
BASIC BRAKE SYSTEM

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CONTENTS

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GENERAL INFORMATION	3	Load Sensing Spring Length Check and Adjustment	13
SERVICE SPECIFICATIONS	5	Load Sensing Proportioning Valve Function Test	14
LUBRICANTS	6	Disc Brake Pad Check and Replacement	15
SEALANTS	6	Front Disc Brake Rotor Check	16
SPECIAL TOOLS	6	Brake Lining Thickness Check	17
TROUBLESHOOTING	7	Brake Drum Inside Diameter Check	18
ON-VEHICLE SERVICE	10	Brake Lining and Brake Drum Connection Check	18
Brake Pedal Check and Adjustment	10	BRAKE PEDAL	19
Stop Lamp Switch Check	11	MASTER CYLINDER AND BRAKE BOOSTER	20
Brake Booster Operating Test	11	LOAD SENSING PROPORTIONING VALVE	23
Check Valve Operation Check	12	FRONT DISC BRAKE	24
Brake Booster Vacuum Switch Check <Diesel-powered vehicles>	12	REAR DRUM BRAKE	30
Bleeding	12		
Brake Fluid Level Sensor Check	13		

GENERAL INFORMATION

35100010120

The brake system has high reliability and durability which maintains excellent braking performance and braking feeling. The main features are as follows.

- A dual type master cylinder is equipped in all models.
- Both a single type and a tandem type brake booster have been adopted.

- The following type of brake have been adopted.
 Front: Floating caliper, 2-piston, ventilated disc brakes (V4-W43, V5-W43) or floating caliper, 1-piston, ventilated disc brakes (V4-S60, V5-S60)
 Rear: Leading-trailing type drum brake.

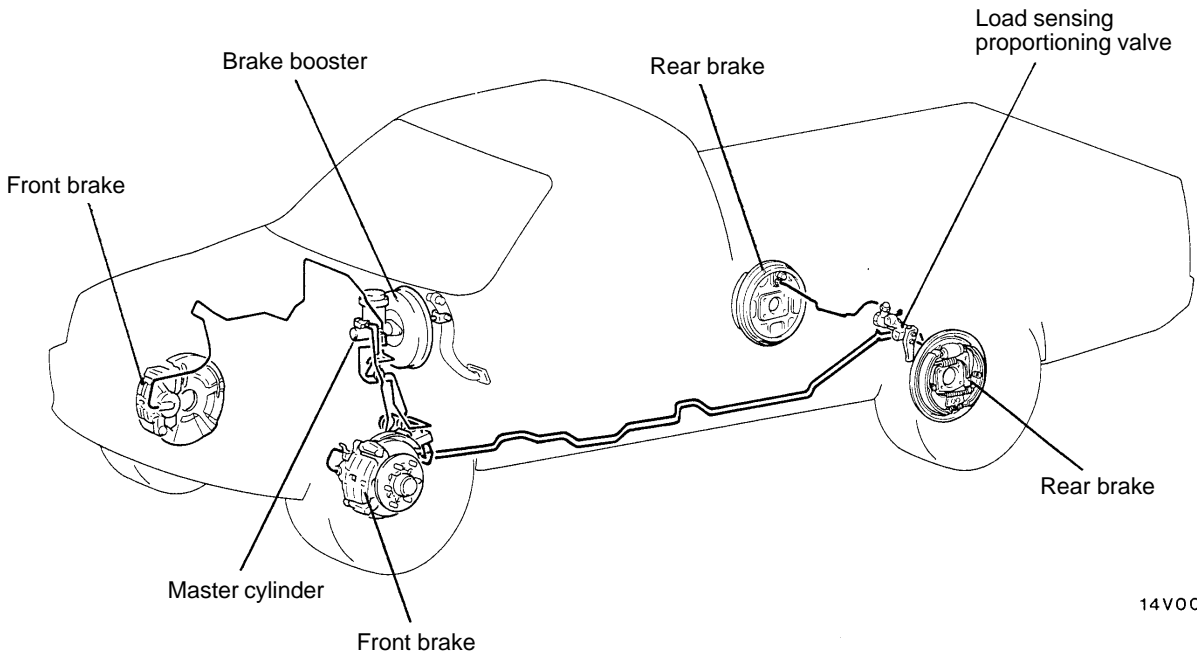
Items	2WD <Petrol-powered vehicles>	2WD <Diesel-powered vehicles>	4WD <Petrol-powered vehicles>	4WD <Diesel-powered vehicles>
Master cylinder I.D. mm	23.8	23.8	23.8	23.8
Brake booster effective dia. of power cylinder mm	230 205 + 230*	230 180 + 205*	205 + 230	180 + 205
Brake booster boosting ratio	5.0	5.0	7.0	7.0
Load sensing proportioning valve decompression ratio	0.15	0.15	0.15	0.15
Front brake disc effective dia. mm	200	200	222 228*	222 228*
Front brake wheel cylinder I.D. mm	60.3 42.9*	60.3 42.9*	60.3 42.9*	60.3 42.9*
Rear drum brake drum I.D. mm	254	254	270	270
Rear drum brake wheel cylinder I.D. mm	23.8	23.8	23.8	23.8
Rear drum brake lining thickness mm	4.7	4.7	4.7	4.7

NOTE

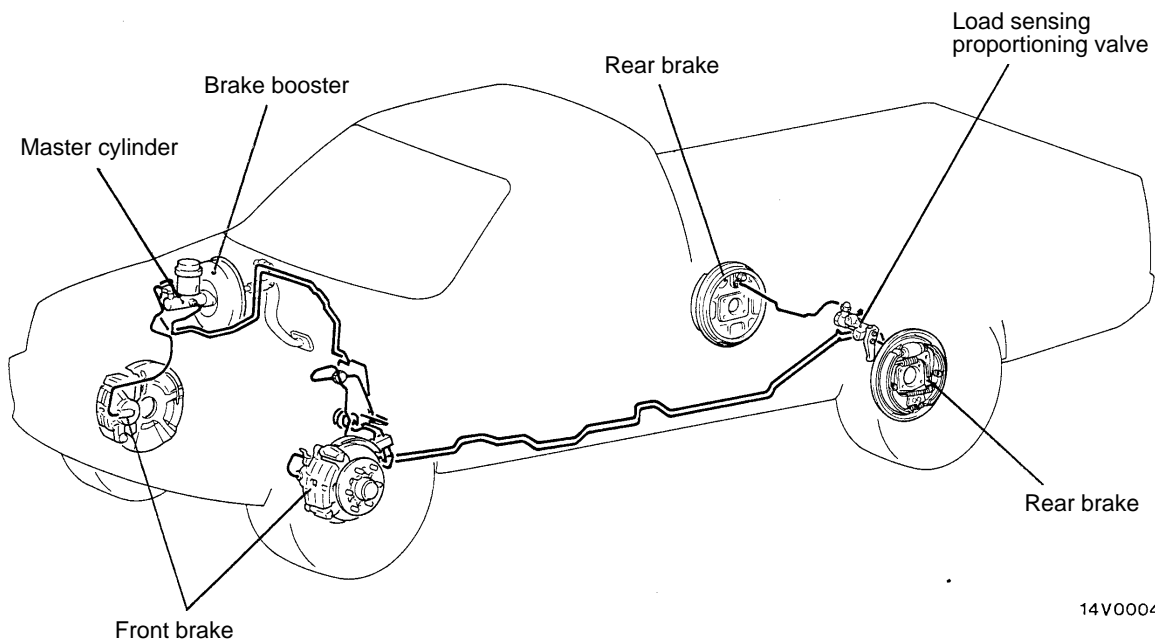
*: Vehicles with ABS.

CONFIGURATION DIAGRAM

<L.H. drive vehicles>



<R.H. drive vehicles>



SERVICE SPECIFICATIONS

35100030119

Items			Standard value	Limit
Brake pedal height mm			176 – 181	–
Brake pedal free play mm			3 – 8	–
Brake pedal to floor board clearance mm			95 or more	–
Load sensing proportioning valve output pressure kPa (Input pressure kPa)	2WD	When load sensing spring length is 190 mm (when unladen)	3,625 (5,884)	–
			5,390 (17,652)	–
		When load sensing spring length is 215 mm (when laden)	14,393 (17,652)	–
	4WD	When load sensing spring length is 190 mm (when unladen)	4,309 (5,884)	–
			6,074 (17,652)	–
		When load sensing spring length is 215 mm (when laden)	16,310 (17,652)	–
Load sensing spring length mm			189 – 193	–
Booster push rod to master cylinder piston clearance mm	Single brake booster	Petrol-powered vehicles	0.65 – 1.05	–
		Diesel-powered vehicles	1.00 – 1.40	–
	Tandem brake booster	Vehicle which brake booster of power cylinder is 180 mm and 205 mm in effective diameter	0.90 – 1.30	–
		Vehicle which brake booster of power cylinder is 205 mm and 230 mm in effective diameter	0.70 – 1.10	–
Front disc brake pad thickness mm			10	2.0
Front brake disc thickness mm			24	22.4
Front brake disc run-out mm	2WD		–	0.08
	4WD		–	0,06
Front disc brake drag force (tangential force of wheel mounting bolts) N			69 or less	–
Rear drum brake lining thickness mm			4.7	1.0
Rear drum inside diameter mm	2WD		254.0	256.0
	4WD		270.0	272.0
Front hub end play mm			0.05	–

35A-6 BASIC BRAKE SYSTEM – Lubricants/Sealants/Special Tools

LUBRICANTS

35100040105

Items	Specified lubricant
Brake fluid	DOT3 or DOT4
Brake piston seal	Repair kit grease
Guide pin boot inner surface	
Lock pin boot inner surface	
Piston boot mounting grooves	
Brake piston boot inner surface	
Lock pin bush inner surface	
Piston cup surface	
Rear brake shoe and backing plate contact surface	
Auto adjuster assembly	

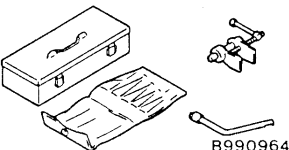
SEALANTS

35100050108

Items	Specified sealant	Remarks
Vacuum switch	3M ATD Part No.8661 or equivalent	Semi-drying sealant
Shoe hold-down pin	3M ATD Part No.8513 or equivalent	Drying sealant

SPECIAL TOOLS

35100060095

Tool	Number	Name	Use
	MB990964 MB990520 MB990623	Brake tool set	Pushing-in of the disc brake piston Installation of drum brake wheel cylinder piston cup

TROUBLESHOOTING

35100070081

Symptom	Probable cause	Remedy
Vehicle pulls to one side when brakes are applied	Grease or oil on pad or lining surface	Replace
	Inadequate contact of pad or lining	Correct
	Auto adjuster malfunction	Adjust
	Drum eccentricity or uneven wear	Repair or replace as necessary
Insufficient braking power	Low or deteriorated brake fluid	Refill or change
	Air in brake system	Bleed air
	Overheated brake rotor due to dragging of pad or lining	Correct
	Inadequate contact of pad or lining	
	Brake booster malfunction	
	Clogged brake line	
	Grease or oil on pad or lining surface	Replace
	Load sensing proportioning valve malfunction	Adjust
Auto adjuster malfunction		
Increased pedal stroke (Reduced pedal to floor board clearance)	Air in brake system	Bleed air
	Worn lining or pad	Replace
	Broken vacuum hose	
	Faulty master cylinder	
	Brake fluid leaks	Correct
	Auto adjuster malfunction	Adjust
	Excessive push rod to master cylinder clearance	
Brake drag	Incomplete release of parking brake	Correct
	Clogged master cylinder return port	
	Incorrect parking brake adjustment	Adjust
	Improper push rod to master cylinder clearance	
	Faulty master cylinder piston return spring	Replace
	Worn brake pedal return spring	
	Broken rear drum brake shoe to shoe spring	
	Lack of lubrication in sliding parts	Lubricate

Symptom	Probable cause	Remedy
Insufficient parking brake function	Worn brake lining or pad	Replace
	Grease or oil on lining or pad surface	
	Parking brake cable sticking	
	Stuck wheel cylinder or caliper piston	
	Excessive parking brake lever stroke	Adjust the parking brake lever stroke or check the parking brake cable routing
	Auto adjuster malfunction	Adjust
Scraping or grinding noise when brakes are applied	Worn brake lining or pad	Replace
	Caliper to wheel interference	Correct or replace
	Dust cover to disc interference	
	Bent brake backing plate	
	Cracked drums or brake disc	
Squealing, groaning or chattering noise when brakes are applied	Disc brakes – Missing or damaged brake pad anti-squeak shim	Replace
	Brake drums and linings, discs and pads worn or scored	Correct or replace
	Improper lining parts	
	Disc brake – Burred or rusted calipers	Correct or deburr
	Dirty, greased, contaminated or glazed linings	Clean or replace
	Drum brakes – Weak, damaged or incorrect shoe hold-down springs, loose or damaged shoe hold-down pins and springs	Correct or replace
	Incorrect brake pedal or booster push rod	Adjust

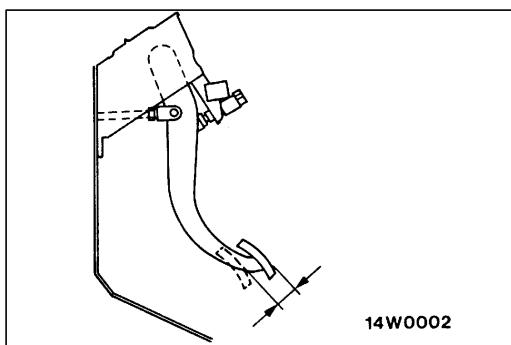
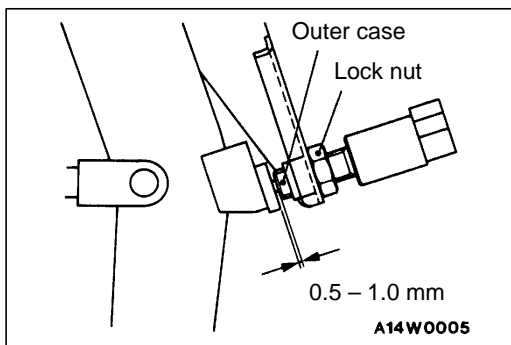
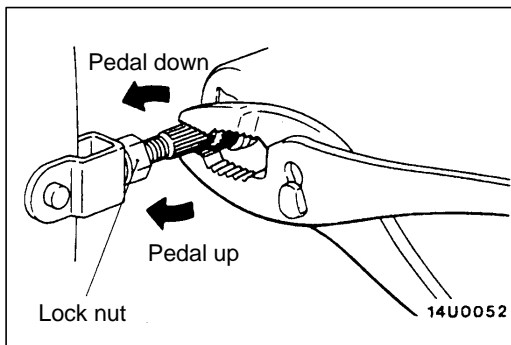
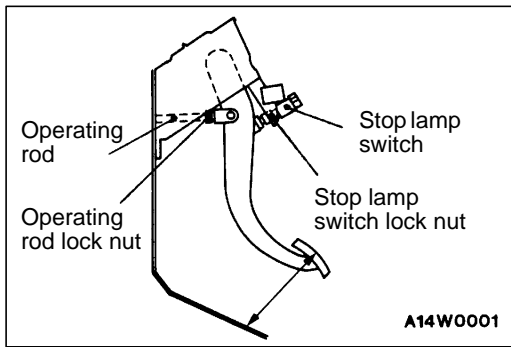
Symptom	Probable cause	Remedy
Squealing noise when brakes are not applied	Bent or warped backing plate causing interference with drum	Replace
	Drum brakes – Weak, damaged or incorrect shoe-to-shoe spring	
	Poor return of brake booster, master cylinder or wheel cylinder	
	Loose or extra parts in brakes	Retighten
	Improper positioning of pads in caliper	Correct
	Improper installation of support mounting to caliper body	
	Improper machining of drum causing interference with backing plate or shoe	Replace drum
	Disc brakes – Rusted, stuck	Lubricate or replace
	Worn, damaged or insufficiently lubricated wheel bearings	
	Incorrect brake pedal or booster push rod	Adjust
Groaning, clicking or rattling noise when brakes are not applied	Stones or foreign material trapped inside wheel covers	Remove stones, etc.
	Loose wheel nuts	Retighten
	Disc brakes – Loose installation bolts	
	Worn, damaged or dry wheel bearings	Lubricate or replace
	Disc brakes – Failure of shim	Replace
	Disc brakes – Wear on sleeve	
	Incorrect brake pedal or booster push rod	Adjust

ON-VEHICLE SERVICE**BRAKE PEDAL CHECK AND ADJUSTMENT****BRAKE PEDAL HEIGHT**

1. Turn back the carpet etc. under the brake pedal.
2. Measure the brake pedal height as illustrated. If it is not within the standard value, adjust as follows.

Standard value: 176 – 181 mm (From the surface of melting seat to the face of pedal pad)

- (1) Disconnect the stop lamp switch connector, loosen the lock nut, and move the stop lamp switch to a position where it does not contact the brake pedal arm.
 - (2) Adjust the brake pedal height by turning the operating rod with pliers (with the operating rod lock nut loosened).
 - (3) Screw in the stop lamp switch until it contacts the brake pedal stopper (just before brake pedal is caused to move), return the stop lamp switch 1/2 to 1 turn and secure with the lock nut.
 - (4) Connect the connector of the stop lamp switch.
 - (5) Check to be sure that the stop lamp is not illuminated with the brake pedal released.
3. Return the carpet etc.

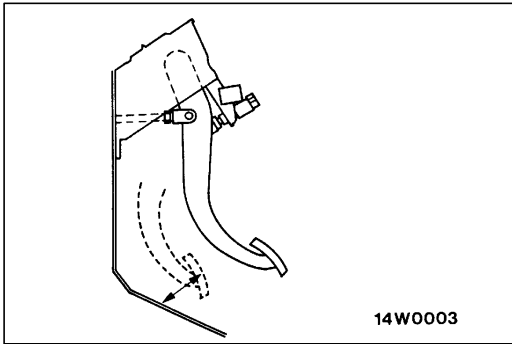
**BRAKE PEDAL FREE PLAY**

With the engine stopped, 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

If the free play exceeds the standard value, it is probably due to excessive play between the clevis pin and brake pedal arm.

Check for excessive clearance and replace faulty parts as required.



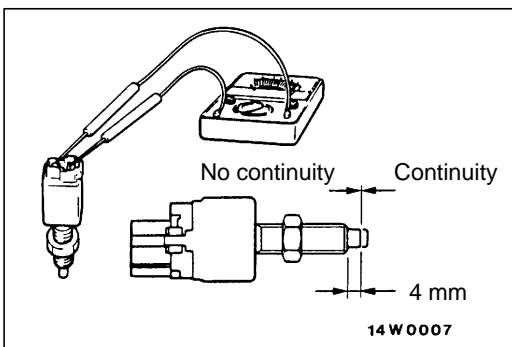
CREARANCE BETWEEN BRAKE PEDAL AND FLOOR BOARD

1. Turn back the carpet etc. under the brake pedal.
2. Start the engine, depress the brake pedal with approximately 490 N of force, and measure the clearance between the brake pedal and the floorboard.

Standard value:

95 mm or more (From the surface of melting seat to the face of pedal pad)

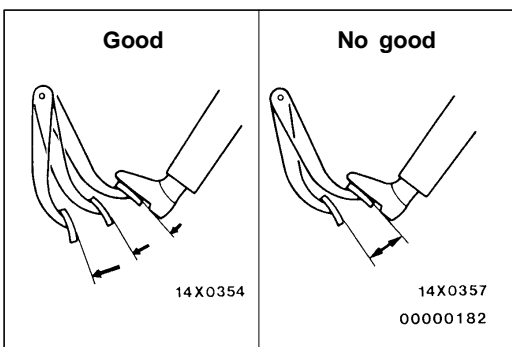
3. If the clearance is outside the standard value, check for air trapped in the brake line, clearance between the lining and the drum and dragging in the parking brake. Adjust and replace defective parts as required.
4. Return the carpet etc.



STOP LAMP SWITCH CHECK

35100890090

Connect a circuit tester to the stop lamp switch, and check whether or not there is continuity when the plunger of the stop lamp switch is pushed in and when it is released. The stop lamp switch is in good condition if there is no continuity when the plunger is pushed in to a depth of within 4 mm from the outer case edge surface, and if there is continuity when it is released.



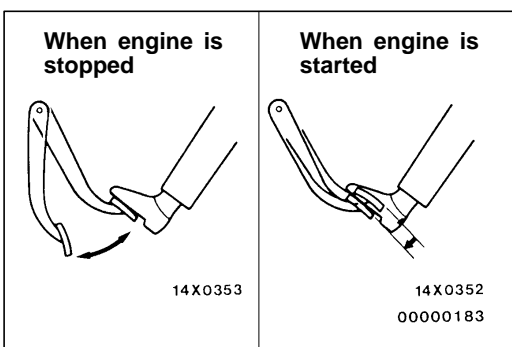
BRAKE BOOSTER OPERATING TEST

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

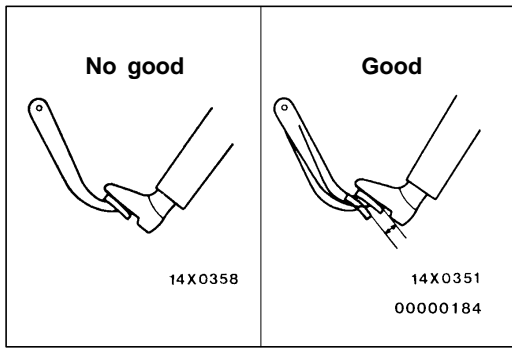
1. Run the engine for one or two minutes, and then stop it.

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.



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.



- 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. If the above three tests are okay, the booster performance can be determined as good. If one of the above three tests is not okay at last, the check valve, vacuum hose, or booster will be defective.

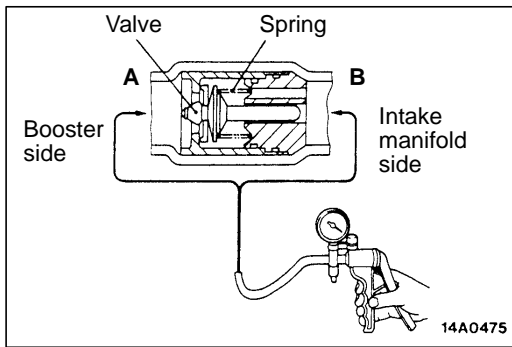
CHECK VALVE OPERATION CHECK

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- Remove the vacuum hose. (Refer to P.35A-20.)

Caution

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

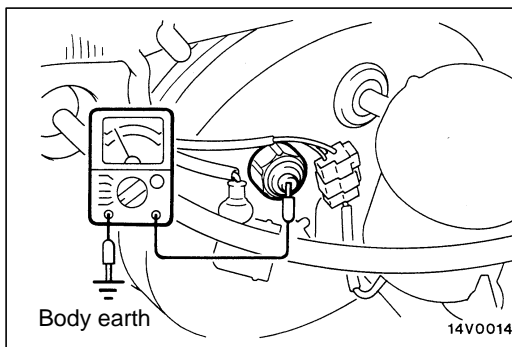


- Check the operation of the check valve by using a vacuum pump.

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.

Caution

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



BRAKE BOOSTER VACUUM SWITCH CHECK <DIESEL-POWERED VEHICLES>

35100920034

- Connect an ohmmeter to the connector of the vacuum switch.
- Start the engine and check for continuity when the vacuum hose is connected, and when it is disconnected. The vacuum switch is in good condition if there is no continuity when the vacuum hose is connected, and if there is continuity when it is disconnected.

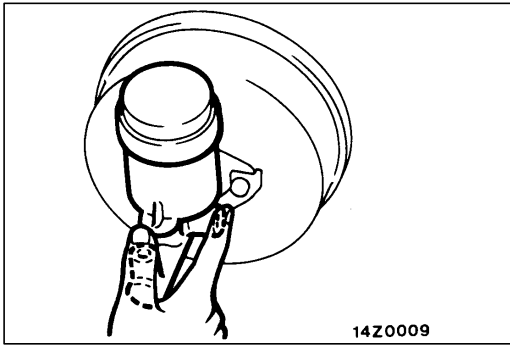
BLEEDING

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Caution

Use the specified brake fluid. Avoid using a mixture of the specified brake fluid and other fluid.

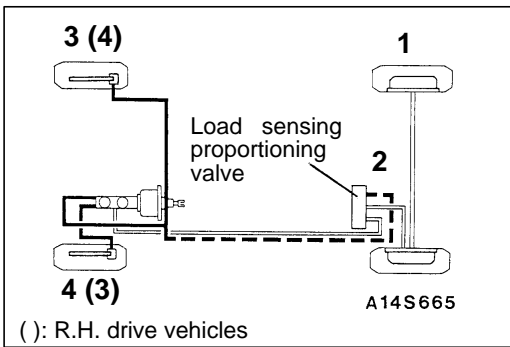
Specified brake fluid: DOT3 or DOT4



MASTER CYLINDER BLEEDING

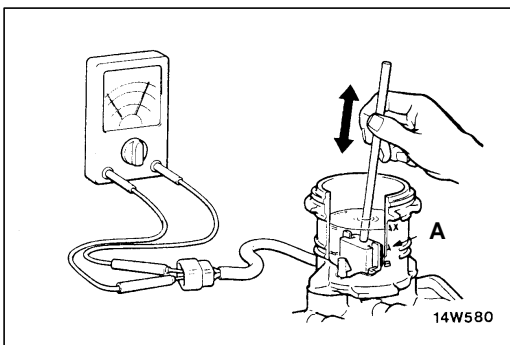
The master cylinder used has no check valve, so if bleeding is carried out by the following procedure, bleeding of air from the brake pipeline will become easier. (When brake fluid is not contained in the master cylinder.)

- (1) Fill the 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.



BRAKE PIPE LINE BLEEDING

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



BRAKE FLUID LEVEL SENSOR CHECK

35100910086

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

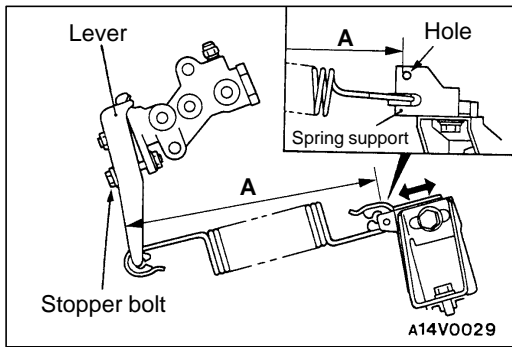
LOAD SENSING SPRING LENGTH CHECK AND ADJUSTMENT

35100120021

1. Park the vehicle on a level ground. The vehicle should be unloaded and supported only by wheels.

Caution

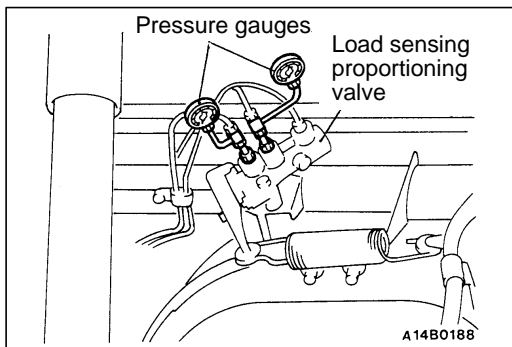
Never support the vehicle with jacks or other similar means.



2. While the lever of the load sensing proportioning valve is touching the stopper bolt, install the spring support so that the distance (A) from the edge of the spring mounting section of the lever to the place on the spring support shown in the illustration is at the standard value.

Standard value (A): 189 – 193 mm

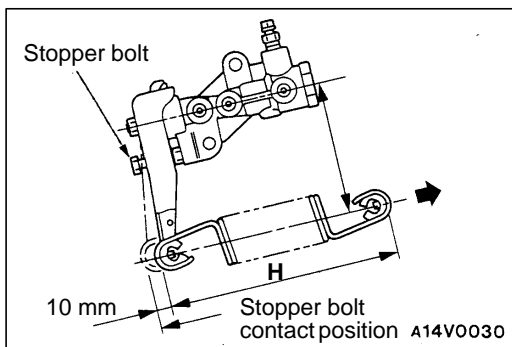
3. If the spring length is not within the standard value, loosen the bolt attaching the support and adjust the distance by moving the support.



LOAD SENSING PROPORTIONING VALVE FUNCTION TEST

35100130024

1. Connect pressure gauges to the input and output ports of the load sensing proportioning valve.
2. Bleed the system. (Refer to P.35-12, GROUP 35B – On-vehicle Service.)



3. Disconnect the spring at the support side.
4. Place the spring so that it is in parallel with the load sensing proportioning valve, and pull in the direction indicated by the arrow so that its length H shown in the figure (the length between its ends) is as noted below.

NOTE

At this time the lever is pressed all the way to the load sensing proportioning valve.

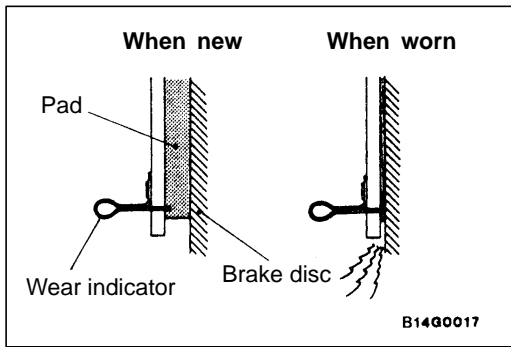
Standard value:

Items	Spring length H mm	Input fluid pressure kPa	Output fluid pressure kPa
2WD	190*1	5,884	3,625
		17,652	5,390
	215*2	17,652	14,393
4WD	190*1	5,884	4,309
		17,652	6,074
	215*2	17,652	16,310

NOTE

*1 and *2 indicate the applicable lengths for unladen and laden vehicles respectively.

5. After making the check, install the spring. Disconnect the pressure gauges from the load sensing proportioning valve and bleed the air. (Refer to P.35A-12, GROUP 35B – On-vehicle Service.)

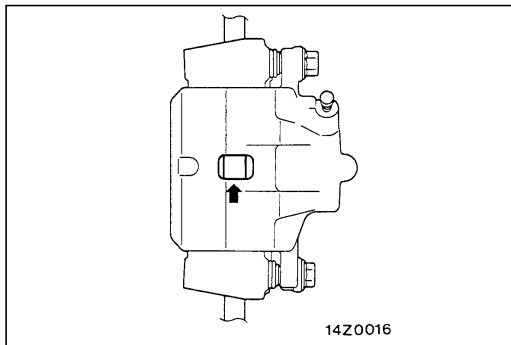


DISC BRAKE PAD CHECK AND REPLACEMENT

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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.



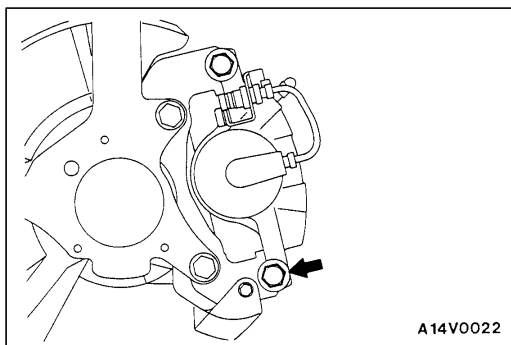
1. Check brake pad thickness through caliper body check port.

Standard value: 10 mm

Limit: 2.0 mm

Caution

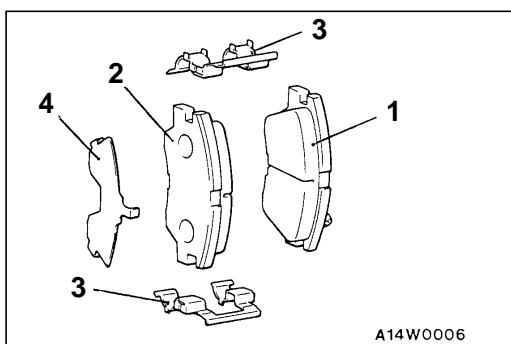
1. When the limit is exceeded, replace the pads at both sides, and also the brake pads for the wheels on the opposite side at the same time.
2. If there is a significant difference in the thicknesses of the pads on the left and right sides, check the sliding condition of the piston, lock pin and guide pin.



2. Remove the guide pin <2WD> or lock pin <4WD>. Lift the caliper assembly and retain with wire.

Caution

Do not wipe the special grease from the guide pin <2WD> or lock pin <4WD>. Do not contaminate the guide pin <2WD> or lock pin <4WD>.



3. Remove the following parts from caliper support.
 - (1) Pad & wear indicator assembly
 - (2) Pad assembly
 - (3) Clip
 - (4) Outer shim
4. Measure hub torque with pad removed to measure brake drag torque after pad installation. (Refer to P.35A-25.)
5. Install the pad and caliper assembly, and check the brake drag force. (Refer to P.35A-25.)

FRONT DISC BRAKE ROTOR CHECK

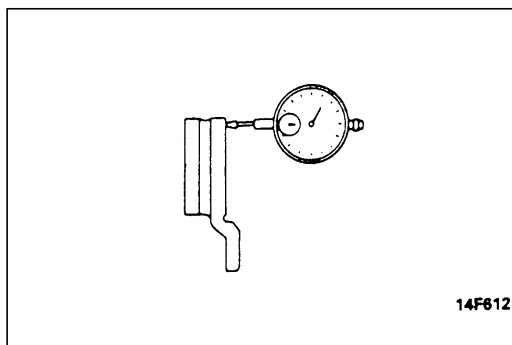
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CAUTION

When servicing disc brakes, it is necessary to exercise caution to keep the disc brakes within the allowable service values in order to maintain normal brake operation.

Before re-finishing or re-processing the brake disc surface, the following conditions should be checked.

Inspection items	Remarks
Scratches, rust, saturated lining materials and wear	<ul style="list-style-type: none"> If the vehicle is not driven for a certain period, the sections of the discs that are not in contact with lining will become rusty, causing noise and shuddering. If grooves resulting from excessive disc wear and scratches are not removed prior to installing a new pad assembly, there will momentarily be inappropriate contact between the disc and the lining (pad).
Run-out or drift	Excessive run-out or drift of the discs will increase the pedal depression resistance due to piston knock-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 inset or warping.



RUN-OUT CHECK AND CORRECTION

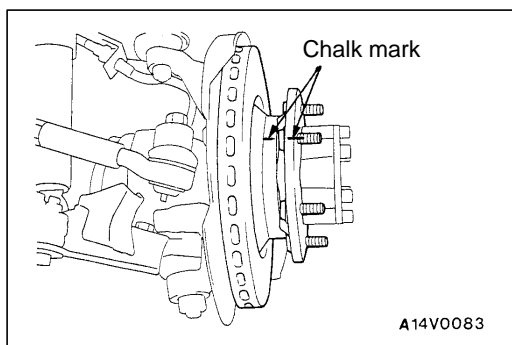
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1. Remove the caliper support; then raise the caliper assembly upward and secure by using wire.
2. Inspect the disc surface for grooves, cracks and rust. Clean the disc thoroughly and remove all rust.
3. Place a dial gauge approximately 5 mm from the outer circumference of the brake disc, and measure the run-out of the disc.

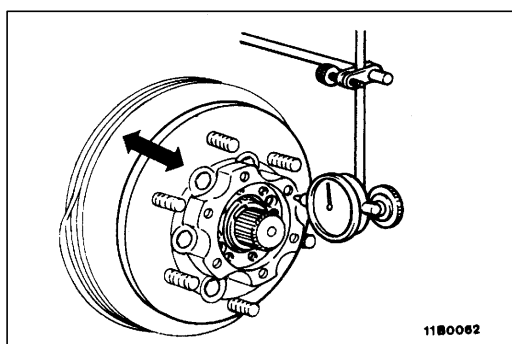
Limit:

<2WD> 0.08 mm

<4WD> 0.06 mm



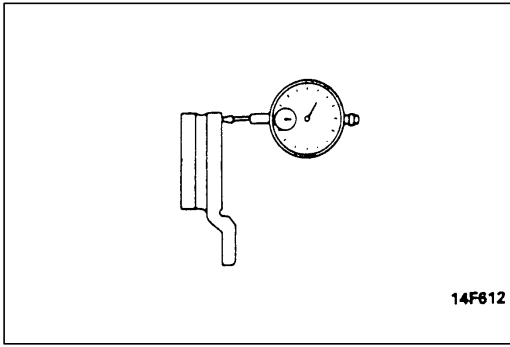
4. If the run-out of the brake disc is equivalent to or exceeds the limit specification, change the phase of the disc and hub, and then measure the run-out again.
 - (1) Before removing the brake disc, chalk both sides of the wheel stud on the side at which run-out is greatest.



- (2) For 4WD, place a dial gauge as show in the illustration, and then move the hub in the axial direction and measure the play.

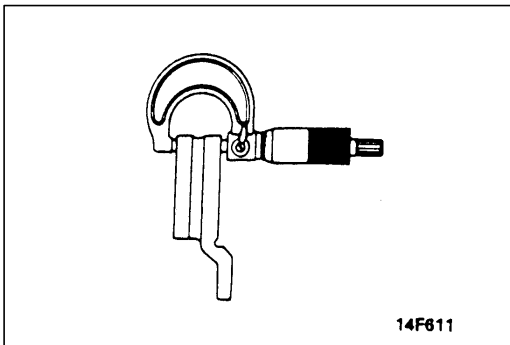
Standard value: 0.05 mm

If the play is equal to or exceeds the standard value, adjust the wheel bearing preload. (Refer to GROUP 26 – Front Hub Assembly <4WD>.)



(3) If the play does not exceed the standard value specification, install the brake disc at a position 180° away from the chalk mark, and then check the run-out of the brake disc once again.

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



THICKNESS CHECK

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

Brake disc thickness

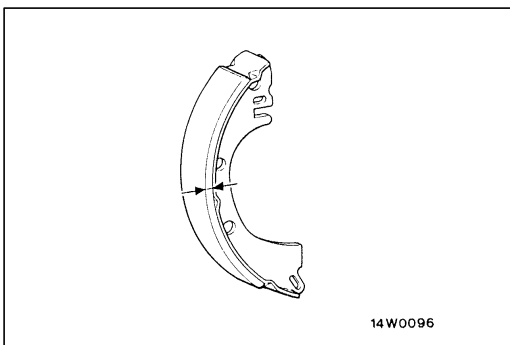
Standard value: 24 mm

Limit: 22.4 mm

Thickness variation (at least 8 positions)

The difference between any thickness measurements should not be more than 0.015 mm.

2. If the disc is beyond the limits for thickness, remove it and install a new one. If thickness variation exceeds the specification, replace the brake disc or turn rotor with on the car type brake lathe ("MAD, DL-8700PF" or equivalent).



BRAKE LINING THICKNESS CHECK

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1. Remove the brake drum.
2. Measure the wear of the brake lining at the place worn the most.

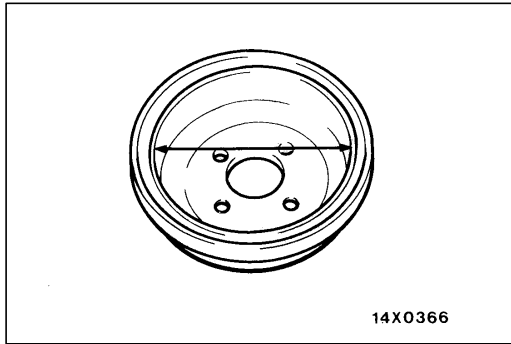
Standard value: 4.7 mm

Limit: 1.0 mm

Replace the shoe and lining assembly if brake lining thickness is less than the limit or if it is not worn evenly. For information concerning the procedures for installation of the shoe and lining assembly, refer to P.35A-30.

Caution

1. **Whenever the shoe and lining assembly is replaced, replace both RH and LH assemblies as a set to prevent car from pulling to one side when braking.**
2. **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.**



BRAKE DRUM INSIDE DIAMETER CHECK

35100320124

1. Remove the brake drum.
2. Measure the inside diameter of the brake drum at two or more locations.

Standard value:

<2WD> 254.0 mm

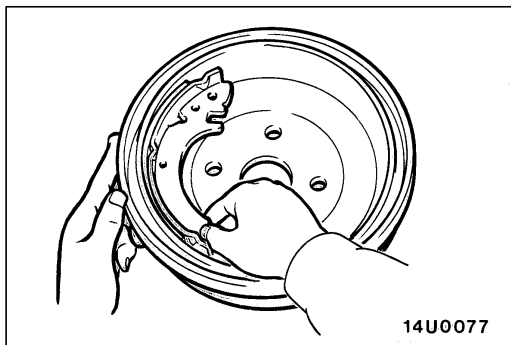
<4WD> 270.0 mm

Limit:

<2WD> 256.0 mm

<4WD> 272.0 mm

3. Replace brake drums, shoe and lining assembly when wear exceeds the limit value or is badly imbalanced.



BRAKE LINING AND BRAKE DRUM CONNECTION CHECK

35100310138

1. Remove the brake drum.
2. Remove the shoe and lining assembly. (Refer to P.35A-30.)
3. Chalk inner surface of brake drum and rub with shoe and lining assembly.
4. Replace shoe and lining assembly or brake drums if there are any irregular contact area.

NOTE

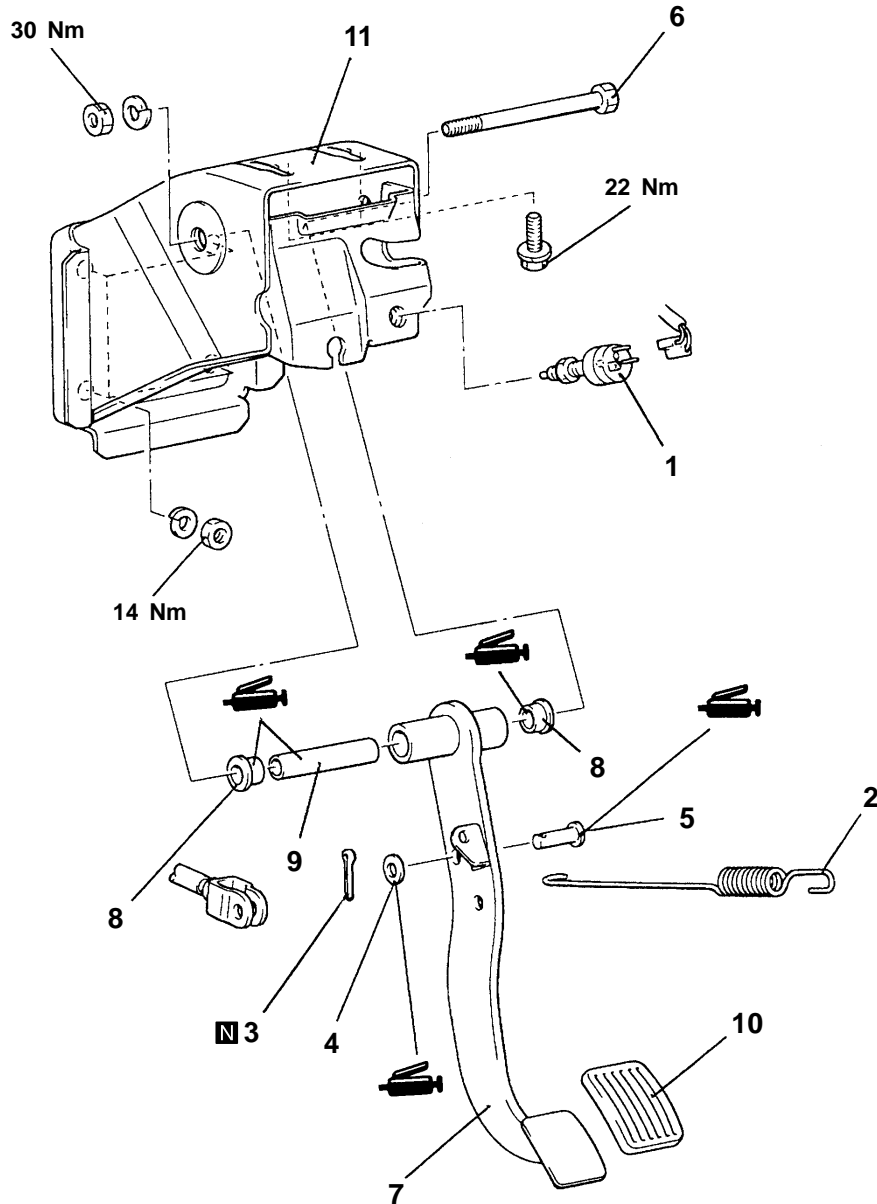
Clean off chalk after check.

BRAKE PEDAL

REMOVAL AND INSTALLATION

Post-installation Operation

- Brake Pedal Adjustment (Refer to P.35A-10.)



A14V0008

Removal steps

- | | |
|------------------------------|--------------------------|
| 1. Stop lamp switch | 7. Brake pedal |
| 2. Brake pedal return spring | 8. Bushing |
| 3. Split pin | 9. Pipe |
| 4. Washer | 10. Pedal pad |
| 5. Clevis pin | 11. Pedal support member |
| 6. Brake pedal shaft bolt | |

MASTER CYLINDER AND BRAKE BOOSTER

35100370150

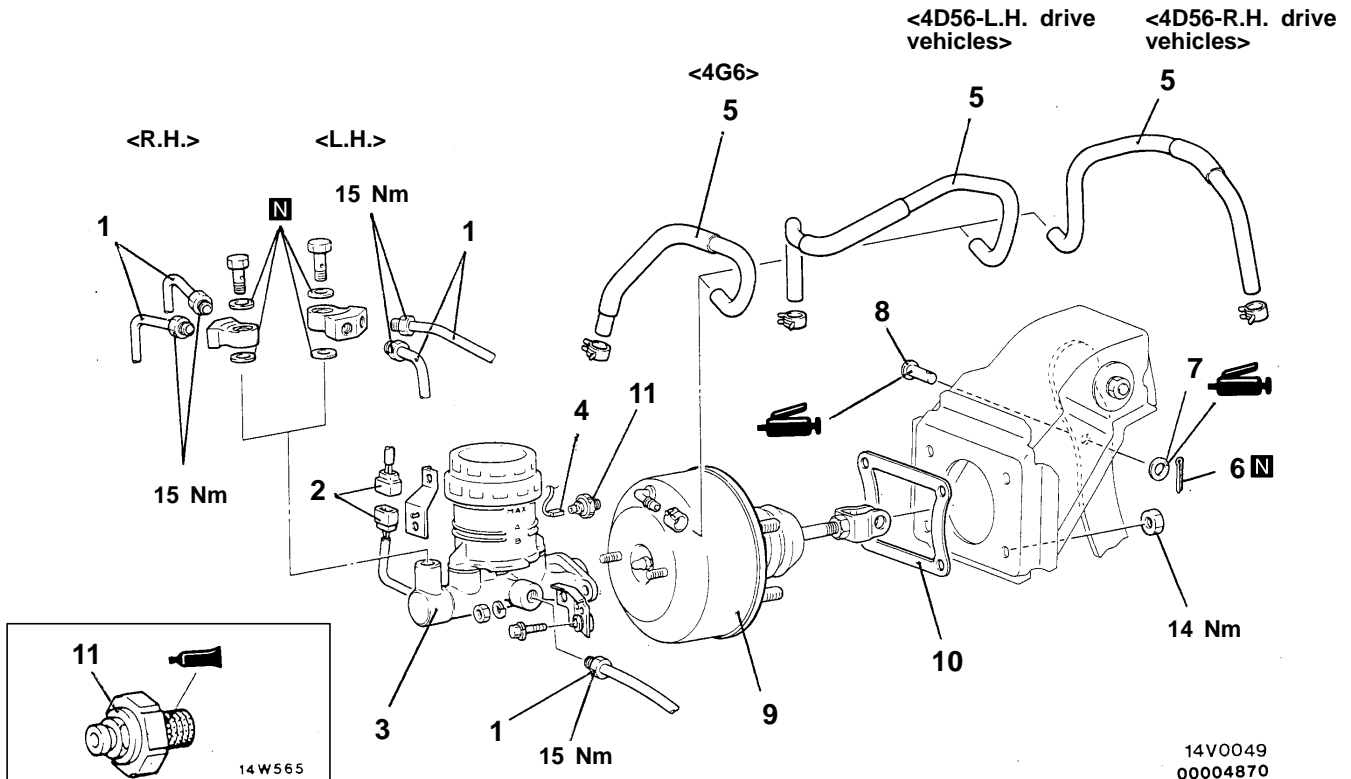
REMOVAL AND INSTALLATION

Pre-removal Operation

- Brake Fluid Draining

Post-installation Operation

- Brake Fluid Supplying
- Brake Line Bleeding (Refer to P.35A-12.)
- Brake Pedal Adjustment (Refer to P.35A-10.)



14V0049
00004870

Sealant: 3M ATD Part No.8661 or equivalent

Removal steps

1. Brake tube connection
2. Brake fluid level sensor connector
3. Master cylinder assembly
- ▶B◀ • Adjustment of clearance between brake booster push rod and primary piston
- ▶A◀ 4. Vacuum switch connector <4D56>
5. Vacuum hose (with built-in check valve)
6. Split pin

7. Washer
8. Clevis pin
9. Brake booster
10. Sealer
11. Vacuum switch <4D56>

Caution

Do not remove the check valve from the vacuum hose. If the check valve is defective, replace it together with the vacuum hose.

INSTALLATION SERVICE POINTS

►A◄ VACUUM HOSE CONNECTION

Insert securely and completely until the vacuum hose at the engine side contacts the edge of the hexagonal part of the fitting, and then secure by using the hose clip.

►B◄ CLEARANCE ADJUSTMENT BETWEEN BRAKE BOOSTER PUSH ROD AND PRIMARY PISTON

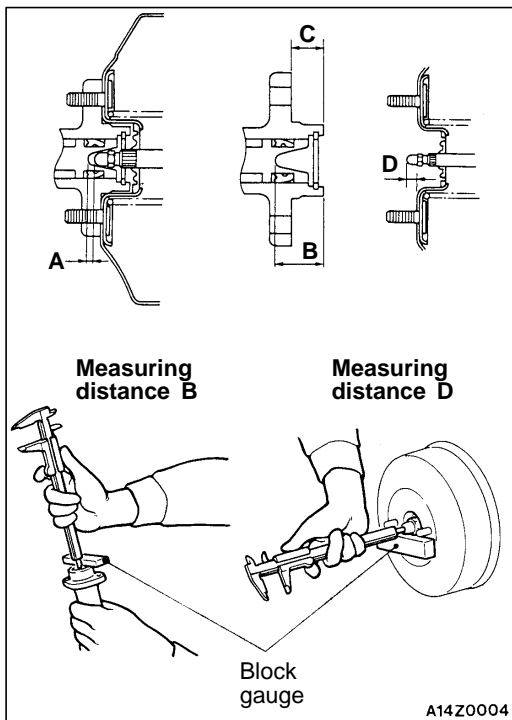
Calculate clearance A from the B, C and D measurements.
 $A = B - C - D$

Standard value:

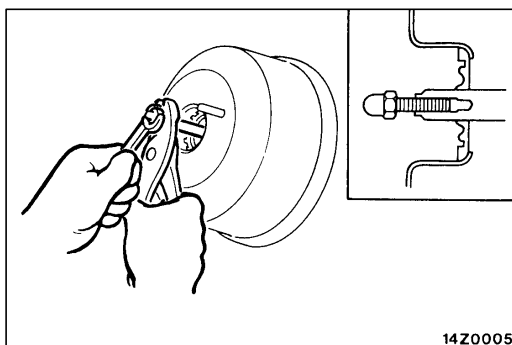
Brake booster size		Clearance A standard valve mm
Single brake booster	Petrol-powered vehicles	0.65 – 1.05
	Diesel-powered vehicles	1.00 – 1.40
Tandem brake booster	Vehicle which brake booster of power cylinder is 180 mm and 205 mm in effective diameter	0.90 – 1.30
	Vehicle which brake booster of power cylinder is 205 mm and 230 mm in effective diameter	0.70 – 1.10

NOTE

When brake booster negative pressure (petrol-powered vehicles: -66.7 kPa, diesel-powered vehicles: -93.3 kPa) is applied, clearance value will become 0.10 – 0.50 mm.



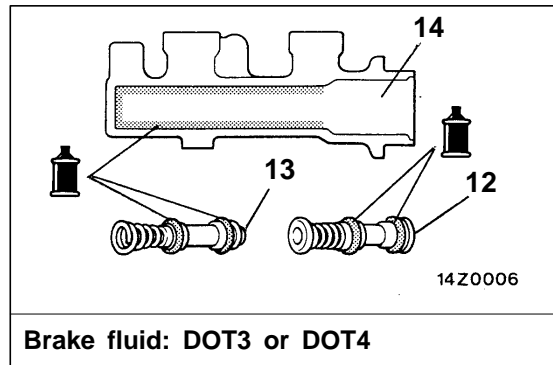
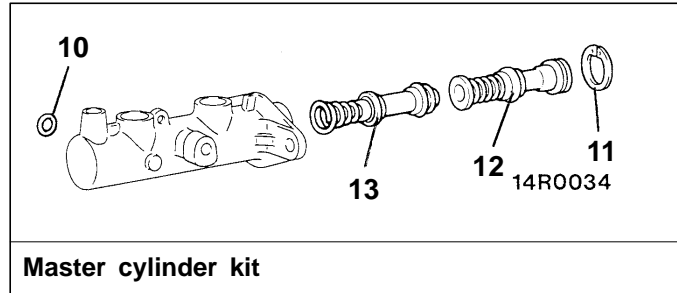
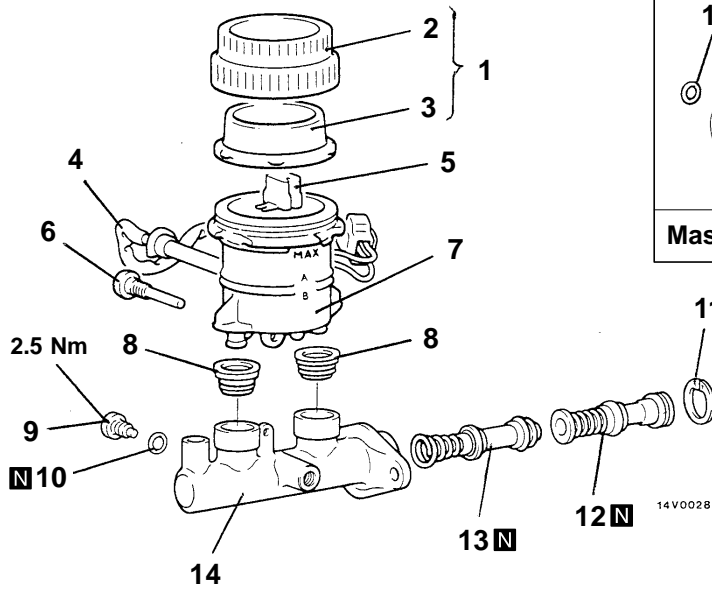
A14Z0004



14Z0005

If the clearance is not within the standard value range, adjust by changing the push rod length by turning the screw of the push rod.

MASTER CYLINDER DISASSEMBLY AND REASSEMBLY



00004871

Disassembly steps

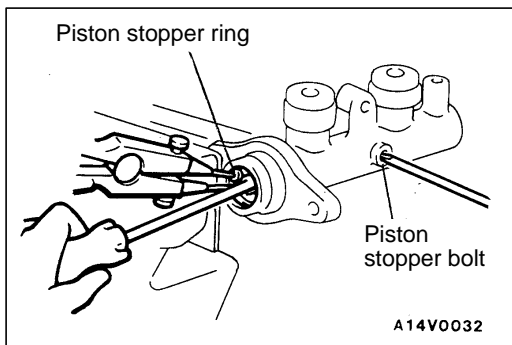
1. Reservoir cap assembly
2. Reservoir cap
3. Diaphragm
4. Brake fluid level sensor
5. Float
6. Reservoir stopper bolt
7. Reservoir tank
8. Reservoir seal
9. Piston stopper bolt



10. Gasket
11. Piston stopper ring
12. Primary piston assembly
13. Secondary piston assembly
14. Master cylinder body

Caution

Do not disassemble the primary piston and secondary piston assembly.



DISASSEMBLY SERVICE POINT

◀▶ PISTON STOPPER BOLT/PISTON STOPPER RING DISASSEMBLY

Remove the piston stopper bolt and piston stopper ring while depressing the piston.

INSPECTION

35100430056

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

LOAD SENSING PROPORTIONING VALVE

35100540018

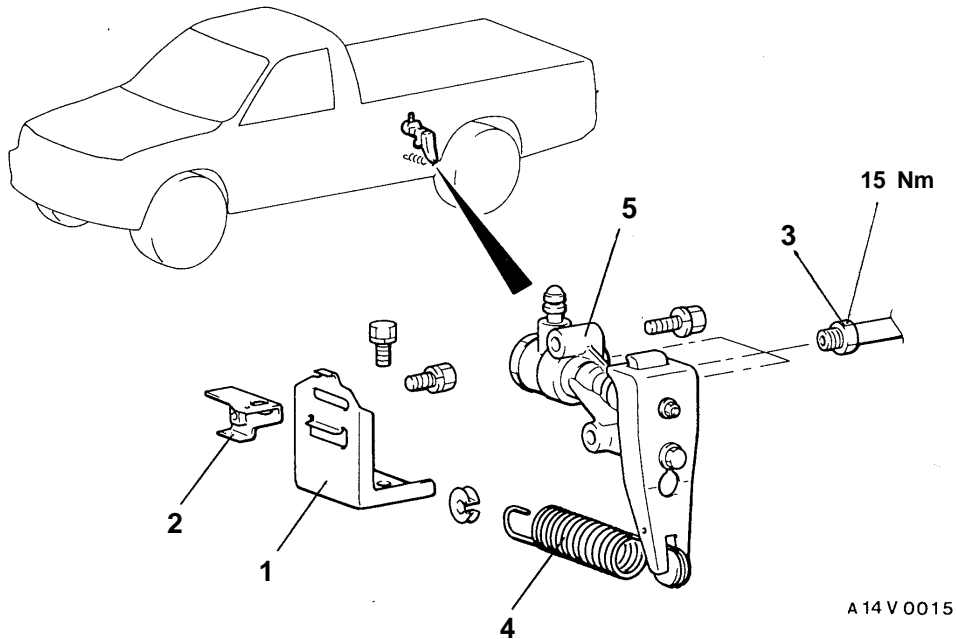
REMOVAL AND INSTALLATION

Pre-removal Operation

- Brake Fluid Draining

Post-installation Operation

- Brake Fluid Supplying
- Brake Line Bleeding (Refer to P.35A-12.)



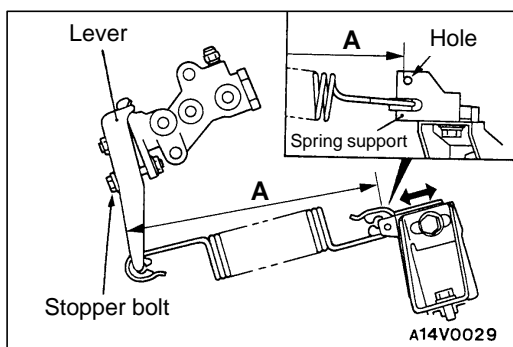
Removal steps



1. Spring holder
2. Spring support
3. Brake tube connection
4. Load sensing spring
5. Load sensing proportioning valve

Caution

Do not disassemble the load sensing proportioning valve.



INSTALLATION SERVICE POINT

▶A◀ SPRING SUPPORT INSTALLATION

While the lever of the load sensing proportioning valve is touching the stopper bolt, install the spring support so that the distance (A) from the edge of the spring mounting section of the lever to the place on the spring support shown in the illustration is within the standard value.

Standard value (A): 189 – 193 mm

FRONT DISC BRAKE

35100600112

REMOVAL AND INSTALLATION

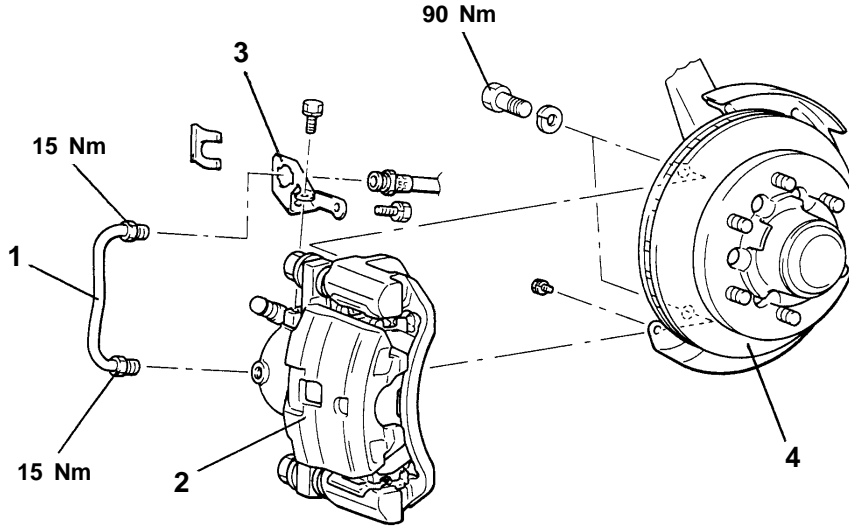
Pre-removal Operation

- Brake Fluid Draining

Post-installation Operation

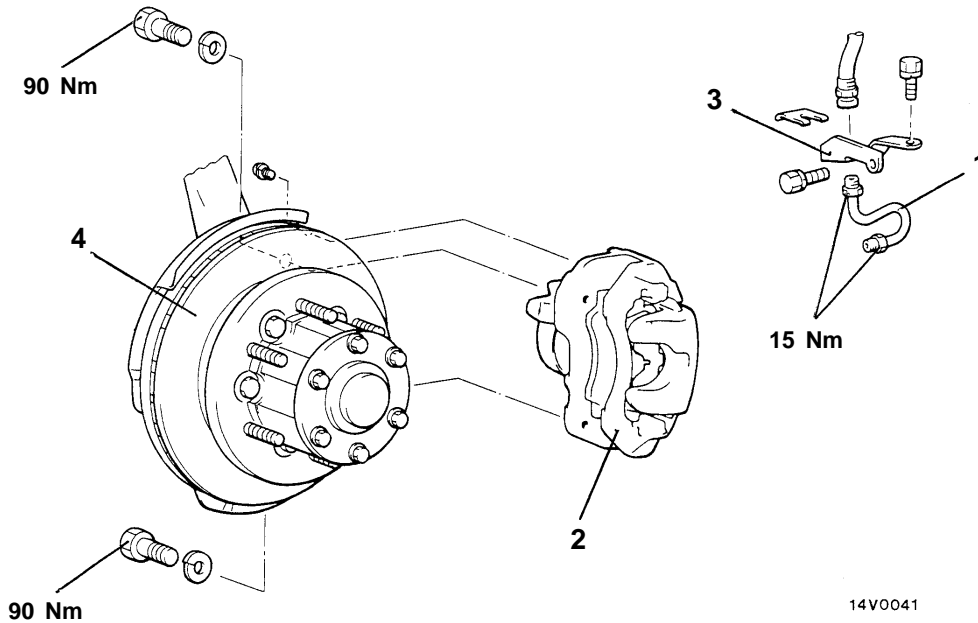
- Brake Fluid Supplying
- Brake Line Bleeding (Refer to P.35A-12.)

<2WD>



14V0016

<4WD>

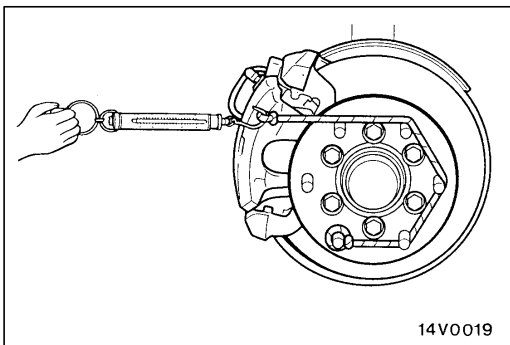
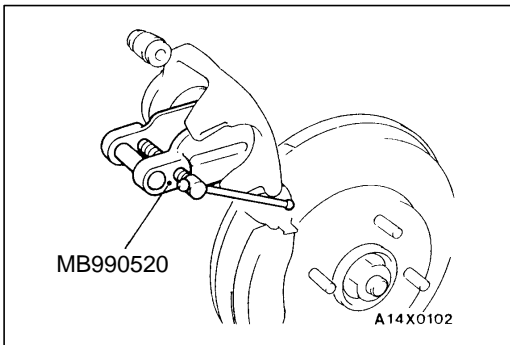
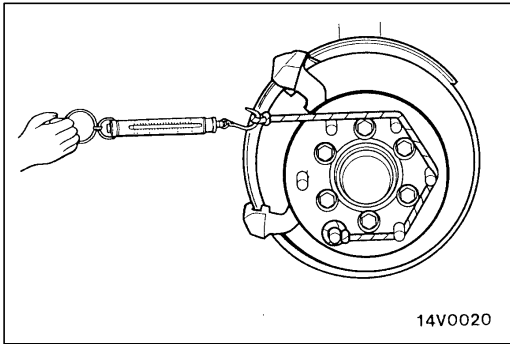


14V0041
00004872

Removal steps



1. Brake tube
2. Front brake assembly
3. Brake hose bracket
4. Brake disc (Refer to GROUP 26 – Front Hub Assembly.)



INSTALLATION SERVICE POINT

►A◄ FRONT BRAKE ASSEMBLY INSTALLATION

1. Measure hub torque (A) with pad removed to measure brake drag torque after pad installation.
2. Securely attach the pad clip to the caliper support.

Caution

For the vehicles with 4WD, engage 2WD before measurement.

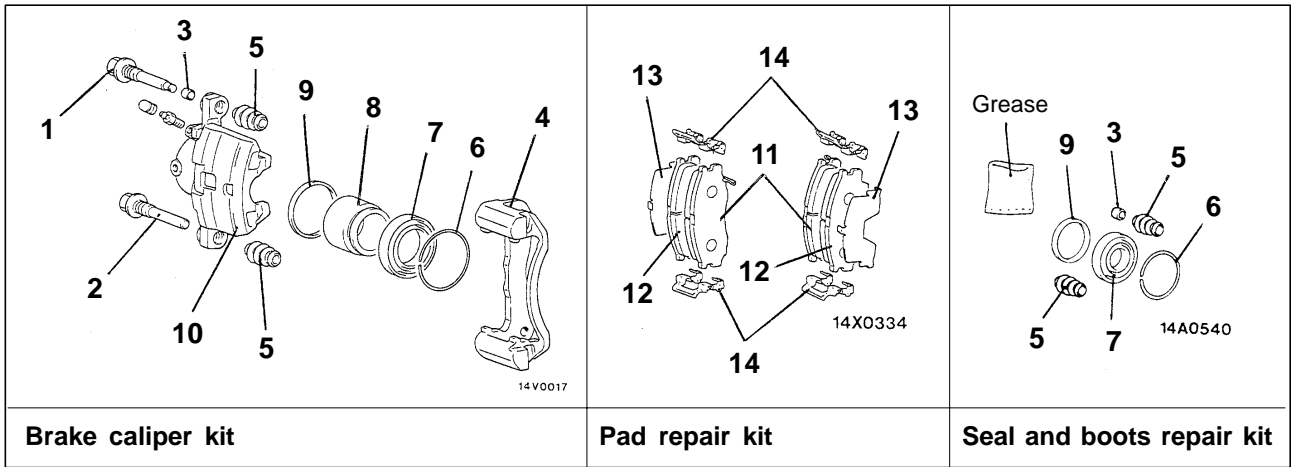
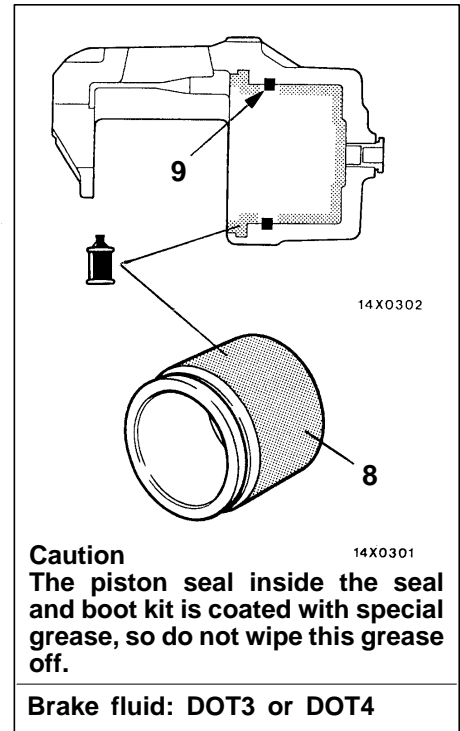
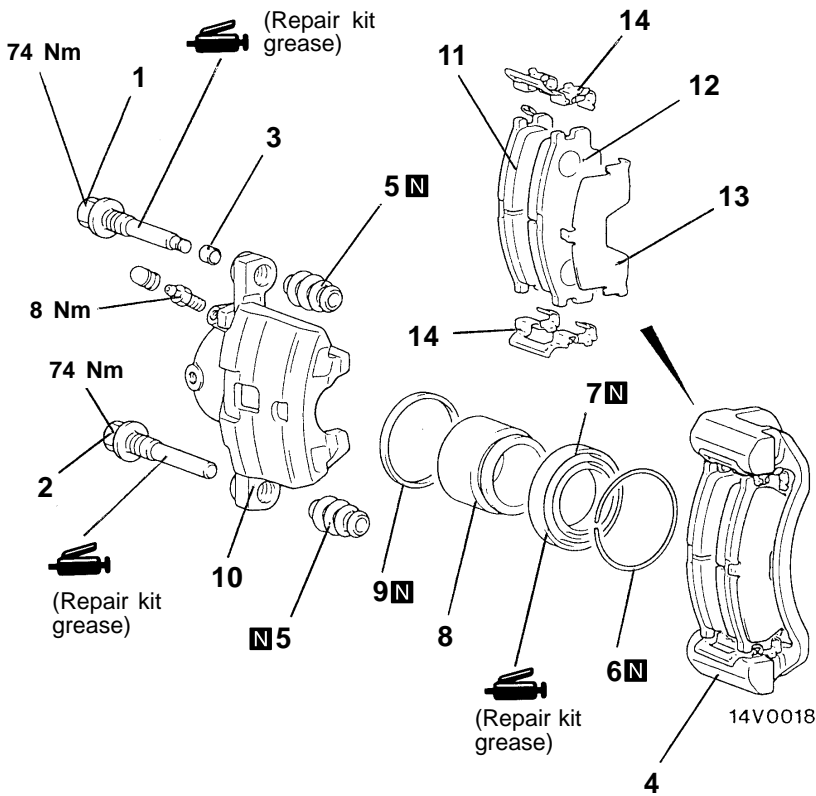
3. Clean the piston and insert into cylinder with special tool.
4. Be careful that the piston boot does not become caught, when lowering the caliper assembly and install the lock pin.
5. Check brake drag torque as follows.
 - (1) Start engine and hold brake pedal down for 5 seconds. (Pedal depression force: approx. 196 N)
 - (2) Stop engine.
 - (3) Turn brake disc forward 10 times.
 - (4) Check hub torque (B) with spring balance.
 - (5) Calculate drag torque of the disc brake [difference between hub torque (B) and hub torque (A)].

Standard value: 69 N or less

6. If the brake drag torque 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.

DISASSEMBLY AND REASSEMBLY

<2WD>



00004873

Caliper assembly disassembly steps



1. Lock pin
2. Guide pin
3. Bushing
4. Caliper support (pad, clip and shim)
5. Pin boot
6. Boot ring
7. Piston boot
8. Piston
9. Piston seal
10. Caliper body

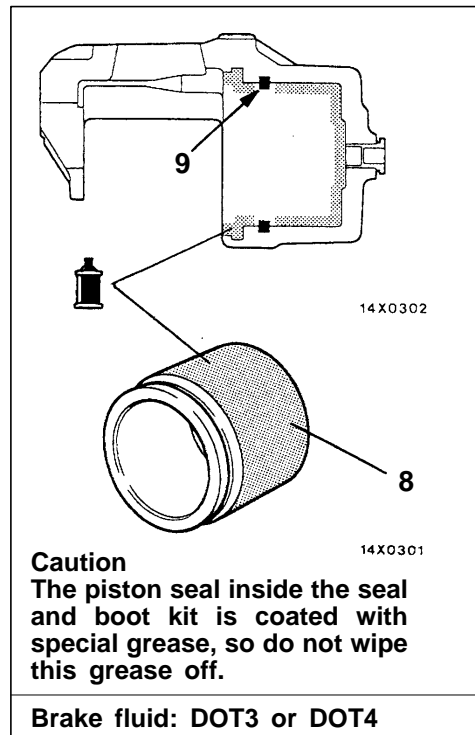
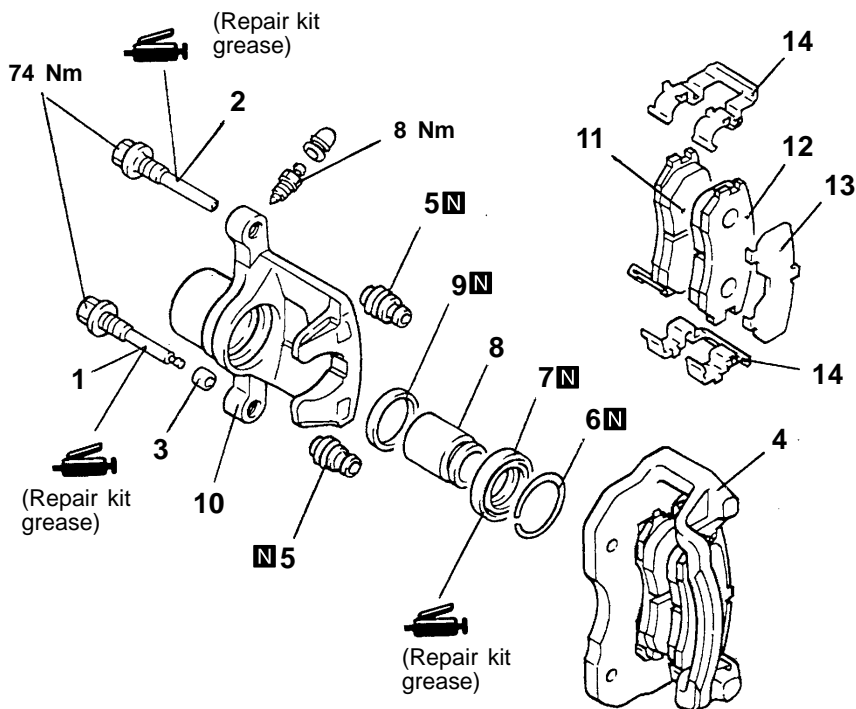


Pad assembly disassembly steps



1. Lock pin
2. Guide pin
3. Bushing
4. Caliper support (pad, clip and shim)
11. Pad and wear indicator assembly
12. Pad assembly
13. Outer shim
14. Clip

<4WD>



14V0042

<p>14V0043</p>	<p>14E0112</p>	<p>14E0113</p>
<p>Brake caliper kit</p>	<p>Pad repair kit</p>	<p>Seal and boot repair kit</p>

00004874

Caliper assembly disassembly steps



1. Lock pin
2. Guide pin
3. Bushing
4. Caliper support (pad, clip and shim)
5. Pin boot
6. Boot ring
7. Piston boot
8. Piston
9. Piston seal
10. Caliper body



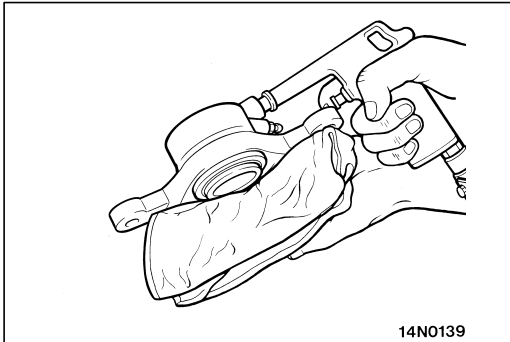
Pad assembly disassembly steps



1. Lock pin
2. Guide pin
3. Bushing
4. Caliper support (pad, clip and shim)
11. Pad and wear indicator assembly
12. Pad assembly
13. Outer shim
14. Clip

DISASSEMBLY SERVICE POINTS

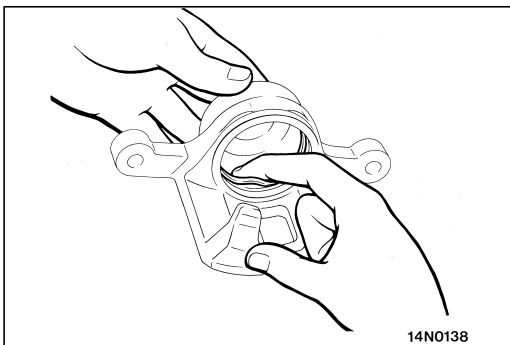
When disassembling the front disc brakes, disassemble both sides (left and right) as a set.

**◀A▶ PISTON BOOT/PISTON REMOVAL**

Protect caliper body with cloth. Blow compressed air through brake hose to remove piston boot and piston.

Caution

Blow compressed air gently.

**◀B▶ PISTON SEAL REMOVAL**

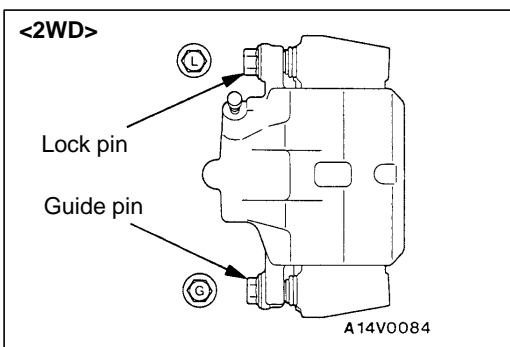
(1) Remove piston seal with finger tip.

Caution

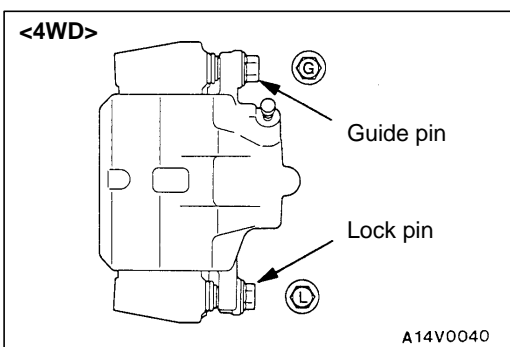
Do not use a flat-tipped screwdriver or other tool to prevent damage to inner cylinder.

(2) Clean piston surface and inner cylinder with trichloroethylene, alcohol or specified brake fluid.

Specified brake fluid: DOT3 or DOT4

**REASSEMBLY SERVICE POINT****▶A◀ LOCK PIN/GUIDE PIN INSTALLATION**

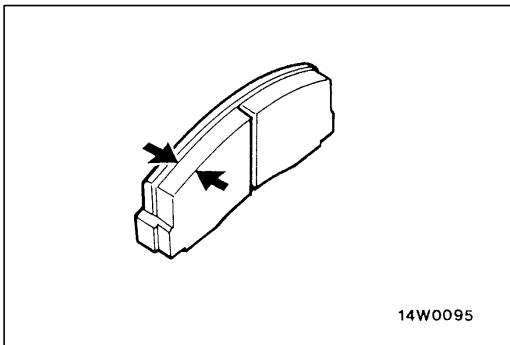
Install the lock pin and guide pin to the caliper body as shown in the illustration.



INSPECTION

35100630104

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

**PAD WEAR CHECK**

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

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

Standard value: 10 mm

Limit: 2.0 mm

Caution

1. Replace the pads always at both sides, and also the brake pads for the wheels on the opposite side at the same time.
2. If there is significant difference in the thicknesses of the pads on the left and right sides, check the sliding condition of the piston, lock pin and guide pin.

REAR DRUM BRAKE

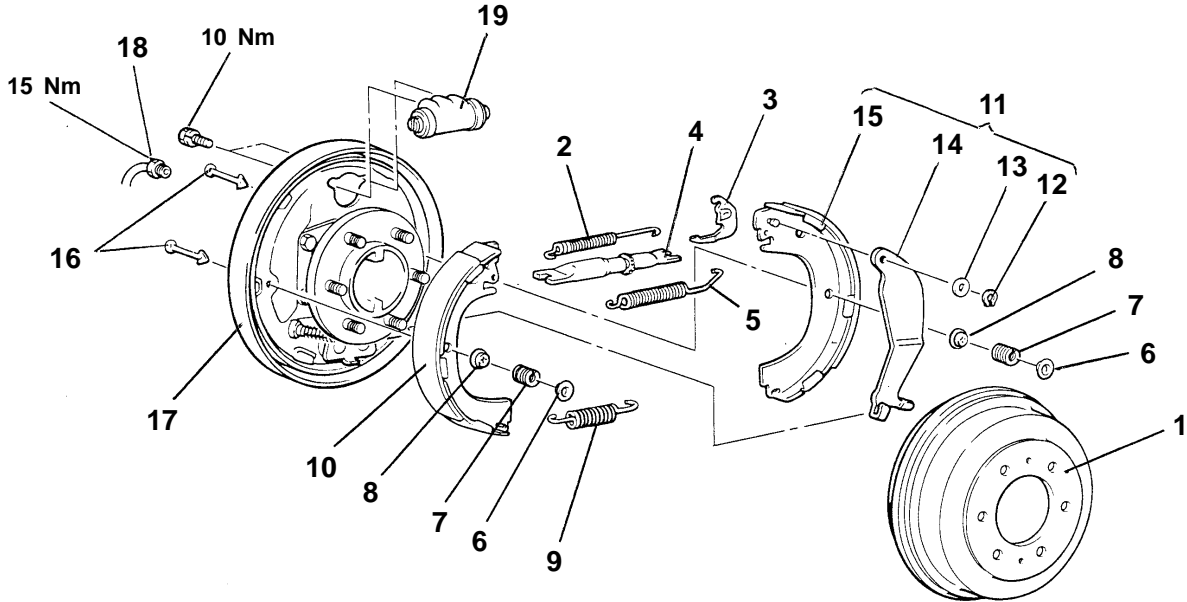
REMOVAL AND INSTALLATION

Pre-removal Operation

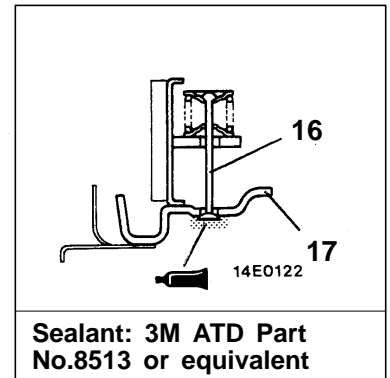
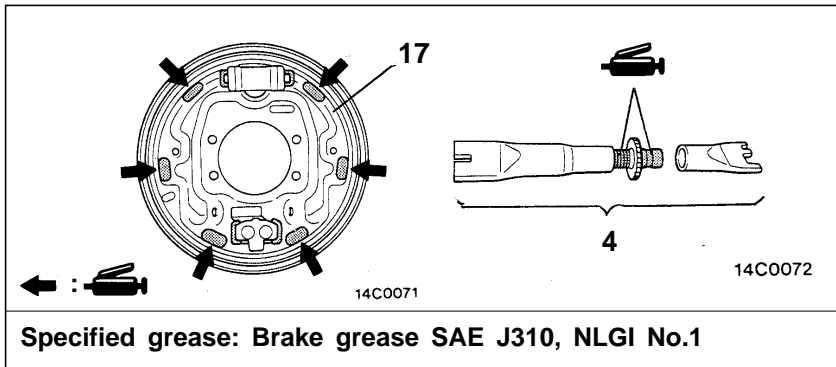
- Loosening the Parking Brake Cable Adjusting Nut.
- Brake Fluid Draining

Post-installation Operation

- Brake Fluid Filling and Air Bleeding (Refer to P.35A-12 or GROUP 35B – On-vehicle Service.)
- Parking Brake Lever Stroke Adjustment (Refer to GROUP 36 – On-vehicle Service.)



14V0027



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Rear drum brake removal steps

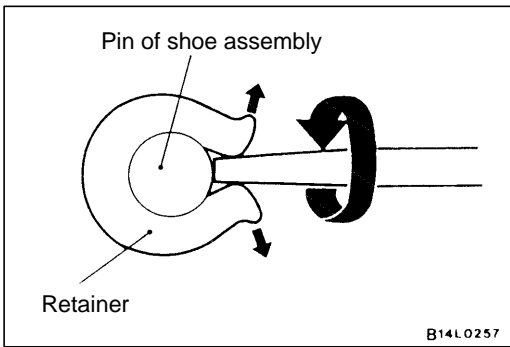
1. Brake drum
2. Shoe-to-lever spring
3. Adjuster lever
4. Auto adjuster assembly
5. Retainer spring
6. Shoe hold-down cup
7. Shoe hold-down spring
8. Shoe hold-down cup
9. Shoe-to-shoe spring
10. Shoe and lining assembly
11. Shoe and lever assembly
12. Retainer

◀A▶ ▶B▶

- ▶A▶ 13. Wave washer
14. Parking lever
15. Shoe and lining assembly
16. Shoe hold-down pin
17. Backing plate (Refer to GROUP 27 – Rear Axle Shaft.)

Wheel cylinder removal steps

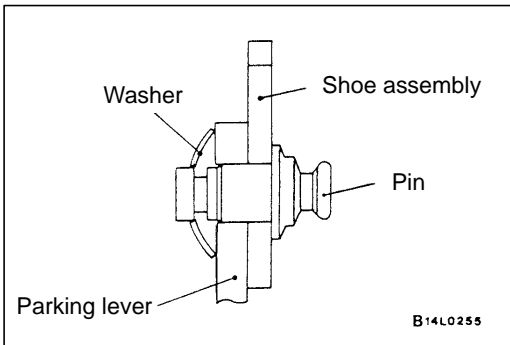
1. Brake drum
18. Brake tube connection
19. Wheel cylinder



REMOVAL SERVICE POINT

◀A▶ RETAINER REMOVAL

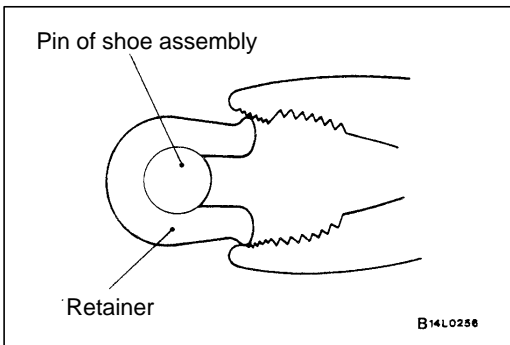
Use a flat-tipped screwdriver or the like to open up the retainer joint, and remove retainer.



INSTALLATION SERVICE POINTS

▶A◀ WAVE WASHER INSTALLATION

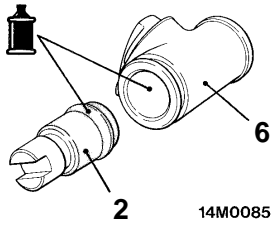
Install the washer in the direction shown in the illustration.



▶B◀ RETAINER INSTALLATION

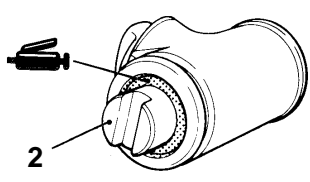
Use pliers or the like to install the retainer or the pin positively.

**WHEEL CYLINDER
DISASSEMBLY AND REASSEMBLY**



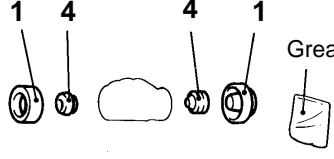
14M0085

Brake fluid: DOT3 or DOT4



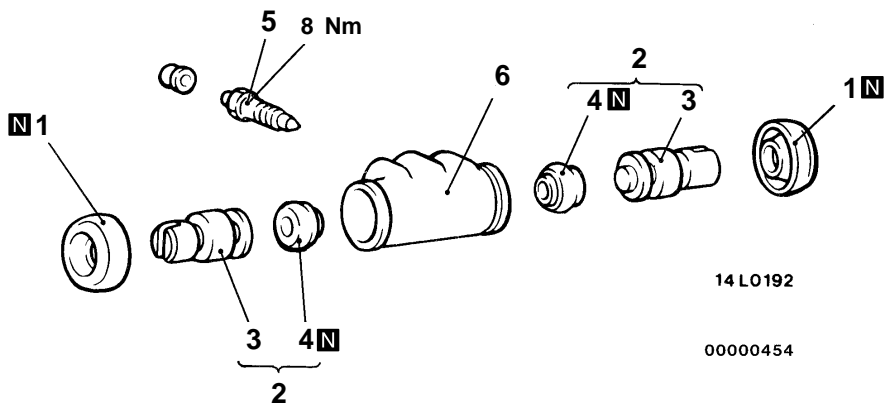
14V554

Grease: Repair kit grease



14B0053

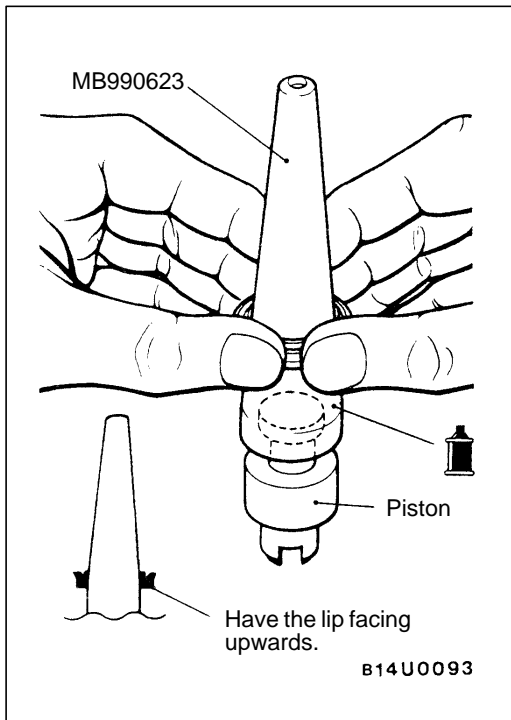
Wheel cylinder repair kit



Disassembly steps

1. Boots
2. Piston assembly
3. Pistons
4. Piston cups
5. Bleeder screw
6. Wheel cylinder body





REASSEMBLY SERVICE POINT

▶◀ PISTON CUP/PISTON REASSEMBLY

- (1) Use alcohol or specified brake fluid to clean the wheel cylinder and the piston.
- (2) Apply the specified brake fluid to the piston cups and the special tool.

Specified brake fluid: DOT3 or DOT4

- (3) Set the piston cup on the special tool with the lip of the cup facing up, fit the cup onto the special tool, and then slide it down the outside of the tool into the piston groove.

Caution

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

INSPECTION

35100780069

Check the piston and wheel cylinder walls for rust or damage, and if there is any abnormality, replace the entire wheel cylinder assembly.

NOTES

GROUP 35A

BASIC BRAKE SYSTEM

GENERAL

OUTLINE OF CHANGE

- The following service procedures have been established due to the changes of 16-inch 2-pot disc brake <Vehicles with over fender>.

FRONT DISC BRAKE

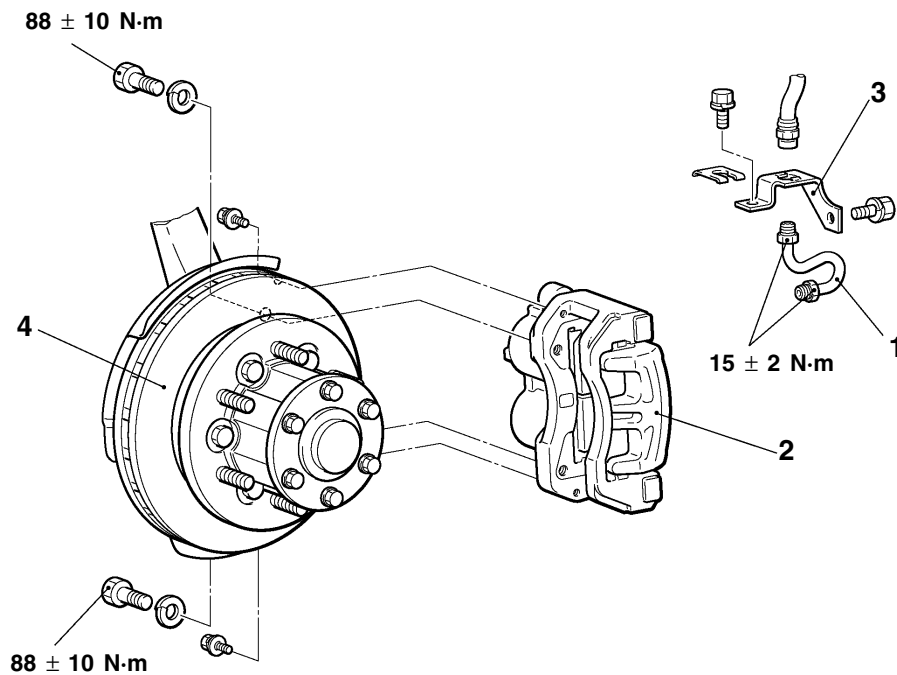
REMOVAL AND INSTALLATION

Pre-removal Operation

- Brake Fluid Draining

Post-installation Operation

- Brake Fluid Supplying
- Brake Line Bleeding



A10041AA

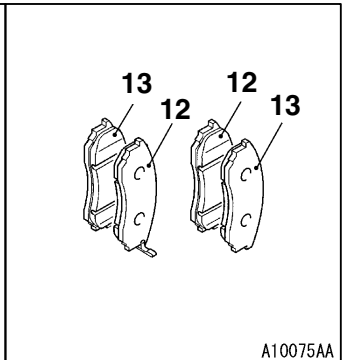
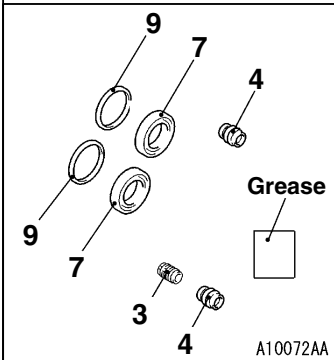
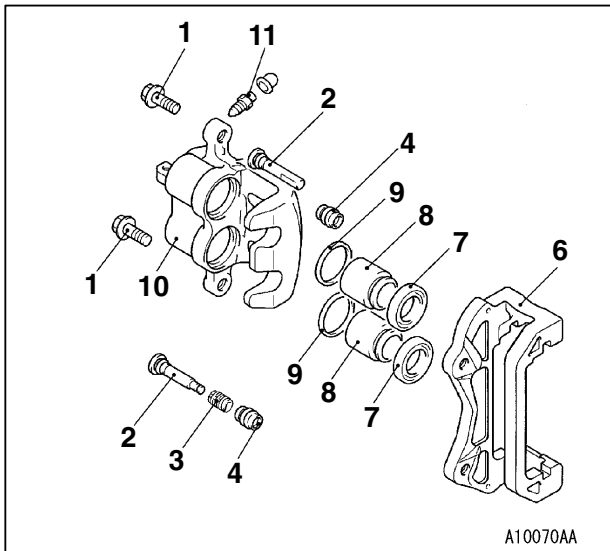
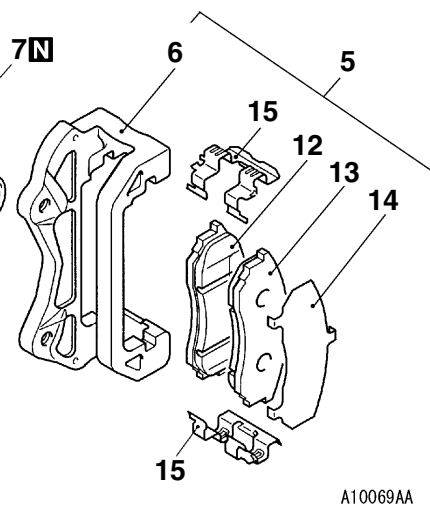
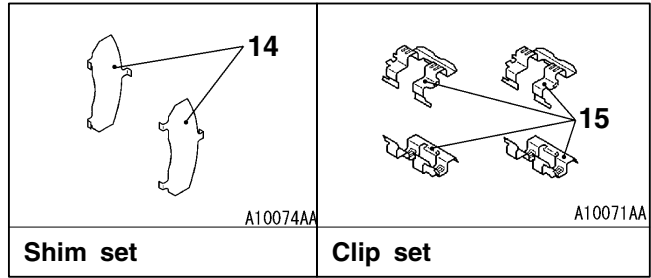
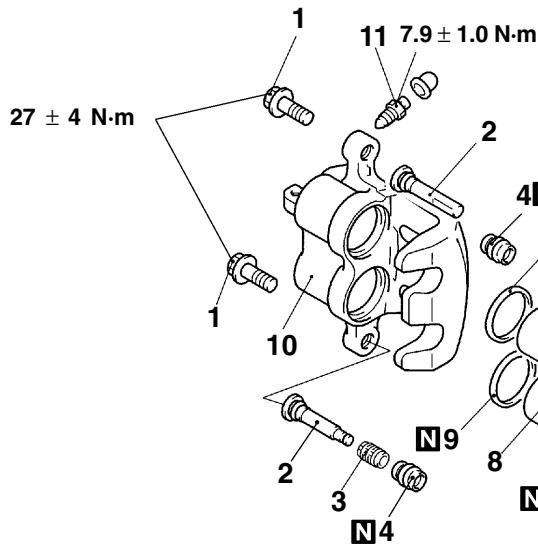
Removal steps

- ▶A◀
1. Brake tube
 2. Front brake assembly
 3. Brake hose bracket
 4. Brake disc (Refer to '97 L200 Workshop Manual GROUP 26 – Front Hub Assembly)

NOTE

For service point, refer to the Basic Manual.

DISASSEMBLY AND REASSEMBLY



Brake caliper kit

Seal and boots kit

Pad set

Caliper assembly disassembly steps

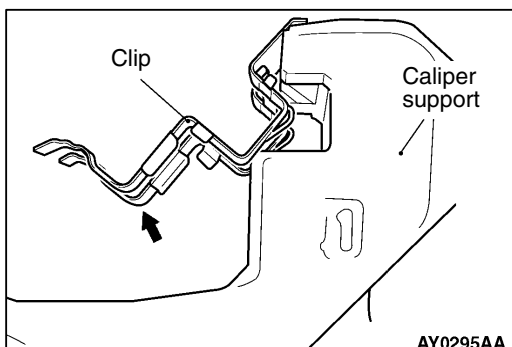
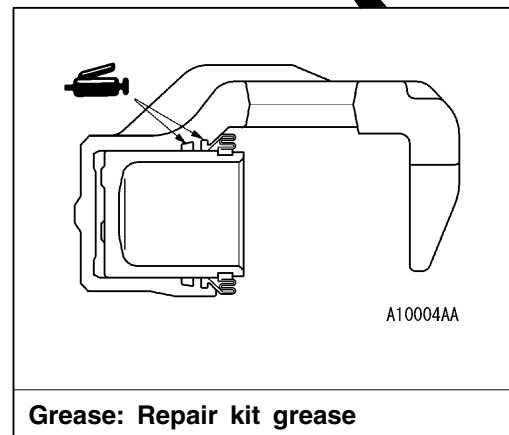
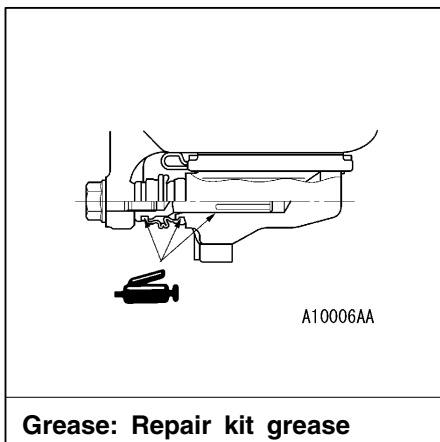
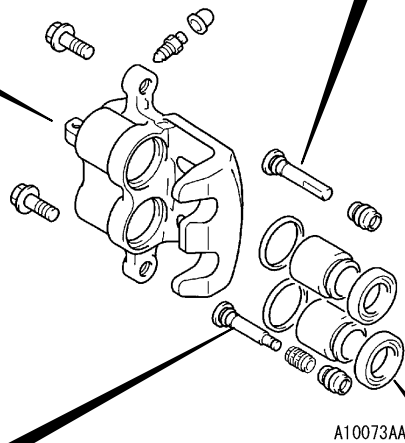
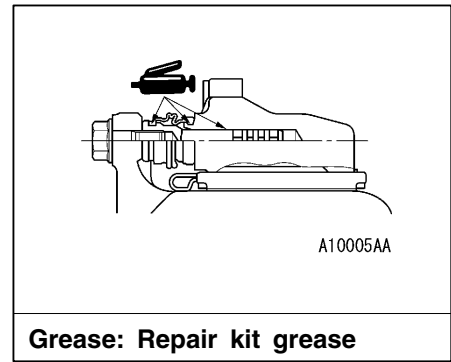
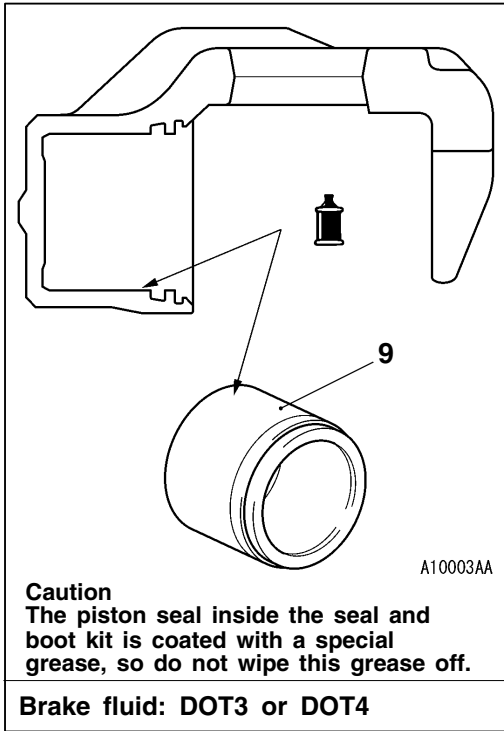
1. Bolt
2. Pin
3. Bushing
4. Pin boot
5. Caliper support, pad, clip and shim assembly
6. Caliper support
7. Piston boot
8. Piston
9. Piston seal
10. Caliper body
11. Bleeder screw

Pad assembly disassembly steps

1. Bolt
2. Pin
3. Bushing
5. Caliper support, pad, clip and shim assembly
12. Pad and wear indicator assembly
13. Pad assembly
14. Outer shim
15. Clip



LUBRICATION POINTS



DISASSEMBLY SERVICE POINTS

Refer to the Basic Manual except for service points described below.

◀C▶ HARNESS CONNECTOR REMOVAL

Caution

Swivel up the clip as shown to avoid deformation of the clip.

NOTES