

SECTION **BR**
BRAKE SYSTEM

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PRECAUTIONS

< PRECAUTION >

PRECAUTION

PRECAUTIONS

Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

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The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SR and SB section of this Service Manual.

WARNING:

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SR section.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

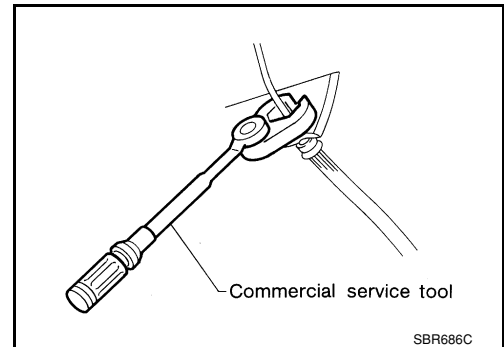
Precaution for Brake System

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- Always use recommended brake fluid. Refer to [MA-10. "Fluids and Lubricants"](#).
- Do not reuse drained brake fluid.
- Be careful not to splash brake fluid on painted areas.
- To clean or wash all parts of master cylinder, disc brake caliper and wheel cylinder, use clean brake fluid.
- Do not use mineral oils such as gasoline or kerosene. They will ruin rubber parts of the hydraulic system.
- Use flare nut wrench when removing and installing brake tube.
- Always check tightening torque when installing brake lines.
- Before working, turn ignition switch to OFF and disconnect connectors for ABS actuator and electric unit (control unit) or battery terminals.
- Burnish the brake contact surfaces after refinishing or replacing drums or rotors, after replacing pads or linings, or if a soft pedal occurs at very low mileage. Refer to [BR-35. "Brake Burnishing Procedure"](#).

WARNING:

- Clean brake pads and shoes with a waste cloth, then wipe with a dust collector.



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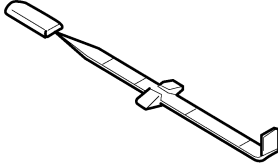
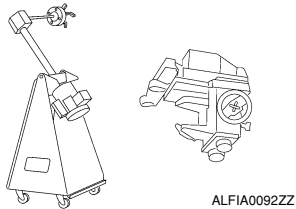
PREPARATION

PREPARATION

Special Service Tool

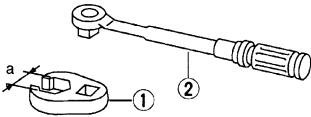
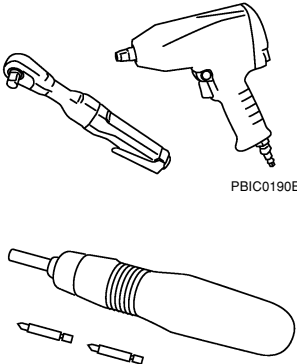
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The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
<p>— (J-46532) Brake and clutch pedal height measurement tool</p>  <p style="text-align: right;">LFIA0227E</p>	<p>Measuring brake pedal height</p>
<p>38-PFM90.5 (—) Pro-Cut PFM90 On-Car Brake Lathe</p>  <p style="text-align: right;">ALFIA0092ZZ</p>	<p>Turning rotors</p>

Commercial Service Tool

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Tool name	Description
<p>1. Flare nut crowfoot 2. Torque wrench</p>  <p style="text-align: right;">S-NT360</p>	<p>Removing and installing each brake piping. a: 10 mm (0.39 in) / 12 mm (0.47 in)</p>
<p>Power tool</p>  <p style="text-align: right;">PBIC0190E PBIC0191E</p>	<p>Removing nuts, bolts and screws.</p>

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

< FUNCTION DIAGNOSIS >

FUNCTION DIAGNOSIS

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

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Use the chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Symptom		Possible cause and SUSPECTED PARTS															
		Pads - damaged	Pads - uneven wear	Shims damaged	Rotor imbalance	Rotor damage	Rotor runout	Rotor deformation	Rotor deflection	Rotor rust	Rotor thickness variation	PROPELLER SHAFT	DIFFERENTIAL	DRIVESHAFT	SUSPENSION	TIRES AND ROAD WHEEL	STEERING
Reference page	Noise	x	x	x								x	x	x	x	x	x
	Shake				x							x		x	x	x	x
	Shimmy, Shudder				x	x	x	x	x	x	x			x	x	x	x
Reference page		BR-6, BR-8 BR-6, BR-8 BR-33, BR-40 BR-48, BR-51 BR-48, BR-51 BR-48, BR-51 BR-48, BR-51 BR-48, BR-51 BR-48, BR-51 BR-48, BR-51 BR-48, BR-51 DLN-180, "NVH Troubleshooting Chart" (2F1310), DLN-188, "NVH Troubleshooting Chart" (2S1410) DLN-201, "NVH Troubleshooting Chart" (FFD), DLN-233, "NVH Troubleshooting Chart" (RFD) FAX-4, "NVH Troubleshooting Chart" (FAX), RAX-4, "NVH Troubleshooting Chart" (RAX) FSU-4, "NVH Troubleshooting Chart" (FSU), RSU-4, "NVH Troubleshooting Chart" (RSU) WT-31, "NVH Troubleshooting Chart" ST-11, "NVH Troubleshooting Chart"															

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FRONT DISC BRAKE

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BASIC INSPECTION

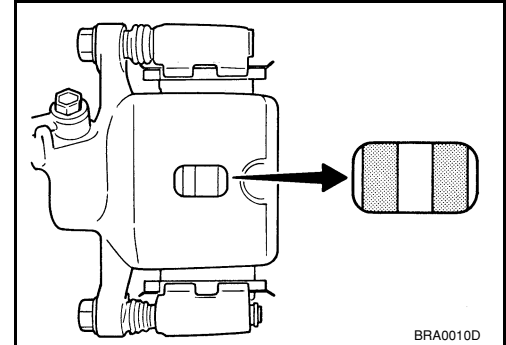
FRONT DISC BRAKE

On-vehicle Inspection

INFOID:000000001531243

PAD WEAR INSPECTION

- Inspect the thickness of pad through cylinder body inspection hole. Use a scale for inspection if necessary. Refer to [BR-54. "Front Disc Brake"](#).



BRAKE PAD

BRAKE PAD : Inspection

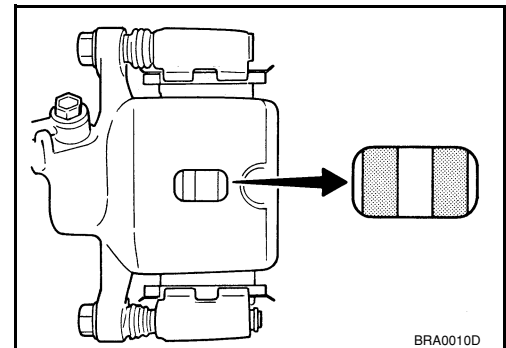
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PAD WEAR

- Check pad thickness from an inspection hole on cylinder body. Check using a scale if necessary.

Standard thickness : 11.0 mm (0.433 in)

Repair limit thickness : 2.0 mm (0.079 in)



DISC ROTOR

DISC ROTOR : Inspection

INFOID:000000001531245

VISUAL

Check surface of disc rotor for uneven wear, cracks, and serious damage. Replace if there are.

RUNOUT

- Fix disc rotor to wheel hub using wheel nuts (2 or more positions).
- Inspect runout using a dial gauge. [Measured at 10 mm (0.39 in) inside the disc edge.]

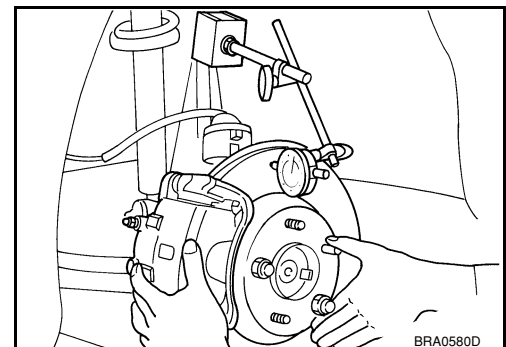
Runout limit : 0.035 mm (0.0014 in)

(with it attached to the vehicle)

NOTE:

Before measuring, make sure that wheel bearing axial end play is within the specification. Refer to [FAX-5. "On-Vehicle Inspection and Service"](#).

- When runout exceeds limit value, displace mounting positions of disc rotor by one hole. And then find a position of the minimum value for runout.
- If runout is outside the specified value after performing the above operation, turn rotor using Tool.



FRONT DISC BRAKE

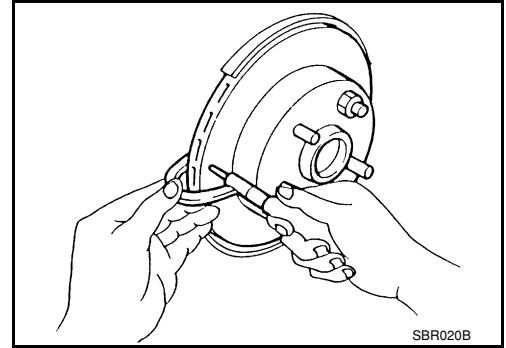
< BASIC INSPECTION >

Tool number : 38-PFM90.5 (—)

THICKNESS

Check thickness of the disc rotor using a micrometer. Replace disc rotor if thickness is under the wear limit.

Standard thickness : 26.0 mm (1.024 in)
Wear limit : 24.0 mm (0.945 in)
**Thickness variation
(Measured at 8 positions)** : 0.015 mm (0.0006 in)



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REAR DISC BRAKE

< BASIC INSPECTION >

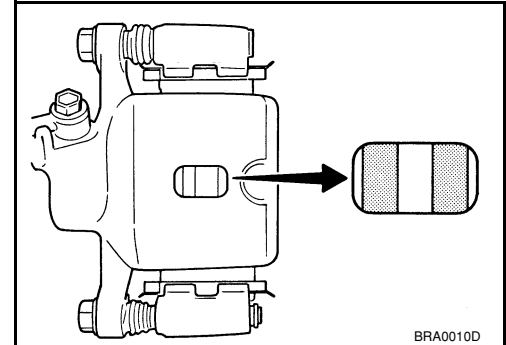
REAR DISC BRAKE

On-vehicle Inspection

INFOID:000000001531246

PAD WEAR INSPECTION

- Inspect the thickness of pad through cylinder body inspection hole. Use a scale for inspection if necessary. Refer to [BR-55, "Rear Disc Brake"](#).



BRAKE PAD

BRAKE PAD : Inspection

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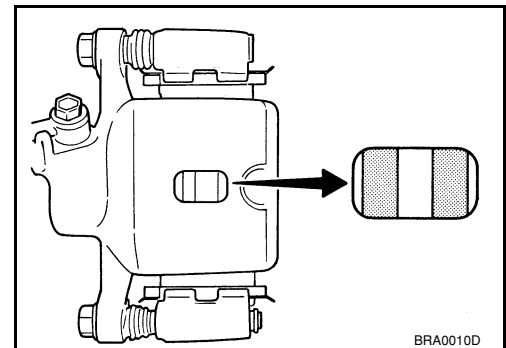
PAD WEAR

- Check pad thickness from an inspection hole on cylinder body. Check using a scale if necessary.

Standard

Standard thickness : 8.5 mm (0.335 in)

Repair limit thickness : 1.0 mm (0.039 in)



DISC ROTOR

DISC ROTOR : Inspection

INFOID:000000001531248

VISUAL

Check surface of disc rotor for uneven wear, cracks, and serious damage. Replace if there are.

RUNOUT

- Fix disc rotor to wheel hub using wheel nuts (2 or more positions).
- Inspect runout using dial gauge. [Measured at 10 mm (0.39 in) inside disc edge.]

Runout limit : 0.05 mm (0.002 in)

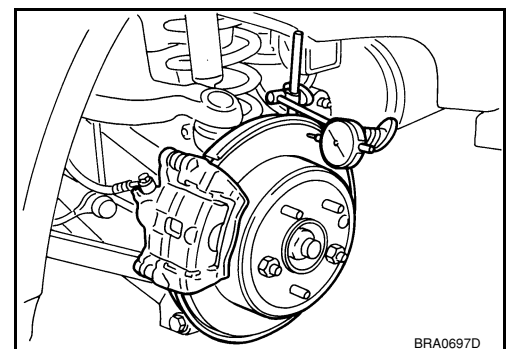
(With it attached to the vehicle)

NOTE:

Before measuring, make sure that wheel bearing axial end play is within the specification. Refer to [RAX-5, "On-Vehicle Inspection and Service"](#).

- When runout exceeds limit value, displace mounting positions of disc rotor by one hole. And then find a position of the minimum value for runout.
- If runout is outside the specified value after performing the above operation, turn rotor using Tool.

Tool number : 38-PFM90.5 (—)



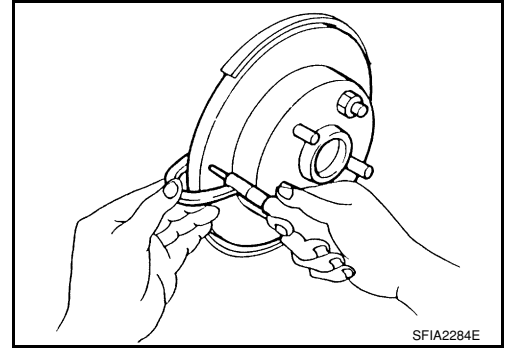
REAR DISC BRAKE

< BASIC INSPECTION >

THICKNESS

Check the thickness of the disc rotor using a micrometer. Replace disc rotor if the thickness is under the wear limit.

Standard thickness	: 9.0 mm (0.354 in)
Wear limit	: 8.0 mm (0.315 in)
Thickness variation (Measured at 8 positions)	: 0.015 mm (0.0006 in)



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BRAKE BOOSTER

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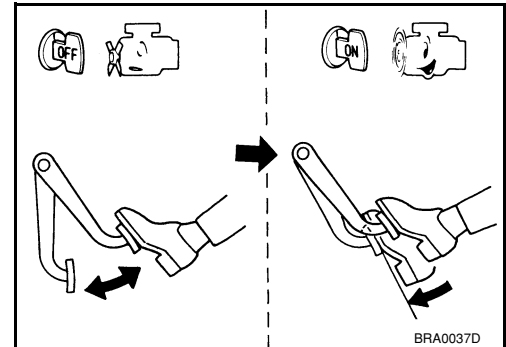
BRAKE BOOSTER

Inspection

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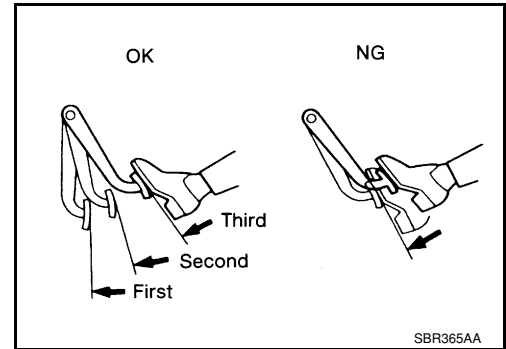
OPERATION

With engine stopped, change vacuum to atmospheric pressure by depressing brake pedal several times. Then with brake pedal fully depressed, start engine and when vacuum pressure reaches the standard, make sure that clearance between brake pedal and floor panel decreases.



AIR TIGHT

- Run engine at idle for approximately 1 minute, and stop it after applying vacuum to booster. Depress brake pedal normally to change vacuum to atmospheric pressure. Make sure that distance at intervals of 5 seconds between brake pedal and floor panel gradually increases.
- Depress brake pedal while engine is running, and stop engine with pedal depressed. The pedal stroke should not change after holding pedal down for 30 seconds.



BRAKE MASTER CYLINDER

< BASIC INSPECTION >

BRAKE MASTER CYLINDER

On Board Inspection

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LEAK INSPECTION

- Check for leaks at master cylinder to brake booster attachment point, reservoir tank, and brake tube connections.

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BRAKE TUBE AND HOSE

< BASIC INSPECTION >

Brake tubes and hoses are important safety parts. Always disassemble the parts and retighten their fittings, if a brake fluid leak is detected. Replace applicable part with a new one, if damaged part is detected.

1. Check brake lines (tubes and hoses) and connections for fluid leakage, damage, twists, deformation, contacts with other parts, and loose connections. Replace any damage parts.
2. While depressing brake pedal under a force of 785 N (80 kg-f, 177 lb-f) with engine running for approximately 5 seconds, then check each part for fluid leakage.

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BRAKE PEDAL

< ON-VEHICLE MAINTENANCE >

ON-VEHICLE MAINTENANCE

BRAKE PEDAL

Inspection and Adjustment

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INSPECTION

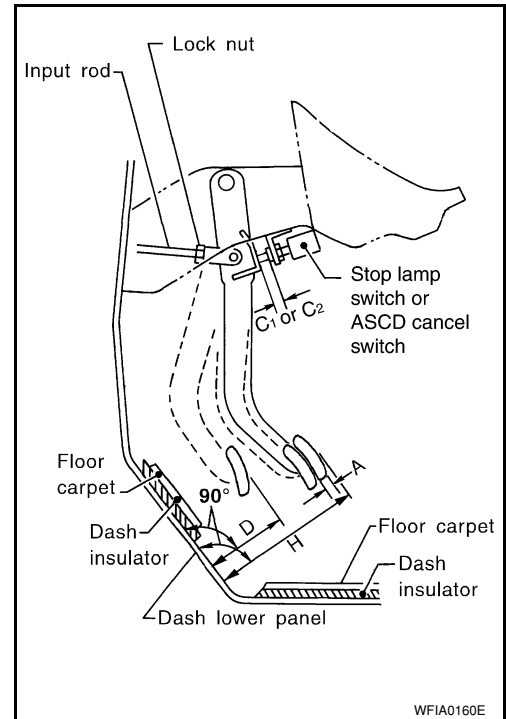
1. Inspect the brake pedal free height "H" from the dash lower panel using Tool.

Tool number : — (J-46532)

2. Adjust the height referring to the following specifications.

CAUTION:

When equipped with adjustable pedal, the pedal must be in the forwardmost (closest to the floor) position for pedal height measurement.



Brake Pedal Specifications

Unit: mm (in)

Free height "H"	: 182.3 - 192.3 mm (7.18 - 7.57 in)
Depressed pedal height "D" [under a force of 490 N (50 kg-f, 110 lb-f) with engine running]	: More than 90.3 mm (3.55 in)
Clearance between pedal stopper and threaded end of stop lamp switch and ASCD cancel switch "C1" or "C2"	: 0.74 - 1.96 mm (0.029 - 0.077 in)
Pedal play "A"	: 3 - 11 mm (0.12 - 0.43 in)

ADJUSTMENT

1. Loosen the stop lamp switch and ASCD cancel switch by turning 45° counterclockwise.

BRAKE PEDAL

< ON-VEHICLE MAINTENANCE >

- Loosen lock nut (A) on the input rod, then turn input rod to adjust the pedal to specified height. When finished adjusting, tighten lock nut (A).

CAUTION:

Make sure that the screw portion of the end of input rod is located inside the clevis.

Lock nut (A) : 18.6 N·m (1.9 kg-m, 14 ft-lb)

- With the pedal pulled up and held by hand, press the stop lamp switch and the ASCD switch in until threaded ends contact pedal bracket.
- With the threaded ends of the stop lamp switch and ASCD switch contacting the pedal bracket, turn the switches 45° clockwise to lock in place.

CAUTION:

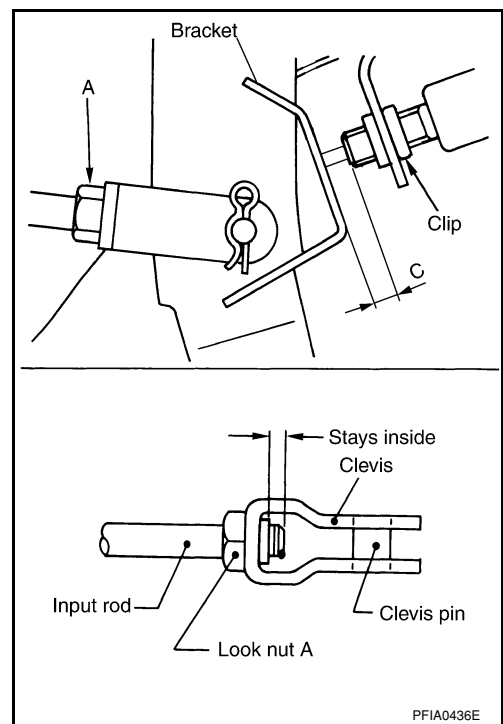
Make sure that the gap (C) between the bracket and switch ends are within specification.

- Check the pedal play.

CAUTION:

Make sure that the stop lamp goes off when the pedal is released.

- Start the engine and check the height of the brake pedal when depressing it.



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BRAKE FLUID

< ON-VEHICLE MAINTENANCE >

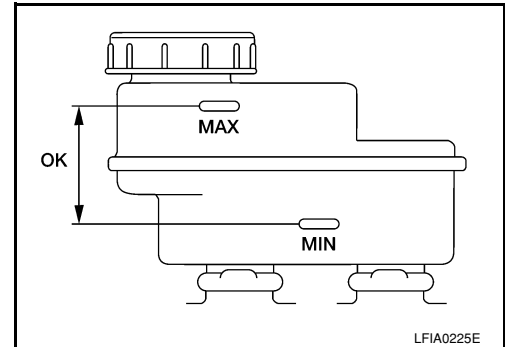
BRAKE FLUID

On Board Inspection

INFOID:000000001531255

LEVEL CHECK

- Make sure the fluid level in reservoir tank is within the standard (between MAX and MIN lines).
- Visually check around reservoir tank for fluid leaks.
- If fluid level is excessively low, check brake system for leaks.
- If brake warning lamp remains illuminated after parking brake pedal is released, check brake system for fluid leakage.



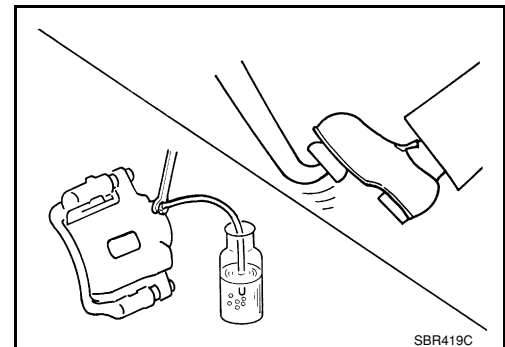
Drain and Refill

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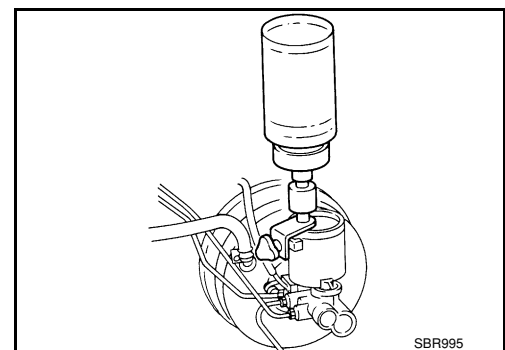
CAUTION:

- Refill with new brake fluid. Refer to [BR-16, "Drain and Refill"](#).
- Do not reuse drained brake fluid.
- Do not let brake fluid splash on the painted surfaces of the body. This might damage the paint, so if splashing it, immediately wipe off the area and wash away with water.
- Before servicing, disconnect ABS actuator and electric unit (control unit) connector or battery negative cable.

1. Connect a vinyl tube to each bleed valve.
2. Depress brake pedal, loosen each bleed valve, and gradually remove brake fluid.



3. Make sure there is no foreign material in reservoir tank, and refill with new brake fluid.
4. Rest foot on brake pedal. Loosen bleed valve. Slowly depress pedal until it stops. Tighten bleed valve. Release brake pedal. Repeat this process a few times, then pause to add new brake fluid to master cylinder. Continue until new brake fluid flows out. Bleed air. Refer to [BR-16, "Bleeding Brake System"](#).



Bleeding Brake System

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CAUTION:

While bleeding, pay attention to master cylinder fluid level.

1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector or battery negative cable.
2. Connect a vinyl tube to the rear right bleed valve.

BRAKE FLUID

< ON-VEHICLE MAINTENANCE >

3. Fully depress brake pedal 4 to 5 times.
4. With brake pedal depressed, loosen bleed valve to let the air out, and then tighten it immediately.
5. Repeat steps 3 and 4 until no more air comes out.
6. Tighten bleed valve to the specified torque. Refer to [BR-33. "Component"](#) (front disc brake), [BR-40. "Component"](#) (rear disc brake).
7. Repeat steps 2 through 6 at each wheel, with master cylinder reservoir tank filled at least half way, bleeding air in order from the front left, rear left, and front right bleed valves.

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BRAKE PEDAL

< ON-VEHICLE REPAIR >

ON-VEHICLE REPAIR

BRAKE PEDAL

Inspection and Adjustment

INFOID:000000001537448

INSPECTION

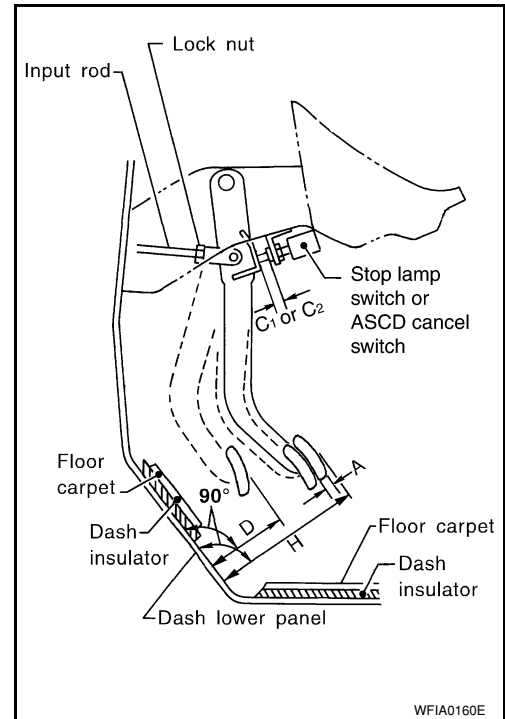
1. Inspect the brake pedal free height "H" from the lower dash panel using tool.

Tool number : — (J-46532)

2. Adjust the height referring to the following specifications.

CAUTION:

When equipped with adjustable pedal, the pedal must be in the forwardmost (closest to the floor) position for pedal height measurement.



Brake Pedal Specifications

Unit: mm (in)

Free height "H"	: 182.3 - 192.3 mm (7.18 - 7.57 in)
Depressed pedal height "D" [under a force of 490 N (50 kg-f, 110 lb-f) with engine running]	: More than 90.3 mm (3.55 in)
Clearance between pedal stopper and threaded end of stop lamp switch and ASCD switch "C1 " or "C2 "	: 0.74 - 1.96 mm (0.029 - 0.077 in)
Pedal play "A"	: 3 - 11 mm (0.12 - 0.43 in)

ADJUSTMENT

1. Loosen the stop lamp switch and ASCD switch by turning 45° counterclockwise.

BRAKE PEDAL

< ON-VEHICLE REPAIR >

- Loosen lock nut on the input rod, then turn input rod to adjust the pedal to specified height. When finished adjusting, tighten lock nut.

CAUTION:

Make sure that the screw portion of the end of input rod is located inside the clevis.

Lock nut : 18.6 N·m (1.9 kg-m, 14 ft-lb)

- With the pedal pulled up and held by hand, press the stop lamp switch and the ASCD switch in until threaded ends contact pedal arm.
- With the threaded ends of the stop lamp switch and ASCD switch contacting the pedal arm, turn the switches 45° clockwise to lock in place.

CAUTION:

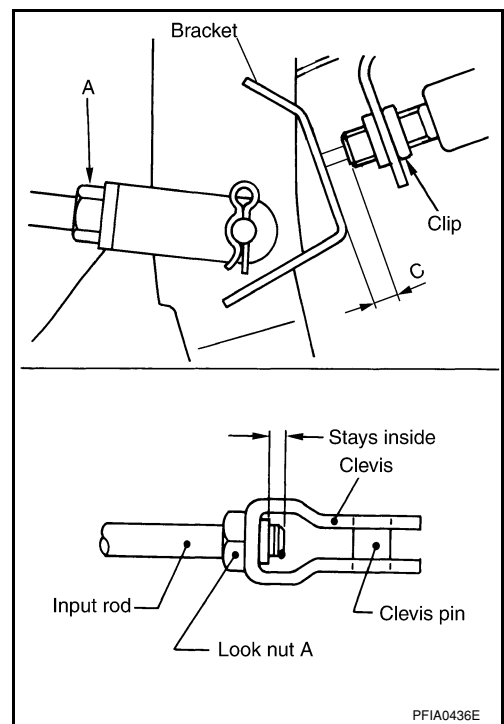
Make sure that the gap (C) between the rubber stops and switch ends are within specification.

- Check the pedal play.

CAUTION:

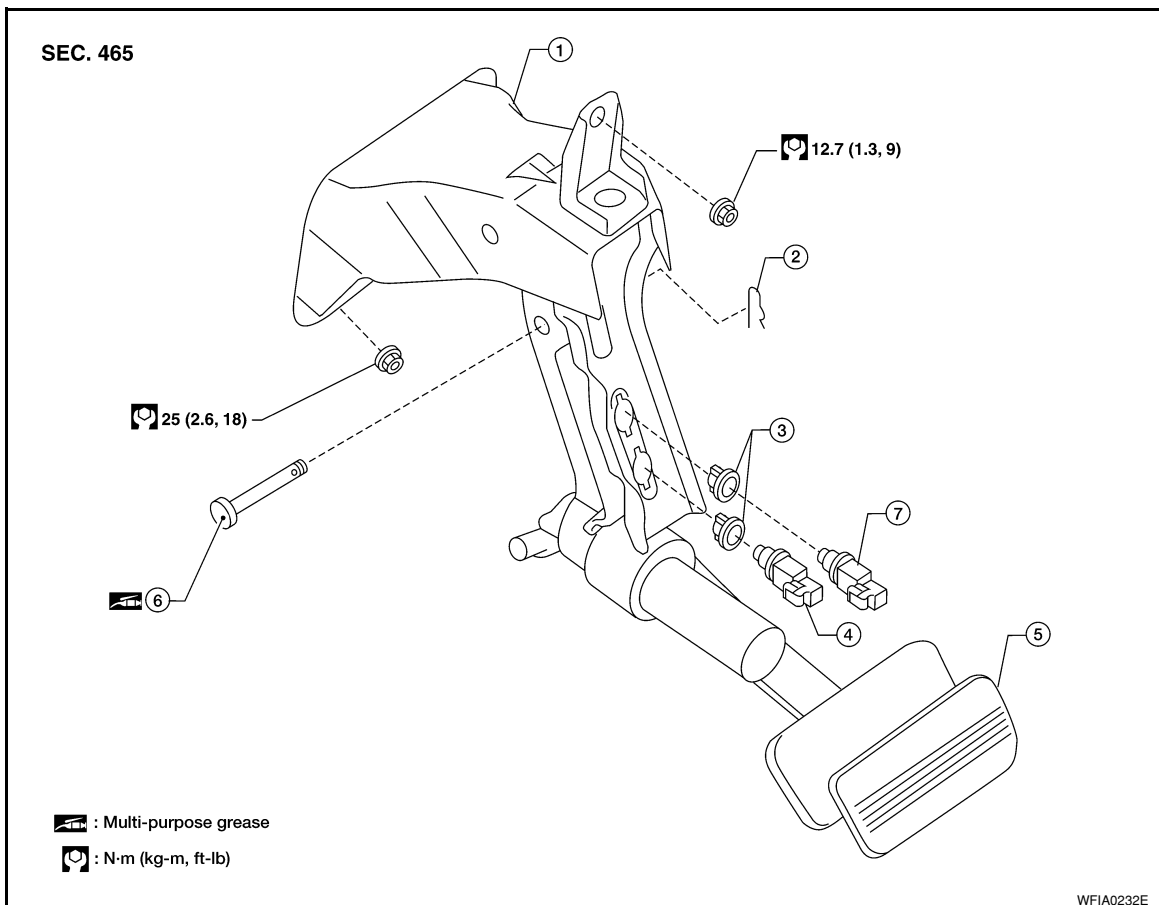
Make sure that the stop lamp goes off when the pedal is released.

- Start the engine and check the height of the brake pedal when depressing it.



Removal and Installation

INFOID:000000001537449



1. Brake pedal assembly

2. Snap pin

3. Clip

BRAKE PEDAL

< ON-VEHICLE REPAIR >

4. Stop lamp switch
5. Pedal pad
6. Clevis pin
7. ASCD cancel switch

REMOVAL

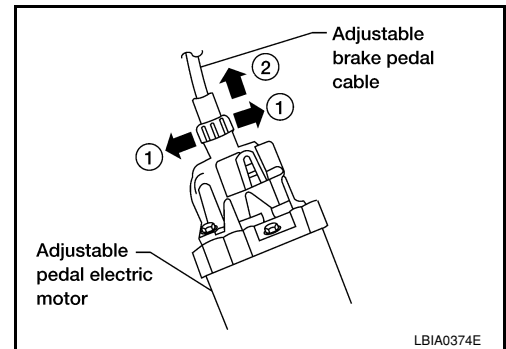
WARNING:

Do not deform the brake tube.

CAUTION:

- Before removal and installation the accelerator and brake pedals must be in the forward most position (closest to the floor). This is to align the base position of the accelerator and brake pedals.
- Do not disassemble the brake pedal adjusting mechanism.
- Avoid damage from dropping the brake pedal assembly during handling.
- Keep the brake pedal assembly away from water.

1. Remove the lower driver instrument panel. Refer to [IP-11, "Removal and Installation"](#).
2. Remove the stop lamp switch and ASCD switch from the pedal assembly.
3. Disconnect the adjustable brake pedal cable from the adjustable pedal electric motor.
 - Unlock (1) then pull (2) the adjustable brake pedal cable to disconnect it from the adjustable pedal electric motor as shown.
4. Remove snap pin and clevis pin from the clevis of brake booster.
5. Remove mounting nuts and the pedal assembly.
 - Temporarily install nuts by hand to support booster.



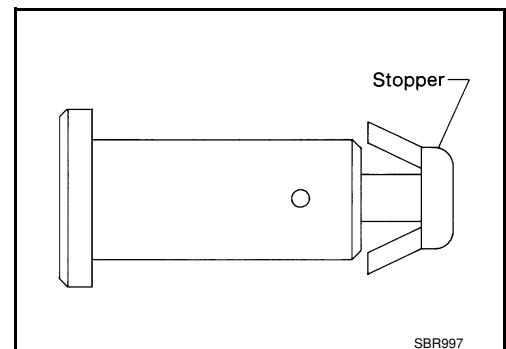
CAUTION:

- Before removal and installation the accelerator and brake pedals must be in the forwardmost position (closest to the floor). This is to align the base position of the accelerator and brake pedals.
- Do not disassemble the brake pedal adjusting mechanism.
- Avoid damage from dropping the brake pedal assembly during handling.
- Keep the brake pedal assembly away from water.

INSPECTION AFTER REMOVAL

Check brake pedal for following items.

- Crack or deformation of clevis pin stopper
- Clevis pin deformation
- Crack of any welded portion
- Brake pedal bend



INSTALLATION

1. Installation is in the reverse order of removal.
 - Check the brake pedal for smooth operation. There should be no binding or sticking when applying or releasing the brake pedal.
 - Check the brake pedal adjustable feature for smooth operation. There should be no binding or sticking when adjusting the brake pedal forward or backward.
- After installing the brake pedal assembly in the vehicle, be sure to adjust it. Refer to [BR-14, "Inspection and Adjustment"](#).

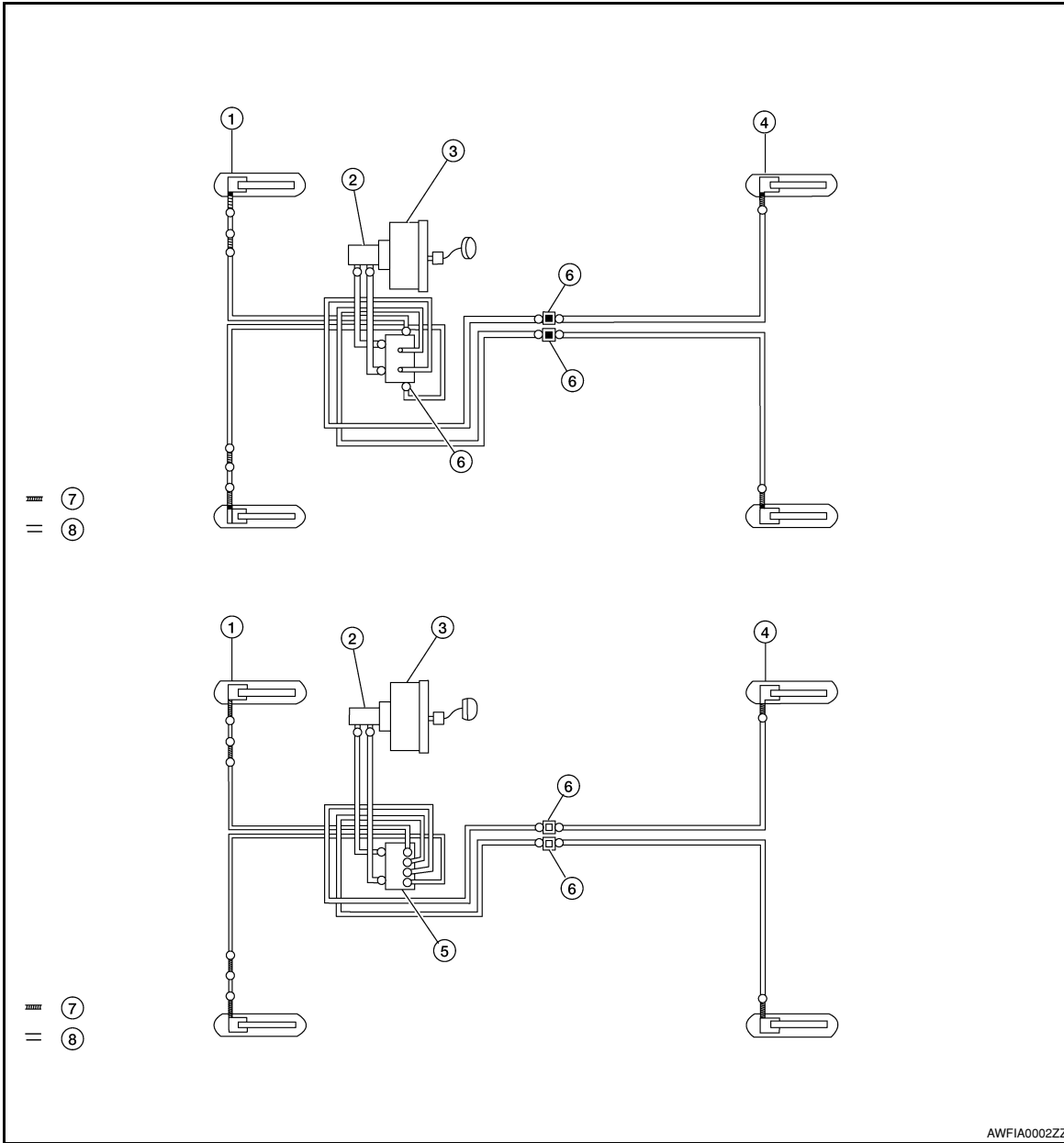
BRAKE TUBE AND HOSE

< ON-VEHICLE REPAIR >

BRAKE TUBE AND HOSE FRONT BRAKE

FRONT BRAKE : Exploded View

INFOID:000000001531259



A. With out ABS

2. Master cylinder

5. ABS actuator and electric unit (control unit)

8. Brake tube

■ : Union bolt

⊕ : 18.2 (1.9, 13)

B. With ABS

3. Brake booster

6. Connector

● : Flare nut

⊕ : 19.1 (1.9, 14)

■ : Connector mounting bolt

⊕ : 7.0 (0.7, 62)

1. Front disc brake

4. Rear disc brake

7. Brake hose

○ : Flare nut

⊕ : 16.2 (1.7, 12)

Refer to GI section for symbol marks in the figure.

BRAKE TUBE AND HOSE

< ON-VEHICLE REPAIR >

FRONT BRAKE : Removal and Installation of Front Brake Piping and Brake Hose

INFOID:000000001531260

REMOVAL

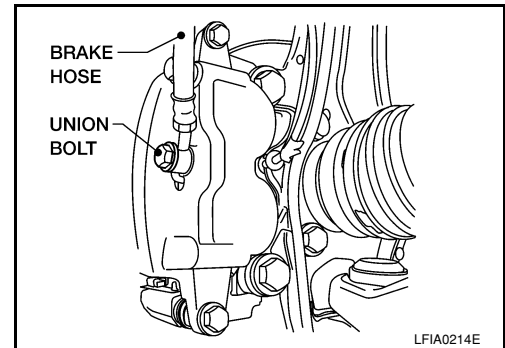
1. Drain brake fluid. Refer to [BR-16. "Drain and Refill"](#).
2. Using a flare nut wrench, remove brake tube from brake hose.
3. Remove lock plate and brake hose from bracket.
4. Remove union bolt and then remove brake hose from cylinder body.

INSTALLATION

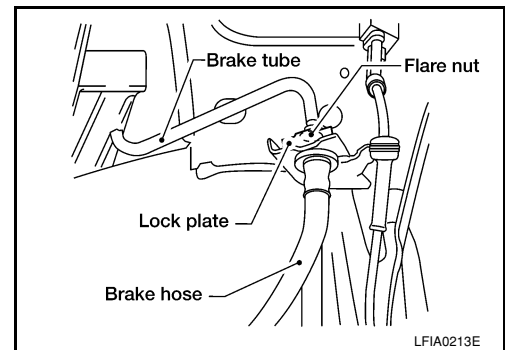
1. Install brake hose by aligning with the protrusion on cylinder body, then install the union bolt and new copper washers.

NOTE:

Do not reuse copper washer.



2. Insert brake hose end through bracket, then secure it to bracket with lock plate.
3. Install brake tube to brake hose, then tighten the flare nut using a flare nut wrench.
4. Refill brake fluid and bleed air. Refer to [BR-16. "Bleeding Brake System"](#).



FRONT BRAKE : Inspection After Installation

INFOID:000000001531261

CAUTION:

If a leak is detected at the connections, retighten it or, if necessary, replace the damaged part.

1. Check brake lines (tubes and hoses), and connections for fluid leaks, damage, twist, deformation, contact with other parts, and loose connections. Replace any damage parts.
2. While depressing brake pedal under a force of 785 N (80 kg, 177 lb) with engine running for approximately 5 seconds, check for fluid leakage from each part.

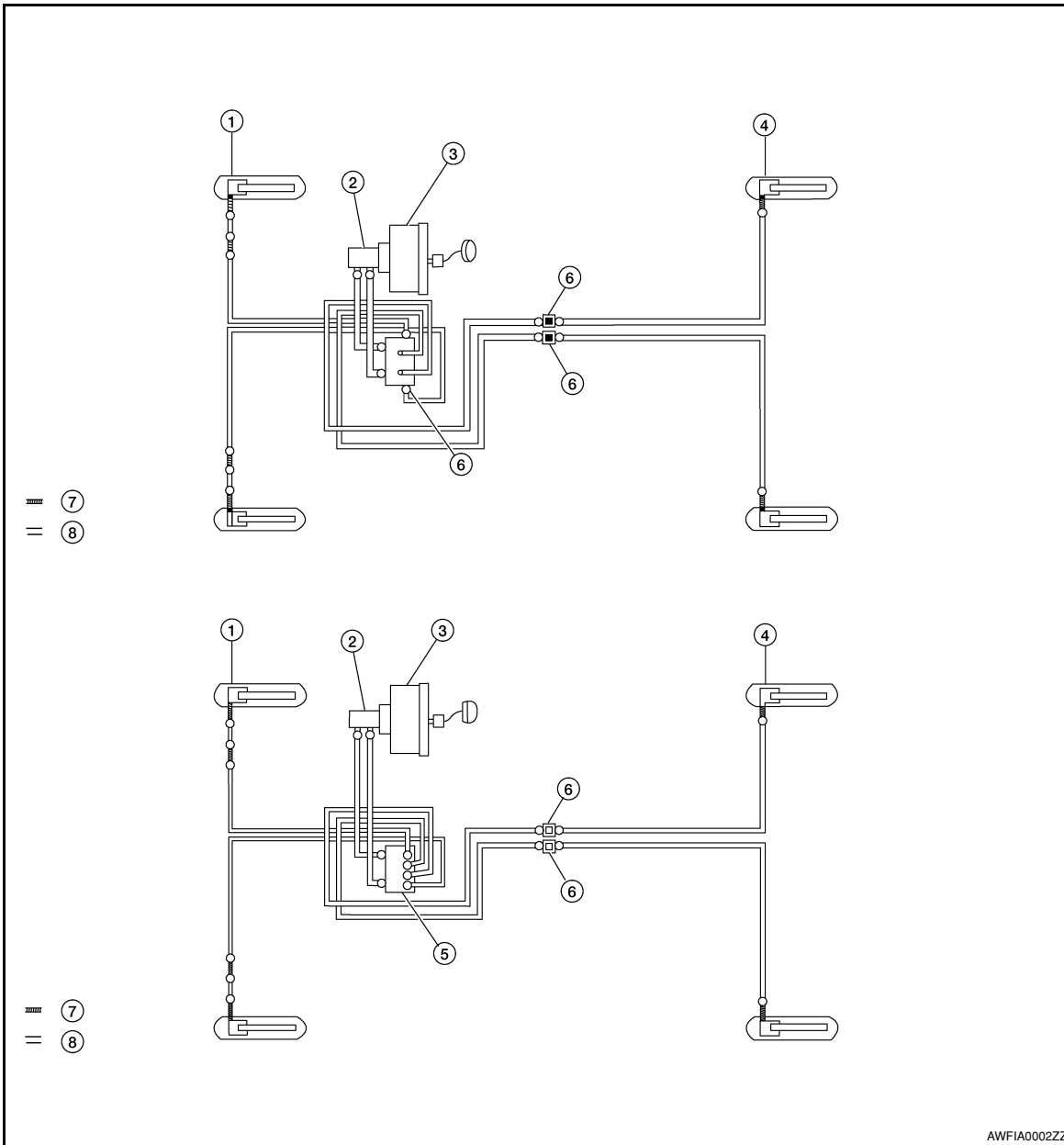
REAR BRAKE

BRAKE TUBE AND HOSE

< ON-VEHICLE REPAIR >

REAR BRAKE : Exploded View

INFOID:000000001531262



A. With out ABS

2. Master cylinder

5. ABS actuator and electric unit (control unit)

8. Brake tube

■ : Union bolt

⊕ : 18.2 (1.9, 13)

B. With ABS

3. Brake booster

6. Connector

● : Flare nut

⊕ : 19.1 (1.9, 14)

■ : Connector mounting bolt

⊕ : 7.0 (0.7, 62)

1. Front disc brake

4. Rear disc brake

7. Brake hose

○ : Flare nut

⊕ : 16.2 (1.7, 12)

Refer to GI section for symbol marks in the figure.

REAR BRAKE : Removal and Installation of Rear Brake Piping and Brake Hose

INFOID:000000001531263

REMOVAL

1. Drain brake fluid. Refer to [BR-16. "Drain and Refill"](#).

BRAKE TUBE AND HOSE

< ON-VEHICLE REPAIR >

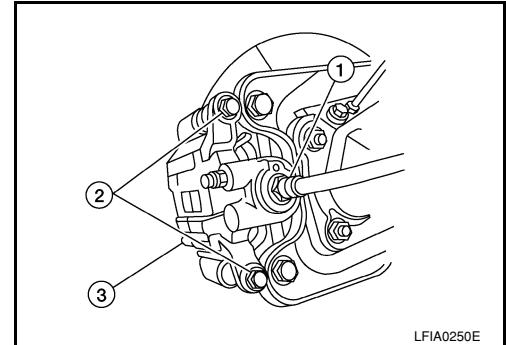
2. Using a flare nut wrench, remove brake tube from brake hose.
3. Remove lock plate and brake hose from bracket.
4. Remove brake hose from cylinder body.

INSTALLATION

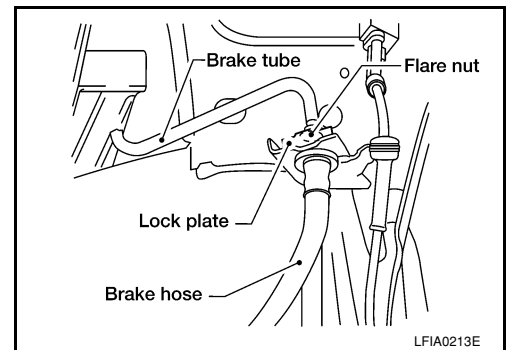
1. Install brake hose (1) and new copper washer to cylinder body and tighten to specification. Refer to [BR-12, "Hydraulic Circuit"](#).
 - (2): Bolt
 - (3): Rear cylinder body

NOTE:

Do not reuse copper washer.



2. Insert brake hose end through bracket, then secure it to bracket with lock plate.
3. Install brake tube to brake hose, then tighten the flare nut using a flare nut wrench. Refer to [BR-12, "Hydraulic Circuit"](#).
4. Refill brake fluid and bleed air. Refer to [BR-16, "Bleeding Brake System"](#).



REAR BRAKE : Inspection After Installation

INFOID:000000001531264

CAUTION:

If a leak is detected at the connections, retighten it or, if necessary, replace the damaged part.

1. Check brake lines (tubes and hoses), and connections for fluid leaks, damage, twist, deformation, contact with other parts, and loose connections. Replace any damage parts.
2. While depressing brake pedal under a force of 785 N (80 kg, 177 lb) with engine running for approximately 5 seconds, check for fluid leakage from each part.

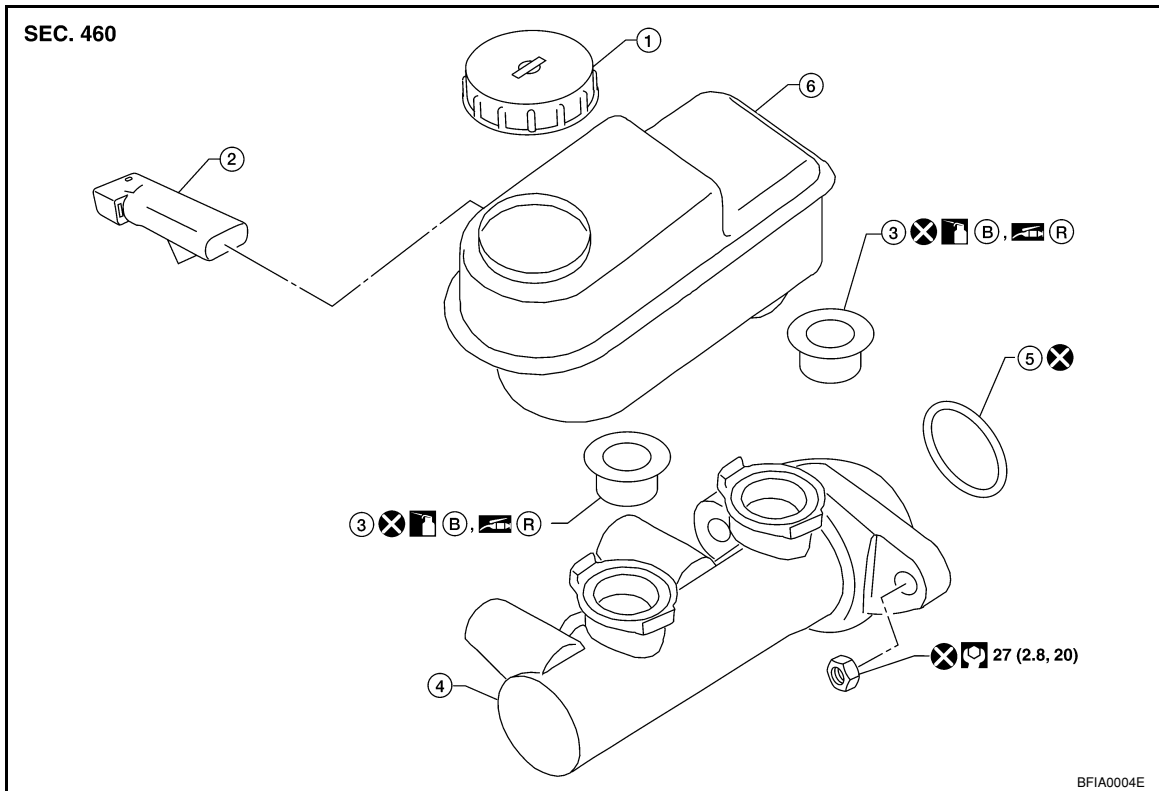
BRAKE MASTER CYLINDER

< ON-VEHICLE REPAIR >

BRAKE MASTER CYLINDER

With ABS

INFOID:000000001531265



- | | | |
|---------------------------------|-----------------------|-------------------|
| 1. Reservoir cap | 2. Fluid level sensor | 3. Grommet |
| 4. Master cylinder sub-assembly | 5. Seal | 6. Reservoir tank |

CAUTION:

Be careful not to splash brake fluid on painted areas; it may cause paint damage. If brake fluid is splashed on painted areas, wash it away with water immediately.

REMOVAL AND INSTALLATION

Removal

1. Drain brake fluid. Refer to [BR-16, "Drain and Refill"](#).
2. Disconnect harness connector for fluid level sensor.
3. Using a flare nut wrench, disconnect brake tube from master cylinder assembly.
4. Remove master cylinder assembly nuts and master cylinder assembly.

Installation

Installation is in the reverse order of removal.

- Refill brake fluid and bleed air. Refer to [BR-16, "Bleeding Brake System"](#).

CAUTION:

- Refill with new brake fluid. Refer to [BR-16, "Drain and Refill"](#).
- Do not reuse drained brake fluid.
- Adjust brake pedal. Refer to [BR-14, "Inspection and Adjustment"](#).

DISASSEMBLY AND ASSEMBLY

Disassembly

CAUTION:

- Master cylinder cannot be disassembled.
- Remove reservoir tank only when absolutely necessary.

BRAKE MASTER CYLINDER

< ON-VEHICLE REPAIR >

Pull reservoir tank off master cylinder sub-assembly, then remove grommets from master cylinder sub-assembly body.

Assembly

CAUTION:

- Never use mineral oil such as kerosene or gasoline during the cleaning and assembly process.
- Do not drop parts. If a part is dropped, do not use it.

1. Apply brake fluid or rubber grease to new grommets, then insert into master cylinder sub-assembly. Refer to [BR-25](#).

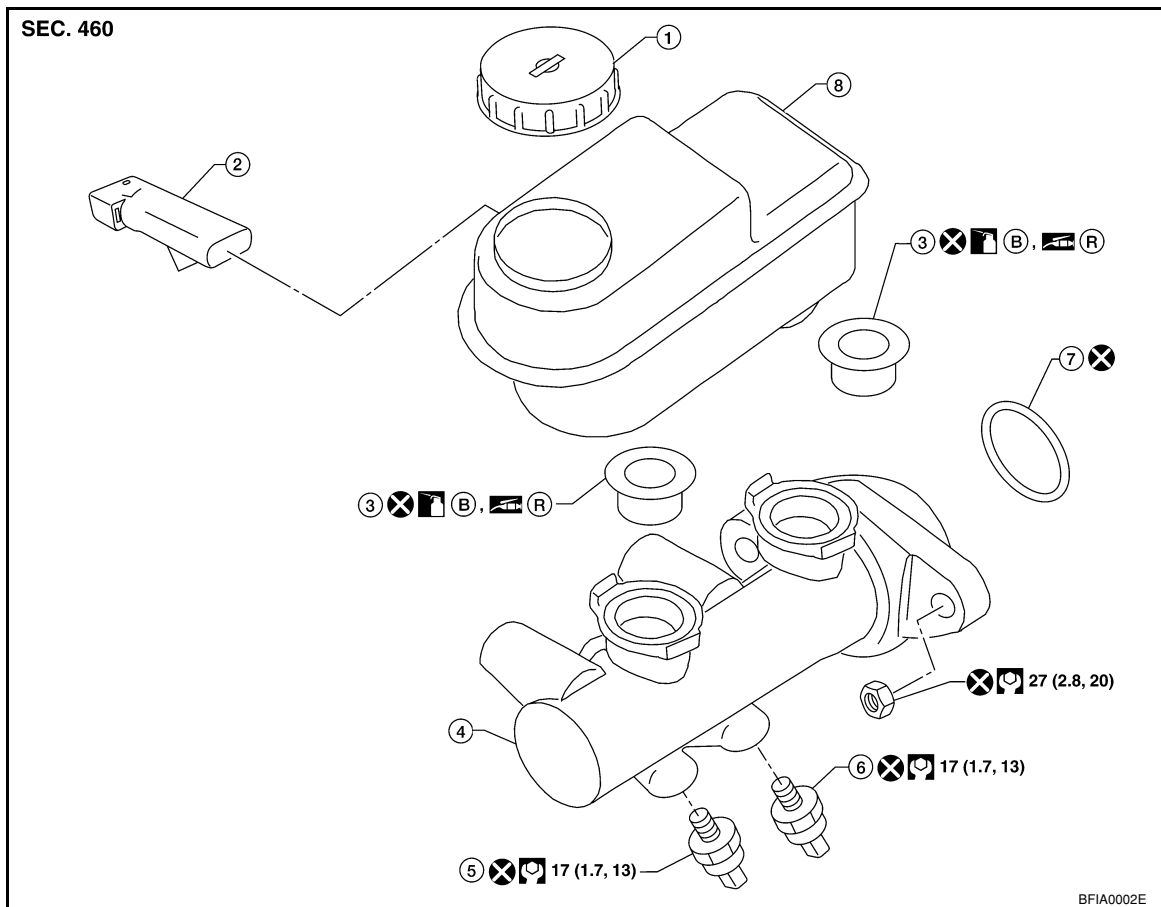
CAUTION:

Do not reuse grommet.

2. Install reservoir tank onto master cylinder assembly.

With ABLS or VDC

INFOID:000000001531266



- | | | |
|---------------------------------|--------------------------|-------------------------|
| 1. Reservoir cap | 2. Fluid level sensor | 3. Grommet |
| 4. Master cylinder sub-assembly | 5. Front pressure sensor | 6. Rear pressure sensor |
| 7. Seal | 8. Reservoir tank | |

REMOVAL AND INSTALLATION

Removal

CAUTION:

- Be careful not to splash brake fluid on painted areas; it may cause paint damage. If brake fluid is splashed on painted areas, wash it away with water immediately.
- Before removing brake master cylinder, depress the brake pedal 5-6 times with the key OFF to deplete vacuum in the booster.

1. Drain brake fluid. Refer to [BR-16, "Drain and Refill"](#).

2. Disconnect harness connectors for fluid level sensor and pressure sensors.

BRAKE MASTER CYLINDER

< ON-VEHICLE REPAIR >

- Using a flare nut wrench, disconnect brake tube from master cylinder assembly.
- Remove master cylinder assembly nuts and master cylinder assembly.

Installation

Installation is in the reverse order of removal.

- Refill brake fluid and bleed air. Refer to [BR-16, "Bleeding Brake System"](#).

CAUTION:

- Refill with new brake fluid. Refer to [BR-16, "Drain and Refill"](#).**
- Do not reuse drained brake fluid.**
- Adjust brake pedal. Refer to [BR-14, "Inspection and Adjustment"](#).

DISASSEMBLY AND ASSEMBLY

Disassembly

CAUTION:

- Master cylinder cannot be disassembled.**
- Remove reservoir tank only when absolutely necessary.**

- Pull reservoir tank off master cylinder sub-assembly, then remove grommets from master cylinder sub-assembly body.
- Remove master cylinder front and rear pressure sensors.

Assembly

CAUTION:

- Never use mineral oil such as kerosene or gasoline during the cleaning and assembly process.**
- Do not drop parts. If a part is dropped, do not use it.**

- Apply brake fluid or rubber grease to new grommets, then insert into master cylinder sub-assembly. Refer to [BR-26, "With ABLs or VDC"](#).

CAUTION:

Do not reuse grommet.

- Install reservoir tank onto master cylinder assembly.
- Install master cylinder front and rear pressure sensors.

A
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BRAKE BOOSTER

< ON-VEHICLE REPAIR >

BRAKE BOOSTER

On-Vehicle Service

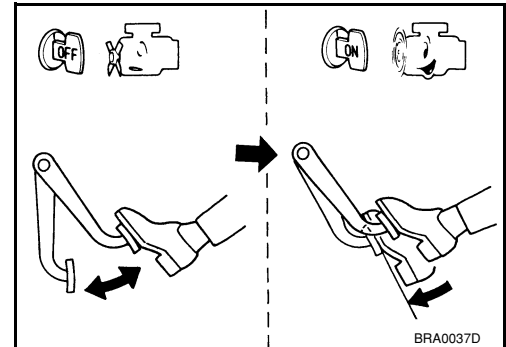
INFOID:000000001531267

OPERATING CHECK

With engine stopped, change the vacuum to the atmospheric pressure by depressing brake pedal several times. Then with brake pedal fully depressed, start engine and when the vacuum pressure reaches the standard, make sure the clearance between brake pedal and floor panel decreases.

CAUTION:

Depressing pedal interval is approximately 5 seconds.

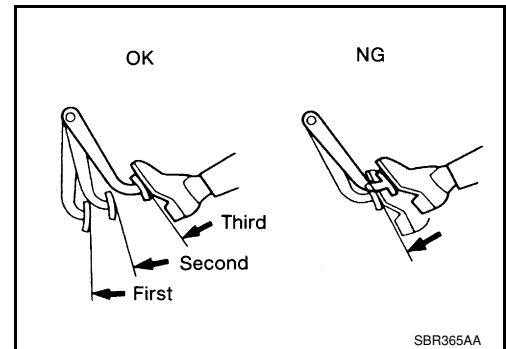


AIRTIGHT CHECK

- Run engine at idle for approximately 1 minute, and stop it after applying vacuum to booster. Depress brake pedal normally to change the vacuum to the atmospheric pressure. Make sure distance between brake pedal and floor panel gradually increases.
- Depress brake pedal while engine is running and stop engine with pedal depressed. The pedal stroke should not change after holding pedal down for 30 seconds.

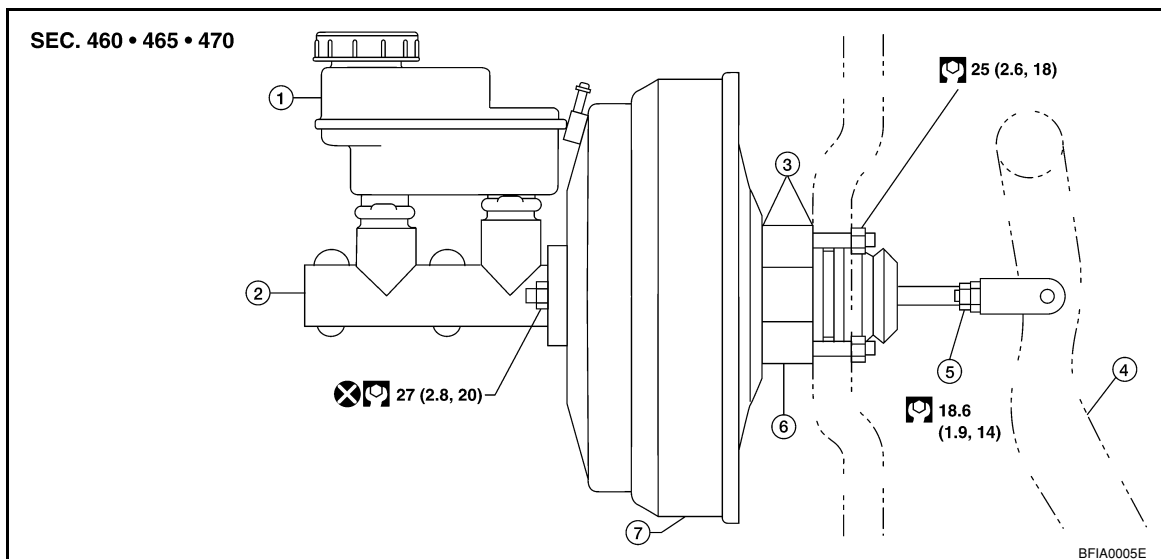
CAUTION:

Depressing pedal interval is approximately 5 seconds.



With ABS or ABLs

INFOID:000000001531268



- | | | |
|-------------------|---------------------------------|-----------------|
| 1. Reservoir tank | 2. Master cylinder sub-assembly | 3. Gasket |
| 4. Brake pedal | 5. Lock nut | 6. Spacer block |
| 7. Brake booster | | |

REMOVAL

CAUTION:

- Be careful not to deform or bend brake piping while removing and installing brake booster.
- Replace clevis pin if it is damaged.

BRAKE BOOSTER

< ON-VEHICLE REPAIR >

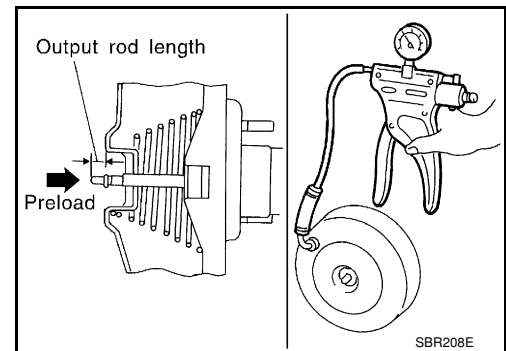
- **Be careful not to damage brake booster stud bolt threads. If brake booster is tilted or inclined during installation, dash panel may damage the threads.**
 - **Attach the check valve in the correct direction.**
1. Remove engine room cover with power tool. Refer to [EM-22, "Removal and Installation"](#).
 2. Remove engine air duct assembly. Refer to [EM-23, "Removal and Installation"](#).
 3. Remove brake piping from brake master cylinder.
 4. Remove brake master cylinder. Refer to [BR-25, "With ABS"](#).
 5. Remove vacuum hose from brake booster. Refer to [BR-32](#).
 6. Remove brake pedal attachment snap pin and clevis pin from inside the vehicle.
 7. Remove nuts on brake booster and brake pedal assembly.
 8. Remove brake booster assembly from dash panel.

INSPECTION AFTER REMOVAL

Output Rod Length Inspection

1. Using a suitable vacuum pump, apply a vacuum of -66.7 kPa (-500 mmHg , -19.69 inHg) to brake booster.
2. Check output rod length.

Standard dimension when vacuum -66.7 kPa (-500 mmHg , -19.69 inHg) : $15.6 - 15.9 \text{ mm}$ ($0.614 - 0.626 \text{ in}$)

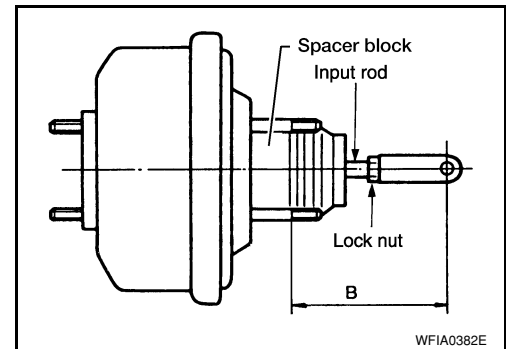


INSTALLATION

1. Loosen lock nut to adjust input rod length so that the length "B", as shown, satisfies the specified value.

Length "B" : 151 mm (5.94 in)

2. After adjusting "B", temporarily tighten lock nut and install booster assembly to the vehicle.
 - Install a gaskets and spacer block between booster assembly and the dash panel.
3. Connect brake pedal with clevis of input rod.



4. Install pedal bracket nuts and tighten them to the specified torque.
5. Install brake piping from brake master cylinder to ABS actuator and electric unit (control unit). Refer to [BR-12, "Hydraulic Circuit"](#).
6. Connect vacuum hose to brake booster.
7. Install master cylinder to booster assembly. Refer to [BR-26, "With ABS or VDC"](#).
8. Adjust the height and play of brake pedal. Refer to [BR-14, "Inspection and Adjustment"](#).
9. Tighten lock nut of input rod to the specified torque.
10. Install engine air duct assembly. Refer to [EM-23, "Removal and Installation"](#).
11. Install engine room cover. Refer to [EM-22, "Removal and Installation"](#).
12. Refill brake fluid and bleed air. Refer to [BR-16, "Bleeding Brake System"](#).

CAUTION:

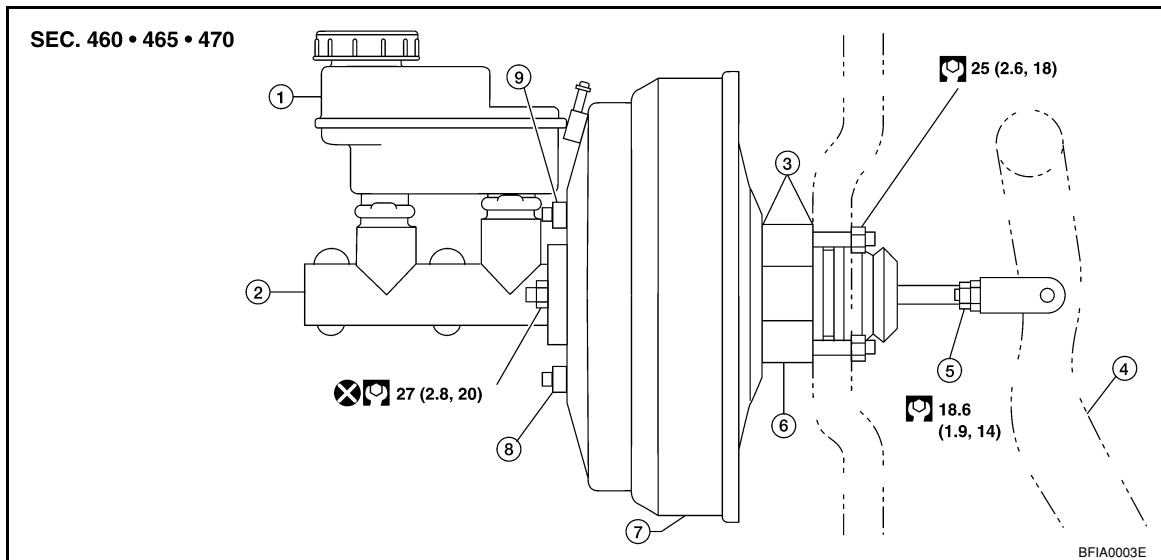
- **Refill with new brake fluid. Refer to [BR-16, "Drain and Refill"](#).**
- **Do not reuse drained brake fluid.**

BRAKE BOOSTER

< ON-VEHICLE REPAIR >

With VDC

INFOID:000000001531269



- | | | |
|-------------------|--------------------|------------------------|
| 1. Reservoir tank | 2. Master cylinder | 3. Gasket |
| 4. Brake pedal | 5. Lock nut | 6. Spacer block |
| 7. Brake booster | 8. Active booster | 9. Delta stroke sensor |

REMOVAL

CAUTION:

- Be careful not to deform or bend brake piping while removing and installing brake booster.
- Replace clevis pin if it is damaged.
- Be careful not to damage brake booster stud bolt threads. If brake booster is tilted or inclined during installation, dash panel may damage the threads.
- Attach the check valve in the correct direction.

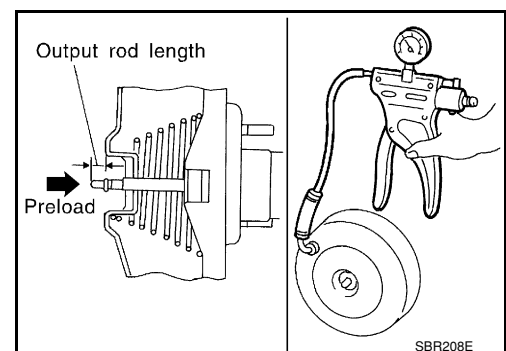
1. Remove engine room cover with power tool. Refer to [EM-22. "Removal and Installation"](#).
2. Remove engine air duct assembly. Refer to [EM-23. "Removal and Installation"](#).
3. Remove brake piping from brake master cylinder.
4. Remove brake master cylinder. Refer to [BR-26. "With ABLs or VDC"](#).
5. Remove vacuum hose from brake booster. Refer to [BR-32](#).
6. Disconnect active boost and delta stroke sensor harness connectors from brake booster assembly.
7. Remove brake pedal attachment snap pin and clevis pin from inside the vehicle.
8. Remove nuts on brake booster and brake pedal assembly.
9. Remove brake booster assembly from dash panel.

INSPECTION AFTER REMOVAL

Output Rod Length Inspection

1. Using a handy vacuum pump, apply a vacuum of -66.7 kPa (-500 mmHg , -19.69 inHg) to brake booster.
2. Check output rod length.

Standard dimension when vacuum -66.7 kPa (-500 mmHg , -19.69 inHg) : $15.6 - 15.9 \text{ mm}$ ($0.614 - 0.626 \text{ in}$)



BRAKE BOOSTER

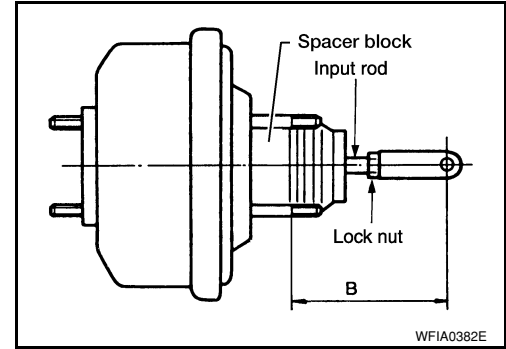
< ON-VEHICLE REPAIR >

INSTALLATION

1. Loosen lock nut to adjust input rod length so that the length "B" (in the figure) satisfies the specified value.

Length "B" : 151 mm (5.94 in)

2. After adjusting "B", temporarily tighten lock nut and install booster assembly to the vehicle.
 - Install a gaskets and spacer block between booster assembly and the dash panel.
3. Connect brake pedal with clevis of input rod.



4. Install pedal bracket mounting nuts and tighten them to the specified torque.
5. Install brake piping from brake master cylinder to ABS actuator and electric unit (control unit). Refer to [BR-12, "Hydraulic Circuit"](#).
6. Connect active boost and delta stroke sensor harness connectors to brake booster assembly.
7. Connect vacuum hose to brake booster.
8. Install master cylinder to booster assembly. Refer to [BR-26, "With ABLs or VDC"](#).
9. Adjust the height and play of brake pedal. Refer to [BR-14, "Inspection and Adjustment"](#).
10. Tighten lock nut of input rod to the specified torque.
11. Install engine air duct assembly. Refer to [EM-23, "Removal and Installation"](#).
12. Install engine room cover. Refer to [EM-22, "Removal and Installation"](#).
13. Refill brake fluid and bleed air. Refer to [BR-16, "Bleeding Brake System"](#).

CAUTION:

- Refill with new brake fluid. Refer to [BR-16, "Drain and Refill"](#).
- Do not reuse drained brake fluid.

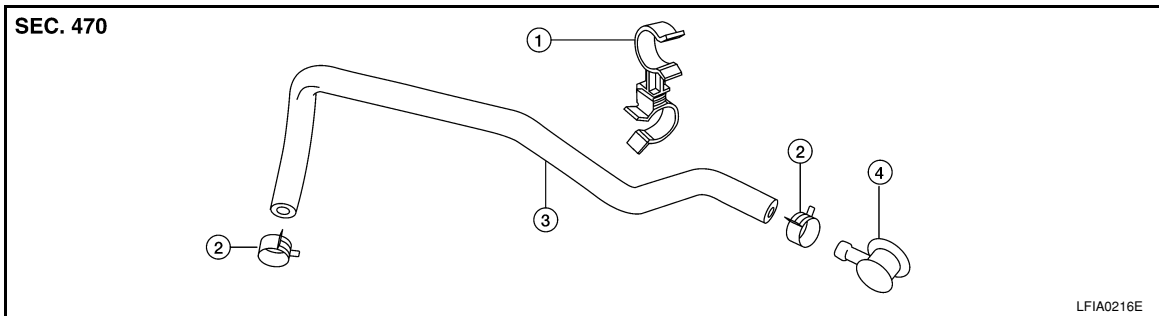
VACUUM LINES

< ON-VEHICLE REPAIR >

VACUUM LINES

Removal and Installation

INFOID:000000001531270



1. Hose clip
2. Clamp
3. Vacuum hose
4. Check valve

REMOVAL

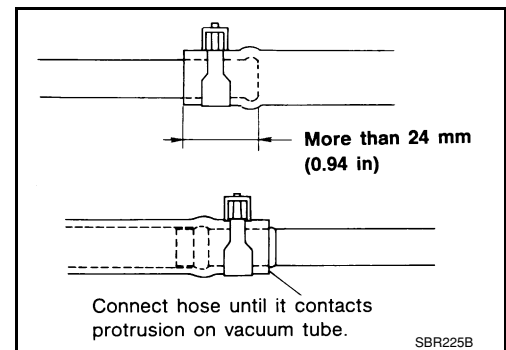
1. Disconnect vacuum hose from hose clip.
2. Release clamps and disconnect vacuum hose.
3. Remove check valve from brake booster.

INSTALLATION

1. Installation is in the reverse order of removal.

CAUTION:

- Insert vacuum hose for at least 24 mm (0.94 in).
- Do not use lubricating oil during assembly.



Inspection

INFOID:000000001531271

VISUAL INSPECTION

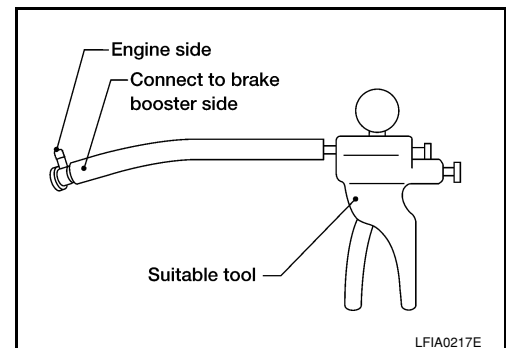
Check for improper assembly, damage and deterioration.

CHECK VALVE INSPECTION

Airtightness Inspection

Use a suitable vacuum pump to check. Connect to brake booster side of check valve.

Check valve specification : Vacuum decrease should be within 1.3 kPa (10 mmHg, 0.39 inHg) for 15 seconds under a vacuum of -66.7 kPa (-500 mmHg, -19.69 inHg)



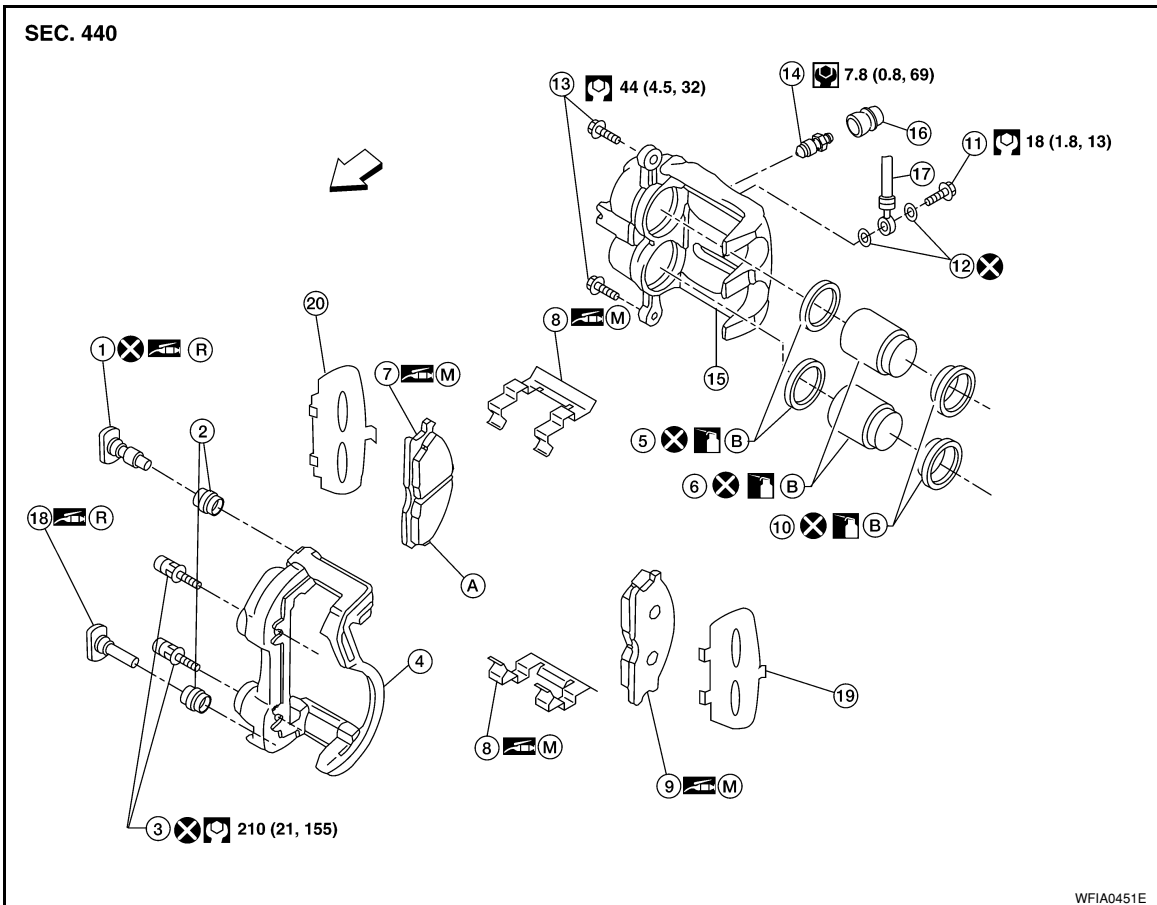
FRONT DISC BRAKE

< ON-VEHICLE REPAIR >

FRONT DISC BRAKE

Component

INFOID:000000001531272



- | | | |
|----------------------|---------------------|-----------------------|
| 1. Upper sliding pin | 2. Sliding pin boot | 3. Torque member bolt |
| 4. Torque member | 5. Piston seal | 6. Piston |
| 7. Inner pad | 8. Pad retainer | 9. Outer pad |
| 10. Piston boot | 11. Union bolt | 12. Copper washer |
| 13. Sliding pin bolt | 14. Bleed valve | 15. Cylinder body |
| 16. Cap | 17. Brake hose | 18. Lower sliding pin |
| 19. Outer shim | 20. Inner shim | A. Wear indicator |
- ← Front

WARNING:

Clean dust on caliper and brake pad with a vacuum dust collector to minimize the hazard of airborne particles or other materials.

CAUTION:

- While removing cylinder body never depress brake pedal because piston will pop out.
- It is not necessary to remove bolts on torque member and brake hose except for disassembly or replacement of cylinder body. In this case, hang cylinder body with a wire so as not to stretch brake hose.
- Do not damage piston boot.
- Burnish brake contact surface after refinishing or replacing rotors, after replacing pads, or if a soft pedal occurs at very low mileage. Refer to [BR-35, "Brake Burnishing Procedure"](#).

Removal and Installation of Brake Pad

INFOID:000000001531273

REMOVAL

FRONT DISC BRAKE

< ON-VEHICLE REPAIR >

1. Remove tires from vehicle using power tool.
2. Remove lower sliding pin bolt.
3. Suspend cylinder body using suitable wire and remove pads, shims, and pad retainers from torque member.

INSTALLATION

1. Push pistons in so that pad is firmly installed and mount cylinder body to torque member.

CAUTION:

By pushing in piston, brake fluid returns to master cylinder reservoir tank. Watch the level of the surface of reservoir tank.

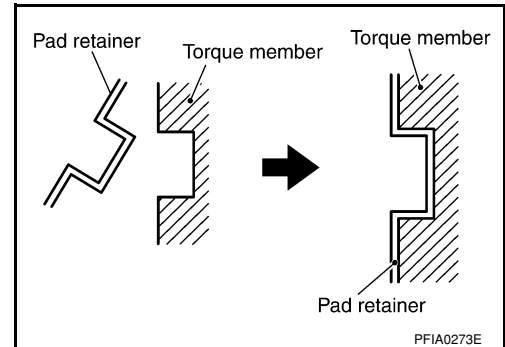
NOTE:

Using a commercially available disc brake piston tool, makes it easier to push in piston.

2. Attach pad retainers, pads and shims to torque member.
 - Apply Molykote M-77 grease to pad retainer where brake pad contacts and between pad and shim.

CAUTION:

- **When attaching pad retainer, attach it firmly so that it is seated fully in the torque member as shown.**
- **Do not get grease on the brake rotor friction surface.**



3. Install lower sliding pin bolt and tighten it to the specified torque. Refer to [BR-33, "Component"](#).
4. Check brake for drag.
5. Install tires to the vehicle. Refer to [WT-36, "Rotation"](#).

Removal and Installation of Brake Caliper and Disc Rotor

INFOID:000000001531274

REMOVAL

1. Remove tires from vehicle using power tool.
2. Drain brake fluid as necessary. Refer to [BR-16, "Drain and Refill"](#).
NOTE:
Do not remove union bolt unless removing cylinder body from vehicle.
3. Remove union bolt as necessary and torque member bolts, then remove cylinder body.
NOTE:
Position cylinder body aside using suitable wire, as necessary.
NOTE:
When servicing cylinder body, remove sliding pin bolts and caliper from torque member.
4. Remove disc rotor.

INSTALLATION

CAUTION:

- **Refill with new brake fluid. Refer to [BR-16, "Drain and Refill"](#).**
- **Do not reuse drained brake fluid.**

1. Install disc rotor.
2. Install sliding pin bolts if removed and tighten to specified torque. Refer to [BR-33, "Component"](#).

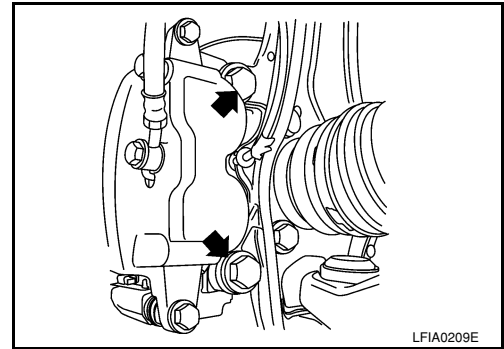
FRONT DISC BRAKE

< ON-VEHICLE REPAIR >

3. Install cylinder body to the vehicle, then tighten the torque member bolts to the specified torque. Refer to [BR-33. "Component"](#).

CAUTION:

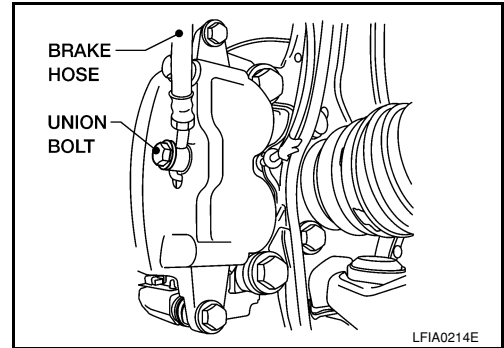
- When attaching cylinder body to the vehicle, wipe any oil off knuckle spindle, washers and cylinder body attachment surfaces.
- Do not reuse caliper torque member bolts.



4. Install brake hose to cylinder body, then tighten union bolt to specification. Refer to [BR-33. "Component"](#).

CAUTION:

- Do not reuse copper washers for union bolt.
- Attach brake hose to cylinder body together with union bolt and washers.



5. Refill new brake fluid and bleed air. Refer to [BR-16. "Bleeding Brake System"](#).
6. Attach tires to the vehicle. Refer to [WT-36. "Rotation"](#).

Brake Burnishing Procedure

INFOID:000000001531275

Burnish contact surfaces between disc rotors and pads according to following procedure after refinishing or replacing rotors, after replacing pads, or if a soft pedal occurs at very low mileage.

CAUTION:

- Be careful of vehicle speed because the brake does not operate easily until pad and disc rotor are securely fitted.
 - Only perform this procedure under safe road and traffic conditions. Use extreme caution.
1. Drive vehicle on straight, flat road.
 2. Depress brake pedal with the power to stop vehicle within 3 to 5 seconds until the vehicle stops.
 3. Drive without depressing brake for a few minutes to cool the brake.
 4. Repeat steps 1 to 3 until pad and disc rotor are securely fitted.

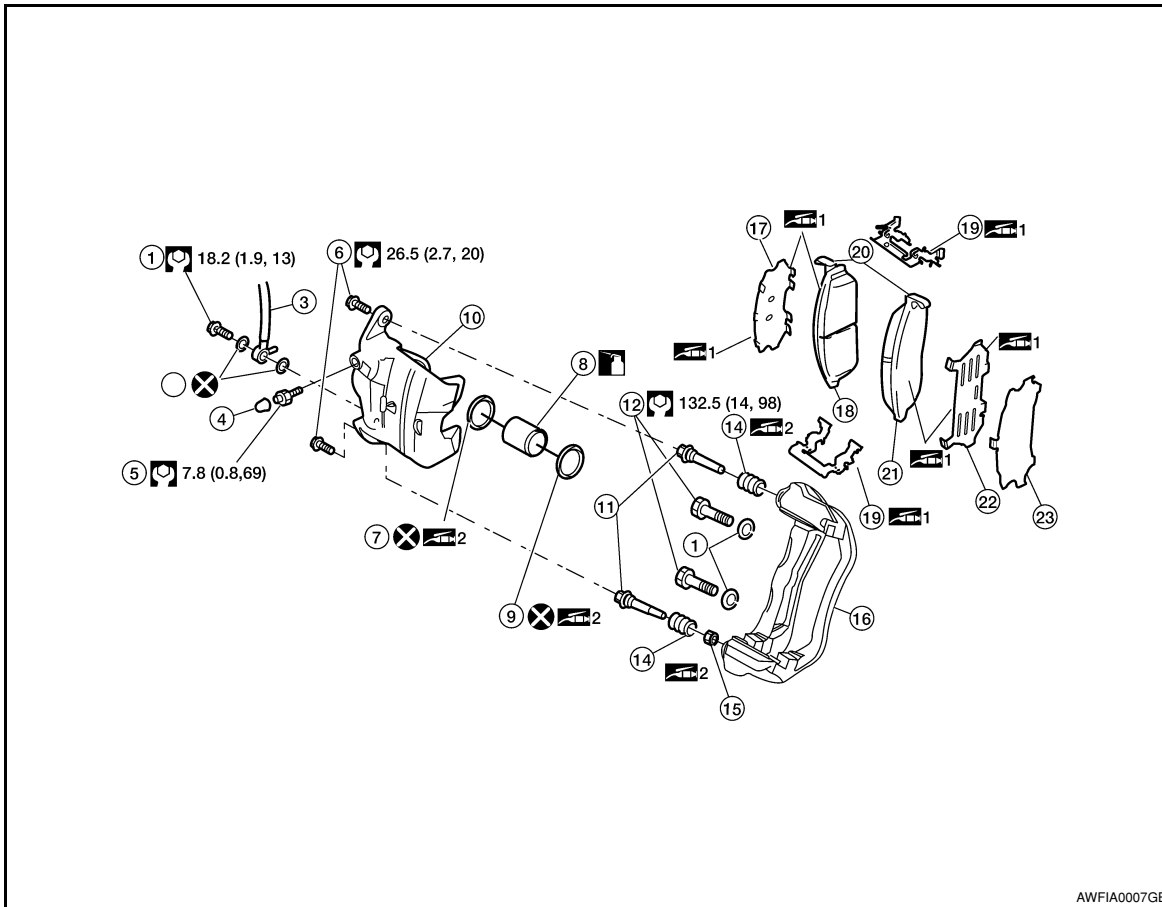
BRAKE PAD

FRONT DISC BRAKE

< ON-VEHICLE REPAIR >

BRAKE PAD : Exploded View

INFOID:000000001531276



- | | | |
|-------------------|-----------------------------|---------------------------------|
| 1. Union bolt | 2. Copper washer | 3. Brake hose |
| 4. Cap | 5. Bleed valve | 6. Sliding pin bolt |
| 7. Piston seal | 8. Piston | 9. Piston boot |
| 10. Cylinder body | 11. Sliding pin | 12. Torque member mounting bolt |
| 13. Washer | 14. Sliding pin boot | 15. Bushing |
| 16. Torque member | 17. Inner multilayered shim | 18. Inner pad |
| 19. Pad retainer | 20. Pad wear sensor | 21. Outer pad |
| 22. Outer shim | 23. Outer shim cover | |
- 1: Molykote M-77 grease
 2: Rubber grease
 : Brake fluid

Refer to GI section for symbol marks except in the above.

BRAKE PAD : Removal and Installation

INFOID:000000001531277

REMOVAL

WARNING:

Clean dust on caliper and brake pad with a vacuum dust collector to minimize the hazard of air borne particles or other materials.

CAUTION:

- While removing cylinder body, do not depress brake pedal because piston will pop out.
- It is not necessary to remove bolts on torque member and brake hose except for disassembly or replacement of caliper assembly. In this case, hang cylinder body with a wire so as not to stretch brake hose.
- Do not damage piston boot.
- If any shim is subject to serious corrosion, replace it with a new one.
- Always replace shim and shim cover as a set when replacing brake pads.

FRONT DISC BRAKE

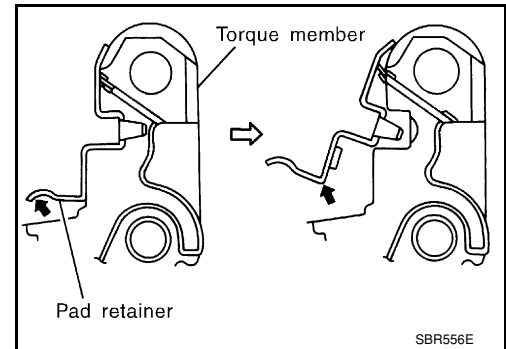
< ON-VEHICLE REPAIR >

- Keep rotor free from brake fluid.
- Burnish the brake pads and disc rotor mutually contacting surfaces, after refinishing or replacing rotors, after replacing pads, or if a soft pedal occurs at very low mileage. Refer to [BR-35, "Brake Burnishing Procedure"](#).

1. Remove front tires from vehicle using power tool.
2. Remove lower sliding pin bolt.
3. Hang cylinder body with a wire, and remove pads, pad retainers, shims, and shim cover from torque member.

CAUTION:

When removing the pad retainer from the torque member, lift it in the direction indicated by the arrow as shown so that it does not deform.



INSTALLATION

WARNING:

Clean dust on caliper and brake pad with a vacuum dust collector to minimize the hazard of air borne particles or other materials.

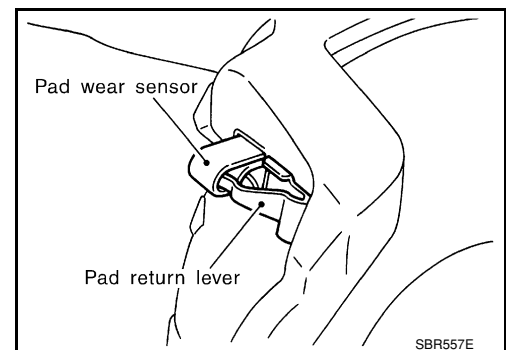
CAUTION:

- While removing cylinder body, do not depress brake pedal because piston will pop out.
- It is not necessary to remove bolts on torque member and brake hose except for disassembly or replacement of caliper assembly. In this case, hang cylinder body with a wire so as not to stretch brake hose.
- Do not damage piston boot.
- If any shim is subject to serious corrosion, replace it with a new one.
- Always replace shim and shim cover as a set when replacing brake pads.
- Keep rotor free from brake fluid.
- Burnish the brake pads and disc rotor mutually contacting surfaces, after refinishing or replacing rotors, after replacing pads, or if a soft pedal occurs at very low mileage. Refer to [BR-35, "Brake Burnishing Procedure"](#).

1. Apply Molykote M-77 grease or equivalent to between shim cover and shim. Install outer shim, outer shim cover to inner pad, and inner multilayered shim to outer pad.
2. Apply Molykote M-77 grease or equivalent to between pad retainer and pad. Install pad retainers and pads to torque member.

CAUTION:

- Securely assemble pad retainers so that they are not being lifted up from torque member.
- Both inner and outer pads have a pad return system on the pad retainer. Install pad return lever securely to pad wear sensor.



3. Install cylinder body to torque member.

CAUTION:

In the case of replacing a pad with new one, check a brake fluid level in the reservoir tank because brake fluid returns to master cylinder reservoir tank when pressing piston in.

NOTE:

Use a disc brake piston tool (commercial service tool) to easily press piston.

4. Install lower sliding pin bolt, and tighten it to the specified torque. Refer to [BR-36, "BRAKE PAD : Exploded View"](#).
5. Check front disc brake for drag.
6. Install front tires.

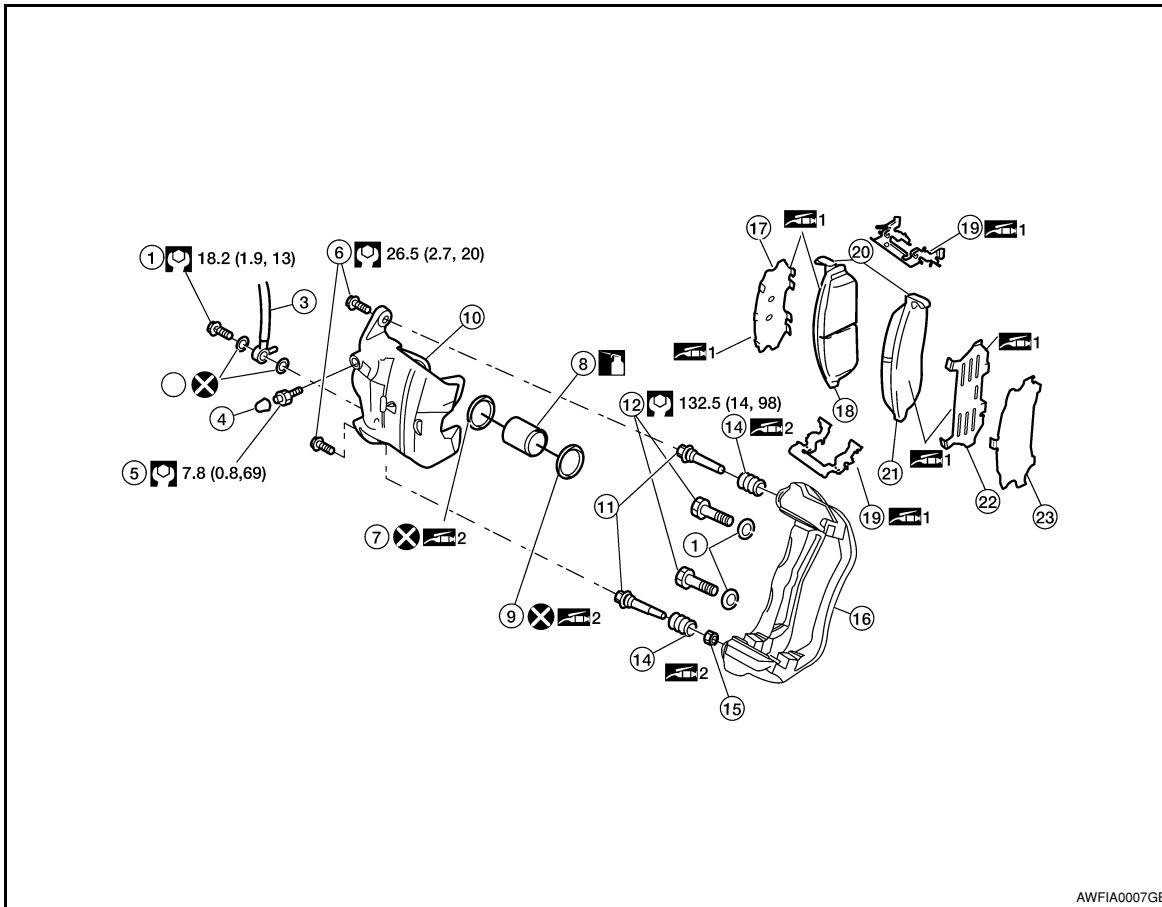
BRAKE CALIPER ASSEMBLY

FRONT DISC BRAKE

< ON-VEHICLE REPAIR >

BRAKE CALIPER ASSEMBLY : Exploded View

INFOID:000000001531278



- | | | |
|-------------------|-----------------------------|---------------------------------|
| 1. Union bolt | 2. Copper washer | 3. Brake hose |
| 4. Cap | 5. Bleed valve | 6. Sliding pin bolt |
| 7. Piston seal | 8. Piston | 9. Piston boot |
| 10. Cylinder body | 11. Sliding pin | 12. Torque member mounting bolt |
| 13. Washer | 14. Sliding pin boot | 15. Bushing |
| 16. Torque member | 17. Inner multilayered shim | 18. Inner pad |
| 19. Pad retainer | 20. Pad wear sensor | 21. Outer pad |
| 22. Outer shim | 23. Outer shim cover | |

1: Molykote M-77 grease

2: Rubber grease

: Brake fluid

Refer to GI section for symbol marks except in the above.

BRAKE CALIPER ASSEMBLY : Removal and Installation

INFOID:000000001531279

REMOVAL

WARNING:

Clean dust on caliper and brake pad with a vacuum dust collector to minimize the hazard of air borne particles or other materials.

CAUTION:

- While removing cylinder body, do not depress brake pedal because piston will pop out.
- Do not damage piston boot.
- Keep rotor free from brake fluid.

1. Remove front tires using power tool.
2. Fasten disc rotor using wheel nut.
3. Drain brake fluid. Refer to [BR-16. "Drain and Refill"](#).

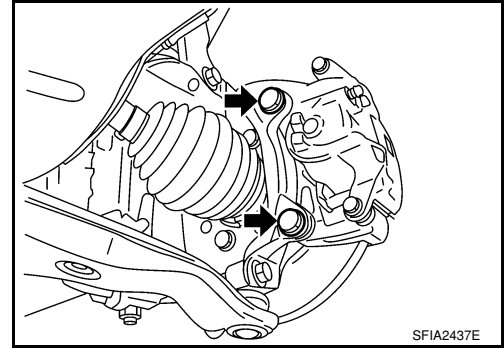
FRONT DISC BRAKE

< ON-VEHICLE REPAIR >

4. Remove union bolt, and then disconnect brake hose from caliper assembly.
5. Remove torque member mounting bolts, and remove brake caliper assembly.

CAUTION:

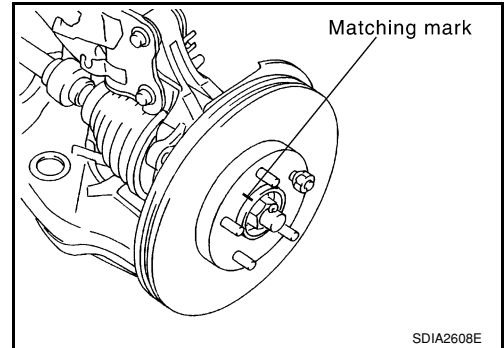
Do not drop brake pad.



6. Remove disc rotor.

CAUTION:

Put matching marks on wheel hub assembly and disc rotor, if it is necessary to remove disc rotor.



INSTALLATION

WARNING:

Clean dust on caliper and brake pad with a vacuum dust collector to minimize the hazard of air borne particles or other materials.

CAUTION:

- While removing cylinder body, do not depress brake pedal because piston will pop out.
- Do not damage piston boot.
- Keep rotor free from brake fluid.
- Refill with new brake fluid "DOT 3".
- Never reuse drained brake fluid.

1. Install disc rotor.

CAUTION:

Put alignment marks on disc rotor and wheel hub at the time of removal when reusing disc rotor.

2. Install brake caliper assembly to vehicle, and tighten torque member mounting bolts to the specified torque. Refer to [BR-40, "Component"](#).

CAUTION:

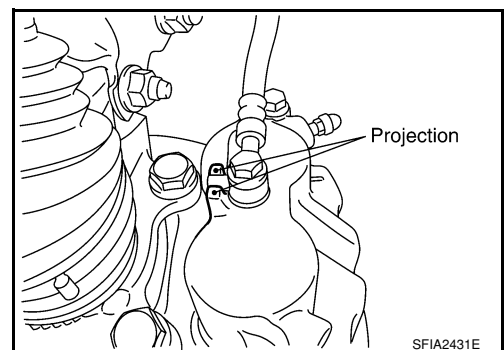
Do not allow oil or any moisture on all contact surfaces between steering knuckle and caliper assembly, bolts, and washer.

3. Install brake hose to brake caliper assembly, and tighten union bolts to the specified torque. Refer to [BR-40, "Component"](#).

4. Refill with new brake fluid and bleed air. Refer to [BR-16, "Bleeding Brake System"](#).

5. Check front disc brake for drag.

6. Install front tires.



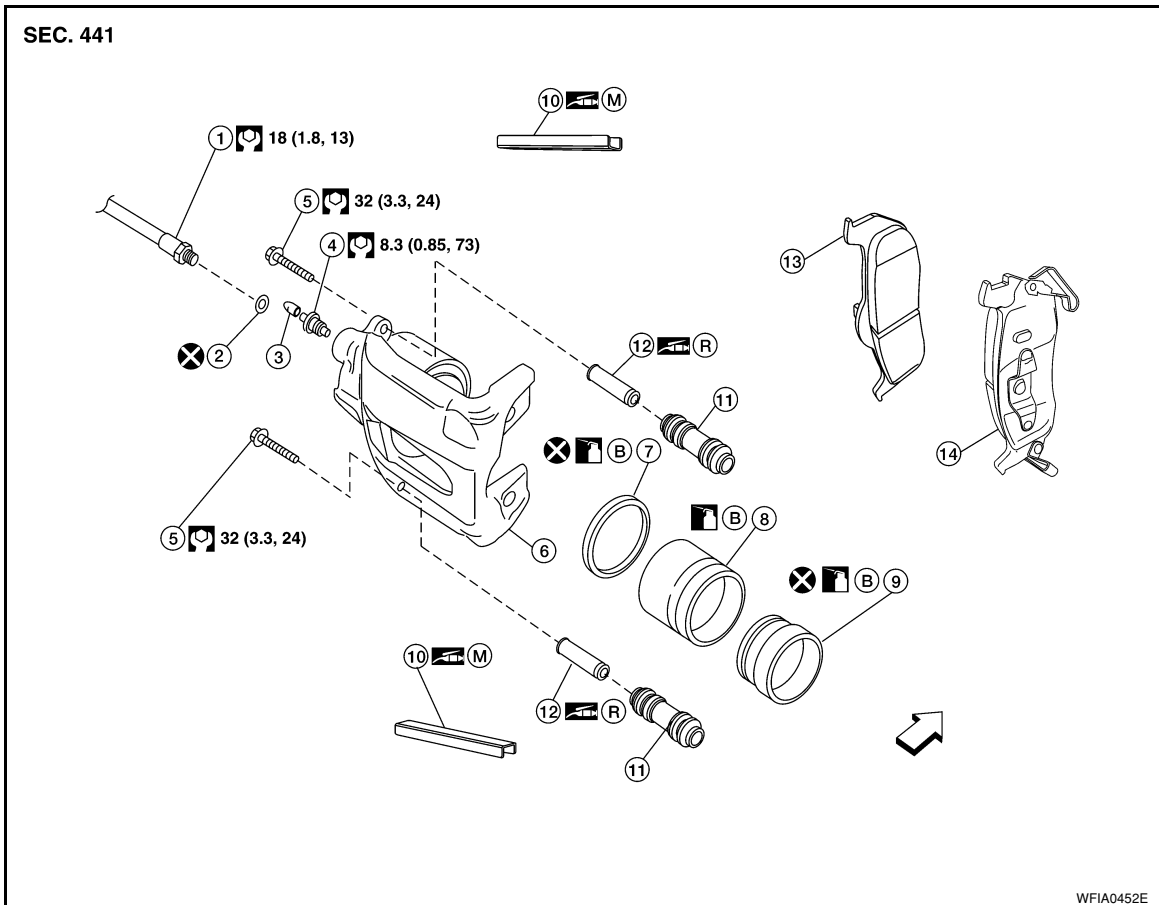
REAR DISC BRAKE

< ON-VEHICLE REPAIR >

REAR DISC BRAKE

Component

INFOID:000000001531280



- | | | |
|-------------------|-------------------------|--------------------|
| 1. Brake hose | 2. Copper washer | 3. Cap |
| 4. Bleed valve | 5. Bolt | 6. Cylinder body |
| 7. Piston seal | 8. Piston | 9. Piston boot |
| 10. Knuckle slide | 11. Sliding sleeve boot | 12. Sliding sleeve |
| 13. Inner pad | 14. Outer pad | ← Front |

WARNING:

Clean dust on caliper and brake pad with a vacuum dust collector to minimize the hazard of airborne particles or other materials.

CAUTION:

- While removing cylinder body, never depress brake pedal because piston will pop out.
- It is not necessary to remove the torque member and disconnect the brake hose except for disassembly or replacement of cylinder body. When replacing brake pads, hang cylinder body with a wire so as not to stretch brake hose.
- Do not damage piston boot.
- Burnish brake contact surface after refinishing or replacing rotors, after replacing pads, or if a soft pedal occurs at very low mileage. Refer to [BR-35, "Brake Burnishing Procedure"](#).

Removal and Installation of Brake Pad

INFOID:000000001531281

REMOVAL

1. Remove tires from vehicle with power tool.
2. Remove mounting bolt from the top mount.
3. Swing cylinder body open, and remove pads.

REAR DISC BRAKE

< ON-VEHICLE REPAIR >

INSTALLATION

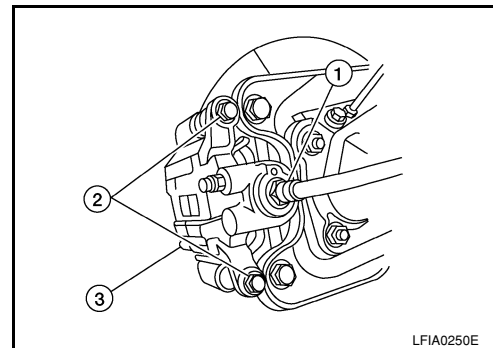
1. Push piston in so that pad is firmly attached and mount cylinder body to torque member.
NOTE:
Using a commercially available disc brake piston tool, makes it easier to push in the piston.
CAUTION:
By pushing in piston, brake fluid returns to master cylinder reservoir tank. Watch the level of the surface of reservoir tank.
2. Apply Molykote M-77 grease to knuckle slide where brake pad contacts.
CAUTION:
Do not get grease on the brake rotor friction surface.
3. Install pads to cylinder body.
4. Install top mounting bolt and tighten to specification.
5. Check brake for drag.
6. Install tires to the vehicle. Refer to [WT-36. "Rotation"](#).

Removal and Installation of Brake Caliper and Disc Rotor

INFOID:000000001531282

REMOVAL

1. Remove tires from vehicle with power tool.
2. Drain brake fluid as necessary. Refer to [BR-16. "Drain and Refill"](#).
NOTE:
Do not disconnect brake hose unless removing the cylinder body.
3. Remove bolts (2) as shown, and cylinder body (3).
 - (1): Brake hose**NOTE:**
Position cylinder body aside using suitable wire, as necessary.
4. Remove disc rotor.



INSTALLATION

- **Refill with new brake fluid. Refer to [BR-16. "Drain and Refill"](#).**
- **Do not reuse drained brake fluid.**
1. Install disc rotor.
2. Install cylinder body to the vehicle, and tighten bolts to specification. Refer to [BR-40. "Component"](#).
CAUTION:
Before installing cylinder body to the vehicle, wipe off mounting surface of cylinder body.
3. Install brake hose to cylinder body with new copper washer and tighten to specification. Refer to [BR-40. "Component"](#).
CAUTION:
 - **Do not reuse copper washer.**
 - **Securely attach brake hose to protrusion on cylinder body.**
4. Refill new brake fluid and bleed air. Refer to [BR-16. "Bleeding Brake System"](#).
5. Install tires to the vehicle. Refer to [WT-36. "Rotation"](#).

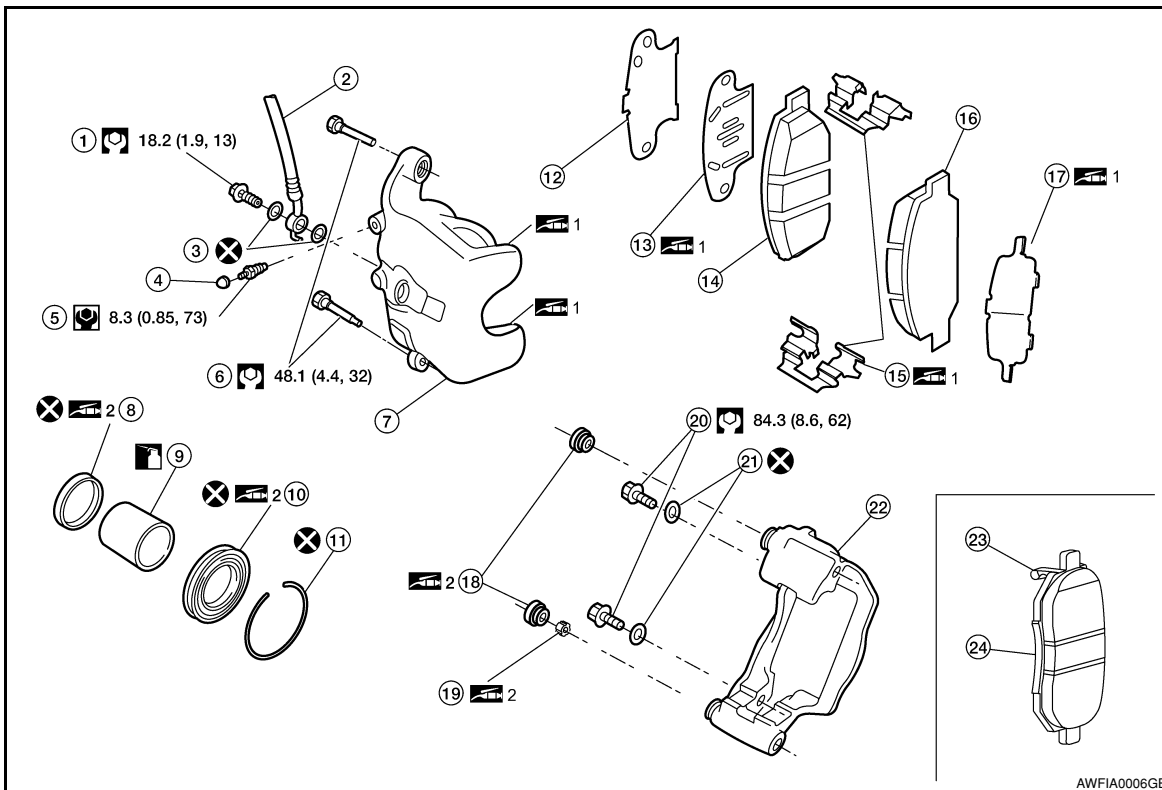
BRAKE PAD




REAR DISC BRAKE

< ON-VEHICLE REPAIR >

BRAKE PAD : Exploded View

INFOID:000000001531283



- | | | |
|-------------------|---------------------------------|----------------------|
| 1. Union bolt | 2. Brake hose | 3. Copper washer |
| 4. Cap | 5. Bleed valve | 6. Sliding pin bolt |
| 7. Cylinder body | 8. Piston seal | 9. Piston |
| 10. Piston boot | 11. Retaining ring | 12. Inner shim cover |
| 13. Inner shim | 14. Inner pad | 15. Pad retainer |
| 16. Outer pad | 17. Outer multilayered shim | 18. Sliding pin boot |
| 19. Bushing | 20. Torque member mounting bolt | 21. Washer |
| 22. Torque member | 23. Pad wear sensor | 24. Inner pad (RH) |
-  1: PBC (Poly Butyl Cuprysil) grease or silicone-based grease
  2: Rubber grease
  : Brake fluid

Refer to GI section for symbol marks except in the above.

BRAKE PAD : Removal and Installation of Brake Pad

INFOID:000000001531284

REMOVAL

1. Remove tires from vehicle with power tool.
2. Remove mounting bolt from the top mount.
3. Swing cylinder body open, and remove pads.

INSTALLATION

1. Push piston in so that pad is firmly attached and mount cylinder body to torque member.

NOTE:
Using a commercially available disc brake piston tool, makes it easier to push in the piston.

CAUTION:
By pushing in piston, brake fluid returns to master cylinder reservoir tank. Watch the level of the surface of reservoir tank.
2. Apply Molykote M-77 grease to knuckle slide where brake pad contacts.

CAUTION:
Do not get grease on the brake rotor friction surface.

REAR DISC BRAKE

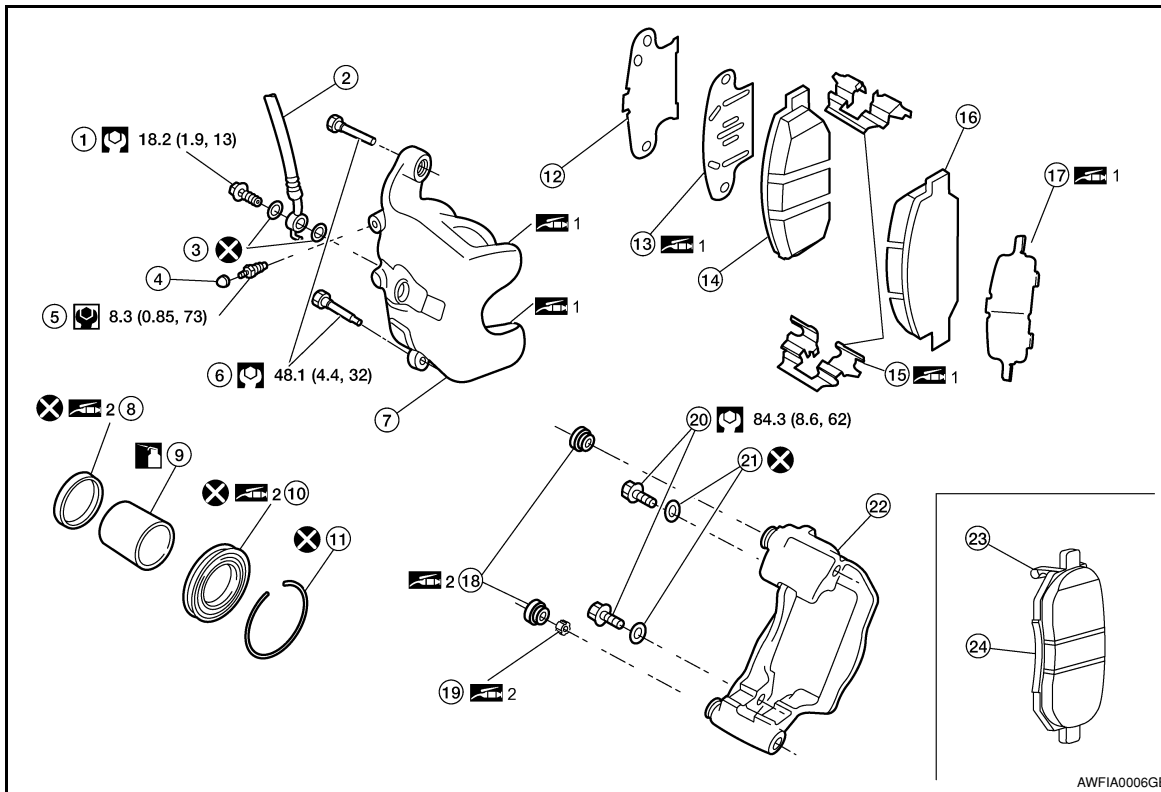
< ON-VEHICLE REPAIR >

3. Install pads to cylinder body.
4. Install top mounting bolt and tighten to specification.
5. Check brake for drag.
6. Install tires to the vehicle. Refer to [WT-36. "Rotation"](#).

BRAKE CALIPER ASSEMBLY

BRAKE CALIPER ASSEMBLY : Exploded View

INFOID:000000001531285



- | | | |
|-------------------|---------------------------------|----------------------|
| 1. Union bolt | 2. Brake hose | 3. Copper washer |
| 4. Cap | 5. Bleed valve | 6. Sliding pin bolt |
| 7. Cylinder body | 8. Piston seal | 9. Piston |
| 10. Piston boot | 11. Retaining ring | 12. Inner shim cover |
| 13. Inner shim | 14. Inner pad | 15. Pad retainer |
| 16. Outer pad | 17. Outer multilayered shim | 18. Sliding pin boot |
| 19. Bushing | 20. Torque member mounting bolt | 21. Washer |
| 22. Torque member | 23. Pad wear sensor | 24. Inner pad (RH) |
- 1: PBC (Poly Butyl Cuprysil) grease or silicone-based grease
 2: Rubber grease
 : Brake fluid

Refer to GI section for symbol marks except in the above.

BRAKE CALIPER ASSEMBLY : Removal and Installation of Brake Caliper and Disc Rotor

INFOID:000000001531286

REMOVAL

1. Remove tires from vehicle with power tool.
2. Drain brake fluid as necessary. Refer to [BR-16. "Drain and Refill"](#).

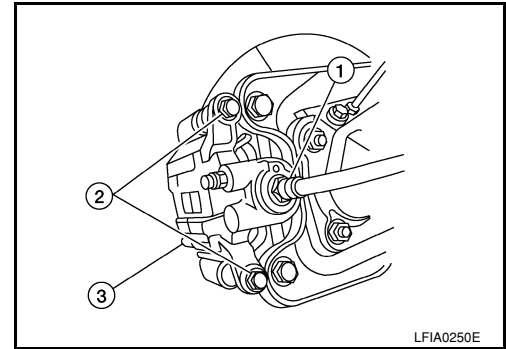
NOTE:

Do not disconnect brake hose unless removing the cylinder body.

REAR DISC BRAKE

< ON-VEHICLE REPAIR >

3. Remove bolts (2) as shown, and cylinder body (3).
 - (1): Brake hose**NOTE:**
Position cylinder body aside using suitable wire, as necessary.
4. Remove disc rotor.



INSTALLATION

CAUTION:

- Refill with new brake fluid. Refer to [BR-16, "Drain and Refill"](#).
 - Do not reuse drained brake fluid.
1. Install disc rotor.
 2. Install cylinder body to the vehicle, and tighten bolts to specification. Refer to [BR-40, "Component"](#).
CAUTION:
Before installing cylinder body to the vehicle, wipe off mounting surface of cylinder body.
 3. Install brake hose to cylinder body with new copper washer and tighten to specification. Refer to [BR-40, "Component"](#).
CAUTION:
 - Do not reuse copper washer.
 - Securely attach brake hose to protrusion on cylinder body.
 4. Refill new brake fluid and bleed air. Refer to [BR-16, "Bleeding Brake System"](#).
 5. Install tires to the vehicle. Refer to [WT-36, "Rotation"](#).

BRAKE MASTER CYLINDER

< DISASSEMBLY AND ASSEMBLY >

DISASSEMBLY AND ASSEMBLY

BRAKE MASTER CYLINDER

On Board Inspection

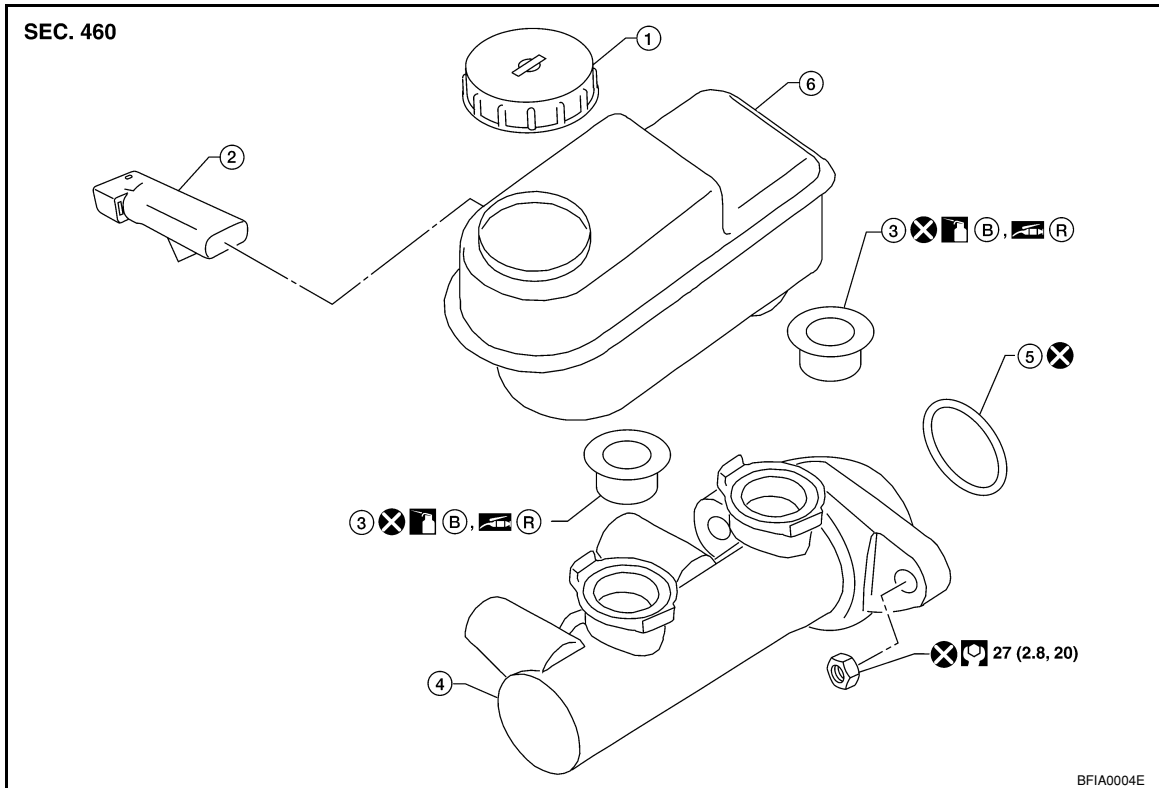
INFOID:000000001531287

LEAK INSPECTION

- Check for leaks at master cylinder to brake booster attachment point, reservoir tank, and brake tube connections.

With ABS

INFOID:000000001531288



- | | | |
|---------------------------------|-----------------------|-------------------|
| 1. Reservoir cap | 2. Fluid level sensor | 3. Grommet |
| 4. Master cylinder sub-assembly | 5. Seal | 6. Reservoir tank |

CAUTION:

Be careful not to splash brake fluid on painted areas; it may cause paint damage. If brake fluid is splashed on painted areas, wash it away with water immediately.

REMOVAL AND INSTALLATION

Removal

1. Drain brake fluid. Refer to [BR-16, "Drain and Refill"](#).
2. Disconnect harness connector for fluid level sensor.
3. Using a flare nut wrench, disconnect brake tube from master cylinder assembly.
4. Remove master cylinder assembly nuts and master cylinder assembly.

Installation

Installation is in the reverse order of removal.

- Refill brake fluid and bleed air. Refer to [BR-16, "Bleeding Brake System"](#).

CAUTION:

- Refill with new brake fluid. Refer to [BR-16, "Drain and Refill"](#).
- Do not reuse drained brake fluid.

BRAKE MASTER CYLINDER

< DISASSEMBLY AND ASSEMBLY >

- Adjust brake pedal. Refer to [BR-14. "Inspection and Adjustment"](#).

DISASSEMBLY AND ASSEMBLY

Disassembly

CAUTION:

- **Master cylinder cannot be disassembled.**
- **Remove reservoir tank only when absolutely necessary.**

Pull reservoir tank off master cylinder sub-assembly, then remove grommets from master cylinder sub-assembly body.

Assembly

CAUTION:

- **Never use mineral oil such as kerosene or gasoline during the cleaning and assembly process.**
- **Do not drop parts. If a part is dropped, do not use it.**

1. Apply brake fluid or rubber grease to new grommets, then insert into master cylinder sub-assembly. Refer to [BR-45](#).

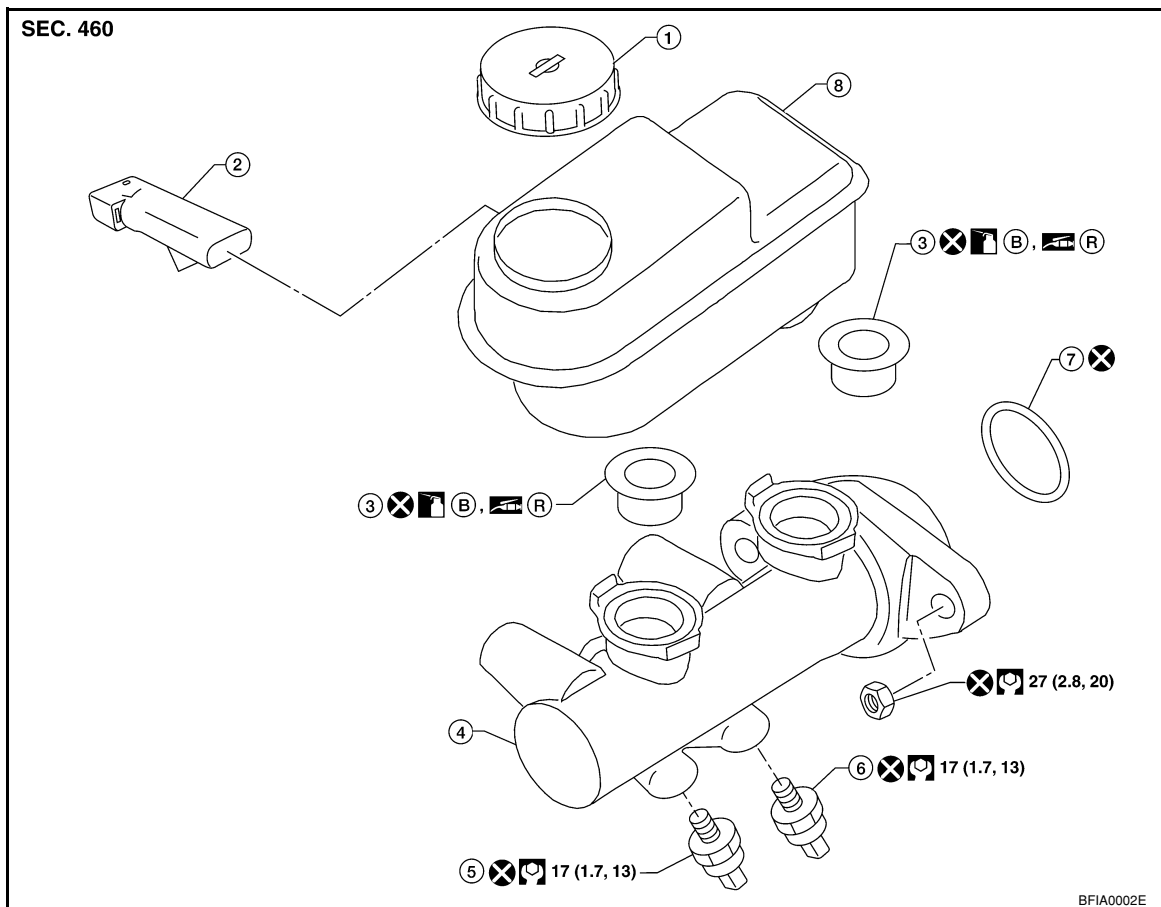
CAUTION:

Do not reuse grommet.

2. Install reservoir tank onto master cylinder assembly.

With ABLS or VDC

INFOID:000000001531289



- | | | |
|---------------------------------|--------------------------|-------------------------|
| 1. Reservoir cap | 2. Fluid level sensor | 3. Grommet |
| 4. Master cylinder sub-assembly | 5. Front pressure sensor | 6. Rear pressure sensor |
| 7. Seal | | |

REMOVAL AND INSTALLATION

Removal

CAUTION:

BRAKE MASTER CYLINDER

< DISASSEMBLY AND ASSEMBLY >

- **Be careful not to splash brake fluid on painted areas; it may cause paint damage. If brake fluid is splashed on painted areas, wash it away with water immediately.**
 - **Before removing brake master cylinder, depress the brake pedal 5-6 times with the key OFF to deplete vacuum in the booster.**
1. Drain brake fluid. Refer to [BR-16, "Drain and Refill"](#).
 2. Disconnect harness connectors for fluid level sensor and pressure sensors.
 3. Using a flare nut wrench, disconnect brake tube from master cylinder assembly.
 4. Remove master cylinder assembly nuts and master cylinder assembly.

Installation

Installation is in the reverse order of removal.

- Refill brake fluid and bleed air. Refer to [BR-16, "Bleeding Brake System"](#).
- CAUTION:**
- **Refill with new brake fluid. Refer to [BR-16, "Drain and Refill"](#).**
 - **Do not reuse drained brake fluid.**
- Adjust brake pedal. Refer to [BR-14, "Inspection and Adjustment"](#).

DISASSEMBLY AND ASSEMBLY

Disassembly

CAUTION:

- **Master cylinder cannot be disassembled.**
 - **Remove reservoir tank only when absolutely necessary.**
1. Pull reservoir tank off master cylinder sub-assembly, then remove grommets from master cylinder sub-assembly body.
 2. Remove master cylinder front and rear pressure sensors.

Assembly

CAUTION:

- **Never use mineral oil such as kerosene or gasoline during the cleaning and assembly process.**
 - **Do not drop parts. If a part is dropped, do not use it.**
1. Apply brake fluid or rubber grease to new grommets, then insert into master cylinder sub-assembly. Refer to [BR-46](#).
- CAUTION:**
- **Do not reuse grommet.**
2. Install reservoir tank onto master cylinder assembly.
 3. Install master cylinder front and rear pressure sensors.

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FRONT DISC BRAKE

< DISASSEMBLY AND ASSEMBLY >

FRONT DISC BRAKE

Disassembly and Assembly of Brake Caliper

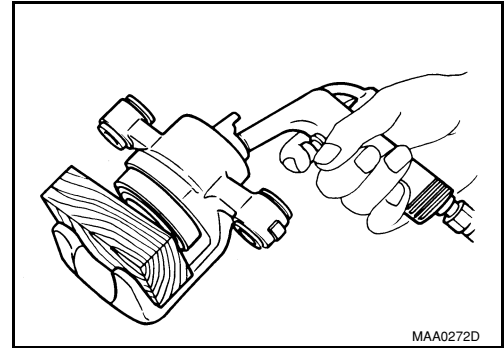
INFOID:000000001531290

DISASSEMBLY

1. Remove sliding pin bolt, and then remove the pad, shim, shim cover, and pad retainer from the torque member.
2. Remove sliding pins and sliding pin boots from torque member.
3. Place a wooden block as shown, and blow air from union bolt mounting hole to remove pistons and piston boots.

CAUTION:

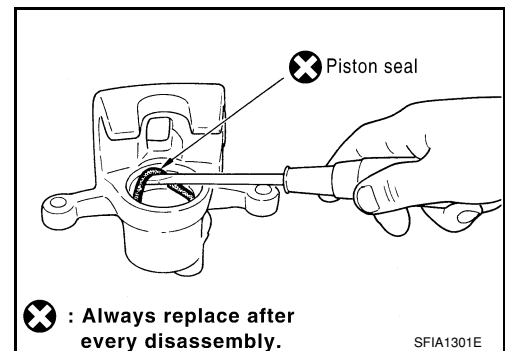
Do not get your fingers caught in piston.



4. Using a flat-bladed screwdriver, remove piston seal from cylinder body.

CAUTION:

Be careful not to damage cylinder inner wall.



CALIPER INSPECTION

Cylinder Body

CAUTION:

- Use new brake fluid for cleaning. Do not use mineral oils such as gasoline or kerosene.
- Check inside surface of cylinder for score, rust, wear, damage or foreign materials. If any of the above conditions are observed, replace cylinder body.
- Minor damage from rust or foreign materials may be eliminated by polishing surface with a fine emery paper. Replace cylinder body if necessary.

Torque Member

Check for wear, cracks, and damage. If damage or deformation is present, replace the affected part.

Piston

Check piston for score, rust, wear, damage or presence of foreign materials. Replace if any of the above conditions are observed.

CAUTION:

Piston sliding surface is plated, do not polish with emery paper even if rust of foreign materials are stuck to sliding surface.

Sliding Pins, and Sliding Pin Boots

Check sliding pin and sliding pin boot for wear, damage, and cracks. If damage or deformation is present, replace the affected part.

CAUTION:

Trailing/upper sliding pin must be replaced at each service.

ASSEMBLY

CAUTION:

FRONT DISC BRAKE

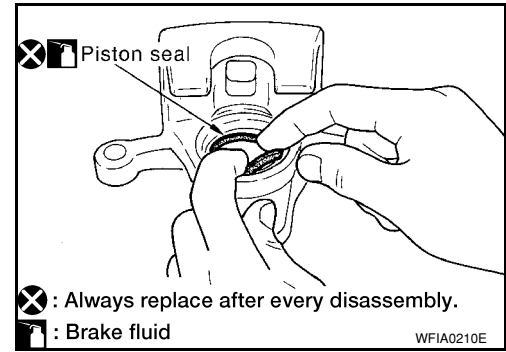
< DISASSEMBLY AND ASSEMBLY >

Do not use NISSAN Rubber Grease (KRE00 00010, KRE00 00010 01) when assembling.

1. Apply clean brake fluid to new piston seal and insert seal in to groove on cylinder body.

CAUTION:

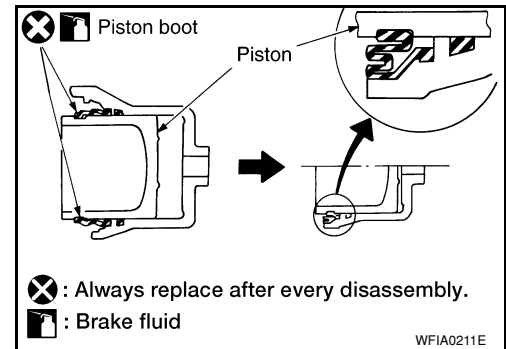
Do not reuse piston seal.



2. Apply clean brake fluid to piston and piston boot, then install piston boot in to piston groove.

CAUTION:

Do not reuse piston boot.



3. Insert into cylinder body by hand and insert piston boot piston-side lip into piston groove.
CAUTION:
Press piston evenly and vary the pressing point to prevent cylinder inner wall from being rubbed.
4. Install sliding pins and sliding pin boots to torque member.
CAUTION:
Trailing/upper sliding pin must be replaced at each service.
5. Install cylinder body. Tighten sliding pin bolt to the specified torque. Refer to [BR-33. "Component"](#).

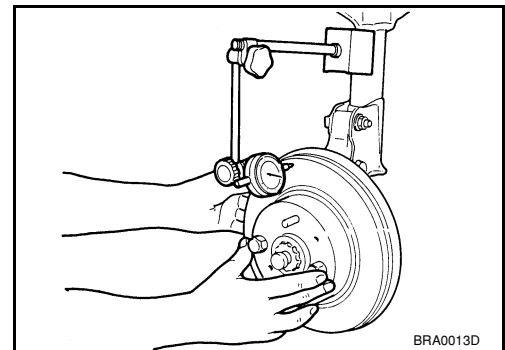
DISC ROTOR INSPECTION

Visual Inspection

Check surface of disc rotor for uneven wear, cracks, and serious damage. If any of them is detected, replace applicable part.

Runout Inspection

1. Using wheel nuts, install disc rotor to wheel hub at 2 or more positions and tighten wheel nuts temporarily to 40 ft-lb.
2. Inspect runout using a dial gauge. (Measured at 10 mm (0.39 in) inside the disc edge.) Refer to [BR-54. "Front Disc Brake"](#).
NOTE:
Make sure that wheel bearing axial end play is within the specifications before measuring runout. Refer to [FAX-5. "On-Vehicle Inspection and Service"](#).
3. If runout is outside the limit, find the minimum runout point by shifting mounting positions of disc rotor and wheel hub by one hole.
4. If runout still out of specification, turn rotor with on-car brake lathe.

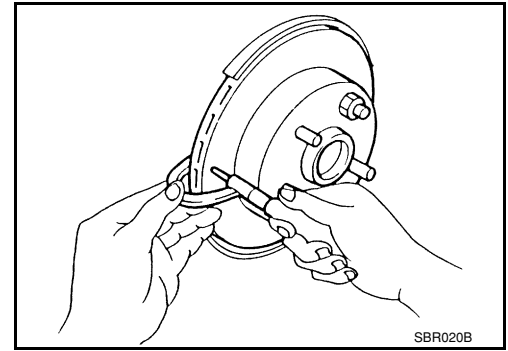


Thickness Inspection

FRONT DISC BRAKE

< DISASSEMBLY AND ASSEMBLY >

Using a micrometer, check thickness of disc rotor. If thickness is either at or below the wear limit, or exceeds maximum uneven wear, replace disc rotor. Refer to [BR-54, "Front Disc Brake"](#).



BRAKE BURNISHING PROCEDURE

Burnish brake contact surface according to the following procedure after refinishing or replacing rotors, after replacing pads, or if a soft pedal occurs at very low mileage.

CAUTION:

Only perform this procedure under safe road and traffic conditions. Use extreme caution.

1. Drive the vehicle on a straight smooth road at 50 km/h (31 MPH).
2. Use medium brake pedal/foot effort to bring the vehicle to a complete stop from 50 km/h (31 MPH). Adjust brake pedal/foot pressure such that vehicle stopping time equals 3 to 5 seconds.
3. To cool brake system, drive the vehicle at 50 km/h (31 MPH) for 1 minute without stopping.
4. Repeat steps 1 to 3, 10 times or more to complete the burnishing procedure.

REAR DISC BRAKE

< DISASSEMBLY AND ASSEMBLY >

REAR DISC BRAKE

Disassembly and Assembly of Brake Caliper

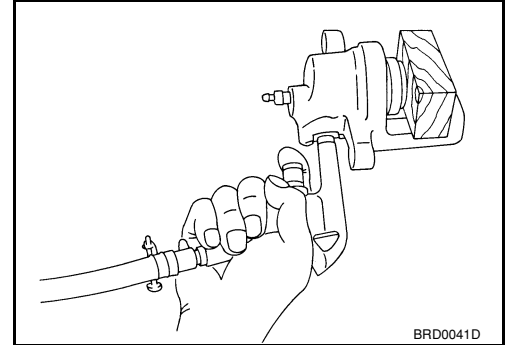
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DISASSEMBLY

1. Remove pads from cylinder body.
2. Remove sliding sleeve and boot from cylinder body.
3. Place a wooden block as shown, and blow air from union bolt mounting hole to remove piston and piston boot.

CAUTION:

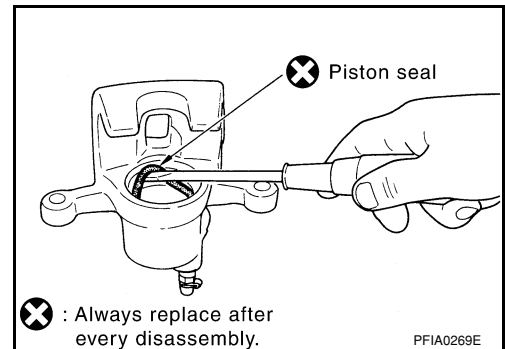
Do not get your fingers caught in piston.



4. Using a flat-bladed screwdriver, remove piston seal from cylinder body.

CAUTION:

Be careful not to damage cylinder inner wall.



CALIPER INSPECTION

Cylinder Body

CAUTION:

- Use new brake fluid to clean. Do not use mineral oils such as gasoline or kerosene.
- Check inside surface of cylinder for score, rust wear, damage or foreign materials. If any of the above conditions are observed, replace cylinder body.
- Minor damage from rust or foreign materials may be eliminated by polishing surface with a fine emery paper. Replace cylinder body if necessary.

Torque Member

Check for wear, cracks, and damage. If damage or deformation is present, replace the affected part.

Piston

CAUTION:

- Piston sliding surface is plated, do not polish with emery paper even if rust or foreign materials are stuck to sliding surface.
- Check piston for score, rust, wear, damage or presence of foreign materials. Replace if any of the above conditions are observed.

Sliding Pin Bolts and Sliding Pin Boots

Make sure there is no wear, damage, or cracks in sliding sleeve and sliding sleeve boots, and if there are, replace them.

ASSEMBLY

CAUTION:

Do not use NISSAN Rubber Grease (KRE00 00010, KRE00 00010 01) when assembling.

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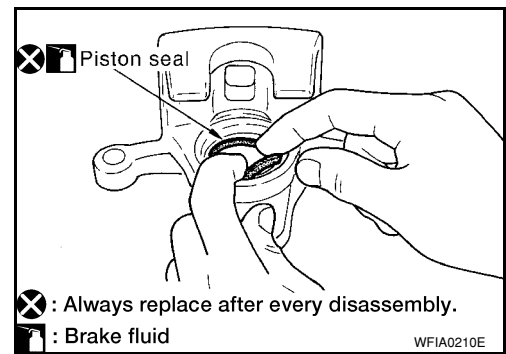
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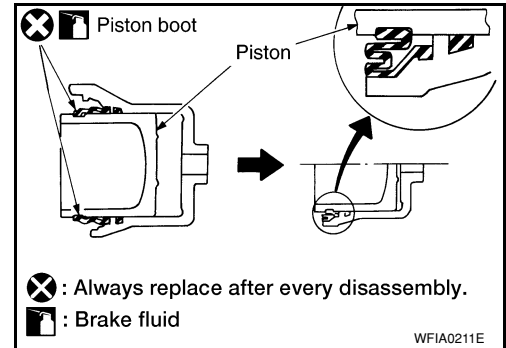
REAR DISC BRAKE

< DISASSEMBLY AND ASSEMBLY >

1. Apply clean brake fluid to new piston seal and insert into groove on cylinder body.
CAUTION:
Do not reuse piston seal.



2. Apply brake fluid to piston and to piston boot, then install piston boot in to piston groove.
CAUTION:
Do not reuse piston boot.



3. Insert piston into cylinder body by hand and insert piston boot piston-side lip into piston groove.
CAUTION:
Press piston evenly and vary the pressing point to prevent cylinder inner wall from being rubbed.
4. Install sliding boots and sleeves to cylinder body.

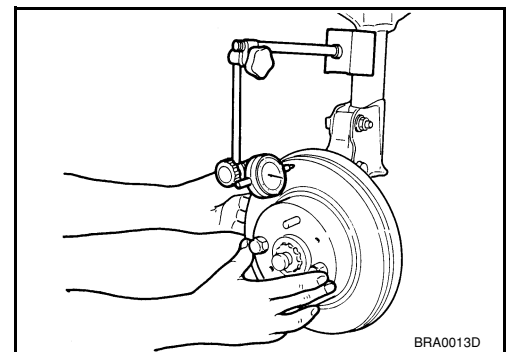
DISC ROTOR INSPECTION

Visual Inspection

Check surface of disc rotor for uneven wear, cracks, and serious damage. If any non-standard condition is detected, replace applicable part.

Runout Inspection

1. Using wheel nuts, install disc rotor to wheel hub at 2 or more positions.
2. Inspect runout using a dial gauge. [Measured at 10 mm (0.39 in) inside disk edge.] Refer to [BR-55. "Rear Disc Brake"](#).
NOTE:
Make sure that wheel bearing axial end play is within the specification before measuring runout. Refer to [RAX-5. "On-Vehicle Inspection and Service"](#).
3. If runout is outside the limit, find the minimum runout point by shifting mounting positions of disc rotor and wheel hub by one hole.
4. If runout still out of specification, turn rotor with on-car brake lathe.

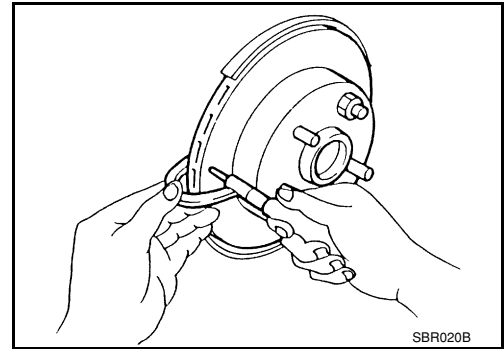


Thickness Inspection

REAR DISC BRAKE

< DISASSEMBLY AND ASSEMBLY >

Using a micrometer, check thickness of disc rotor. If thickness is either at or below the wear limit, or exceeds maximum uneven wear, replace disc rotor. Refer to [BR-55. "Rear Disc Brake"](#).



BRAKE BURNISHING PROCEDURE

Burnish brake contact surface according to the following procedure after refinishing or replacing rotors, after replacing pads, or if a soft pedal occurs at very low mileage.

CAUTION:

Only perform this procedure under safe road and traffic conditions. Use extreme caution.

1. Drive the vehicle on a straight smooth road at 50 km/h (31 MPH).
2. Use medium brake pedal/foot effort to bring the vehicle to a complete stop from 50 km/h (31 MPH). Adjust brake pedal/foot pressure such that vehicle stopping time equals 3 to 5 seconds.
3. To cool brake system, drive the vehicle at 50 km/h (31 MPH) for 1 minute without stopping.
4. Repeat steps 1 to 3, 10 times or more to complete the burnishing procedure.

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

General Specification

INFOID:000000001531292

Unit: mm (in)

Front brake	Brake model	CLZ31VC
	Rotor outer diameter × thickness	350 × 30 (13.80 × 1.2)
	Pad Length × width × thickness	111.0 × 73.5 × 11.88 (4.73 × 2.894 × 0.374)
	Cylinder bore diameter (each)	51 (2.01)
Rear brake	Brake model	AD14VE
	Rotor outer diameter × thickness	320 × 14 (12.60 × 0.6)
	Pad Length × width × thickness	83.0 × 33.0 × 8.5 (3.268 × 1.299 × 0.335)
	Cylinder bore diameter	48 (1.89)
Control valve	Valve model	Electric brake force distribution
Brake booster	Booster model	C215T
	Diaphragm diameter	215 (8.46)
Recommended brake fluid		Refer to MA-10 .

Brake Pedal

INFOID:000000001531293

Brake pedal height (from dash panel top surface)	182.3 – 192.3 mm (7.18 – 7.57 in)
Depressed pedal height [under a force of 490 N (50 kg-f, 110 lb-f) with engine running]	More than 90.3 mm (3.55 in)
Clearance between stopper rubber and the threaded end of stop lamp switch and ASCD cancel switch	0.74 – 1.96 mm (0.029 – 0.077 in)
Pedal play	3 – 11 mm (0.12 – 0.43 in)

When equipped with adjustable pedal, the pedal must be in the forward most (closest to the floor) position for pedal height measurement.

Brake Booster

INFOID:000000001531294

Input rod installation standard dimension	151 mm (5.94 in)
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Check Valve

INFOID:000000001531295

Vacuum leakage [at vacuum of – 66.7 kPa (– 500 mmHg, – 19.69 inHg)]	Within 1.3 kPa (10 mmHg, 0.39 inHg) of vacuum for 15 seconds
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Front Disc Brake

INFOID:000000001531296

Brake model	CLZ31VC	
Brake pad	Standard thickness (new)	11.88 mm (0.468 in)
	Repair limit thickness	1.0 mm (0.039 in)
Disc rotor	Standard thickness (new)	26.0 mm (1.024 in)
	Repair limit thickness	24.5 mm (0.965 in)
	Maximum uneven wear (measured at 8 positions)	0.015mm (0.0006 in)
	Runout limit (with it attached to the vehicle)	0.03 mm (0.001 in)

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

Rear Disc Brake

INFOID:000000001531297

Brake model		AD14VE
Brake pad	Standard thickness (new)	12.13 mm (0.478 in)
	Repair limit thickness	1.0 mm (0.039 in)
Disc rotor	Standard thickness (new)	14.0 mm (0.551 in)
	Repair limit thickness	12.0 mm (0.472 in)
	Maximum uneven wear (measured at 8 positions)	0.015 mm (0.0006 in)
	Runout limit (with it attached to the vehicle)	0.07 mm (0.003 in)

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