SECTION BR
BRAKE SYSTEM

CONTENTS

SERVICE INFORMATION

PRECAUTIONS

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

INFOID:0000000007328832

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 WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

WARNING:

- **When working near the Airbag Diagnosis Sensor Unit or other Airbag System sensors with the Ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.**
- **When using air or electric power tools or hammers, always switch the Ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.**

Precaution Necessary for Steering Wheel Rotation After Battery Disconnect

INFOID:0000000007328833

NOTE:

- This Procedure is applied only to models with Intelligent Key system and NATS (NISSAN ANTI-THEFT SYSTEM).
- Remove and install all control units after disconnecting both battery cables with the ignition knob in the ″LOCK″ position.
- Always use CONSULT to perform self-diagnosis as a part of each function inspection after finishing work. If DTC is detected, perform trouble diagnosis according to self-diagnostic results.

For models equipped with the Intelligent Key system and NATS, an electrically controlled steering lock mechanism is adopted on the key cylinder.
For this reason, if the battery is disconnected or if the battery is discharged, the steering wheel will lock and steering wheel rotation will become impossible.
If steering wheel rotation is required when battery power is interrupted, follow the procedure below before starting the repair operation.

OPERATION PROCEDURE

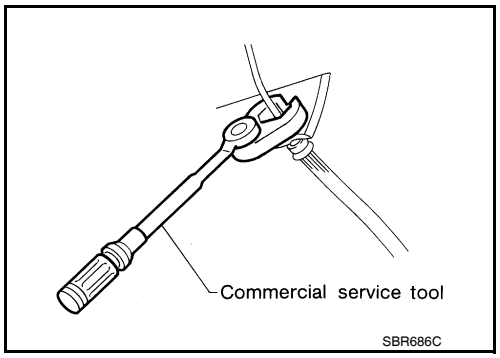
1. Connect both battery cables.
   NOTE:
   Supply power using jumper cables if battery is discharged.
2. Use the Intelligent Key or mechanical key to turn the ignition switch to the ″ACC″ position. At this time, the steering lock will be released.
3. Disconnect both battery cables. The steering lock will remain released and the steering wheel can be rotated.
4. Perform the necessary repair operation.

5. When the repair work is completed, return the ignition switch to the ″LOCK″ position before connecting the battery cables. (At this time, the steering lock mechanism will engage.)
6. Perform a self-diagnosis check of all control units using CONSULT.

Precaution for Brake System

INFOID:0000000007328834

- Refill using recommended brake fluid. Refer to MA-13.
- Never reuse drained brake fluid.
- Be careful not to splash brake fluid on painted surface of body. If brake fluid is splashed on painted surfaces of body immediately wipe it off with cloth and then wash it away with water.
- To clean or wash all parts of master cylinder, disc brake caliper and wheel cylinder, use new brake fluid.
- Never use mineral oils such as gasoline or kerosene. They will ruin rubber parts of the hydraulic system.
- Use a flare nut wrench when removing a brake tube and use a flare nut torque wrench when installing a brake tube.
- When installing brake tubes and hoses, be sure to check torque.
- Before working, turn ignition switch OFF and disconnect connectors of ABS actuator and electric unit (control unit) or the battery cable from the negative terminal.
- Burnish the new braking 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-32, "Brake Burnishing Procedure" .

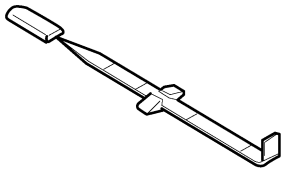
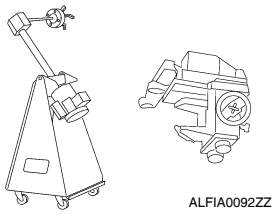


PREPARATION

Special Service Tool

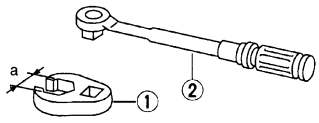
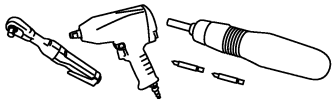
INFOID:0000000007328835

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

Tool number (Kent-Moore No.) Tool name	Description
— (J-46532) Brake and clutch pedal height measurement tool  LFIA0227E	Measuring brake pedal height
38-PFM90.5 (—) Pro-Cut PFM90 On-Car Brake Lathe  ALFIA0092ZZ	Turning rotors

Commercial Service Tool

INFOID:0000000007328836

Tool name	Description
1. Flare nut crowfoot 2. Torque wrench  S-NT360	Removing and installing brake piping **a: 10 mm (0.39 in) / 12 mm (0.47 in)**
Pin punch  ZZA0515D	Removing and installing reservoir tank pin **Tip diameter: 4 mm (0.16 in)**
Power tool  PIIB1407E	Removing nuts, bolts and screws

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

INFOID:0000000007328837

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

Reference page		BR-25, BR-33	BR-25, BR-33	BR-25	BR-29, BR-33	BR-29, BR-33	BR-29, BR-33	BR-29, BR-33	BR-29, BR-33	—	BR-29, BR-33	BR-33	FAX-5, "NVH Troubleshooting Chart"	MT-9, "NVH Troubleshooting Chart"	FSU-6, "NVH Troubleshooting Chart"	WT-5, "NVH Troubleshooting Chart"	WT-5, "NVH Troubleshooting Chart"	FAX-5, "NVH Troubleshooting Chart"	PS-5, "NVH Troubleshooting Chart"
Possible cause and SUSPECTED PARTS		Pads/Lining damaged	Pads/Lining - uneven wear	Shims damaged	Rotor imbalance	Rotor damage	Rotor runout	Rotor deformation	Rotor deflection	Rotor rust	Rotor thickness variation	Drum out of round	WHEEL HUB	DIFFERENTIAL	SUSPENSION	TIRES	ROAD WHEEL	DRIVE SHAFT	STEERING
Symptom	Noise	×	×	×									×	×	×	×	×	×	×
	Shake				×								×		×	×	×	×	×
	Shimmy, Shudder				×	×	×	×	×	×	×	×			×	×	×		×

×: Applicable

BRAKE PEDAL

Inspection and Adjustment

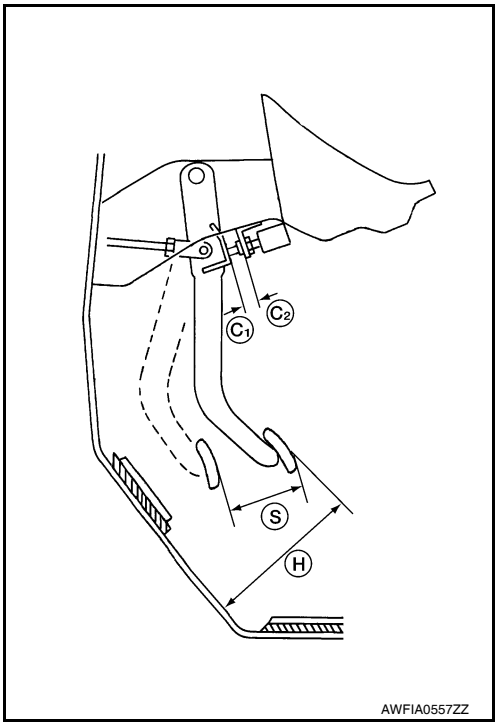
INFOID:0000000007328838

INSPECTION

1. Check brake pedal free height (H) from dash panel top surface using Tool.

Tool number : — (J-46532)

2. Check clearance between pedal stopper (C_1) and threaded end of stop lamp switch and ASCD cancel switch (C_2), if equipped.



Brake pedal free height (H) (from dash panel top surface)	**: Refer to BR-38, "Brake Pedal".**
Brake pedal full stroke (S)	**: Refer to BR-38, "Brake Pedal".**
Clearance between pedal stopper (C_1) and threaded end of stop lamp switch and ASCD cancel switch (C_2), if equipped.	**: Refer to BR-38, "Brake Pedal".**

ADJUSTMENT

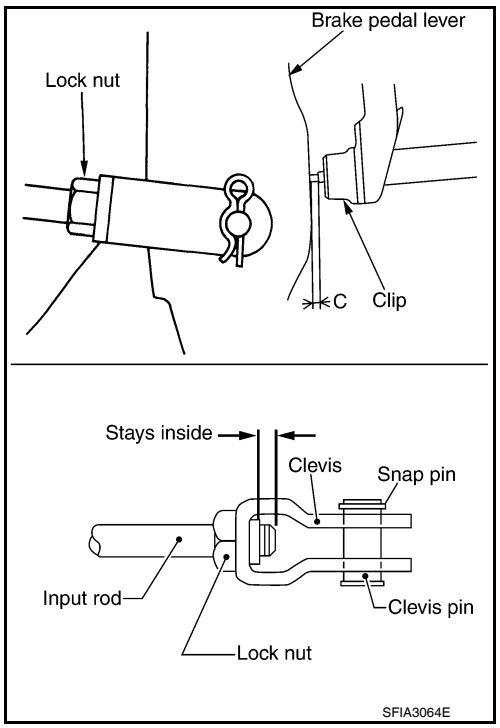
1. Loosen stop lamp switch and ASCD cancel switch, if equipped, by rotating it counterclockwise by 45°.

2. Loosen lock nut on input rod, then rotate input rod to set pedal to the specified height, and tighten the lock nut.
CAUTION:
Make sure that the threaded end of input rod stays inside clevis.

Lock nut : Refer to BR-21, "Removal and Installation".

3. With the pedal pulled and held by hand, press stop lamp switch and ASCD cancel switch, if equipped, until their threaded end contacts the brake pedal stopper.
4. With the threaded end of stop lamp switch and ASCD cancel switch, if equipped, contacting brake pedal stopper, rotate the switches clockwise by 45° to secure.
CAUTION:
Make sure that the clearance (C) between pedal stopper and switch threaded end is within specification.

Clearance between pedal stopper (C_1) and threaded end of stop lamp switch and ASCD cancel switch (C_2), if equipped : Refer to BR-38, "Brake Pedal".

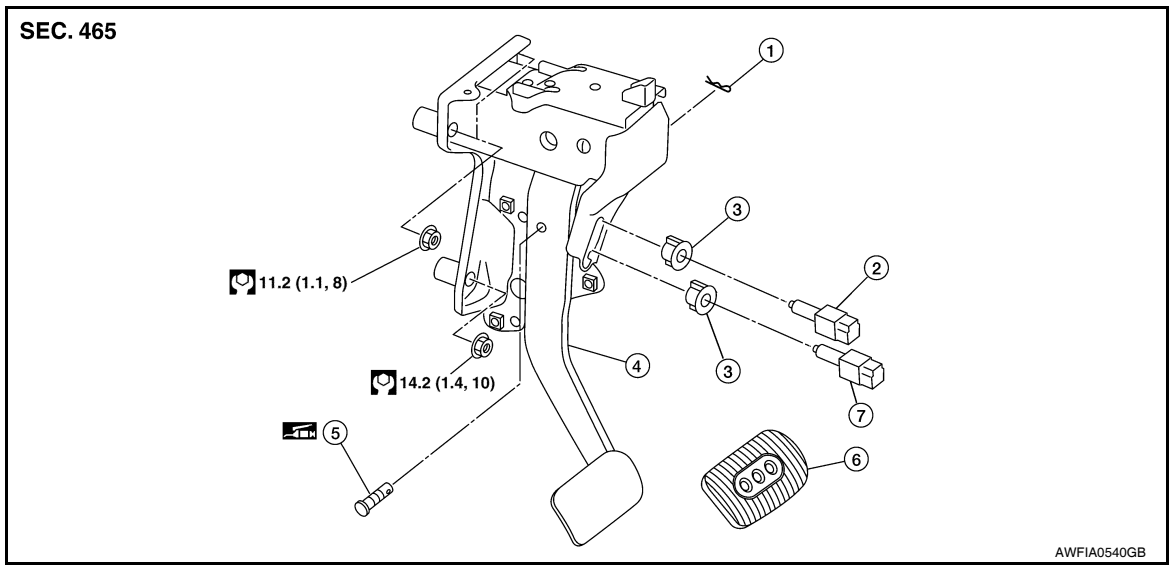


5. Check that the stop lamps go out when the brake pedal is released.
CAUTION:
Make sure that stop lamps go off when brake pedal is released.
6. Start the engine and check the brake pedal for smooth operation.

Removal and Installation

INFOID:0000000007328839

COMPONENTS

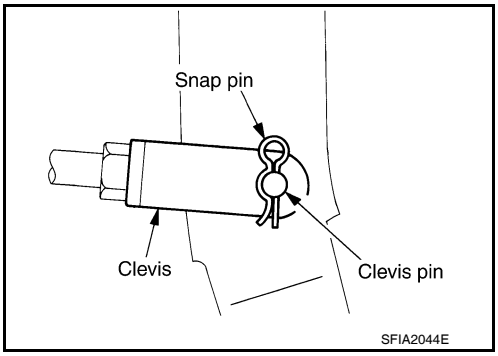


1. Snap pin
2. Stop lamp switch
3. Clip
4. Brake pedal assembly
5. Clevis pin
6. Brake pedal pad
7. ASCD cancel switch (if equipped)

REMOVAL

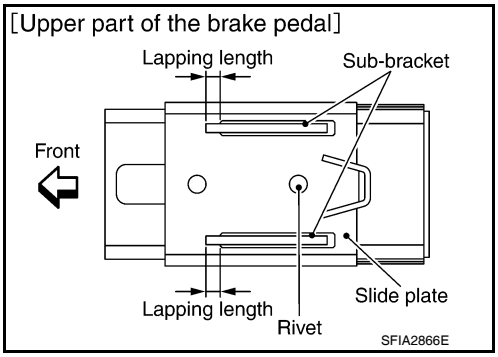
1. Remove the instrument lower panel LH. Refer to IP-11, "Component Parts".

2. Disconnect accelerator pedal position sensor harness connector.
3. Remove stop lamp switch and ASCD cancel switch, if equipped, from brake pedal assembly.
4. Remove snap pin and clevis pin from clevis of brake booster.
5. Remove nuts from brake pedal bracket, and remove brake pedal assembly from vehicle.
6. Remove accelerator pedal from brake pedal assembly.

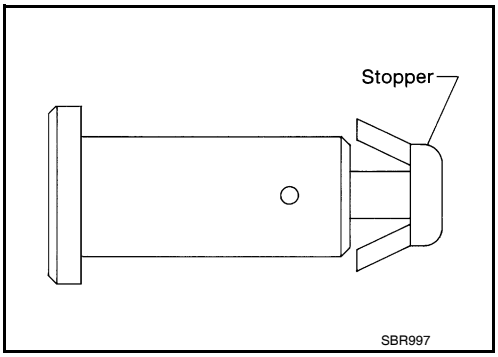


INSPECTION AFTER REMOVAL

- Check brake pedal upper rivet for deformation.
- Make sure that the lapping length of sub-bracket and slide plate is at least 6.9 ± 0.5 mm (0.272 ± 0.020 in).
- Check brake pedal for bend, damage, and cracks on the welded parts.
- Replace brake pedal assembly if any non-standard condition is detected.

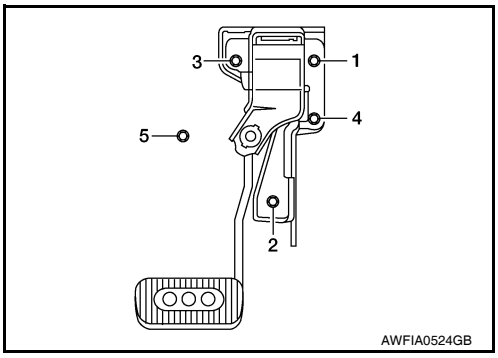


- Check clevis pin and plastic stopper for damage and deformation. Replace clevis pin as necessary.



INSTALLATION

1. Install the accelerator pedal on the brake pedal assembly. Refer to ACC-4, "Removal and Installation".
2. Install the brake pedal assembly on the lower dash panel and tighten the brake pedal assembly nuts in the order as shown to specification.



3. Installation of the remaining components are in the reverse order of the removal.
   - After installing brake pedal assembly to vehicle, adjust brake pedal. Refer to BR-6, "Inspection and Adjustment".
   - After installing accelerator pedal, check accelerator pedal. Refer to ACC-4, "Removal and Installation".

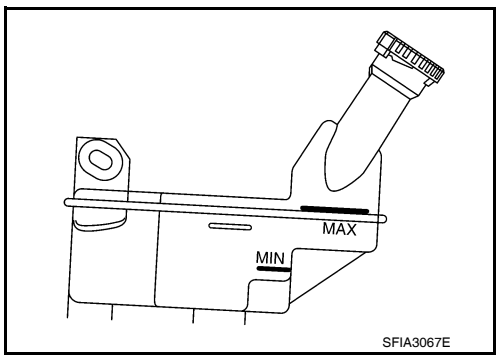
BRAKE FLUID

On Board Inspection

INFOID:0000000007328840

CHECKING BRAKE FLUID LEVEL

- Make sure the fluid level in the reservoir tank is within the standard (between MAX and MIN lines).
- Visually check around the reservoir tank for fluid leaks.
- If fluid level is excessively low, check brake system for fluid leaks.
- Release parking brake lever and see if brake warning lamp goes off. If not, check brake system for fluid leaks.



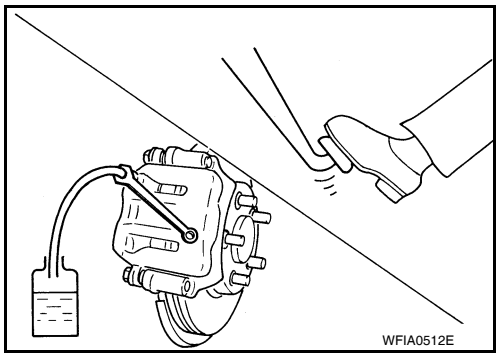
Drain and Refill

INFOID:0000000007328841

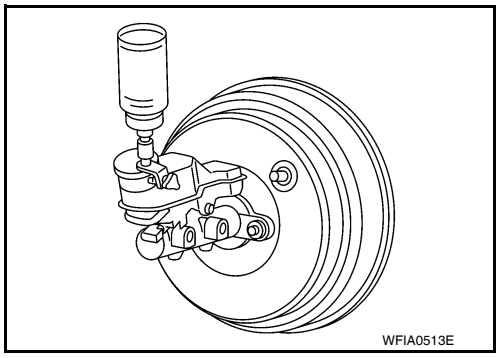
CAUTION:

- **Refill using recommended brake fluid. Refer to MA-13, "Fluids and Lubricants".**
- **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, immediately wipe them with cloth and wash it away with water.**
- **Before working, disconnect connectors of ABS actuator and electric unit (control unit) or battery negative terminal.**

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



3. Clean inside of reservoir tank, and refill with new brake fluid.
4. Loosen bleed valve, depress brake pedal slowly to full stroke and then release it. Repeat the procedure every 2 or 3 seconds until the new brake fluid comes out, then close the bleed valve while depressing the brake pedal. Repeat the same procedure for each wheel.
5. Bleed the air from the brake hydraulic system. Refer to BR-9, "Bleeding Brake System" .



Bleeding Brake System

INFOID:0000000007328842

CAUTION:

- **While bleeding, pay attention to master cylinder fluid level.**
- **Before working, disconnect connectors of ABS actuator and electric unit (control unit) or the battery cable from the negative terminal.**

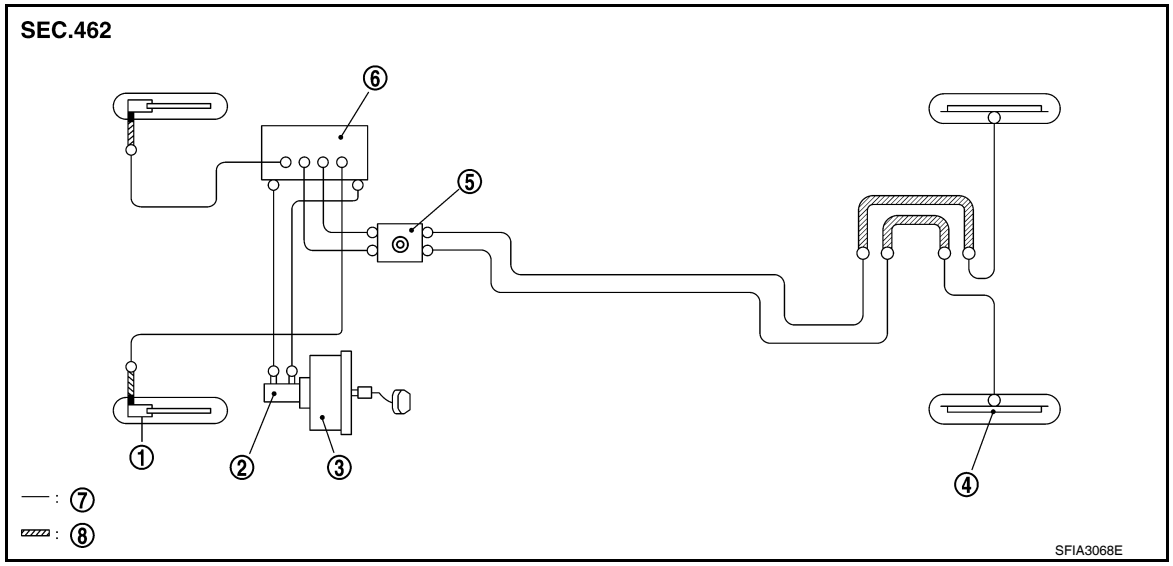
1. Connect a vinyl tube to the rear right bleed valve.
2. Fully depress brake pedal 4 to 5 times.

3. With brake pedal depressed, loosen bleed valve to let the air out, and then tighten it immediately.
4. Repeat steps 2, 3 until no more air comes out.
5. Tighten bleed valve to specified torque. Refer to BR-25, "Component" (front disc brake), BR-33, "Component" (rear drum brake).
6. Following the steps 1 to 5 above, with master cylinder reservoir tank filled at least half way, bleed air from the rear right, front left, rear left, and front right brake, in that order.

BRAKE TUBE AND HOSE

Hydraulic Circuit

INFOID:0000000007328843



1.	Front disc brake	2.	Brake master cylinder	3.	Brake booster
4.	Rear drum brake	5.	Connector	6.	ABS actuator and electric unit (control unit)
7.	Brake tube	8.	Brake hose		
■:	Union bolt 18.2 N.m (1.9 kg-m, 13.0 ft-lb)	◎:	Connector bolt 7.0 N.m (0.71 kg-m, 62 in-lb)	○:	Flare nut 16.2 N.m (1.7 kg-m, 12.0 ft-lb)

CAUTION:

- **All tubes and hoses must be free from excessive bending, twisting and pulling.**
- **Make sure there is no interference with other parts when turning steering both clockwise and counterclockwise.**
- **Brake tubes and hoses are an important safety part. Always disassemble the parts and retighten their fittings, if a brake fluid leak is detected. Replace applicable part with a new one, if damaged part is detected.**
- **Be careful not to splash brake fluid on painted areas; it may cause paint damage. If brake fluid is splashed on painted surfaces of body, immediately wipe them with cloth and then wash it away with water.**
- **Do not bend or twist brake hose sharply, or strongly pull it.**
- **When removing components, cover brake line connections so that dirt, dust, or other foreign matters do not get in.**
- **Refill using recommended brake fluid. Refer to MA-13, "Fluids and Lubricants".**
- **Never reuse drained brake fluid.**
- **Do not reuse copper sealing washers.**

NOTE:

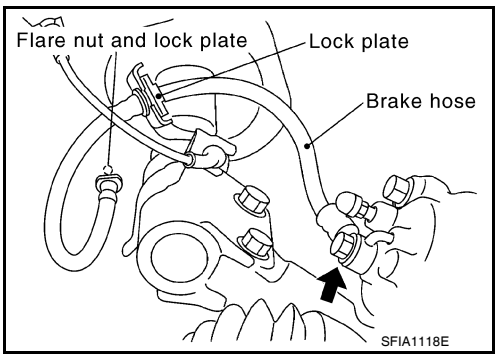
When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

Front Brake Tube and Hose

INFOID:0000000007328844

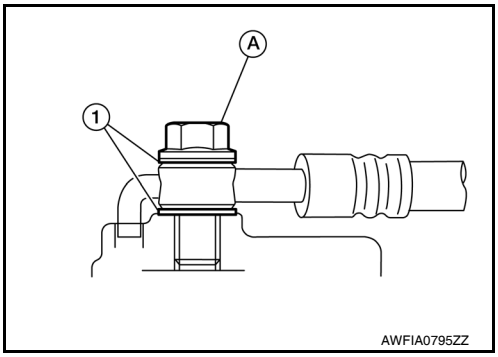
REMOVAL

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 discard the copper sealing washers.
   CAUTION:
   Do not reuse copper sealing washers.
4. Remove brake hose from caliper assembly.
5. Remove lock plate, and remove brake hose.



INSTALLATION

1. Assemble union bolt (A) and new copper sealing washers (1) on to brake hose.
   CAUTION:
   Do not reuse copper sealing washers.
2. Position the L-shape metal fitting of the brake hose to the brake caliper assembly positioning hole.
3. Tighten union bolt (A) to the specified torque. Refer to BR-11, "Hydraulic Circuit".
4. Connect brake hose to brake tube, and temporarily tighten flare nut by hand as much as possible.
5. Secure brake hose and brake tube with lock plates.
6. Tighten flare nut to the specified torque with a suitable tool. Refer to BR-11, "Hydraulic Circuit".
7. Bleed the air from the brake hydraulic system. Refer to BR-9, "Bleeding Brake System".



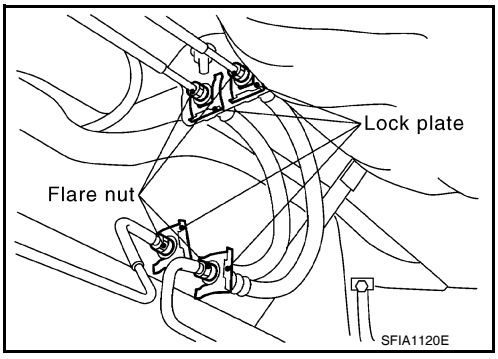
Rear Brake Tube and Hose

INFOID:0000000007328845

NOTE:
When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

REMOVAL

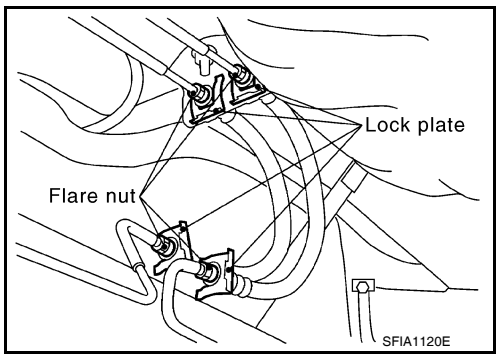
1. Drain brake fluid. Refer to BR-9, "Drain and Refill".
2. Remove brake tube from brake hose using a suitable tool.
3. Remove lock plate, and remove brake hose.



INSTALLATION

1. Connect brake hose to brake tube, and temporarily tighten flare nut by hand as much as possible.

2. Secure it to the bracket with the lock plate.
3. Tighten flare nut to the specified torque using a suitable tool. Refer to BR-11, "Hydraulic Circuit".



4. Bleed the air from the brake hydraulic system. Refer to BR-9, "Bleeding Brake System".

Inspection After Installation

INFOID:0000000007328846

CAUTION:

- **Always disassemble the parts and retighten their fittings, if a brake fluid leak is detected. Replace applicable part with a new one, if damaged part is detected.**
- **If leak is detected at the connections, retighten it or replace the damaged part.**

1. Check brake hose, tube, and connections for fluid leaks, damage, twisting, deformation, contact with other parts, and loose connections.
2. While depressing pedal under a force of 785 N (80 kg-f, 177 lb-f) with the engine running for approximately 5 seconds, check for fluid leaks from each part of the brake hydraulic system.

BRAKE MASTER CYLINDER

On-Board Inspection

INFOID:0000000007328849

LEAK INSPECTION

- Check for leaks around the master cylinder installation surface, the reservoir tank installation surface, and all the brake tube connections.

Removal and Installation

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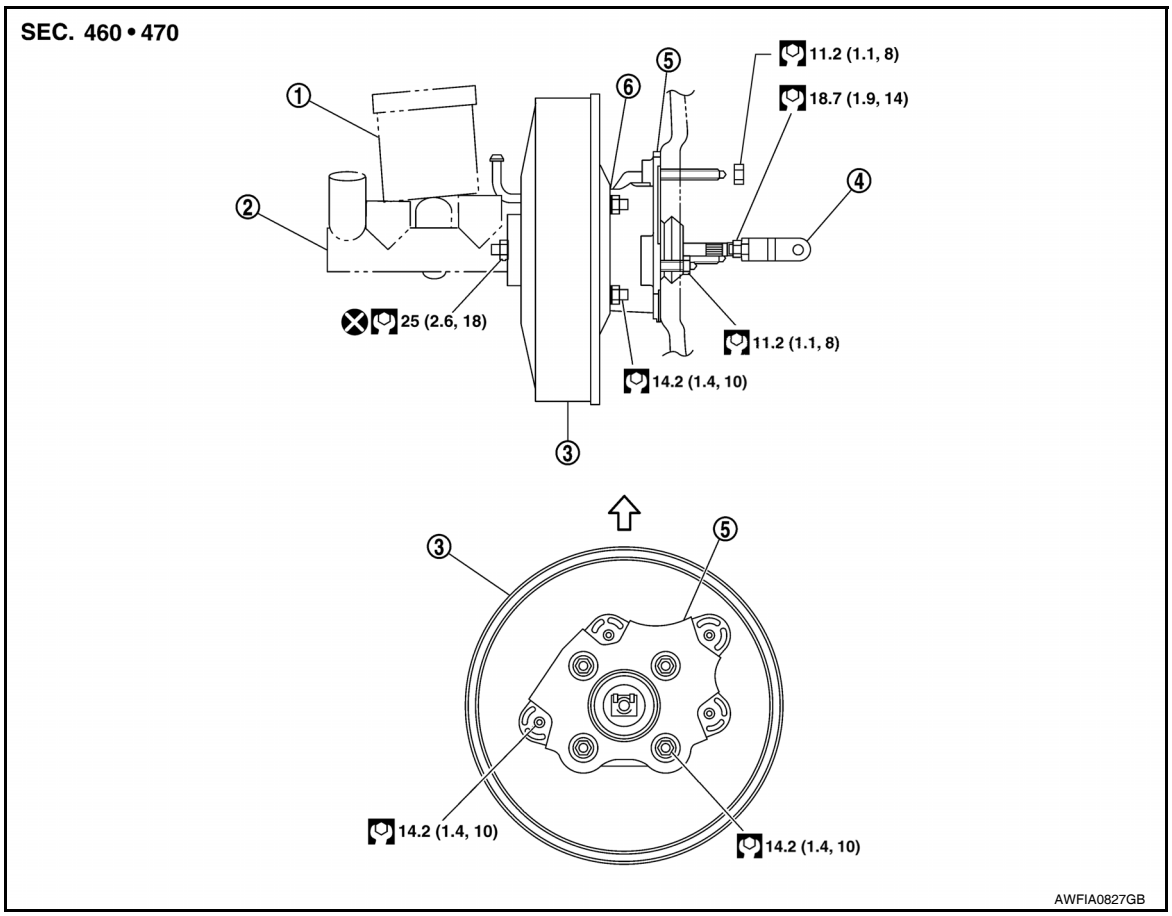


1. Reservoir tank
2. Master cylinder
3. Brake booster
4. Clevis
5. Spacer
6. Gasket

⇦ Up

CAUTION:

- **Be careful not to splash brake fluid on painted areas; it may cause paint damage. If brake fluid is splashed on painted areas, immediately wipe them with cloth and wash it away with water.**
- **Do not reuse O-ring.**
- **Do not reuse master cylinder nuts.**

NOTE:

When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

REMOVAL

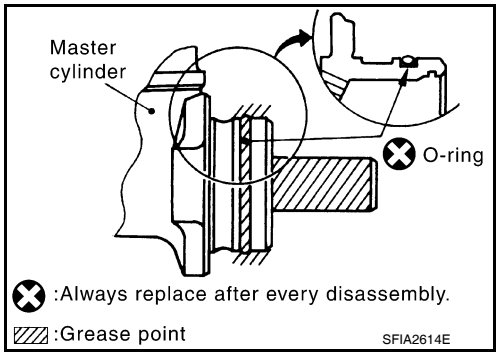
1. Drain the brake fluid. Refer to BR-9, "Drain and Refill".
2. Remove the battery. Refer to SC-7, "Removal and Installation".
3. Remove the air duct. Refer to EM-16, "Removal and Installation".
4. Remove the air cleaner. Refer to EM-16, "Removal and Installation".

5. Disconnect the brake fluid level switch harness connector.
6. Disconnect the clutch hose from the reservoir tank, if equipped.
7. Remove the brake tube from master cylinder using a suitable tool.
8. Remove the master cylinder assembly nuts, and remove master cylinder assembly.
9. Remove O-ring from master cylinder.

INSTALLATION

CAUTION:
- **Refill using recommended brake fluid. Refer to MA-13, "Fluids and Lubricants".**
- **Never reuse drained brake fluid.**
- **Check if the rod of primary piston has dust or scratches.**

1. Install O-ring to master cylinder.
   CAUTION:
   - **Do not reuse O-ring.**
   - **Apply silicone grease for O-ring, primary piston rod and to inside of booster.**
2. Install master cylinder to brake booster assembly, and tighten nuts to the specified torque.
   CAUTION:
   - **Do not damage or strain rod of primary piston.**
   - **Do not reuse master cylinder nuts.**

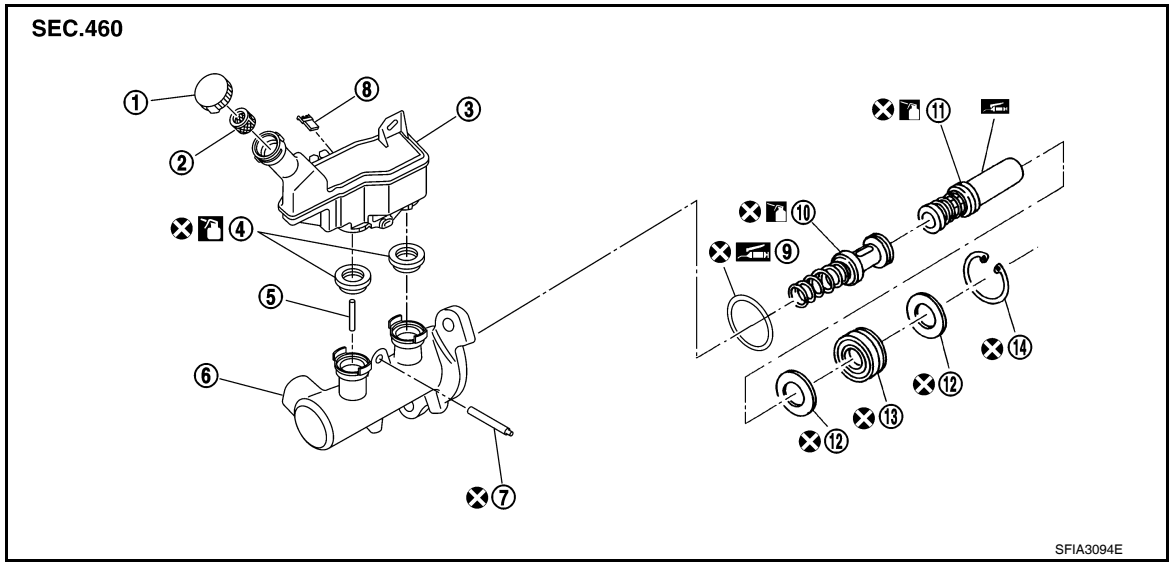


3. Install brake tubes to master cylinder, and temporarily tighten the flare nuts on the brake tube to master cylinder by hand.
4. Tighten brake tube flare nuts to the specified torque using a flare nut torque wrench. Refer to BR-11, "Hydraulic Circuit".
5. Connect the clutch hose to the reservoir tank, if equipped.
6. Connect brake fluid level switch harness connector.
7. Install the air cleaner. Refer to EM-16, "Removal and Installation".
8. Install the air duct. Refer to EM-16, "Removal and Installation".
9. Install the battery. Refer to SC-7, "Removal and Installation".
10. Refill with new brake fluid and bleed the air from the brake hydraulic system. Refer to BR-9, "Bleeding Brake System".

Disassembly and Assembly

INFOID:0000000007328851

COMPONENTS



1. Reservoir cap
2. Oil filter
3. Reservoir tank
4. Grommet
5. Piston stopper
6. Cylinder body
7. Pin
8. Brake fluid level switch
9. O-ring
10. Secondary piston assembly
11. Primary piston assembly
12. Plate
13. Guide assembly
14. Snap ring

: Brake fluid

: PBC (Poly Butyl Cuprysil) grease or silicone-based grease

DISASSEMBLY

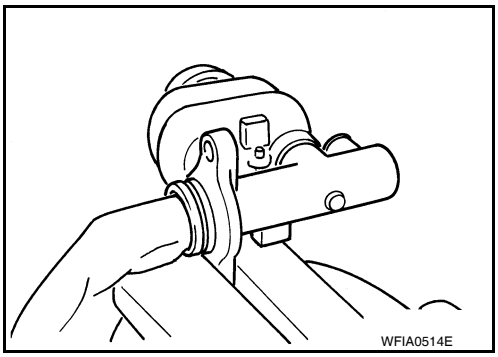
CAUTION:

While working, cover primary piston rod with cloth to prevent it from being damaged.

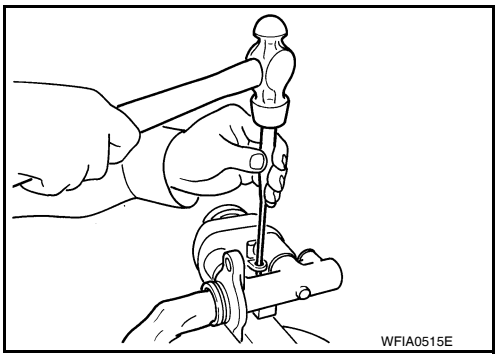
1. Secure flange of cylinder body in vise as shown.

   CAUTION:

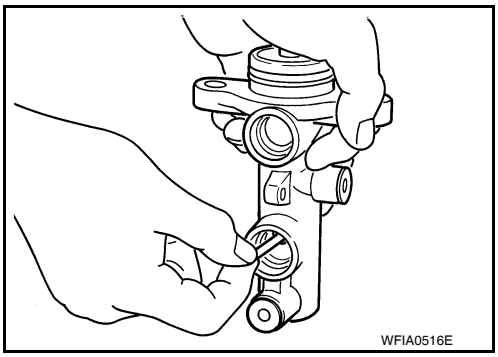
   - **Use copper plate or cloth to cover flange when securing in vise.**
   - **When securing master cylinder assembly in a vise, be sure not to over-tighten.**



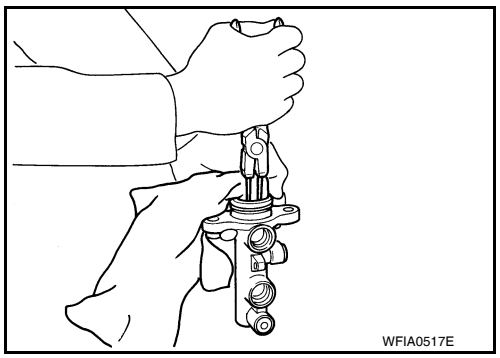
2. Using a pin-punch [commercial service tool: diameter approx. 4 mm (0.16 in)], remove pin from reservoir tank.
3. Remove master cylinder assembly from vise.
4. Remove reservoir tank and grommet from cylinder body.



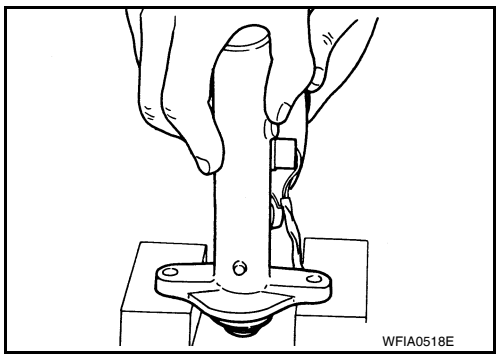
5. While pushing primary piston, remove piston stopper through secondary tank boss hole in the cylinder body.



6. Remove snap ring while pushing primary piston.
CAUTION:
Be careful not to pop out piston.
7. Holding rod of primary piston, remove primary piston assembly, plate and guide assembly by pulling straight to prevent piston cup from being caught by the inner wall of cylinder.
8. Remove plate and guide assembly from primary piston.
CAUTION:
Be careful not to damage rod from the inner wall of plate.


WFIA0517E

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


WFIA0518E

INSPECTION AFTER DISASSEMBLY

Cylinder Body

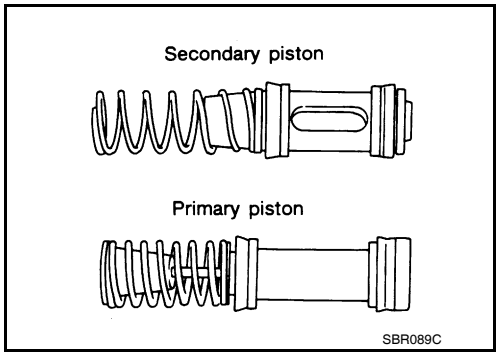
- Check the inner wall of cylinder for damage, wear, corrosion, and pin holes. Replace cylinder body if necessary.

ASSEMBLY

CAUTION:

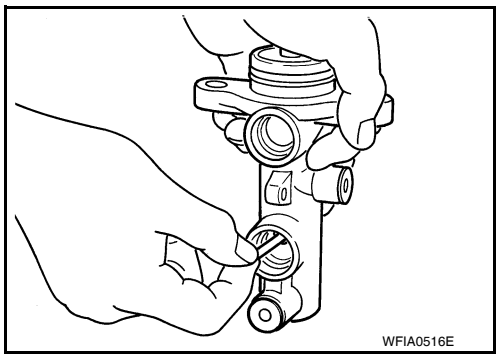
- **Never use mineral oils such as kerosene or gasoline during the cleaning and assembly processes.**
- **Make sure that there is no foreign material such as dirt and dust on the inner wall of cylinder, piston, and piston cup. Be careful not to damage parts with a service tool when assembling.**
- **Do not drop parts. If a part is dropped, do not use it.**

1. Apply brake fluid to the inner wall of cylinder body, primary piston assembly and secondary piston assembly.
2. Insert secondary piston and primary piston assembly into cylinder body in this order.
CAUTION:
  - **Pay attention to the orientation of piston cup, and insert straight to prevent cup from being caught by the inner wall of cylinder.**
  - **Always replace inner kit as a set.**

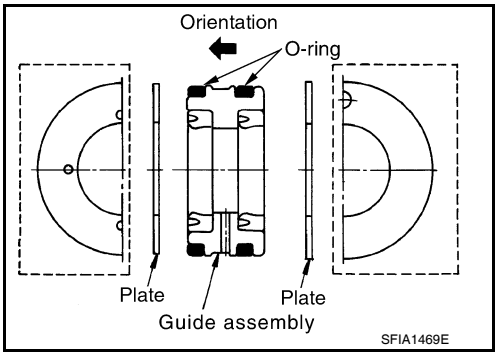


SBR089C

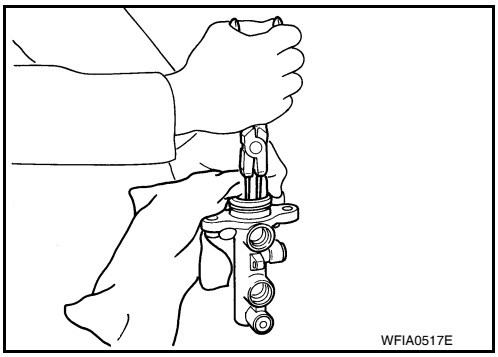
3. Set the slit of secondary piston towards the piston stopper mounting hole of cylinder body while pushing in the primary piston. Then install the piston stopper through the slit of secondary piston.


WFIA0516E

4. Insert plate and guide assembly into cylinder body.
CAUTION:
- **Be careful not to damage rod of primary piston.**
- **Pay attention to the orientation of guide assembly.**
- **Do not drop O-ring.**
- **Be careful the guide and/or plate are not inserted at an angle to cylinder inner wall.**

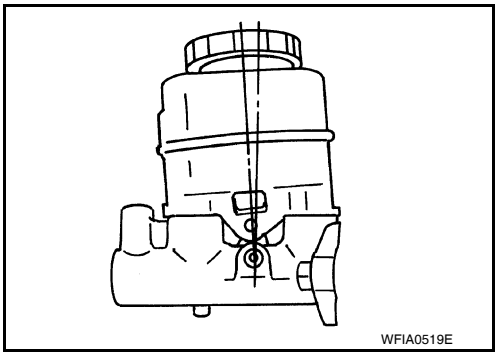


5. Be careful not to damage rod of primary piston with the cloth. Then insert snap ring to cylinder body while pushing primary piston.
CAUTION:
Make sure that snap ring is securely engaged in cylinder body inner diameter groove.

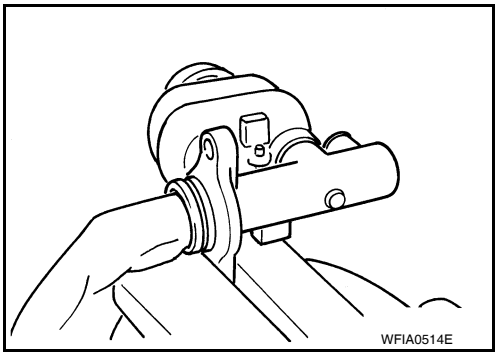


6. Apply brake fluid to a grommet, and press it into reservoir tank to install.

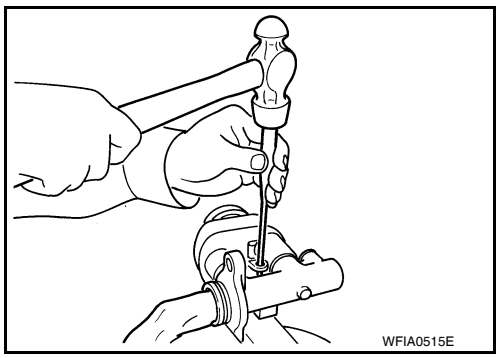
7. Install reservoir tank to cylinder body.
CAUTION:
Pay attention to the orientation of reservoir tank. Make sure reservoir tank is fully seated on master cylinder.



8. Secure flange of cylinder body in vise as shown.
CAUTION:
- **Use copper plate or cloth to cover flange for securing in the vise.**
- **When securing master cylinder assembly in a vise, be sure not to over-tighten.**
- **Be sure to secure the flange part with the brake tube installation side of cylinder body facing up (chamfered pin insert hole of cylinder body facing up).**



9. Using a pin punch [commercial service tool: diameter approx. 4 mm (0.16 in)], insert the reservoir tank pin into the pin hole.



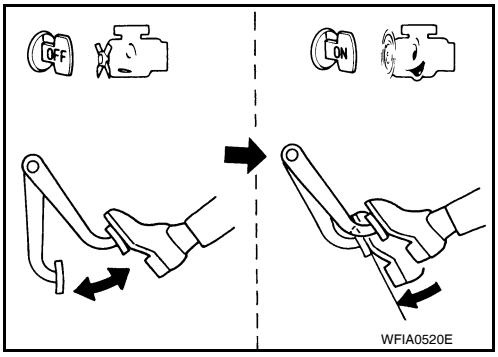
BRAKE BOOSTER

On Board Inspection

INFOID:0000000007328852

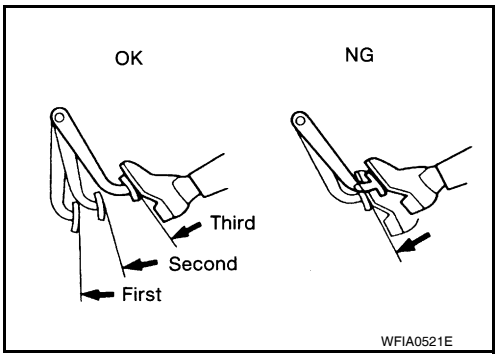
OPERATING CHECK

- With the engine stopped, change the vacuum to the atmospheric pressure by depressing brake pedal several times at intervals of 5 seconds.
- Then with brake pedal fully depressed, start engine and when the vacuum pressure reaches the standard, make sure that the clearance between brake pedal and floor panel decreases.



AIRTIGHT CHECK

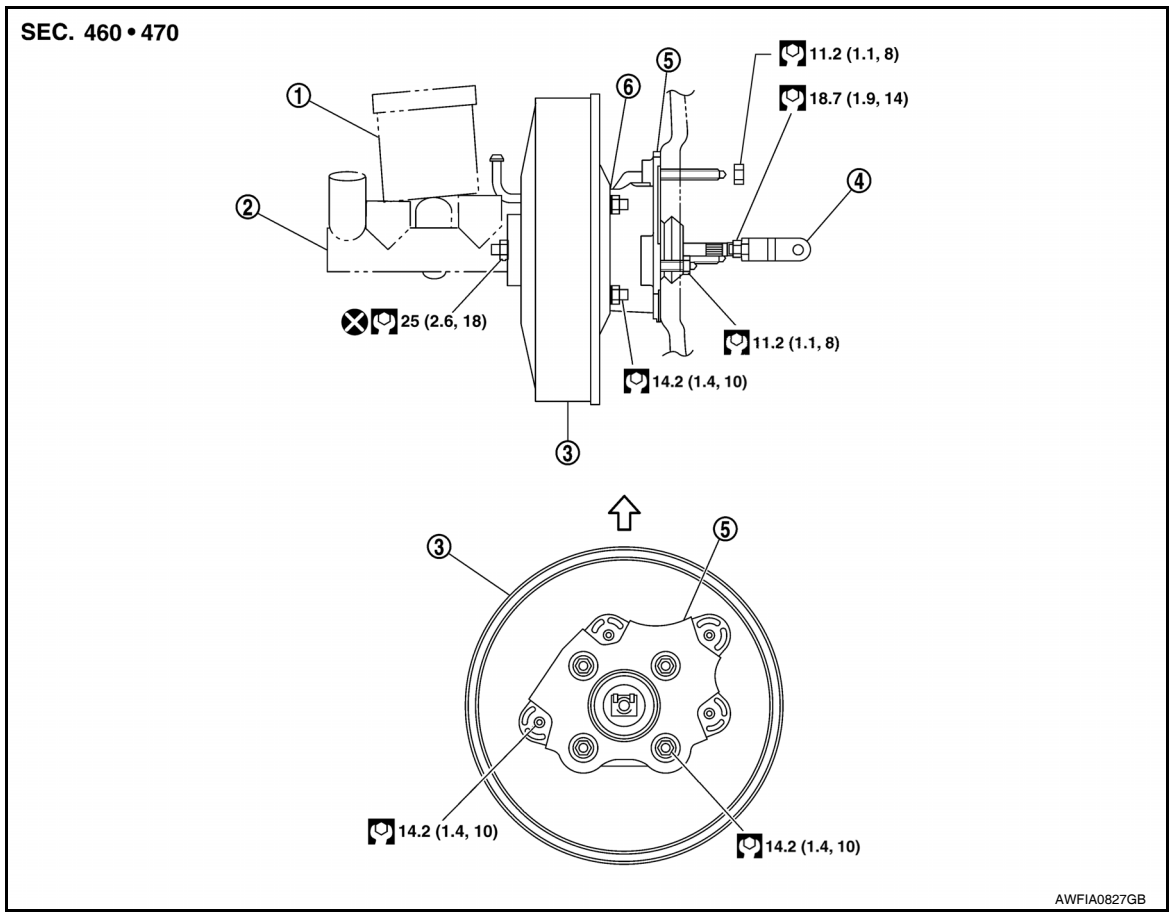
- Run engine at idle for approximately 1 minute, and stop it after applying vacuum to booster. Depress brake pedal normally to change the vacuum to the atmospheric pressure. Make sure that distance between brake pedal and floor panel gradually increases.



- Depress the brake pedal while engine is running, then stop engine with brake pedal depressed. The pedal stroke should not change after holding pedal down for 30 seconds.

Removal and Installation

INFOID:0000000007328853



1. Reservoir tank
2. Master cylinder
3. Brake booster
4. Clevis
5. Spacer
6. Gasket

⇦ Up

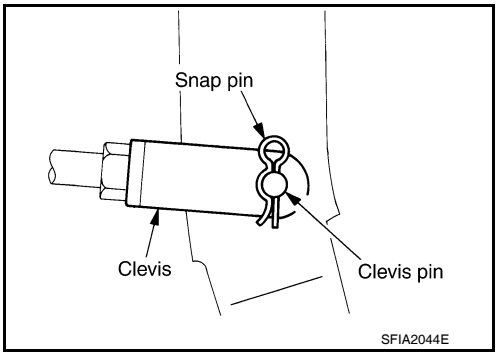
REMOVAL

CAUTION:

- **Be careful not to splash brake fluid on painted areas such as body. It may cause paint damage. If brake fluid is splashed on painted surfaces of body, wipe them with cloth immediately and then wash it away with water.**
- **Be careful not to deform or bend brake tubes while removing and installing brake booster.**
- **Replace clevis pin if it is damaged.**
- **Be careful not to damage brake booster stud bolt threads. If brake booster is tilted or inclined during installation, dash panel may damage the threads.**

1. Remove vacuum hose from brake booster.
2. Remove master cylinder assembly. Refer to BR-14, "Removal and Installation".
3. Remove the battery and battery tray. Refer to SC-7, "Removal and Installation".
4. Remove the instrument lower panel LH. Refer to IP-11, "Component Parts".

5. Remove snap pin and clevis pin on the clevis of the brake booster, and disconnect the input rod from the brake pedal.

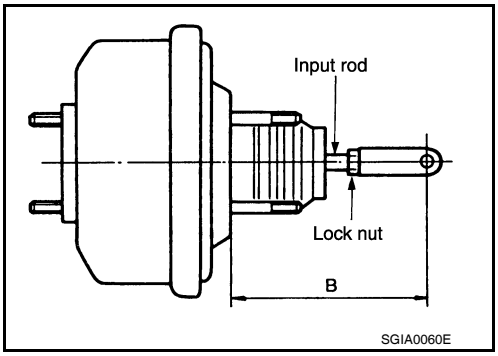


6. Remove brake pedal nuts on pedal bracket.
7. Remove the cowl top. Refer to EI-22, "Removal and Installation".
8. Remove between spacer and dash panel nut from dash panel.
9. Remove brake booster and spacer.
10. Remove spacer and gasket from brake booster.

INSTALLATION

1. Loosen lock nut to adjust input rod length (B) to the specified value.

Input rod length (B) : Refer to BR-39, "Brake Booster".

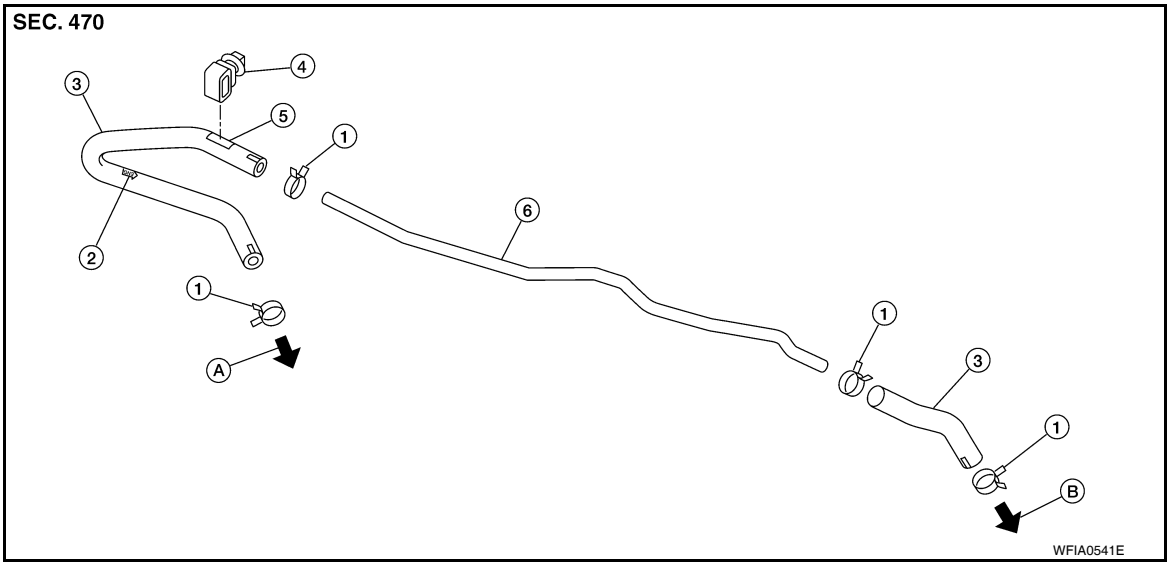


2. Install spacer and gasket to brake booster and tighten spacer nut (brake booster side) to the specified torque.
   CAUTION:
   Be sure to install the gasket between brake booster and dash panel.
3. After adjusting length (B), temporarily tighten lock nut to install brake booster assembly to dash panel.
4. Connect brake pedal to clevis of input rod with the clevis pin and snap pin.
5. Install brake pedal bracket nuts and tighten them to the specified torque.
6. Install master cylinder assembly. Refer to BR-14, "Removal and Installation".
7. Install the battery tray and battery. Refer to SC-7, "Removal and Installation".
8. Adjust the height and play of brake pedal. Refer to BR-6, "Inspection and Adjustment".
9. Tighten lock nut of input rod to the specified torque.
10. Install vacuum hose into brake booster. Refer to BR-23, "Removal and Installation".
11. Install cowl top. Refer to EI-22, "Removal and Installation".
12. Install instrument lower panel LH. Refer to IP-11, "Component Parts".
13. Bleed the air from the brake hydraulic system. Refer to BR-9, "Bleeding Brake System".

VACUUM LINES

Component

INFOID:0000000007328854



1. Hose clamp	2. Engine side indicator stamp (for built-in check valve orientation)	3. Vacuum hose
4. Clip	5. Clip position stamp	6. Vacuum tube
A. To intake manifold	B. To brake booster	

Removal and Installation

INFOID:0000000007328855

REMOVAL

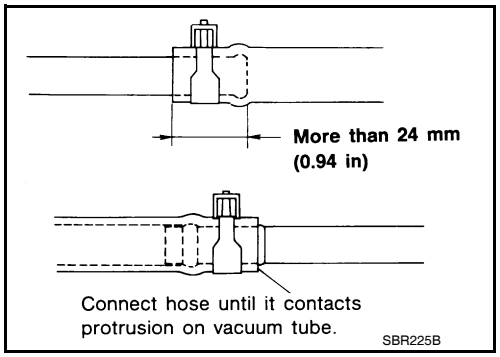
1. Remove the air intake duct. Refer to EM-16, "Removal and Installation".
2. Disconnect the vacuum hose from the intake manifold.
3. Disconnect the vacuum hose from the brake booster.
4. Disconnect the vacuum hose from the clip and remove the vacuum hose and vacuum tube assembly.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

- **Because the vacuum hose at the intake manifold contains a built-in check valve, it must be installed in the correct orientation. Refer to the stamp or label to confirm correct installation orientation. Brake booster will not operate normally if hose is installed in the reverse orientation.**
- **Insert vacuum hose at least 24 mm (0.94 in) on to the vacuum tube and vacuum fittings on the brake booster and intake manifold as shown.**
- **Never use lubricating oil during assembly.**



Inspection

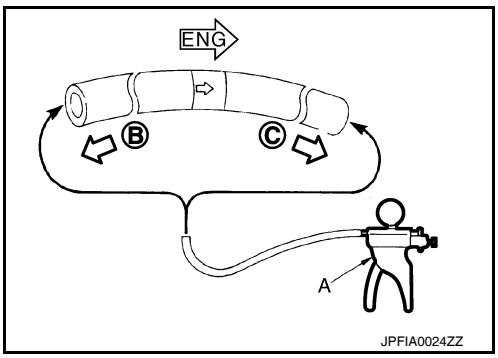
INFOID:0000000007328856

VISUAL INSPECTION

Check for improper installation, damage and deterioration. Replace parts as necessary.

CHECK VALVE INSPECTION

Use a suitable tool (A) to check the built-in check valve.
Replace the vacuum hose with the built-in check valve as an assembly if the vacuum hose is out of specifications.



When connected to booster side (B) : **Refer to** **BR-39, "Check Valve".**

When connected to engine side (C) : **Refer to** **BR-39, "Check Valve".**

FRONT DISC BRAKE

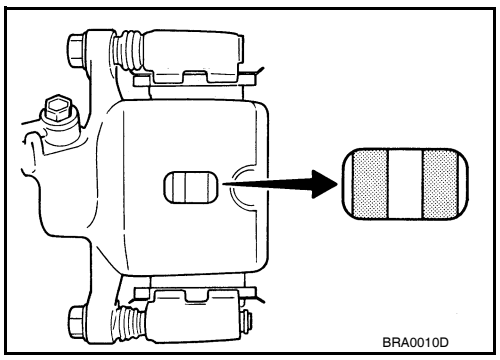
On Board Inspection

INFOID:0000000007328857

PAD WEAR INSPECTION

- Check pad thickness from check hole on cylinder body.

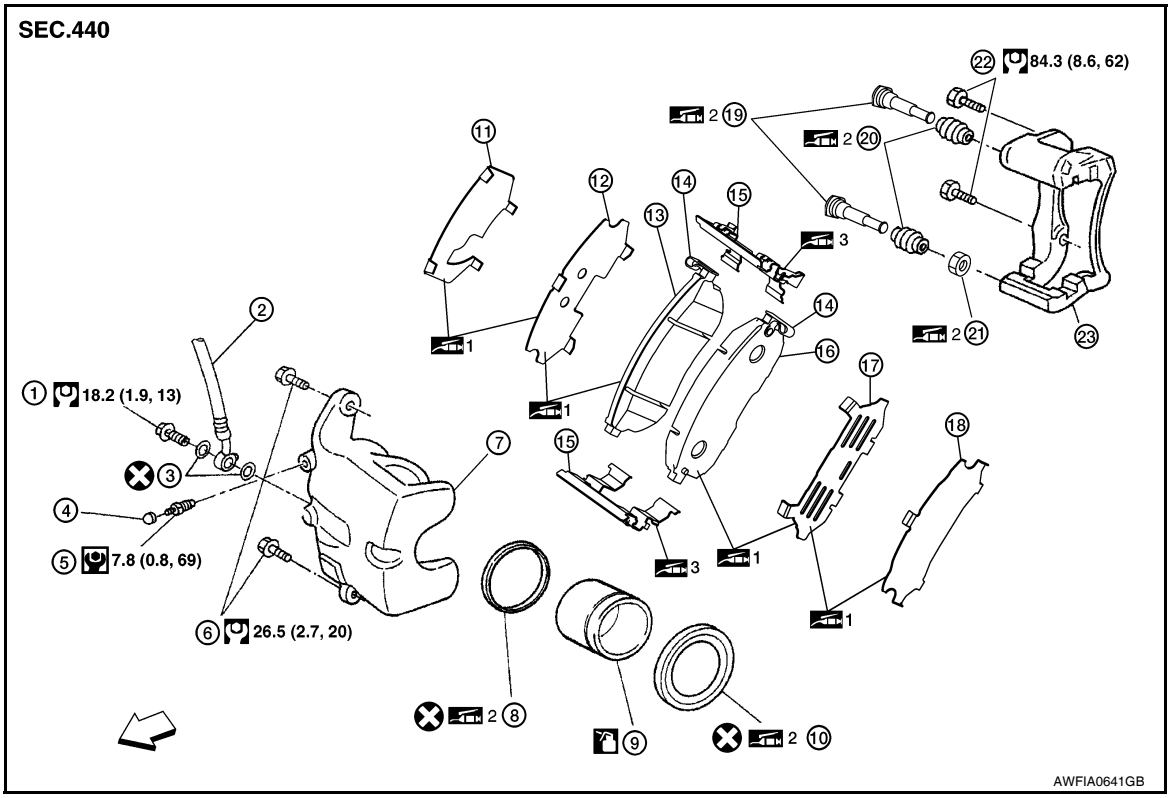
Standard thickness	**: Refer to BR-39, "Front Disc Brake".**
Repair limit thickness	**: Refer to BR-39, "Front Disc Brake".**



Component

INFOID:0000000007328858

CLZ25VF



1. Union bolt	2. Brake hose	3. Copper sealing washer
4. Cap	5. Bleed valve	6. Sliding pin bolt
7. Cylinder body	8. Piston seal	9. Piston
10. Piston boot	11. Inner shim cover	12. Inner shim
13. Inner pad	14. Pad wear sensor	15. Pad retainer
16. Outer pad	17. Outer shim	18. Outer shim cover
19. Sliding pin	20. Sliding pin boot	21. Bushing
22. Torque member bolt	23. Torque member	⇦ Front
: Brake fluid	1:Molykote AS-880N grease	2: Rubber grease
3: Molykote 7439 grease		

CAUTION:
- **Clean dust on caliper and brake pad with a vacuum dust collector. Do not blow with compressed air.**
- **While removing brake pad or cylinder body, do not depress brake pedal because piston will pop out.**
- **It is not necessary to remove torque member mounting bolts and brake hose except for disassembly or replacement of 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.**
- **Keep rotor free from brake fluid.**
- **When replacing brake pad, replace shim with a new one.**
- **Burnish the brake pads and disc rotor mutually contacting surfaces, after refinishing or replacing rotors, after replacing pads, or if a soft pedal occurs at very low mileage. Refer to BR-32, "Brake Burnishing Procedure".**

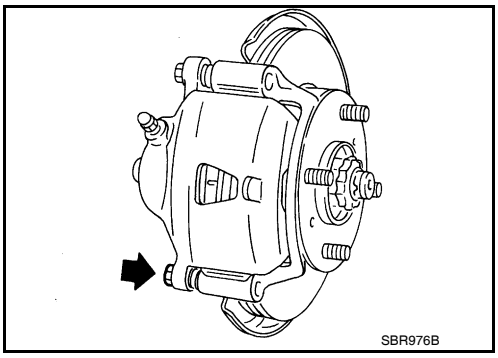
Removal and Installation of Brake Pad

INFOID:0000000007328859

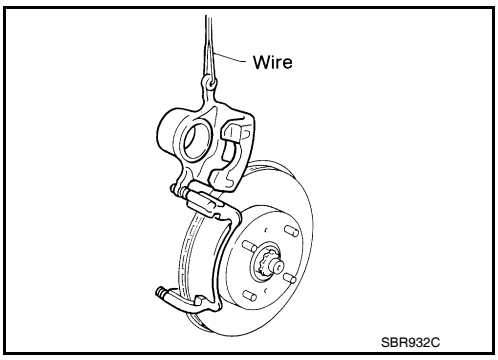
CLZ25VF

Removal

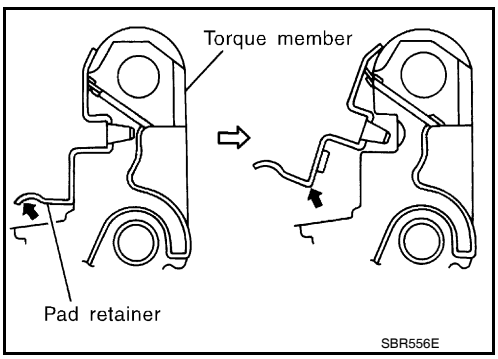
1. Partially drain brake fluid from reservoir. refer to BR-9, "Drain and Refill".
2. Remove the front wheel and tire using power tool.
3. Remove sliding pin bolt (lower side).



4. Hang cylinder body with a wire, and remove pads, shims and pad retainers from torque member.

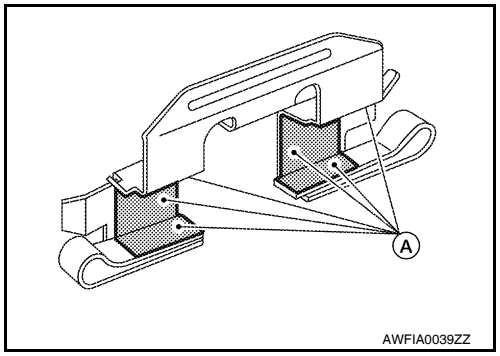


CAUTION:
When removing pad retainer from torque member, lift pad retainer in the direction shown by arrow, so as not to deform it.

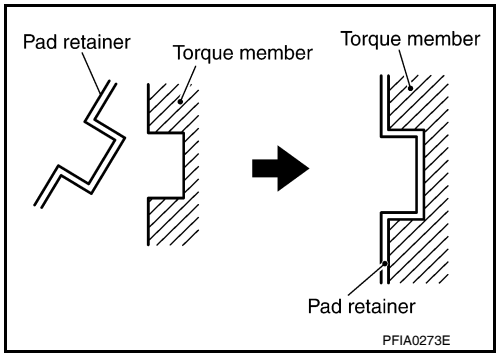


Installation

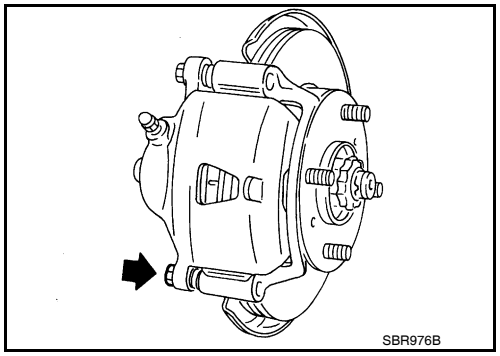
1. Apply Molykote AS-880N grease to the shims. Install shims to pads.
CAUTION:
Securely install shims according to mounting direction of pads.
2. Apply Molykote 7439 grease as shown (A).



3. Install pad retainers, shims, shim covers and pads to the torque member.
CAUTION:
When installing pad retainer, attach it firmly so that it is not lifted up from torque member, as shown.



4. Install cylinder body over the pads and shims on to torque member and apply rubber grease, then install lower sliding pin bolt (lower side) and tighten it to the specified torque. Refer to BR-25, "Component".
CAUTION:
Check the brake fluid level in the reservoir tank for fluid level because brake fluid returns to master cylinder reservoir tank when pressing piston in.
NOTE:
Use a disc brake piston tool (commercial service tool) to easily press to piston in.



5. Check brake for drag.
6. Install the front wheel and tire. Refer to WT-7, "Adjustment".
7. Check brake fluid level. Refer to BR-9, "On Board Inspection".

Removal and Installation of Brake Caliper Assembly

INFOID:0000000007328860

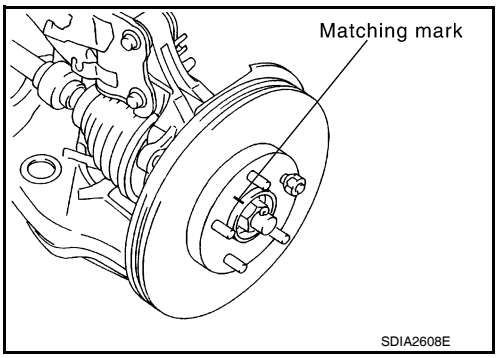
WARNING:
Clean dust on caliper and brake pads with a vacuum dust collector to minimize the hazard of air borne particles or other materials.
CAUTION:
- **While removing caliper, do not depress the brake pedal because the piston will pop out.**
- **Do not damage piston boot.**
- **Keep disc rotor free from brake fluid.**
- **Refill the brake reservoir with new brake fluid “DOT 3”.**
- **Never reuse drained brake fluid.**

- **Burnish the brake pads and disc rotor mutually contacting surfaces, after refinishing or replacing rotors, after replacing pads, or if a soft pedal occurs at very low mileage. Refer to BR-32, "Brake Burnishing Procedure".**

NOTE:
When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

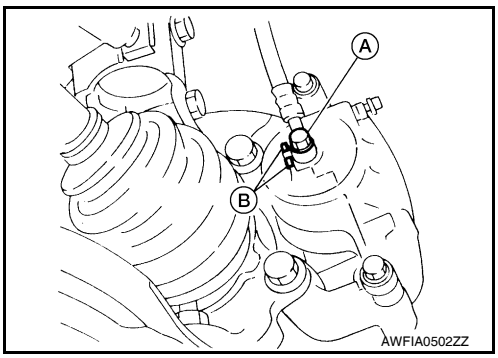
REMOVAL

1. Remove front wheel and tire.
2. Secure the disc rotor using wheel nuts.
   CAUTION:
   Put matching marks on wheel hub assembly and disc rotor, if it is necessary to remove the disc rotor.

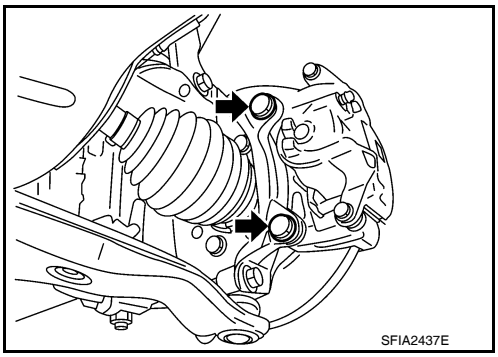


3. Drain brake fluid. Refer to BR-9, "Drain and Refill".
4. Remove the union bolt (A) and discard the copper sealing washers. Remove the brake hose from the cylinder body.
   - Protrusions (B)

   CAUTION:
   Do not reuse copper sealing washers

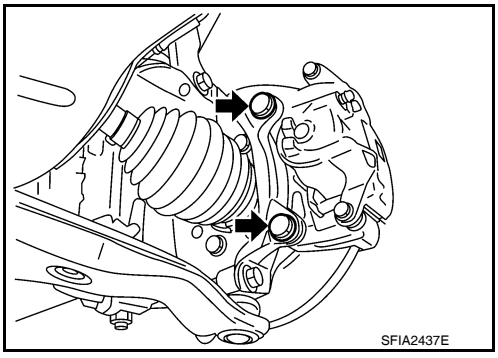


5. Remove the torque member bolts and remove the cylinder body and torque member as an assembly.

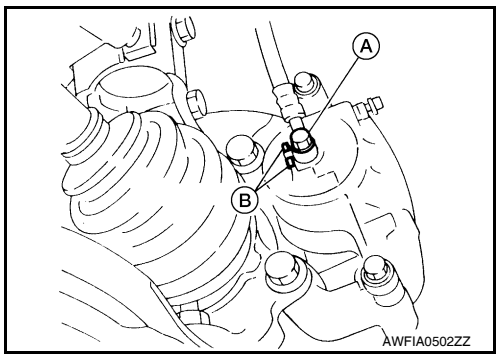


INSTALLATION

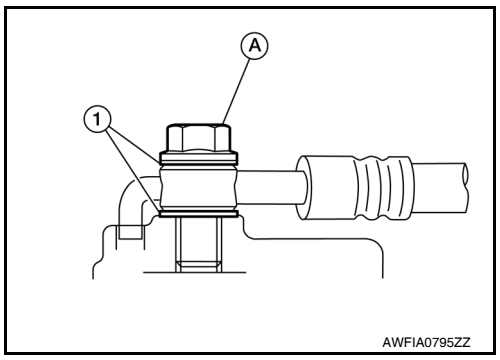
1. Install the torque member and cylinder body as an assembly and tighten the torque member bolts to the specified torque. Refer to BR-25, "Component".
   CAUTION:
   Before installing torque member to vehicle, wipe oil and grease on mounting surface of steering knuckle and torque member.



2. Install the brake hose to caliper assembly with new copper sealing washers. Align the brake hose tab between the protrusions (B) on the cylinder body as shown. Tighten the union bolt (A) to the specified torque. Refer to BR-11, "Hydraulic Circuit".



CAUTION:
- **Do not reuse copper sealing washers (1).**
- **Union bolt (A).**



3. Refill with new brake fluid and bleed air. Refer to BR-9, "Bleeding Brake System".
4. Check front disc brake for drag.
5. Install front wheel and tire. Refer to WT-7, "Adjustment".

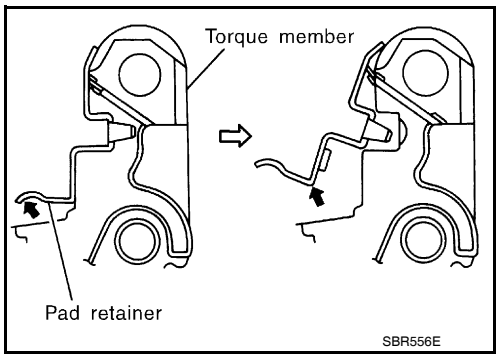
Disassembly and Assembly of Brake Caliper Assembly

INFOID:0000000007328861

DISASSEMBLY

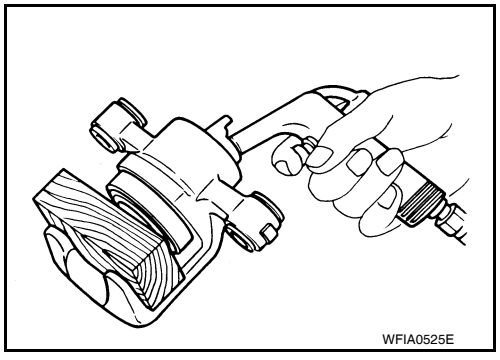
1. Remove the caliper assembly. Refer to BR-27, "Removal and Installation of Brake Caliper Assembly".
2. Remove sliding pin bolts and remove cylinder body from the torque member. Remove pads, shims, and pad retainers from torque member as necessary.

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

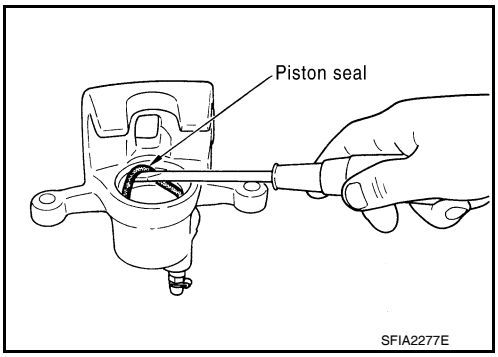


3. Remove sliding pins and sliding pin boots from torque member.
4. Place a wooden block as shown, and blow air from union bolt mounting hole to remove piston and piston boot.

WARNING:
Do not get fingers caught between the piston and wooden block.



5. Remove piston seal with a suitable tool.
   CAUTION:
   - **Be careful not to damage the inner wall of cylinder.**
   - **Do not reuse the piston seal.**



INSPECTION AFTER DISASSEMBLY

Cylinder Body

Check the inner wall of cylinder for corrosion, wear, and damage. Replace cylinder body as necessary.

CAUTION:

Clean cylinder body using new brake fluid. Never use mineral oils such as gasoline or kerosene.

Torque Member

Check for wear, cracks, and damage. Replace torque member as necessary.

Piston

Check piston surface for corrosion, wear, and damage. Replace piston as necessary.

CAUTION:

The piston sliding surface is plated. Do not polish with sandpaper.

Sliding Pin, Sliding Pin Bolt, and Sliding Pin Boot

Check sliding pins, sliding pin bolts and sliding pin boots for wear, damage, and cracks. Replace applicable part as necessary.

DISC ROTOR INSPECTION

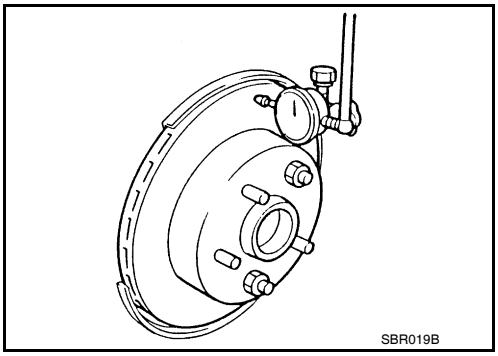
Visual Inspection

Check surfaces of disc rotor for uneven wear, cracks, and serious damage. Replace as necessary.

Runout Inspection

1. Using wheel nuts, secure disc rotor to wheels hub at two or more positions.
2. Using a dial indicator, check runout.
   CAUTION:
   Make sure that wheel bearing axial end play is within the specifications before measuring runout. Refer to FAX-6, "On-Vehicle Inspection and Service".

   Runout limit [measured at 10.0 mm (0.394 in) inside the disc edge] : **Refer to BR-39, "Front Disc Brake".**



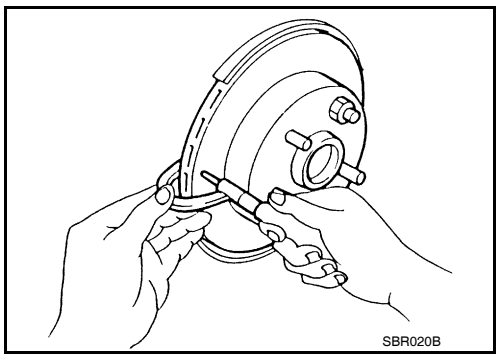
3. If runout is outside the limit, find the minimum runout point by shifting the mounting positions of disc rotor and wheel hub by one hole.
4. If runout is still out of the specification, grind rotor on-car using Tool until runout is within the specified limit.

   Tool number : 38-PFM90.5 (—)

Thickness Inspection

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

Standard thickness (new)	**: Refer to BR-39, "Front Disc Brake".**
Repair limit thickness	**: Refer to BR-39, "Front Disc Brake".**
Maximum uneven wear (measured at 8 positions)	**: Refer to BR-39, "Front Disc Brake".**

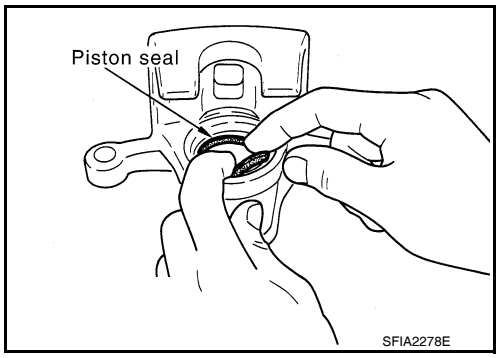


ASSEMBLY

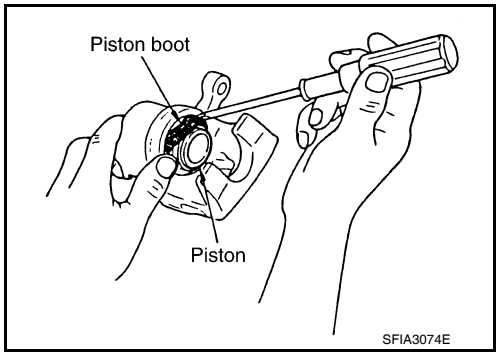
CAUTION:

Use rubber grease during assembly.

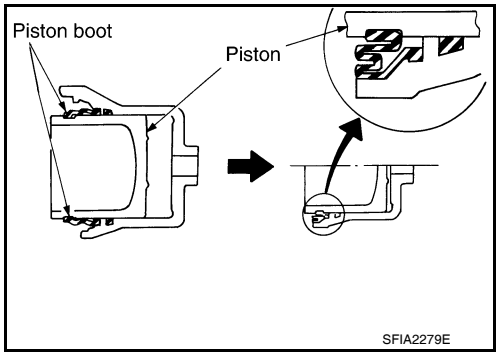
1. Apply rubber grease to new piston seal and install on cylinder body.
   CAUTION:
   Do not reuse the piston seal.



2. Apply rubber grease to piston boot and apply brake fluid to piston. Cover the piston end with piston boot, and install cylinder-side lip on piston boot properly into groove on cylinder body.



3. Press piston into cylinder body by hand to assemble piston-side lip on piston boot properly into a groove on piston.
   CAUTION:
   Press piston evenly and change pressing point to prevent inner wall of cylinder from being rubbed.
4. Install sliding pins and sliding pin boots to the torque member.



5. Install pads, shims, shim covers and pad retainers to the torque member. Refer to BR-26, "Removal and Installation of Brake Pad".
6. Install cylinder body to torque member.
7. Tighten sliding pin bolts to specified torque. Refer to BR-25, "Component".
8. Install the caliper assembly. Refer to BR-27, "Removal and Installation of Brake Caliper Assembly".

Brake Burnishing Procedure

INFOID:0000000007328862

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

CAUTION:

- **Be careful of vehicle speed because brake does not operate easily until pad and disc rotor are securely fitted.**
- **Only perform this procedure under safe road and traffic conditions. Use extreme caution.**

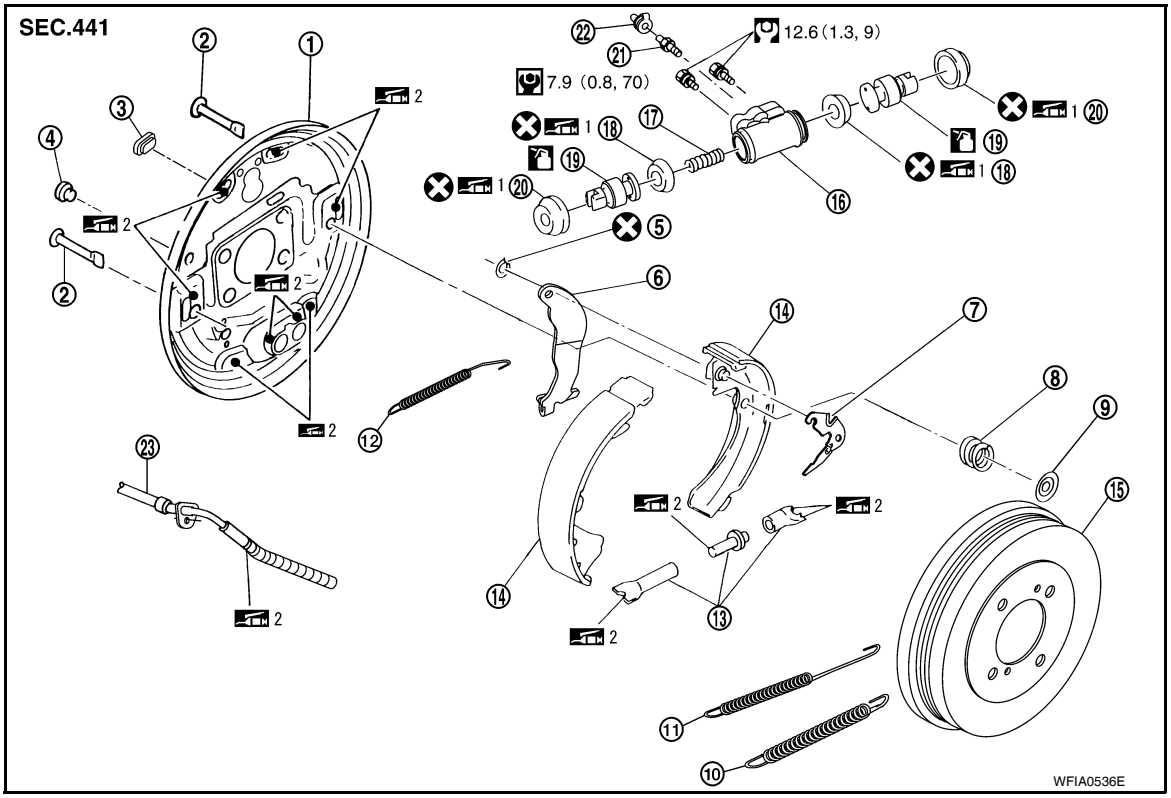
1. Drive vehicle on straight, flat road.
2. Depress brake pedal with the power to stop vehicle within 3 to 5 seconds until the vehicle stops.
3. Drive without depressing brake pedal for a few minutes to cool brake.
4. Repeat steps 1 to 3 until pad and disc rotor are securely fitted.

REAR DRUM BRAKE

Component

INFOID:0000000007328863

LT23



1. Back plate	2. Shoe hold pin	3. Plug
4. Plug	5. Retainer ring	6. Operating lever
7. Adjuster lever	8. Spring	9. Retainer
10. Return spring (lower side)	11. Return spring (upper side)	12. Adjuster spring
13. Adjuster	14. Brake shoe	15. Brake drum
16. Wheel cylinder	17. Spring	18. Piston seal
19. Piston	20. Boot	21. Bleed valve
22. Cap	23. Parking brake rear cable	: Brake fluid
1: Rubber grease	2: PBC (Poly Butyl Cuprysil) grease or silicone-based grease	

WARNING:
Clean dust on drum and back plate with a vacuum dust collector to minimize the hazard of air borne particles or other materials.
CAUTION:
Make sure parking brake lever is released completely.

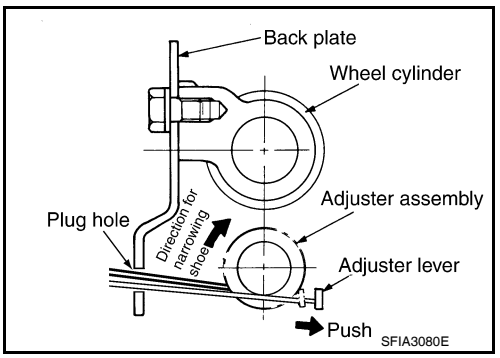
Removal and Installation of Drum Brake Assembly

INFOID:0000000007328864

REMOVAL

1. Remove rear wheel and tire using power tool.
2. With the parking brake lever released, remove the brake drum. If it is difficult to remove the brake drum, remove as follows:

a. Press up adjuster lever using suitable tool from plug hole (plug hole at the side of wheel cylinder) on the back plate as shown. Turn frame of adjuster assembly with a suitable tool in the direction that reduces brake shoe adjustment.

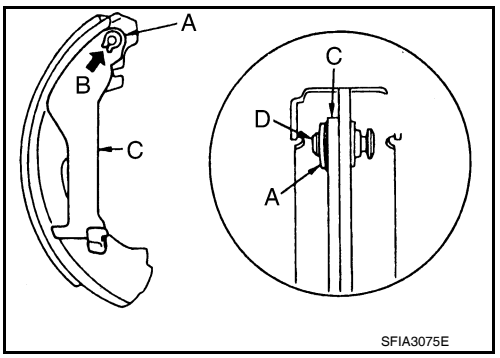


3. While pushing and rotating the retainer, pull out shoe hold pin, and remove shoe assembly.
CAUTION:
Do not damage the wheel cylinder boot.

4. Remove the parking brake rear cable from the operating lever.
CAUTION:
Do not bend the parking brake cable.

5. Disassemble the shoe assembly (shoe, springs, adjuster, adjuster lever).

6. Remove retainer ring (A) with a tool to separate operating lever (C) from brake shoe.
- Retainer ring (A)
- Contact point (B)
- Operating lever (C)
- Pin (D)

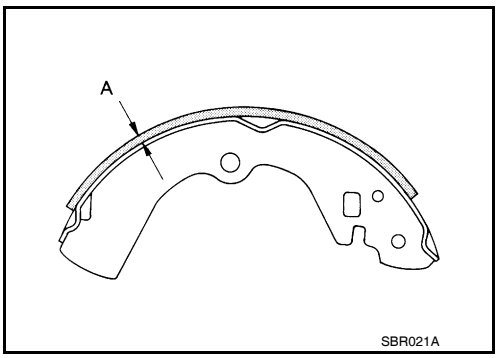


INSPECTION AFTER REMOVAL

Lining Thickness Inspection
Check lining thickness.

Standard thickness (A) (new) : Refer to BR-39, "Rear Drum Brake".

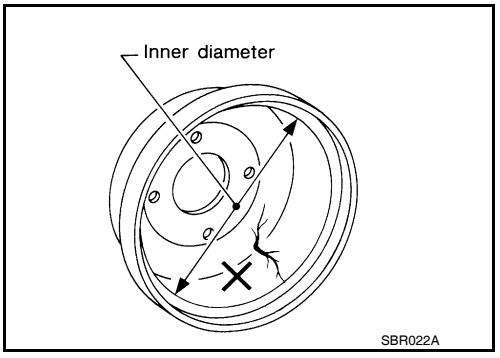
Repair limit thickness (A) : Refer to BR-39, "Rear Drum Brake".



Drum Inner Diameter Inspection
Check inner diameter of brake drum.
Measurement area: lining contact surface (center)

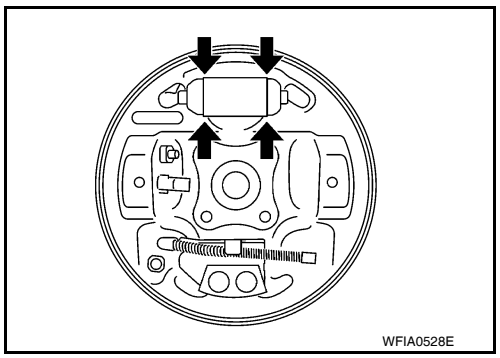
Standard inner diameter : Refer to BR-39, "Rear Drum Brake".

Repair limit inner diameter : Refer to BR-39, "Rear Drum Brake".



Wheel Cylinder Leakage Inspection

- Check wheel cylinder for brake fluid leakage.
- Check for wear, damage, and looseness. If any non-standard condition is found, replace it.



Other Inspections

Check the following:

- Inside of the drum for excessive wear, damage, and cracks.
- Lining for excessive wear, damage, and peeling.
- Shoe sliding surface for excessive wear and damage.
- Return spring for sagging.
- Check back plate for damage, cracks, and deformation. Replace back plate as necessary.

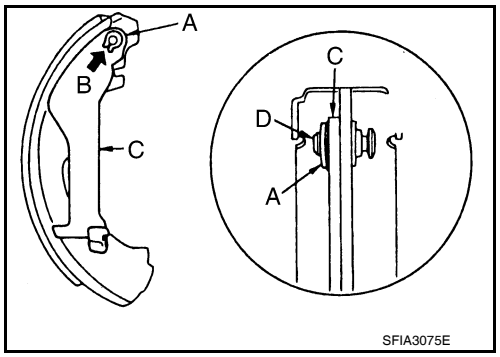
Replace applicable part as necessary.

INSTALLATION

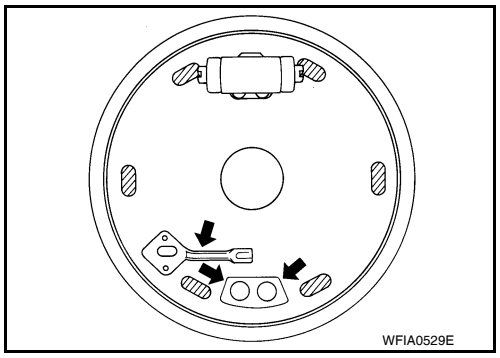
1. Install operating lever (C) if removed, using the following steps.

a. Install operating lever (C) to brake shoe.

b. Install retainer ring (A) to operating lever (C), and crimp them until their contact points (B) are met.
   - Retainer ring (A)
   - Contact point (B)
   - Operating lever (C)
   - Pin (D)

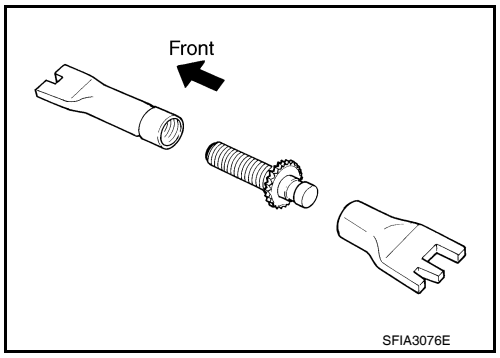


2. Apply PBC (Poly Butyl Cuprysil) grease or silicone based grease to brake shoes sliding surfaces (the shaded areas) and other parts on the back plate as indicated by arrows.



3. Apply PBC (Poly Butyl Cuprysil) grease or silicone based grease to screw and confirm the difference between right and left wheel for assembling when disassembled.

Right rear wheel	**Thread cutting direction**	**: Right-hand screw**
Left rear wheel	**Thread cutting direction**	**: Left-hand screw**



4. Assemble the shoe, adjuster, adjuster lever and springs to the shoe assembly.

5. Connect the parking brake rear cable to the operating lever.
6. Install the shoe assembly. After assembly, be sure that each part is installed properly.
   CAUTION:
   Do not damage the wheel cylinder piston boot.
7. Install the brake drum.
8. Depress brake pedal for several times (approximately 2 or 3 times).
9. Adjust clearance of brake shoe. Refer to PB-5, "On-Vehicle Service".
10. Install rear wheel and tire. Refer to WT-7, "Adjustment".

Removal and Installation of Wheel Cylinder

INFOID:0000000007328865

NOTE:
When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

REMOVAL

1. Drain the brake fluid. Refer to BR-9, "Drain and Refill".
2. Remove the rear brake shoe assembly. Refer to BR-33, "Removal and Installation of Drum Brake Assembly".
3. Remove the bleed valve.
4. Disconnect the brake tube from the wheel cylinder.
5. Remove the wheel cylinder bolts and then remove the wheel cylinder from the back plate.

INSTALLATION

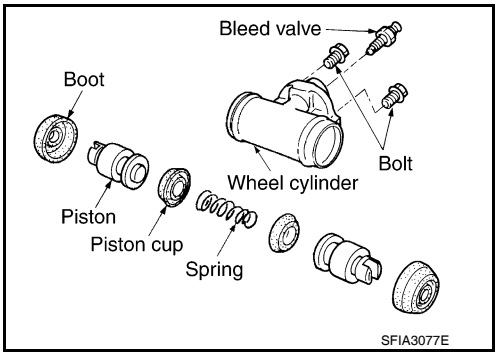
Installation is in the reverse order of removal.
- Tighten bolts and bleed valve to the specified torque. Refer to BR-33, "Component".
- Refill with new brake fluid and bleed the air. Refer to BR-9, "Bleeding Brake System".

Disassembly and Assembly of Wheel Cylinder

INFOID:0000000007328866

DISASSEMBLY

1. Remove boots at the right and left of the wheel cylinder, and pull the pistons and spring out of the cylinder.
2. Remove the piston cups from the pistons.



INSPECTION AFTER DISASSEMBLY

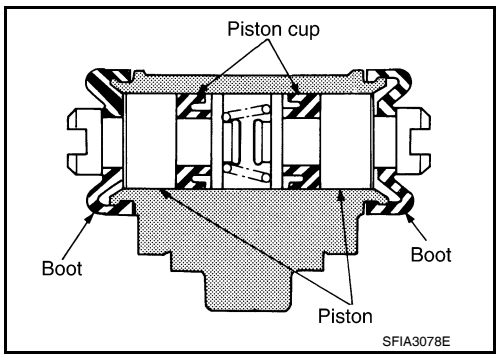
Check the pistons, spring and inner wall of the cylinder for wear, corrosion, and damage. Replace any parts as necessary.

ASSEMBLY

CAUTION:
When inserting the piston, be careful not to scratch the cylinder.

1. Apply brake fluid to the piston sliding surface on the wheel cylinder.

2. Apply rubber grease to the piston cups and boots and assemble the wheel cylinder as shown.



SERVICE DATA AND SPECIFICATIONS (SDS)

General Specification

INFOID:0000000007328867

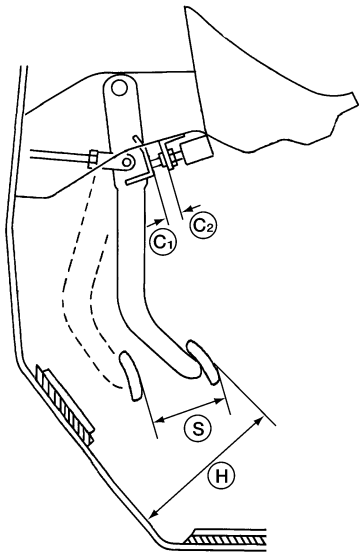
MR18DE

Front brake	Brake model	CLZ25VF
	Cylinder bore diameter	57.2 mm (2.252 in)
	Pad Length × width × thickness	125.6 mm × 48.0 mm × 9.5 mm (4.945 in × 1.890 in × 0.374 in)
	Rotor outer diameter × thickness	280 mm × 24.0 mm (11.02 in × 0.945 in)
Rear brake	Brake model	LT23
	Cylinder bore diameter	19.06 mm (0.750 in)
	Drum inner diameter	228.6 mm (9.000 in)
Master cylinder	Cylinder bore diameter	23.81 ± 0.015 mm (0.937 ± 0.001 in)
Brake booster	Booster model	C255
	Diaphragm diameter	255 mm (10.04 in)
Recommended brake fluid		Refer to MA-13, "Fluids and Lubricants".

Brake Pedal

INFOID:0000000007328868

Unit: mm (in)



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Brake pedal free height (H) (from dash panel top surface)	A/T, CVT model	172.4 +10/-0 (6.78 +0.39/-0)
	M/T model	162.3 +10/-0 (6.39 +0.39/-0)
Brake pedal full stroke (S)		133 (5.24)
Clearance between the pedal stopper and threaded end of stop lamp switch (C_1) and ASCD cancel switch (C_2), if equipped		0.74 - 1.96 (0.0291 - 0.0772)

Check Valve

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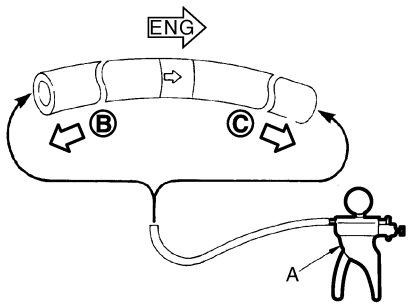

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When suitable tool (A) is connected to booster side (B)	Within 1.3 kPa (10 mmHg, 0.39 inHg) of vacuum for 15 seconds [at vacuum of – 66.7 kPa (– 500 mmHg, – 19.69 inHg]
When suitable tool (A) is connected to engine side (C)	No vacuum will be applied

Brake Booster

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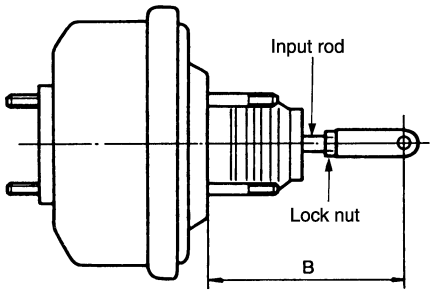

SGIA0060E

Input rod installation standard dimension (B)	159 ± 0.95 mm (6.26 ± 0.037 in)
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

Front Disc Brake

INFOID:0000000007328871

Unit: mm (in)

Brake model		CLZ25VF
Brake pad	Standard thickness (new)	9.5 (0.374)
	Minimum thickness	2.0 (0.079)
Disc rotor	Standard thickness (new)	24.0 (0.945)
	Repair limit thickness	22.0 (0.866)
	Runout limit (measured at 10.0 mm (0.394 in) inside the disc edge	0.07 (0.0028)
	Maximum uneven wear (measured at 8 positions)	0.02 mm (0.0008 in) or less

Rear Drum Brake

INFOID:0000000007328872

Unit: mm (in)

Brake model		LT23
Brake lining	Standard thickness (new)	4.0 (0.157)
	Minimum thickness	1.5 (0.059)
Drum	Standard inner diameter (new)	228.6 (9.000)
	Repair limit inner diameter	230.0 (9.055)