SECTION BR
BRAKE SYSTEM

CONTENTS

PRECAUTIONS 3
Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER” 3
Precautions for Battery Service 3
Precautions for Brake System 3
PREPARATION 4
Commercial Service Tools 4
NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING 5
NVH Troubleshooting Chart 5
BRAKE PEDAL 6
Inspection and Adjustment 6
PLAY AND CLEARANCE BETWEEN BRAKE PEDAL AND FLOOR PANEL WITH PEDAL DEPRESSED. 6
ADJUSTMENT 7
Removal and Installation 7
COMPONENT PARTS DRAWING 7
REMOVAL 8
INSPECTION AFTER REMOVAL 8
INSTALLATION 8
BRAKE FLUID 9
On-board Inspection 9
LEVEL CHECK 9
Drain and Refill 9
Bleeding Brake System 10
BRAKE PIPING AND HOSE 11
Hydraulic Circuit 11
Removal and Installation of the Front Brake Piping Brake Hose 11
REMOVAL 11
INSTALLATION 11
Removal and Installation of the Rear Brake Piping Brake Hose 12
REMOVAL 12
INSTALLATION 12
Inspection After Installation 12
BRAKE MASTER CYLINDER 13
On-board Inspection 13
LEAK INSPECTION 13
Removal and Installation 13
REMOVAL 13
INSTALLATION 13
Components 13
Disassembly and Assembly 14
DISASSEMBLY 14
INSPECTION AFTER DISASSEMBLY 15
ASSEMBLY 15
BRAKE BOOSTER 17
On-Vehicle Service 17
OPERATING CHECK 17
AIRTIGHT CHECK 17
Removal and Installation 17
REMOVAL 18
INSPECTION AFTER REMOVAL 18
INSTALLATION 18
VACUUM LINES 19
Removal and Installation 19
Inspection 19
VISUAL INSPECTION 19
CHECK VALVE INSPECTION 19
FRONT DISC BRAKE 20
On-board Inspection 20
PAD WEAR INSPECTION 20
Components 20
Removal and Installation of Brake Pad 21
REMOVAL 21
INSTALLATION 21
Removal and Installation of Caliper Assembly 22
REMOVAL 22
INSTALLATION 22
Disassembly and Assembly of Caliper Assembly 23
DISASSEMBLY 23
CALIPER INSPECTION 23
ASSEMBLY 24
DISC ROTOR INSPECTION 25
BRAKE BURNISHING PROCEDURE 25
REAR DISC BRAKE 26
On-board Inspection 26

PAD WEAR INSPECTION 26
Components 26
Removal and Installation of Brake Pad 27
REMOVAL 27
INSTALLATION 27
Removal and Installation of Caliper Assembly 27
REMOVAL 27
INSTALLATION 27
Disassembly and Assembly of Caliper Assembly... 28
DISASSEMBLY 28
CALIPER INSPECTION 28
ASSEMBLY 29
DISC ROTOR INSPECTION 30
SERVICE DATA AND SPECIFICATIONS (SDS) 32
General Specifications 32
Brake Pedal 32
Brake Booster 32
Check Valve 32
Front Disc Brake 32
Rear Disc Brake 33

PRECAUTIONS

PFP:00001

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

AFS00285

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 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 Battery Service

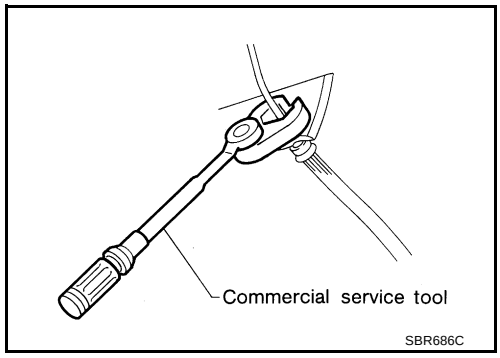
AFS0016D

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Brake System

AFS0007W

- 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 torque brake lines when installing.
- Before working, turn ignition switch OFF and disconnect connectors for control unit or battery negative terminal.
- 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-25, "BRAKE BURNISHING PROCEDURE" .



WARNING:

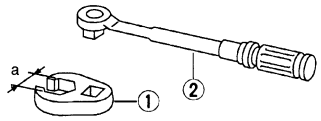
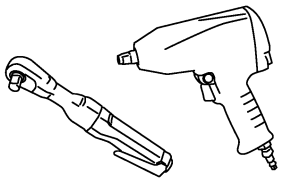
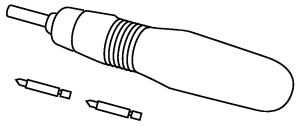
- **Clean brake pads and shoes with a waste cloth, then wipe with a dust collector.**

PREPARATION

PFP:00002

Commercial Service Tools

AFS0007X

Tool name		Description
1. Flare nut crowfoot a:10 mm (0.39 in) 2. Torque wrench	 S-NT360	Removing and installing each brake piping
Power tool	 PBIC0190E  PBIC0191E	Removing front and rear caliper assembly, tires

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

AFS0007Y

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

Reference page			BR-21, BR-27	BR-20, BR-26	BR-21, BR-27	—	—	BR-25, BR-30	—	—	—	BR-25, BR-30	—	NVH in PR section	NHV in RFD section	NVH in FAX, RAX and FSU, RSU section	NVH in WT section	NVH in WT section	NVH in RAX section	NVH in PS section
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	Drum out of round	PROPELLER SHAFT	DIFFERENTIAL	AXLE AND SUSPENSION	TIRES	ROAD WHEEL	DRIVE SHAFT	STEERING
Symptom	BRAKE	Noise	×	×	×									×	×	×	×	×	×	×
		Shake				×								×		×	×	×	×	×
		Shimmy, Judder				×	×	×	×	×	×	×				×	×	×		×

×: Applicable

BRAKE PEDAL

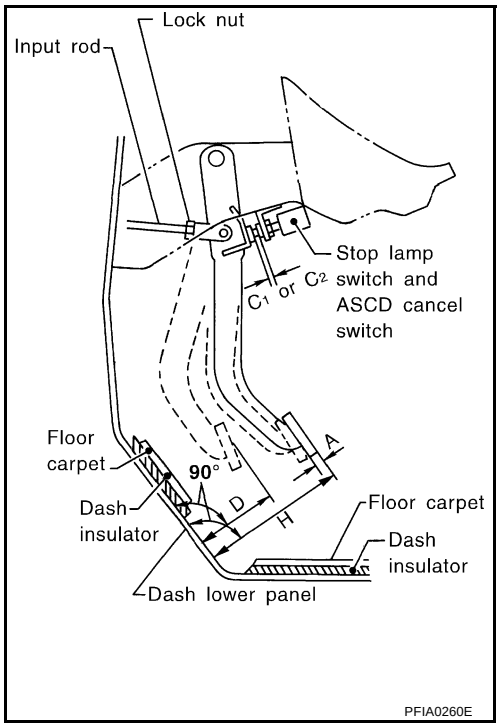
PFP:46501

Inspection and Adjustment

AFS0007Z

PLAY AND CLEARANCE BETWEEN BRAKE PEDAL AND FLOOR PANEL WITH PEDAL DEPRESSED.

1. Check the brake pedal free height from dash floor panel.
2. Adjust the height referring to the following specifications.



H	**Brake pedal height (from dash panel top surface)**	**M/T Model**	**154 - 164 mm (6.06- 6.46 in)**
		A/T model	**162 - 172 mm (6.38 - 6.77 in)**
D	**Depressed pedal height (under a force of 490 N (50 kg, 110 lb) with the engine running)**	**M/T Model**	**More than 90 mm (3.54 in)**
		A/T Model	**More than 95 mm (3.74 in)**
C_1 or C_2	**Clearance between stopper rubber and the threaded end of the stop lamp switch and ASCD cancel switch.**		**0.74 - 1.96 mm (0.0291 - 0.0772 in)**
A	**Pedal play**		**3 - 11 mm (0.12 - 0.43 in)**

ADJUSTMENT

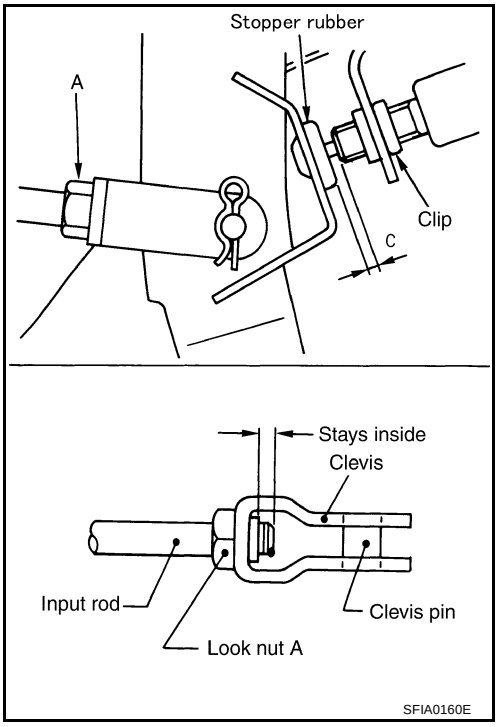
1. Loosen stop lamp switch and ASCD cancel switch by rotating it counterclockwise by 45°.
2. Loosen lock nut (A) on the input rod, then rotate input rod to set pedal to the specified height, and tighten lock nut (A).

   CAUTION:
   Check that the threaded end of the input rod stays inside clevis.

   Lock nut (A) :
   15.7 - 21.6 N·m (1.6 - 2. 2 kg-m, 12 - 15 in-lb)
3. With the pedal pulled and held by hand, press stop lamp switch and ASCD cancel switch until its threaded end contacts stopper rubber.
4. With the threaded end of the stop lamp switch contacting stopper rubber and ASCD cancel switch, rotate the switch clockwise by 45° to secure.

   CAUTION:
   Make sure that the clearance (C) between stopper rubber and threaded end of the stop lamp switch and ASCD cancel switch is within the standard.
5. Check the pedal play.

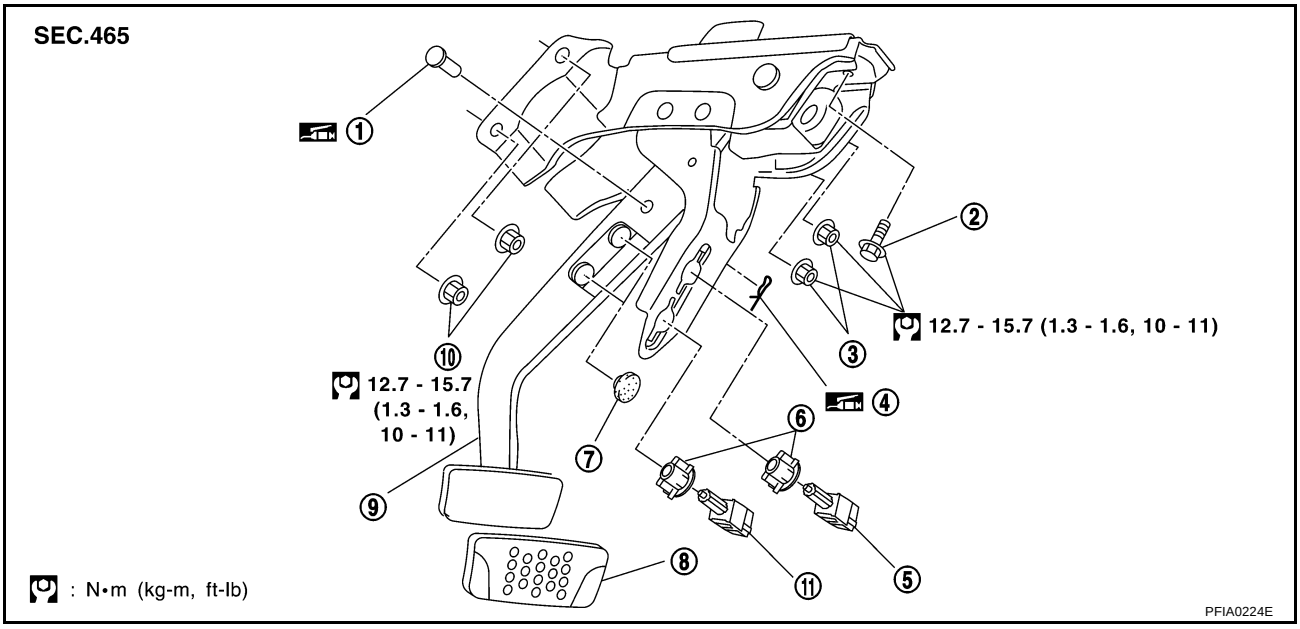
   CAUTION:
   Make sure that stop lamps go off when pedal is released.
6. Start engine to check the brake pedal's depressed height.



Removal and Installation

AFS00080

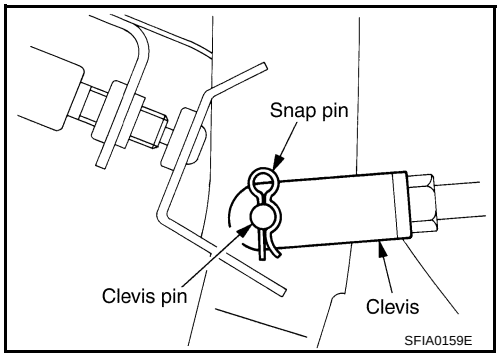
COMPONENT PARTS DRAWING



1. Clevis pin
2. Bolt
3. Nut
4. Snap pin
5. ASCD cancel switch
6. Clip
7. Stopper rubber
8. Pedal pad
9. Brake pedal assembly

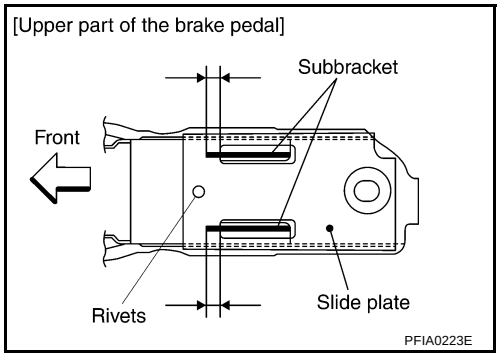
REMOVAL

1. Remove lower driver-side instrument panel. Refer to IP-12, "INSTRUMENT DRIVER PANEL LOWER" .
2. Remove steering column. Refer to PS-10, "STEERING COLUMN" .
3. Remove stop lamp switch and ASCD cancel switch from pedal assembly.
4. Remove snap pin and clevis pin from brake booster clevis.
5. Remove mounting nuts and bolts from bracket, and remove pedal assembly from vehicle.

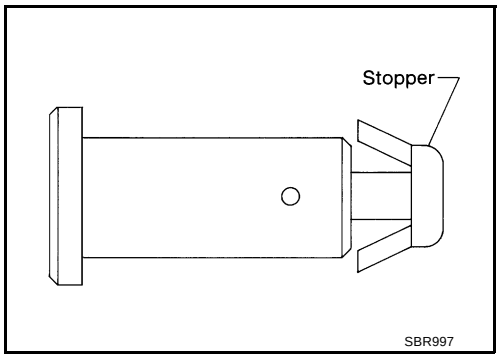


INSPECTION AFTER REMOVAL

- Check that rivets in the upper part of the brake pedal are not deformed.
- Make sure sub bracket and slide plate are at least 4 mm (0.16 in) apart.



- Check brake pedal for bend, damage, and cracks on the welded parts. Replace the applicable part if a failure is detected.
- Check clevis pin and resin stopper for damage and deformation. If a failure is detected, replace clevis pin.



INSTALLATION

Paying attention to the following items, install in the reverse order of removal.

- After installing brake pedal assembly to vehicle, adjust brake pedal.

BRAKE FLUID

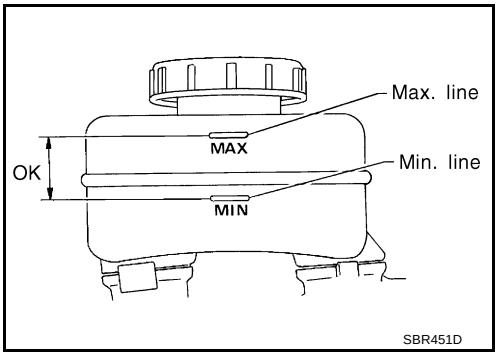
PFP:KN100

On-board Inspection

AFS000TY

LEVEL CHECK

- Check that 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 warning lamp remains illuminated after parking lever is released, check brake system for fluid leakage.



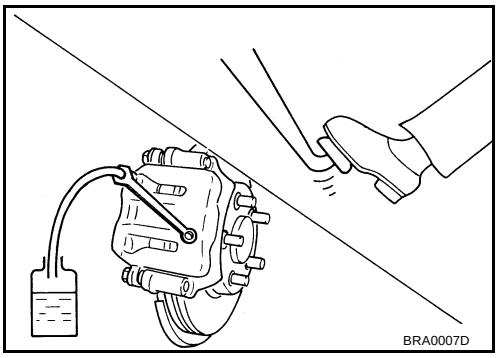
Drain and Refill

AFS000TZ

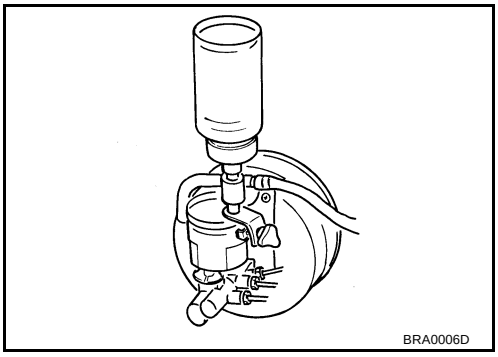
CAUTION:

- **Refill with new brake fluid “DOT3”.**
- **Never reuse drained brake fluid.**
- **Do not let brake fluid come in contact with painted surfaces on the body. This might damage the paint, so if it does come in contact, immediately wipe area and wash off with water.**

1. Connect a vinyl tube to air bleeder.
2. Depress brake pedal, loosen air bleeder, and gradually remove brake fluid.
3. Turn key switch to off position and remove battery negative terminal.



4. Make sure there is no foreign material in reservoir tank, and refill with new brake fluid.
5. Rest foot on brake pedal. Loosen air bleeder. Slowly depress pedal until it stops. Tighten air bleeder. 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-10, "Bleeding Brake System" .



Bleeding Brake System

AFS000U0

CAUTION:

While bleeding, pay attention to master cylinder fluid level.

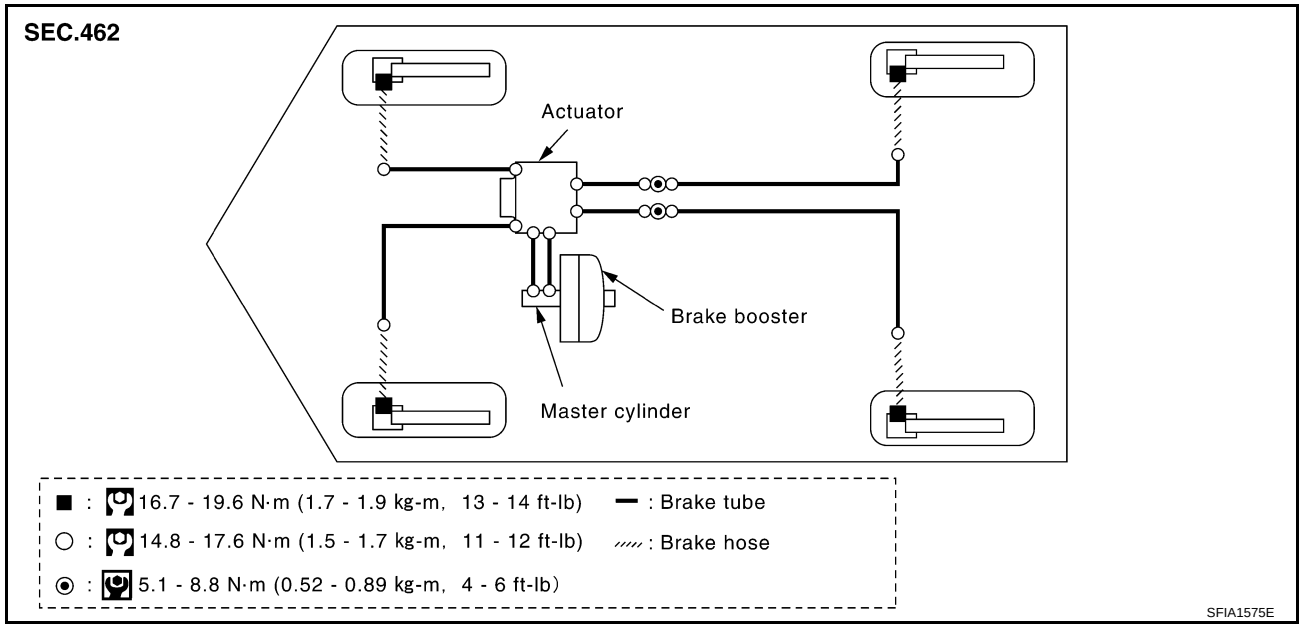
1. Turn ignition switch to OFF position.
2. Connect a vinyl tube to rear right air bleeder.
3. Fully depress brake pedal 4 to 5 times.
4. With the brake pedal depressed, loosen air bleeder to let the air out, and then tighten it immediately.
5. Repeat steps 3, 4 until no more air comes out.
6. Tighten air bleeder to the specified torque. Refer to BR-20, "Components" , BR-26, "Components" .
7. In steps 2 to 6 below, with master cylinder reservoir tank filled at least half way, bleed air from front left, rear left, and front right tires, in that order.

BRAKE PIPING AND HOSE

PFP:46210

Hydraulic Circuit

AFS000U1



CAUTION:

- **Make sure it does not twist or break when being attached.**
- **Make sure there is no interference with other parts when turning steering both clockwise and counterclockwise.**
- **Brake piping is an important safety part. If a brake fluid leak is detected, always disassemble the parts. Replace applicable part with a new one, if necessary.**
- **Do not let brake fluid come in contact with painted surfaces on the body. This might damage the paint, so if it does come in contact, immediately wipe area and wash off with water.**
- **Do not bend or twist brake hose sharply, or strongly pull it.**
- **When removing components, cover connections so that no dirt, dust, or other foreign matter gets in.**
- **Refill with new brake fluid " DOT 3 "**
- **Never reuse drained brake fluid.**

Removal and Installation of the Front Brake Piping Brake Hose

AFS000U3

REMOVAL

1. Drain brake fluid. Refer to BR-9, "Drain and Refill" .
2. Using a flare nut wrench, remove brake tube from brake hose.
3. Remove union bolt and remove brake hose from caliper assembly.
4. Remove lock plate and nut, and remove brake hose from vehicle.

INSTALLATION

1. Attach brake hose to vehicle and tighten nut to the specified torque.

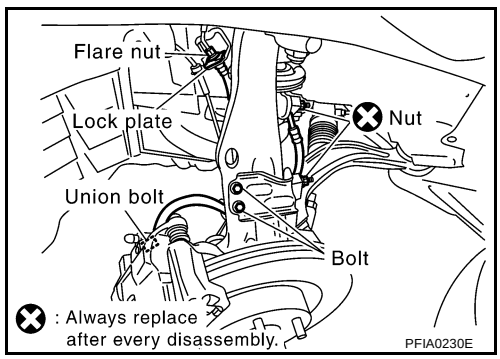
   : 19.6 - 23.5 N·m (2.0 - 2.3 kg-m, 15 - 17 ft-lb)

   NOTE:
   When removed bracket attaching bolt is tightened with provisions torque.

   : 10.8 - 15.6 N·m (1.1 - 1.5 kg-m, 8 - 11 ft-lb)

2. Install brake hose by aligning with the protrusion on caliper assembly, and tighten union bolts to the specified torque.

   : 16.7 - 19.6 N·m (1.7 - 1.9 kg-m, 13 - 14 ft-lb)



CAUTION:
Do not reuse copper washer.

3. Attach brake hose to brake tube, partially tighten flare nut as far as possible by hand, then secure it to bracket with lock plate.
4. Using a flare nut wrench, tighten flare nut to the specified torque.

: 14.8 - 17.6 (1.5 - 1.7 kg-m, 11 - 12 ft-lb)

5. Refill brake fluid and bleed air. Refer to BR-9, "Drain and Refill" .

Removal and Installation of the Rear Brake Piping Brake Hose

AFS000U4

REMOVAL

1. Drain brake fluid. Refer to BR-9, "Drain and Refill" .
2. Using a flare nut wrench, remove brake tube from brake hose.
3. Remove union bolts, and then remove brake hose from caliper assembly.
4. Remove lock plate and then remove brake hose from vehicle.

INSTALLATION

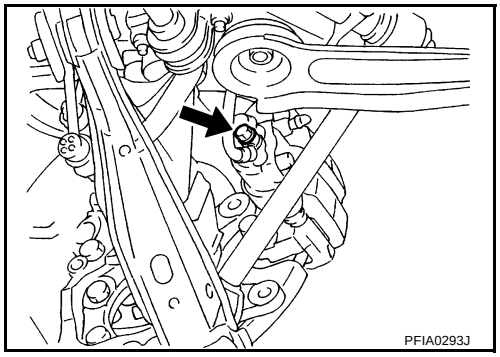
1. Attach brake hose L-pin to the caliper assembly positioning hole and tighten union bolt to the specified torque.

: 1 6.7 - 19.6 N·m (1.7 - 1.9 kg-m, 13 - 14 ft-lb)

CAUTION:
Do not reuse copper washer.

2. After securing brake hose to vehicle with lock plate, partially tighten brake tube flare nut as far as possible by hand and then tighten to the specified torque with flare nut torque wrench.

: 14.8 - 17.6 N·m (1.5 - 1.7 kg-m, 11 - 12 ft-lb)



3. Refill brake fluid and bleed air. Refer to BR-10, "Bleeding Brake System" .

Inspection After Installation

AFS000U6

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

1. Check hose, tube, and connections for fluid leaks, damage, twist, deformation, contact with other parts, and loose connections.
2. While depressing 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

PFP:46010

On-board Inspection

AFS000U7

LEAK INSPECTION

- Check for leaking in the master cylinder installation surface, the reservoir tank installation surface, and the brake tube connections.

Removal and Installation

AFS000U8

CAUTION:

Do not let brake fluid come in contact with painted surfaces on the body. This might damage the paint, so if it does come in contact, immediately wipe area and wash off with water.

REMOVAL

1. Drain brake fluid. Refer to BR-9, "Drain and Refill" .
2. Remove the fluid surface sensor harness connector.
3. Using a flare nut wrench, disconnect master cylinder assembly and brake tube.
4. Remove master cylinder assembly nut and remove master cylinder assembly from vehicle. Refer to BR-13, "Removal and Installation" .

INSTALLATION

CAUTION:

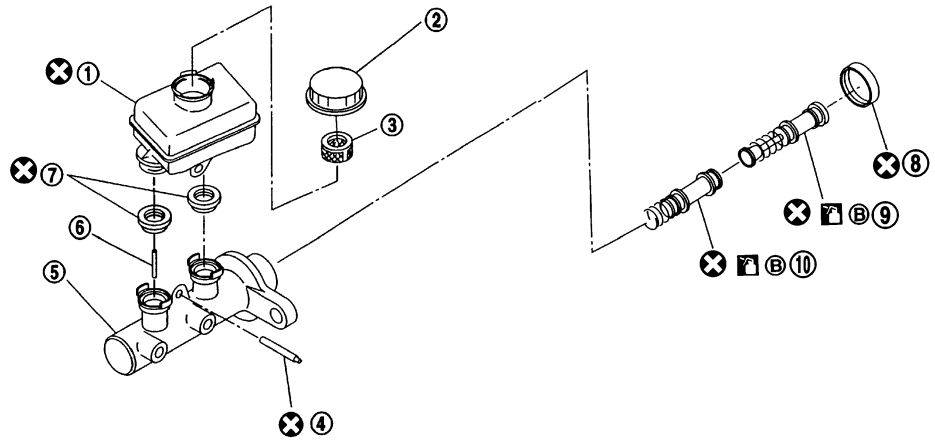
- **Refill with new brake fluid “DOT3”.**
- **Never reuse drained brake fluid.**

1. Attach master cylinder assembly to brake booster assembly and tighten nut to the specified torque. Refer to BR-13, "Removal and Installation" .
2. Install brake tube to master cylinder assembly and temporarily tighten flare nuts by hand.
3. Tighten brake tube flare nut to the specified torque with flare nut torque wrench. Refer to BR-11, "Hydraulic Circuit" .
4. Refill brake fluid and bleed air. Refer to BR-10, "Bleeding Brake System" .

Components

AFS0010N

SEC.460



: Brake fluid

: Always replace after every disassembly.

SFIA1576E

1. Reservoir tank	2. Reservoir cap	3. Oil strainer
4. Pin	5. Cylinder body	6. Piston stopper
7. Grommet	8. Stopper cap	9. Primary piston assembly
10. Secondary piston assembly		

Disassembly and Assembly

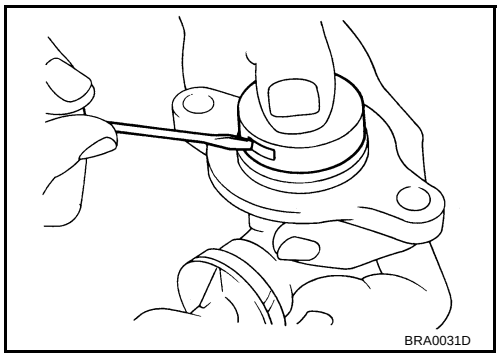
AFS000U9

DISASSEMBLY

CAUTION:

Only remove reservoir tank when absolutely necessary.

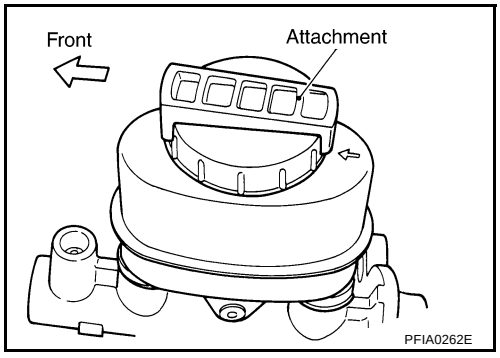
1. Using a screwdriver as shown in the figure, lift up the tabs on the stopper cap and remove it from master cylinder. The piston inside the master cylinder might pop out when this is done, so hold the stopper cap down at the same time.



2. Attach attachment in inner kit to reservoir cap as shown in the figure.

   CAUTION:

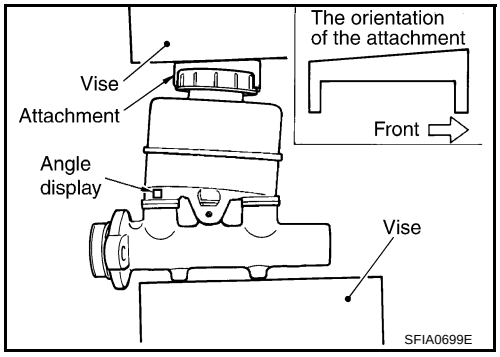
   When attaching attachment to reservoir cap, make sure it is pointing in the right direction.



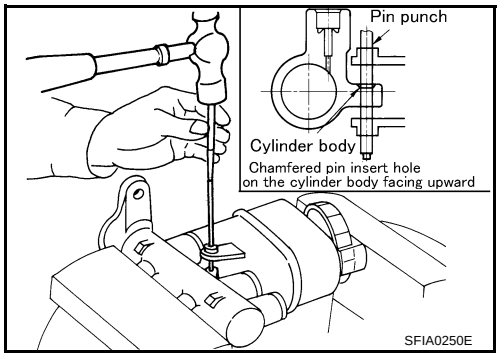
3. Place the side of the cylinder body with chamfering around the pin insertion hole facing up, and secure master cylinder assembly with a vise.

   CAUTION:

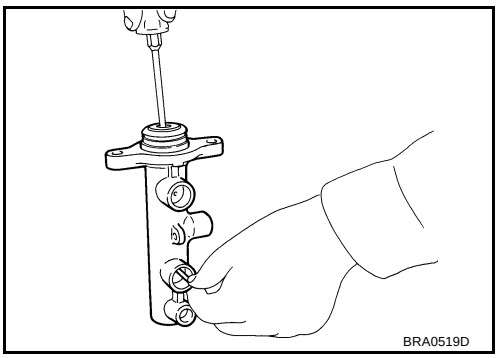
   - **Tighten without letting the pin securing reservoir tank and cylinder body come in contact with the pin insertion hole of the reservoir tank.**
   - **When securing master cylinder assembly with vise, be sure not to over-tighten.**
   - **When securing in a vise, use copper plates or cloth to protect flange.**



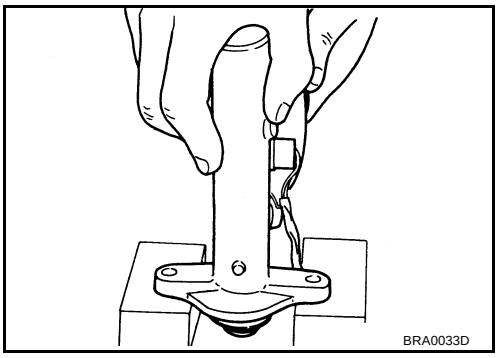
4. Using a pin punch [commercial service tool: diameter Approx. 4 mm (0.16 in)], remove mounting pins on the reservoir tank.
5. Remove master cylinder assembly from vise.
6. Remove reservoir tank and grommet from cylinder body.



7. Using a Phillips screwdriver, push in piston and remove piston stopper from cylinder body.
8. Carefully pull the primary piston assembly straight out to prevent cylinder inner wall from being damaged.



9. Tap flange using a soft block such as wood, and carefully pull the secondary piston assembly straight out to prevent cylinder inner wall from being damaged.



INSPECTION AFTER DISASSEMBLY

Master cylinder

- Check that there is no damage, friction, rusting, or pinholes on the cylinder inner wall, and replace if there are any non-standard conditions.

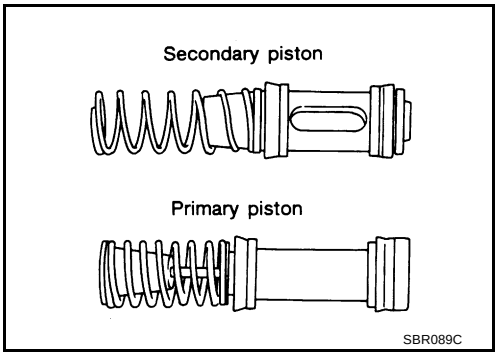
ASSEMBLY

CAUTION:

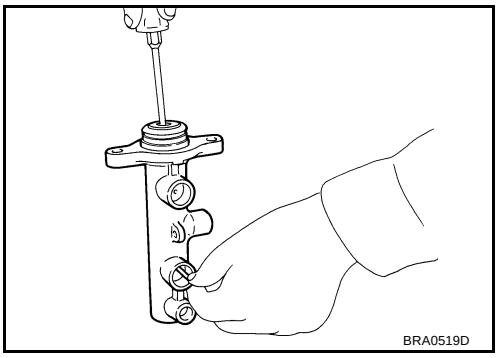
- **Never use mineral oils such as kerosene, gasoline during the cleaning and assembly process.**
- **Make sure there is no foreign matter such as dirt or dust attached to the inner cylinder walls, piston, or cap seal, and use care to avoid damaging parts with the assembly tools.**
- **Do not drop parts. If a part is dropped, do not use it.**

1. Apply fluid to cylinder inner wall body and contact surface of the piston assembly. Then insert secondary piston assembly and primary piston assembly into cylinder body in this order.

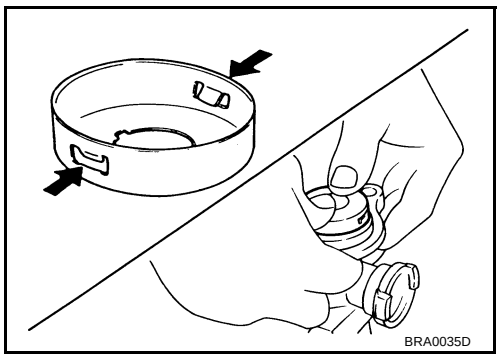
   CAUTION:
   - **Do not reuse the primary and secondary piston assemblies.**
   - **Be sure to replace the assembly without disassembling new inner kit.**
   - **Pay attention to the orientation of the piston cup, and insert straight to prevent cup from being caught by cylinder inner wall.**



2. Perform a visual inspection of the secondary piston slit through the tank boss hole on the secondary side of the cylinder body, and attach piston stopper.



3. Holding down piston with stopper cap, push stopper cap tabs so they are firmly into the cylinder grooves, then attach stopper cap.



CAUTION:
Do not reuse stopper cap.

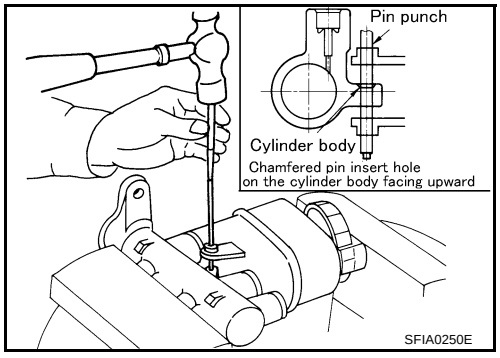
4. Apply brake fluid grommet and attach to cylinder body.

CAUTION:
Do not reuse grommet.

5. Attach attachment in inner kit to reservoir cap as described in disassembly step 2.

CAUTION:
Make sure attachment is pointing in the right direction.

6. Master cylinder assembly is fixed in vise as described in disassembly step 3.
7. Using a pin punch [commercial service tool: diameter Approx. 4 mm (0.16 in)], attach reservoir tank mounting pin so that the attachment side and the opposite side are identical.



CAUTION:
Do not reuse reservoir tank and mounting pin.

BRAKE BOOSTER

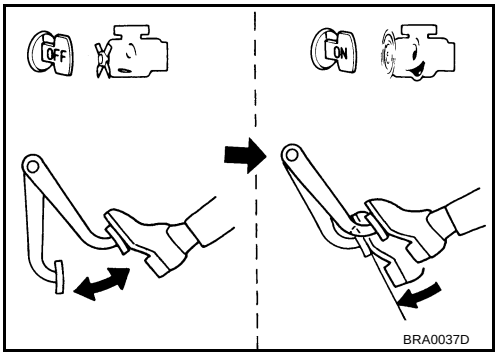
PFP:47200

On-Vehicle Service

AFS0008B

OPERATING CHECK

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

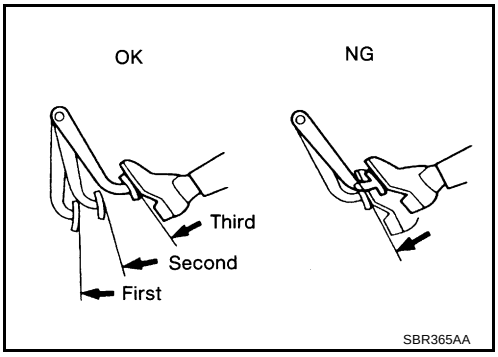


CAUTION:

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 the brake pedal normally to change the vacuum to the atmospheric pressure. Check that 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.

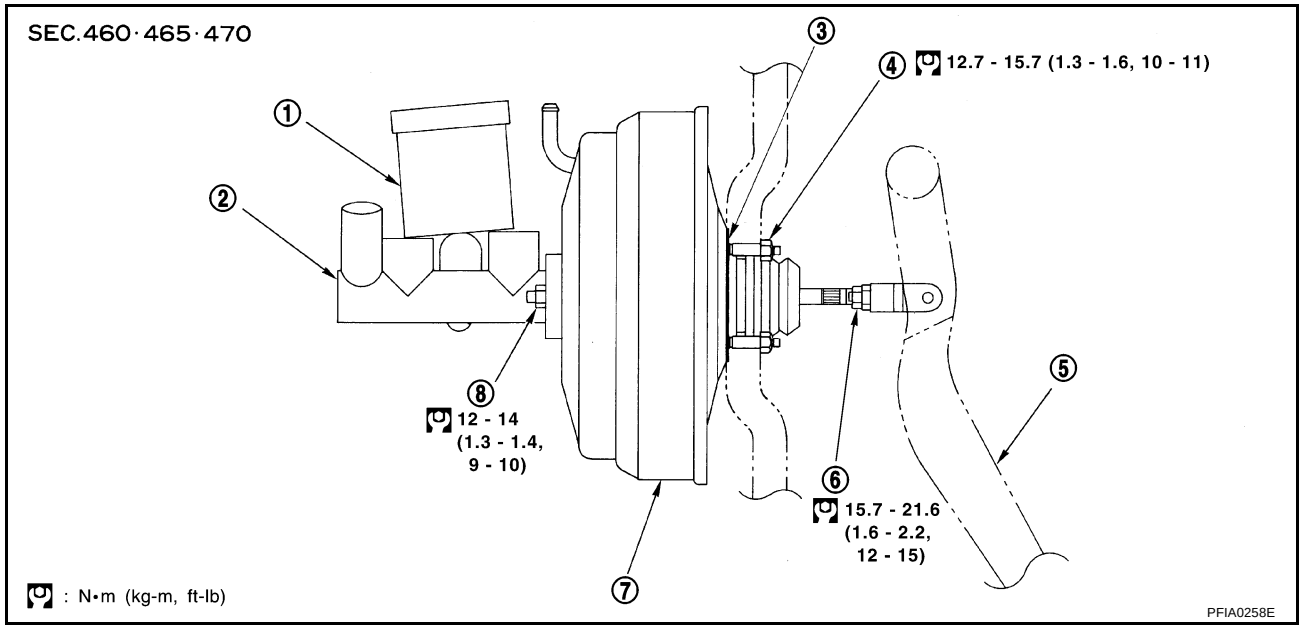


CAUTION:

Depressing pedal interval is approximately 5 seconds.

Removal and Installation

AFS000UA



1. Reservoir tank
2. Master cylinder
3. Gasket
4. Nut
5. Brake pedal
6. Nut
7. Brake booster
8. Nut

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, the dash panel may damage the threads.**
- **Attach the check valve in the correct orientation.**

1. Remove vacuum hose from brake booster. Refer to BR-19, "VACUUM LINES" .
2. Remove brake master cylinder.BR-17, "Removal and Installation"
3. Remove brake piping between master cylinder and ABS actuator. Refer to BR-11, "Hydraulic Circuit" .

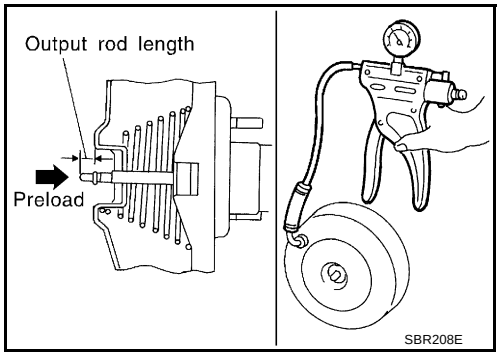
   CAUTION:

   For M/T vehicles with remove brake piping after removing the clutch reservoir tank bolt.
4. Remove brake pedal attachment snap pin and clevis pin from inside vehicle.
5. Remove nuts on the brake booster and brake pedal assembly.
6. Remove brake booster assembly from the engine compartment side.

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.

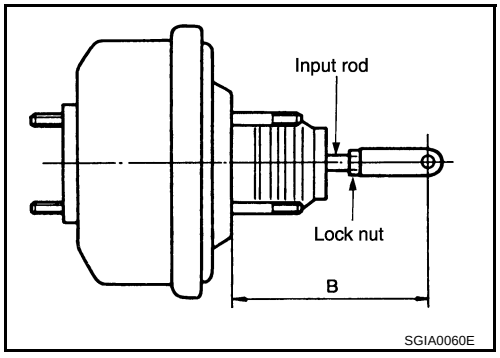


Standard dimension when vacuum – 66.7 kPa (– 500 mmHg, – 19.69 inHg) : 10.4 mm (0.409 in)

INSTALLATION

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

   Length “B” : 125 mm (4.92 in)
2. After adjusting “B”, temporarily tighten lock nut to install booster assembly to vehicle. At this time, make sure to install a gasket between booster assembly and vehicle.
3. Connect brake pedal with clevis of the input rod.
4. Install pedal bracket mounting nuts and tighten them to the specified torque.
5. Install brake piping between master cylinder and ABS actuator. Refer to BR-11, "Hydraulic Circuit" .
6. Install master cylinder to booster assembly.BR-17, "Removal and Installation"
7. Adjust the height and play of the brake pedal.
8. Tighten lock nut of the input rod to the specified torque.
9. Refill new brake fluid and bleed air. Refer to BR-10, "Bleeding Brake System"

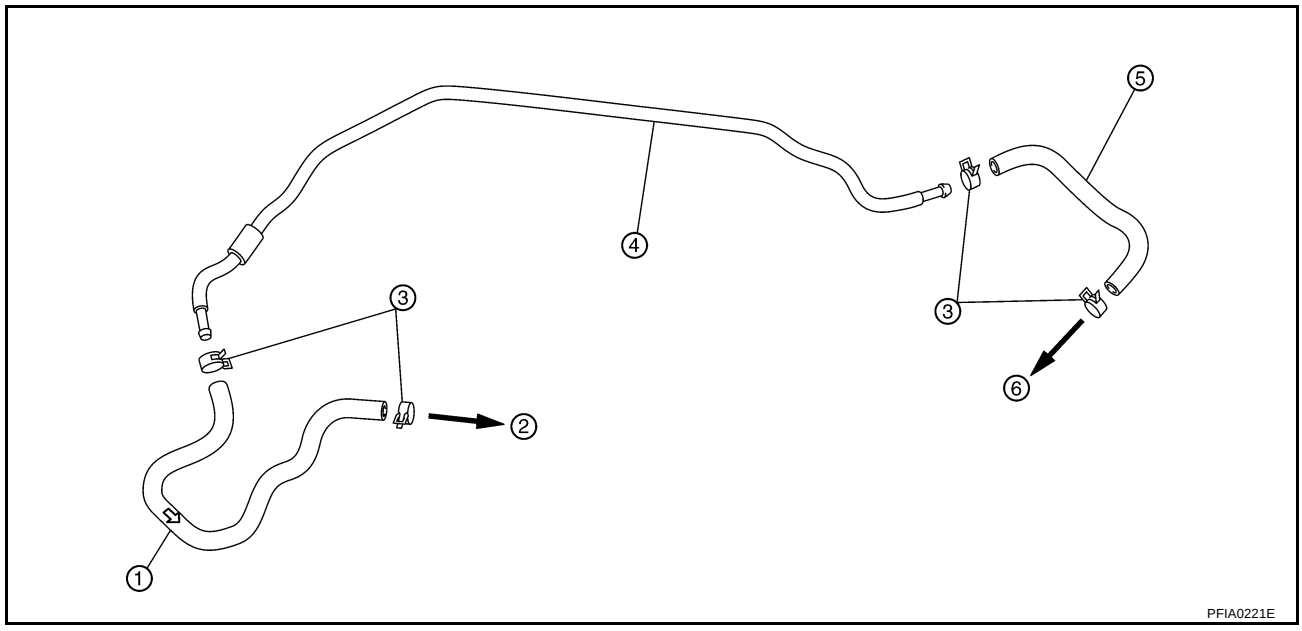


VACUUM LINES

PFP:41920

Removal and Installation

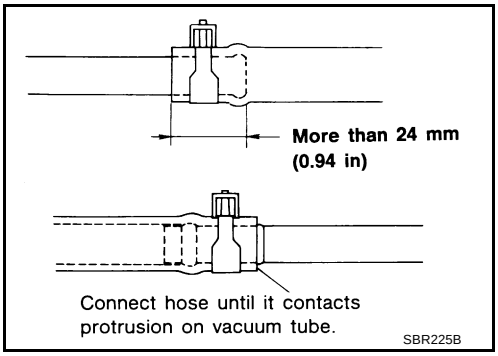
AFS0008D



1. Check valve inclusion position stamp
2. Intake manifold
3. Clamp
4. Vacuum piping
5. Vacuum hose
6. Brake booster

CAUTION:

- **Because vacuum hose contains a check valve, it must be installed in the correct orientation. Refer to the stamp or label to confirm correct installation. The brake booster will not operate normally if hose is installed in the wrong direction.**
- **Insert vacuum hose for at least 24 mm (0.94 in).**
- **Never use lubricating oil during assembly.**



Inspection

AFS0008E

VISUAL INSPECTION

Check for improper assembly, damage and deteriorate.

CHECK VALVE INSPECTION

Airtightness Inspection

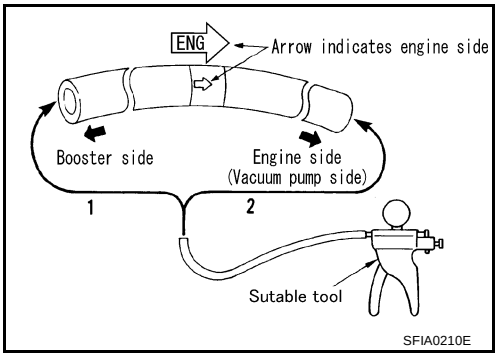
Use a hand-held vacuum pump to check.

When connected to booster side (1):

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)

When connected to engine side (2):

No vacuum will be applied



FRONT DISC BRAKE

PFP:41000

On-board Inspection

AFS00168

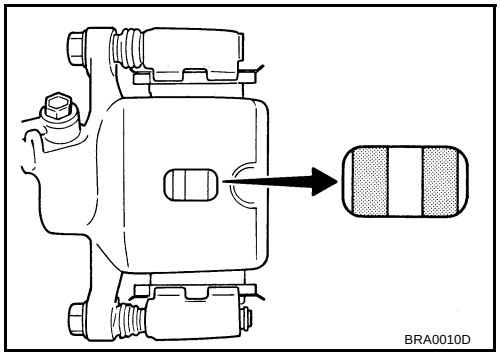
PAD WEAR INSPECTION

- Inspect the thickness of the pad through the cylinder body inspection hole. Use a scale for inspection if necessary.

Standard

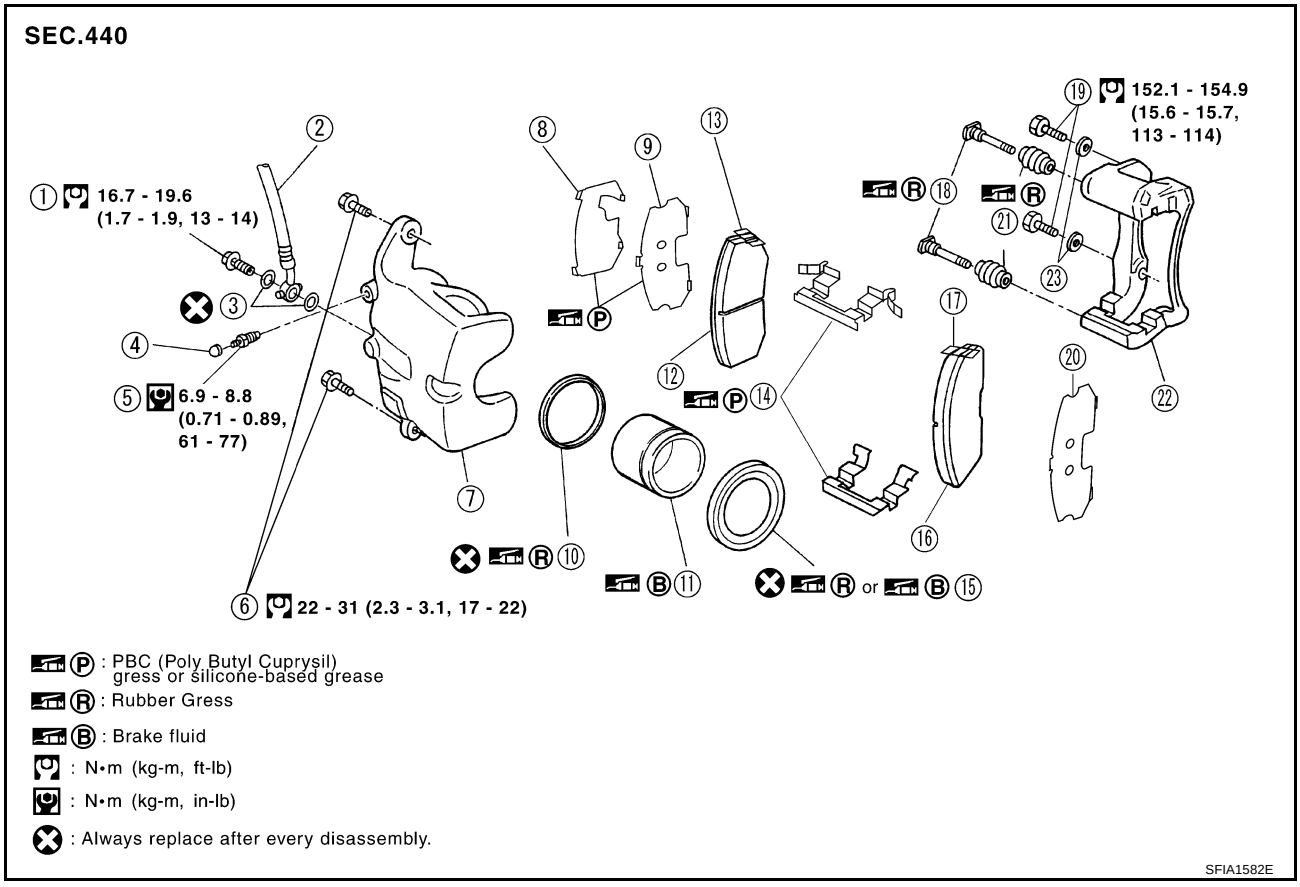
Standard thickness : 11.0 mm (0.433 in)

Repair limit thickness : 2.0 mm (0.079 in)



Components

AFS00169



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

CAUTION:

- **Clean dust on caliper and brake pad with a vacuum dust collector. Do not blow with compressed air.**
- **While brake pad and cylinder body are separated, piston may suddenly jump out, so do not depress brake pedal.**

- **It is not necessary to remove bolts on torque member and brake hose except for disassembly or replacement of the caliper assembly. In this case, hang cylinder body with a wire so that brake hose is not under tension.**
- **Do not damage piston boot.**
- **If any shim is subject to serious corrosion, replace it with a new one.**
- **Always replace shims and shim covers as a set when replacing brake pads.**
- **Keep the rotor clean of brake fluid.**

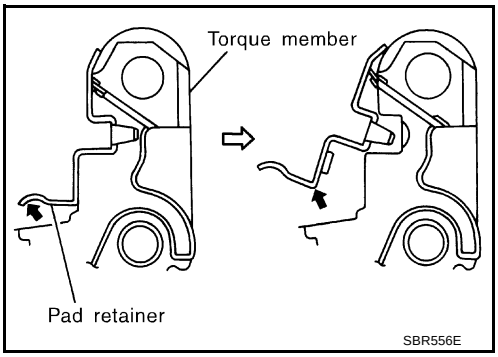
Removal and Installation of Brake Pad

AFS0016A

REMOVAL

1. Remove tires from vehicle with power tool.
2. Remove lower sliding pin bolt (1).
3. Hang cylinder body with a wire and remove pad and shim from torque member.

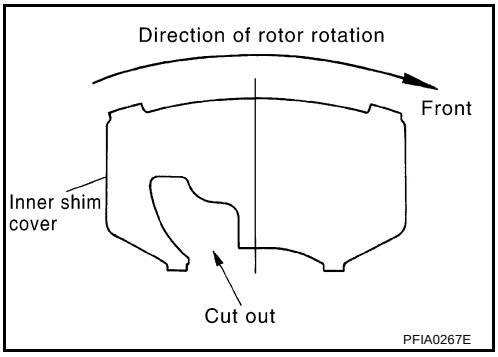
   CAUTION:
   When removing pad retainer from torque member, lift pad retainer in the direction shown by the arrow (shown in the figure) so as not to deform it.



INSTALLATION

1. Apply PBC (Poly Butyl Cuprysil) grease or silicone -based grease between inner shim cover and inner shim.
2. Attach inner shim and shim cover to inner pad and outer shim to outer pad.

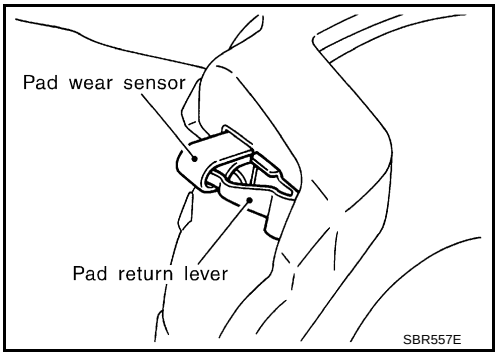
   CAUTION:
   Attach inner shim cover in the direction shown in the figure.



3. Apply PBC (Poly Butyl Cuprysil) grease or silicone -based grease to the contact surface of the pad retainer and attach pad retainer and pad to torque member.

   CAUTION:
   Since both inner and outer pads have pad return mechanisms on the upper pad retainer, when attaching a pad, make sure pad return lever is firmly attached to pad wear sensor.
4. Push piston in so that pad is firmly attached and attach cylinder body to torque member.

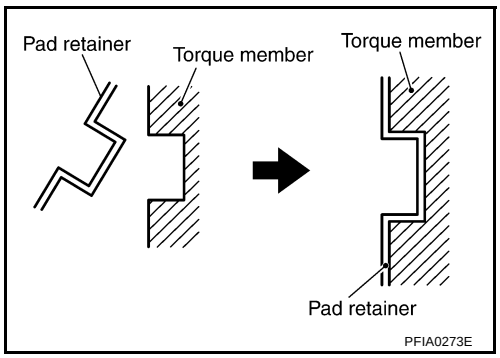
   NOTE:
   Using a disc brake piston tool (commercial service tool), etc., makes it easier to push in piston.



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

- **When attaching pad retainer, attach it firmly so that it does not float up higher than torque member, as shown in the figure.**

5. Install lower sliding pin bolt (1), and tighten it to the specified torque.
6. Check brake for drag.
7. Attach tires to vehicle.



Removal and Installation of Caliper Assembly

AFS0016B

REMOVAL

1. Remove tires from vehicle with power tool.
2. Drain brake fluid. Refer toBR-9, "Drain and Refill" .
3. Remove union bolts and torque member bolts, and remove caliper assembly.
4. Remove disc rotor.

INSTALLATION

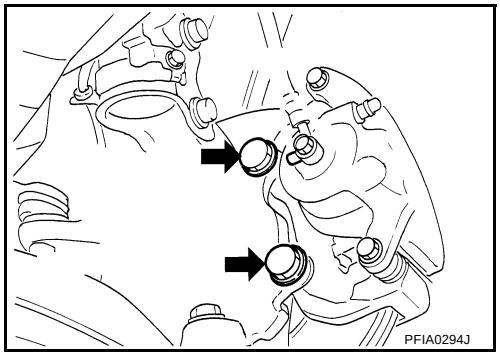
CAUTION:

- **Refill with new brake fluid “DOT3”**
- **Never reuse drained brake fluid.**

1. Install disc rotor.
2. Install caliper assembly to vehicle, and tighten bolts to the specified torque.

   : 152.1 - 154.9 N·m (15.6 - 15.7 kg-m, 113 - 114 ft - lb)

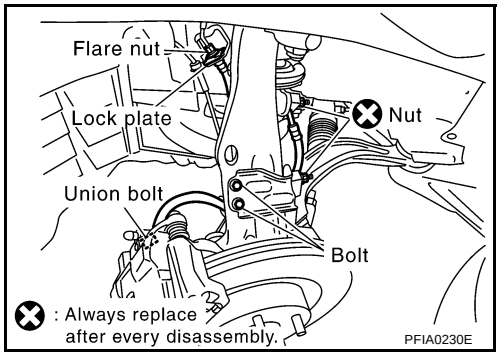
   CAUTION:
   - **Do not allow the knuckle attachment surface, caliper attachment surface, screws, bolts, or washers to come in contact with oil or water.**



3. Install brake hose to caliper assembly, and tighten union bolts to the specified torque.

   : 16.7 - 19.6 N·m (1.7 - 1.9 kg-m, 13 - 14 ft-lb)

   CAUTION:
   - **Do not reuse copper washer for union bolts.**
   - **Attach brake hose to the protrusion on the caliper assembly attachment part.**



4. Refill new brake fluid and bleed air. Refer toBR-10, "Bleeding Brake System" .
5. Attach tires to vehicle.

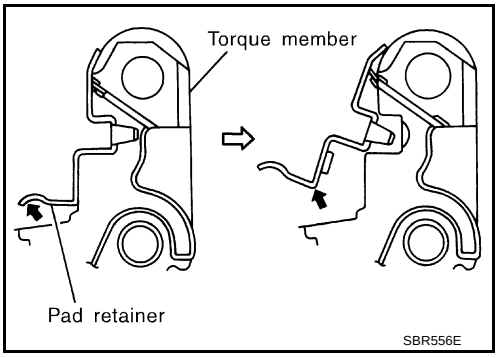
Disassembly and Assembly of Caliper Assembly

AFS0016C

DISASSEMBLY

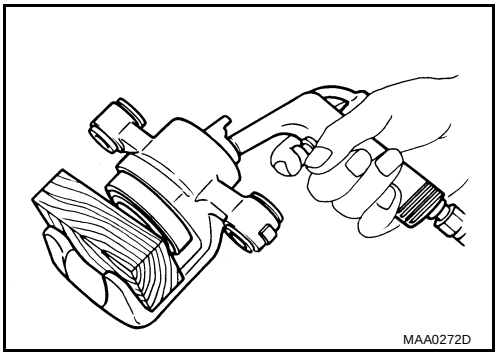
1. Remove slide pin bolt, and then remove pad, shim, shim cover, and pad retainer from torque member.

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



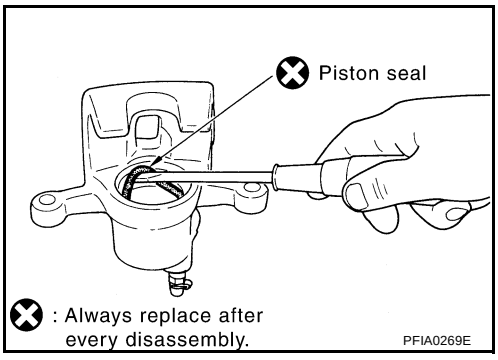
2. Remove sliding pins and sliding pin boots from torque member.
3. Place a wooden block as shown in the figure, and blow air from union bolt mounting hole to remove pistons and piston boots.

   CAUTION:
   Do not get your fingers caught in piston.



4. Using a 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. Never use mineral oils such as gasoline or kerosene.**
- **Check for corrosion, wear, or damage to the cylinder inner wall, and replace caliper if there are any non-standard conditions.**
- **Minor flaws caused by corrosion or a foreign material can be removed by polishing the surface with a fine sandpaper. 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:

- **Since the piston surface is plated, do not repair using sandpaper.**
- **Check piston surface for corrosion, wear, and damage. If any non-standard condition is detected, replace applicable part.**

Sliding Pins, Sliding Pin Bolts, 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.

ASSEMBLY

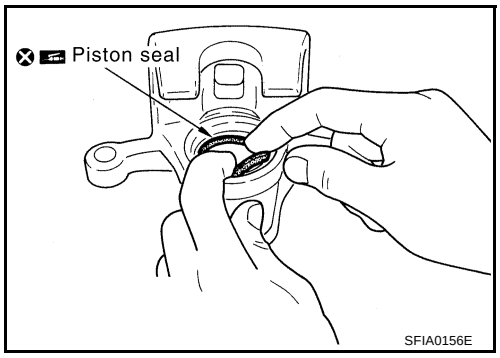
CAUTION:

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

1. Apply rubber grease to piston seal and attach to cylinder body.

   CAUTION:

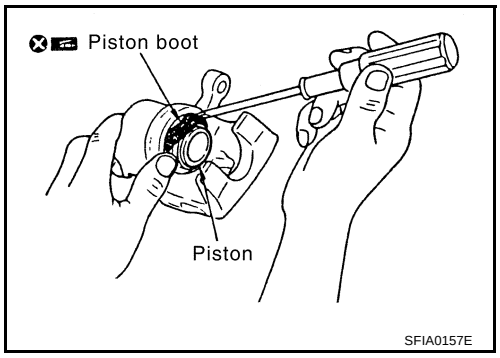
   Do not reuse piston seals.



2. Apply brake fluid or rubber grease to piston boot, place it on the piston, and firmly insert the piston boot cylinder-side lip into the cylinder body groove.

   CAUTION:

   Do not reuse piston boot.

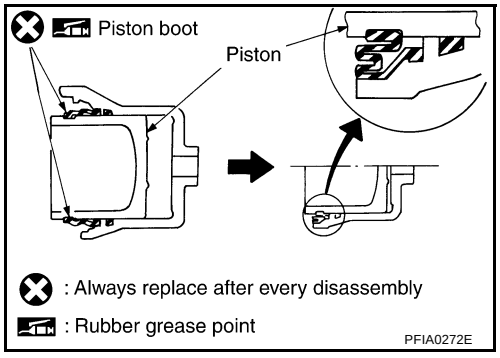


3. Apply brake fluid or rubber grease to piston, insert into cylinder body by hand and firmly attach the piston boot piston-side lip into the piston groove.

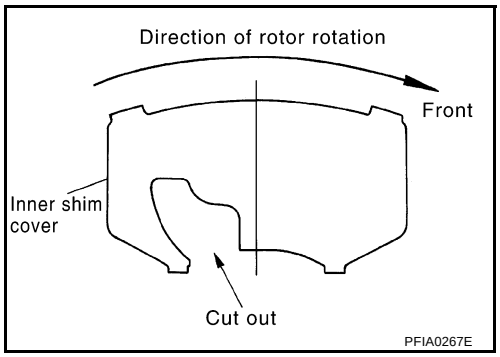
   CAUTION:

   Press the piston evenly and vary the pressing point to prevent cylinder inner wall from being rubbed.

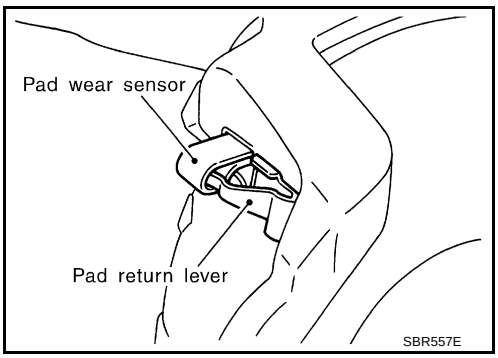
4. Install sliding pins and sliding pin boots to torque member.



5. Apply PBC (Poly Butyl Cuprysil) grease or silicone -based grease between inner shim cover and inner shim.
6. Attach inner shim and shim cover to inner pad and outer shim to outer pad.



7. Apply PBC (Poly Butyl Cuprysil) grease or silicone -based grease to the contact surface of the pad retainer and attach pad retainer and pad to torque member.
8. Install cylinder body. Tighten sliding pin bolt to the specified torque.



DISC ROTOR INSPECTION

Visual Inspection

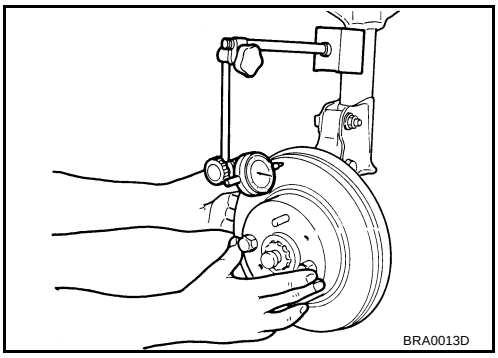
Check surface of the disc rotor for uneven wear, cracks, and serious damage. If any non-standard condition is detected, replace applicable part.

Runout Inspection

1. Using wheel nuts, fix disc rotor to wheel hub. (2 or more positions)
2. Inspect runout using a dial gauge.

Standard value
(measured at 10 mm (0.39 in) inside the disc edge)

Runout limit (with it attached to vehicle)	**: 0.035 mm (0.0014 in) or less**
Runout limit (just disc rotor)	**: 0.020 mm (0.0008 in) or less**



CAUTION:
Before measuring, make sure the axle endplay is 0 mm (0 in).

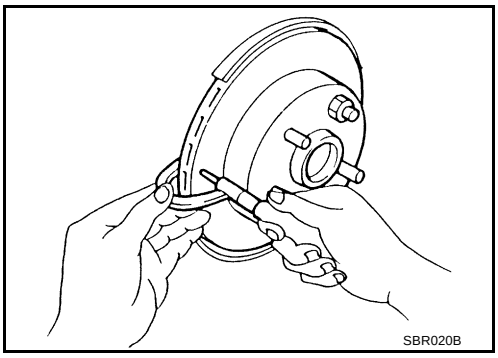
3. If runout is outside the limit, find the minimum runout point by shifting mounting positions of the disc rotor and wheel hub by one hole.

Thickness Inspection

Using a micrometer, check thickness of the disc rotor. If thickness is outside the standard, replace disc rotor.

Standard

Standard thickness	**: 24.0 mm (0.945 in)**
Wear limit	**: 22.0 mm (0.866 in)**
Maximum uneven wear (measured at 8 positions)	**: 0.015 mm (0.0006 in) or less**



BRAKE BURNISHING PROCEDURE

Burnish the 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 vehicle on a straight smooth road at 50 km/h (31 MPH).**
2. **Use medium brake pedal /foot effort to bring 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 vehicle at 50 km/h (31 MPH) for 1 minute without stopping.**
4. **Repeat steps 1 to 3, 10times or more to complete the burnishing procedure.**

REAR DISC BRAKE

PFP:44000

On-board Inspection

AFS000YC

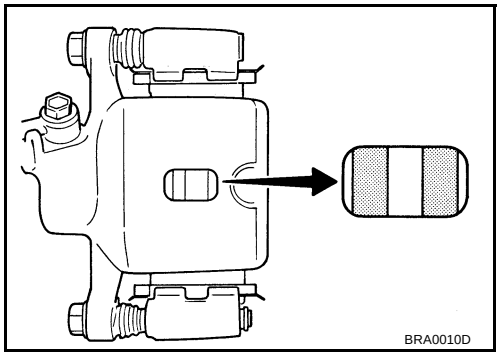
PAD WEAR INSPECTION

- Inspect the thickness of the pad through the cylinder body inspection hole. Use a scale for inspection if necessary.

Standard

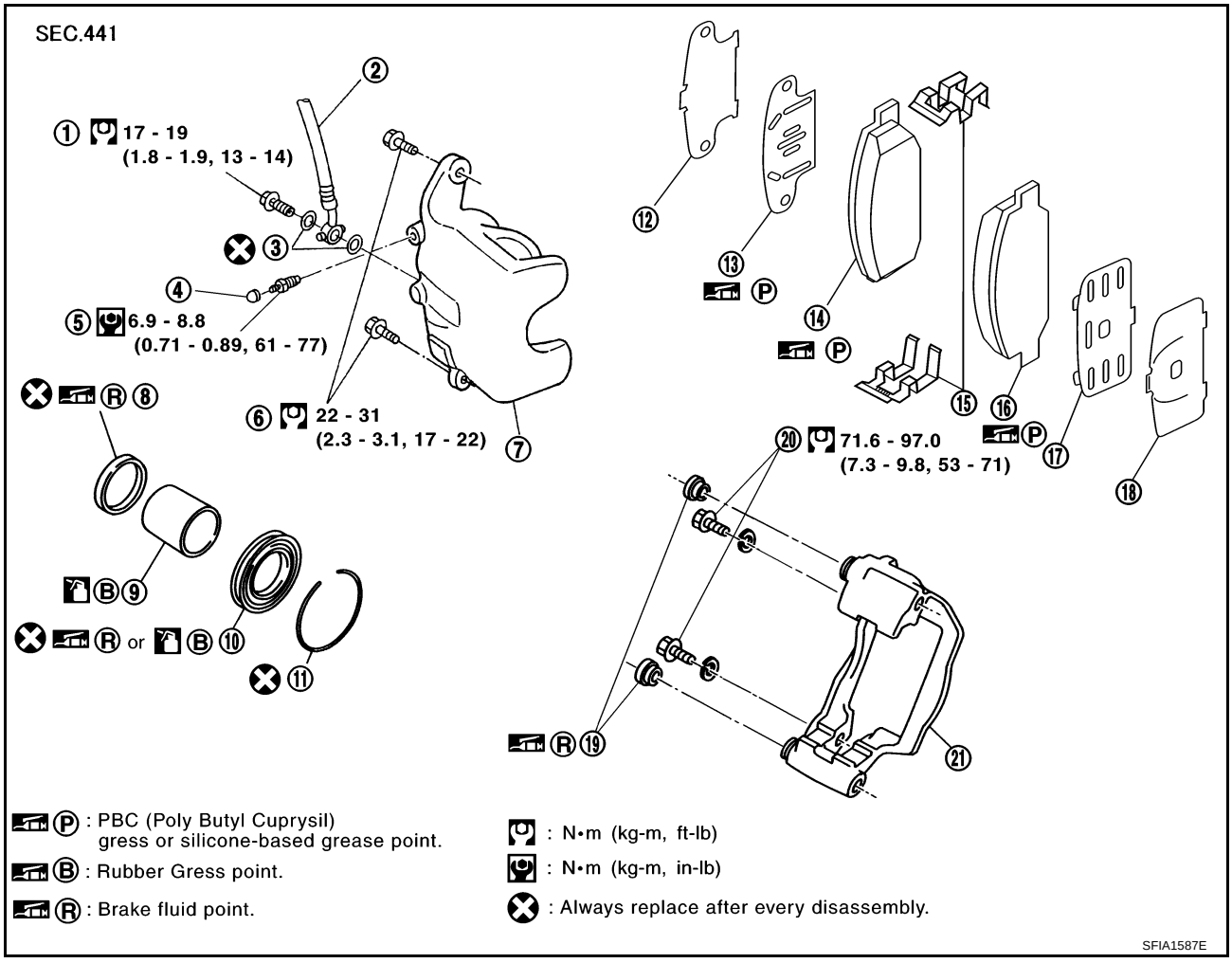
Standard thickness : 8.5 mm (0.335 in)

Repair limit thickness : 2.0 mm (0.079 in)



Components

AFS000YD



1.	Union bolt	2.	Brake hose	3.	Copper washer
4.	Cap	5.	Air bleeder	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 shim	18.	Outer shim cover
19.	Slide pin boot	20.	Torque member bolts	21.	Torque member

CAUTION:

- **Clean dust on caliper and brake pad with a vacuum dust collector. Do not blow with compressed air.**
- **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 the caliper assembly. In this case, hang cylinder body with a wire so that brake hose is not under tension.**
- **Do not damage piston boot.**
- **Always replace shims and shim covers as a set when replacing brake pads.**
- **Keep the rotor clean of brake fluid.**

Removal and Installation of Brake Pad

AFS000YE

REMOVAL

1. Remove tires from vehicle with power tool.
2. Remove sliding pin bold (one on top).
3. Hang cylinder body with a wire, and remove pads, pad retainers, shims from torque member.

INSTALLATION

1. Apply PBC (Poly Butyl Cuprysil) grease or silicon- based grease to the rear of the pad and to both sides of shim, and attach inner shim and shim cover to inner pad, and outer shim and outer shim cover to outer pad.
2. Attach pad retainer and pad to torque member.
3. Push piston in so that pad is firmly attached and attach cylinder body to torque member.

   NOTE:
   Using a disc brake piston tool (commercial service tool), etc., makes it easier to push in piston.

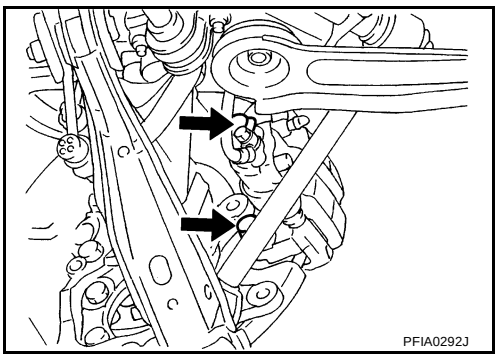
   CAUTION:
   By pushing in piston, the brake fluid returns to master cylinder reservoir tank. Watch the level of the surface of the reservoir tank.
4. Attach sliding pin bolt (one on top) and tighten to the specified torque.
5. Check brake for drag.
6. Attach tires to vehicle.

Removal and Installation of Caliper Assembly

AFS000YF

REMOVAL

1. Remove tires from vehicle with power tool.
2. Drain brake fluid. Refer to BR-9, "Drain and Refill" .
3. Remove union bolts and torque member bolts, and remove caliper assembly.
4. Remove disc rotor.



INSTALLATION

CAUTION:

- **Refill with new brake fluid “DOT 3”.**
- **Never reuse drained brake fluid.**

1. Install disc rotor.
2. Install caliper assembly to vehicle, and tighten bolts to the specified torque.

   CAUTION:
   Before installing caliper assembly to vehicle, wipe off oil and grease on washer seats on axle assembly and mounting surface of caliper assembly.
3. Install brake hose to caliper assembly and tighten union bolts to the specified torque.

CAUTION:
- **Do not reuse copper washer for union bolts.**
- **Securely attach brake hose to protrusion on caliper assembly.**

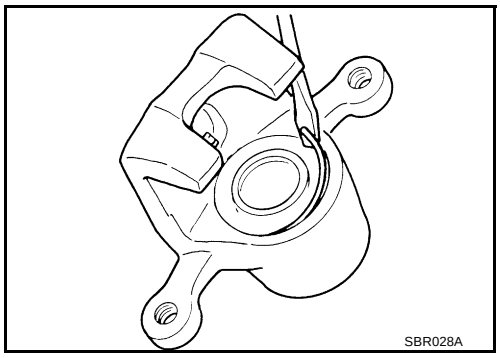
4. Insert new brake fluid and bleed air. Refer to BR-10, "Bleeding Brake System" .
5. Attach tires to vehicle.

Disassembly and Assembly of Caliper Assembly

AFS000YG

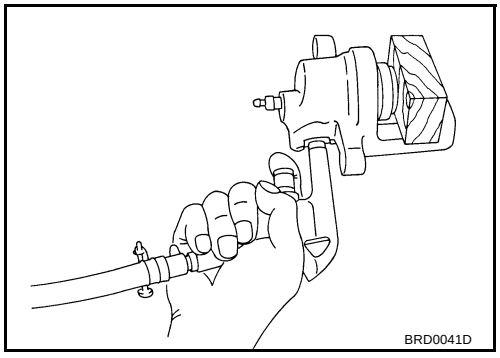
DISASSEMBLY

1. Remove slide pin bolt, and then remove pad, shim, shim cover, and pad retainer from torque member and cylinder.
2. Remove sliding pin boot from torque member.
3. As shown in the figure, using a screwdriver, remove retaining ring from cylinder body.



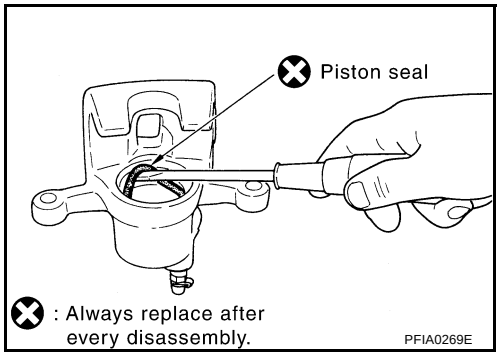
4. Place a wooden block as shown in the figure, and blow air from union bolt mounting hole to remove pistons and piston boots.

   CAUTION:
   Do not get your fingers caught in piston.



5. Using a screwdriver, remove piston seals from cylinder body.

   CAUTION:
   Be careful not to damage cylinder inner wall.



CALIPER INSPECTION

Cylinder Body

CAUTION:
- **Use new brake fluid to clean. Never use mineral oils such as gasoline or kerosene.**
- **Check inner wall of cylinder for corrosion, wear, and damage. If any non-standard condition is detected, replace cylinder body.**
- **Minor flaws caused by corrosion or a foreign material can be removed by polishing the surface with a fine sandpaper. 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:

Since the piston surface is plated, do not repair using sandpaper.

Check piston surface for corrosion, wear, and damage. If any non-standard condition is detected, replace applicable part.

Sliding Pin Bolts and Sliding Pin Boots

Check that there is no wear, damage, or cracks in sliding pin bolts and sliding pin boots, and if there are, replace them.

ASSEMBLY

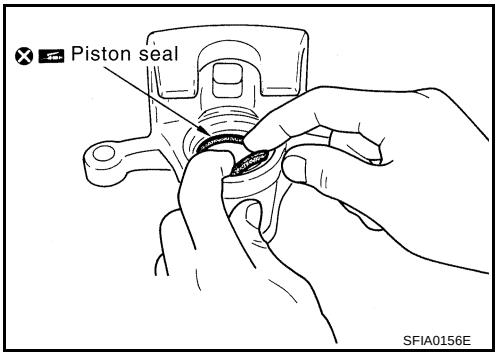
CAUTION:

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

1. Apply a rubber grease to piston seal and attach to cylinder body.

   CAUTION:

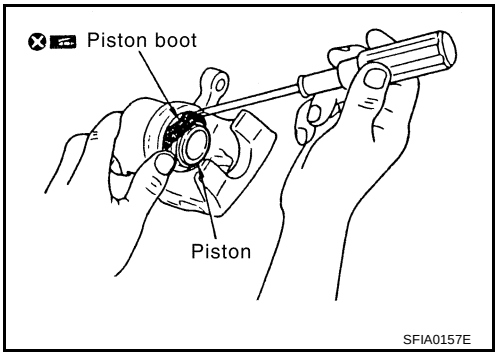
   Do not reuse piston seals.



2. Apply brake fluid or rubber grease to piston boot, place it on the piston, and firmly insert the piston boot cylinder-side lip into the cylinder body groove.

   CAUTION:

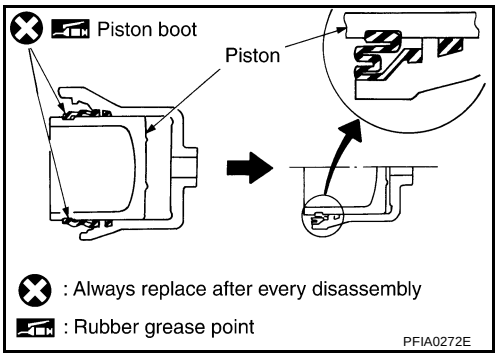
   Do not reuse piston boot.



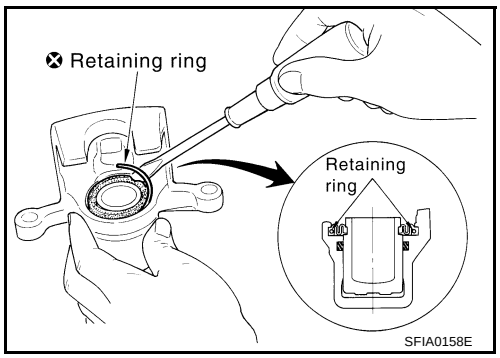
3. Apply a brake fluid to piston, insert into cylinder body by hand and firmly attach the piston boot piston-side lip into the piston groove.

   CAUTION:

   Press the piston evenly and vary the pressing point to prevent cylinder inner wall from being rubbed.



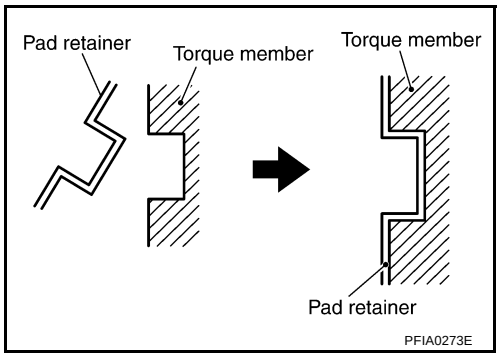
4. Fix piston boot with retaining ring.



CAUTION:

- **Make sure boot is firmly in the cylinder body groove.**
- **Do not reuse retaining ring.**

5. Attach sliding pin bolt and sliding pin boot to torque member.
6. Apply PBC (Poly Butyl Cuprysil) grease or silicon- based grease to the rear of the pad and to both sides of the shim, and attach inner shim and shim cover to inner pad, and outer shim and outer shim cover to outer pad.
7. Attach pad retainer and pad to torque member.



CAUTION:

When attaching pad retainer, attach it firmly so that it does not float up higher than torque member, as shown in the figure.

8. After assembling shims and shim covers to pad, install it to torque member.
9. Install cylinder body. Tighten sliding pin bolts to the specified torque.

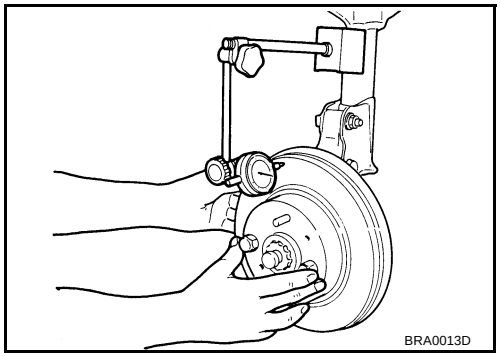
DISC ROTOR INSPECTION

Visual Inspection

Check surface of the 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, fix disc rotor to wheel hub. (2 or more positions)
2. Inspect runout using a dial gauge.



Standard value
(measured at 10 mm (0.39 in) inside the disc edge)

Measurement position	**: At a point 10 mm (0.39 in) from outer edge of the disc.**
Runout limit (with it attached to vehicle)	**: 0.10 mm (0.0039 in) or less**
Runout limit (just disc rotor)	**:0.07 mm (0.0028 in) or less**

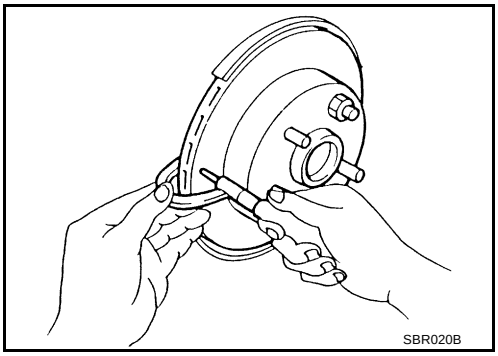
CAUTION:

Before measuring, make sure the axle endplay is 0 mm (0 in).

3. If runout is outside the limit, find the minimum runout point by shifting mounting positions of the disc rotor and wheel hub by one hole.

Thickness Inspection

Using a micrometer, check thickness of the disc rotor. If thickness is outside the standard, replace disc rotor.



Standard

Standard thickness	**: 16.0 mm (0.630 in)**
Wear limit	**: 14.0 mm (0.551 in)**
Maximum uneven wear (measured at 8 positions)	**: 0.015 mm (0.0006 in) or less**

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

General Specifications

AFS0008Q

Unit: mm (in)

Front brake	Brake model	CLZ25VD
	Rotor outer diameter × thickness	296 × 24.0 (11.65 × 0.945)
	Pad Length × width × thickness	125.6 × 46.0 × 11.0 (4.94 × 1.811 × 0.433)
	Cylinder bore diameter	57.2 (2.252)
Rear brake	Brake model	AD14VE
	Rotor outer diameter × thickness	292 × 16 (11.50 × 0.63)
	Pad Length × width × thickness	83.0 × 33.0 × 8.5 (3.268 × 1.299 × 0.335)
	Cylinder bore diameter	42.86 (1.6874)
Master cylinder	Cylinder bore diameter	26.99 (1.0626)
Control valve	Valve model	Electric brake force distribution
Brake booster	Booster model	M215T
	Diaphragm diameter	205 (8.07) / 230 (9.06)
Recommended brake fluid		DOT 3

Brake Pedal

AFS0008R

Brake pedal height (from dash panel top surface)	M/T model	154 - 164 mm (6.06 - 6.46 in)
	A/T model	162 - 172 mm (6.38 - 6.77 in)
Depressed pedal height (under a force of 490 N (50 kg, 110 lb) with the engine running)	M/T model	More than 90 mm (3.54 in)
	A/T model	More than 95 mm (3.74 in)
Clearance between stopper rubber and the threaded end of the stop lamp switch and ASCD cancel switch.		0.74 - 1.96 mm (0.0291 - 0.0772 in)
Pedal play		3 - 11 mm (0.12 - 0.43 in)

Brake Booster

AFS0008T

Vacuum type

Vacuum leakage [at vacuum of – 66.7 kPa (– 500 mmHg, –19.69 inHg)]	Within 3.3 kPa (25 mmHg, 0.98 inHg) of vacuum for 15 seconds
Input rod installation standard dimension	125 mm (4.92 in)

Check Valve

AFS0008S

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

Front Disc Brake

AFS0008U

Brake model		CLZ25VD
Brake pad	Standard thickness (new)	11.0 mm (0.433 in)
	Repair limit thickness	2.0 mm (0.079 in)
Disc rotor	Standard thickness (new)	24.0 mm (0.945 in)
	Repair limit thickness	22.0 mm (0.866 in)
	Maximum uneven wear (measured at 8 positions)	0.015mm (0.0006 in) or less
	Runout limit (with it attached to vehicle)	0.035 mm (0.0014 in) or less
	Runout limit (just disc rotor)	0.020 mm (0.0008 in) or less

Rear Disc Brake

AFS0008V

Brake model		AD14VE
Brake pad	Standard thickness (new)	8.5 mm (0.335 in)
	Repair limit thickness	2.0 mm (0.079 in)
Disc rotor	Standard thickness (new)	16.0 mm (0.630 in)
	Repair limit thickness	14.0 mm (0.551 in)
	Maximum uneven wear (measured at 8 positions)	0.015 mm (0.0006 in) or less
	Runout limit (with it attached to vehicle)	0.10 mm (0.0039 in) or less
	Runout limit (just disc rotor)	0.07 mm (0.0028 in) or less