

A  
B  
C  
D  
E

# SECTION **BR** BRAKE SYSTEM

## CONTENTS

<p><b>PRECAUTIONS</b> ..... 3</p> <p>    Precautions for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER" ..... 3</p> <p>    Precautions for Brake System ..... 3</p> <p>    Wiring Diagrams and Trouble Diagnosis ..... 3</p> <p><b>PREPARATION</b> ..... 4</p> <p>    Commercial Service Tools ..... 4</p> <p><b>NOISE, VIBRATION, AND HARSHNESS (NVH)</b></p> <p><b>TROUBLESHOOTING</b> ..... 5</p> <p>    NVH Troubleshooting Chart ..... 5</p> <p><b>BRAKE PEDAL</b> ..... 6</p> <p>    Inspection and Adjustment ..... 6</p> <p>    Removal and Installation ..... 7</p> <p>        REMOVAL ..... 7</p> <p>        INSPECTION AFTER REMOVAL ..... 7</p> <p>        INSTALLATION ..... 7</p> <p><b>BRAKE FLUID</b> ..... 8</p> <p>    Checking Brake Fluid Level ..... 8</p> <p>    Changing Brake Fluid ..... 8</p> <p>    Bleeding Brake System ..... 8</p> <p><b>BRAKE PIPING AND HOSE</b> ..... 9</p> <p>    Hydraulic Circuit ..... 9</p> <p>    Front Brake Piping and Hose ..... 9</p> <p>        REMOVAL ..... 9</p> <p>        INSTALLATION ..... 10</p> <p>    Rear Brake Piping and Hose ..... 10</p> <p>        REMOVAL ..... 10</p> <p>        INSTALLATION ..... 11</p> <p>    Inspection ..... 11</p> <p><b>BRAKE MASTER CYLINDER</b> ..... 12</p> <p>    Removal and Installation ..... 12</p> <p>        REMOVAL ..... 12</p> <p>        INSTALLATION ..... 12</p> <p>    Disassembly and Assembly ..... 13</p> <p>        COMPONENTS ..... 13</p> <p>        DISASSEMBLY ..... 13</p> <p>        INSPECTION AFTER REMOVAL ..... 14</p> <p>        ASSEMBLY ..... 14</p> <p><b>BRAKE BOOSTER</b> ..... 15</p>	<p>    On-vehicle Service ..... 15</p> <p>        OPERATING CHECK ..... 15</p> <p>        AIRTIGHT CHECK ..... 15</p> <p>    Removal and Installation ..... 15</p> <p>        REMOVAL ..... 15</p> <p>        INSPECTION AFTER REMOVAL ..... 16</p> <p>        INSTALLATION ..... 16</p> <p><b>VACUUM LINES</b> ..... 17</p> <p>    Removal and Installation ..... 17</p> <p>    Inspection ..... 17</p> <p>    HOSES AND CONNECTORS ..... 17</p> <p>    CHECK VALVE ..... 17</p> <p><b>FRONT DISC BRAKE</b> ..... 18</p> <p>    Component ..... 18</p> <p>    On-vehicle Service ..... 18</p> <p>        INSPECTION ..... 18</p> <p>        PAD REPLACEMENT ..... 19</p> <p>    Removal and Installation ..... 19</p> <p>        REMOVAL ..... 19</p> <p>        INSTALLATION ..... 20</p> <p>    Disassembly and Assembly ..... 20</p> <p>        DISASSEMBLY ..... 20</p> <p>        INSPECTION AFTER DISASSEMBLY ..... 21</p> <p>        ASSEMBLY ..... 22</p> <p>    Brake Burnishing Procedure ..... 23</p> <p><b>REAR DISC BRAKE</b> ..... 24</p> <p>    Component ..... 24</p> <p>    On-vehicle Service ..... 24</p> <p>        INSPECTION ..... 24</p> <p>        PAD REPLACEMENT ..... 25</p> <p>    Removal and Installation ..... 26</p> <p>        REMOVAL ..... 26</p> <p>        INSTALLATION ..... 26</p> <p>    Disassembly and Assembly ..... 27</p> <p>        DISASSEMBLY ..... 27</p> <p>        INSPECTION AFTER DISASSEMBLY ..... 27</p> <p>        ASSEMBLY ..... 28</p> <p>    Brake Burnishing Procedure ..... 28</p> <p><b>DUAL PROPORTIONING VALVE</b> ..... 29</p> <p>    Inspection ..... 29</p>
--	---

BR

G

H

I

J

K

L

M

---

<b>SERVICE DATA AND SPECIFICATIONS (SDS) .....</b>	<b>30</b>	Brake Pedal .....	30
General Specifications .....	30	Control Valve .....	30
Disc Brake .....	30	Brake Booster .....	30

# PRECAUTIONS

## PRECAUTIONS

PFP:00001

### Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

EFS0024Y

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. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

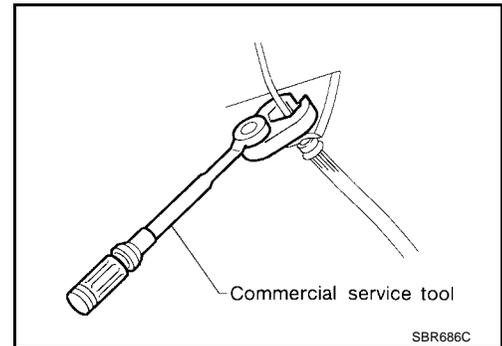
#### WARNING:

- 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 SRS 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.

### Precautions for Brake System

EFS0024Z

- Recommended fluid is brake fluid “DOT 3”.
- Never 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.
- Never 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 tighten brake lines to specified torque when installing.
- 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-28](#) (Front disc brake) and [BR-23](#) (Rear disc brake) for brake burnishing procedure.



#### WARNING:

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

### Wiring Diagrams and Trouble Diagnosis

EFS00250

When you read wiring diagrams, refer to the following:

- Refer to [GI-12, "How to Read Wiring Diagrams"](#) .
- Refer to [PG-3, "POWER SUPPLY ROUTING CIRCUIT"](#) for power distribution circuit.

When you perform trouble diagnosis, refer to the following:

- Refer to [GI-10, "HOW TO FOLLOW TEST GROUPS IN TROUBLE DIAGNOSES"](#) .
- Refer to [GI-25, "How to Perform Efficient Diagnosis for an Electrical Incident"](#) .
- For trouble diagnoses of models with ABS, refer to [BRC-8, "TROUBLE DIAGNOSIS"](#) .
- For trouble diagnoses of models with TCS even if the diagnostic items are related to the ABS system, refer to [BRC-52, "TROUBLE DIAGNOSIS"](#) .

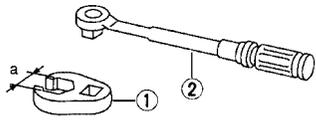
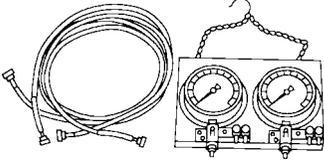
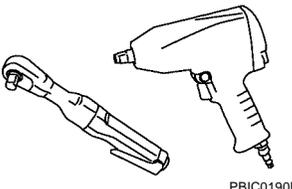
# PREPARATION

## PREPARATION

PFP:00002

### Commercial Service Tools

EFS00251

Tool name	Description
<p>1 Flare nut crowfoot 2 Torque wrench</p>  <p>S-NT360</p>	<p>Removing and installing each brake piping <b>a: 10 mm (0.39 in)</b></p>
<p>Brake fluid pressure gauge</p>  <p>NT151</p>	<p>Measuring brake fluid pressure</p>
<p>Power tool</p>  <p>PBIC0190E</p>	<p>Loosening bolts and nuts</p>

# NOISE, VIBRATION, AND HARSHNESS (NVH) TROUBLESHOOTING

## NOISE, VIBRATION, AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

### NVH Troubleshooting Chart

EFS00252

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

Reference page			<a href="#">BR-18, BR-24</a>	<a href="#">BR-18, BR-24</a>	<a href="#">BR-18, BR-24</a>	<a href="#">BR-21, BR-27</a>	<a href="#">BR-18, BR-24</a>	<a href="#">BR-21, BR-27</a>	<a href="#">BR-21, BR-27</a>	<a href="#">BR-21, BR-27</a>	<a href="#">BR-23, BR-28</a>	<a href="#">BR-18, BR-24</a>	<a href="#">FAX-4</a>	<a href="#">FAX-4</a>	<a href="#">FSU-4, RSU-4</a>	<a href="#">WT-2</a>	<a href="#">WT-2</a>	<a href="#">PS-5</a>	
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	DRIVE SHAFT	AXLE	SUSPENSION	TIRES	ROAD WHEEL	STEERING	
Symptom	BRAKE	Noise	X	X	X								X	X	X	X	X	X	
		Shake				X								X	X	X	X	X	X
		Shimmy, Judder				X	X	X	X	X	X	X		X	X	X	X	X	X

X: Applicable

A  
B  
C  
D  
E  
**BR**  
G  
H  
I  
J  
K  
L  
M

# BRAKE PEDAL

PF:46501

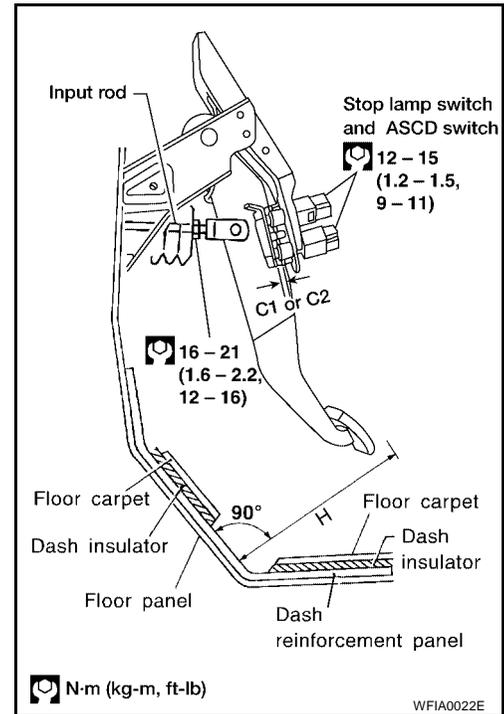
EFS00253

## BRAKE PEDAL

### Inspection and Adjustment

Inspect the brake pedal free height "H" from dash reinforcement panel. Adjust if necessary.

Free height "H"	Refer to <a href="#">BR-30, "Brake Pedal"</a> .	
Clearance between pedal stopper and threaded end of stop lamp switch and ASCD switch "C1, C2"	0.74 - 1.96 mm (0.0291 - 0.0772 in)	
Pedal height (with engine running, brake pedal force 490 N {50 kgf, 110 lbf}) "H2"	M/T vehicle	: More than 84 mm (3.31 in)
	A/T vehicle	: More than 90.3 mm (3.55 in)
Pedal play "A"	3 - 11 mm (0.12 - 0.43 in)	



1. Loosen the stop lamp switch and ASCD switch (if equipped) by turning 45° counterclockwise.
2. 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 : 16 - 21 N-m (1.6 - 2.2 kg-m, 12 - 16 ft-lb)**

3. With the pedal pulled up and held by hand, press the stop lamp switch and the ASCD switch (if equipped) in until threaded ends contact rubber stops.
4. With the threaded ends of the stop lamp switch and ASCD switch (if equipped) contacting the rubber stops, turn the switches 45° clockwise to lock in place.

**CAUTION:**

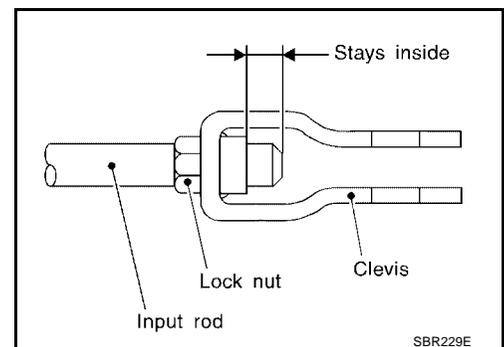
**Make sure that the gap (C<sup>1</sup>, C<sup>2</sup>) between the rubber stops and switch ends are within specification.**

5. Check the pedal play.

**CAUTION:**

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

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



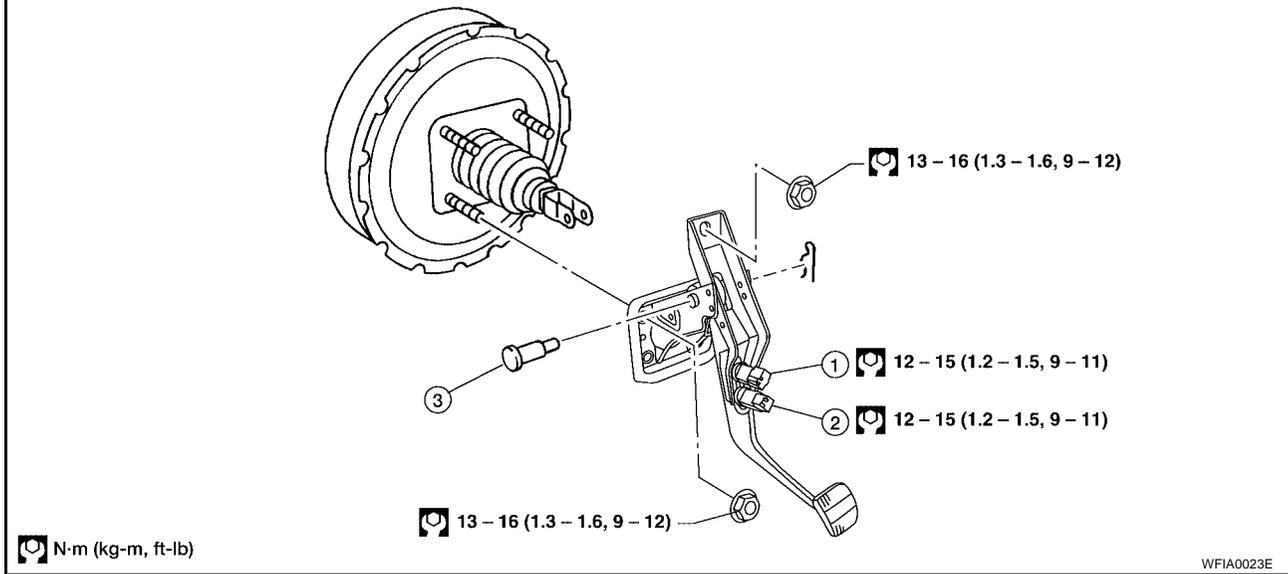
SBR229E

# BRAKE PEDAL

## Removal and Installation

EFS00254

SEC. 465 • 470



1. ASCD cancel switch

2. Stop lamp switch

3. Clevis pin

### REMOVAL

#### **WARNING:**

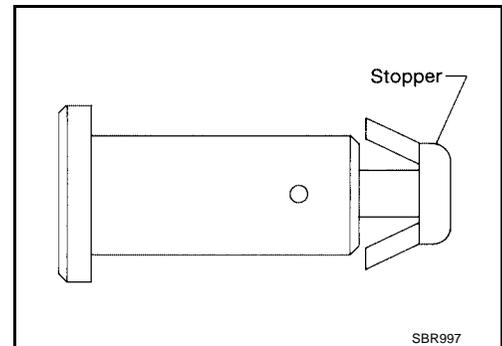
**Do not deform the brake tube.**

1. Remove the instrument lower cover on driver side. Refer to [IP-12, "Driver Lower Instrument Panel"](#) .
2. Remove the stop lamp switch from the pedal assembly.
3. Remove ASCD switch (if equipped) from pedal assembly.
4. Remove snap pin and clevis pin from the clevis of brake booster.
5. Remove mounting nuts from the pedal assembly, then carefully remove the brake booster from the bulkhead so as not to damage the brake tubes.
6. Remove the steering column assembly from the steering member.
7. Pushing down the pedal assembly to the right, remove it from the vehicle while keeping the steering post bracket stay out.

### 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

- Installation is in the reverse order of removal.
- After installing the brake pedal assembly in the vehicle, be sure to adjust it. Refer to [BR-6, "Inspection and Adjustment"](#) .

# BRAKE FLUID

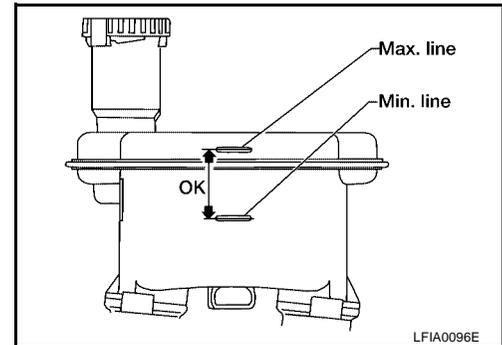
## BRAKE FLUID

PPF:KN100

### Checking Brake Fluid Level

EFS00257

- Check fluid level in reservoir tank. It should be between Max and Min lines on reservoir tank.
- Visually check around the reservoir tank for leaks.
- If fluid level is extremely low, check brake system for leaks.
- Release parking brake lever and see if brake warning lamp goes off. If not, check brake system for leaks.



### Changing Brake Fluid

EFS00255

#### CAUTION:

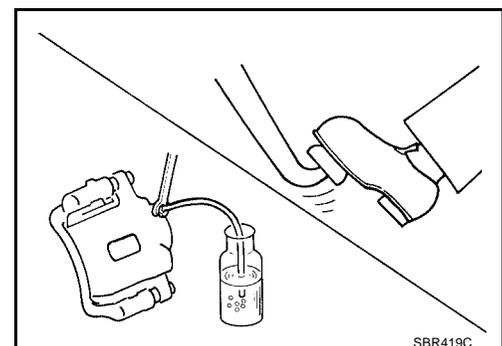
- Refill with new brake fluid "DOT 3".
  - Always keep fluid level higher than minimum line on reservoir tank.
  - Never reuse drained brake fluid.
  - Be careful not to splash brake fluid on painted areas; it may cause paint damage. If brake fluid is splashed on painted areas, wash it away with water immediately.
1. Connect a vinyl tube and container to the air bleeder.
  2. Depressing the brake pedal, drain the brake fluid gradually from the air bleeder of each wheel.
  3. Turn the ignition switch to OFF and disconnect the ABS actuator and control unit connector.
  4. Clean inside of reservoir tank, and refill with new brake fluid.
  5. Loosen the air bleeder, depress the pedal slowly to the full stroke and then release it. Repeat the procedure every 2 or 3 seconds until the new brake fluid comes out, then close the air bleeder while depressing the pedal.
- Refer to [BR-8. "Bleeding Brake System"](#) .

### Bleeding Brake System

EFS00256

#### CAUTION:

- Carefully monitor brake fluid level at master cylinder during bleeding operation.
  - Fill reservoir with new brake fluid "DOT 3". Make sure it is full at all times while bleeding air out of system.
  - Place a container under master cylinder to avoid spillage of brake fluid.
  - Do not loosen the connecting portion of the actuator during air bleeding.
1. For models with ABS, turn ignition switch OFF and disconnect ABS actuator and control unit connectors or battery ground cable.
  2. Connect a transparent vinyl tube and container to air bleeder valve.
  3. Fully depress brake pedal several times.
  4. With brake pedal depressed, open air bleeder valve to release air.
  5. Close air bleeder valve.
  6. Release brake pedal slowly.
  7. Tighten air bleeder valve to specification.  
**Air bleeder valve : 7 - 9 N·m (0.7 - 0.9 kg·m, 61 - 78 in·lb)**
  8. Repeat steps 2. through 7. until no more air bubbles come out of air bleeder valve.
  9. Bleed the brake hydraulic system air bleeder valves in the following order:  
**Right rear brake → Left front brake → Left rear brake → Right front brake**



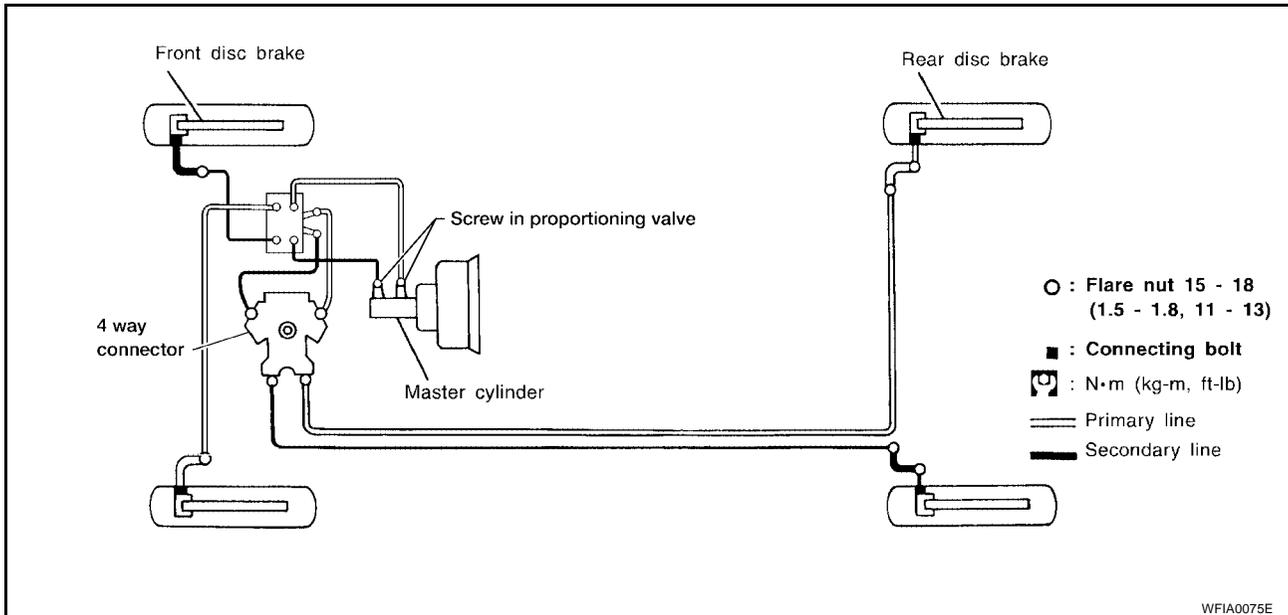
# BRAKE PIPING AND HOSE

## BRAKE PIPING AND HOSE

PFP:46210

### Hydraulic Circuit

EFS00258



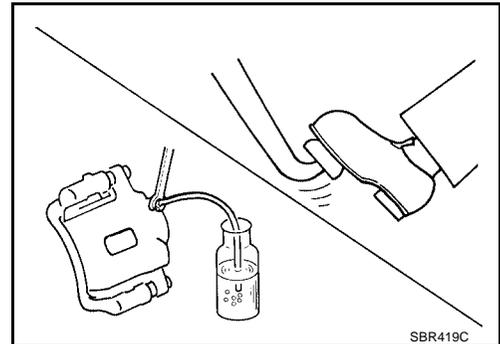
### Front Brake Piping and Hose REMOVAL

EFS00259

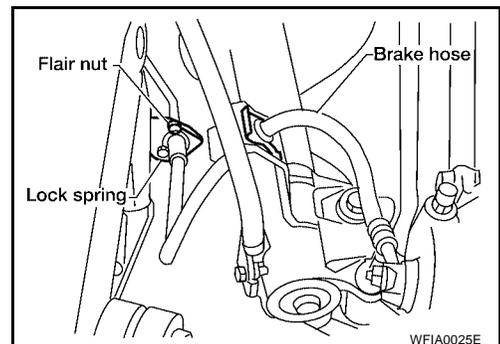
#### CAUTION:

- 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.
- All hoses must be free from excessive bending, twisting and pulling.
- Cover the open end of lines and hoses when disconnecting to prevent entrance of dirt.

1. Connect vinyl tube and container to air bleeder valve.
2. Drain brake fluid from each air bleeder valve by depressing brake pedal.



3. Remove the flare nut connecting the brake tube and hose, then withdraw the lock spring.
4. Remove the connecting bolt and disconnect the brake hose from the caliper assembly.
5. Remove lock springs from the mounting portion of the brake tube and the mounting portion of the strut.



# BRAKE PIPING AND HOSE

## INSTALLATION

### CAUTION:

- Refill with new brake fluid "DOT 3".
  - Never reuse drained brake fluid.
1. Attach the brake hose to the caliper assembly, then temporarily tighten the connecting bolt by hand.

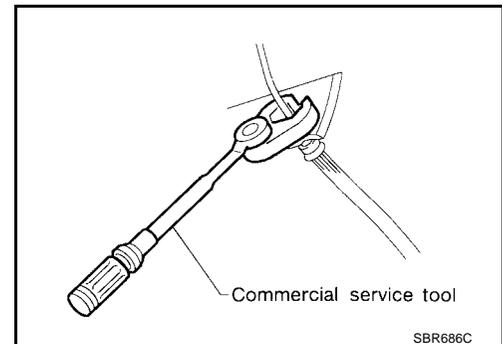
### CAUTION:

- Correctly attach the brake hose to the cylinder body.
  - The copper washers of the connecting bolt have to be replaced with new ones every time the fitting is disconnected.
2. Attach the brake hose to the strut, then secure it with a lock spring.
  3. Attach the brake hose to the brake tube and temporarily tighten the flare nut as much as possible by hand, then secure it with a lock spring.
  4. Tighten all flare nuts and connecting bolts.

**Flare nut** : 5 - 18 N·m (1.5 - 1.8 kg·m,  
11 - 13 ft·lb)

**Connecting bolt** : 17 - 20 N·m (1.7 - 2.0 kg·m,  
12 - 14 ft·lb)

5. Refill until new brake fluid comes out of each air bleeder valve.
6. Bleed air. Refer to [BR-8, "Bleeding Brake System"](#).



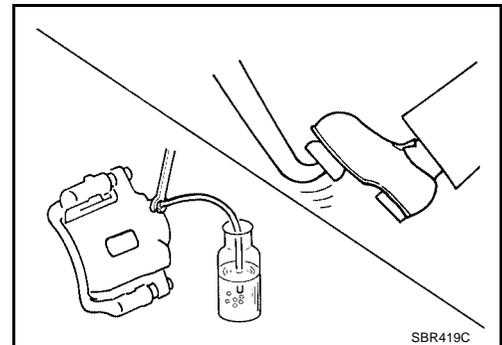
EFS0025A

## Rear Brake Piping and Hose REMOVAL

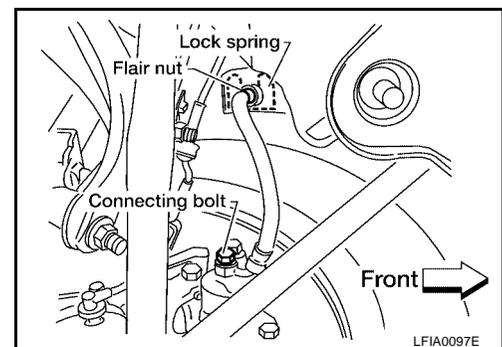
### CAUTION:

- 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.
- All hoses must be free from excessive bending, twisting and pulling.
- Cover the open end of lines and hoses when disconnecting to prevent entrance of dirt.

1. Connect vinyl tube and container to air bleeder valve.
2. Drain brake fluid from each air bleeder valve by depressing brake pedal.



3. Remove flare nut connecting brake tube and hose, then withdraw lock spring.
4. Remove connecting bolt and disconnect brake hose from caliper assembly.



# BRAKE PIPING AND HOSE

## INSTALLATION

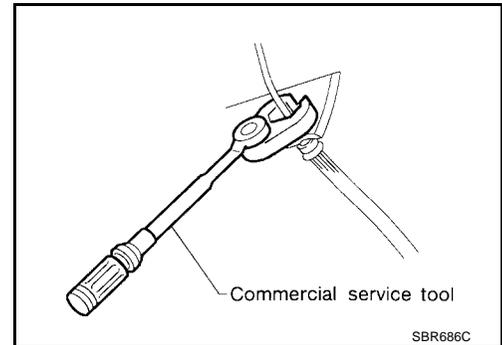
### CAUTION:

- Refill with new brake fluid "DOT 3".
  - Never reuse drained brake fluid.
1. Attach the brake hose to the brake tube and temporarily tighten the flare nut as much as possible by hand.
  2. Attach the brake hose with a lock spring, then tighten the connecting bolt to the specified torque. Tighten the flare nut with a torque wrench to the specified torque.

**Flare nut** : 5 - 18 N·m (1.5 - 1.8 kg·m, 11 - 13 ft·lb)

**Connecting bolt** : 17 - 20 N·m (1.7 - 2.0 kg·m, 12 - 14 ft·lb)

3. Refill until new brake fluid comes out of each air bleeder valve.
4. Bleed air from the brake system. Refer to [BR-8, "Bleeding Brake System"](#).



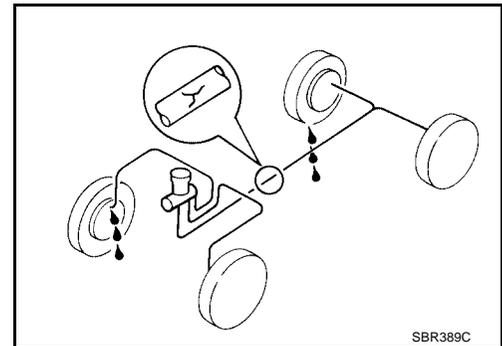
EFS0025B

## Inspection

### CAUTION:

**If leakage occurs around hose and tube connections, retighten or, if necessary, replace damaged parts.**

1. Check brake lines (tubes and hoses) for leaks, cracks, distortion, deformation, without interfering with other parts or loosening connecting parts, deterioration or other damage. Replace any damaged parts.
2. Apply a stepping force of 784 N (80 kgf, 176 lbf) to the brake pedal with the engine running and keep it for about 5 seconds, then check each part for leaks.



# BRAKE MASTER CYLINDER

## BRAKE MASTER CYLINDER

PF0:46010

### Removal and Installation

EFS0025C

#### 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

1. Connect a vinyl tube and container to air bleeder valve.
2. Drain brake fluid from each air bleeder valve by depressing brake pedal to empty fluid from the master cylinder. Remove the harness connector of the brake fluid master cylinder level sensor.
3. Remove brake pipe flare nuts.
4. Remove master cylinder mounting nuts.

#### INSTALLATION

#### CAUTION:

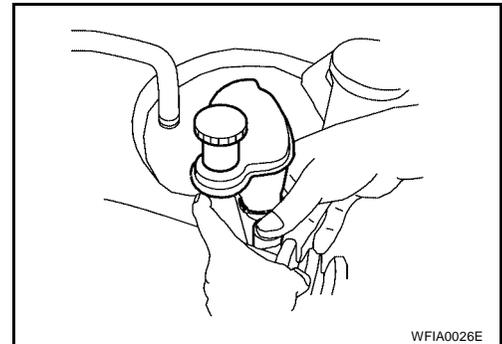
- Refill with new brake fluid "DOT 3".
  - Never reuse drained brake fluid.
1. Place master cylinder onto brake booster and tighten mounting nuts by hand.
  2. Tighten the master cylinder mounting nuts to specification.

**Master cylinder : 12 - 15 N·m (1.2 - 1.5 kg·m, 9 - 11 ft·lb)**

3. Fill the reservoir tank with new brake fluid.
4. Plug all ports on master cylinder with fingers to prevent air suction while releasing brake pedal.
5. Have driver depress brake pedal slowly several times until no air comes out of master cylinder.
6. Install the brake lines to master cylinder.
7. Tighten flare nuts to specification.

**Flare nuts : 15 - 18 N·m (1.5 - 1.8 kg·m, 11 - 13 ft·lb)**

8. Bleed air from the brake system. Refer to [BR-8, "Bleeding Brake System"](#).

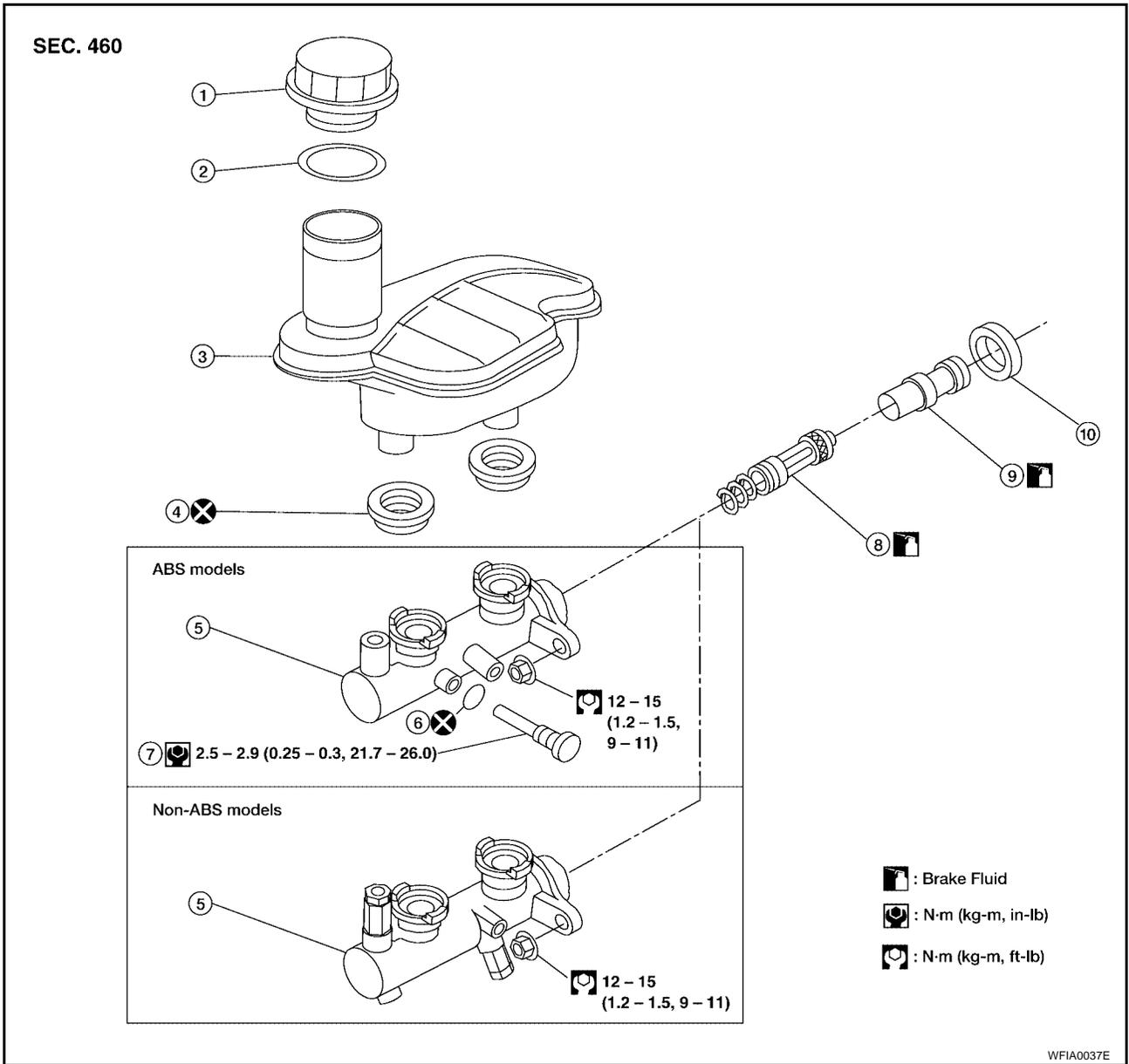


WFIA0026E

# BRAKE MASTER CYLINDER

EFS0025D

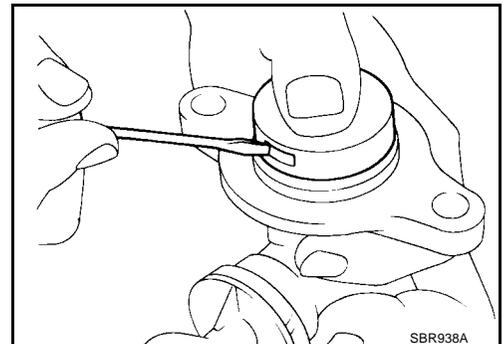
## Disassembly and Assembly COMPONENTS



- |                   |                              |                            |
|-------------------|------------------------------|----------------------------|
| 1. Reservoir cap  | 2. O-ring                    | 3. Reservoir tank          |
| 4. Seal           | 5. Cylinder body             | 6. O-ring                  |
| 7. Piston stopper | 8. Secondary piston assembly | 9. Primary piston assembly |
| 10. Stopper cap   |                              |                            |

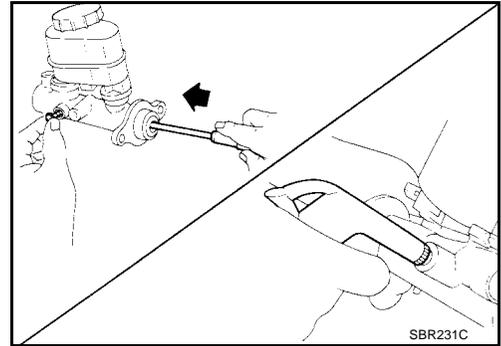
### DISASSEMBLY

1. Bend claws of stopper cap outward.



# BRAKE MASTER CYLINDER

2. Remove piston stopper while piston is pushed into cylinder.
3. Remove piston assemblies.  
If it is difficult to remove secondary piston assembly, gradually apply compressed air through fluid outlet.
4. Remove the reservoir tank.



## INSPECTION AFTER REMOVAL

### Master Cylinder Inner Wall

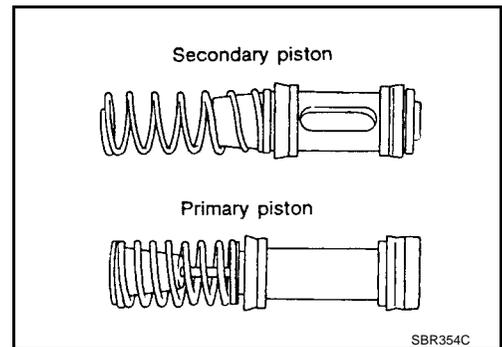
- Check the inner wall of the cylinder for damage, abrasion, corrosion and pin holes. If defective, replace the master cylinder.

### Piston

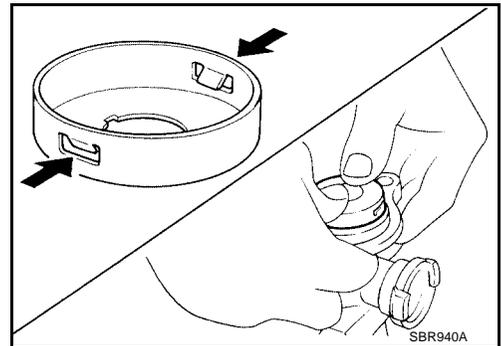
- Check for deformation of or scratches on piston cups.

## ASSEMBLY

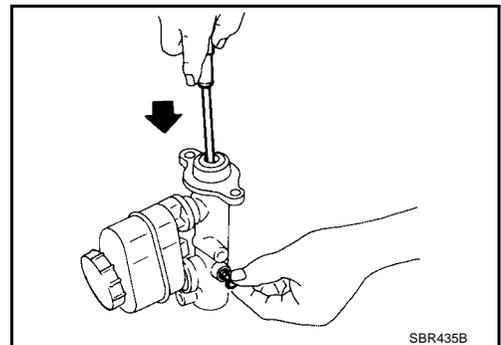
1. Insert secondary piston assembly. Then insert primary piston assembly.
  - Pay attention to alignment of secondary piston slit with piston stopper mounting hole of cylinder body.



2. Install stopper cap.  
Before installing stopper cap, ensure that claws are bent inward.



3. Push reservoir tank seals into cylinder body.
4. Push reservoir tank into cylinder body.
5. Install piston stopper while piston is pushed into cylinder.



# BRAKE BOOSTER

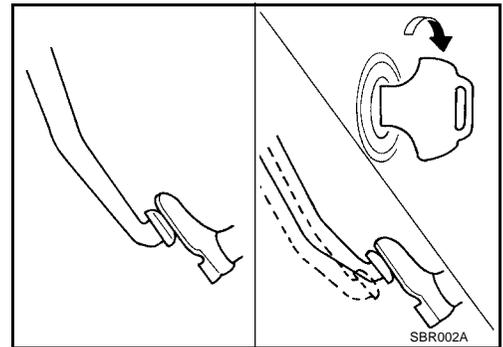
PFP:47200

EFS0025E

## BRAKE BOOSTER

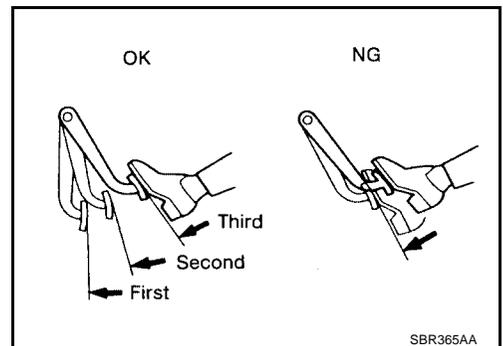
### On-vehicle Service OPERATING CHECK

1. Stop engine and depress brake pedal several times. Check that pedal stroke does not change.
2. Depress brake pedal, then start engine. If pedal goes down slightly, operation is normal.



### AIRTIGHT CHECK

- Start engine, and stop it after one or two minutes. Depress brake pedal several times slowly. The pedal should go further down the first time, and then it should gradually rise thereafter.
- 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.

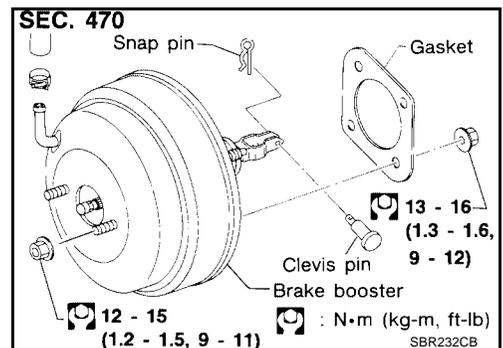


## Removal and Installation

### 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.
- Be careful not to deform or bend brake pipes during removal of booster.
- Replace clevis pin if damaged.
- Refill with new brake fluid "DOT 3".
- Never reuse drained brake fluid.
- Take care not to damage brake booster mounting bolt thread when installing. Due to the acute angle of installation, the threads can be damaged with the dash panel.



1. Remove the vacuum pipe from the brake booster.
2. Remove the master cylinder. Refer to [BR-12. "REMOVAL"](#).
3. Remove snap pin and clevis pin from clevis, then remove the input rod from the brake pedal.
4. Remove the mounting nuts from the brake booster and the brake pedal assembly.
5. Remove the booster assembly from the engine compartment.

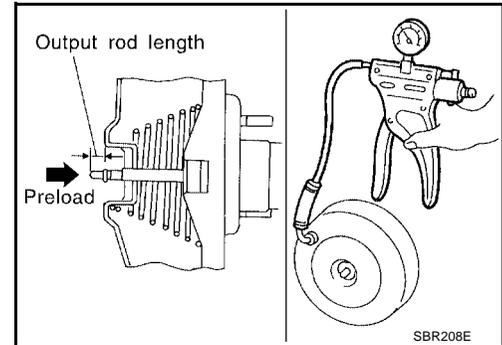
# BRAKE BOOSTER

## INSPECTION AFTER REMOVAL

### Output Rod Length Check

1. Apply vacuum of  $-66.7$  kPa ( $-500$  mmHg,  $-19.69$  inHg) to brake booster with a hand vacuum pump.
2. Add preload of  $19.6$  N ( $2$  kg,  $4.4$  lb) to output rod.
3. Check output rod length.

**Specified length : 10.275 - 10.525 mm  
(0.4045 - 0.4144 in)**



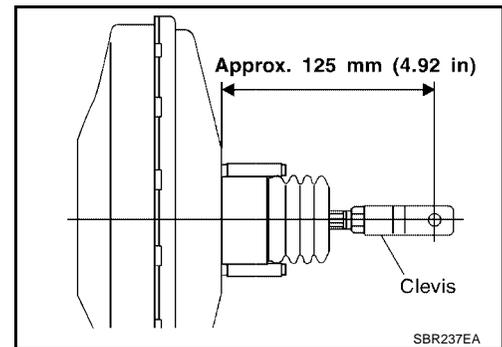
## INSTALLATION

1. Adjust the length of the input rod by loosening the lock nut so that the dimensions shown match the standard value.

**Standard value : 125 mm (4.92 in)**

2. Tighten the lock nut temporarily and install the booster assembly in the vehicle.
3. Connect the brake pedal to the clevis of the input rod.
4. Tighten the mounting nut for the brake pedal assembly to the specified torque.

**Brake pedal assembly : 13 - 16 N·m (1.3 - 1.6 kg·m,  
9 - 12 ft·lb)**



5. Install the master cylinder on the booster assembly. Refer to [BR-12, "INSTALLATION"](#).
6. Adjust the height and play of the brake pedal. Refer to [BR-6, "Inspection and Adjustment"](#).
7. Tighten the lock nut of the input rod to the specified torque.

**Input rod lock nut : 16 - 21 N·m (1.6 - 2.2 kg·m,  
12 - 15 ft·lb)**

8. Bleed air from brake system. Refer to [BR-8, "Bleeding Brake System"](#).

# VACUUM LINES

PFP:41920

## VACUUM LINES

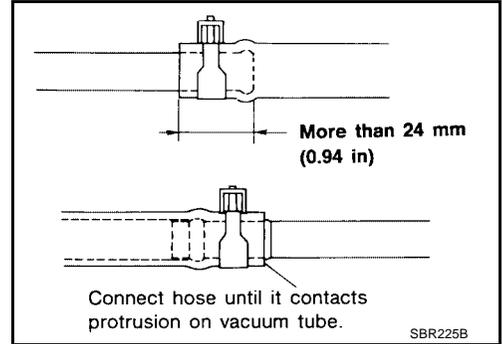
### Removal and Installation

EFS0025G

#### CAUTION:

When installing vacuum hose, pay attention to the following points.

- Do not apply any oil or lubricants to vacuum hose with check valve.
- Insert vacuum tube into vacuum hose as shown.
- Install vacuum hose with internal check valve, noting that arrow on hose indicates engine side.



### Inspection

#### HOSES AND CONNECTORS

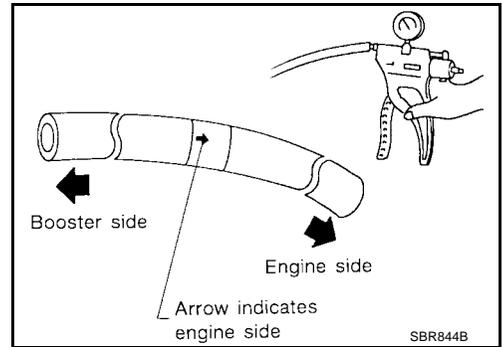
EFS0025H

Check vacuum hose and connections for airtightness, improper attachment, chafing and deterioration. Repair or replace as necessary.

#### CHECK VALVE

Check vacuum with a vacuum pump.

Connect to booster side	Vacuum should exist
Connect to engine side	Vacuum should not exist



A  
B  
C  
D  
E  
BR  
G  
H  
I  
J  
K  
L  
M

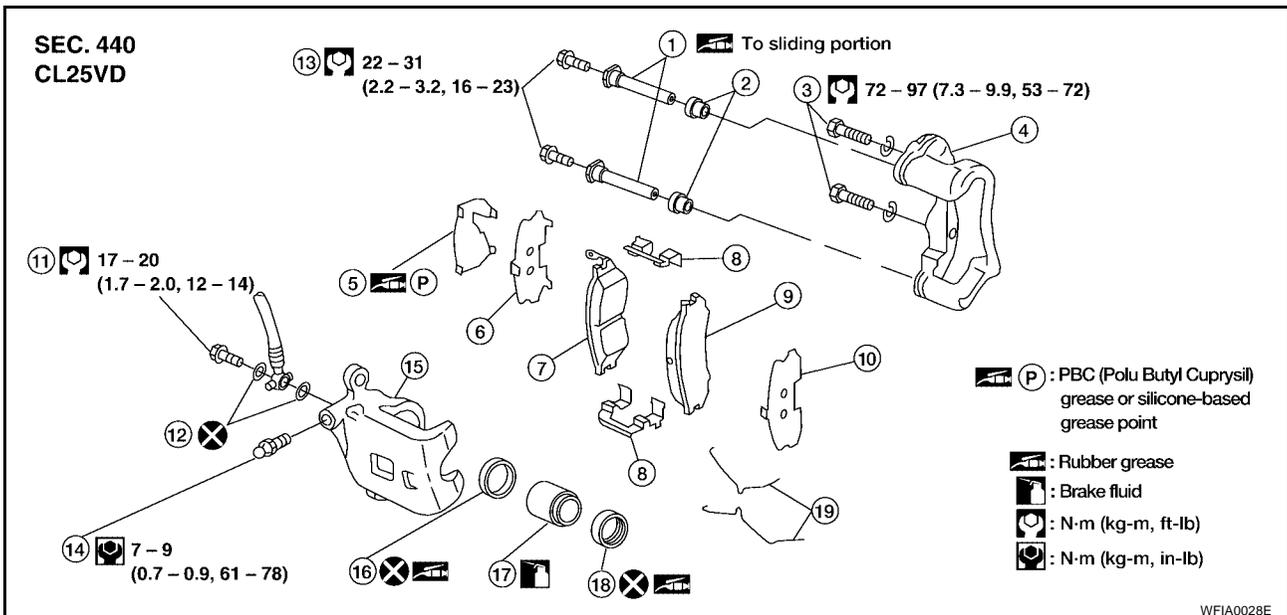
# FRONT DISC BRAKE

## FRONT DISC BRAKE

PFP:41000

### Component

EFS0025I



- |                       |                     |                              |
|-----------------------|---------------------|------------------------------|
| 1. Main pin           | 2. Pin boot         | 3. Torque member fixing bolt |
| 4. Torque member      | 5. Shim cover       | 6. Inner shim                |
| 7. Inner pad          | 8. Pad retainer     | 9. Outer pad                 |
| 10. Outer shim        | 11. Connecting bolt | 12. Copper washer            |
| 13. Main pin bolt     | 14. Bleed valve     | 15. Cylinder body            |
| 16. Piston seal       | 17. Piston          | 18. Piston boot              |
| 19. Pad return spring |                     |                              |

### WARNING:

Clean brake pads with a vacuum dust collector to minimize the hazard of airborne particles or other materials.

### CAUTION:

- When cylinder body is open, do not depress the brake pedal because the piston will pop out.
- It is not necessary to remove connecting bolt except for disassembly or replacement of caliper assembly. In this case, suspend cylinder body with wire so as not to stretch brake hose.
- Be careful not to damage piston boot or get oil on rotor. Always replace shims when replacing pads.
- Burnish the brake contact surfaces after refinishing or replacing rotors, after replacing pads, or if a soft pedal occurs at very low mileage.  
Refer to [BR-23. "Brake Burnishing Procedure"](#) .

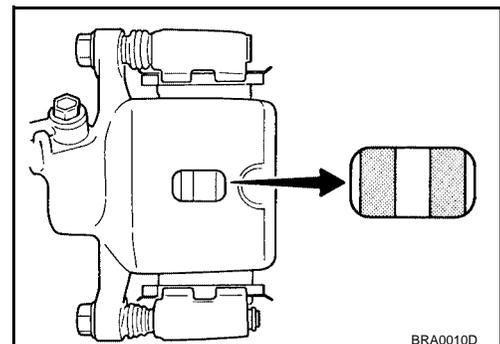
## On-vehicle Service INSPECTION

EFS0028M

### Pad Thickness

- Remove a wheel with the vehicle lifted up, and then check the thickness of the pad from the inspection hole of the cylinder body. If necessary, check it with a micrometer.

**Standard pad thickness : 11 mm (0.43 in)**  
**Pad wear limit : 2.0 mm (0.079 in)**

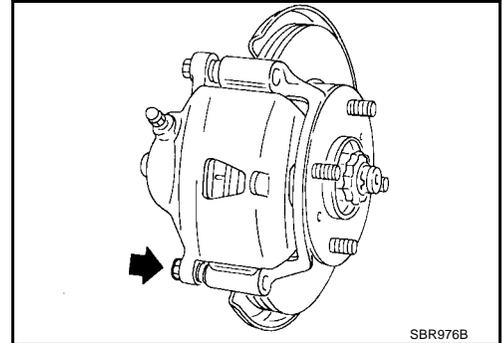


# FRONT DISC BRAKE

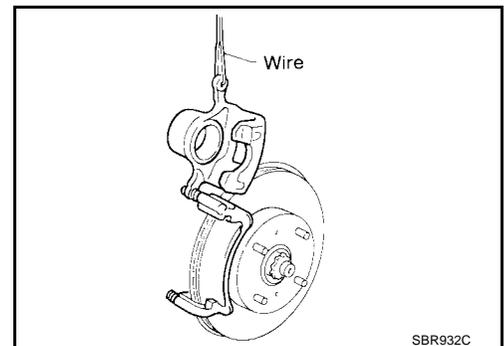
## PAD REPLACEMENT

### Removal

- If shims are rusted or show peeling of the rubber coat, replace them with new shims.
  - Whenever the brake pads are replaced, the inner shim, the outer shim and the shim cover have to be replaced as a set.
1. Remove master cylinder reservoir cap.
  2. Remove pin bolt, using power tool.



3. Suspend the cylinder body with wire. Then remove pads with retainers, inner and outer shims and pad return springs.



### Installation

1. Attach the inner shim and shim cover to the inner pad and attach the outer shim to the outer pad.
2. Apply grease to the contact surface of pad retainer with the pads, then attach the pad retainer, pads and pad return spring to the torque member.
3. Install the cylinder body to the torque member.
4. Insert a main pin bolt (on the lower side) and tighten it to specification. Refer to [BR-18, "Component"](#).
5. Check the brakes for drag.

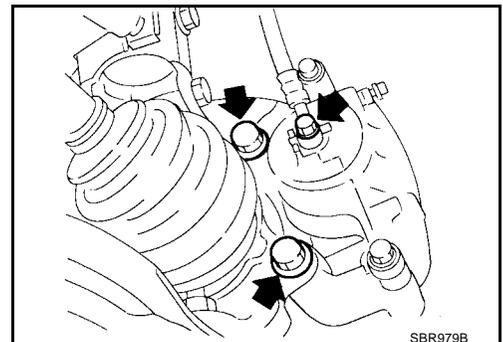
### CAUTION:

**Burnish the brake contact surfaces after refinishing or replacing brake rotors, after replacing pads, or if a soft pedal occurs at very low mileage. Refer to [BR-23, "Brake Burnishing Procedure"](#).**

## Removal and Installation

### REMOVAL

1. Connect the vinyl tube and container to the air bleeder.
2. Depress the brake pedal and drain the brake fluid gradually from the air bleeder.
3. Remove connecting bolt and torque member fixing bolts.
4. Remove the brake caliper, using power tool.
5. Remove brake rotor.



EFS0025L

# FRONT DISC BRAKE

## INSTALLATION

### CAUTION:

- Refill with new brake fluid "DOT 3".
  - Never reuse drained brake fluid.
1. Install brake rotor.
  2. Install the brake caliper and tighten main pin bolt to specification. Refer to [BR-18, "Component"](#) .

### CAUTION:

When installing the caliper assembly in the vehicle, wipe oil from the seating surface of the knuckle spindle washer and the mounting surface of the caliper assembly.

3. Install brake hose to caliper and tighten connecting bolt to specification. Refer to [BR-18, "Component"](#) .

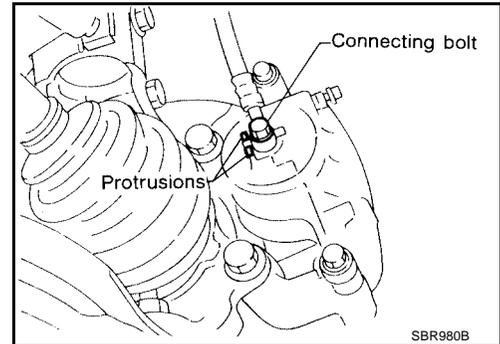
### CAUTION:

- The copper washer of the connecting bolt has to be replaced every time the fitting is disconnected.
- Correctly attach the brake hose to the projecting portion of the cylinder body.

4. Bleed air from brake system. Refer to [BR-8, "Bleeding Brake System"](#) .

### CAUTION:

Burnish the brake contact surfaces after refinishing or replacing brake rotors, after replacing pads, or if a soft pedal occurs at very low mileage. Refer to [BR-23, "Brake Burnishing Procedure"](#) .



## Disassembly and Assembly

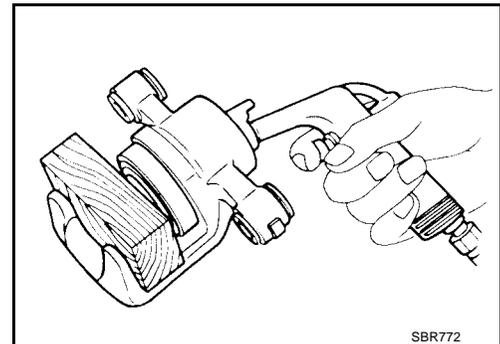
### DISASSEMBLY

EFS0025M

1. Push out piston with piston boot using compressed air.

### WARNING:

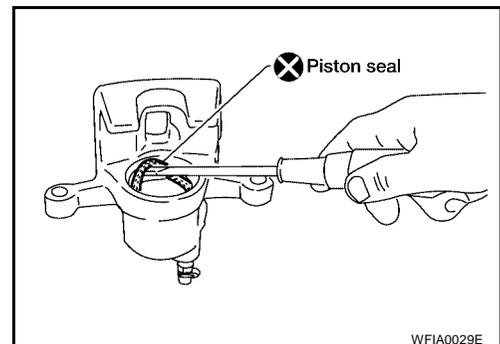
Do not place your fingers in front of piston.



2. Remove piston seal with a suitable tool.

### CAUTION:

Do not scratch or score cylinder wall.



# FRONT DISC BRAKE

## INSPECTION AFTER DISASSEMBLY

### Caliper

#### CYLINDER BODY

##### CAUTION:

Use brake fluid to clean. Never use mineral oil.

- Check inside surface of cylinder for score, rust, wear, damage or presence of 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 or other damage. Replace if necessary.

#### 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.

#### SLIDE PIN, PIN BOLT AND PIN BOOT

Check for wear, cracks or other damage. Replace if any of the conditions are observed.

### Rotor

#### VISUAL INSPECTION

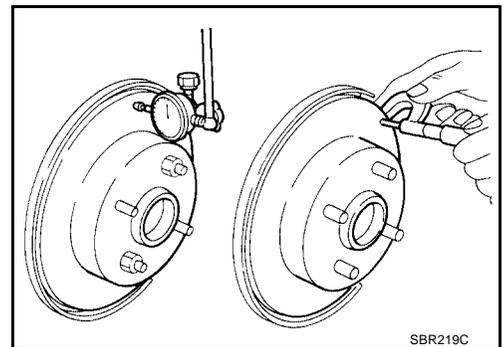
Check rotor for roughness, cracks or chips.

#### RUNOUT

1. Secure rotor to wheel hub with at least two nuts (M12 x 1.25).
2. Check runout using a dial indicator. Make sure that wheel bearing axial end play is within the specifications before measuring runout. Refer to [FAX-5. "Front Wheel Bearing"](#).
3. Change relative positions of rotor and wheel hub so that runout is minimized.

**Maximum runout : 0.07 mm (0.0028 in)**

4. If the runout is still out of specification, turn rotor with on-car brake lathe ("MAD, DL-8700", "AMMCO 700 and 705" or equivalent).



#### THICKNESS

Check thickness using a micrometer.

**Thickness variation : Maximum 0.015 mm  
(At least 8 positions) (0.0006 in)**

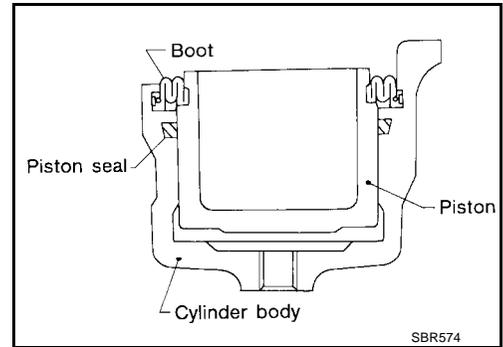
If thickness variation exceeds the specification, turn rotor with on-car brake lathe.

**Rotor thickness : 22.0 mm (0.866 in)  
repair limit**

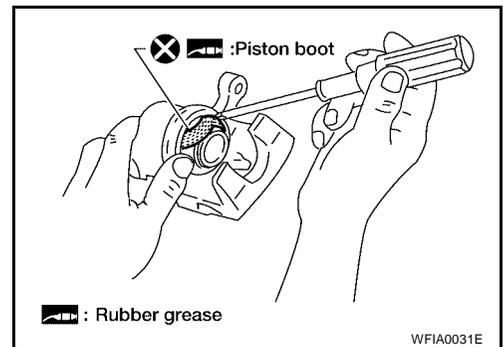
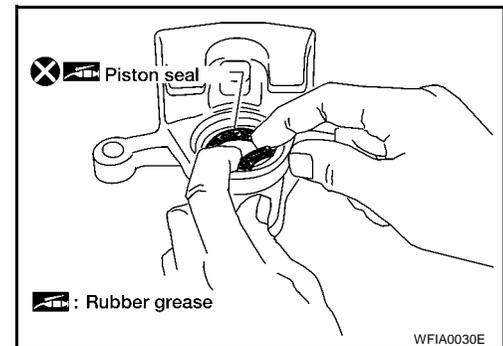
# FRONT DISC BRAKE

## ASSEMBLY

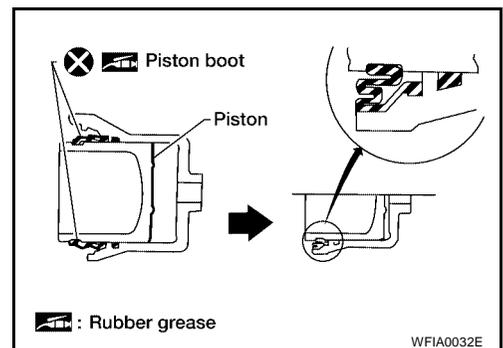
1. Apply rubber grease to new piston seal and insert seal into groove on cylinder body.



2. With piston boot fitted to piston, insert piston boot into groove on cylinder body and install piston.



3. Make sure piston boot is properly installed.



# FRONT DISC BRAKE

## Brake Burnishing Procedure

EFS0025N

Burnish the brake contact surfaces according to the following procedure after refinishing or replacing brake rotors, after replacing pads or linings, 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 so that vehicle stopping time equals 3 to 5 seconds.
3. To cool the 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.

A  
B  
C  
D  
E  
G  
H  
I  
J  
K  
L  
M

BR

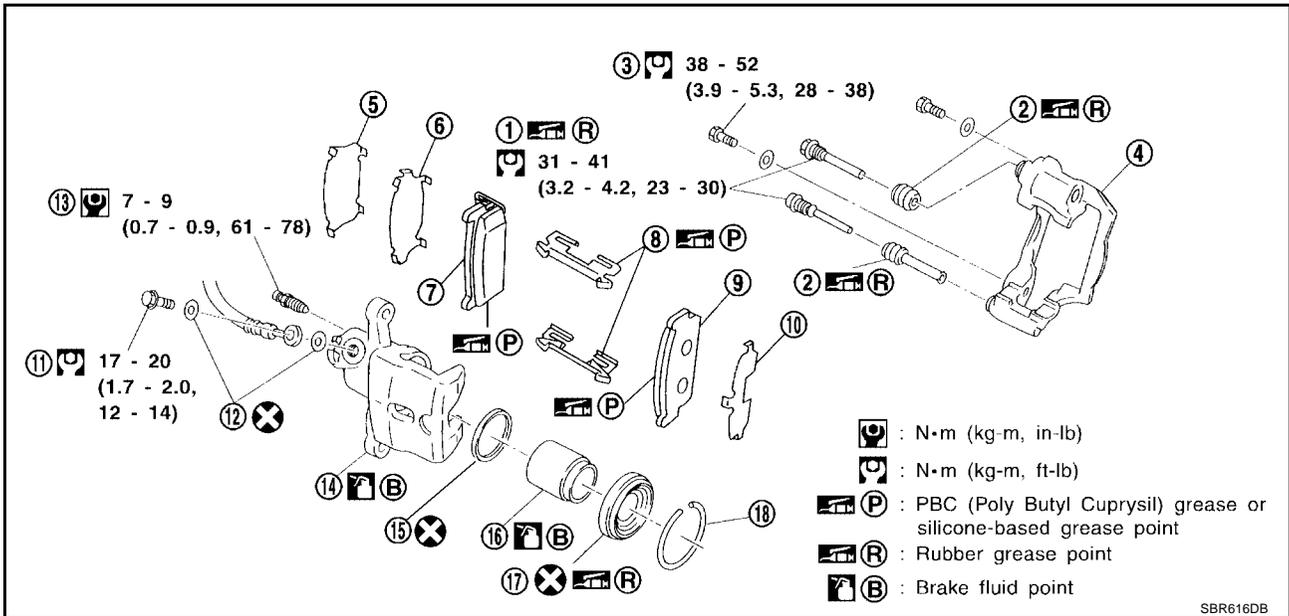
# REAR DISC BRAKE

## REAR DISC BRAKE

PF0:44000

### Component

EFS00250



SBR616DB

- |                  |                     |                              |
|------------------|---------------------|------------------------------|
| 1. Main pin bolt | 2. Pin boot         | 3. Torque member fixing bolt |
| 4. Torque member | 5. Shim cover       | 6. Inner shim                |
| 7. Inner pad     | 8. Pad retainer     | 9. Outer pad                 |
| 10. Outer pad    | 11. Connecting bolt | 12. Copper washers           |
| 13. Bleed valve  | 14. Cylinder body   | 15. Piston seal              |
| 16. Piston       | 17. Piston boot     | 18. Piston boot retainer     |

### WARNING:

Clean brake pads with a vacuum dust collector to minimize the hazard of airborne particles or other materials.

### CAUTION:

- When cylinder body is open, do not depress brake pedal because piston will pop out.
- Be careful not to damage piston boot or get oil on rotor. Always replace shims in replacing pads.
- It is not necessary to remove connecting bolt except for disassembly or replacement of caliper assembly. In this case, suspend cylinder body with wire so as not to stretch brake hose.
- Burnish the brake contact surfaces after refinishing or replacing brake rotors, after replacing pads, or if a soft pedal occurs at very low mileage. Refer to [BR-28, "Brake Burnishing Procedure"](#).

## On-vehicle Service INSPECTION

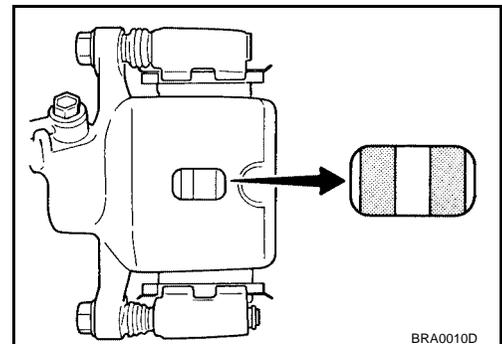
EFS0028L

### Pad Thickness

- Remove a wheel with the vehicle lifted up, and then check the thickness of the pad from the inspection hole of the cylinder body. If necessary, check it with a scale.

**Standard pad thickness : 8 mm (0.31 in)**

**Pad wear limit : 1.5 mm (0.059 in)**



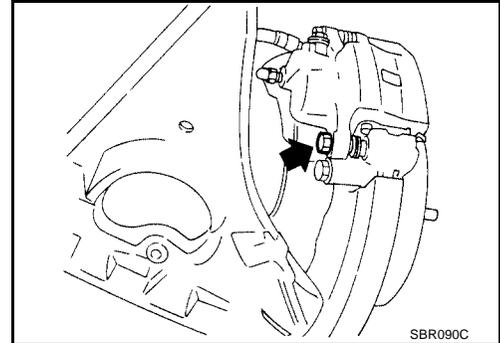
BRA0010D

# REAR DISC BRAKE

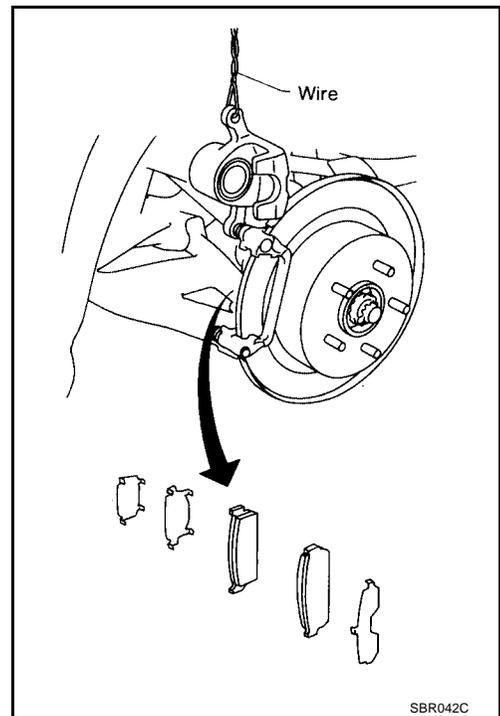
## PAD REPLACEMENT

### Removal

- If shims are rusted or show peeling of the rubber coat, replace them with new shims.
  - Whenever the brake pads are replaced, the inner shim, the outer shim and the shim cover have to be replaced as a set.
1. Remove master cylinder reservoir cap.
  2. Remove lower pin bolt, using power tool.



3. Open cylinder body upward and secure with wire. Then remove pad retainers, and inner and outer shims.



### Installation

1. Apply grease to the inner and outer shim, and then attach them to the pads.
2. Attach the pad retainer to the torque member, and then attach it to the pad.
3. When installing new pads, push piston back into cylinder body.
  - Carefully monitor brake fluid level because brake fluid will return to the reservoir when pushing back piston.
4. Close cylinder body down into the torque member.
5. Install a main pin bolt and tighten it to specification. Refer to [BR-24, "Component"](#).
6. Check the brake for drag.

### CAUTION:

**Burnish the brake contact surfaces refinishing or replacing brake rotors, after replacing pads, or if a soft pedal occurs at very low mileage. Refer to [BR-28, "Brake Burnishing Procedure"](#).**

# REAR DISC BRAKE

EFS0025R

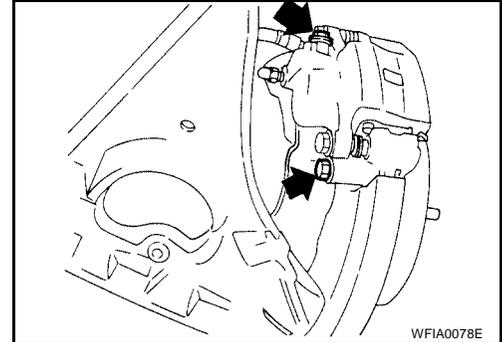
## Removal and Installation

### REMOVAL

#### **WARNING:**

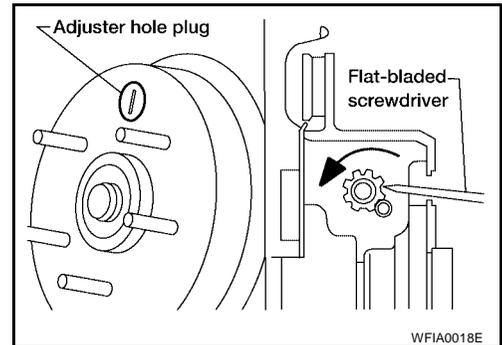
Clean brakes with a vacuum dust collector to minimize the hazard of airborne particles or other materials.

1. Remove torque member fixing bolts using power tool and brake hose connecting bolt.



2. Remove caliper and brake rotor. If the brake rotor cannot be removed, remove as follows:

- Make sure parking brake lever is completely disengaged.
- Hold down the brake rotor with the wheel nut and remove the brake rotor plug.
- Insert a flat-bladed screwdriver through the plug opening and rotate the star wheel on the adjuster assembly in the direction shown to loosen and retract the brake shoes.
- Remove wheel nuts and rotor.



### INSTALLATION

#### **CAUTION:**

- Refill with new brake fluid "DOT 3".
- Never reuse drained brake fluid.

1. Install brake rotor.
2. Install caliper assembly and tighten main pin bolt to specification. Refer to [BR-24, "Component"](#) .
3. Install brake hose to caliper and tighten connecting bolt to specification. Refer to [BR-24, "Component"](#) .

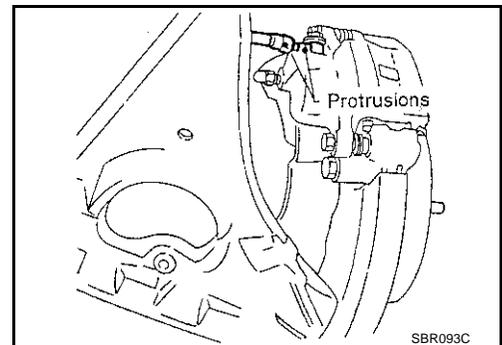
#### **CAUTION:**

- The copper washers for the connecting bolt have to be replaced every time the fitting is disconnected.

4. Bleed air from brake system. Refer to [BR-8, "Bleeding Brake System"](#) .
5. Adjust the parking brake. Refer to [PB-3, "Adjustment"](#) .

#### **CAUTION:**

Burnish the brake contact surfaces refinishing or replacing brake rotors, after replacing pads, or if a soft pedal occurs at very low mileage. Refer to [BR-28, "Brake Burnishing Procedure"](#) .

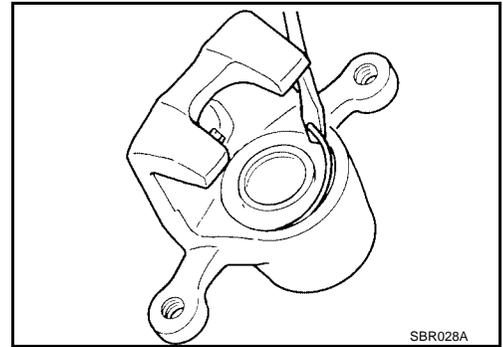


# REAR DISC BRAKE

## Disassembly and Assembly DISASSEMBLY

EFS0025S

1. Remove piston boot retainer with a flat-bladed screwdriver.



2. Push out piston and piston boot with compressed air.

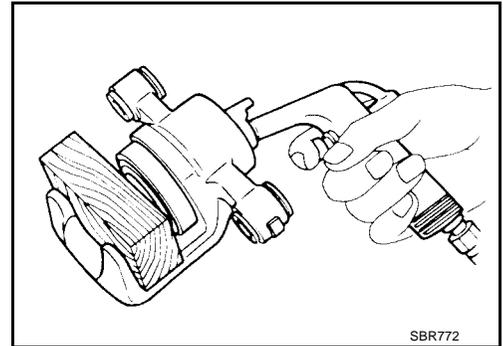
**WARNING:**

**Do not place your finger in front of piston.**

3. Remove piston seal with a suitable tool.

**CAUTION:**

**Do not scratch or score cylinder wall.**



## INSPECTION AFTER DISASSEMBLY

### Caliper

#### CYLINDER BODY

**CAUTION:**

Use brake fluid to clean. Never use mineral oil.

- Check inside surface of cylinder for score, rust, wear, damage or presence of 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 or other damage. Replace if necessary.

#### 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.

#### SLIDE PIN, PIN BOLT AND PIN BOOT

Check for wear, cracks or other damage. Replace if any of the conditions are observed.

### Rotor

#### VISUAL INSPECTION

Check rotor for roughness, cracks or chips.

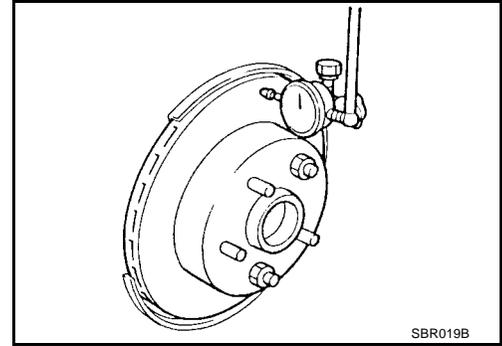
A  
B  
C  
D  
E  
BR  
G  
H  
I  
J  
K  
L  
M

# REAR DISC BRAKE

## RUNOUT

1. Secure rotor to wheel hub with at least two nuts (M12 x 1.25).
2. Check runout using a dial indicator.  
Make sure that wheel bearing axial end play is within the specifications before measuring runout. Refer to [RAX-5, "Rear Wheel Bearing"](#).
3. Change relative positions of rotor and wheel hub so that runout is minimized.

**Maximum runout : 0.07 mm (0.0028 in)**



## THICKNESS

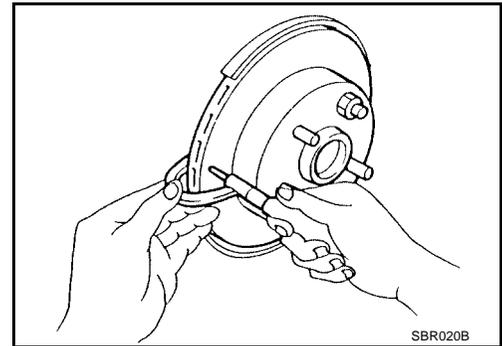
Check thickness using a micrometer.

**Rotor repair limit**

**Standard thickness : 9 mm (0.35 in)**

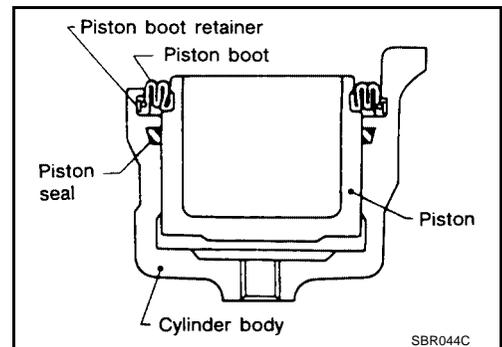
**Minimum thickness : 8 mm (0.31 in)**

**Thickness variation (At least 8 positions) : Maximum 0.015 mm (0.0006 in)**



## ASSEMBLY

1. Insert piston seal into groove on cylinder body.
2. With piston boot fitted to piston, insert piston boot into groove on cylinder body and install piston.
3. Secure piston boot with retainer.



## Brake Burnishing Procedure

EF50025T

Burnish the brake contact surfaces according to the following procedure after refinishing or replacing brake rotors, after replacing pads or linings, 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 the 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.

# DUAL PROPORTIONING VALVE

PFP:46400

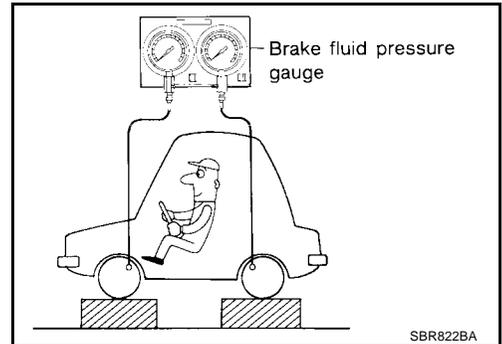
## DUAL PROPORTIONING VALVE

### Inspection

EFS0025U

#### CAUTION:

- Carefully monitor brake fluid level at master cylinder.
  - Use new brake fluid "DOT 3".
  - Be careful not to splash brake fluid on painted areas; it may cause paint damage. If brake fluid is splashed on paint areas, wash it away with water immediately.
1. Connect Tool to air bleeders of front and rear brakes on either LH and RH side.



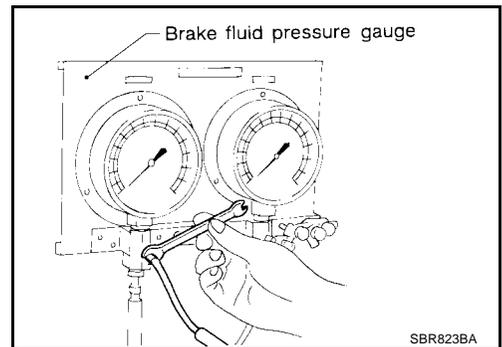
2. Bleed air from the Tool.
3. Check fluid pressure by depressing brake pedal.

**Applied pressure : 7,355 kPa (75 kg/cm<sup>2</sup>, 1,067 psi)  
(Front brake)**

**Output pressure : 5,100 - 5,492 kPa (52 - 56 kg/cm<sup>2</sup>,  
(Rear brake) 739 - 796 psi)**

If output pressure is out of specification, replace dual proportioning valve.

4. Bleed air after disconnecting the Tool. Refer to [BR-8. "Bleeding Brake System"](#).



# SERVICE DATA AND SPECIFICATIONS (SDS)

## SERVICE DATA AND SPECIFICATIONS (SDS)

PF0:00030

### General Specifications

EFS0025V

Unit: mm (in)

Front brake	Brake model		CLZ25VD disc brake
	Cylinder bore diameter		57.2 (2.252)
	Pad Length × width × thickness		125.6 × 46 × 11 (4.94 × 1.81 × 0.43)
	Rotor outer diameter × thickness		296 × 26 (11.65 × 1.02)
Rear brake	Brake model		AD9V disc brake
	Cylinder bore diameter		34.9 (1.3740)
	Pad Length × width × thickness		89.1 × 39.5 × 10 (3.508 × 1.555 × 0.31)
	Rotor outer diameter × thickness		292 × 9 (11.50 × 0.35)
Master cylinder	Cylinder bore diameter		23.81 (15/16)
Control valve	Screw in type		30 × 0.4 (1.18 × 0.02)
Brake booster	Booster model		M215T
	Diaphragm diameter	Primary	230 (9.06)
		Secondary	205 (8.07)
Recommended brake fluid			DOT 3

### Disc Brake

EFS0025W

Unit: mm (in)

Brake model		CLZ25VD	AD9V
Pad wear limit	Minimum thickness	2.0 (0.079)	1.5 (0.059)
	Maximum runout	0.07 (0.0028)	0.07 (0.0028)
Rotor repair limit	Minimum thickness	22.0 (0.866)	8.0 (0.31)

### Brake Pedal

EFS0025X

Unit: mm (in)

Free height "H"	M/T	164.1 - 174.1 (6.46 - 6.85)
	A/T	173.1 - 183.1 (6.81 - 7.21)
Clearance "C" between pedal stopper and threaded end of stop lamp switch or ASCD switch		0.74 - 1.96 (0.0291 - 0.0772)

\*: Measured from surface of dash reinforcement panel to surface of pedal pad

### Control Valve

EFS0025Y

Unit: kPa (kg/cm<sup>2</sup>, psi)

Applied pressure (front)	7,355 (75, 1,067)
Output pressure (rear)	5,100 - 5,492 (52 - 56, 739 - 796)

### Brake Booster

EFS0025Z

Unit: mm (in)

Output rod length	10.275 - 10.525 (0.4045 - 0.4144)
Clevis length	130 (5.12)