in the parking brake. And then adjust and replace defective parts as required.
4. Return the carpet etc. to its original position.

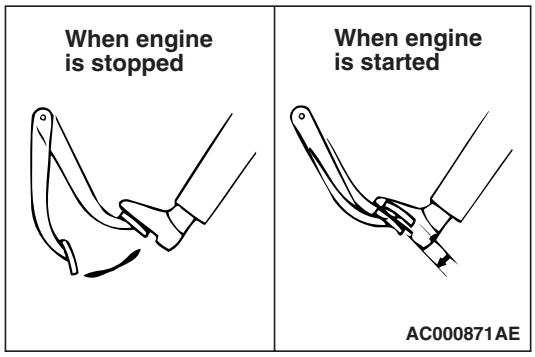
BRAKE BOOSTER OPERATING TEST

M1351001000446

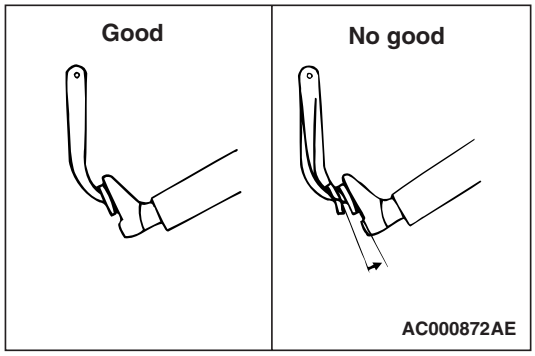
1. For simple checking of the brake booster operation, carry out the following tests:



(1) Run the engine for one or two minutes, and then stop it. If the pedal depresses fully the first time but gradually becomes higher when depressed succeeding times, the booster is operating properly. If the pedal height remains unchanged, the booster is defective. Go to step 2.



(2) With the engine stopped, step on the brake pedal several times. Then step on the brake pedal and start the engine. If the pedal moves downward slightly, the booster is in good condition. If there is no change, the booster is defective. Go to step 3.



(3) With the engine running, step on the brake pedal and then stop the engine. Hold the pedal depressed for 30 seconds. If the pedal height does not change, the booster is in good condition, if the pedal rises, the booster is defective.

2. If the above three tests are okay, the booster is OK. If one of the above three tests is not okay, the check valve, vacuum hose, or booster is defective. Check the check valve (Refer to P.35A-6), vacuum hose for leaks, high volume engine vacuum applied to booster. Repair or replace as necessary. If these are OK, replace the booster and repeat this test starting at Step 1.

CHECK VALVE OPERATION CHECK

M1351009000451

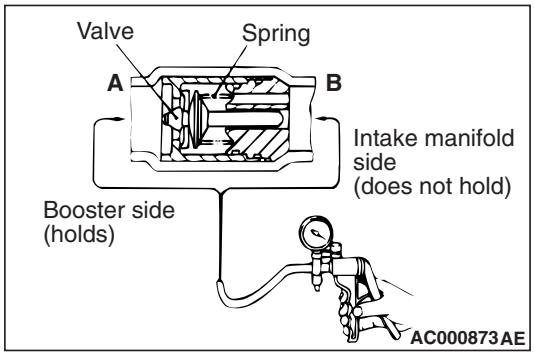
⚠ CAUTION

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

1. Remove the vacuum hose (Refer to P.35A-14).

⚠ 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

M1351001400563

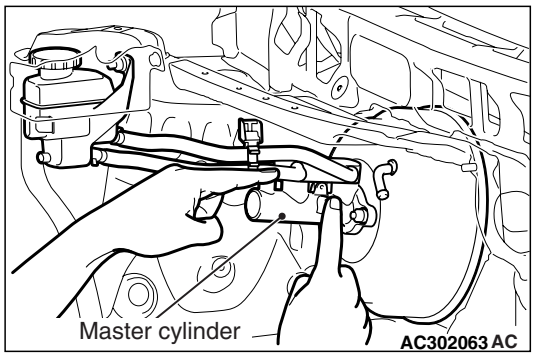
⚠ CAUTION

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.

MASTER CYLINDER BLEEDING

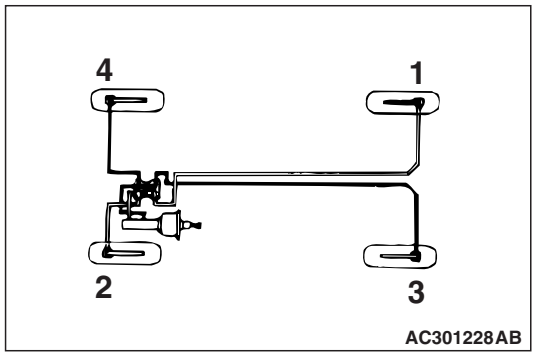
The master cylinder used has no check valve, so if bleeding is carried out by the following procedure, bleeding of air from the brake pipeline will become easier (When brake fluid is not contained in the master cylinder).

1. Fill the reservoir 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.

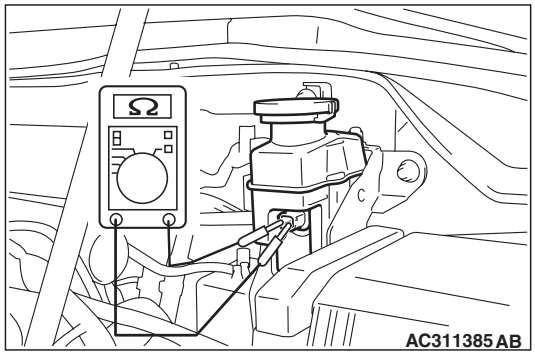
BRAKE LINE BLEEDING



Start the engine and bleed the air in the sequence shown in the figure.

BRAKE FLUID LEVEL SENSOR CHECK

M1351009100458

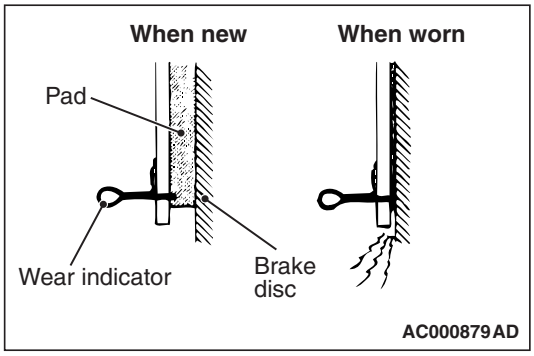


The brake fluid level sensor is in good condition if there is no continuity when the float surface is above "MIN" and if there is continuity when the float surface is below "MIN".

DISC BRAKE PAD CHECK AND REPLACEMENT

M1351002300495

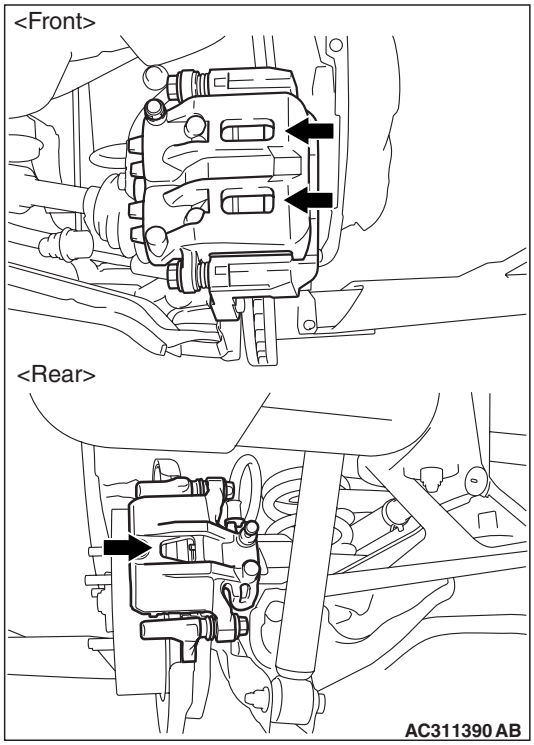
NOTE:



The brake pads have indicators that contact the brake disc when the brake pad thickness becomes 2 mm, and emit a squealing sound to warn the driver.

⚠ CAUTION

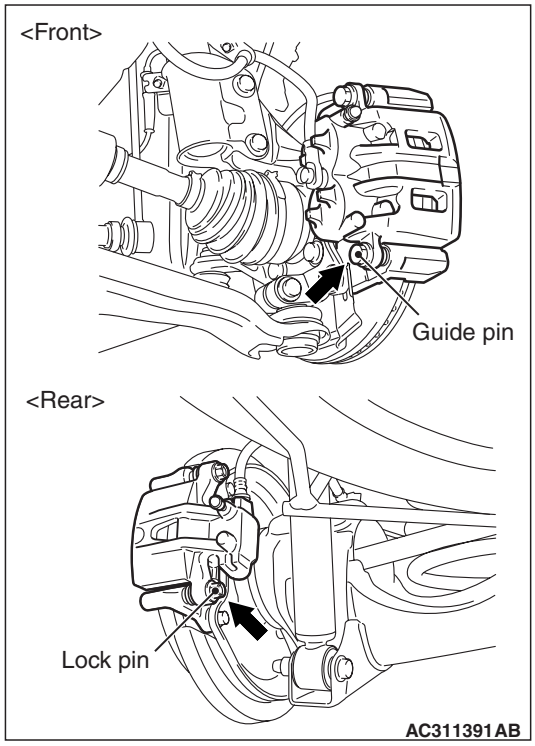
- **Whenever a pad must be replaced, replace both LH and RH wheel pads as a set to prevent the vehicle from pulling to one side when braking.**
- **If there is a significant difference in the thicknesses of the pads on the left and right sides, check the sliding condition of the piston and slide pins.**



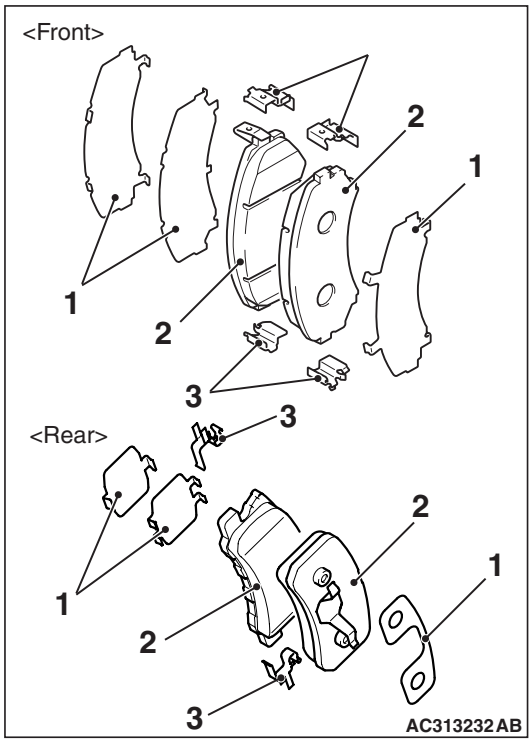
1. Check the brake pad thickness through the caliper body check port.

   Standard value: 10.0 mm
   Minimum limit: 2.0 mm

⚠ CAUTION
Do not wipe off the special grease that is on the lock pin or allow it to contaminate the lock pin.



2. Remove the guide/lock pin bolt. Pivot the caliper assembly and hold it with wires.



3. Remove the following parts from caliper support.
   (1) Shim
   (2) Pad assembly or Pad and wear indicator assembly
   (3) Pad clip
4. In order to measure the brake drag force after pad installation, measure the rotary-sliding resistance of the hub with the pads removed. For the front brakes, refer to P.35A-18. For the rear brakes, refer to P.35A-23.
5. Install the pads and caliper assembly, and then check the brake drag force. For the front brakes, refer to P.35A-18. For the rear brakes, refer to P.35A-23.

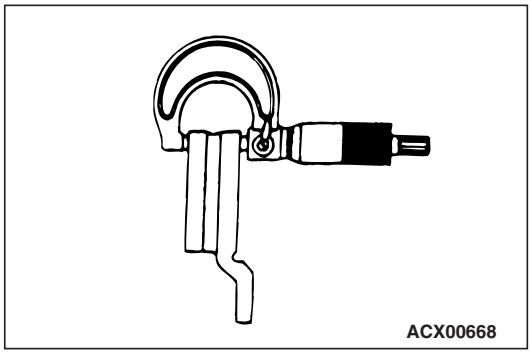
DISC BRAKE ROTOR CHECK

M1351002900419

⚠ CAUTION
Disc brakes must be kept within the allowable service values in order to maintain normal brake operation.
Before turning the brake disc, the following conditions should be checked.

Inspection item	Remark
Scratches, rust, saturated lining materials and wear	• If the vehicle is not driven for a long period of time, sections of the discs that are not in contact with the pads will become rusty, causing noise and shuddering. • If grooves and scratches resulting from excessive disc wear are not removed prior to installing a new pad assembly, there will be inadequate contact between the disc and the lining (pad) until the pads conform to the disc.
Run-out	Excessive run-out of the discs will increase the pedal depression resistance due to piston kick-back.
Change in thickness (parallelism)	If the thickness of the disc changes, this will cause pedal pulsation, shuddering and surging.
Inset or warping (flatness)	Overheating and improper handling while servicing will cause warping or distortion.

BRAKE DISC THICKNESS CHECK



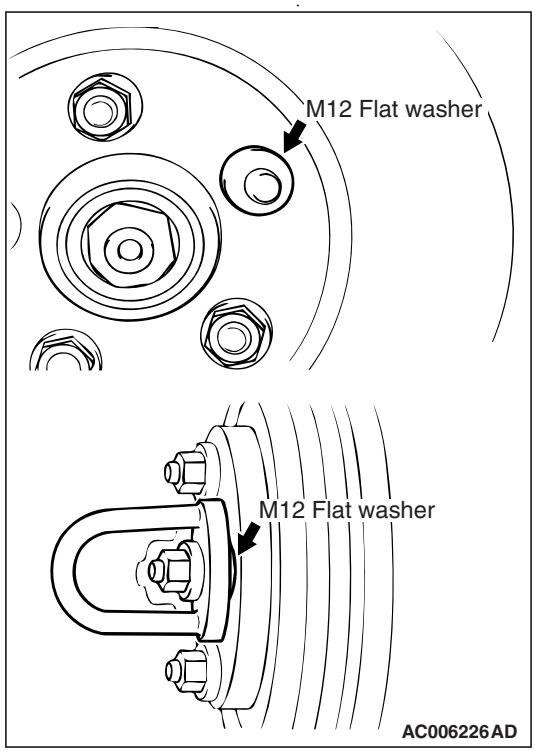
1. Using a micrometer, measure disc thickness at eight positions, approximately 45° apart and 10 mm in from the outer edge of the disc.

Standard value:
<Front> 26.0 mm
<Rear> 10.0 mm
Minimum limit:
<Front> 24.4 mm
<Rear> 8.4 mm

NOTE: Thickness variation (at least 8 positions) should not be more than 0.015 mm.

⚠ CAUTION

- **After a new brake disc is installed, always grind the brake disc with on-the-car type brake lathe. If this step is not carried out, the brake disc run-out exceeds the specified value, resulting in judder.**



When the on-the-car type lathe is used, first install M12 flat washer on the stud bolt in the brake disc side according to the figure, and then install the adapter. If the adapter is installed with M12 flat washer not seated, the brake disc rotor may be deformed, resulting in inaccurate grinding.

- **Grind the brake disc with all wheel nuts diagonally and equally tightened to the specified torque 100 N·m. When all numbers of wheel nuts are not used, or the tightening torque is excessive or not equal, the brake disc rotor or drum may be deformed, resulting in judder.**

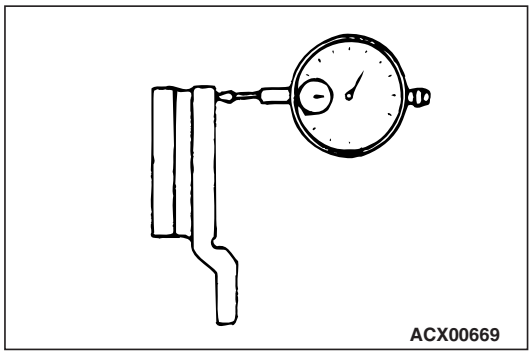
2. If the disc thickness is less than the limits, replace it with a new one. If thickness variation exceeds the specification, turn rotor with an on-the-car type brake lathe ("MAD, DL-8700PF" or equivalent). If the calculated final thickness after turning the rotor is less than the standard value, replace the disc.

BRAKE DISC RUN-OUT CHECK AND CORRECTION

⚠ CAUTION

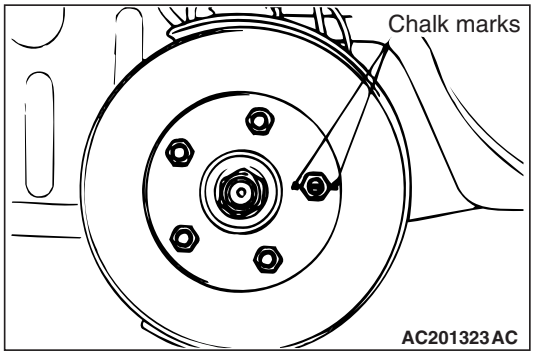
The vehicle speed detection magnetic encoder collects any metallic particle easily, because it is magnetised. When replacing brake disc, make sure that the magnetic encoder does not collect any metallic particle.

1. Remove the brake caliper assembly, and then hold it with wire.
2. Temporarily install the disc with the hub nut.

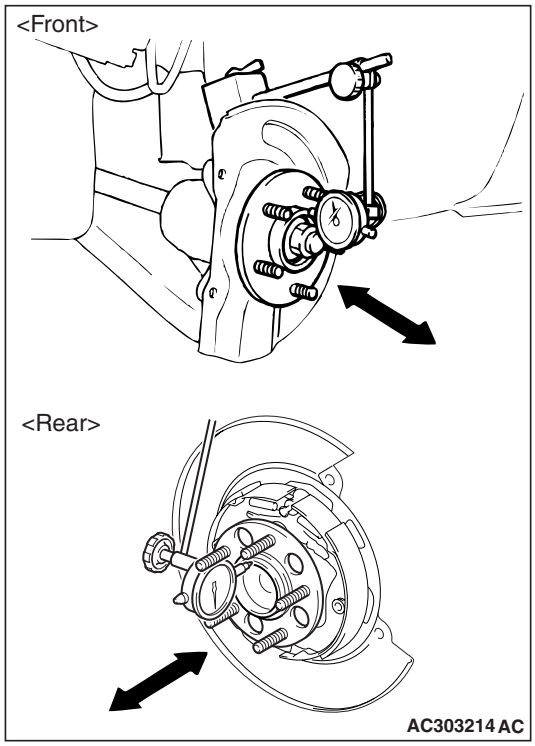


3. Place a dial gauge approximately 5 mm from the outer circumference of the brake disc, and measure the run-out of the disc.

   Limit:
   <Front> 0.03 mm
   <Rear> 0.04 mm



4. If the brake disc run-out exceeds the limit, correct it as follows:
   (1) Chalk phase marks on the wheel stud and the brake disc, which run-out is excessive as shown.



(2) Remove the brake disc. Then place a dial gauge as shown, and measure the wheel bearing axial play by pushing and pulling the wheel hub.

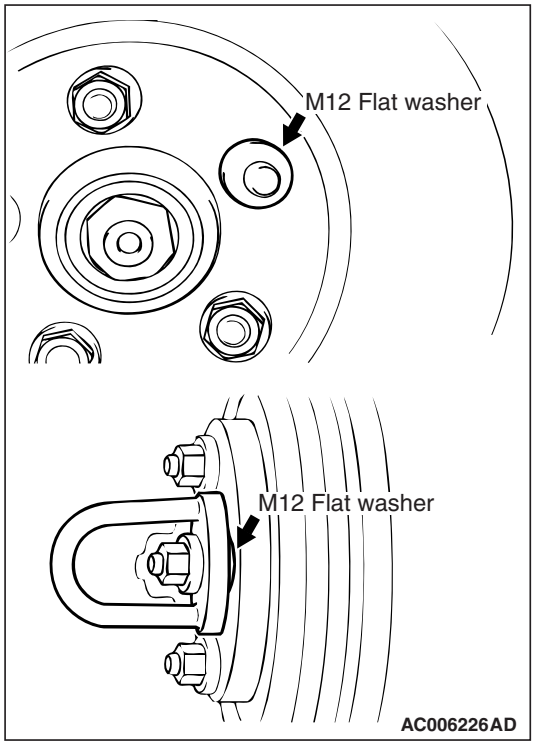
Limit: 0.05 mm

(3) If the axial play exceeds the limit, replace the wheel hub.

(4) If the axial play does not exceed the limit, dephase the brake disc and secure it. Then recheck the brake disc run-out.

⚠ CAUTION

- **After a new brake disc is installed, always grind the brake disc with on-the-car type brake lathe. If this step is not carried out, the brake disc run-out exceeds the specified value, resulting in judder.**



When the on-the-car type lathe is used, first install M12 flat washer on the stud bolt in the brake disc side according to the figure, and then install the adapter. If the adapter is installed with M12 flat washer not seated, the brake disc rotor may be deformed, resulting in inaccurate grinding.

- **Grind the brake disc with all wheel nuts diagonally and equally tightened to the specified torque 100 N·m. When all numbers of wheel nuts are not used, or the tightening torque is excessive or not equal, the brake disc rotor or drum may be deformed, resulting in judder.**

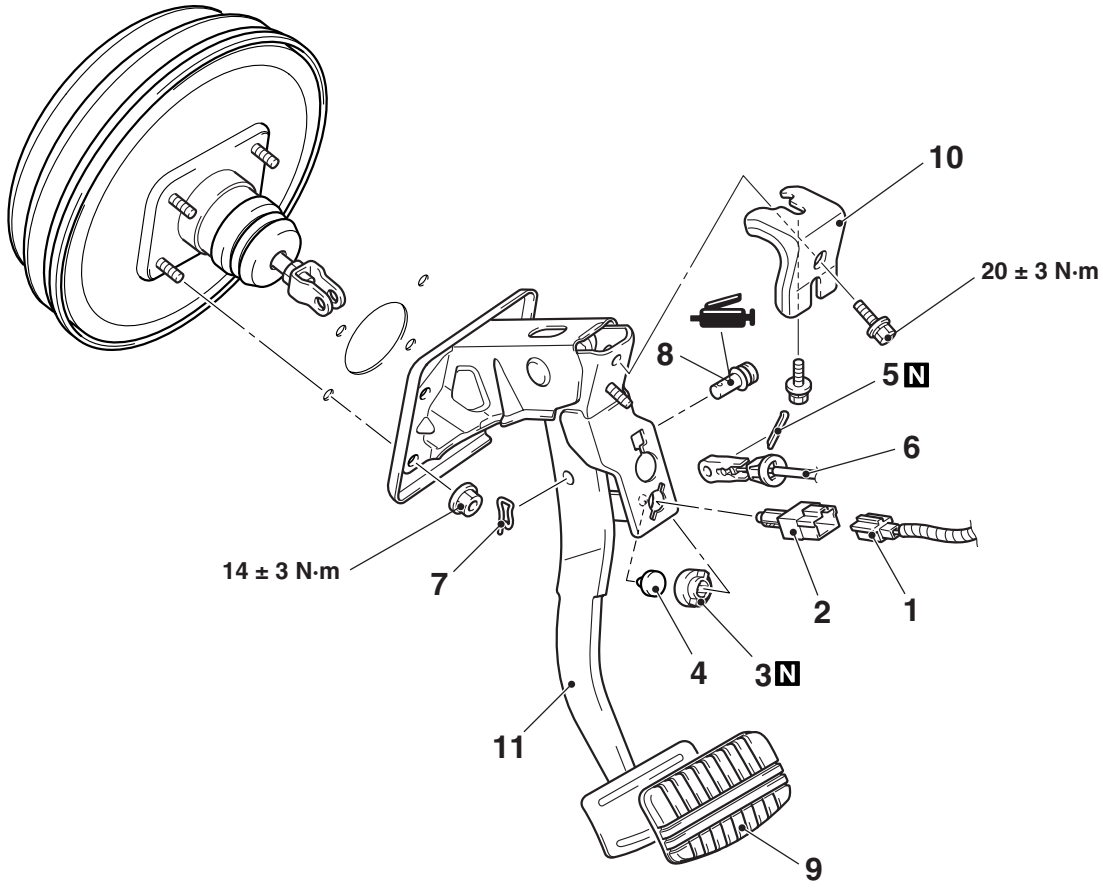
5. If the run-out cannot be corrected by changing the phase of the brake disc, replace the brake disc or grind it with the on-the-car type brake lathe ("MAD, DL-8700PF" or equivalent).

BRAKE PEDAL

REMOVAL AND INSTALLATION

M1351003400484

Pre-removal Operation	Post-installation Operation
• Air Cleaner Resonator, Air Cleaner Cover, Air Cleaner Intake Duct, Air Cleaner Body Assembly Removal (Refer to GROUP 15, Air CleanerP.15-3.) <LH drive vehicles> • Engine Cover and Engine Cover Bracket Removal (Refer to GROUP 11A, Camshaft and Valve Stem Seal P.11A-16.) <LH drive vehicles> • Air Intake Hose Removal (Refer to GROUP 15, Air CleanerP.15-3.) <LH drive vehicles>	• Air Intake Hose Installation (Refer to GROUP 15, Air CleanerP.15-3.) <LH drive vehicles> • Engine Cover and Engine Cover Bracket Installation (Refer to GROUP 11A, Camshaft and Valve Stem Seal P.11A-16.) <LH drive vehicles> • Air Cleaner Resonator, Air Cleaner Cover, Air Cleaner Intake Duct, Air Cleaner Body Assembly Installation (Refer to GROUP 15, Air CleanerP.15-3.) <LH drive vehicles> • Brake Pedal Adjustment (Refer to P.35A-4.)



AC302674 AC

Removal steps

1. Harness connector
2. Stop lamp switch
3. Pedal clip
4. Pedal stopper
5. Split pin <A/T>
6. Shift lock cable connection <A/T>
7. Snap pin
8. Pin
9. Pedal pad

>>A<< 10. Guide bracket

<<A>> >>A<< 11. Brake pedal assembly

REMOVAL SERVICE POINT

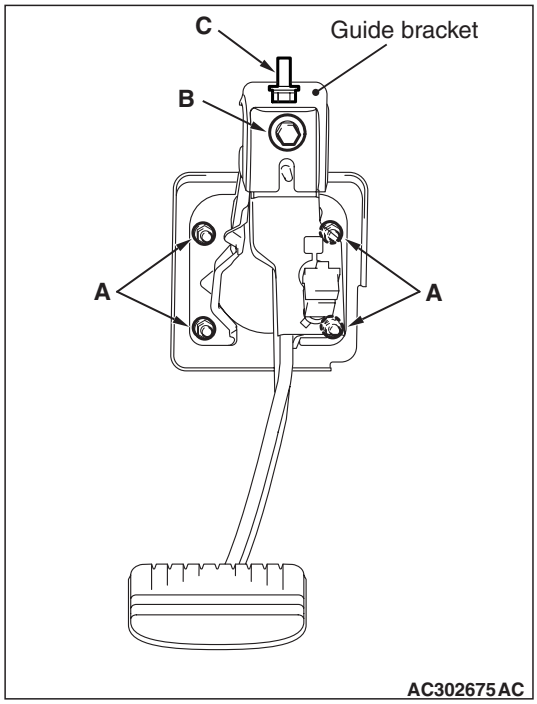
<<A>> BRAKE PEDAL ASSEMBLY REMOVAL

While pulling the brake booster from the engine compartment, remove the brake pedal assembly.

INSTALLATION SERVICE POINTS

>>A<< BRAKE PEDAL ASSEMBLY/GUIDE BRACKET INSTALLATION

1. Temporarily tighten the brake pedal assembly.
2. Temporarily tighten the guide bracket.

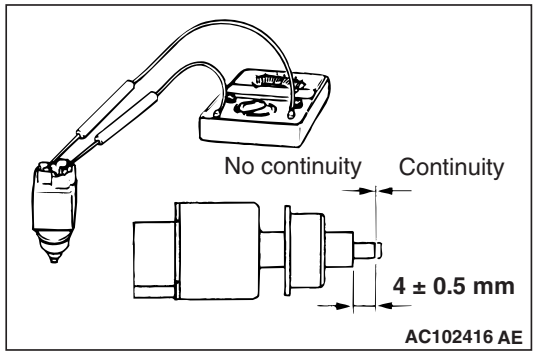


3. Tighten the mounting nuts and bolts in alphabetical order shown in the illustration.

INSPECTION

M1351003500265

STOP LAMP SWITCH CHECK



1. Connect an ohmmeter between the stop lamp switch connector terminals.
2. There should be no continuity between the terminals when the plunger is pushed in as shown. There should be continuity when it is released.

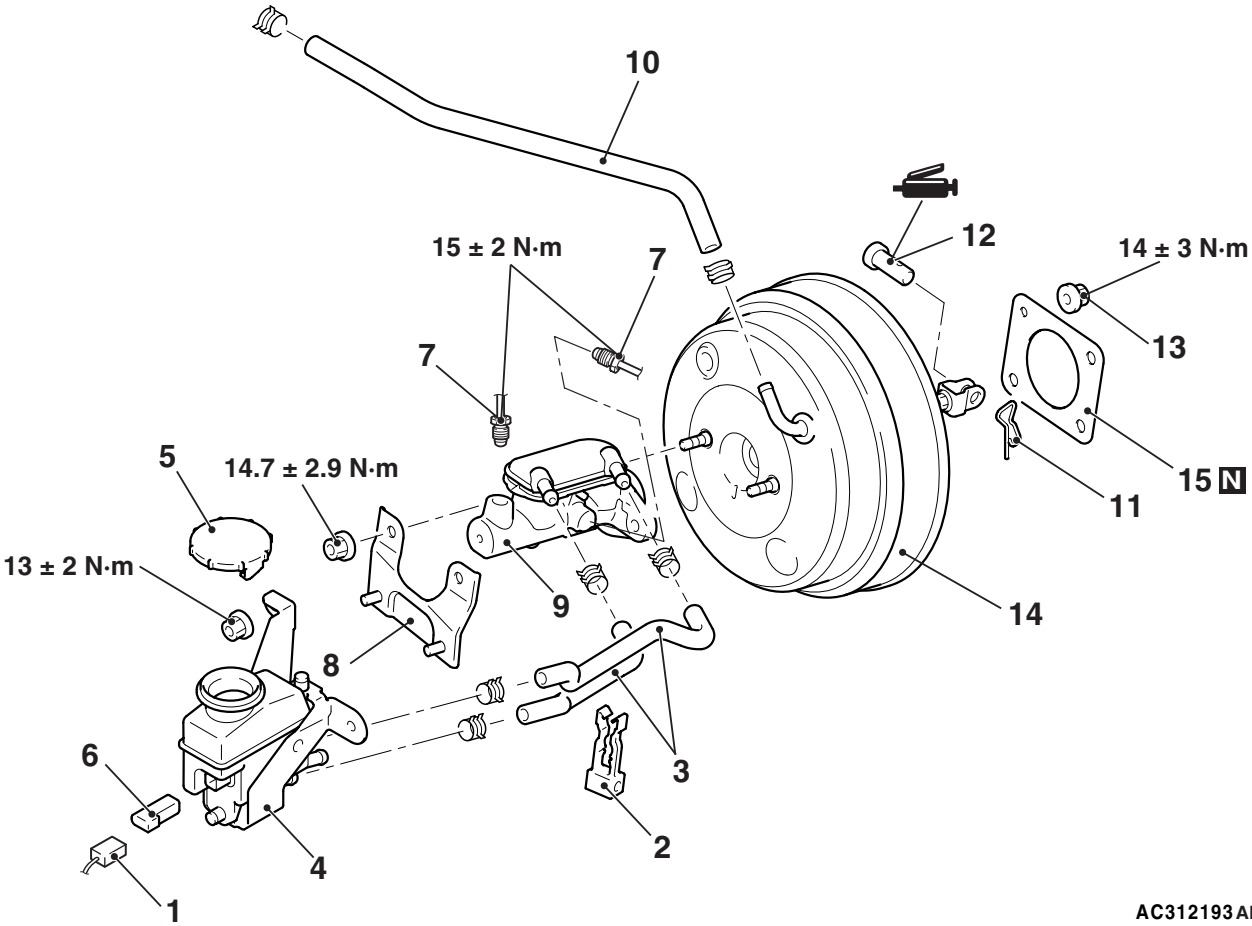
MASTER CYLINDER ASSEMBLY AND BRAKE BOOSTER

REMOVAL AND INSTALLATION

M1351003700548

Pre-removal Operation	Post-installation Operation
• Air Cleaner Resonator, Air Cleaner Cover, Air Cleaner Intake Duct, Air Cleaner Body Assembly Removal (Refer to GROUP 15, Air CleanerP.15-3.) <LH drive vehicles> • Engine Cover and Engine Cover Bracket Removal (Refer to GROUP 11A, Camshaft and Valve Stem Seal P.11A-16.) <LH drive vehicles> • Air Intake Hose Removal (Refer to GROUP 15, Air CleanerP.15-3.) <LH drive vehicles> • Canister removal (Refer to GROUP 17, Evaporative Emission Control System – Canister P.17-64.) <LH drive vehicles> • Brake Fluid Draining	• Brake Fluid Supplying and Air Bleeding (Refer to P.35A-6.) • Canister Installation (Refer to GROUP 17, Evaporative Emission Control System – Canister P.17-64.) <LH drive vehicles> • Brake Pedal Adjustment (Refer to P.35A-4.) • Air Intake Hose Installation (Refer to GROUP 15, Air CleanerP.15-3.) <LH drive vehicles> • Engine Cover and Engine Cover Bracket Installation (Refer to GROUP 11A, Camshaft and Valve Stem Seal P.11A-16.) <LH drive vehicles> • Air Cleaner Resonator, Air Cleaner Cover, Air Cleaner Intake Duct, Air Cleaner Body Assembly Installation (Refer to GROUP 15, Air CleanerP.15-3.) <LH drive vehicles>

<LH drive vehicles>



Master cylinder removal steps

1. Brake fluid level switch connector
2. Hose clip

>>C<< 3. Reservoir hose

4. Reservoir assembly
5. Reservoir cap
6. Brake fluid level switch

Master cylinder removal steps

7. Brake pipe connection
- Brake pipe [between brake master cylinder and hydraulic unit (ABS-ECU)] (Refer to GROUP 35B, Hydraulic Unit P.35B-77.)

Master cylinder removal steps

- Clip (LH side only) (Refer to P.35A-18.)

8. Clutch damper bracket
9. Brake master cylinder

>>B<<

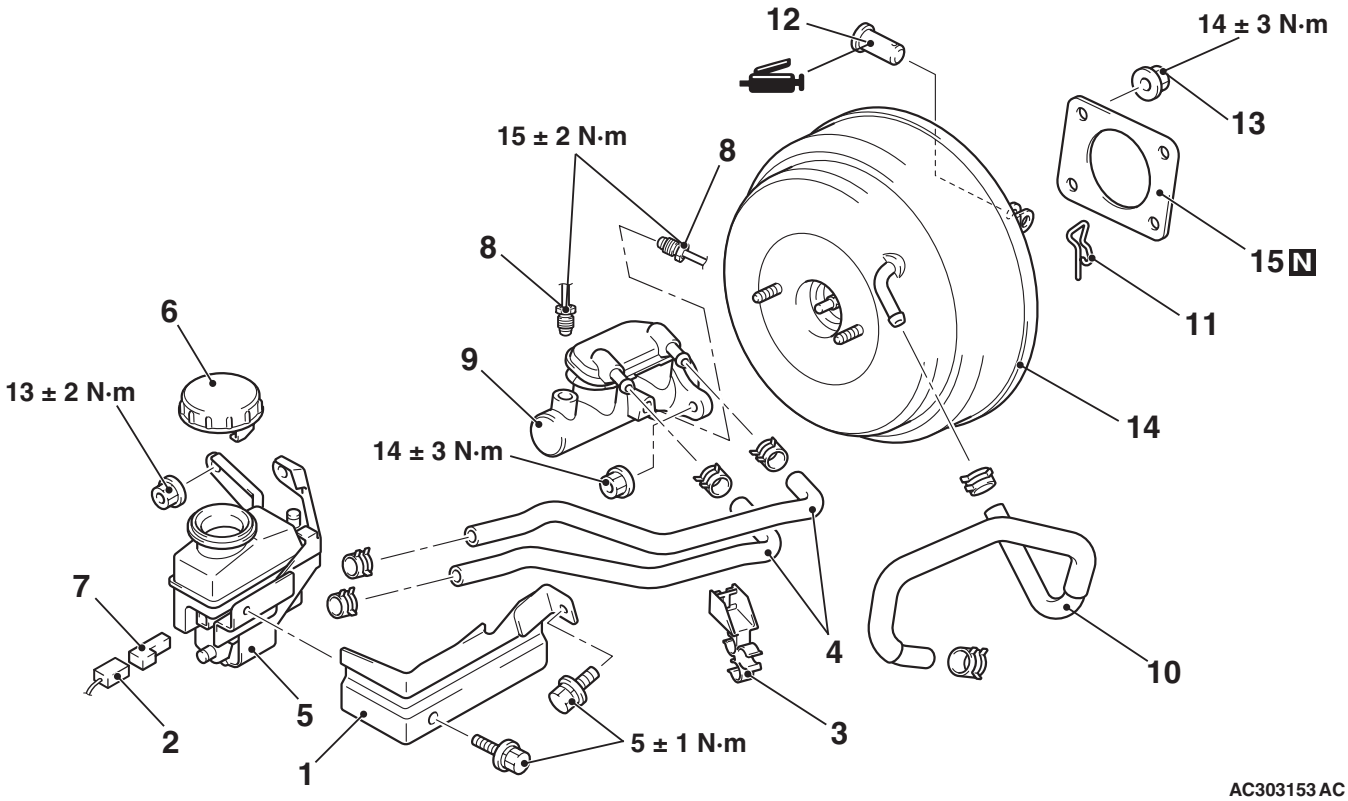
- Push rod protrusion amount check and adjustment

Brake booster removal steps

>>A<<

10. Vacuum hose (with built-in check valve)
11. Snap pin
12. Pin
13. Brake booster mounting nut
14. Brake booster assembly
15. Sealer

<RH drive vehicles>



AC303153 AC

Master cylinder removal steps

1. Heat protector
2. Brake fluid level switch connector
3. Hose clip

>>C<<

4. Reservoir hose
5. Reservoir assembly
6. Reservoir cap
7. Brake fluid level switch
8. Brake pipe connection
9. Brake master cylinder

>>B<<

- Push rod protrusion amount check and adjustment

Brake booster removal steps

>>A<<

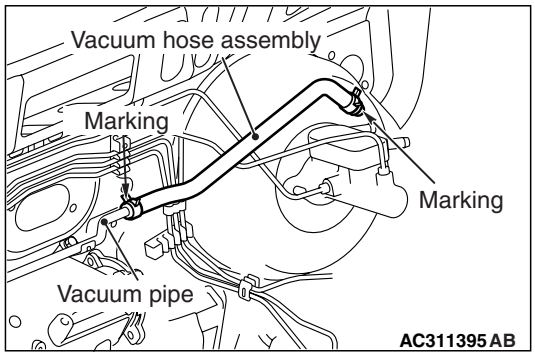
10. Vacuum hose (with built-in check valve)

- Inlet manifold (Refer to GROUP 15, Inlet manifold P.15-5.)

11. Snap pin
12. Pin
13. Brake booster mounting nut
14. Brake booster assembly
15. Sealer

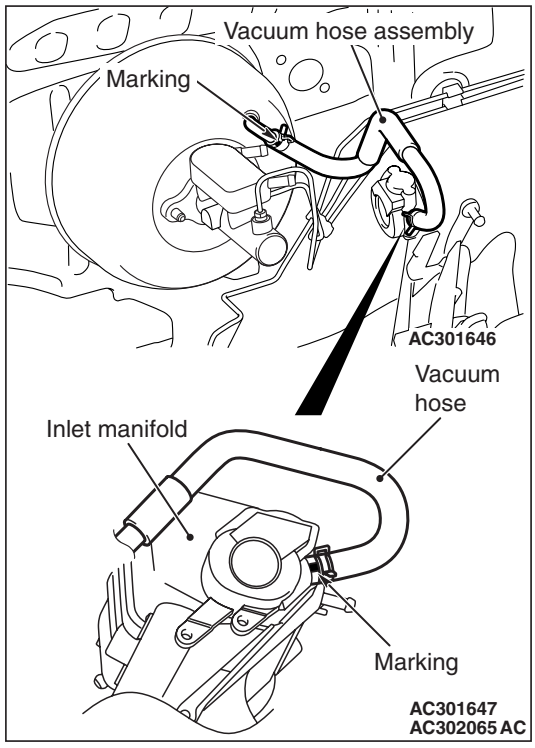
INSTALLATION SERVICE POINTS

>>A<< VACUUM HOSE CONNECTION



<LH drive vehicles>

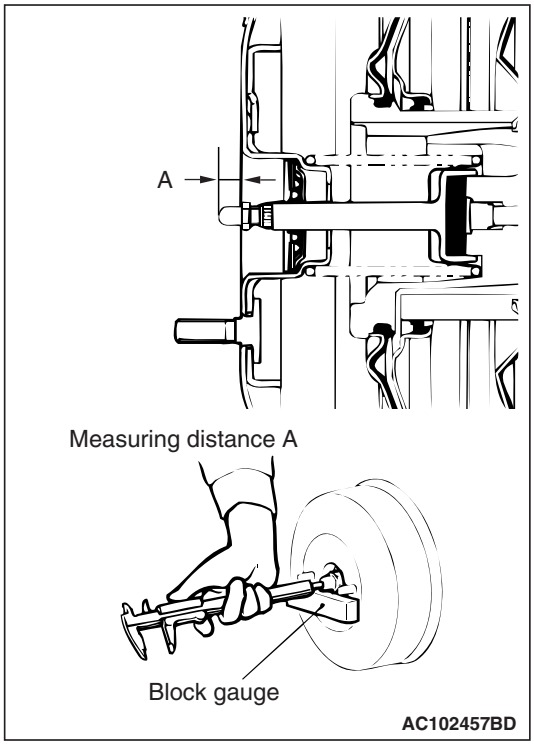
1. Insert the vacuum hose into the vacuum pipe with its white marking facing upward.
2. Insert the vacuum hose into the brake booster with its brown marking facing forward.



<RH drive vehicles>

1. Insert the vacuum hose into the inlet manifold with its white marking facing vehicle right side.
2. Insert the vacuum hose into the brake booster with its blue marking facing forward.

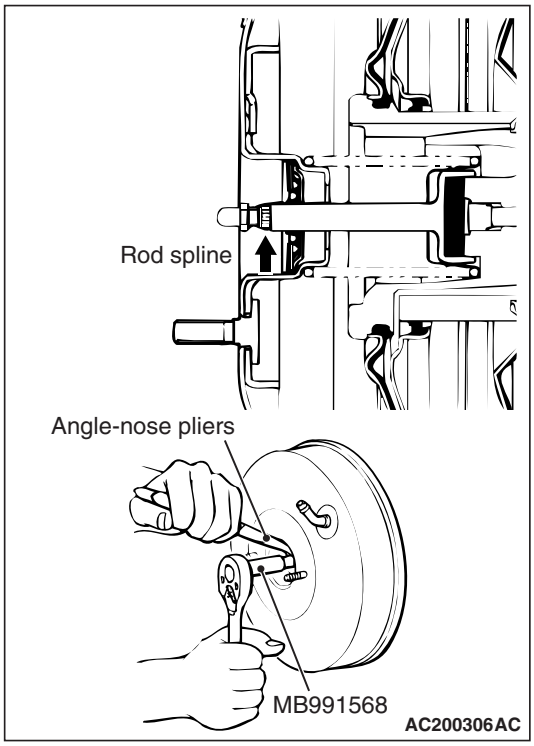
>>B<< PUSH ROD PROTRUSION AMOUNT CHECK AND ADJUSTMENT



1. Use the vacuum pump to measure dimension "A" applying a negative pressure of 66.7 kPa to the brake booster.

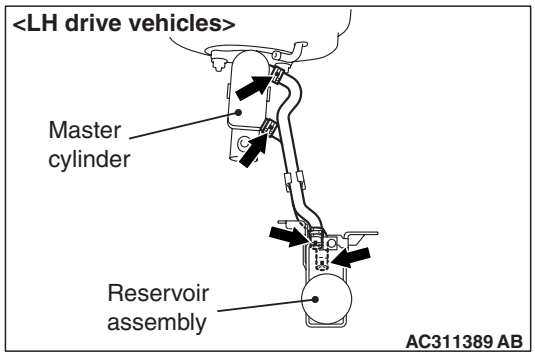
   Standard value (A): 11.3 – 11.7 mm

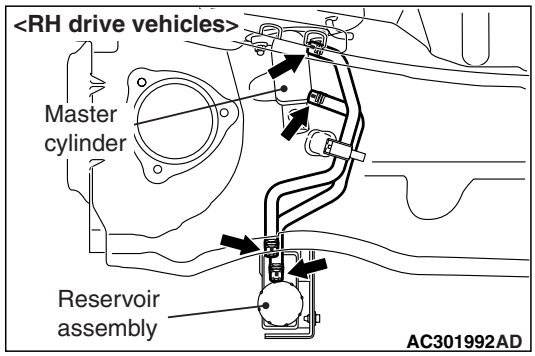
   NOTE: When a negative pressure of 66.7 kPa is not applied to the brake booster, the push rod protrusion amount (A) should be 10.3 - 10.7 mm.



2. If the protrusion amount is not within the standard value range, adjust the push rod length by turning the push rod. Use special tool push rod adjusting socket (MB991568) to turn the push rod while holding the rod spline with angle-nose pliers.

>>C<< RESERVOIR HOSE CONNECTION



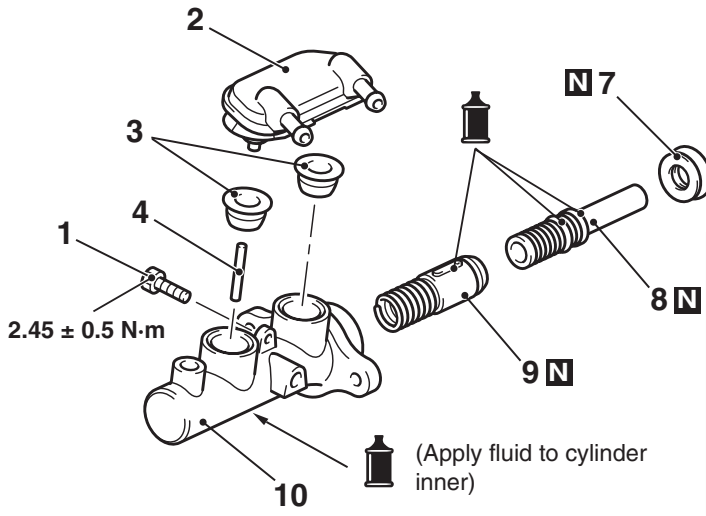


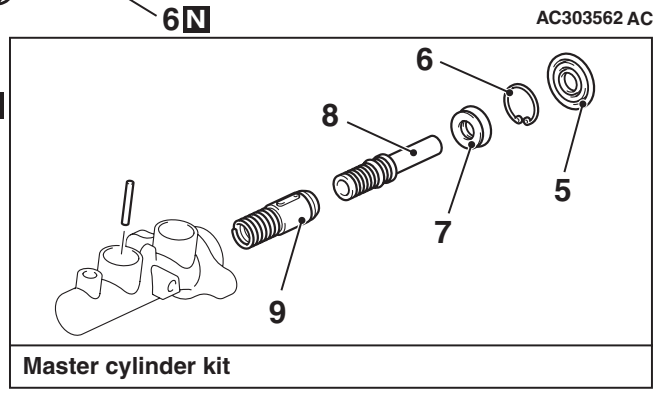
1. Insert the reservoir hose into the reservoir assembly with its paint mark facing upward.
2. Insert the reservoir hose into the master cylinder with its paint mark facing upward.

MASTER CYLINDER

M1351004200450

DISASSEMBLY AND REASSEMBLY





Master cylinder kit

Disassembly steps

1. Inner bolt
2. Reservoir union
3. Reservoir seal
4. Stop pin
5. Rod seal

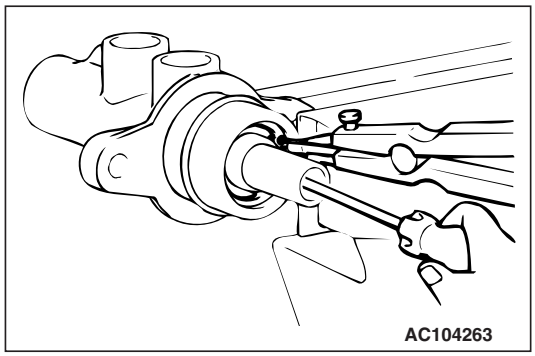
<<A>>

Disassembly steps (Continued)

6. Circlip
7. Piston guide assembly
8. Primary piston assembly
9. Secondary piston assembly
10. Master cylinder body

DISASSEMBLY SERVICE POINT

<<A>> CIRCLIP REMOVAL



While pushing the primary piston assembly, remove the circlip.

INSPECTION

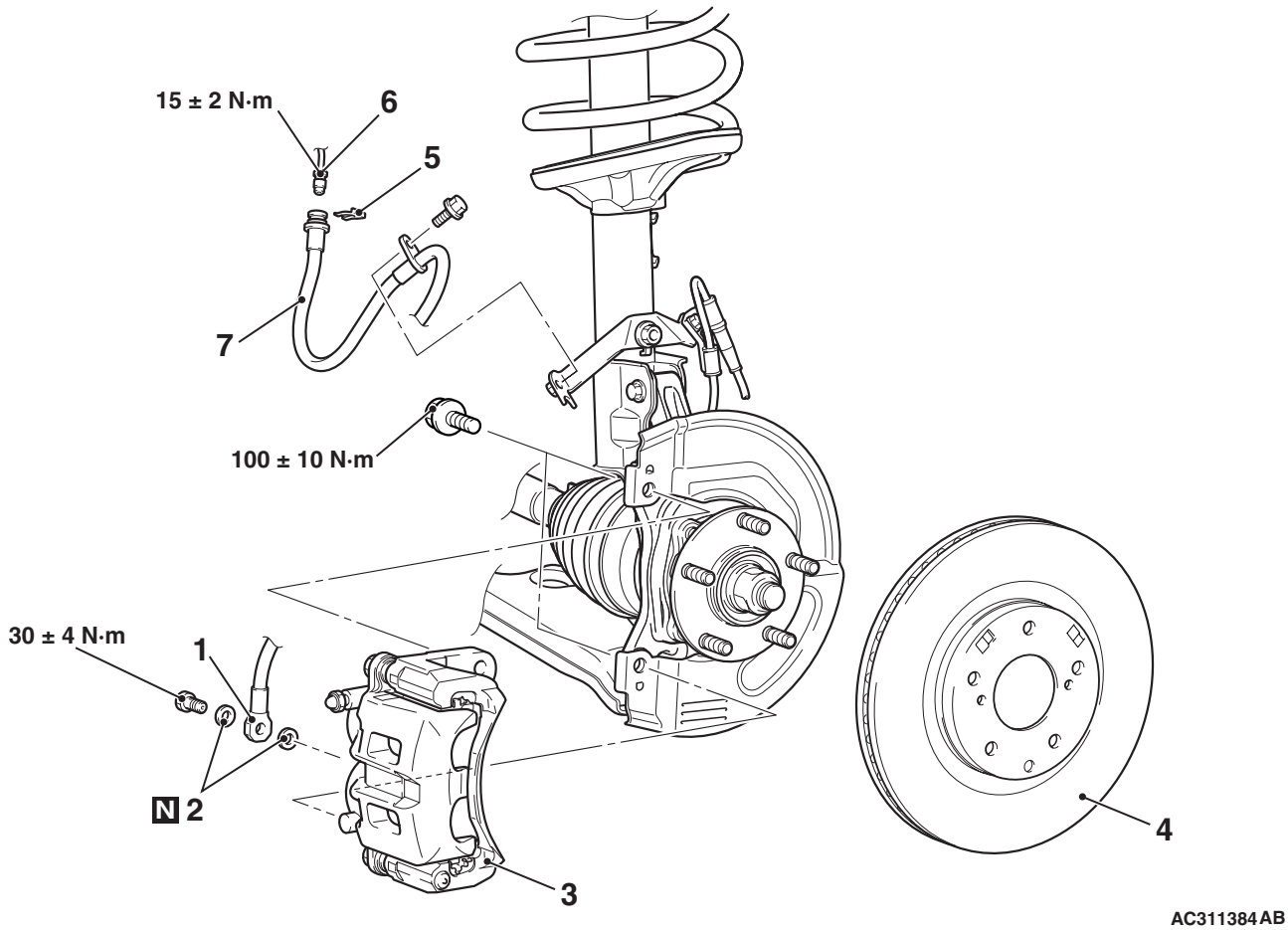
M1351004300349

- Check the inner surface of master cylinder body for rust or pitting.
- Check the primary and secondary pistons for rust, scoring, wear or damage.

FRONT DISC BRAKE ASSEMBLY

REMOVAL AND INSTALLATION

M1351006000537



Removal steps

- Brake fluid draining

1. Brake hose connection
2. Gasket
3. Front brake assembly

<<A>>

4. Front brake disc
5. Clip

Removal steps (Continued)

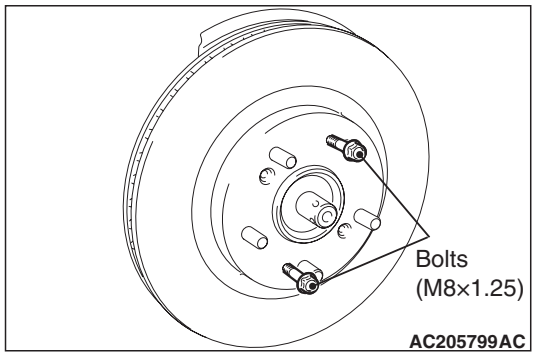
6. Brake pipe and brake hose connection
7. Brake hose

Installation steps

>>A<< 7. Brake hose
6. Brake pipe and brake hose connection
5. Clip
4. Front brake disc
>>B<< 3. Front brake assembly
2. Gasket
1. Brake hose connection
- Brake Fluid Supplying and Air Bleeding (Refer to P.35A-6.)
>>C<< - Brake drag force check

REMOVAL SERVICE POINTS

<<A>> FRONT BRAKE DISC REMOVAL

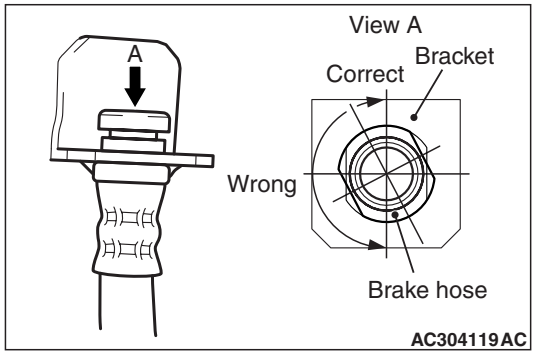


If the front brake disc is seized, install a M8 x 1.25 bolts as shown, and remove the disc by tightening the bolts evenly and gradually.

INSTALLATION SERVICE POINTS

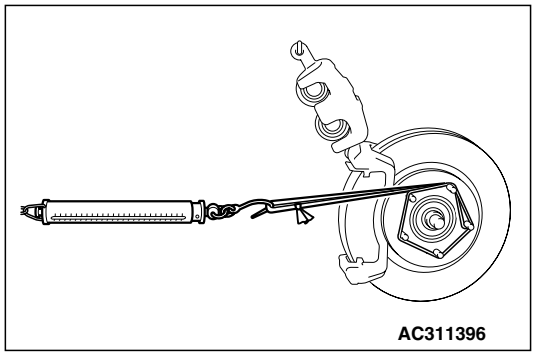
>>A<< BRAKE HOSE INSTALLATION

1. Install the brake hose end on the bracket and another end on the front brake assembly.



2. Twist the brake hose towards the lesser torsion between the brake hose and bracket as shown and secure it to the bracket.

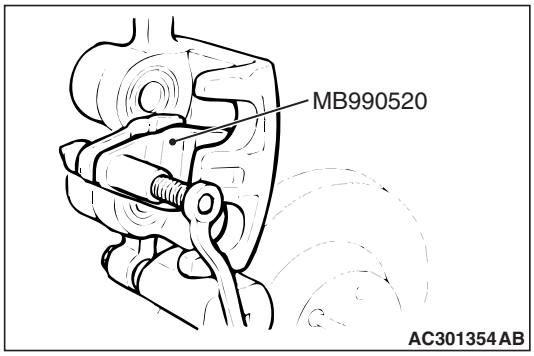
>>B<< FRONT BRAKE ASSEMBLY INSTALLATION



1. In order to measure the brake drag torque, measure the hub torque with the pads removed by the following procedure.
   (1) Use a spring balance to measure the hub torque in the forward direction.
   (2) Record hub torque with pads removed.

⚠ CAUTION
Do not let any oil, grease or other contamination get onto the friction surfaces of the pads and brake discs.

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



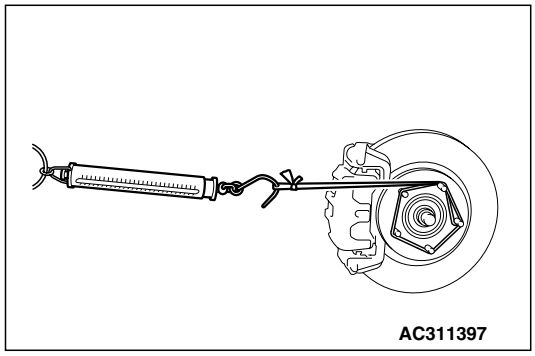
3. Clean the piston and insert into cylinder with special tool disc brake piston expander (MB990520).
4. Install the pad clips and the pads to the caliper support and tighten the guide pin bolt to the specified torque.

Tightening torque : 89 ± 4 N·m

>>C<< BRAKE DRAG FORCE CHECK

1. Check the brake drag force as follows.
   (1) Start the engine and hold the brake pedal down for 5 seconds. (Pedal depression force: approximately 200 N)
   (2) Stop the engine.

(3) Turn the brake disc forward 10 times.



(4) Use a spring balance to measure the hub torque with pads installed in the same direction as earlier.

(5) Calculate the drag force of the disc brake [difference between hub torque with pads installed and hub torque with pads removed].

Standard value: 68 N or less

2. If the brake drag force exceeds the standard value, disassemble and clean the piston. Check for corrosion or worn piston seal, and check the sliding condition of the lock pin and guide pin.

INSPECTION

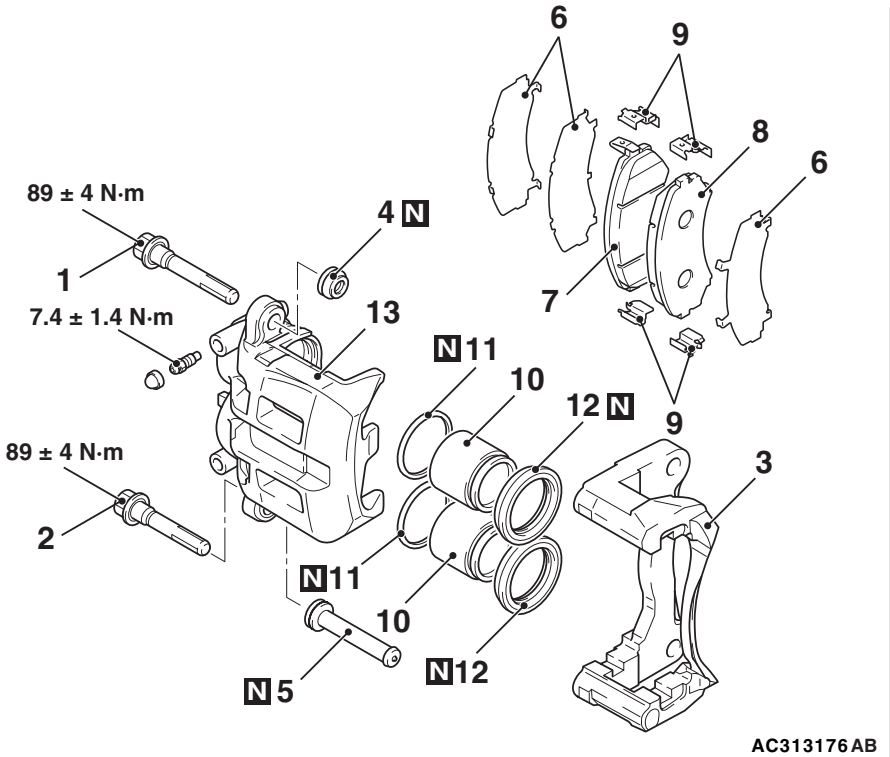
M1351006100352

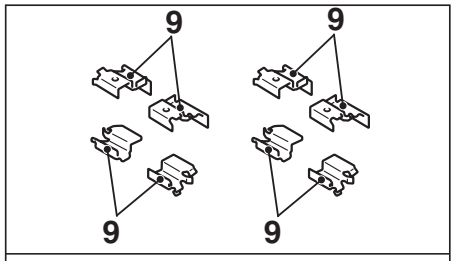
BRAKE DISC CHECK

Disc wear (Refer to P.35A-8).
Disc run-out (Refer to P.35A-8).

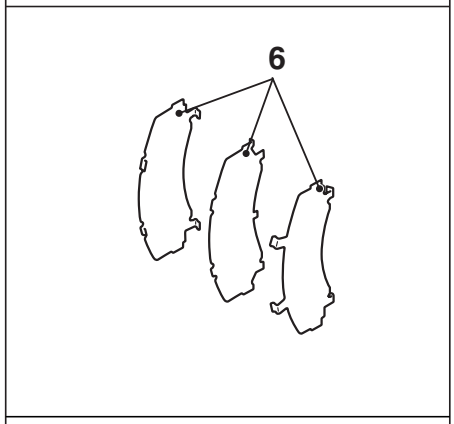
DISASSEMBLY AND REASSEMBLY

M1351006200597

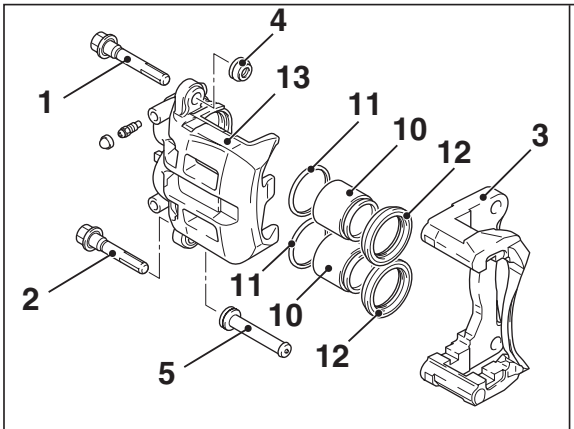




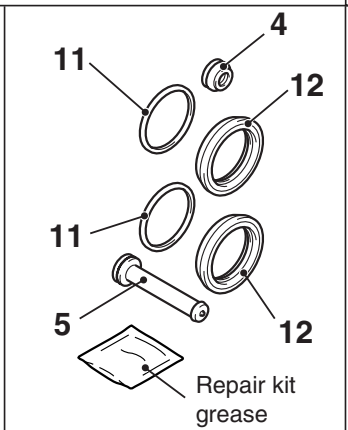
Clip set



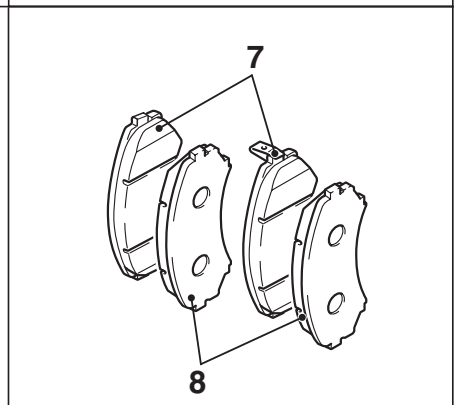
Shim kit



Brake caliper kit



Seal and boot kit



Pad set

Disassembly steps

1. Lock pin
2. Guide pin
3. Caliper support (including pad, clip, and shim)
4. Pin boot
5. Bushing
6. Shim
7. Pad and wear indicator assembly

Disassembly steps (Continued)

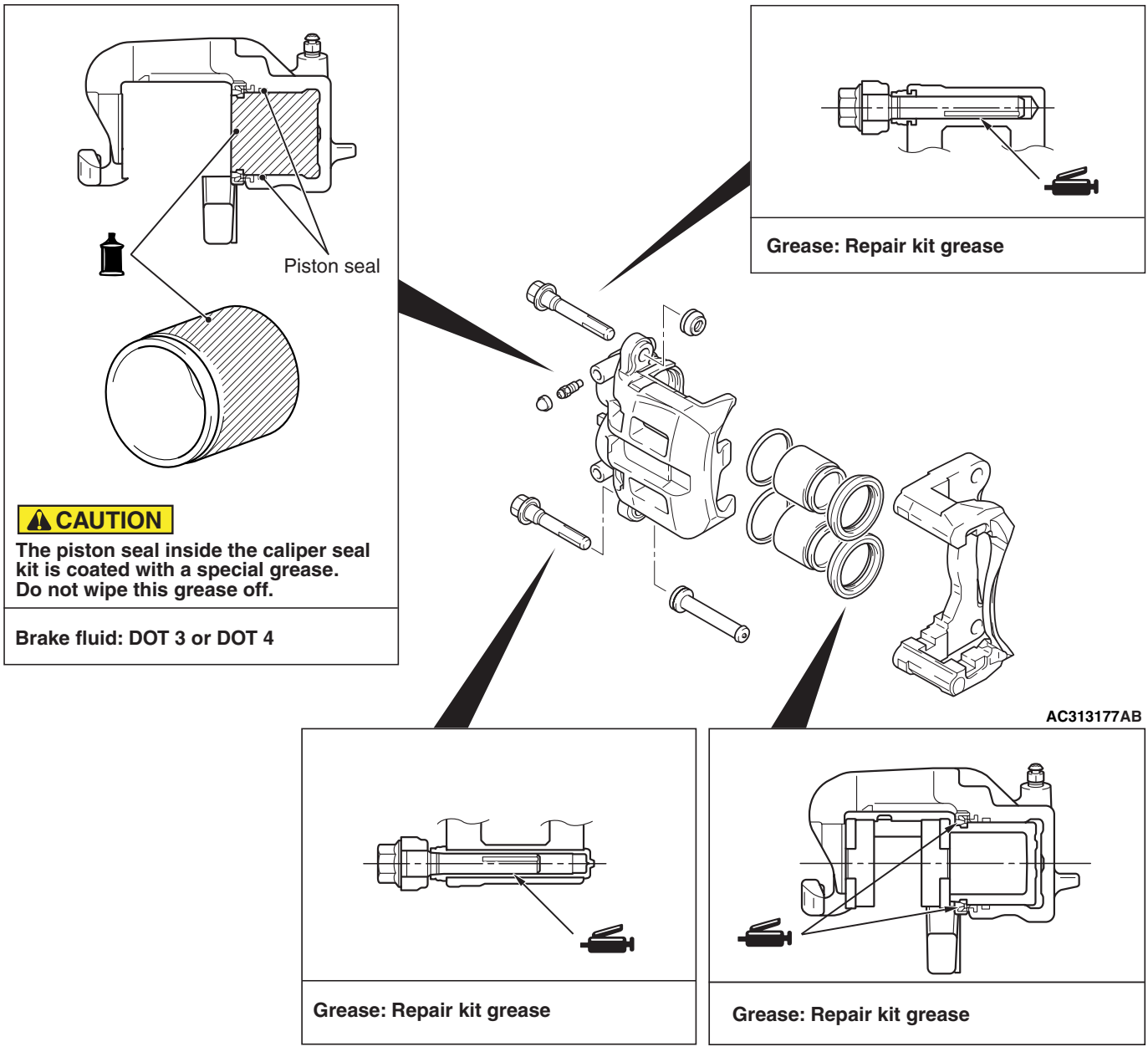
8. Pad
9. Clip

<<A>>
10. Piston

<<B>>
11. Piston seal

<<A>>
12. Piston boot
13. Caliper body

LUBRICATION POINTS



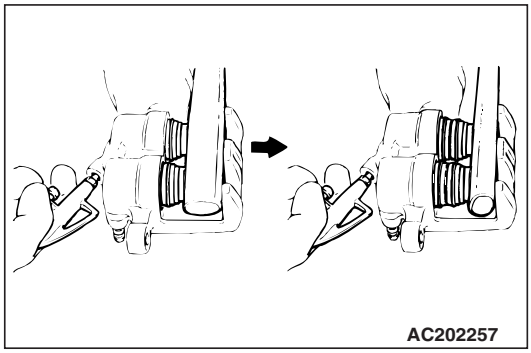
DISASSEMBLY SERVICE POINTS

When disassembling the disc brakes, disassemble both sides (left and right) as a set.

<<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.**
- **If one piston has been removed completely, it will become impossible to remove the second piston.**

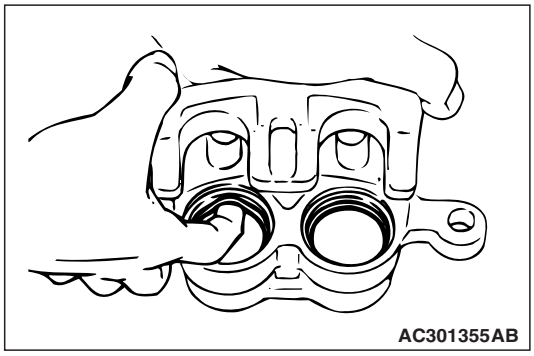

AC202257

Remove the pistons and the piston boots by pumping in air from the brake hose connection. Be sure to use the handle of a plastic hammer and adjust the height of the two pistons so that the pistons protrude evenly.

<<B>> 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.


AC301355AB

1. Remove the piston seal with your finger tip.
2. Clean the piston surface and inner cylinder with alcohol or brake fluid DOT 3 or DOT 4.

INSPECTION

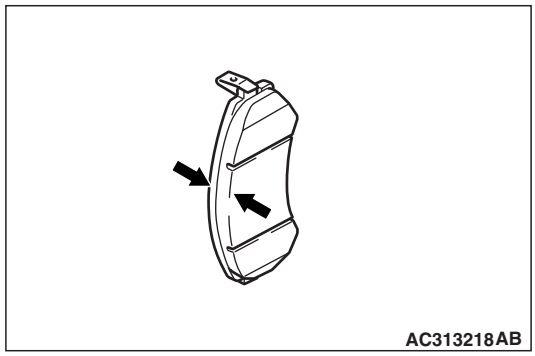
M1351006300442

- Check the cylinder for wear, damage or rust.
- Check the piston surface for wear, damage or rust.
- Check the caliper body or sleeve for wear.
- Check the pad for damage or adhesion of grease, check the backing metal for damage.

PAD WEAR CHECK

⚠ WARNING

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


AC313218AB

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

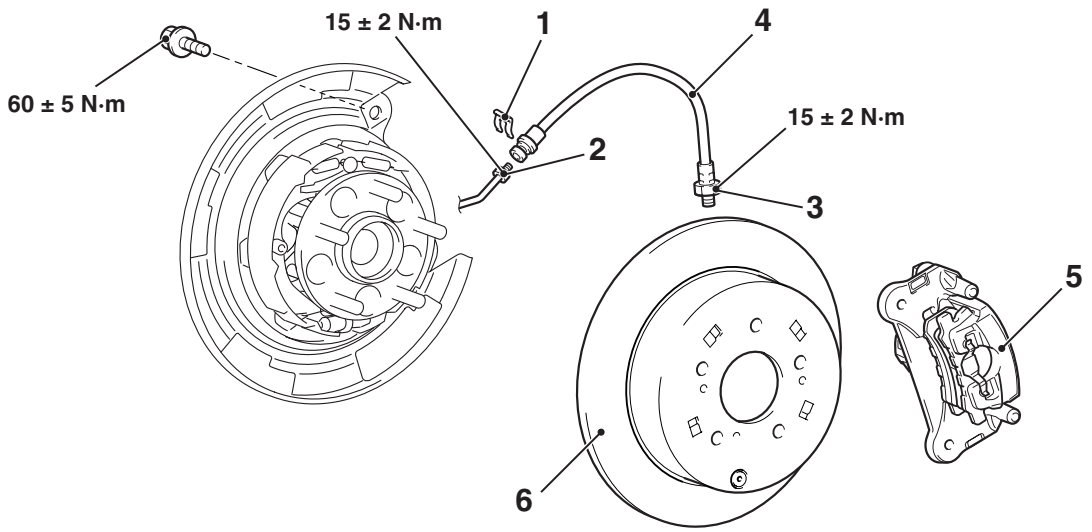
   Standard value: 10.0 mm
   Minimum limit: 2.0 mm

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

REAR DISC BRAKE ASSEMBLY

REMOVAL AND INSTALLATION

M1351007000422



AC302748 AD

Removal steps
- Brake fluid draining

1. Clip
2. Brake pipe and brake hose connection
3. Brake hose and rear brake assembly connection
4. Brake hose
5. Rear brake assembly

<<A>> 6. Rear brake disc

Installation steps

6. Rear brake disc

>>A<< 5. Rear brake assembly

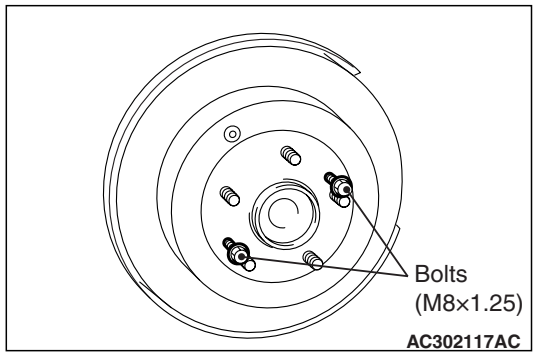
4. Brake hose
3. Brake hose and rear brake assembly connection
2. Brake pipe and brake hose connection
1. Clip

- Brake Fluid Supplying and Air Bleeding (Refer to P.35A-6.)

>>B<<
- Brake drag force check

REMOVAL SERVICE POINTS

<<A>> BRAKE DISC REMOVAL

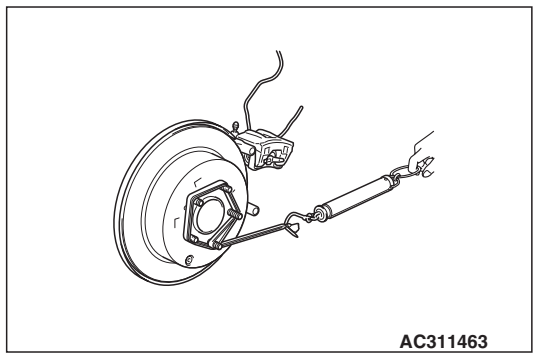


AC302117AC

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

INSTALLATION SERVICE POINTS

>>A<< REAR BRAKE ASSEMBLY INSTALLATION



AC311463

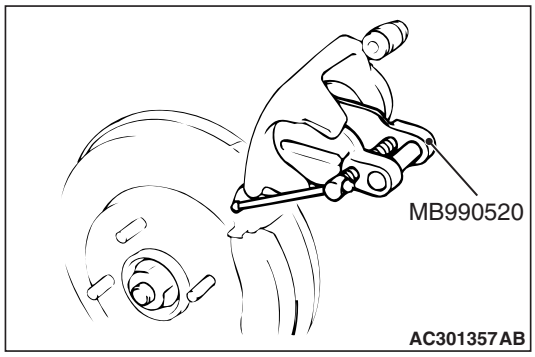
1. In order to measure the brake drag torque, measure the hub torque with the pads removed by the following procedure.

   Use a spring balance to measure the hub torque in the forward direction. Record hub torque with pads removed.

⚠ CAUTION

Do not let any oil, grease or other contamination get onto the friction surfaces of the pads and brake discs.

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

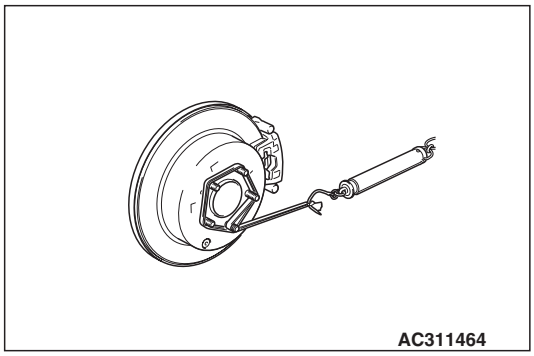


3. Clean the piston and insert into cylinder with special tool disc brake piston expander (MB990520).
4. Be careful that the piston boot does not become caught, when lowering the caliper assembly and installing the lock pin. Tighten the lock pin to the specified torque.

   Tightening torque: 44 ± 5 N·m

>>B<< BRAKE DRAG FORCE CHECK

1. Check the brake drag force as follows.
   (1) Start the engine and hold the brake pedal down for 5 seconds. (Pedal depression force: approximately 200 N)
   (2) Stop the engine.
   (3) Turn the brake disc forward 10 times.



   (4) Use a spring balance to measure the hub torque with pads installed in the same direction as earlier.
   (5) Calculate the drag force of the disc brake [difference between hub torque with pads installed and hub torque with pads removed].

   Standard value: 68 N or less

2. If the brake drag force exceeds the standard value, disassemble and clean the piston. Check for corrosion or worn piston seal, and check the sliding condition of the lock pin and guide pin.

INSPECTION

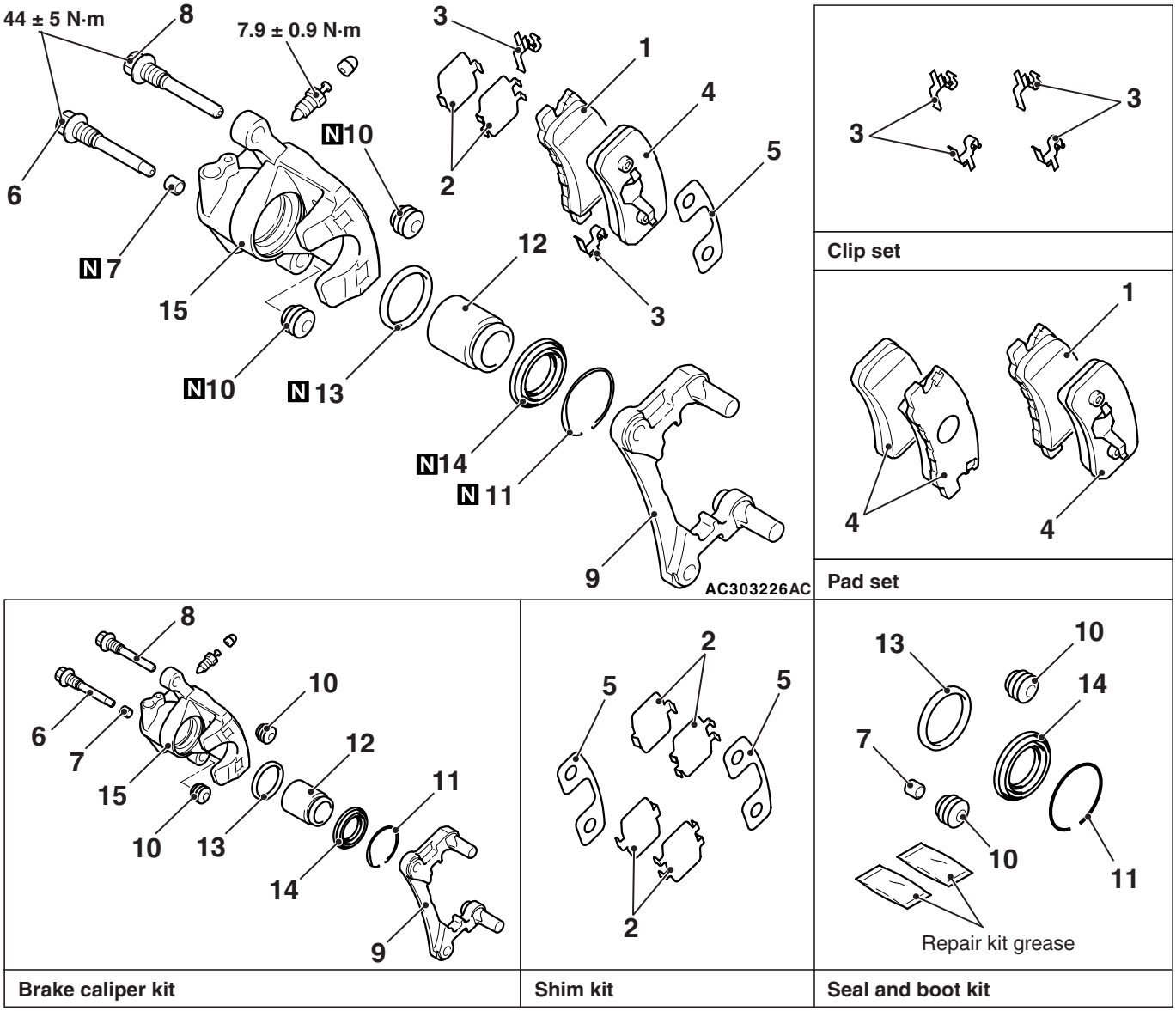
M1351007100311

BRAKE DISC CHECK

Disc wear (Refer to P.35A-8).
Disc run-out (Refer to P.35A-8).

DISASSEMBLY AND REASSEMBLY

M1351007200385



Disassembly steps

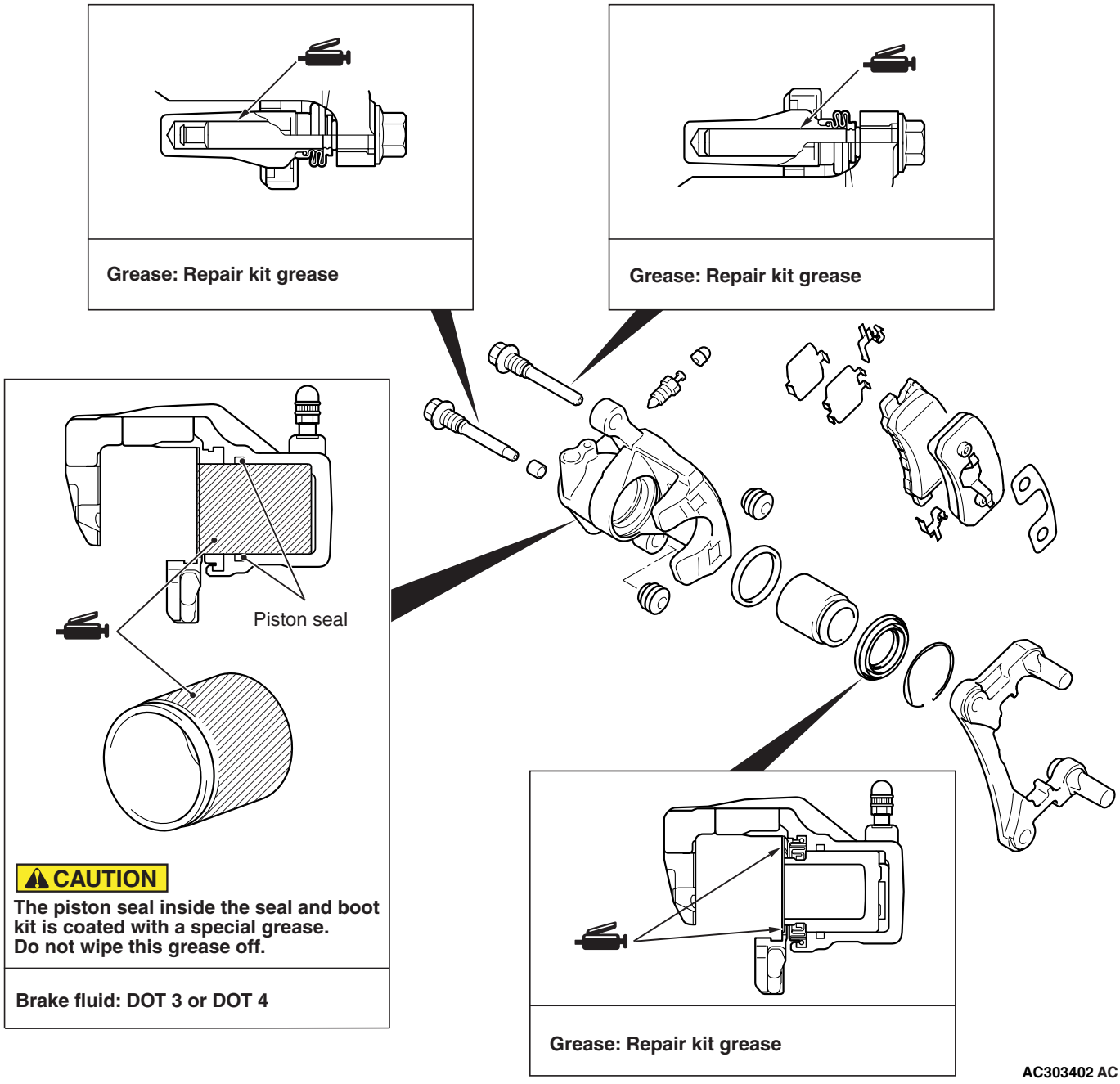
1. Pad and wear indicator assembly
2. Inner shim
3. Clip
4. Pad assembly
5. Outer shim
6. Lock pin
7. Bushing
8. Guide pin

Disassembly steps (Continued)

9. Caliper support
10. Pin boot
11. Boot ring
12. Piston
13. Piston seal
14. Piston boot
15. Caliper body

<<A>>
<<B>>
<<A>>

LUBRICATION POINTS



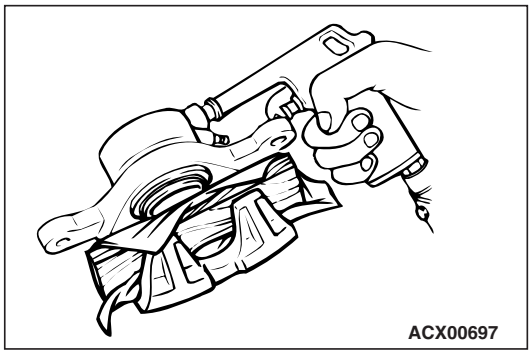
DISASSEMBLY SERVICE POINTS

When disassembling the disc brakes, disassemble both sides (left and right) as a set.

<<A>> PISTON BOOT/PISTON REMOVAL

⚠ CAUTION

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

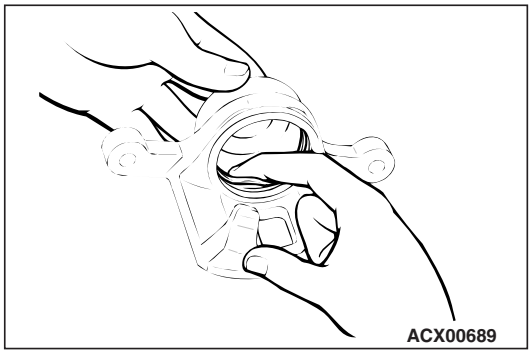


Place a piece of wood, etc. against the caliper body as shown. Blow compressed air through the brake hose to remove the piston boot and piston.

<<B>> PISTON SEAL REMOVAL

⚠ CAUTION

Do not use a flat-tipped screwdriver or similar tool to remove 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 inner cylinder with alcohol or brake fluid DOT 3 or DOT 4.

INSPECTION

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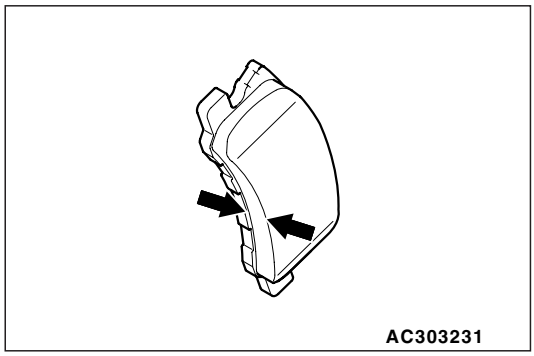
- Check the cylinder for wear, damage or rust.
- Check the piston surface for wear, damage or rust.
- Check the caliper body or sleeve for wear.
- Check the pad for damage or adhesion of grease, check the backing plate for damage.

PAD WEAR CHECK

⚠ WARNING

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



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

   Standard value: 10.0 mm
   Minimum limit: 2.0 mm

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