

SECTION **BR**
BRAKE SYSTEM

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NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

< SYMPTOM DIAGNOSIS >

[LHD]

SYMPTOM DIAGNOSIS

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

INFOID:000000001181462

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

Symptom	BRAKE	Possible cause and SUSPECTED PARTS																
		Pads - damaged	Pads - uneven wear	Shims damaged	Rotor imbalance	Rotor damage	Rotor runout	Rotor deformation	Rotor deflection	Rotor rust	Rotor thickness variation	PROPELLER SHAFT	DIFFERENTIAL	AXLE AND SUSPENSION	TIRE	ROAD WHEEL	DRIVE SHAFT	STEERING
	Noise	×	×	×								×	×	×	×	×	×	×
	Shake				×							×		×	×	×	×	×
	Shimmy, Judder				×	×	×	×	×	×	×			×	×	×		×
Reference page		BR-15, BR-16	BR-15, BR-16	BR-38, BR-44	BR-15, BR-16	BR-15, BR-16	BR-15, BR-16	BR-15, BR-16	BR-15, BR-16	BR-15, BR-16	BR-15, BR-16	NVH in DLN section	NHV in DLN section	NVH in FAX, RAX, FSU and RSU section	NVH in WT section	NVH in WT section	NVH in FAX and/or RAX section	NVH in ST section

×: Applicable

PRECAUTION

PRECAUTIONS

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

INFOID:000000001181463

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 AIRBAG" and "SEAT BELT" 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 AIRBAG".
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

Precaution Necessary for Steering Wheel Rotation After Battery Disconnect

INFOID:000000001181464

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-III 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-III.

Precaution for Brake System

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WARNING:

Clean any dust from the front brake and rear brake with a vacuum dust collector. Never blow with compressed air.

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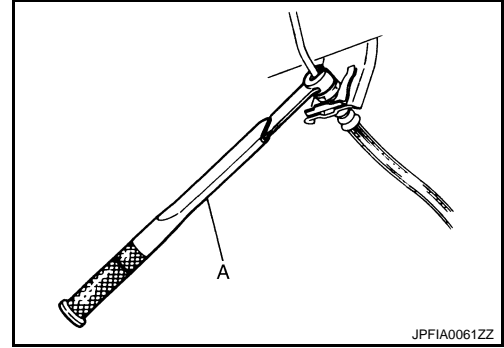
PRECAUTIONS

< PRECAUTION >

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CAUTION:

- Only use “DOT 4” brake fluid. Refer to [MA-27, "Fluids and Lubricants"](#).
- Never reuse drained brake fluid.
- Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.
- Always clean with new brake fluid when cleaning the master cylinder, brake caliper and other components.
- Never use mineral oils such as gasoline or light oil to clean. They may damage rubber parts and cause improper operation.
- Always loosen the brake tube flare nut with a flare nut wrench.
- Tighten the brake tube flare nut to the specified torque with flare nut torque wrench (A).
- Always confirm the specified tightening torque when installing the brake pipes.
- Turn the ignition switch OFF and disconnect the ABS actuator and electric unit (control unit) connector or the battery negative terminal before performing the work.
- Check that no brake fluid leakage is present after replacing the parts.
- Burnish the brake contact surfaces after refinishing or replacing rotors, after replacing pads, or if a soft pedal occurs at very low mileage. Refer to [BR-38, "BRAKE PAD : Inspection and Adjustment"](#) (front brake pad), [BR-41, "BRAKE CALIPER ASSEMBLY : Inspection and Adjustment"](#) (front disc rotor), [BR-44, "BRAKE PAD : Inspection and Adjustment"](#) (rear brake pad), [BR-47, "BRAKE CALIPER ASSEMBLY : Inspection and Adjustment"](#) (rear disc rotor).



PREPARATION

< PREPARATION >

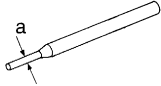
[LHD]

PREPARATION

PREPARATION

Commercial Service Tool

INFOID:000000001181466

Tool name	Description
<p>Pin punch a: 4 mm (0.16 in) dia.</p>  <p>NT410</p>	<p>Removing and installing reservoir tank pin</p>

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ON-VEHICLE MAINTENANCE

BRAKE PEDAL

Inspection and Adjustment

INFOID:000000001181468

INSPECTION

Brake Pedal Height

Check the height (H₁) between the accelerator pedal stopper (1) and the brake pedal upper surface.

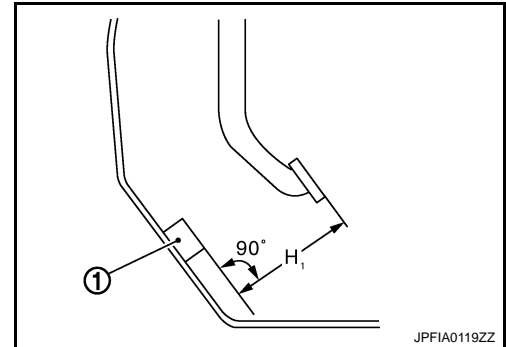
Standard

Brake pedal height (H₁)

: Refer to [BR-49, "Brake Pedal"](#).

CAUTION:

Remove the floor trim.



ASCD brake Switch and Stop Lamp Switch

Check the clearance (C) among bracket (1) and ASCD brake switch/ stop lamp switch (2) threaded end.

Standard

Clearance (C) between bracket and ASCD brake switch/stop lamp switch threaded end

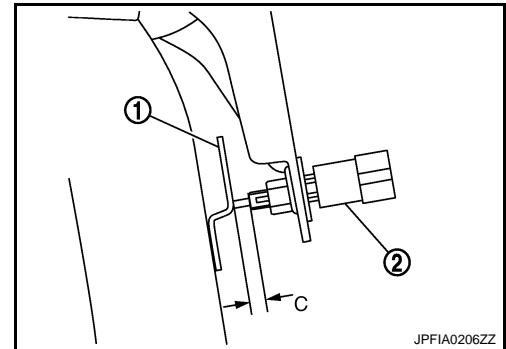
: Refer to [BR-49, "Brake Pedal"](#).

CAUTION:

The stop lamp must be turned off when the brake pedal is released.

NOTE:

Pull the brake pedal pad to make the clearance between bracket and ASCD brake switch/stop lamp switch threaded end.



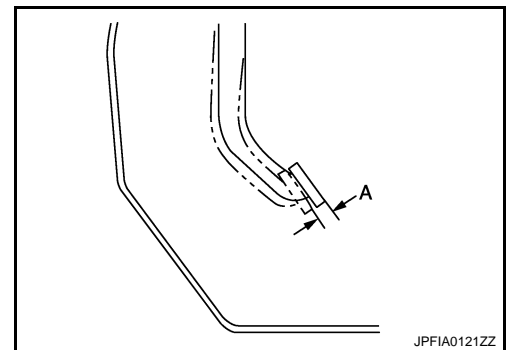
Brake Pedal Play

Press the brake pedal. Check the brake pedal play (A).

Standard

Pedal play (A)

: Refer to [BR-49, "Brake Pedal"](#).



Depressed Brake Pedal Height

BRAKE PEDAL

[LHD]

< ON-VEHICLE MAINTENANCE >

Check the height between the accelerator pedal stopper (1) and the brake pedal upper surface (H₂) when depressing the brake pedal at 490 N (50 kg, 110 lb) while turning engine ON.

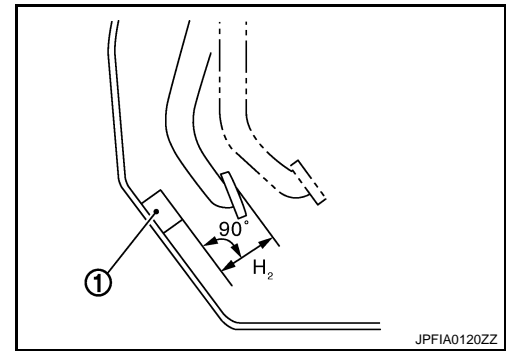
Standard

Depressed brake pedal height (H₂)

: Refer to [BR-49, "Brake Pedal"](#).

CAUTION:

Remove the floor trim.



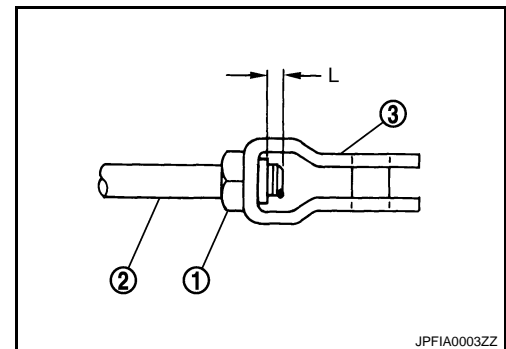
ADJUSTMENT

Brake Pedal Height

1. Disconnect the harness connector from ASCD brake switch and stop lamp switch.
2. Turn the ASCD brake switch and stop lamp switch 45° counterclockwise.
3. Loosen the input rod lock nut (1). Adjust the brake pedal to the specification. Tighten the input rod lock nut to the specification. Refer to [BR-30, "Exploded View"](#).

CAUTION:

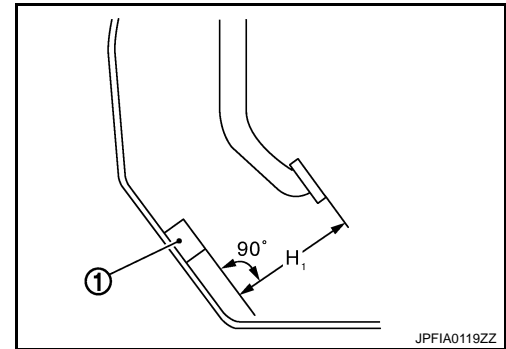
The threaded end of the input rod (2) must project to the inner side (L) of the clevis (3).



Standard

Brake pedal height (H₁)

: Refer to [BR-49, "Brake Pedal"](#).

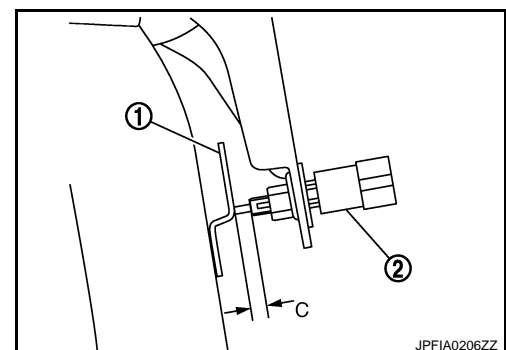


ASCD brake Switch and Stop Lamp Switch

1. Disconnect the harness connector from ASCD brake switch and stop lamp switch.
2. Turn the ASCD brake switch and stop lamp switch 45° counterclockwise.
3. Press-fit ASCD brake switch/stop lamp switch (2) until ASCD brake switch/stop lamp switch hits the bracket (1) 45° clockwise.

CAUTION:

- The clearance (C) between the bracket and ASCD brake switch/stop lamp switch threaded end must be the specified value. Refer to [BR-49, "Brake Pedal"](#).
- The stop lamp must be turned off when the brake pedal is released.



Brake Pedal Play

1. Disconnect the harness connector from ASCD brake switch and stop lamp switch.
2. Turn the ASCD brake switch and stop lamp switch 45° counterclockwise.

BRAKE PEDAL

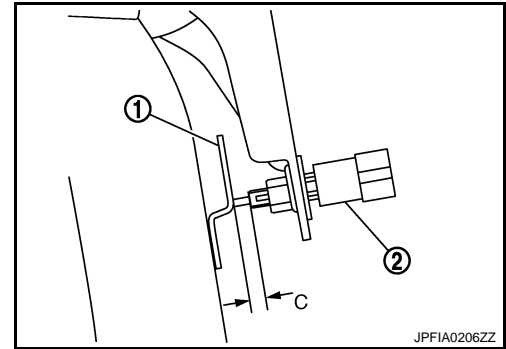
[LHD]

< ON-VEHICLE MAINTENANCE >

3. Press-fit ASCD brake switch/stop lamp switch (2) until ASCD brake switch/stop lamp switch hits the bracket (1) 45° clockwise.

CAUTION:

- The clearance (C) between the bracket and ASCD brake switch/stop lamp switch threaded end must be the specified value. Refer to [BR-49. "Brake Pedal"](#).
- The stop lamp must be turned off when the brake pedal is released.



BRAKE FLUID

< ON-VEHICLE MAINTENANCE >

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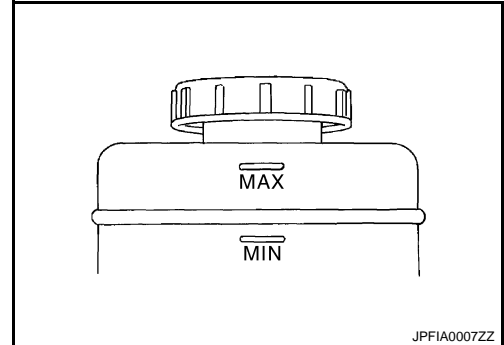
BRAKE FLUID

Inspection

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BRAKE FLUID LEVEL

- Check that the fluid level in the reservoir tank is within the specified range (MAX – MIN lines).
- Visually check for any brake fluid leakage around the reservoir tank.
- Check the brake system for any leakage if the fluid level is extremely low (lower than MIN).
- Check the brake system for fluid leakage if the warning lamp remains illuminated even after the parking brake is released.

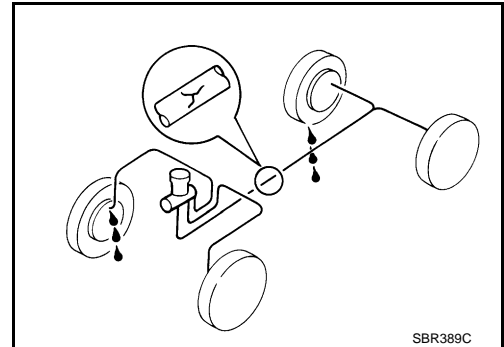


BRAKE LINE

1. Check brake line (tubes and hoses) for cracks, deterioration or other damage. Replace any damaged parts.
2. Check for fluid leakage by fully depressing brake pedal while engine is running.

CAUTION:

If leakage occurs around joints, retighten or, if necessary, replace damaged parts.



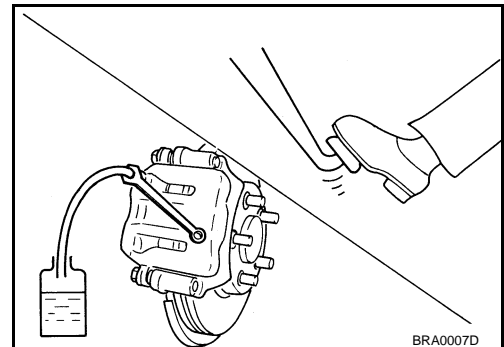
Draining

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CAUTION:

- **Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.**
- **Turn the ignition switch OFF and disconnect the ABS actuator and electric unit (control unit) connector or the battery negative terminal before draining.**

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



Refilling

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CAUTION:

Turn the ignition switch OFF and disconnect the ABS actuator and electric unit (control unit) connector or the battery negative terminal before refilling.

BRAKE FLUID

< ON-VEHICLE MAINTENANCE >

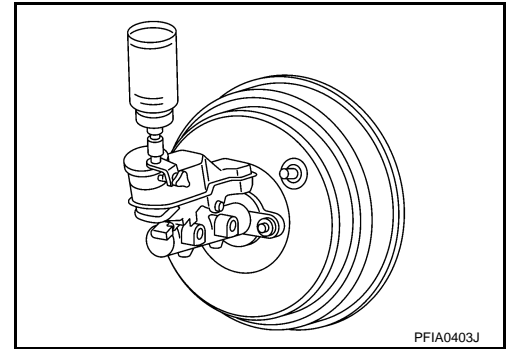
[LHD]

1. Check that there is no foreign material in the reservoir tank, and refill with new brake fluid.

CAUTION:

Never reuse drained brake fluid.

2. Loosen the bleeder valve, slowly depress the brake pedal to the full stroke, and then release the pedal. Repeat this operation at intervals of 2 or 3 seconds until all brake fluid is discharged. Then close the bleeder valve with the brake pedal depressed. Repeat the same work on each wheel.
3. Perform the air bleeding. Refer to [BR-12. "Bleeding Brake System"](#).



Bleeding Brake System

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CAUTION:

- Turn the ignition switch OFF and disconnect the ABS actuator and electric unit (control unit) connector or the battery negative terminal before performing the work.
 - Monitor the fluid level in the reservoir tank during the air bleeding.
 - Always use new brake fluid for refilling. Never reuse the drained brake fluid.
1. Connect a vinyl tube to the bleeder valve of the rear right brake.
 2. Fully depress the brake pedal 4 to 5 times.
 3. Loosen the bleeder valve and bleed air with the brake pedal depressed, and then quickly tighten the bleeder valve.
 4. Repeat steps 2 and 3 until all of the air is out of the brake line.
 5. Tighten the bleeder valve to the specified torque. Refer to [BR-39. "BRAKE CALIPER ASSEMBLY : Exploded View"](#) (front disc brake), [BR-45. "BRAKE CALIPER ASSEMBLY : Exploded View"](#) (rear disc brake).
 6. Perform steps 1 to 5 for the rear right brake → front left brake → rear left brake → and front right brake in order.
 7. Check that the fluid level in the reservoir tank is within the specified range after air bleeding. Refer to [BR-11. "Inspection"](#).

BRAKE MASTER CYLINDER

< ON-VEHICLE MAINTENANCE >

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BRAKE MASTER CYLINDER

Inspection

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FLUID LEAK

Check for brake fluid leakage from the master cylinder mounting face, reservoir tank mounting face and brake tube connections.

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BRAKE BOOSTER

< ON-VEHICLE MAINTENANCE >

[LHD]

BRAKE BOOSTER

Inspection

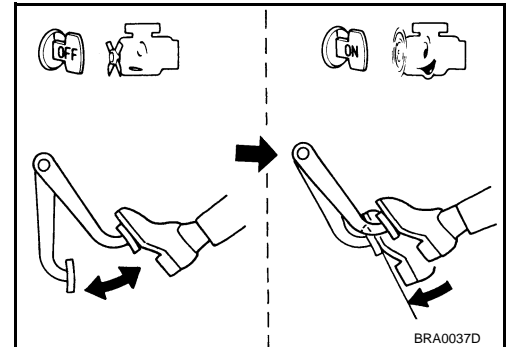
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OPERATION

Depress the brake pedal several times at 5-second intervals with the engine stopped. Start the engine with the brake pedal fully depressed. Check that the clearance between brake pedal and dash lower panel decreases.

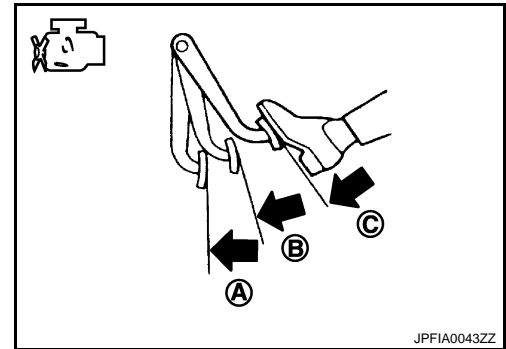
NOTE:

A slight impact with a small click may be felt on the pedal when the brake pedal is fully depressed. This is a normal phenomenon due to the brake system operation.



AIR TIGHT

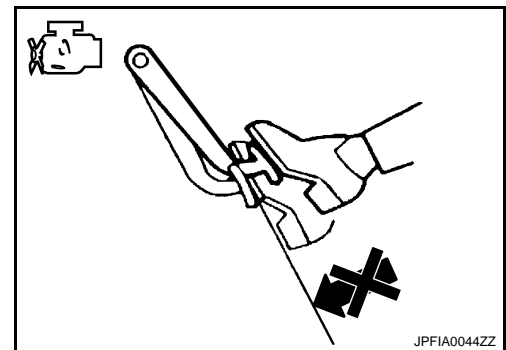
- Idle the engine for 1 minute to apply vacuum to the brake booster, and stop the engine. Then depress the brake pedal several times at 5-second intervals until the accumulated vacuum is released to atmospheric pressure. Check that the clearance between brake pedal and dash lower panel gradually increases (A → B → C) each time the brake pedal is depressed during this operation.



- Depress the brake pedal with the engine running. Then stop the engine while holding down the brake pedal. Check that the brake pedal stroke does not change after holding down the brake pedal for 30 seconds or more.

NOTE:

A slight impact with a small click may be felt on the pedal when the brake pedal is fully depressed. This is a normal phenomenon due to the brake system operation.



FRONT DISC BRAKE

< ON-VEHICLE MAINTENANCE >

[LHD]

FRONT DISC BRAKE BRAKE PAD

BRAKE PAD : Inspection

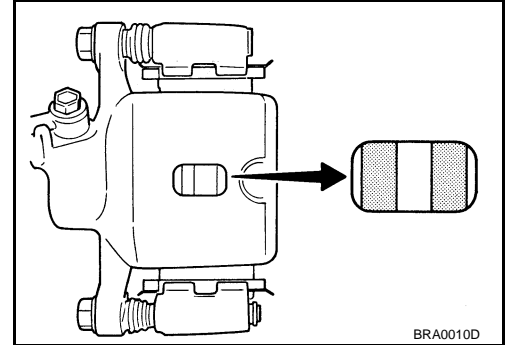
INFOID:000000001181478

PAD WEAR

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

Standard thickness : Refer to [BR-49, "Front Disc Brake"](#).

Wear limit thickness : Refer to [BR-49, "Front Disc Brake"](#).



DISC ROTOR

DISC ROTOR : Inspection

INFOID:000000001181479

APPEARANCE

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

RUNOUT

1. Fix the disc rotor to the wheel hub and bearing assembly with wheel nuts (2 points at least).
2. Inspect the runout with a dial gauge. [Measured at 10 mm (0.39 in) inside the disc edge.]

Runout limit : Refer to [BR-49, "Front Disc Brake"](#).

NOTE:

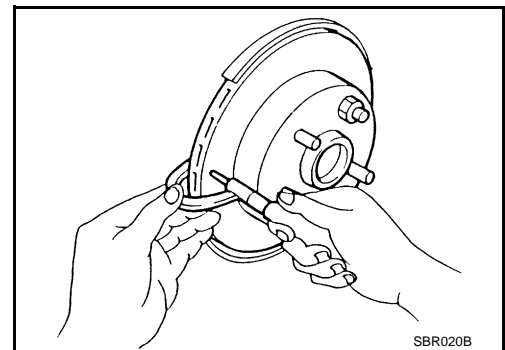
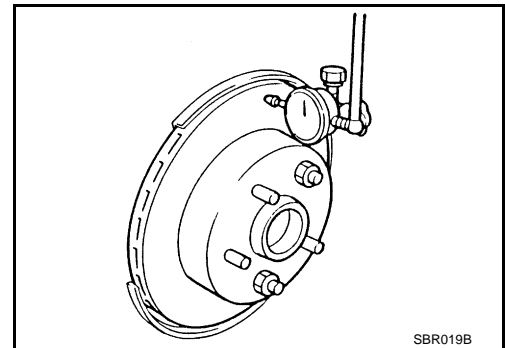
Check the wheel bearing axial end play before the inspection.
Refer to [FAX-7, "Inspection"](#) (2WD), [FAX-59, "Inspection"](#) (4WD).

3. Find the installation position with a minimum runout by shifting the disc rotor-to-wheel hub and bearing assembly installation position by one hole at a time if the runout exceeds the limit value.
4. Replace or lathe the disc rotor if the runout exceeds the limit even after the above operation.

THICKNESS

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

Wear limit thickness : Refer to [BR-49, "Front Disc Brake"](#).



REAR DISC BRAKE

< ON-VEHICLE MAINTENANCE >

[LHD]

REAR DISC BRAKE

BRAKE PAD

BRAKE PAD : Inspection

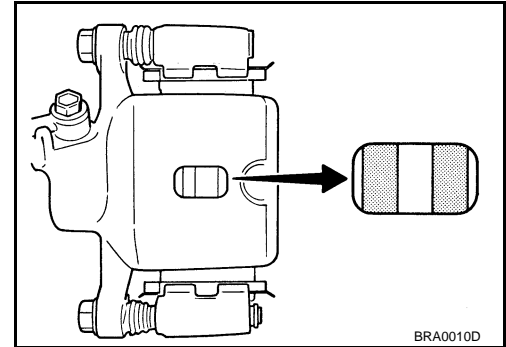
INFOID:000000001181481

PAD WEAR

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

Standard thickness : Refer to [BR-49, "Rear Disc Brake"](#).

Wear limit thickness : Refer to [BR-49, "Rear Disc Brake"](#).



DISC ROTOR

DISC ROTOR : Inspection

INFOID:000000001181482

APPEARANCE

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

RUNOUT

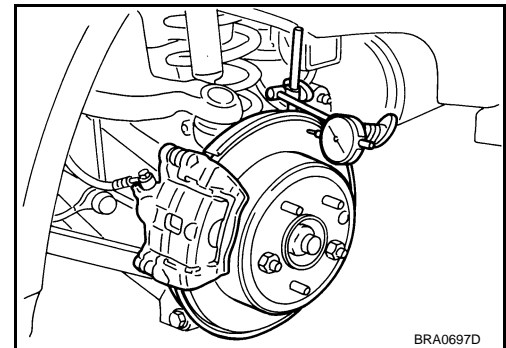
1. Fix the disc rotor to the wheel hub and bearing assembly with wheel nuts (2 points at least).
2. Inspect the runout with a dial gauge. [Measured at 10 mm (0.39 in) inside disc edge.]

Runout limit : Refer to [BR-49, "Rear Disc Brake"](#).

NOTE:

Check the wheel bearing axial end play before the inspection. Refer to [RAX-3, "Inspection"](#) (2WD), [RAX-9, "Inspection"](#) (4WD).

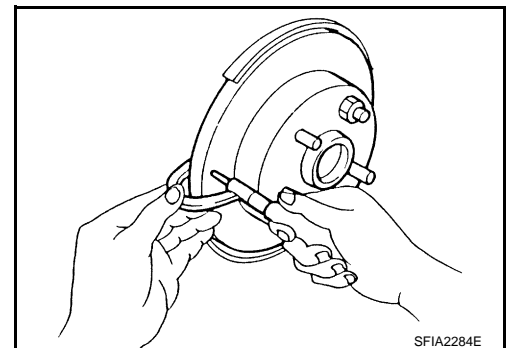
3. Find the installation position with a minimum runout by shifting the disc rotor-to-wheel hub and bearing assembly installation position by one hole at a time if the runout exceeds the limit value.
4. Replace or lathe the disc rotor if the runout exceeds the limit even after the above operation.



THICKNESS

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

Wear limit thickness : Refer to [BR-49, "Rear Disc Brake"](#).



BRAKE PEDAL

< ON-VEHICLE REPAIR >

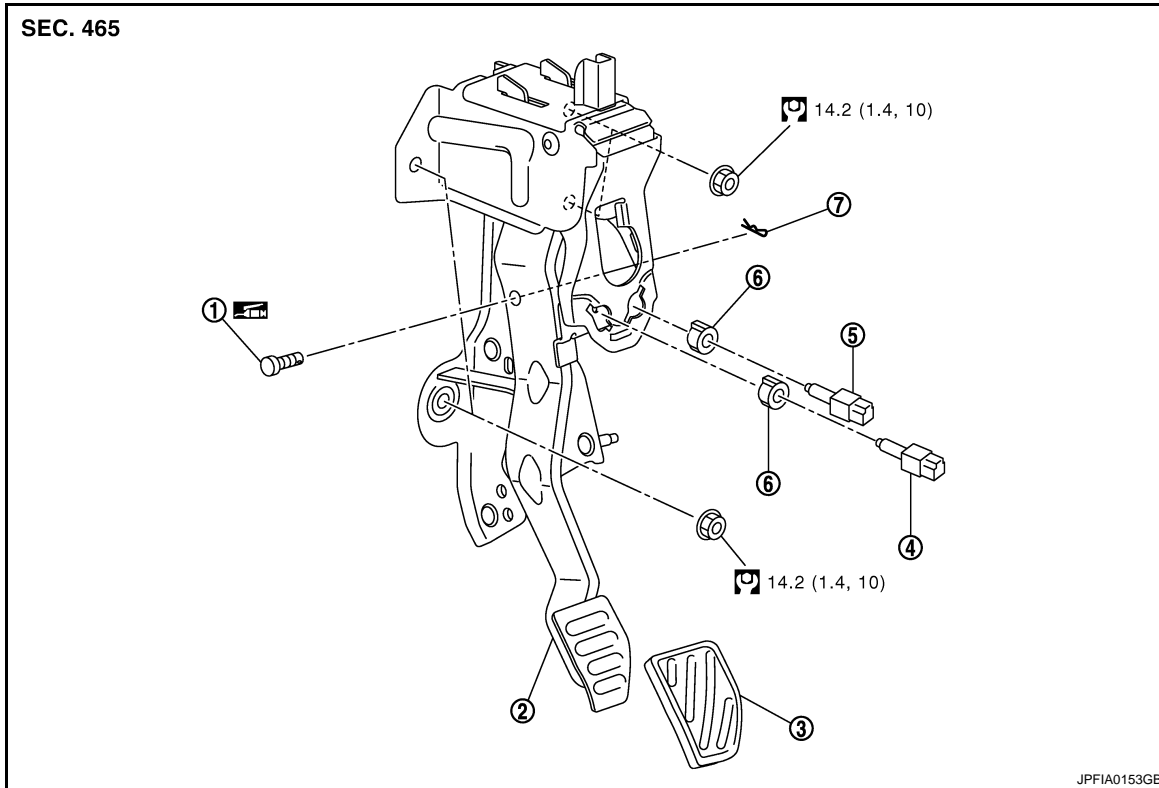
[LHD]

ON-VEHICLE REPAIR


BRAKE PEDAL

Exploded View

INFOID:000000001181483



- | | | |
|----------------------|-------------------------|--------------------|
| 1. Clevis pin | 2. Brake pedal assembly | 3. Brake pedal pad |
| 4. ASCD brake switch | 5. Stop lamp switch | 6. Clip |
| 7. Snap pin | | |

: Apply multi-purpose grease.

Refer to [GI-4, "Components"](#) for symbols not described on the above.

Removal and Installation

INFOID:000000001181484

REMOVAL

1. Remove front kicking plate inner. Refer to [INT-14, "Exploded View"](#).
2. Remove dash side finisher. Refer to [INT-14, "Exploded View"](#).
3. Remove instrument driver lower panel. Refer to [IP-11, "Exploded View"](#).
4. Remove foot duct. Refer to [VTL-56, "FOOT DUCT : Exploded View"](#) (automatic air conditioner), [VTL-110, "FOOT DUCT : Exploded View"](#) (manual air conditioner)
5. Remove mode door motor. Refer to [VTL-36, "Exploded View"](#) (automatic air conditioner).
6. Disconnect ASCD brake switch and the stop lamp switch harness connectors.
7. Disconnect accelerator pedal position sensor harness connector.
8. Remove steering member stay.
9. Remove snap pin and clevis pin from clevis of brake booster.
10. Remove the brake pedal assembly and the accelerator pedal.
11. Remove the accelerator pedal from brake pedal assembly. Refer to [ACC-3, "Exploded View"](#).

INSTALLATION

Note the following, and installation is the reverse order of removal.

BRAKE PEDAL

[LHD]

< ON-VEHICLE REPAIR >

- Apply the multi-purpose grease to the clevis pin and the mating faces. (Not necessary if grease has been already applied.)

NOTE:

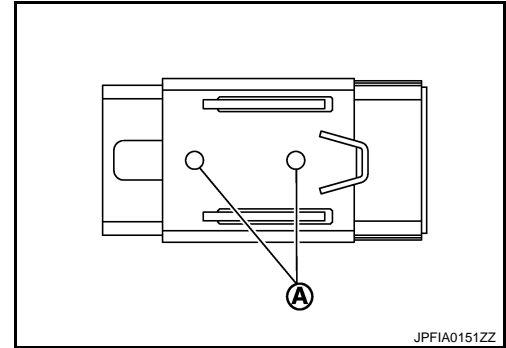
The clevis pin may be inserted in either direction.

Inspection and Adjustment

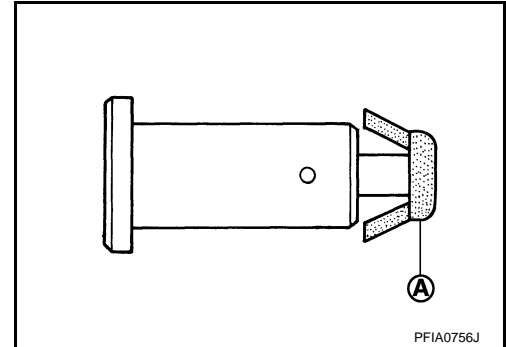
INFOID:000000001181485

INSPECTION AFTER REMOVAL

- Check the following items and replace the brake pedal assembly if necessary.
 - Check the brake pedal upper rivet (A) for deformation.
 - Check the brake pedal for bend, damage, and cracks on the welded parts.



- Check clevis pin and plastic stopper (A) for damage and deformation. If any is found, replace clevis pin.



ADJUSTMENT AFTER INSTALLATION

- Perform the brake pedal adjustment after installing the brake pedal assembly. Refer to [BR-8. "Inspection and Adjustment"](#).
- Perform the accelerator pedal check after installing the accelerator pedal. Refer to [ACC-3. "Inspection"](#).

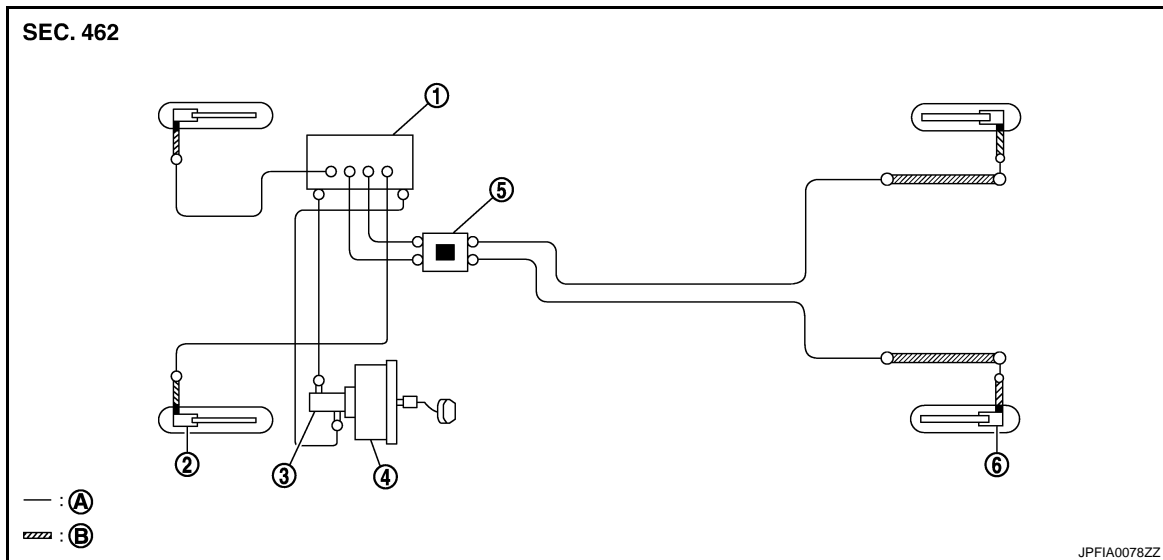
BRAKE PIPING

< ON-VEHICLE REPAIR >

[LHD]

FRONT (WITHOUT ESP) : Hydraulic Piping

INFOID:000000001181487



- | | | |
|--|---------------------|-----------------------------|
| 1. ABS actuator and electric unit (control unit) | 2. Front disc brake | 3. Master cylinder assembly |
| 4. Brake booster | 5. Connector | 6. Rear disc brake |
| A. Brake tube | B. Brake hose | |

- : Flare nut
- : Union bolt
- ▣ : Connector

FRONT (WITHOUT ESP) : Removal and Installation

INFOID:000000001181488

REMOVAL

CAUTION:

Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.

1. Remove tires.
2. Drain brake fluid. Refer to [BR-11. "Draining"](#).
3. Loosen the flare nut with a flare nut wrench and separate the brake tube from the hose.

CAUTION:

- Never scratch the flare nut and the brake tube.
- Never bend sharply, twist or strongly pull out the brake hoses and tubes.
- Cover open end of brake tubes and hoses when disconnecting to prevent entrance of dirt.

4. Remove the union bolt and remove the brake hose from the brake caliper assembly.
5. Remove the lock plate and remove the brake hose.

INSTALLATION

CAUTION:

Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.

1. Assemble the union bolt and the copper washer to the brake hose.

CAUTION:

Never reuse the copper washer.

BRAKE PIPING

[LHD]

< ON-VEHICLE REPAIR >

- Align the brake hose pin to the projection (A) of the brake caliper assembly and tighten the union bolt (1) to the specified torque.
- Install the brake tube to the brake hose, temporarily tighten the flare nut by hand until it does not rotate further, and fix the brake hose to the bracket with the lock plate.

CAUTION:

Check that all brake hoses and tubes are not twisted and bent.

- Tighten the flare nut to the specified torque with a flare nut torque wrench.

CAUTION:

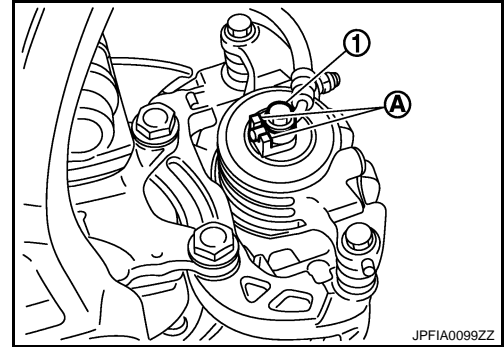
Never scratch the flare nut and the brake tube.

- Refill with new brake fluid and perform the air bleeding. Refer to [BR-12. "Bleeding Brake System"](#).

CAUTION:

Never reuse drained brake fluid.

- Install tires.



FRONT (WITHOUT ESP) : Inspection

INFOID:000000001181489

BR

INSPECTION AFTER INSTALLATION

- Check the brake hoses and tubes for the following: no scratches; no twist and deformation; no interference with other components when steering the steering wheel; no looseness at connections.
- Depress the brake pedal with a force of 785 N (80 kg, 176 lb) and hold down the pedal for approximately 5 seconds with the engine running. Check for any fluid leakage.

CAUTION:

Retighten the applicable connection to the specified torque and repair any abnormal (damaged, worn or deformed) part if any brake fluid leakage is present.

FRONT (WITH ESP)

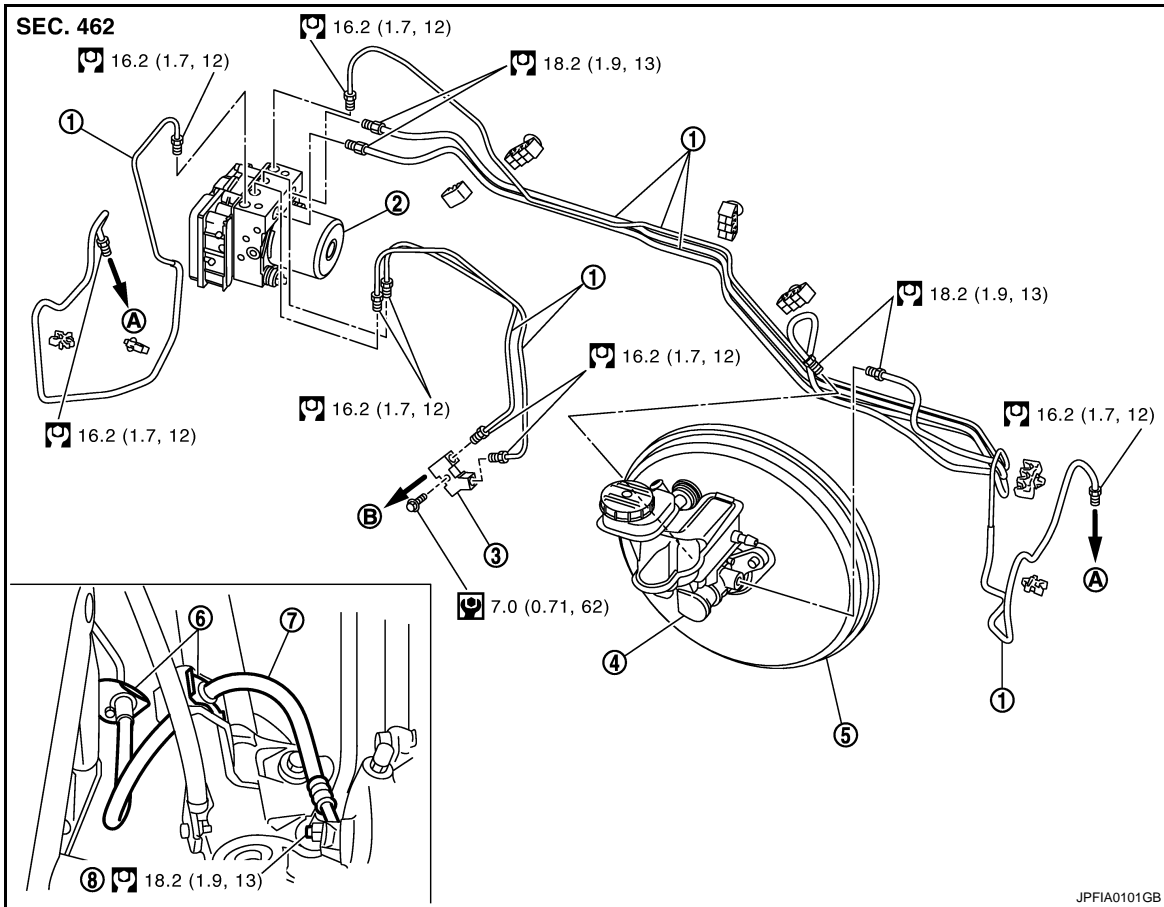
BRAKE PIPING

< ON-VEHICLE REPAIR >

[LHD]

FRONT (WITH ESP) : Exploded View

INFOID:000000001181490



- | | | |
|-----------------------------|--|---------------|
| 1. Brake tube | 2. ABS actuator and electric unit (control unit) | 3. Connector |
| 4. Master cylinder assembly | 5. Brake booster | 6. Lock plate |
| 7. Brake hose | 8. Union bolt | |
| A. To front brake hose | B. To rear brake tube | |

Refer to [GI-4, "Components"](#) for symbols in the figure.

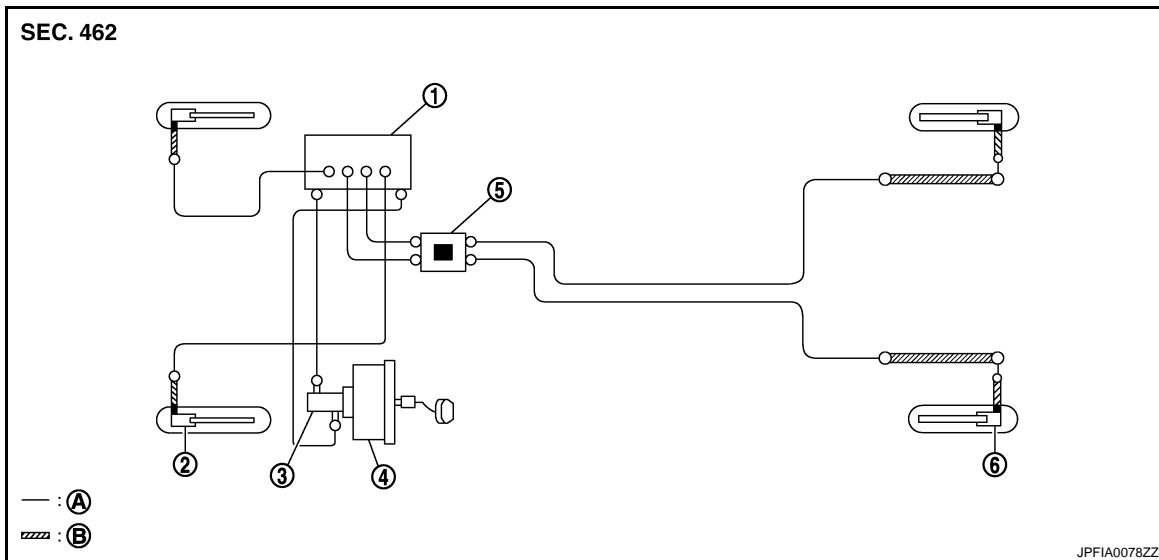
BRAKE PIPING

< ON-VEHICLE REPAIR >

[LHD]

FRONT (WITH ESP) : Hydraulic Piping

INFOID:000000001181491



- | | | |
|--|---------------------|-----------------------------|
| 1. ABS actuator and electric unit (control unit) | 2. Front disc brake | 3. Master cylinder assembly |
| 4. Brake booster | 5. Connector | 6. Rear disc brake |
| A. Brake tube | B. Brake hose | |

- : Flare nut
■ : Union bolt
■ : Connector

FRONT (WITH ESP) : Removal and Installation

INFOID:000000001181492

REMOVAL

CAUTION:

Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.

1. Remove tires.
2. Drain brake fluid. Refer to [BR-11. "Draining"](#).
3. Loosen the flare nut with a flare nut wrench and separate the brake tube from the hose.

CAUTION:

- Never scratch the flare nut and the brake tube.
- Never bend sharply, twist or strongly pull out the brake hoses and tubes.
- Cover open end of brake tubes and hoses when disconnecting to prevent entrance of dirt.

4. Remove the union bolt and remove the brake hose from the brake caliper assembly.
5. Remove the lock plate and remove the brake hose.

INSTALLATION

CAUTION:

Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.

1. Assemble the union bolt and the copper washer to the brake hose.

CAUTION:

Never reuse the copper washer.

BRAKE PIPING

[LHD]

< ON-VEHICLE REPAIR >

- Align the brake hose pin to the projection (A) of the brake caliper assembly and tighten the union bolt (1) to the specified torque.
- Install the brake tube to the brake hose, temporarily tighten the flare nut by hand until it does not rotate further, and fix the brake hose to the bracket with the lock plate.

CAUTION:

Check that all brake hoses and tubes are not twisted and bent.

- Tighten the flare nut to the specified torque with a flare nut torque wrench.

CAUTION:

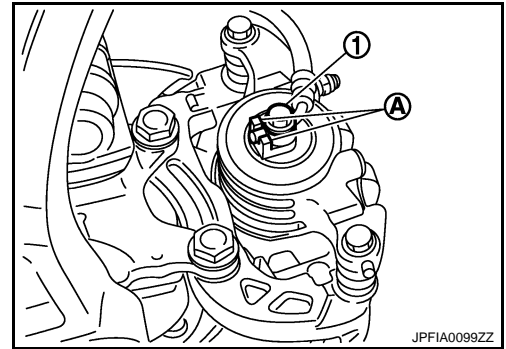
Never scratch the flare nut and the brake tube.

- Refill with new brake fluid and perform the air bleeding. Refer to [BR-12. "Bleeding Brake System"](#).

CAUTION:

Never reuse drained brake fluid.

- Install tires.



FRONT (WITH ESP) : Inspection

INFOID:000000001181493

INSPECTION AFTER INSTALLATION

- Check the brake hoses and tubes for the following: no scratches; no twist and deformation; no interference with other components when steering the steering wheel; no looseness at connections.
- Depress the brake pedal with a force of 785 N (80 kg, 176 lb) and hold down the pedal for approximately 5 seconds with the engine running. Check for any fluid leakage.

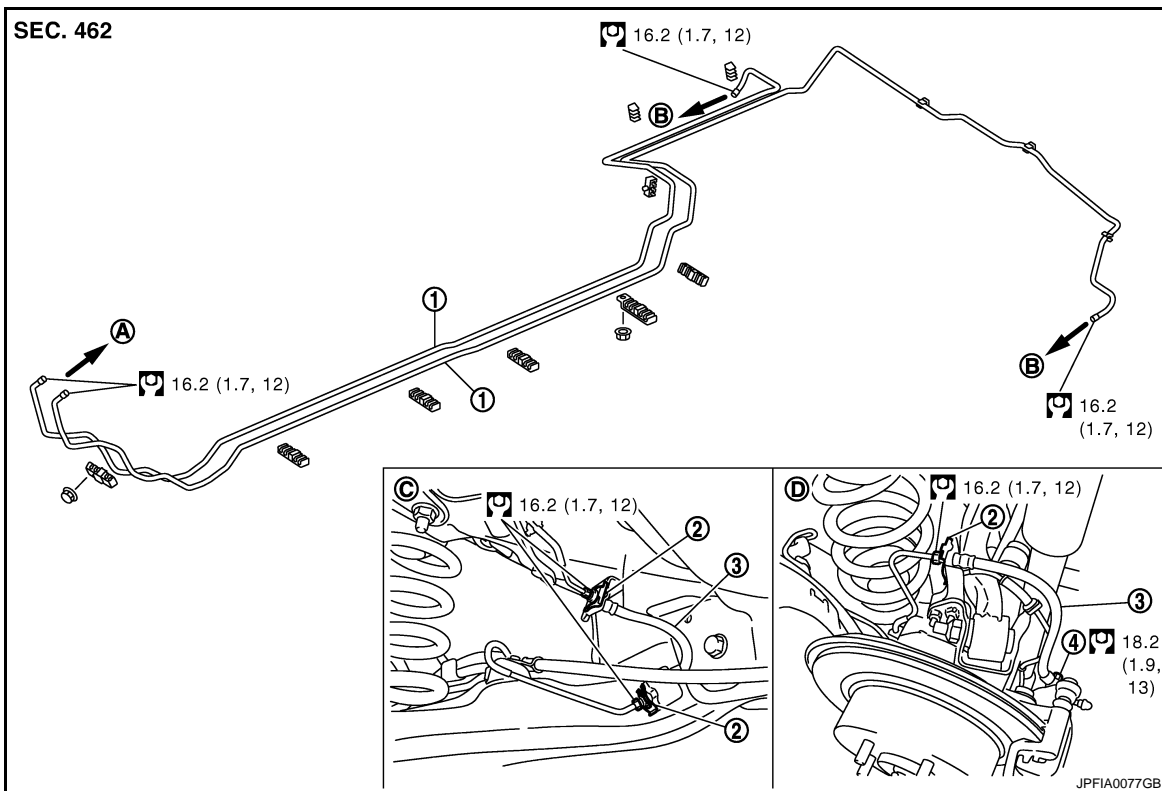
CAUTION:

Retighten the applicable connection to the specified torque and repair any abnormal (damaged, worn or deformed) part if any brake fluid leakage is present.

REAR

REAR : Exploded View

INFOID:000000001181494



BRAKE PIPING

< ON-VEHICLE REPAIR >

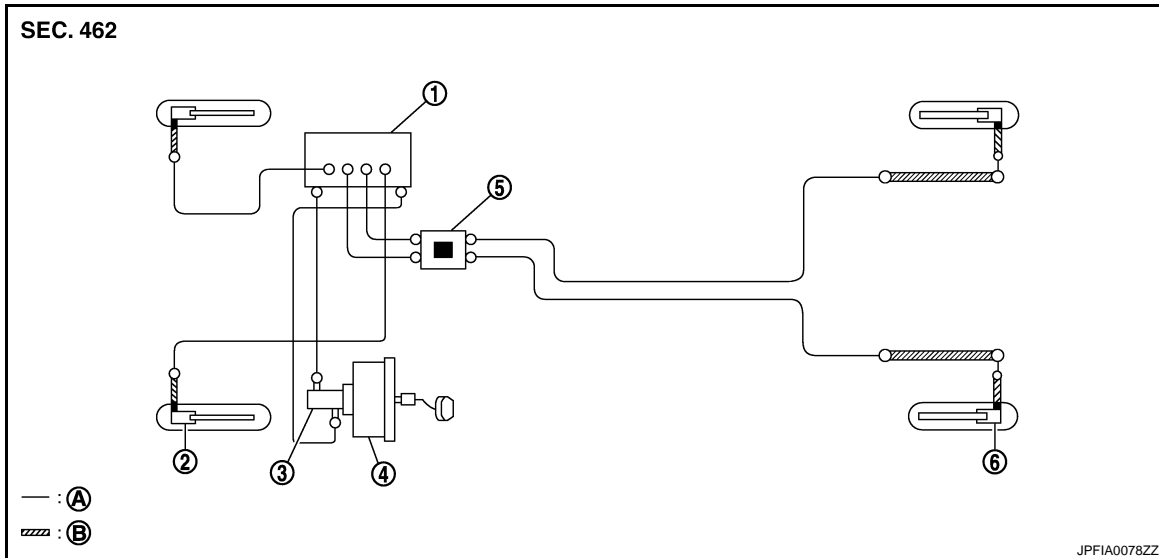
[LHD]

- | | | |
|------------------------|-----------------------|---------------|
| 1. Brake tube | 2. Lock plate | 3. Brake hose |
| 4. Union bolt | | |
| A. To front brake tube | B. To rear brake hose | C. Floor side |
| D. Caliper side | | |

Refer to [GI-4, "Components"](#) for symbols in the figure.

REAR : Hydraulic Piping

INFOID:000000001181495



- | | | |
|--|---------------------|--------------------|
| 1. ABS actuator and electric unit (control unit) | 2. Front disc brake | 3. Master cylinder |
| 4. Brake booster | 5. Connector | 6. Rear disc brake |
| A. Brake tube | B. Brake hose | |

- : Flare nut
■ : Union bolt
▨ : Connector

REAR : Removal and Installation

INFOID:000000001181496

REMOVAL

CAUTION:

Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.

1. Remove tires.
2. Drain brake fluid. Refer to [BR-11, "Draining"](#).
3. Loosen the flare nut with a flare nut wrench and separate the brake tube from the hose.

CAUTION:

- Never scratch the flare nut and the brake tube.
- Never sharply bend, twist or strongly pull the brake hoses and tubes.
- Cover the open end of brake tubes and hoses when disconnecting to prevent entrance of dirt.

4. Remove the union bolt and remove the brake hose from the brake caliper assembly.
5. Remove the lock plate and remove the brake hose from the vehicle.

INSTALLATION

CAUTION:

Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.

BRAKE PIPING

< ON-VEHICLE REPAIR >

[LHD]

1. Assemble the union bolt and the copper washer to the brake hose.

CAUTION:

Never reuse copper washer.

2. Install the brake hose L-pin by aligning it with the brake caliper assembly positioning hole, and tighten the union bolt (1) to the specified torque.

3. Connect the hose to the brake tube, temporarily tighten the flare nut by hand until it does not rotate further, and fix the brake hose to the bracket with the lock plate.

CAUTION:

Check that the brake hoses and tubes are not twisted and bent.

4. Tighten the flare nut to the specified torque with a flare nut torque wrench.

CAUTION:

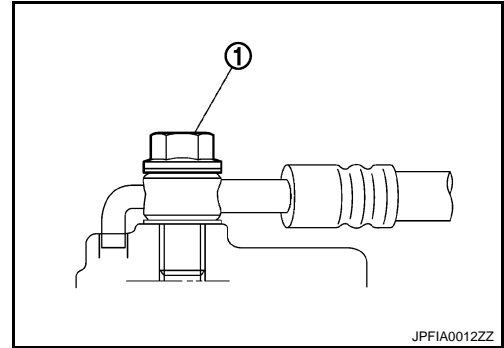
Never scratch the flare nut and the brake tube.

5. Refill with new brake fluid and perform the air bleeding. Refer to [BR-12, "Bleeding Brake System"](#).

CAUTION:

Never reuse drained brake fluid.

6. Install tires.



REAR : Inspection

INFOID:000000001181497

INSPECTION AFTER REMOVAL

1. Check the brake hoses and tubes for the following: no scratches; no twist and deformation; no interference with other components when steering the steering wheel; no looseness at connections.
2. Depress the brake pedal with a force of 785 N (80 kg, 176 lb) and hold down the pedal for approximately 5 seconds with the engine running. Check for any fluid leakage.

CAUTION:

Retighten the applicable connection to the specified torque and repair any abnormal (damaged, worn or deformed) part if any brake fluid leakage is present.

BRAKE MASTER CYLINDER

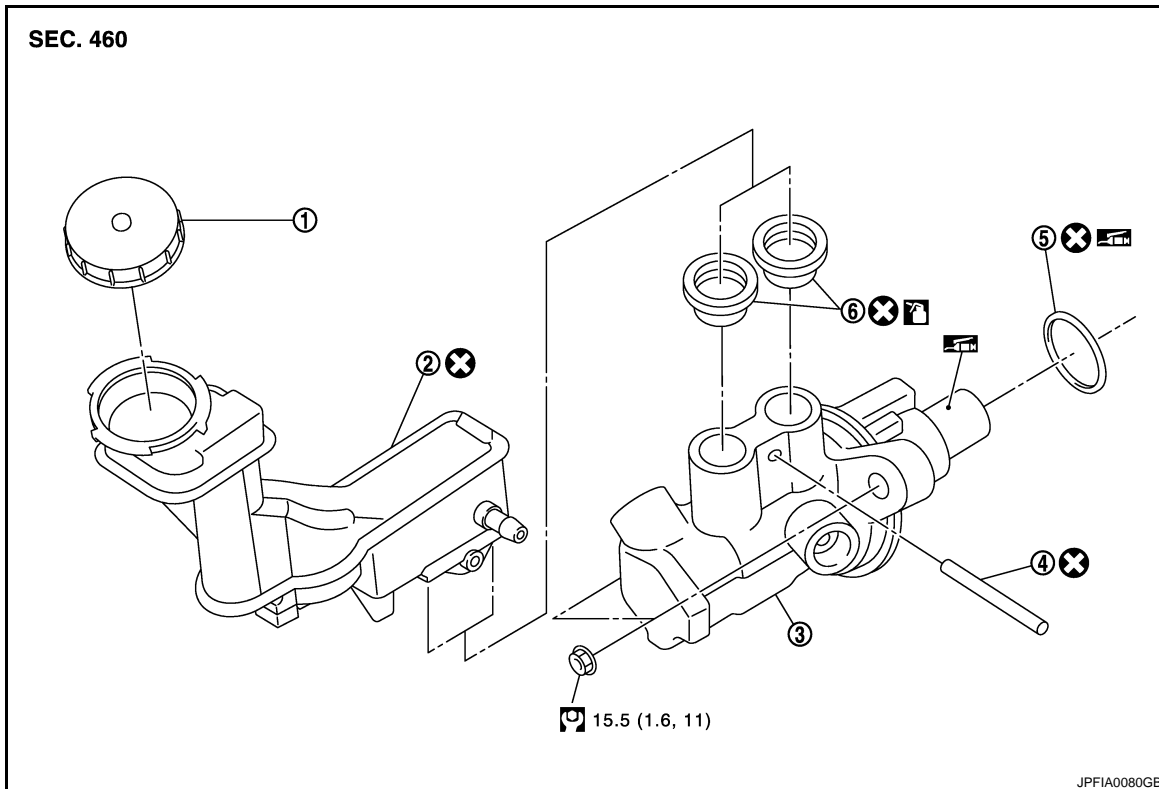
< ON-VEHICLE REPAIR >

[LHD]

BRAKE MASTER CYLINDER

Exploded View

INFOID:000000001181498



- | | | |
|------------------|-------------------|------------------|
| 1. Reservoir cap | 2. Reservoir tank | 3. Cylinder body |
| 4. Pin | 5. O-ring | 6. Grommet |

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

: Apply brake fluid.

Refer to [GI-4, "Components"](#) for symbols not described on the above.

Removal and Installation

INFOID:000000001181499

REMOVAL

CAUTION:

Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.

1. Remove battery and bracket.
2. Remove air duct and air cleaner case. Refer to [EM-28, "Exploded View"](#) (HR16DE engine models), [EM-145, "Exploded View"](#) (HR20DE engine models), [EM-266, "Exploded View"](#) (K9K engine models), XX-XX (M9R engine models).
3. Drain brake fluid. Refer to [BR-11, "Draining"](#).
4. Separate the brake fluid level switch harness connector.
5. Separate the brake tubes from the master cylinder assembly with a flare nut wrench.

CAUTION:

Never scratch the flare nut and the brake tube.

6. Remove the master cylinder assembly.

CAUTION:

- Depress the brake pedal several times to release the vacuum pressure from the brake booster. Then remove the master cylinder assembly.
- Never depress the brake pedal after the master cylinder assembly is removed.

BRAKE MASTER CYLINDER

[LHD]

< ON-VEHICLE REPAIR >

- The piston of the master cylinder assembly is exposed. Never damage it when removing the master cylinder.
- The piston may drop off when pulled out strongly. Never hold the piston. Hold the cylinder body when handling the master cylinder assembly.

INSTALLATION

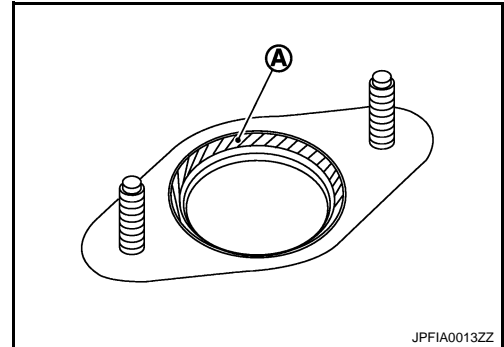
CAUTION:

Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.

- Note the following, and installation is the reverse order of removal.

CAUTION:

- Never depress the brake pedal after the master cylinder assembly is removed.
- Apply PBC (Poly Butyl Cuprysil) silicone-based grease to the brake booster [see (A) in the figure] when installing the master cylinder assembly to the brake booster.
- The piston of the master cylinder assembly is exposed. Never damage it when handling the master cylinder and check that no dirt and dust are present on the piston before installation. Clean it with new brake fluid if necessary.
- The piston may drop off when pulled strongly. Never hold the piston. Hold the cylinder body when handling the master cylinder assembly.
- Temporarily tighten the brake tube flare nut to the master cylinder assembly by hand. Then tighten it to the specified torque with a flare nut torque wrench. Refer to [BR-19. "FRONT \(WITHOUT ESP\) : Exploded View"](#) (without ESP), [BR-22. "FRONT \(WITH ESP\) : Exploded View"](#) (with ESP).



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CAUTION:

Never scratch the flare nut and the brake tube.

- After installation, perform the air bleeding. Refer to [BR-12. "Bleeding Brake System"](#).

CAUTION:

Never reuse drained brake fluid.

Disassembly and Assembly

INFOID:000000001181500

DISASSEMBLY

CAUTION:

- Never disassemble the cylinder body.
- Remove the reservoir tank if necessary.

1. Fix the master cylinder assembly to a vise.

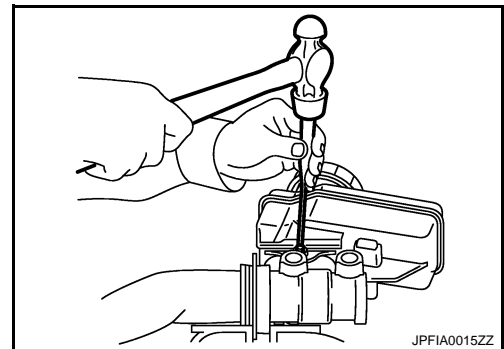
CAUTION:

Always set copper plates or cloth between vise when fixing the cylinder body to a vise. Never overtighten the vise.

2. Remove the reservoir tank mounting pin with a pin punch.
3. Remove the reservoir tank and grommet from the cylinder body.

CAUTION:

Never drop the removed parts. The parts must not be reused if they are dropped.



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ASSEMBLY

1. Apply new brake fluid to the grommet and install it to the cylinder body.

CAUTION:

- Never use mineral oil such as gasoline or light oil.
- Never reuse the grommets.

2. Install the reservoir tank to the cylinder body.

BRAKE MASTER CYLINDER

< ON-VEHICLE REPAIR >

[LHD]

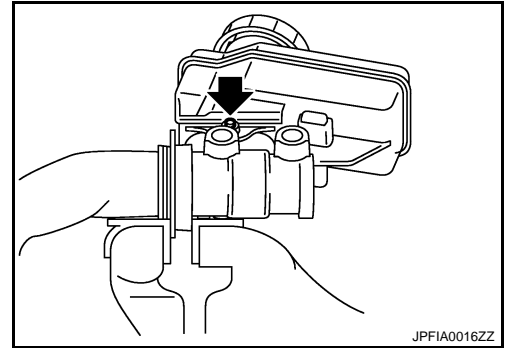
CAUTION:

- Never drop the parts when installing. The parts must not be reused if they are dropped.
- Never reuse reservoir tank.

3. Fix the cylinder body to a vise.

CAUTION:

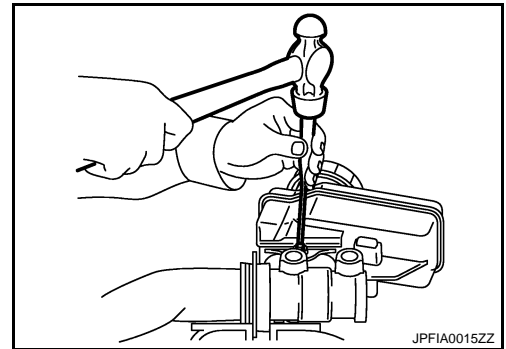
- Place the reservoir tank with the chamfered pin hole (←) facing up.
- Always set copper plates or cloth between vise when fixing the cylinder body to a vise. Never overtighten the vise.



4. Tilt the reservoir tank so that a mounting pin can be inserted. Insert a mounting pin. Return the reservoir tank to the horizontal position. Insert another mounting pin into the pin hole on the opposite side in the same manner after the mounting pin passes through the cylinder body pin hole.

CAUTION:

Never reuse the mounting pin.



Inspection

INSPECTION AFTER INSTALLATION

Fluid Leak

Check for brake fluid leakage from the cylinder body-to-brake booster mounting face, reservoir tank mounting face and brake tube connections.

A
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INFOID:000000001181501

BRAKE BOOSTER

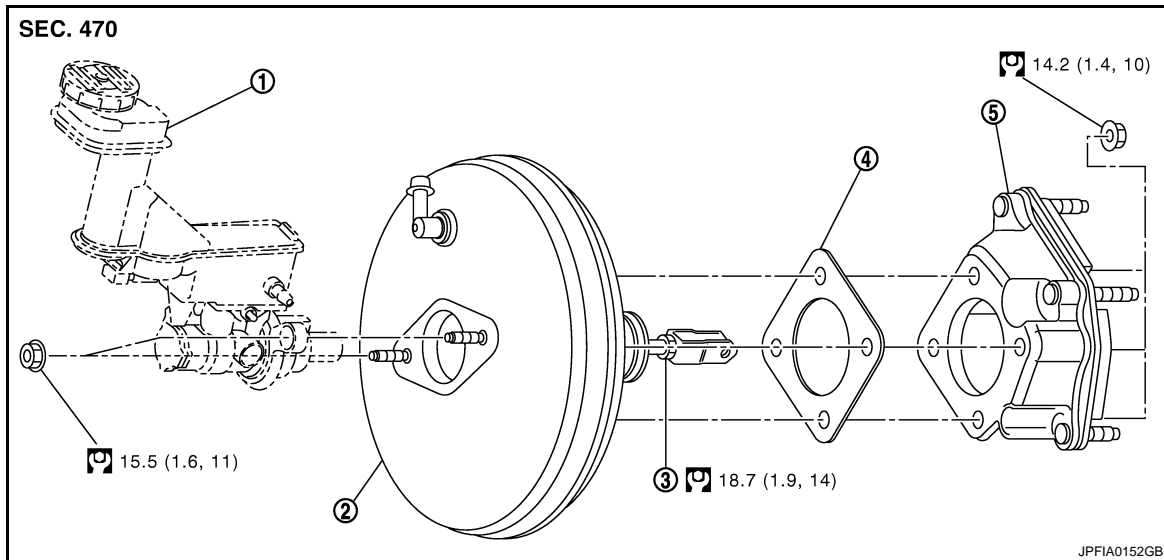
[LHD]

< ON-VEHICLE REPAIR >

BRAKE BOOSTER

Exploded View

INFOID:000000001181502



- | | | |
|-----------------------------|------------------|-------------|
| 1. Master cylinder assembly | 2. Brake booster | 3. Lock nut |
| 4. Gasket | 5. Spacer | |

Refer to [GI-4, "Components"](#) for symbols in the figure.

Removal and installation

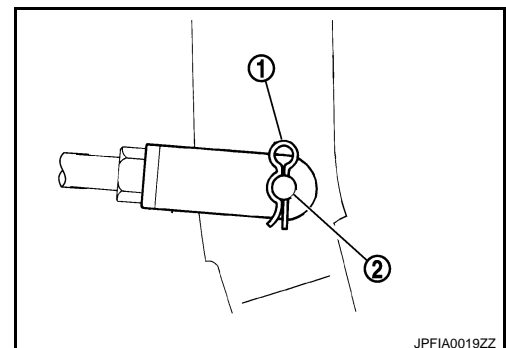
INFOID:000000001181503

REMOVAL

1. Remove battery and bracket.
2. Remove air duct and air cleaner case. Refer to [EM-28, "Exploded View"](#) (HR16DE engine models), [EM-145, "Exploded View"](#) (MR20DE engine models), [EM-266, "Exploded View"](#) (K9K engine models), XX-XX (M9R engine models).
3. Remove brake master cylinder assembly. Refer to [BR-27, "Removal and Installation"](#).

CAUTION:

- Depress the brake pedal several times to release the vacuum pressure from the brake booster. Then remove the master cylinder assembly.
 - Never depress the brake pedal after the master cylinder assembly is removed.
 - The piston of the master cylinder assembly is exposed. Never damage it when removing the master cylinder.
 - The piston may drop off when pulled out strongly. Never hold the piston. Hold the cylinder body when handling the master cylinder assembly.
4. Remove vacuum hose from brake booster. Refer to [BR-33, "HR16DE/MR20DE MODELS : Removal and Installation"](#) (HR16DE, MR20DE engine models), [BR-34, "K9K MODELS : Removal and Installation"](#) (K9K engine models), [BR-35, "M9R MODELS : Exploded View"](#) (M9R engine models).
 5. Remove snap pin (1) and clevis pin (2) from inside vehicle.
 6. Remove nuts on brake booster and brake pedal assembly. Refer to [BR-17, "Exploded View"](#).
 7. Remove brake booster from dash panel in engine room side.
- CAUTION:**
Never deform or bend the brake tubes.
8. Remove the spacer from brake booster.



BRAKE BOOSTER

[LHD]

< ON-VEHICLE REPAIR >

INSTALLATION

Note the following, and installation is the reverse order of removal.

CAUTION:

- Be careful not to damage brake booster stud bolt threads. If brake booster is tilted during installation, the dash panel may damage the threads.
- Never deform or bend the brake tubes when installing the brake booster.
- Always use a new gasket between the brake booster and the spacer.
- Replace the clevis pin if it is damaged. Refer to [BR-18, "Inspection and Adjustment"](#).
- After installation, perform the air bleeding. Refer to [BR-12, "Bleeding Brake System"](#).

CAUTION:

Never reuse drained brake fluid.

Inspection and Adjustment

INFOID:000000001181504

INSPECTION AFTER REMOVAL

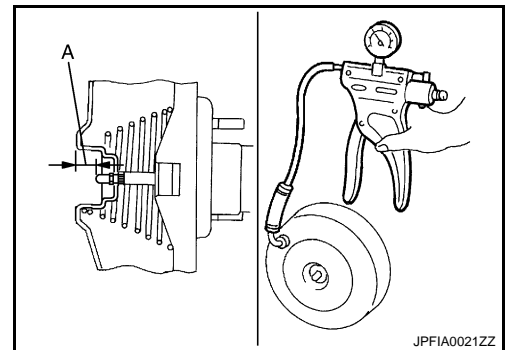
Output Rod Length Inspection

1. With a handy vacuum pump, apply vacuum pressure of -66.7 kPa (-500 mmHg, -19.70 inHg, -0.667 bar) to the brake booster.
2. Check the output rod length (A).

Standard

Output rod length (A)

: Refer to [BR-49, "Brake Booster"](#).



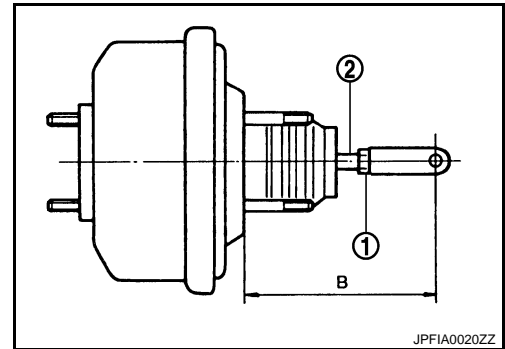
Input Rod Length Inspection

1. Loosen the lock nut (1) and adjust the input rod (2) to the specified length (B).

Standard

Input rod length (B)

: Refer to [BR-49, "Brake Booster"](#).



2. Tighten the lock nut to the specified torque.

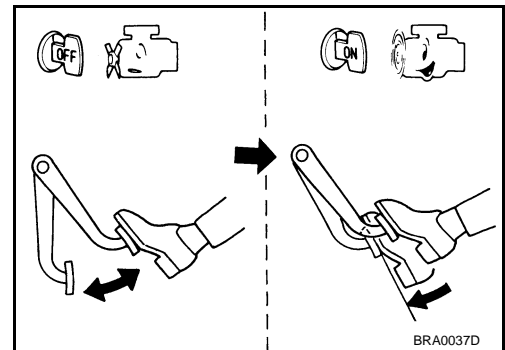
INSPECTION AFTER INSTALLATION

Operation

Depress the brake pedal several times at 5-second intervals with the engine stopped. Start the engine with the brake pedal fully depressed. Check that the clearance between brake pedal and dash lower pane decreases.

NOTE:

A slight impact with a small click may be felt on the pedal when the brake pedal is fully depressed. This is a normal phenomenon due to the brake system operation.



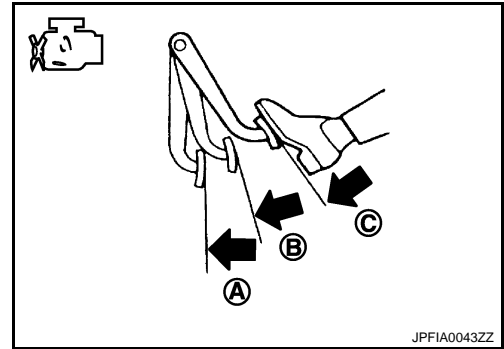
Air Tight

BRAKE BOOSTER

< ON-VEHICLE REPAIR >

[LHD]

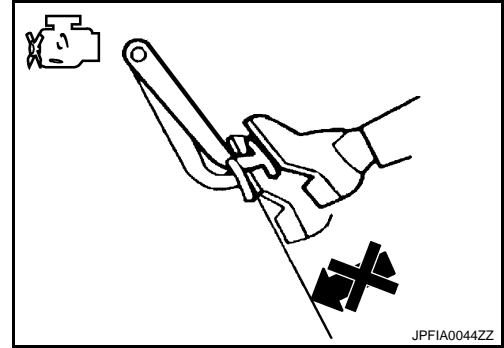
- Idle the engine for 1 minute to apply vacuum to the brake booster, and stop the engine. Then depress the brake pedal several times at 5-second intervals until the accumulated vacuum is released to atmospheric pressure. Check that the clearance between brake pedal and dash lower panel gradually increases (A → B → C) each time the brake pedal is depressed during this operation.



- Depress the brake pedal with the engine running. Then stop the engine while holding down the brake pedal. Check that the brake pedal stroke does not change after holding down the brake pedal for 30 seconds or more.

NOTE:

A slight impact with a small click may be felt on the pedal when the brake pedal is fully depressed. This is a normal phenomenon due to the brake system operation.



ADJUSTMENT AFTER INSTALLTION

Perform the brake pedal adjustment after installing the brake pedal assembly. Refer to [BR-8, "Inspection and Adjustment"](#).

VACUUM LINES

< ON-VEHICLE REPAIR >

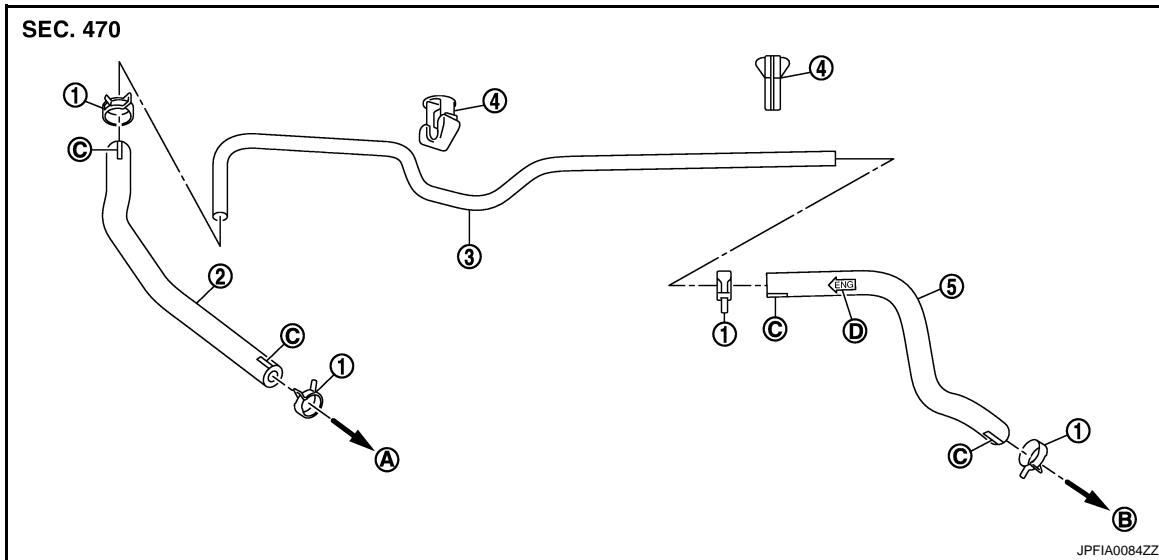
[LHD]

VACUUM LINES

HR16DE/MR20DE MODELS

HR16DE/MR20DE MODELS : Exploded View

INFOID:000000001181505



- | | | |
|--------------------------------------|---------------------------------------|----------------|
| 1. Clamp | 2. Vacuum hose | 3. Vacuum tube |
| 4. Grommet | 5. Vacuum hose (built in check valve) | |
| A. To intake manifold | B. To brake booster | C. Paint mark |
| D. Stamp indicating engine direction | | |

HR16DE/MR20DE MODELS : Removal and Installation

INFOID:000000001181506

REMOVAL

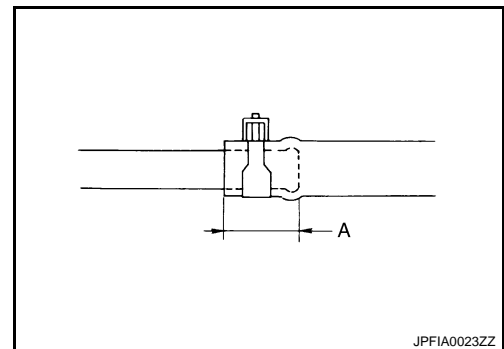
Remove the vacuum hose and tube.

INSTALLATION

Install the vacuum hose and tube.

CAUTION:

- Because vacuum hose contains a check valve, it must be installed in the correct position. Refer to the stamp to confirm correct installation. Brake booster will not operate normally if the hose is installed in the wrong direction.
- Insert vacuum hose at least 24 mm (0.94 in) (A).
- Never use lubricating oil during assembly.
- Face the marking side up when assembling of vacuum hose.
- Face the marking side vehicle front when assembling of vacuum hose (built in check valve).



HR16DE/MR20DE MODELS : Inspection

INFOID:000000001181507

INSPECTION AFTER REMOVAL

Appearance

Check for correct assembly, damage and deterioration.

Check Valve Airtightness

VACUUM LINES

< ON-VEHICLE REPAIR >

[LHD]

- Use a handy vacuum pump (A) to check.

When connected to the brake booster side (B):

Vacuum should decrease within 1.3 kPa (10 mm-Hg, 0.39 inHg, 0.013 bar) for 15 seconds under a vacuum of -66.7 kPa (-500 mmHg, -19.70 inHg, -0.667 bar).

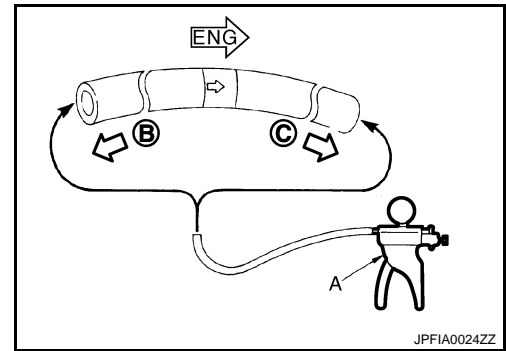
When connected to the engine side (C):

Vacuum should not exist.

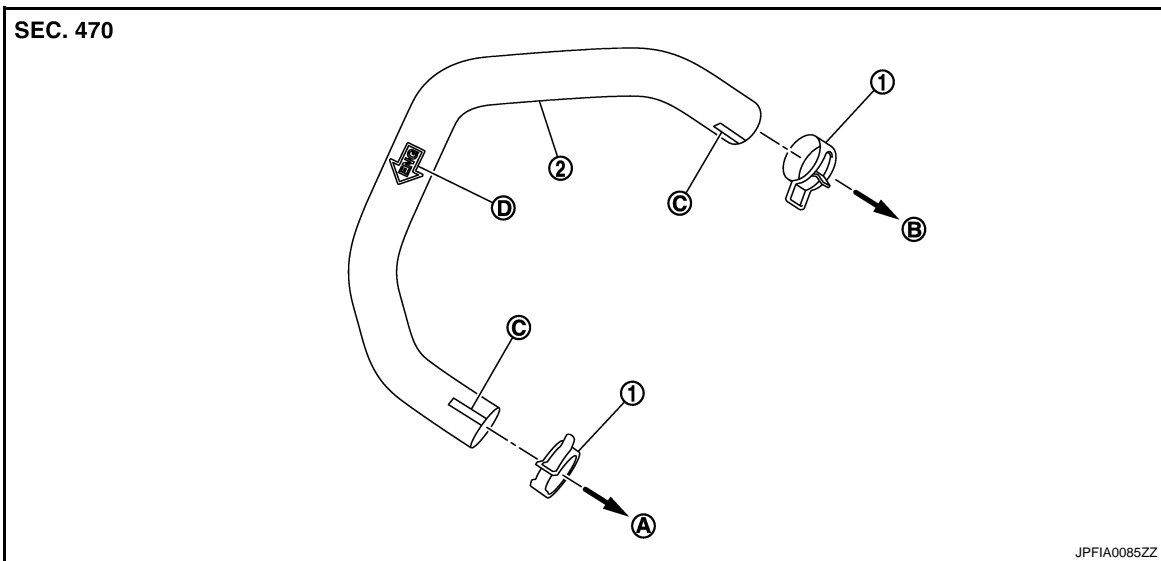
- Replace vacuum hose assembly if vacuum hose and check valve are malfunctioning.

K9K MODELS

K9K MODELS : Exploded View



SEC. 470



- | | | |
|--------------------------------------|---------------------------------------|---------------|
| 1. Clamp | 2. Vacuum hose (built in check valve) | |
| A. To vacuum pump | B. To brake booster | C. Paint mark |
| D. Stamp indicating engine direction | | |

K9K MODELS : Removal and Installation

INFOID:000000001181509

REMOVAL

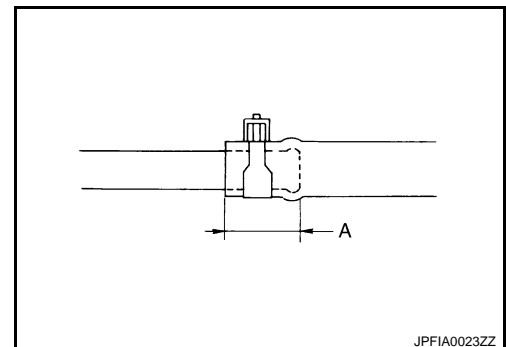
Remove the vacuum hose.

INSTALLATION

Install the vacuum hose.

CAUTION:

- Because vacuum hose contains a check valve, it must be installed in the correct position. Refer to the stamp to confirm correct installation. Brake booster will not operate normally if the hose is installed in the wrong direction.
- Insert vacuum hose at least 24 mm (0.94 in) (A).
- Never use lubricating oil during assembly.
- Face the marking side up when assembling (vacuum pump side).
- Face the marking side vehicle front when assembling (brake booster side).



VACUUM LINES

< ON-VEHICLE REPAIR >

[LHD]

K9K MODELS : Inspection

INFOID:000000001181510

INSPECTION AFTER REMOVAL

Appearance

Check for correct assembly, damage and deterioration.

Check Valve Airtightness

- Use a handy vacuum pump (A) to check.

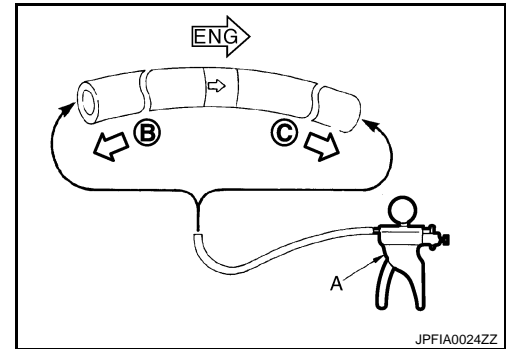
When connected to the brake booster side (B):

Vacuum should decrease within 1.3 kPa (10 mm-Hg, 0.39 inHg, 0.013 bar) for 15 seconds under a vacuum of -66.7 kPa (-500 mmHg, -19.70 inHg, -0.667 bar).

When connected to the engine side (C):

Vacuum should not exist.

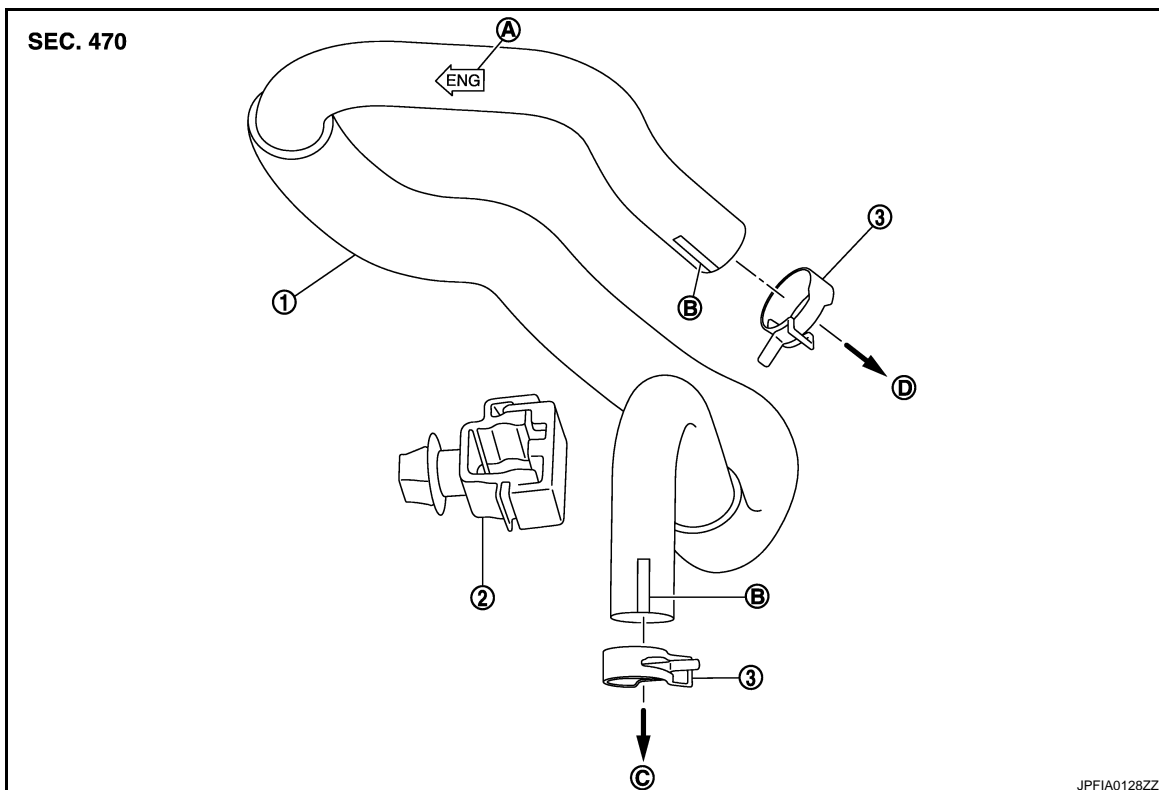
- Replace vacuum hose assembly if vacuum hose and check valve are malfunctioning.



M9R MODELS

M9R MODELS : Exploded View

INFOID:000000001315033



- | | | |
|---------------------------------------|---------------|-------------------|
| 1. Vacuum hose (built in check valve) | 2. Grommet | 3. Clamp |
| A. Stamp indicating engine direction | B. Paint mark | C. To vacuum pump |
| D. To brake booster | | |

M9R MODELS : Removal and Installation

INFOID:000000001315034

REMOVAL

1. Remove engine cover. Refer to [EM-357, "Exploded View"](#).

VACUUM LINES

[LHD]

< ON-VEHICLE REPAIR >

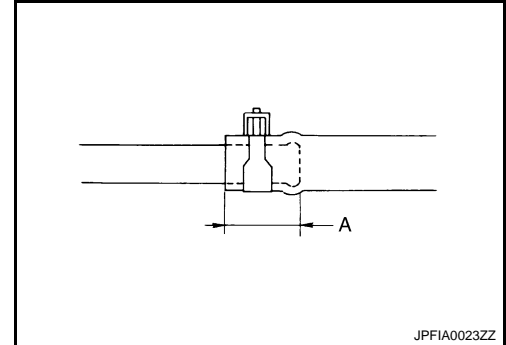
2. Remove the vacuum hose.

INSTALLATION

Note the following, and installation is reverse order of removal.

CAUTION:

- Because vacuum hose contains a check valve, it must be installed in the correct position. Refer to the stamp to confirm correct installation. Brake booster will not operate normally if the hose is installed in the wrong direction.
- Insert vacuum hose at least 24 mm (0.94 in) (A).
- Never use lubricating oil during assembly.
- Face the marking side up when assembling (vacuum pump side).
- Face the marking side vehicle front when assembling (brake booster side).



INFOID:000000001315035

M9R MODELS : Inspection

INSPECTION AFTER REMOVAL

Appearance

Check for correct assembly, damage and deterioration.

Check Valve Airtightness

- Use a handy vacuum pump (A) to check.

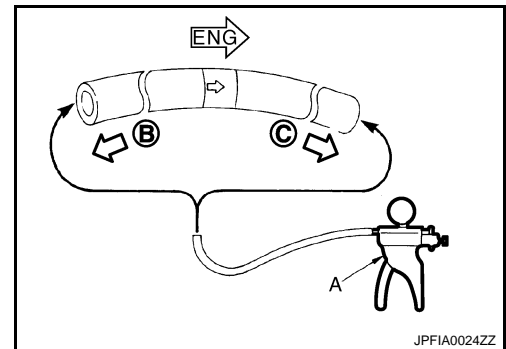
When connected to the brake booster side (B):

Vacuum should decrease within 1.3 kPa (10 mm-Hg, 0.39 inHg, 0.013 bar) for 15 seconds under a vacuum of -66.7 kPa (-500 mmHg, -19.70 inHg, -0.667 bar).

When connected to the engine side (C):

Vacuum should not exist.

- Replace vacuum hose assembly if vacuum hose and check valve are malfunctioning.



FRONT DISC BRAKE

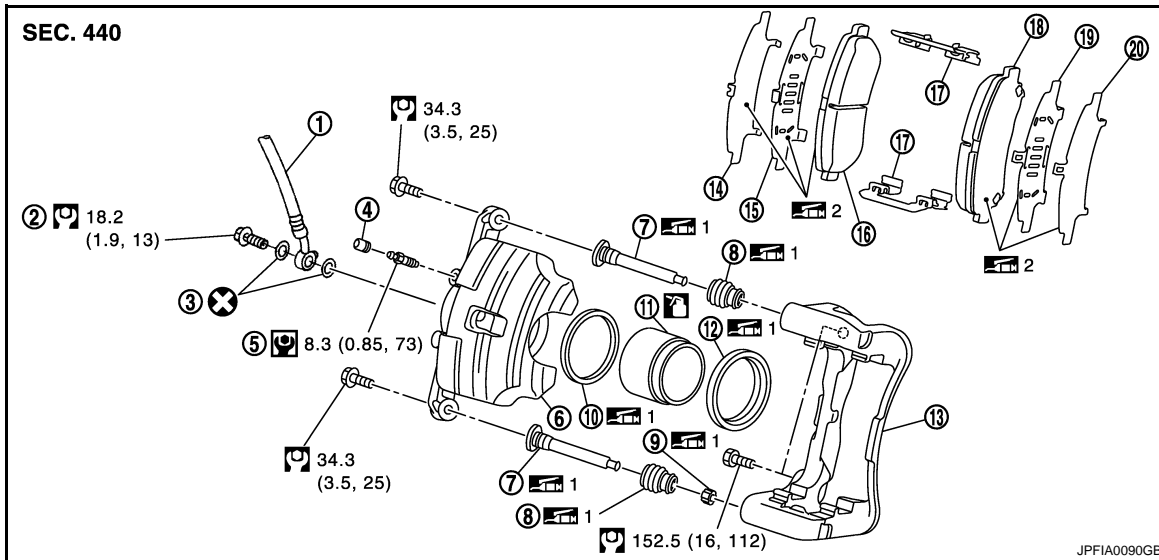
< ON-VEHICLE REPAIR >

[LHD]

FRONT DISC BRAKE BRAKE PAD

BRAKE PAD : Exploded View

INFOID:000000001374880



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

1: Apply rubber grease.

2: Apply copper based brake grease.

3: Apply brake fluid.

Refer to [GI-4, "Components"](#) for symbols not described on the above.

BRAKE PAD : Removal and Installation

INFOID:000000001181512

REMOVAL

WARNING:

Clean any dust from the brake caliper and brake pads with a vacuum dust collector. Never blow with compressed air.

CAUTION:

- Never depress the brake pedal while removing the brake pads because the piston may pop out.
- Never spill or splash brake fluid on the disc rotor.

1. Remove tires.
2. Remove lower sliding pin bolt.
3. Suspend the cylinder body with suitable wire so that the brake hose will not stretch. Then remove the brake pad from the torque member.

CAUTION:

- Never deform the pad retainer when removing the pad retainer from the torque member.
- Never damage the piston boot.
- Never drop the brake pads, shims, and the shim covers.

INSTALLATION

FRONT DISC BRAKE

< ON-VEHICLE REPAIR >

[LHD]

WARNING:

Clean any dust from the brake caliper and brake pads with a vacuum dust collector. Never blow with compressed air.

CAUTION:

- Never depress the brake pedal while removing the brake pads or the cylinder body because the piston may pop out.
- Never spill or splash brake fluid on the disc rotor.

1. Install the pad retainer to the torque member if the pad retainers has been removed.

CAUTION:

- Securely assemble the pad retainers so that it will not be lifted up from the torque member.
- Never deform the pad retainers.

2. Apply copper based brake grease to the mating faces between the pads, shims and shim covers, and install them to the brake pad.

CAUTION:

Always replace the shims together with the shim covers when replacing the brake pad.

3. Install the cylinder body and brake pads to the torque member.

CAUTION:

- Never damage the piston boot.
- When replacing a pad with new one, check a brake fluid level in the reservoir tank because brake fluid returns to master cylinder reservoir tank when pressing piston in.

NOTE:

Use a disc brake piston tool to easily press piston.

4. Install the lower sliding pin bolt and tighten it to the specified torque.
5. Depress the brake pedal several times to check that no drag feel is present for the front disc brake.
6. Install tires.

BRAKE PAD : Inspection and Adjustment

INFOID:000000001181513

INSPECTION AFTER REMOVAL

Replace the shims and the shim covers if rust is excessively attached.

ADJUSTMENT AFTER INSTALLATION

Brake Burnishing Procedure

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

CAUTION:

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

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

BRAKE CALIPER ASSEMBLY

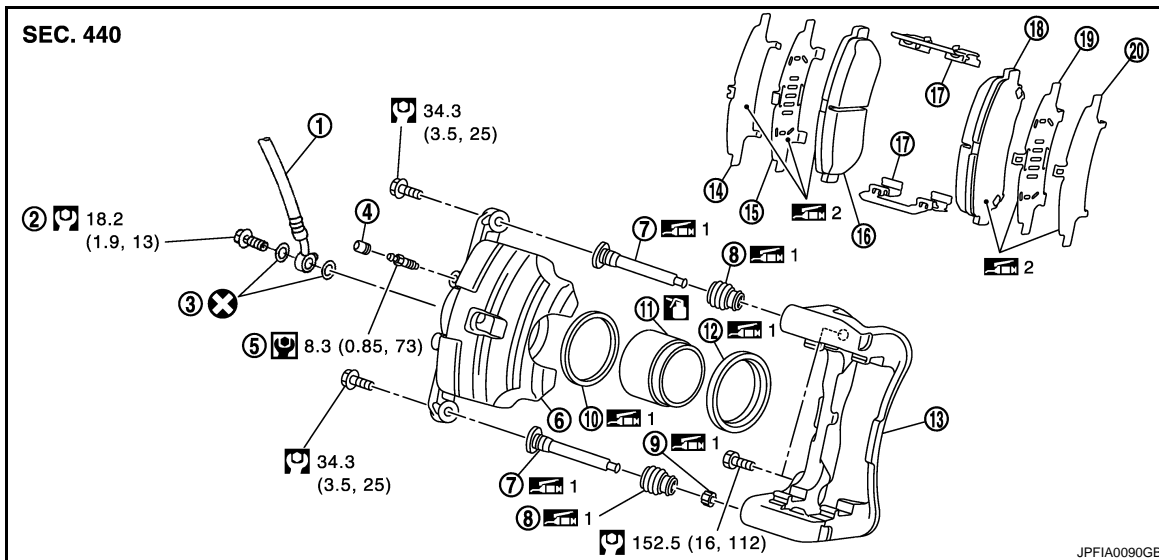
FRONT DISC BRAKE

< ON-VEHICLE REPAIR >

[LHD]

BRAKE CALIPER ASSEMBLY : Exploded View

INFOID:000000001181514



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

1: Apply rubber grease.

2: Apply copper based brake grease.

: Apply brake fluid.

Refer to [GI-4, "Components"](#) for symbols not described on the above.

BRAKE CALIPER ASSEMBLY : Removal and Installation

INFOID:000000001181515

REMOVAL

WARNING:

Clean any dust from the brake caliper and brake pads with a vacuum dust collector. Never blow with compressed air.

CAUTION:

Never depress the brake pedal. Brake fluid may splash while removing the brake hose.

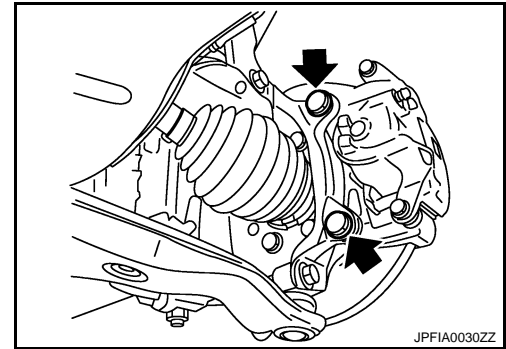
1. Remove tires.
2. Fix the disc rotor using wheel nuts.
3. Drain brake fluid. Refer to [BR-11, "Draining"](#).
CAUTION:
Never spill or splash brake fluid on the disc rotor.
4. Remove union bolt, and then disconnect brake hose from caliper assembly.

FRONT DISC BRAKE

< ON-VEHICLE REPAIR >

[LHD]

5. Remove torque member mounting bolts, and remove brake caliper assembly.
CAUTION:
Never drop brake pads and caliper assembly.
6. Remove disc rotor.
CAUTION:
 - Put matching marks on the wheel hub and bearing assembly and the disc rotor before removing the disc rotor.
 - Never drop disc rotor.



INSTALLATION

WARNING:

Clean any dust from the brake caliper and brake pads with a vacuum dust collector. Never blow with compressed air.

CAUTION:

Never depress the brake pedal. Brake fluid may splash while removing the brake hose.

1. Install disc rotor.
CAUTION:
Align the matching marks made during removal when reusing the disc rotor.
2. Install the brake caliper assembly to the vehicle and tighten the torque member mounting bolts to the specified torque.
CAUTION:
Never spill or splash any grease and moisture on the brake caliper assembly mounting face, threads, mounting bolts and washers. Wipe out any grease and moisture.
3. Install brake hose to brake caliper assembly, and tighten union bolts to the specified torque.
4. Refill with new brake fluid and perform the air bleeding. Refer to [BR-12. "Bleeding Brake System"](#).
CAUTION:
 - Never reuse drained brake fluid.
 - Never spill or splash brake fluid on the disc rotor.
5. Check that no drag feel is present for the front disc brake.
6. Install tires.

BRAKE CALIPER ASSEMBLY : Disassembly and Assembly

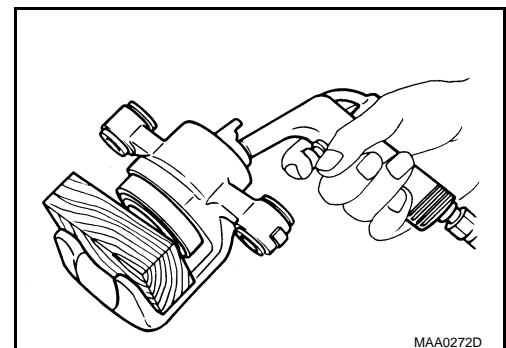
INFOID:000000001181516

DISASSEMBLY

NOTE:

Never remove the torque member, brake pads, shims, shim covers and pad retainers when disassembling and assembling the cylinder body.

1. Remove the sliding pin bolts, and remove the cylinder body from the torque member.
CAUTION:
Never drop pads, shims, shim covers and pad retainers from torque member.
2. Remove sliding pins and sliding pin boots from torque member.
3. Remove bushing from sliding pin.
4. Place a wooden block as shown in the figure, and blow air from union bolt mounting hole to remove piston and piston boot.
CAUTION:
Never get fingers caught in the piston.



FRONT DISC BRAKE

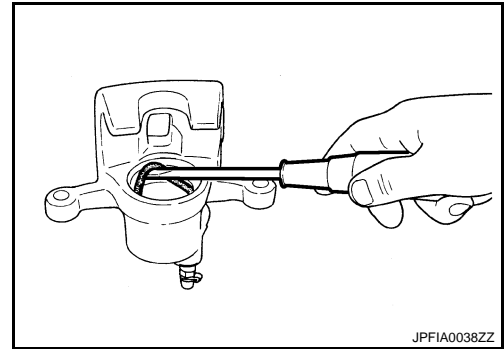
[LHD]

< ON-VEHICLE REPAIR >

- Remove piston seal from cylinder body using suitable tool.

CAUTION:

Be careful not to damage a cylinder inner wall.



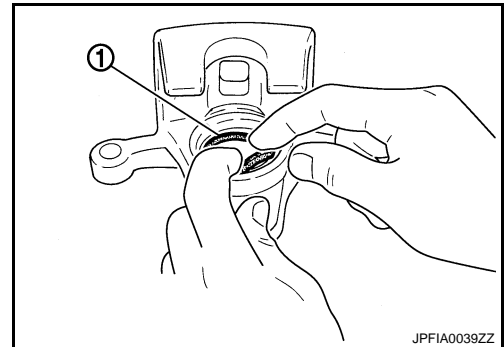
JPFIA0038ZZ

ASSEMBLY

- Apply rubber grease to piston seal (1), and install to cylinder body.

CAUTION:

Never reuse piston seal.

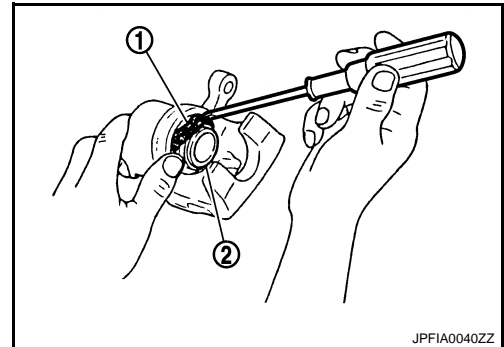


JPFIA0039ZZ

- Apply rubber grease to piston boot (1). Cover the piston (2) end with piston boot, and then install cylinder side lip on piston boot securely into a groove on cylinder body.

CAUTION:

Never reuse piston boot.



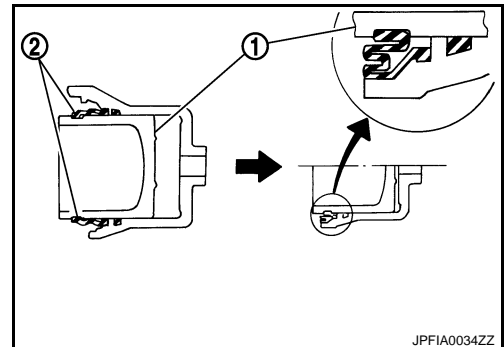
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- Apply brake fluid to piston (1). Push piston into cylinder body by hand and push piston boot (2) piston-side lip into the piston groove.

CAUTION:

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

- Apply rubber grease to bushing, install bushing to sliding pin.
- Apply rubber grease to sliding pins and sliding pin boots, install sliding pins and sliding pin boots to torque member.
- Install the cylinder body to the torque member and tighten the sliding pin bolts to the specified torque.



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BRAKE CALIPER ASSEMBLY : Inspection and Adjustment

INFOID:000000001181517

INSPECTION AFTER DISASSEMBLY

Cylinder Body

Check the inner wall of the cylinder for rust, wear, cracks or damage. Replace the cylinder if any abnormal condition is detected.

CAUTION:

Always clean with new brake fluid. Never clean with mineral oil such as gasoline and light oil.

FRONT DISC BRAKE

[LHD]

< ON-VEHICLE REPAIR >

Torque Member

Check the torque member for rust, wear, cracks or damage. Replace the member if any abnormal condition is detected.

Piston

Check the surface of the piston for rust, wear, cracks or damage. Replace the piston if any abnormal condition is detected.

CAUTION:

A piston sliding surface is plated. Never polish with sandpaper.

Sliding Pin and Sliding Pin Boot

Check the sliding pins and sliding boots for rust, wear, cracks or damage. Replace the parts if any abnormal condition is detected.

ADJUSTMENT AFTER INSTALLATION

Brake Burnishing Procedure

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

CAUTION:

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

REAR DISC BRAKE

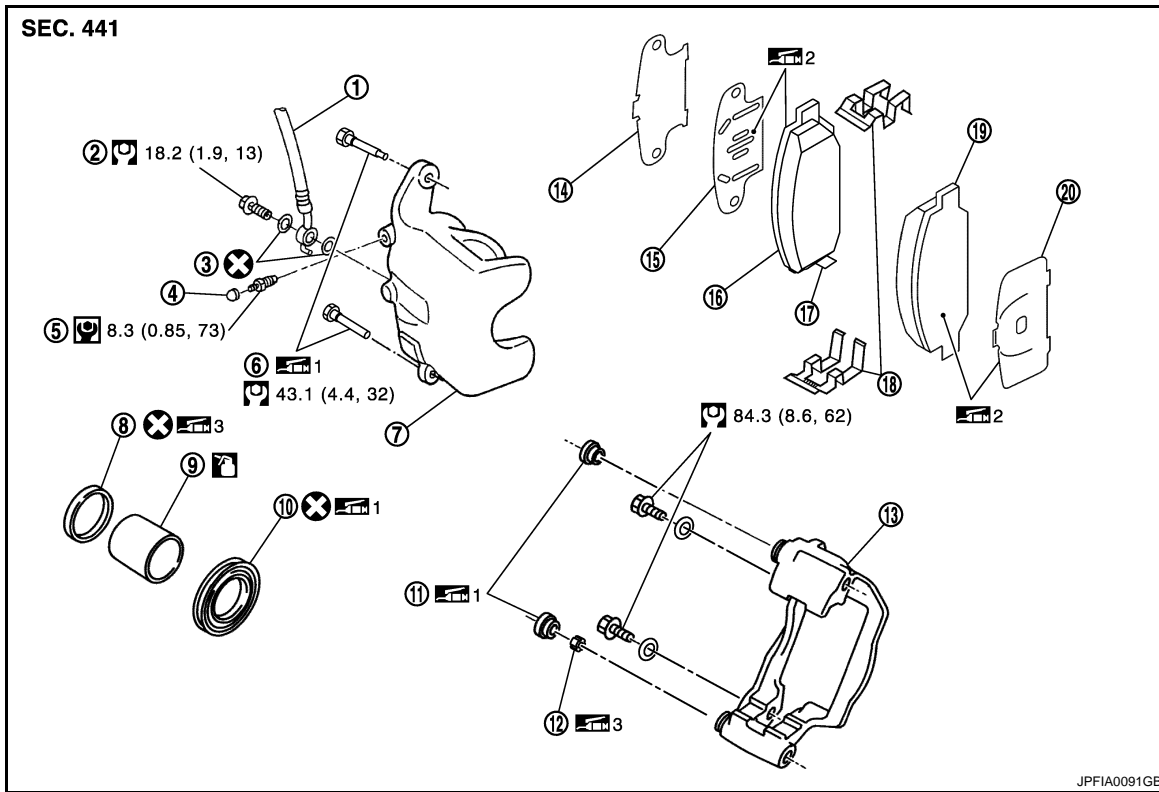
[LHD]

< ON-VEHICLE REPAIR >

REAR DISC BRAKE BRAKE PAD

BRAKE PAD : Exploded View

INFOID:000000001374881



- | | | |
|-------------------|--|---------------------|
| 1. Brake hose | 2. Union bolt | 3. Copper washer |
| 4. Cap | 5. Bleeder valve | 6. Sliding pin bolt |
| 7. Cylinder body | 8. Piston seal | 9. Piston |
| 10. Piston boot | 11. Sliding pin boot | 12. Bushing |
| 13. Torque member | 14. Inner shim cover | 15. Inner shim |
| 16. Inner pad | 17. Pad wear sensor (RH inner side only) | 18. Pad retainer |
| 19. Outer pad | 20. Outer shim | |

1: Apply rubber grease.

2: Apply copper based brake grease.

3: Apply polyglycol ether based lubricant.

: Apply brake fluid.

Refer to [GI-4, "Components"](#) for symbols not described on the above.

BRAKE PAD : Removal and Installation

INFOID:000000001181519

REMOVAL

WARNING:

Clean any dust from the brake caliper and brake pads with a vacuum dust collector. Never blow with compressed air.

CAUTION:

- Never depress the brake pedal while removing the brake pads or the cylinder body because the piston may pop out.
- Never spill or splash brake fluid on the disc rotor.

REAR DISC BRAKE

[LHD]

< ON-VEHICLE REPAIR >

1. Remove tires.
2. Remove the lower sliding pin bolt.
3. Suspend the cylinder body with suitable wire so that the brake hose will not stretch. Remove the brake pads from the torque member.
CAUTION:
 - Never deform the pad retainers if removing the pad retainers.
 - Never damage the piston boot.
 - Never drop the brake pad, shims, and the shim cover.

INSTALLATION

WARNING:

Clean any dust from the brake caliper and brake pads with a vacuum dust collector. Never blow with compressed air.

CAUTION:

- Never depress the brake pedal while removing the brake pads or the cylinder body because the piston may pop out.
- Never spill or splash brake fluid on the disc rotor.

1. Install the pad retainers to the torque member if the pad retainers has been removed.

CAUTION:

- Securely assemble the pad retainers not to be lifted up from the torque member.
- Never deform the pad retainers.

2. Apply copper based brake grease to the mating faces between the brake pads and the shims and install them to the brake pad.

CAUTION:

Always replace the shims together with the shim cover when replacing the brake pad.

3. Install cylinder body and brake pads to torque member.

CAUTION:

- Never damage the piston boot.
- When replacing a pads with new one, check a brake fluid level in the reservoir tank because brake fluid returns to master cylinder reservoir tank when pressing piston in.

NOTE:

Use a disc brake piston tool to easily press piston.

4. Install the lower sliding pin bolt and tighten it to the specified torque.
5. Depress the brake pedal several times to check that no drag feel is present for the rear disc brake.
6. Install tires.

BRAKE PAD : Inspection and Adjustment

INFOID:000000001181520

INSPECTION AFTER REMOVAL

Replace the shims and the shim cover if rust is excessively attached.

ADJUSTMENT AFTER INSTALLATION

Brake Burnishing Procedure

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

CAUTION:

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

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

BRAKE CALIPER ASSEMBLY

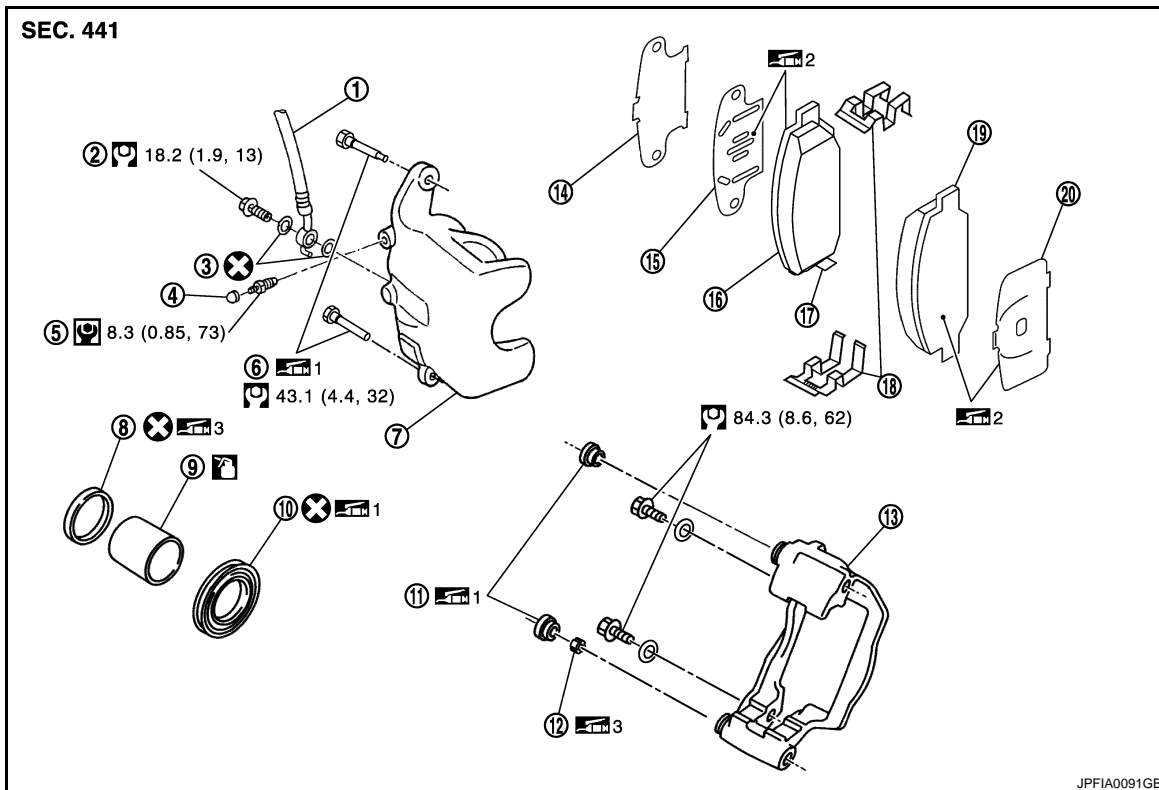
REAR DISC BRAKE

< ON-VEHICLE REPAIR >

[LHD]

BRAKE CALIPER ASSEMBLY : Exploded View

INFOID:000000001181521



- | | | |
|-------------------|--|---------------------|
| 1. Brake hose | 2. Union bolt | 3. Copper washer |
| 4. Cap | 5. Bleeder valve | 6. Sliding pin bolt |
| 7. Cylinder body | 8. Piston seal | 9. Piston |
| 10. Piston boot | 11. Sliding pin boot | 12. Bushing |
| 13. Torque member | 14. Inner shim cover | 15. Inner shim |
| 16. Inner pad | 17. Pad wear sensor (RH inner side only) | 18. Pad retainer |
| 19. Outer pad | 20. Outer shim | |

1: Apply rubber grease.

2: Apply copper based brake grease.

3: Apply polyglycol ether based lubricant.

: Apply brake fluid.

Refer to [GI-4, "Components"](#) for symbols not described on the above.

BRAKE CALIPER ASSEMBLY : Removal and Installation

INFOID:000000001181522

REMOVAL

WARNING:

Clean any dust from the brake caliper and brake pads with a vacuum dust collector. Never blow with compressed air.

CAUTION:

Never depress the brake pedal. Brake fluid may splash while removing the brake hose.

1. Remove tires.
2. Fix the disc rotor using wheel nuts.
3. Drain brake fluid. Refer to [BR-11, "Draining"](#).

CAUTION:

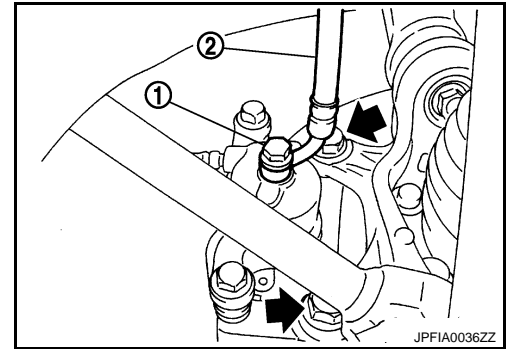
Never spill or splash brake fluid on the disc rotor.

REAR DISC BRAKE

[LHD]

< ON-VEHICLE REPAIR >

4. Remove union bolt (1) and then disconnect brake hose (2) from caliper assembly.
5. Remove torque member mounting bolts, and remove brake caliper assembly.
CAUTION:
Never drop brake pads and caliper assembly.
6. Remove disc rotor.
CAUTION:
 - Put matching marks on the wheel hub and bearing assembly and the disc rotor before removing the disc rotor.
 - Never drop disc rotor.



INSTALLATION

WARNING:

Clean any dust from the brake caliper and brake pads with a vacuum dust collector. Never blow with compressed air.

CAUTION:

Never depress the brake pedal. Brake fluid may splash while removing the brake hose.

1. Install disc rotor.
CAUTION:
Align the matching marks made during removal when reusing the disc rotor.
2. Install the brake caliper assembly to the vehicle and tighten the torque member mounting bolts to the specified torque.
CAUTION:
Never spill or splash any grease and moisture on the brake caliper assembly mounting face, threads, mounting bolts, and washers. Wipe out any grease and moisture.
3. Install brake hose to brake caliper assembly, and tighten union bolts to the specified torque.
4. Refill with new brake fluid and perform the air bleeding. Refer to [BR-12, "Bleeding Brake System"](#).
CAUTION:
 - Never reuse drained brake fluid.
 - Never spill or splash brake fluid on the disc rotor.
5. Check that no drag feel is present for the rear disc brake.
6. Install tires.

BRAKE CALIPER ASSEMBLY : Disassembly and Assembly

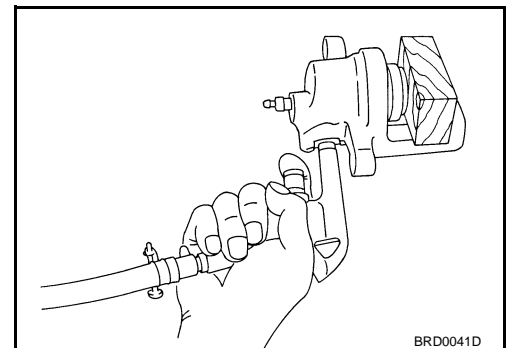
INFOID:000000001181523

DISASSEMBLY

NOTE:

Never remove the torque member, brake pads, shims, shim cover and pad retainers disassembling and assembling the cylinder body.

1. Remove the sliding pin bolts and remove the cylinder body from the torque member.
CAUTION:
Never drop pads, shims, shim cover and pad retainers from torque member.
2. Remove sliding pin boots from torque member.
3. Remove bushing from sliding pin bolt.
4. Place a wooden block as shown in the figure, and blow air from union bolt mounting hole to remove piston and piston boot.
CAUTION:
Never get fingers caught in the piston.



REAR DISC BRAKE

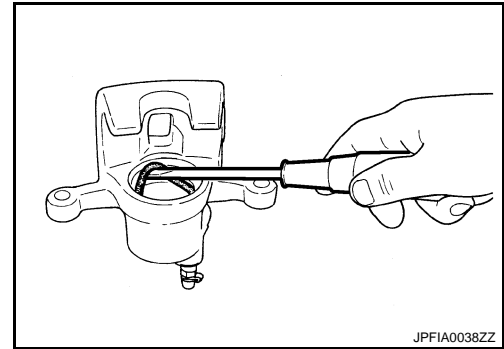
[LHD]

< ON-VEHICLE REPAIR >

- Remove piston seal from cylinder body using suitable tool.

CAUTION:

Be careful not to damage a cylinder inner wall.

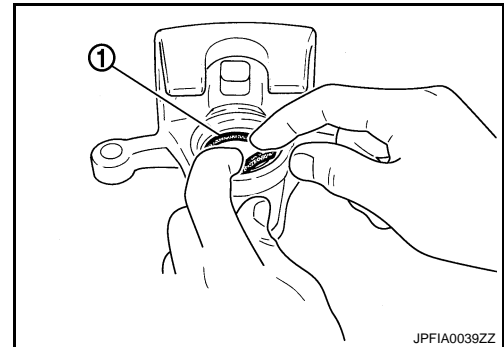


ASSEMBLY

- Apply polyglycol ether based lubricant to piston seal (1), and install to cylinder body.

CAUTION:

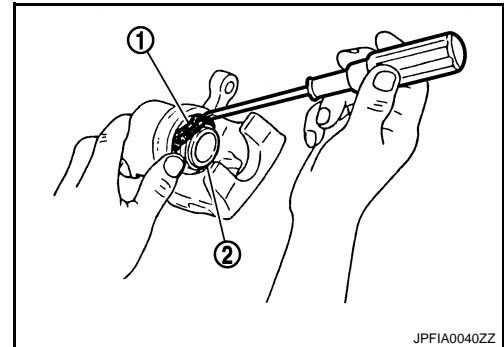
Never reuse piston seal.



- Apply rubber grease to piston boot (1). Cover the piston (2) end with the piston boot, and then install cylinder side lip on the piston boot securely into the groove on cylinder body.

CAUTION:

Never reuse piston boot.

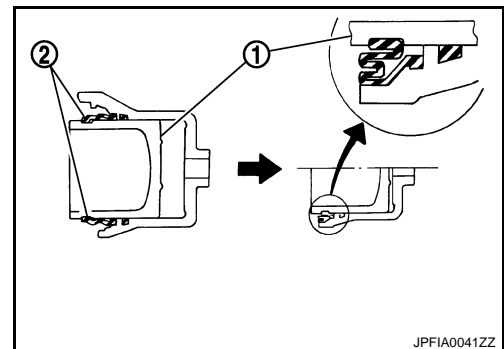


- Apply brake fluid to piston (1). Push piston into cylinder body by hand and push piston boot (2) piston side lip into the piston groove.

CAUTION:

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

- Apply polyglycol ether based lubricant to bushing, install bushing to sliding pin bolt.
- Apply rubber grease to the sliding pin bolts and the sliding pin boots, install sliding pin boot to torque member.
- Install the cylinder body to the torque member and tighten the sliding pin bolts to the specified torque.



BRAKE CALIPER ASSEMBLY : Inspection and Adjustment

INFOID:000000001181524

INSPECTION AFTER DISASSEMBLY

Cylinder Body

Check the inner wall of the cylinder for rust, wear, cracks or damage. Replace the cylinder if any abnormal condition is detected.

CAUTION:

Always clean with new brake fluid. Never clean with mineral oil such as gasoline and light oil.

REAR DISC BRAKE

[LHD]

< ON-VEHICLE REPAIR >

Torque Member

Check the torque member for rust, wear, cracks or damage. Replace the member if any abnormal condition is detected.

Piston

Check the piston for rust, wear, cracks or damage. Replace the piston if any abnormal condition is detected.

CAUTION:

A piston sliding surface is plated. Never polish with sandpaper.

Sliding Pin Bolt and Sliding Pin Boot

Check the sliding pin bolts and sliding pin boots for rust, wear, cracks or damage. Replace the parts if any abnormal condition is detected.

ADJUSTMENT AFTER INSTALLATION

Brake Burnishing Procedure

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

CAUTION:

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

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[LHD]

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

General Specifications

INFOID:0000000001181525

Unit: mm (in.)

Front brake	Cylinder bore diameter	60.33 (2.375)
	Pad length × width × thickness	123.6 × 47.5 × 11.0 (4.87 × 1.870 × 0.433)
	Rotor outer diameter × thickness	296 × 26.0 (11.65 × 1.024)
Rear brake	Cylinder bore diameter	34.93 (1.375)
	Pad length × width × thickness	83.0 × 31.9 × 8.5 (3.268 × 1.256 × 0.335)
	Rotor outer diameter × thickness	292 × 9.0 (11.50 × 0.354)
Master cylinder	Cylinder bore diameter	23.8 (15/16)
Control valve	Valve type	Electric brake force distribution
Brake booster	Diaphragm diameter	275 (10.8)
Recommended brake fluid		DOT 4

Brake Pedal

INFOID:0000000001181526

Unit: mm (in.)

Brake pedal height (H1)	183.7 – 193.7 (7.23 – 7.63)
Clearance (C) between bracket and ASCD cancel switch/stop lamp switch threaded end	0.74 – 1.96 (0.0291 – 0.0772)
Brake pedal play (A)	—
Depressed brake pedal height (H2) [Depressing 490 N (50 kg, 110 lb) while turning the engine ON]	120.5 (4.74)

Brake Booster

INFOID:0000000001181527

Vacuum type

Unit: mm (in.)

Output rod length (A)	30.5 (1.201)
Input rod length (B)	150.7 – 157.7 (5.93 – 6.21)

Front Disc Brake

INFOID:0000000001181528

Unit: mm (in.)

Brake pad	Standard thickness	11.0 (0.433)
	Wear limit thickness	2.0 (0.079)
Disc rotor	Standard thickness	26.0 (1.024)
	Wear limit thickness	24.0 (0.945)
	Thickness variation (measured at 8 positions)	0.020 (0.0008)
	Runout limit (with it attached to the vehicle)	0.035 (0.0014)

Rear Disc Brake

INFOID:0000000001181529

Unit: mm (in.)

Brake pad	Standard thickness	8.5 (0.335)
	Wear limit thickness	2.0 (0.079)

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[LHD]

Disc rotor	Standard thickness	9.0 (0.354)
	Wear limit thickness	8.0 (0.315)
	Thickness variation (measured at 8 positions)	0.020 (0.0008)
	Runout limit (with it attached to the vehicle)	—

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

INFOID:000000001181531

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 AIRBAG" and "SEAT BELT" 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 AIRBAG".
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

Precaution Necessary for Steering Wheel Rotation After Battery Disconnect

INFOID:000000001181532

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-III 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-III.

PRECAUTIONS

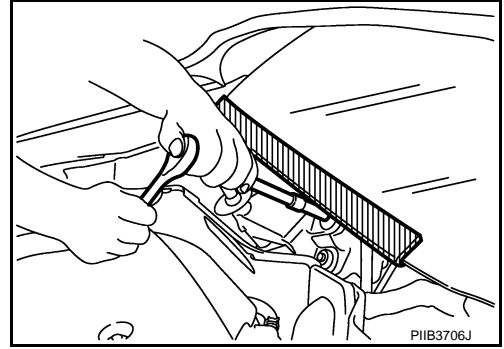
< PRECAUTION >

[RHD]

Precaution for Procedure without Cowl Top Cover

INFOID:000000001315091

When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc.



Precaution for Brake System

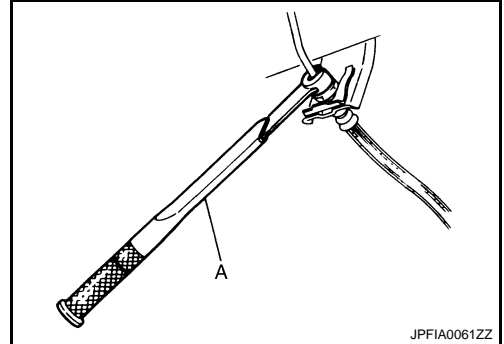
INFOID:000000001181533

WARNING:

Clean any dust from the front brake and rear brake with a vacuum dust collector. Never blow with compressed air.

CAUTION:

- Only use "DOT 4" brake fluid. Refer to [MA-27, "Fluids and Lubricants"](#).
- Never reuse drained brake fluid.
- Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.
- Always clean with new brake fluid when cleaning the master cylinder, brake caliper and other components.
- Never use mineral oils such as gasoline or light oil to clean. They may damage rubber parts and cause improper operation.
- Always loosen the brake tube flare nut with a flare nut wrench.
- Tighten the brake tube flare nut to the specified torque with flare nut torque wrench (A).
- Always confirm the specified tightening torque when installing the brake pipes.
- Turn the ignition switch OFF and disconnect the ABS actuator and electric unit (control unit) connector or the battery negative terminal before performing the work.
- Check that no brake fluid leakage is present after replacing the parts.
- Burnish the brake contact surfaces after refinishing or replacing rotors, after replacing pads, or if a soft pedal occurs at very low mileage. Refer to [BR-85, "BRAKE PAD : Inspection and Adjustment"](#) (front brake pad), [BR-88, "BRAKE CALIPER ASSEMBLY : Inspection and Adjustment"](#) (front disc rotor), [BR-91, "BRAKE PAD : Inspection and Adjustment"](#) (rear brake pad), [BR-94, "BRAKE CALIPER ASSEMBLY : Inspection and Adjustment"](#) (rear disc rotor).



PREPARATION

< PREPARATION >


[RHD]

PREPARATION

PREPARATION

Commercial Service Tool

INFOID:000000001181534

Tool name	Description
<p data-bbox="162 504 373 556">Pin punch a: 4 mm (0.16 in) dia.</p>  <p data-bbox="885 630 958 651">ZZA0515D</p>	<p data-bbox="1063 504 1453 556">Removing and installing reservoir tank pin</p>

ON-VEHICLE MAINTENANCE

BRAKE PEDAL

Inspection and Adjustment

INFOID:000000001181536

INSPECTION

Brake Pedal Height

Check the height (H₁) between the accelerator pedal stopper (1) and the brake pedal upper surface.

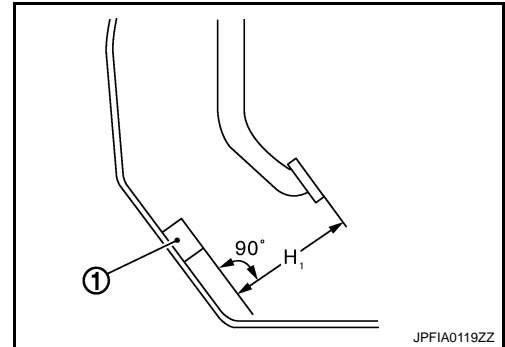
Standard

Brake pedal height (H₁)

: Refer to [BR-96, "Brake Pedal"](#).

CAUTION:

Remove the floor trim.



ASCD brake Switch and Stop Lamp Switch

Check the clearance (C) among bracket (1) and ASCD brake switch/ stop lamp switch (2) threaded end.

Standard

Clearance (C) between bracket and ASCD brake switch/stop lamp switch threaded end

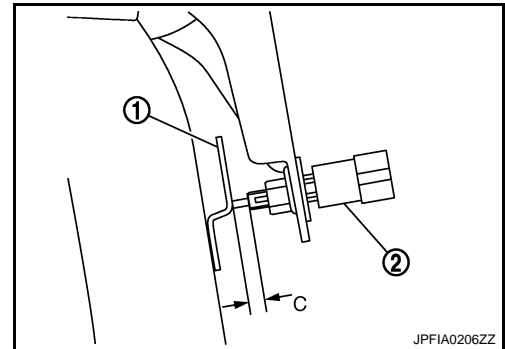
: Refer to [BR-96, "Brake Pedal"](#).

CAUTION:

The stop lamp must be turned off when the brake pedal is released.

NOTE:

Pull the brake pedal pad to make the clearance between bracket and ASCD brake switch/stop lamp switch threaded end.



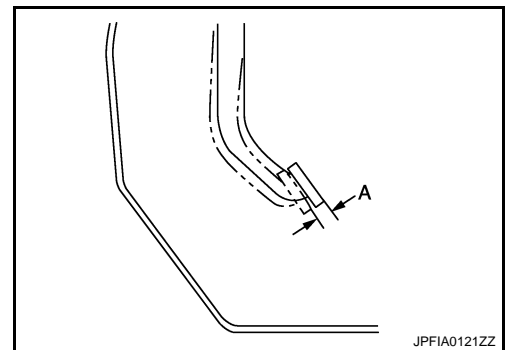
Brake Pedal Play

Press the brake pedal. Check the brake pedal play (A).

Standard

Pedal play (A)

: Refer to [BR-96, "Brake Pedal"](#).



Depressed Brake Pedal Height

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

BRAKE PEDAL

< ON-VEHICLE MAINTENANCE >

[RHD]

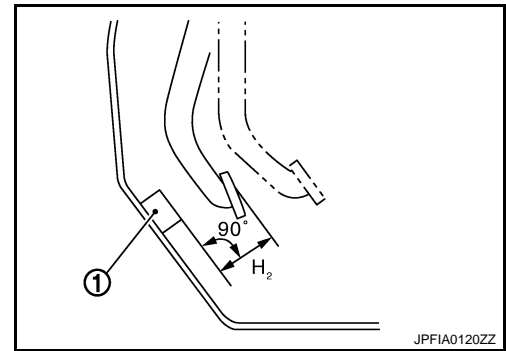
Check the height between the accelerator pedal stopper (1) and the brake pedal upper surface (H_2) when depressing the brake pedal at 490 N (50 kg, 110 lb) while turning engine ON.

Standard

Depressed brake pedal height (H_2)

: Refer to [BR-96, "Brake Pedal"](#).

CAUTION:
Remove the floor trim.



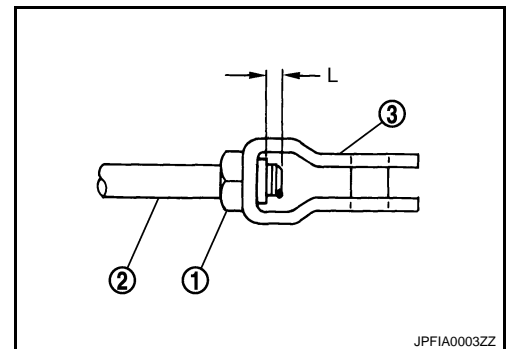
ADJUSTMENT

Brake Pedal Height

1. Disconnect the harness connector from ASCD brake switch and stop lamp switch.
2. Turn the ASCD brake switch and stop lamp switch 45° counterclockwise.
3. Loosen the input rod lock nut (1). Adjust the brake pedal to the specification. Tighten the input rod lock nut to the specification. Refer to [BR-77, "Exploded View"](#).

CAUTION:

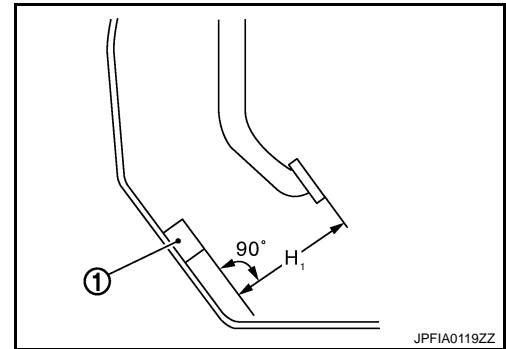
The threaded end of the input rod (2) must project to the inner side (L) of the clevis (3).



Standard

Brake pedal height (H_1)

: Refer to [BR-96, "Brake Pedal"](#).

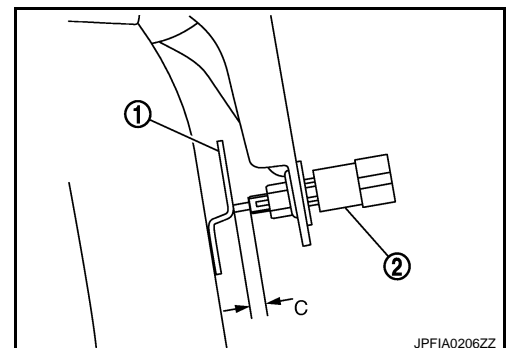


ASCD brake Switch and Stop Lamp Switch

1. Disconnect the harness connector from ASCD brake switch and stop lamp switch.
2. Turn the ASCD brake switch and stop lamp switch 45° counterclockwise.
3. Press-fit ASCD brake switch/stop lamp switch (2) until ASCD brake switch/stop lamp switch hits the bracket (1) 45° clockwise.

CAUTION:

- The clearance (C) between the bracket and ASCD brake switch/stop lamp switch threaded end must be the specified value. Refer to [BR-96, "Brake Pedal"](#).
- The stop lamp must be turned off when the brake pedal is released.



Brake Pedal Play

1. Disconnect the harness connector from ASCD brake switch and stop lamp switch.
2. Turn the ASCD brake switch and stop lamp switch 45° counterclockwise.

BRAKE PEDAL

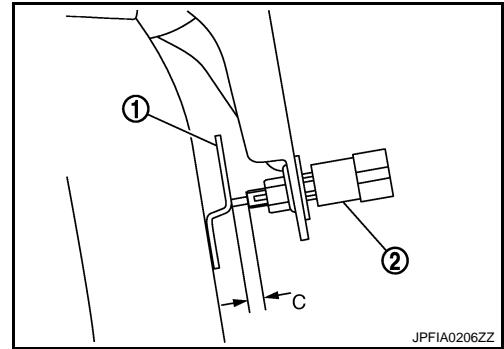
[RHD]

< ON-VEHICLE MAINTENANCE >

3. Press-fit ASCD brake switch/stop lamp switch (2) until ASCD brake switch/stop lamp switch hits the bracket (1) 45° clockwise.

CAUTION:

- The clearance (C) between the bracket and ASCD brake switch/stop lamp switch threaded end must be the specified value. Refer to [BR-96. "Brake Pedal"](#).
- The stop lamp must be turned off when the brake pedal is released.



A

B

C

D

E

BR

G

H

I

J

K

L

M

N

O

P

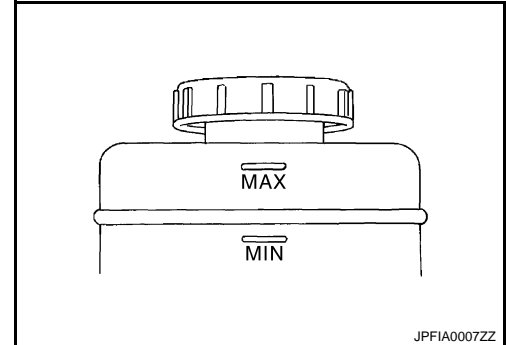
BRAKE FLUID

Inspection

INFOID:000000001181537

BRAKE FLUID LEVEL

- Check that the fluid level in the reservoir tank is within the specified range (MAX – MIN lines).
- Visually check for any brake fluid leakage around the reservoir tank.
- Check the brake system for any leakage if the fluid level is extremely low (lower than MIN).
- Check the brake system for fluid leakage if the warning lamp remains illuminated even after the parking brake is released.

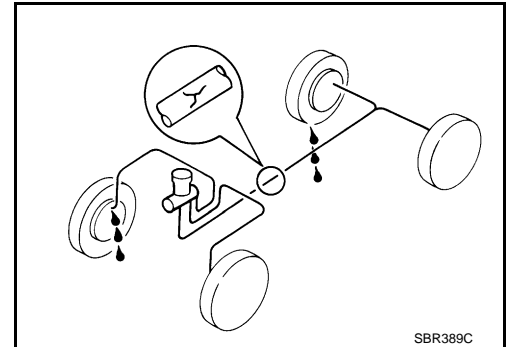


BRAKE LINE

1. Check brake line (tubes and hoses) for cracks, deterioration or other damage. Replace any damaged parts.
2. Check for fluid leakage by fully depressing brake pedal while engine is running.

CAUTION:

If leakage occurs around joints, retighten or, if necessary, replace damaged parts.



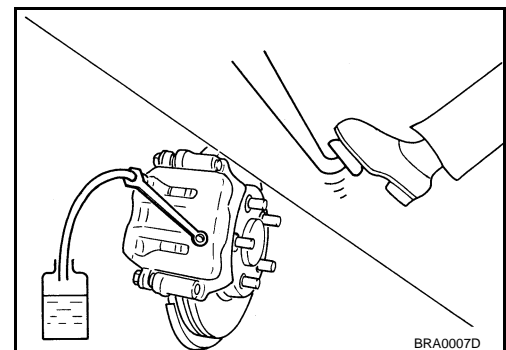
Draining

INFOID:000000001181538

CAUTION:

- Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.
- Turn the ignition switch OFF and disconnect the ABS actuator and electric unit (control unit) connector or the battery negative terminal before draining.

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



Refilling

INFOID:000000001181539

CAUTION:

Turn the ignition switch OFF and disconnect the ABS actuator and electric unit (control unit) connector or the battery negative terminal before refilling.

BRAKE FLUID

< ON-VEHICLE MAINTENANCE >

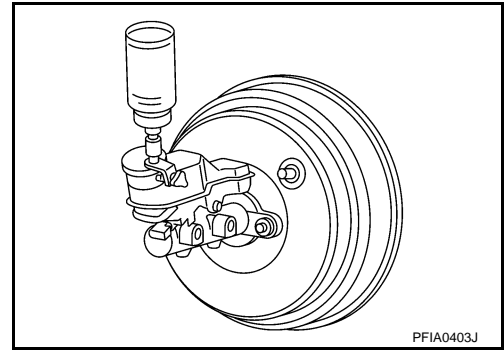
[RHD]

1. Check that there is no foreign material in the reservoir tank, and refill with new brake fluid.

CAUTION:

Never reuse drained brake fluid.

2. Loosen the bleeder valve, slowly depress the brake pedal to the full stroke, and then release the pedal. Repeat this operation at intervals of 2 or 3 seconds until all brake fluid is discharged. Then close the bleeder valve with the brake pedal depressed. Repeat the same work on each wheel.
3. Perform the air bleeding. Refer to [BR-59. "Bleeding Brake System"](#).



Bleeding Brake System

INFOID:000000001181540

CAUTION:

- Turn the ignition switch OFF and disconnect the ABS actuator and electric unit (control unit) connector or the battery negative terminal before performing the work.
- Monitor the fluid level in the reservoir tank during the air bleeding.
- Always use new brake fluid for refilling. Never reuse the drained brake fluid.

1. Connect a vinyl tube to the bleeder valve of the rear left brake.
2. Fully depress the brake pedal 4 to 5 times.
3. Loosen the bleeder valve and bleed air with the brake pedal depressed, and then quickly tighten the bleeder valve.
4. Repeat steps 2 and 3 until all of the air is out of the brake line.
5. Tighten the bleeder valve to the specified torque. Refer to [BR-86. "BRAKE CALIPER ASSEMBLY : Exploded View"](#) (front disc brake), [BR-92. "BRAKE CALIPER ASSEMBLY : Exploded View"](#) (rear disc brake).
6. Perform steps 1 to 5 for the rear left brake → front right brake → rear right brake → and front left brake in order.
7. Check that the fluid level in the reservoir tank is within the specified range after air bleeding. Refer to [BR-58. "Inspection"](#).

BRAKE MASTER CYLINDER

< ON-VEHICLE MAINTENANCE >

[RHD]

BRAKE MASTER CYLINDER

Inspection

INFOID:000000001181542

FLUID LEAK

Check for brake fluid leakage from the master cylinder mounting face, reservoir tank mounting face and brake tube connections.

BRAKE BOOSTER

< ON-VEHICLE MAINTENANCE >

[RHD]

BRAKE BOOSTER

Inspection

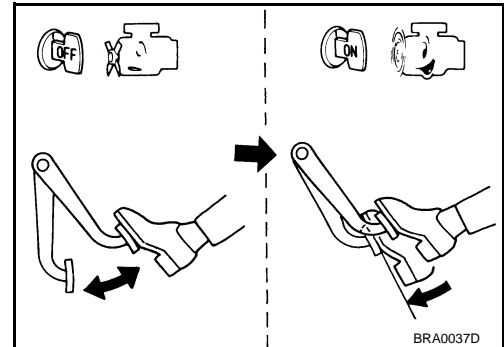
INFOID:000000001181544

OPERATION

Depress the brake pedal several times at 5-second intervals with the engine stopped. Start the engine with the brake pedal fully depressed. Check that the clearance between brake pedal and dash lower panel decreases.

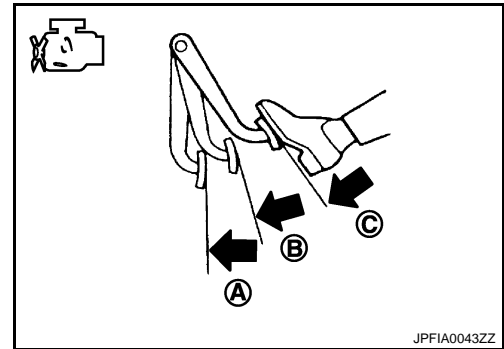
NOTE:

A slight impact with a small click may be felt on the pedal when the brake pedal is fully depressed. This is a normal phenomenon due to the brake system operation.



AIR TIGHT

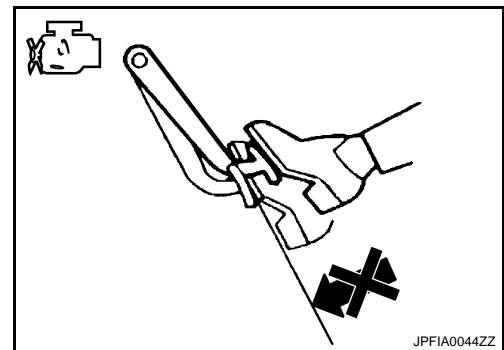
- Idle the engine for 1 minute to apply vacuum to the brake booster, and stop the engine. Then depress the brake pedal several times at 5-second intervals until the accumulated vacuum is released to atmospheric pressure. Check that the clearance between brake pedal and dash lower panel gradually increases (A → B → C) each time the brake pedal is depressed during this operation.



- Depress the brake pedal with the engine running. Then stop the engine while holding down the brake pedal. Check that the brake pedal stroke does not change after holding down the brake pedal for 30 seconds or more.

NOTE:

A slight impact with a small click may be felt on the pedal when the brake pedal is fully depressed. This is a normal phenomenon due to the brake system operation.



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FRONT DISC BRAKE

< ON-VEHICLE MAINTENANCE >

[RHD]

FRONT DISC BRAKE BRAKE PAD

BRAKE PAD : Inspection

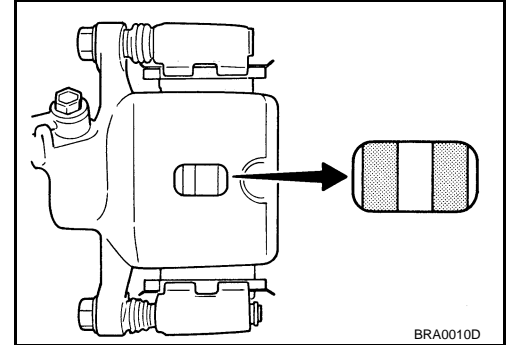
INFOID:000000001181546

PAD WEAR

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

Standard thickness : Refer to [BR-96, "Front Disc Brake"](#).

Wear limit thickness : Refer to [BR-96, "Front Disc Brake"](#).



DISC ROTOR

DISC ROTOR : Inspection

INFOID:000000001181547

APPEARANCE

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

RUNOUT

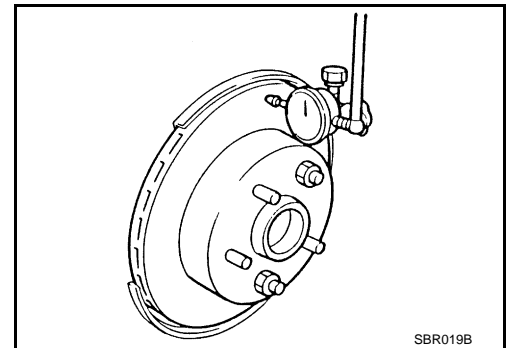
1. Fix the disc rotor to the wheel hub and bearing assembly with wheel nuts (2 points at least).
2. Inspect the runout with a dial gauge. [Measured at 10 mm (0.39 in) inside the disc edge.]

Runout limit : Refer to [BR-96, "Front Disc Brake"](#).

NOTE:

Check the wheel bearing axial end play before the inspection.
Refer to [FAX-7, "Inspection"](#) (2WD), [FAX-59, "Inspection"](#) (4WD).

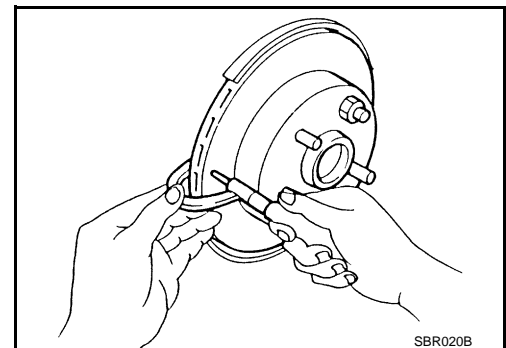
3. Find the installation position with a minimum runout by shifting the disc rotor-to-wheel hub and bearing assembly installation position by one hole at a time if the runout exceeds the limit value.
4. Replace or lathe the disc rotor if the runout exceeds the limit even after the above operation.



THICKNESS

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

Wear limit thickness : Refer to [BR-96, "Front Disc Brake"](#).



REAR DISC BRAKE

< ON-VEHICLE MAINTENANCE >

[RHD]

REAR DISC BRAKE BRAKE PAD

BRAKE PAD : Inspection

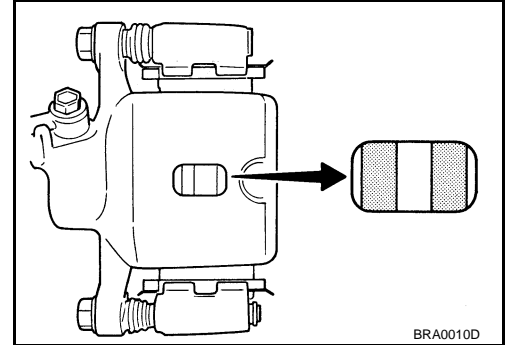
INFOID:000000001181549

PAD WEAR

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

Standard thickness : Refer to [BR-96, "Rear Disc Brake"](#).

Wear limit thickness : Refer to [BR-96, "Rear Disc Brake"](#).



DISC ROTOR

DISC ROTOR : Inspection

INFOID:000000001181550

APPEARANCE

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

RUNOUT

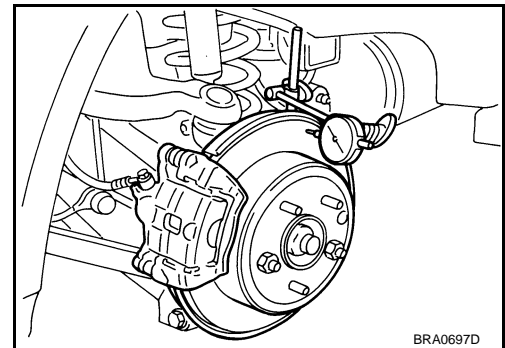
1. Fix the disc rotor to the wheel hub and bearing assembly with wheel nuts (2 points at least).
2. Inspect the runout with a dial gauge. [Measured at 10 mm (0.39 in) inside disc edge.]

Runout limit : Refer to [BR-96, "Rear Disc Brake"](#).

NOTE:

Check the wheel bearing axial end play before the inspection.
Refer to [RAX-3, "Inspection"](#) (2WD), [RAX-9, "Inspection"](#) (4WD).

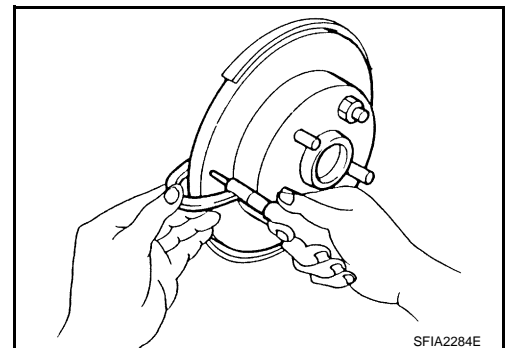
3. Find the installation position with a minimum runout by shifting the disc rotor-to-wheel hub and bearing assembly installation position by one hole at a time if the runout exceeds the limit value.
4. Replace or lathe the disc rotor if the runout exceeds the limit even after the above operation.



THICKNESS

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

Wear limit thickness : Refer to [BR-96, "Rear Disc Brake"](#).



BRAKE PEDAL

< ON-VEHICLE REPAIR >

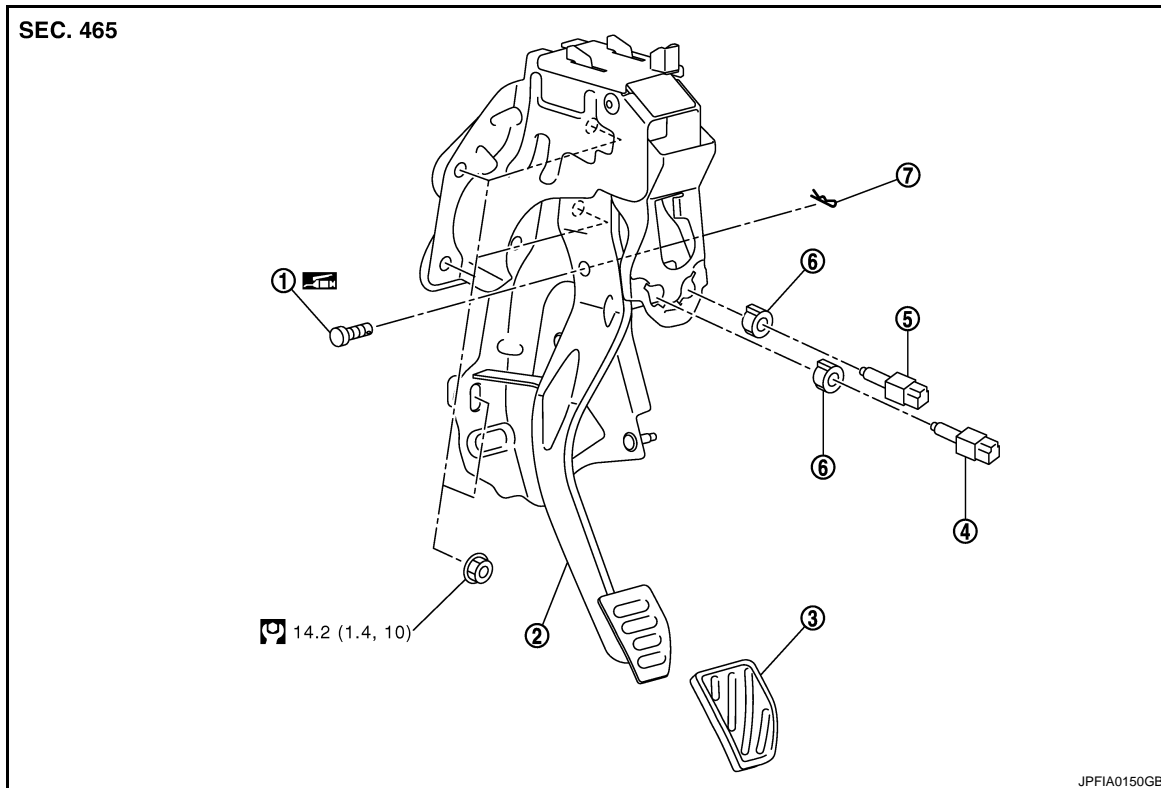
[RHD]

ON-VEHICLE REPAIR


BRAKE PEDAL

Exploded View

INFOID:000000001181551



- | | | |
|----------------------|-------------------------|--------------------|
| 1. Clevis pin | 2. Brake pedal assembly | 3. Brake pedal pad |
| 4. ASCD brake switch | 5. Stop lamp switch | 6. Clip |
| 7. Snap pin | | |

: Apply multi-purpose grease.

Refer to [GI-4, "Components"](#) for symbols not described on the above.

Removal and Installation

INFOID:000000001181552

REMOVAL

1. Remove front kicking plate inner. Refer to [INT-14, "Exploded View"](#).
2. Remove dash side finisher. Refer to [INT-14, "Exploded View"](#).
3. Remove instrument driver lower panel. Refer to [IP-11, "Exploded View"](#).
4. Remove foot duct. Refer to [VTL-56, "FOOT DUCT : Exploded View"](#) (automatic air conditioner), [VTL-110, "FOOT DUCT : Exploded View"](#) (manual air conditioner).
5. Disconnect ASCD brake switch and the stop lamp switch harness connectors.
6. Disconnect accelerator pedal position sensor harness connector.
7. Remove steering member stay.
8. Remove snap pin and clevis pin from clevis of brake booster.
9. Remove the brake pedal assembly and the accelerator pedal.
10. Remove the accelerator pedal from brake pedal assembly. Refer to [ACC-3, "Exploded View"](#).

INSTALLATION

Note the following, and installation is the reverse order of removal.

BRAKE PEDAL

[RHD]

< ON-VEHICLE REPAIR >

- Apply the multi-purpose grease to the clevis pin and the mating faces. (Not necessary if grease has been already applied.)

NOTE:

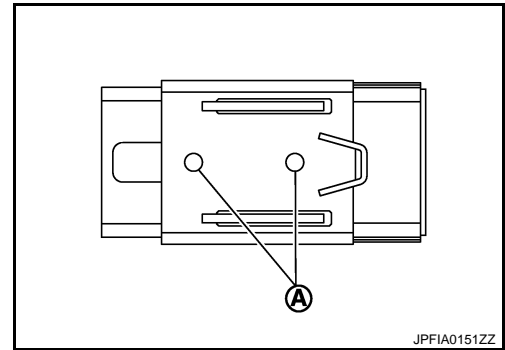
The clevis pin may be inserted in either direction.

Inspection and Adjustment

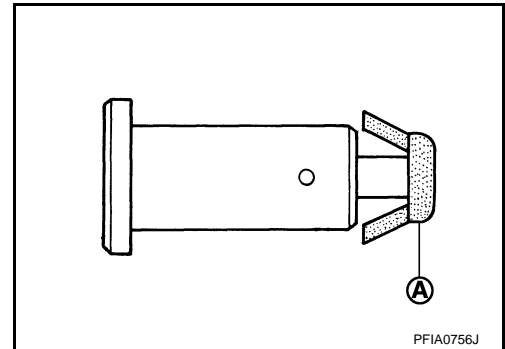
INFOID:000000001181553

INSPECTION AFTER REMOVAL

- Check the following items and replace the brake pedal assembly if necessary.
 - Check the brake pedal upper rivet (A) for deformation.
 - Check the brake pedal for bend, damage, and cracks on the welded parts.



- Check clevis pin and plastic stopper (A) for damage and deformation. If any is found, replace clevis pin.



ADJUSTMENT AFTER INSTALLATION

- Perform the brake pedal adjustment after installing the brake pedal assembly. Refer to [BR-55. "Inspection and Adjustment"](#).
- Perform the accelerator pedal check after installing the accelerator pedal. Refer to [ACC-3. "Inspection"](#).

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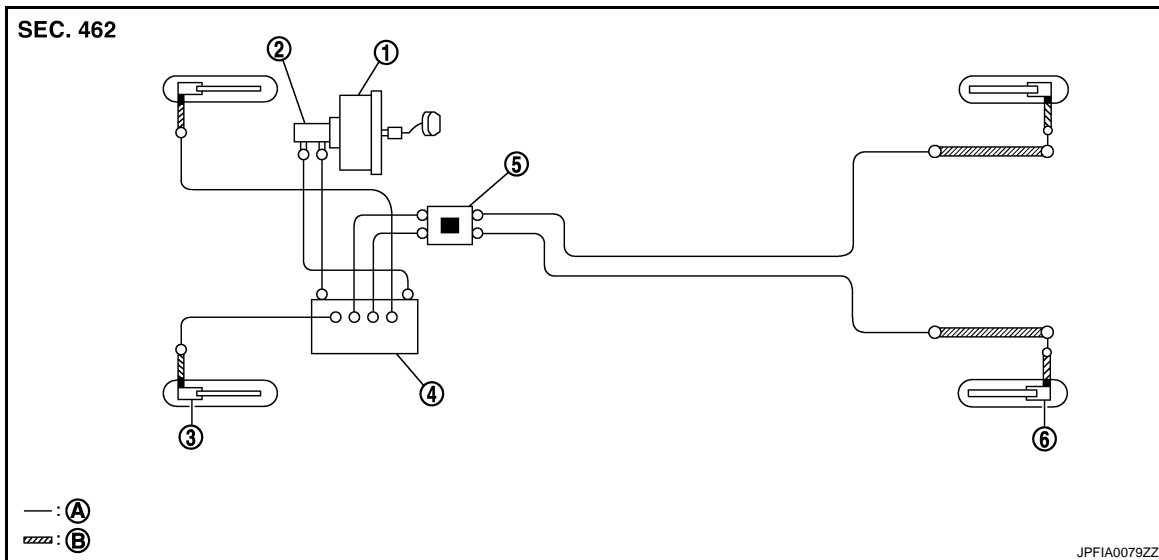
BRAKE PIPING

< ON-VEHICLE REPAIR >

[RHD]

FRONT (WITHOUT ESP) : Hydraulic Piping

INFOID:000000001181555



- | | | |
|--|-----------------------------|---------------------|
| 1. Brake booster | 2. Master cylinder assembly | 3. Front disc brake |
| 4. ABS actuator and electric unit (control unit) | 5. Connector | 6. Rear disc brake |
| A. Brake tube | B. Brake hose | |

- : Flare nut
■ : Union bolt
■ : Connector

FRONT (WITHOUT ESP) : Removal and Installation

INFOID:000000001181556

REMOVAL

CAUTION:

Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.

1. Remove tires.
2. Drain brake fluid. Refer to [BR-58. "Draining"](#).
3. Loosen the flare nut with a flare nut wrench and separate the brake tube from the hose.

CAUTION:

- Never scratch the flare nut and the brake tube.
- Never bend sharply, twist or strongly pull out the brake hoses and tubes.
- Cover open end of brake tubes and hoses when disconnecting to prevent entrance of dirt.

4. Remove the union bolt and remove the brake hose from the brake caliper assembly.
5. Remove the lock plate and remove the brake hose.

INSTALLATION

CAUTION:

Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.

1. Assemble the union bolt and the copper washer to the brake hose.

CAUTION:

Never reuse the copper washer.

BRAKE PIPING

[RHD]

< ON-VEHICLE REPAIR >

- Align the brake hose pin to the projection (A) of the brake caliper assembly and tighten the union bolt (1) to the specified torque.
- Install the brake tube to the brake hose, temporarily tighten the flare nut by hand until it does not rotate further, and fix the brake hose to the bracket with the lock plate.

CAUTION:

Check that all brake hoses and tubes are not twisted and bent.

- Tighten the flare nut to the specified torque with a flare nut torque wrench.

CAUTION:

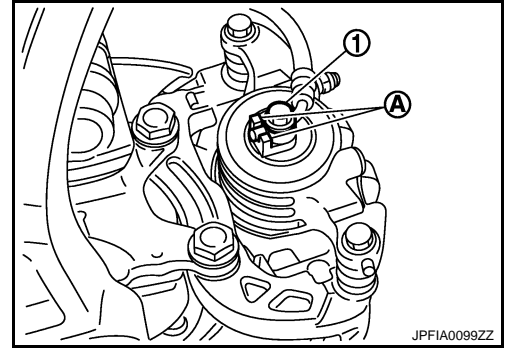
Never scratch the flare nut and the brake tube.

- Refill with new brake fluid and perform the air bleeding. Refer to [BR-59. "Bleeding Brake System"](#).

CAUTION:

Never reuse drained brake fluid.

- Install tires.



FRONT (WITHOUT ESP) : Inspection

INFOID:000000001181557

INSPECTION AFTER INSTALLATION

- Check the brake hoses and tubes for the following: no scratches; no twist and deformation; no interference with other components when steering the steering wheel; no looseness at connections.
- Depress the brake pedal with a force of 785 N (80 kg, 176 lb) and hold down the pedal for approximately 5 seconds with the engine running. Check for any fluid leakage.

CAUTION:

Retighten the applicable connection to the specified torque and repair any abnormal (damaged, worn or deformed) part if any brake fluid leakage is present.

FRONT (WITH ESP)

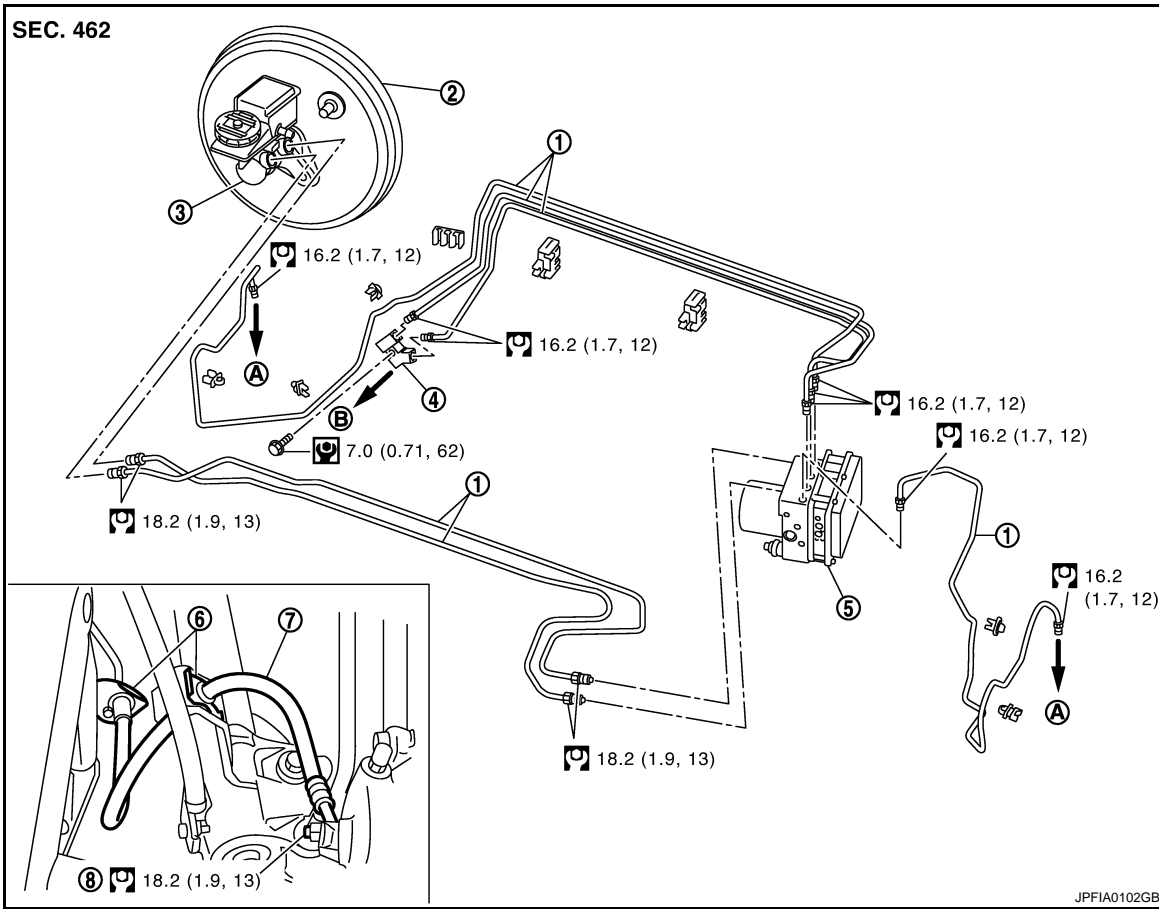
BRAKE PIPING

< ON-VEHICLE REPAIR >

[RHD]

FRONT (WITH ESP) : Exploded View

INFOID:000000001181558



- | | | |
|------------------------|--|-----------------------------|
| 1. Brake tube | 2. Brake booster | 3. Master cylinder assembly |
| 4. Connector | 5. ABS actuator and electric unit (control unit) | 6. Lock plate |
| 7. Brake hose | 8. Union bolt | |
| A. To front brake hose | B. To rear brake tube | |

Refer to [GI-4, "Components"](#) for symbols in the figure.

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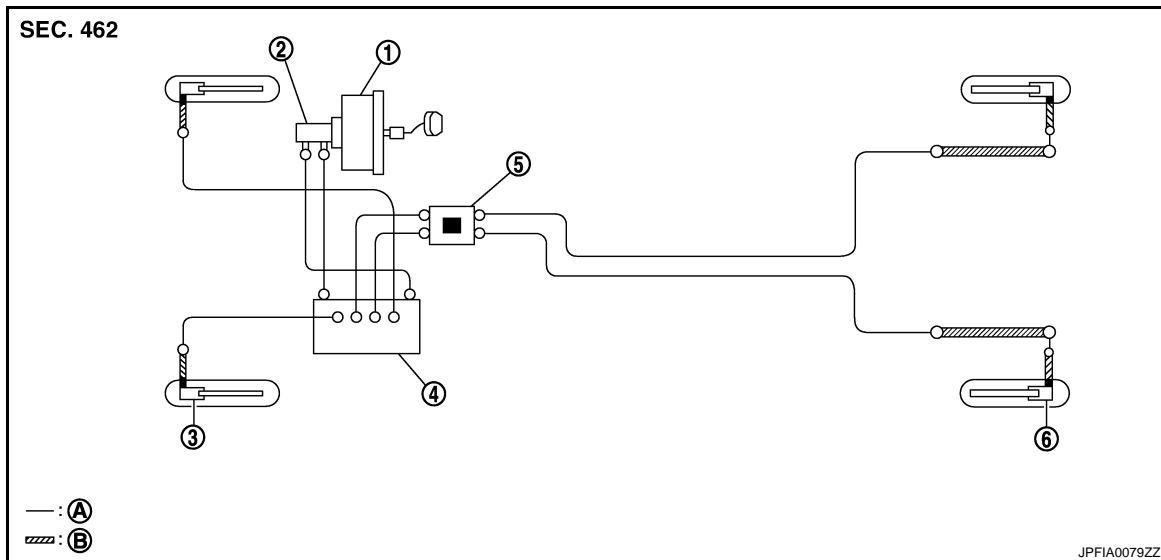
BRAKE PIPING

< ON-VEHICLE REPAIR >

[RHD]

FRONT (WITH ESP) : Hydraulic Piping

INFOID:000000001181559



- | | | |
|--|-----------------------------|---------------------|
| 1. Brake booster | 2. Master cylinder assembly | 3. Front disc brake |
| 4. ABS actuator and electric unit (control unit) | 5. Connector | 6. Rear disc brake |
| A. Brake tube | B. Brake hose | |

- : Flare nut
■ : Union bolt
▣ : Connector

FRONT (WITH ESP) : Removal and Installation

INFOID:000000001181560

REMOVAL

CAUTION:

Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.

1. Remove tires.
2. Drain brake fluid. Refer to [BR-58. "Draining"](#).
3. Loosen the flare nut with a flare nut wrench and separate the brake tube from the hose.

CAUTION:

- Never scratch the flare nut and the brake tube.
- Never bend sharply, twist or strongly pull out the brake hoses and tubes.
- Cover open end of brake tubes and hoses when disconnecting to prevent entrance of dirt.

4. Remove the union bolt and remove the brake hose from the brake caliper assembly.
5. Remove the lock plate and remove the brake hose.

INSTALLATION

CAUTION:

Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.

1. Assemble the union bolt and the copper washer to the brake hose.

CAUTION:

Never reuse the copper washer.

BRAKE PIPING

[RHD]

< ON-VEHICLE REPAIR >

- Align the brake hose pin to the projection (A) of the brake caliper assembly and tighten the union bolt (1) to the specified torque.
- Install the brake tube to the brake hose, temporarily tighten the flare nut by hand until it does not rotate further, and fix the brake hose to the bracket with the lock plate.

CAUTION:

Check that all brake hoses and tubes are not twisted and bent.

- Tighten the flare nut to the specified torque with a flare nut torque wrench.

CAUTION:

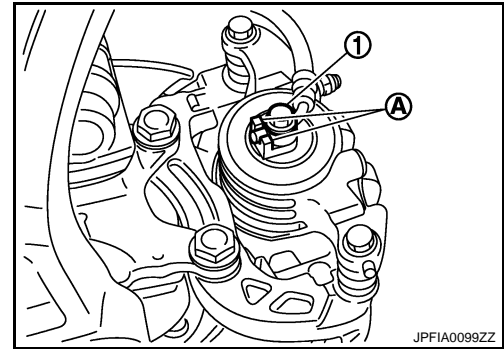
Never scratch the flare nut and the brake tube.

- Refill with new brake fluid and perform the air bleeding. Refer to [BR-59. "Bleeding Brake System"](#).

CAUTION:

Never reuse drained brake fluid.

- Install tires.



FRONT (WITH ESP) : Inspection

INFOID:000000001181561

INSPECTION AFTER INSTALLATION

- Check the brake hoses and tubes for the following: no scratches; no twist and deformation; no interference with other components when steering the steering wheel; no looseness at connections.
- Depress the brake pedal with a force of 785 N (80 kg, 176 lb) and hold down the pedal for approximately 5 seconds with the engine running. Check for any fluid leakage.

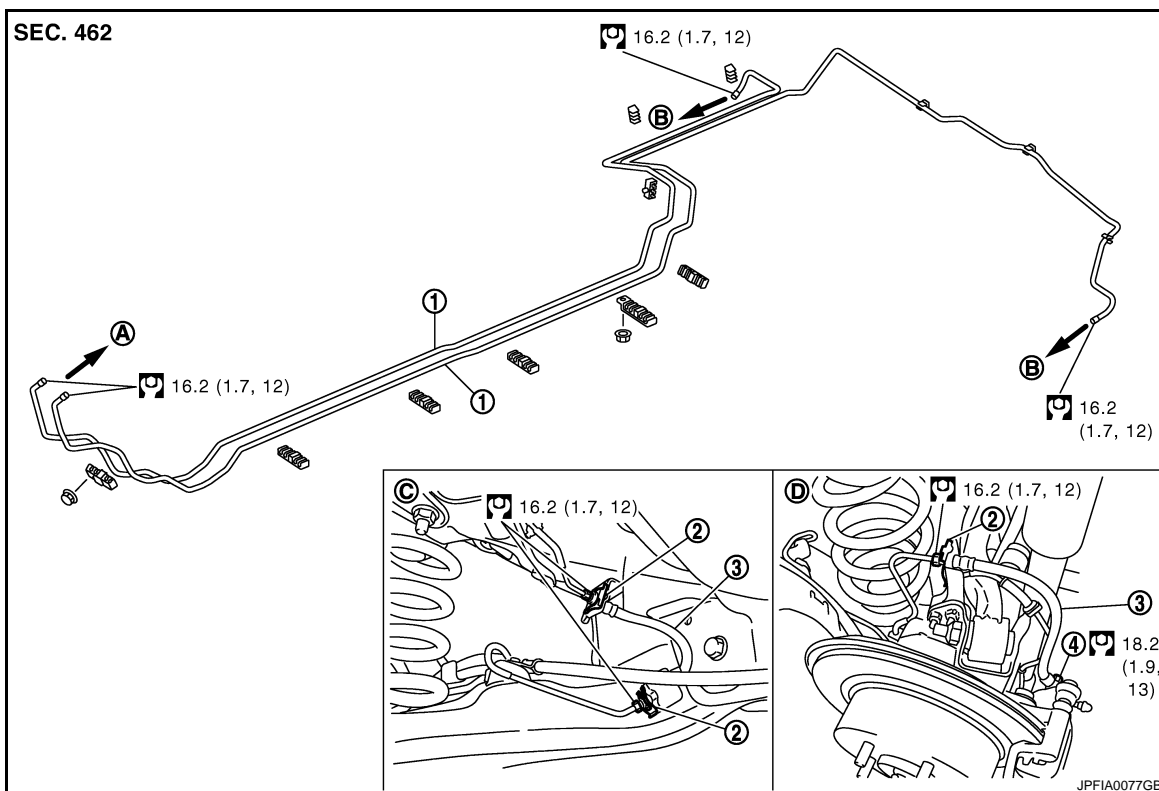
CAUTION:

Retighten the applicable connection to the specified torque and repair any abnormal (damaged, worn or deformed) part if any brake fluid leakage is present.

REAR

REAR : Exploded View

INFOID:000000001181562



BRAKE PIPING

< ON-VEHICLE REPAIR >

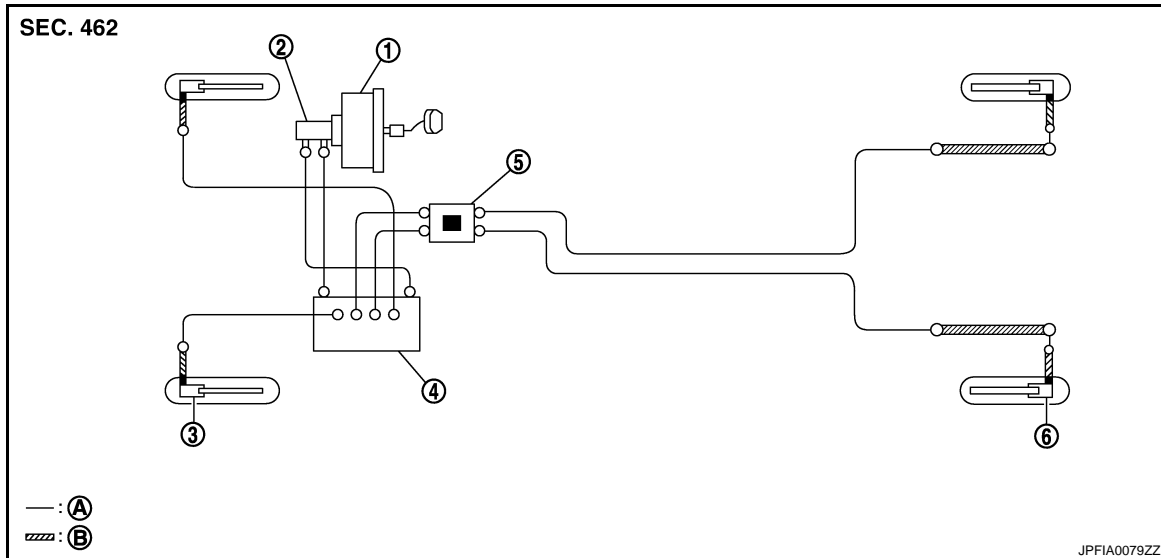
[RHD]

- | | | |
|------------------------|-----------------------|---------------|
| 1. Brake tube | 2. Lock plate | 3. Brake hose |
| 4. Union bolt | | |
| A. To front brake tube | B. To rear brake hose | C. Floor side |
| D. Caliper side | | |

Refer to [GI-4, "Components"](#) for symbols in the figure.

REAR : Hydraulic Piping

INFOID:000000001181563



- | | | |
|--|-----------------------------|---------------------|
| 1. Brake booster | 2. Master cylinder assembly | 3. Front disc brake |
| 4. ABS actuator and electric unit (control unit) | 5. Connector | 6. Rear disc brake |
| A. Brake tube | B. Brake hose | |

- : Flare nut
■ : Union bolt
▣ : Connector

REAR : Removal and Installation

INFOID:000000001181564

REMOVAL

CAUTION:

Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.

1. Remove tires.
2. Drain brake fluid. Refer to [BR-58, "Draining"](#).
3. Loosen the flare nut with a flare nut wrench and separate the brake tube from the hose.

CAUTION:

- Never scratch the flare nut and the brake tube.
- Never sharply bend, twist or strongly pull the brake hoses and tubes.
- Cover the open end of brake tubes and hoses when disconnecting to prevent entrance of dirt.

4. Remove the union bolt and remove the brake hose from the brake caliper assembly.
5. Remove the lock plate and remove the brake hose from the vehicle.

INSTALLATION

CAUTION:

Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.

BRAKE PIPING

[RHD]

< ON-VEHICLE REPAIR >

1. Assemble the union bolt and the copper washer to the brake hose.

CAUTION:

Never reuse copper washer.

2. Install the brake hose L-pin by aligning it with the brake caliper assembly positioning hole, and tighten the union bolt (1) to the specified torque.

3. Connect the hose to the brake tube, temporarily tighten the flare nut by hand until it does not rotate further, and fix the brake hose to the bracket with the lock plate.

CAUTION:

Check that the brake hoses and tubes are not twisted and bent.

4. Tighten the flare nut to the specified torque with a flare nut torque wrench.

CAUTION:

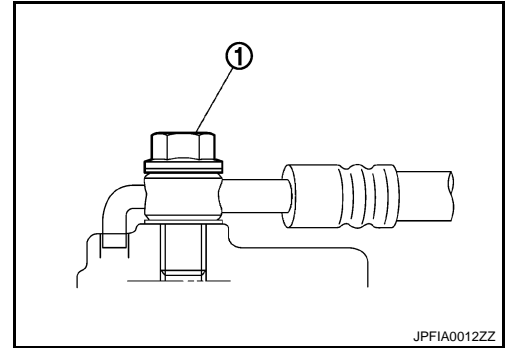
Never scratch the flare nut and the brake tube.

5. Refill with new brake fluid and perform the air bleeding. Refer to [BR-59, "Bleeding Brake System"](#).

CAUTION:

Never reuse drained brake fluid.

6. Install tires.



REAR : Inspection

INFOID:000000001181565

INSPECTION AFTER REMOVAL

1. Check the brake hoses and tubes for the following: no scratches; no twist and deformation; no interference with other components when steering the steering wheel; no looseness at connections.
2. Depress the brake pedal with a force of 785 N (80 kg, 176 lb) and hold down the pedal for approximately 5 seconds with the engine running. Check for any fluid leakage.

CAUTION:

Retighten the applicable connection to the specified torque and repair any abnormal (damaged, worn or deformed) part if any brake fluid leakage is present.

BRAKE MASTER CYLINDER

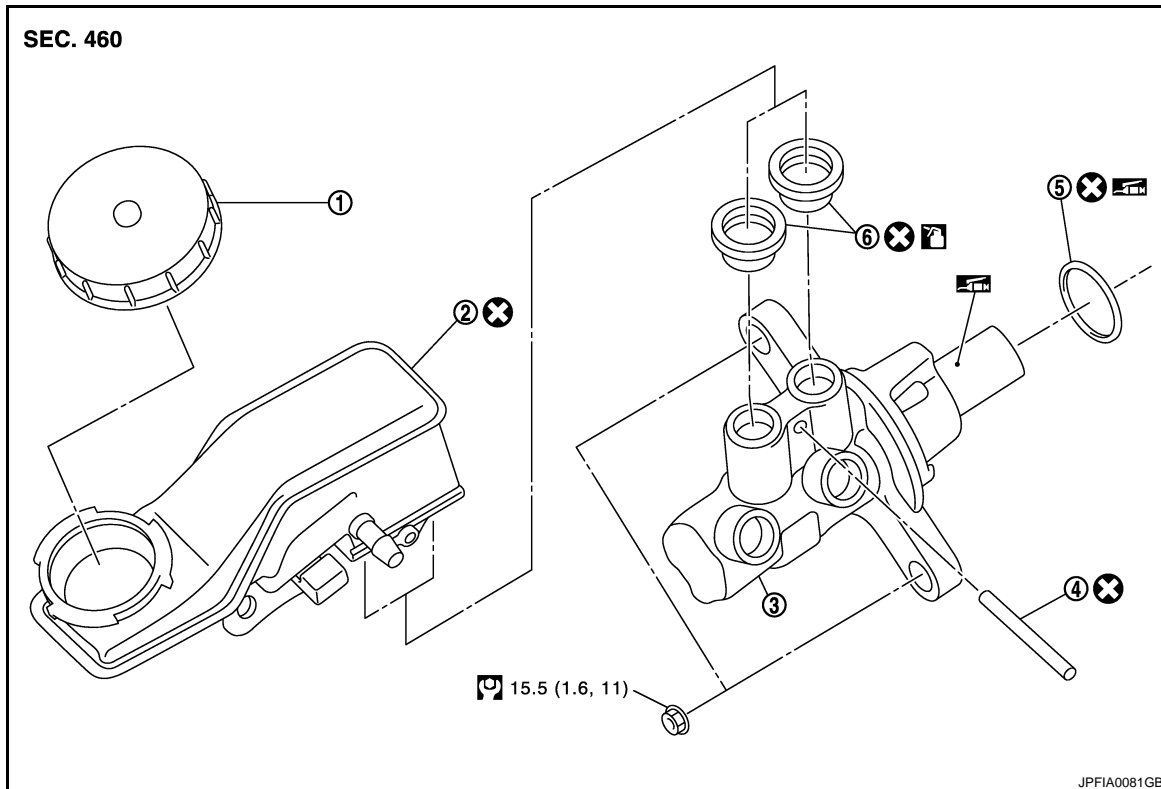
< ON-VEHICLE REPAIR >

[RHD]

BRAKE MASTER CYLINDER


Exploded View

INFOID:000000001181566



- | | | |
|------------------|-------------------|------------------|
| 1. Reservoir cap | 2. Reservoir tank | 3. Cylinder body |
| 4. Pin | 5. O-ring | 6. Grommet |

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

 : Apply brake fluid.

Refer to [GI-4, "Components"](#) for symbols not described on the above.

Removal and Installation

INFOID:000000001181567

REMOVAL

CAUTION:

Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.

1. Drain brake fluid. Refer to [BR-58, "Draining"](#).
2. Separate the brake fluid level switch harness connector.
3. Separate the brake tubes from the master cylinder assembly with a flare nut wrench.

CAUTION:

Never scratch the flare nut and the brake tube.

4. Remove the master cylinder assembly.

CAUTION:

- Depress the brake pedal several times to release the vacuum pressure from the brake booster. Then remove the master cylinder assembly.
- Never depress the brake pedal after the master cylinder assembly is removed.
- The piston of the master cylinder assembly is exposed. Never damage it when removing the master cylinder.
- The piston may drop off when pulled out strongly. Never hold the piston. Hold the cylinder body when handling the master cylinder assembly.

BRAKE MASTER CYLINDER

< ON-VEHICLE REPAIR >

[RHD]

INSTALLATION

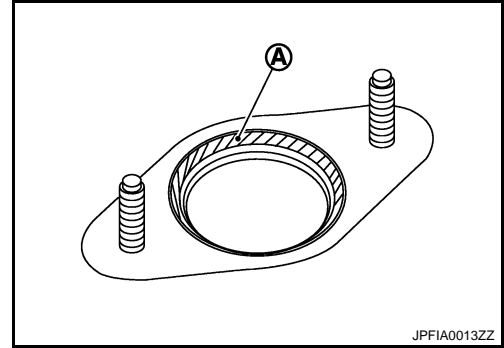
CAUTION:

Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.

- Note the following, and installation is the reverse order of removal.

CAUTION:

- Never depress the brake pedal after the master cylinder assembly is removed.
- Apply PBC (Poly Butyl Cuprysil) silicone-based grease to the brake booster [see (A) in the figure] when installing the master cylinder assembly to the brake booster.
- The piston of the master cylinder assembly is exposed. Never damage it when handling the master cylinder and check that no dirt and dust are present on the piston before installation. Clean it with new brake fluid if necessary.
- The piston may drop off when pulled strongly. Never hold the piston. Hold the cylinder body when handling the master cylinder assembly.
- Temporarily tighten the brake tube flare nut to the master cylinder assembly by hand. Then tighten it to the specified torque with a flare nut torque wrench. Refer to [BR-66. "FRONT \(WITHOUT ESP\) : Exploded View"](#) (without ESP), [BR-69. "FRONT \(WITH ESP\) : Exploded View"](#) (with ESP).



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CAUTION:

Never scratch the flare nut and the brake tube.

- After installation, perform the air bleeding. Refer to [BR-59. "Bleeding Brake System"](#).

CAUTION:

Never reuse drained brake fluid.

Disassembly and Assembly

INFOID:000000001181568

DISASSEMBLY

CAUTION:

- Never disassemble the cylinder body.
- Remove the reservoir tank if necessary.

1. Fix the master cylinder assembly to a vise.

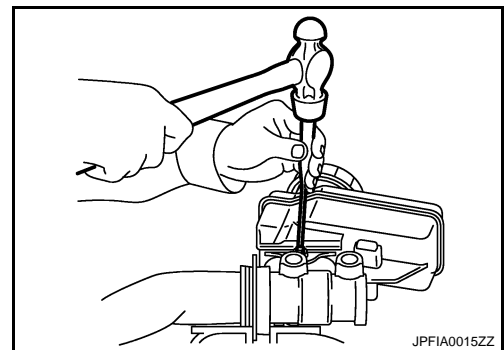
CAUTION:

Always set copper plates or cloth between vise when fixing the cylinder body to a vise. Never overtighten the vise.

2. Remove the reservoir tank mounting pin with a pin punch.
3. Remove the reservoir tank and grommet from the cylinder body.

CAUTION:

Never drop the removed parts. The parts must not be reused if they are dropped.



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ASSEMBLY

1. Apply new brake fluid to the grommet and install it to the cylinder body.

CAUTION:

- Never use mineral oil such as gasoline or light oil.
- Never reuse the grommets.

2. Install the reservoir tank to the cylinder body.

CAUTION:

- Never drop the parts when installing. The parts must not be reused if they are dropped.
- Never reuse reservoir tank.

P

BRAKE MASTER CYLINDER

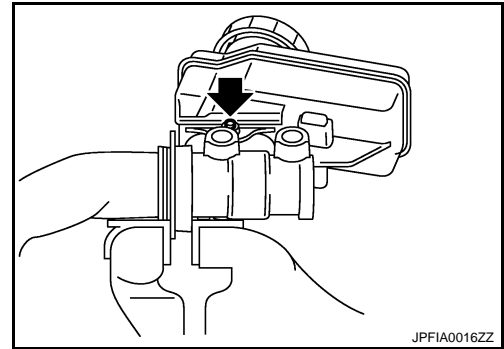
[RHD]

< ON-VEHICLE REPAIR >

3. Fix the cylinder body to a vise.

CAUTION:

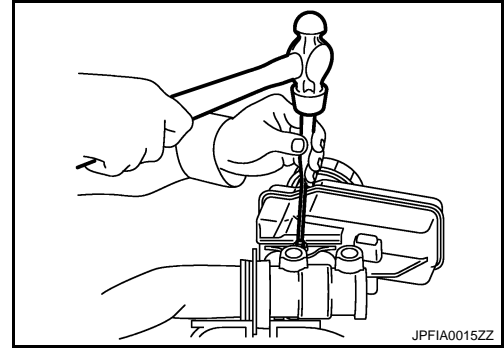
- Place the reservoir tank with the chamfered pin hole (←) facing up.
- Always set copper plates or cloth between vise when fixing the cylinder body to a vise. Never overtighten the vise.



4. Tilt the reservoir tank so that a mounting pin can be inserted. Insert a mounting pin. Return the reservoir tank to the horizontal position. Insert another mounting pin into the pin hole on the opposite side in the same manner after the mounting pin passes through the cylinder body pin hole.

CAUTION:

Never reuse the mounting pin.



Inspection

INFOID:000000001181569

INSPECTION AFTER INSTALLATION

Fluid Leak

Check for brake fluid leakage from the cylinder body-to-brake booster mounting face, reservoir tank mounting face and brake tube connections.

BRAKE BOOSTER

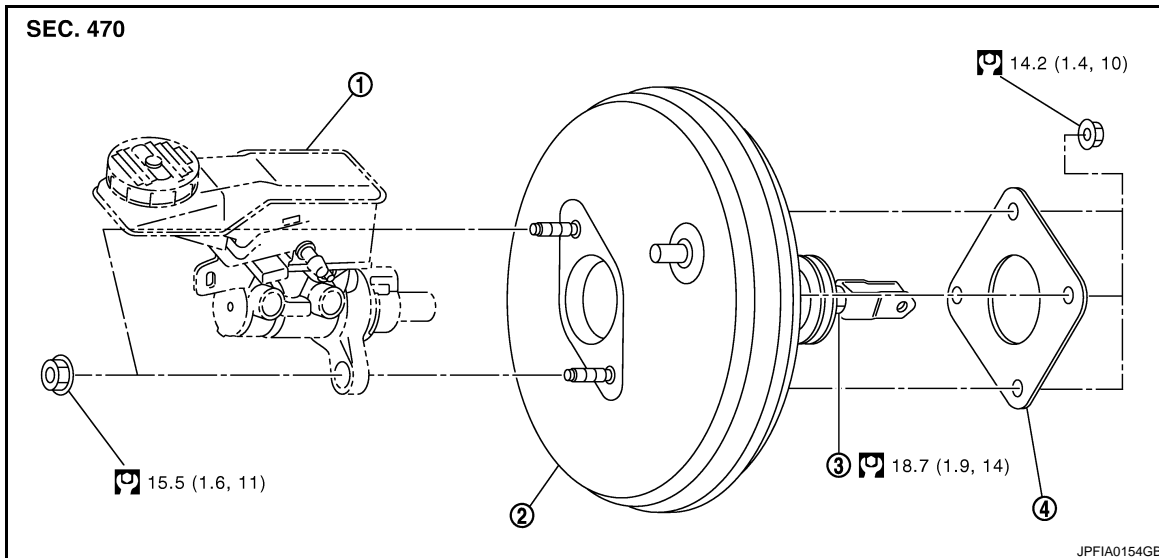
< ON-VEHICLE REPAIR >

[RHD]

BRAKE BOOSTER

Exploded View

INFOID:000000001181570



1. Master cylinder assembly
2. Brake booster
3. Lock nut
4. Gasket

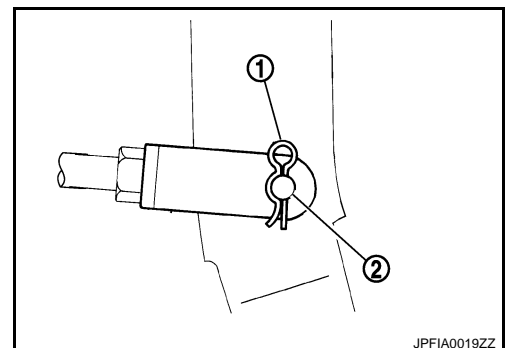
Refer to [GI-4, "Components"](#) for symbols in the figure.

Removal and installation

INFOID:000000001181571

REMOVAL

1. Remove cowl top cover. Refer to [EXT-19, "Exploded View"](#).
2. Remove brake master cylinder assembly. Refer to [BR-74, "Removal and Installation"](#).
CAUTION:
 - **Depress the brake pedal several times to release the vacuum pressure from the brake booster. Then remove the master cylinder assembly.**
 - **Never depress the brake pedal after the master cylinder assembly is removed.**
 - **The piston of the master cylinder assembly is exposed. Never damage it when removing the master cylinder.**
 - **The piston may drop off when pulled out strongly. Never hold the piston. Hold the cylinder body when handling the master cylinder assembly.**
3. Remove vacuum hose from brake booster. Refer to [BR-80, "HR16DE/MR20DE MODELS : Removal and Installation"](#) (HR16DE, MR20DE engine models), [BR-81, "K9K MODELS : Removal and Installation"](#) (K9K engine models), [BR-82, "M9R MODELS : Exploded View"](#) (M9R engine models).
4. Remove snap pin (1) and clevis pin (2) from inside vehicle.
5. Remove nuts on brake booster and brake pedal assembly. Refer to [BR-64, "Exploded View"](#).
6. Remove brake booster from dash panel in engine room side.
CAUTION:
 - **Never deform or bend the brake tubes.**
7. Remove the spacer from brake booster.



INSTALLATION

Note the following, and installation is the reverse order of removal.

CAUTION:

BRAKE BOOSTER

[RHD]

< ON-VEHICLE REPAIR >

- Be careful not to damage brake booster stud bolt threads. If brake booster is tilted during installation, the dash panel may damage the threads.
- Never deform or bend the brake tubes when installing the brake booster.
- Always use a new gasket between the brake booster and the spacer.
- Replace the clevis pin if it is damaged. Refer to [BR-65, "Inspection and Adjustment"](#).
- After installation, perform the air bleeding. Refer to [BR-59, "Bleeding Brake System"](#).

CAUTION:

Never reuse drained brake fluid.

Inspection and Adjustment

INFOID:000000001181572

INSPECTION AFTER REMOVAL

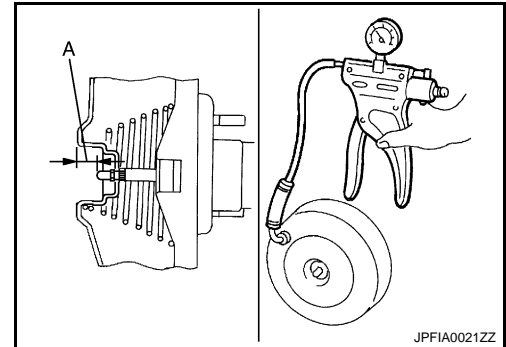
Output Rod Length Inspection

1. With a handy vacuum pump, apply vacuum pressure of -66.7 kPa (-500 mmHg, -19.70 inHg, -0.667 bar) to the brake booster.
2. Check the output rod length (A).

Standard

Output rod length (A)

: Refer to [BR-96, "Brake Booster"](#).



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Input Rod Length Inspection

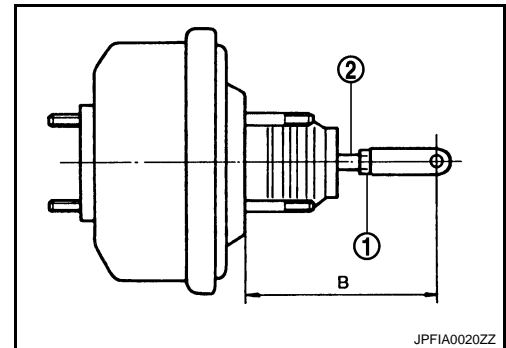
1. Loosen the lock nut (1) and adjust the input rod (2) to the specified length (B).

Standard

Input rod length (B)

: Refer to [BR-96, "Brake Booster"](#).

2. Tighten the lock nut to the specified torque.



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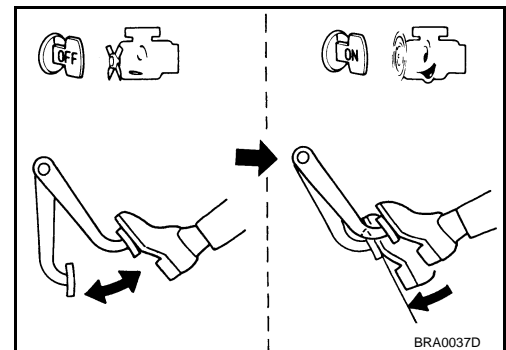
INSPECTION AFTER INSTALLATION

Operation

Depress the brake pedal several times at 5-second intervals with the engine stopped. Start the engine with the brake pedal fully depressed. Check that the clearance between brake pedal and dash lower pane decreases.

NOTE:

A slight impact with a small click may be felt on the pedal when the brake pedal is fully depressed. This is a normal phenomenon due to the brake system operation.



BRA0037D

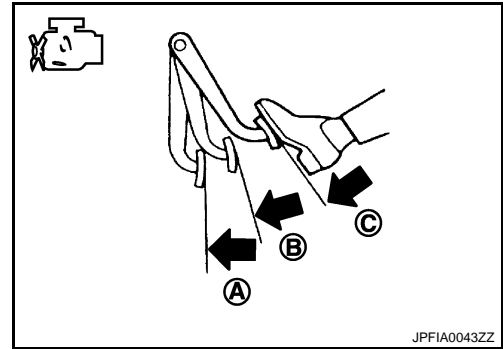
Air Tight

BRAKE BOOSTER

[RHD]

< ON-VEHICLE REPAIR >

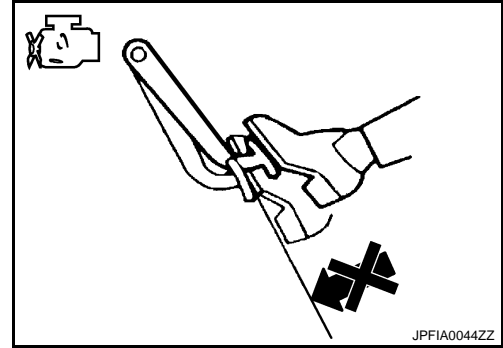
- Idle the engine for 1 minute to apply vacuum to the brake booster, and stop the engine. Then depress the brake pedal several times at 5-second intervals until the accumulated vacuum is released to atmospheric pressure. Check that the clearance between brake pedal and dash lower panel gradually increases (A → B → C) each time the brake pedal is depressed during this operation.



- Depress the brake pedal with the engine running. Then stop the engine while holding down the brake pedal. Check that the brake pedal stroke does not change after holding down the brake pedal for 30 seconds or more.

NOTE:

A slight impact with a small click may be felt on the pedal when the brake pedal is fully depressed. This is a normal phenomenon due to the brake system operation.



ADJUSTMENT AFTER INSTALLTION

Perform the brake pedal adjustment after installing the brake pedal assembly. Refer to [BR-55, "Inspection and Adjustment"](#).

VACUUM LINES

< ON-VEHICLE REPAIR >

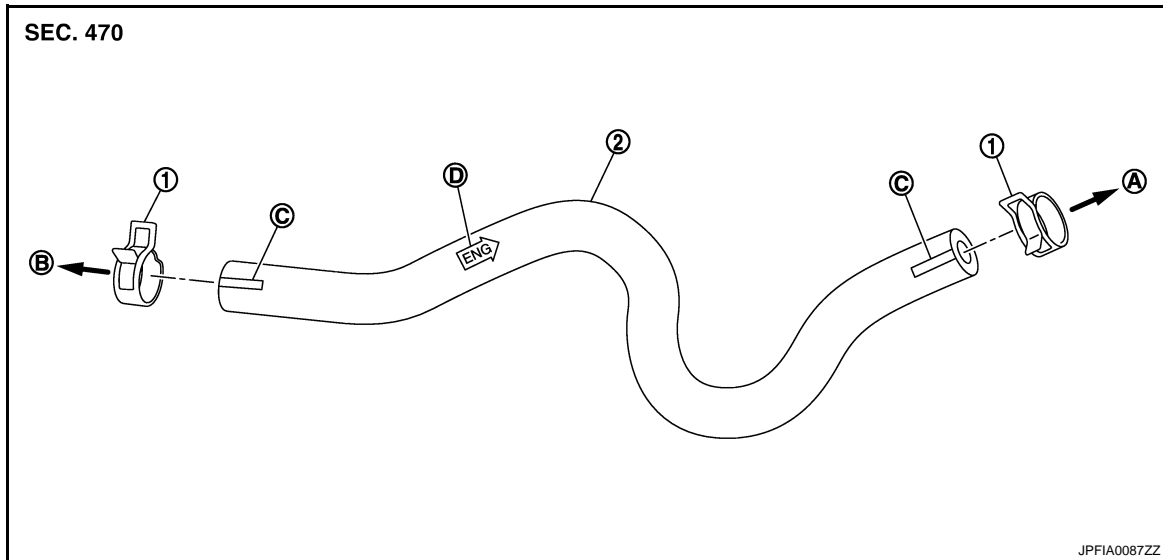
[RHD]

VACUUM LINES

HR16DE/MR20DE MODELS

HR16DE/MR20DE MODELS : Exploded View

INFOID:000000001181573



- | | | |
|--------------------------------------|---------------------------------------|---------------|
| 1. Clamp | 2. Vacuum hose (built in check valve) | |
| A. To intake manifold | B. To brake booster | C. Paint mark |
| D. Stamp indicating engine direction | | |

HR16DE/MR20DE MODELS : Removal and Installation

INFOID:000000001181574

REMOVAL

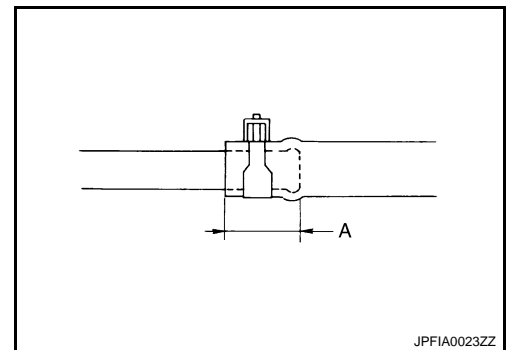
Remove the vacuum hose.

INSTALLATION

Install the vacuum hose.

CAUTION:

- Because vacuum hose contains a check valve, it must be installed in the correct position. Refer to the stamp to confirm correct installation. Brake booster will not operate normally if the hose is installed in the wrong direction.
- Insert vacuum hose at least 24 mm (0.94 in) (A).
- Never use lubricating oil during assembly.
- Face the marking side up when assembling of vacuum hose.



HR16DE/MR20DE MODELS : Inspection

INFOID:000000001181575

INSPECTION AFTER REMOVAL

Appearance

Check for correct assembly, damage and deterioration.

Check Valve Airtightness

VACUUM LINES

< ON-VEHICLE REPAIR >

[RHD]

- Use a handy vacuum pump (A) to check.

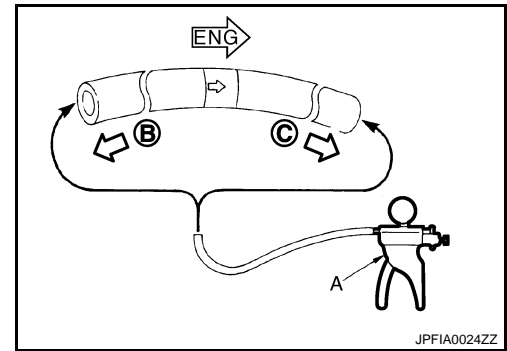
When connected to the brake booster side (B):

Vacuum should decrease within 1.3 kPa (10 mm-Hg, 0.39 inHg, 0.013 bar) for 15 seconds under a vacuum of -66.7 kPa (-500 mmHg, -19.70 inHg, -0.667 bar).

When connected to the engine side (C):

Vacuum should not exist.

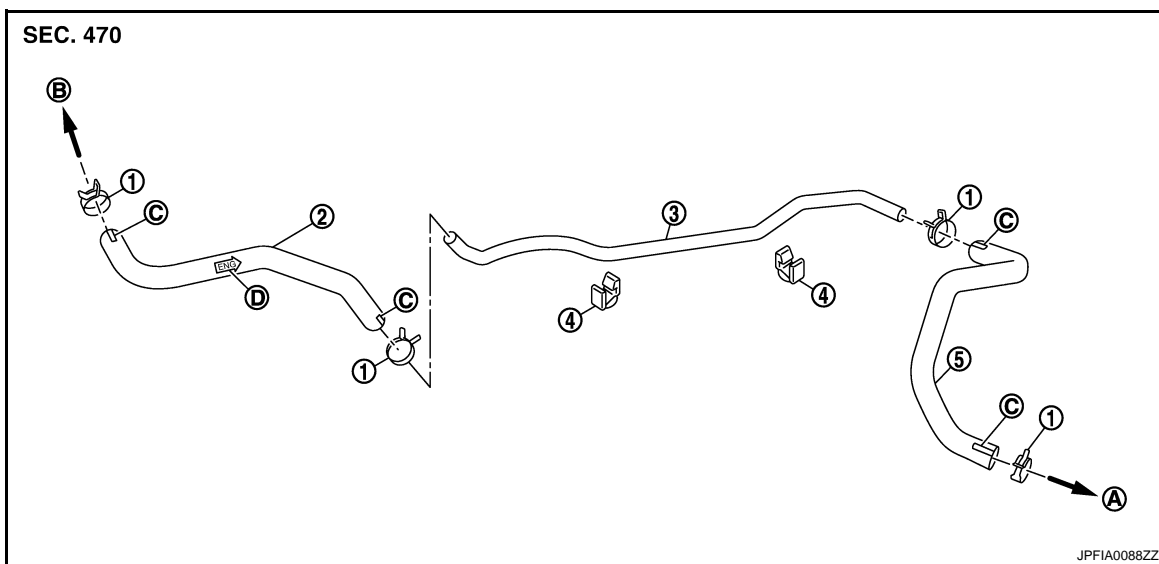
- Replace vacuum hose assembly if vacuum hose and check valve are malfunctioning.



K9K MODELS

K9K MODELS : Exploded View

INFOID:000000001181576



- | | | |
|--------------------------------------|---------------------------------------|----------------|
| 1. Clamp | 2. Vacuum hose (built in check valve) | 3. vacuum tube |
| 4. Clip | 5. Vacuum hose | |
| A. To vacuum pump | B. To brake booster | C. Paint mark |
| D. Stamp indicating engine direction | | |

K9K MODELS : Removal and Installation

INFOID:000000001181577

REMOVAL

Remove the vacuum hose and tube.

INSTALLATION

Install the vacuum hose and tube.

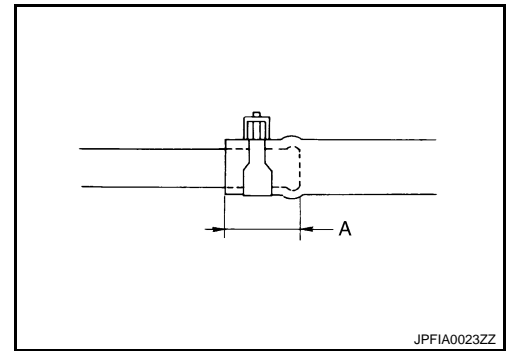
CAUTION:

VACUUM LINES

< ON-VEHICLE REPAIR >

[RHD]

- Because vacuum hose contains a check valve, it must be installed the correct position. Refer to the stamp to confirm correct installation. Brake booster will not operate normally if the hose is installed in the wrong direction.
- Insert vacuum hose at least 24 mm (0.94 in) (A).
- Never use lubricating oil during assembly.
- Face the marking side up when assembling.



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K9K MODELS : Inspection

INFOID:000000001181578

INSPECTION AFTER REMOVAL

Appearance

Check for correct assembly, damage and deterioration.

Check Valve Airtightness

- Use a handy vacuum pump (A) to check.

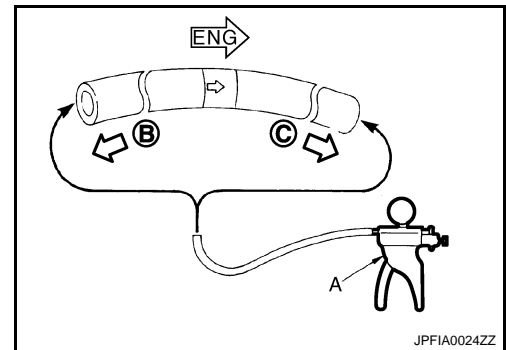
When connected to the brake booster side (B):

Vacuum should decrease within 1.3 kPa (10 mm-Hg, 0.013 bar) for 15 seconds under a vacuum of -66.7 kPa (-500 mmHg, -19.70 inHg, -0.667 bar).

When connected to the engine side (C):

Vacuum should not exist.

- Replace vacuum hose assembly if vacuum hose and check valve are malfunctioning.

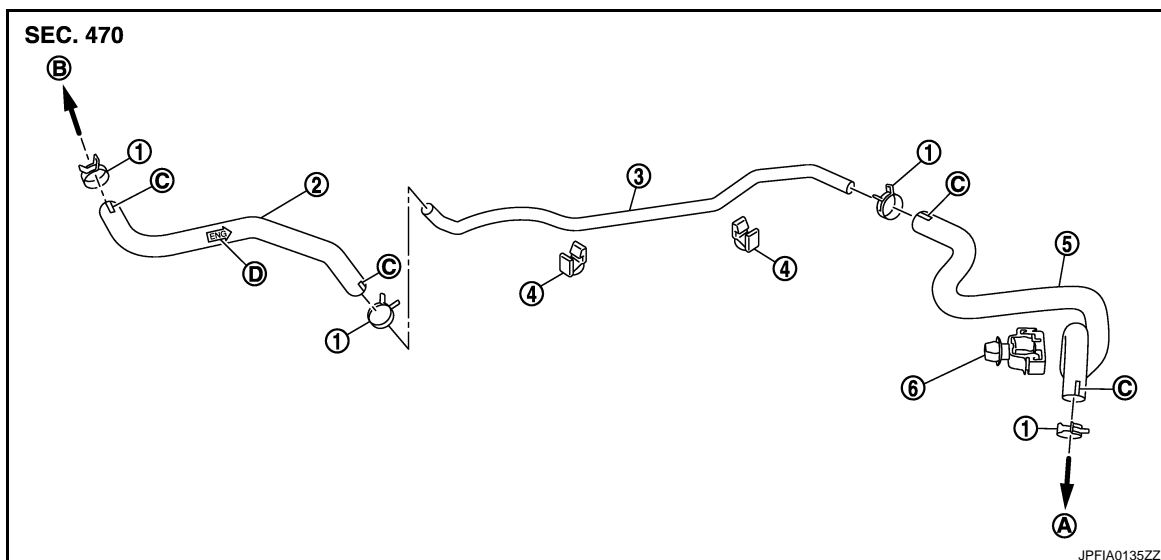


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M9R MODELS

M9R MODELS : Exploded View

INFOID:000000001315036



JPFIA0135ZZ

- | | | |
|--------------------------------------|---------------------------------------|----------------|
| 1. Clamp | 2. Vacuum hose (built in check valve) | 3. Vacuum tube |
| 4. Clip | 5. Vacuum hose | 6. Grommet |
| A. To vacuum pump | B. To brake booster | C. Paint mark |
| D. Stamp indicating engine direction | | |

VACUUM LINES

< ON-VEHICLE REPAIR >

[RHD]

M9R MODELS : Removal and Installation

INFOID:000000001315037

REMOVAL

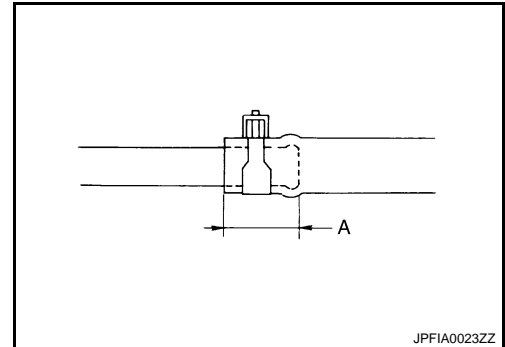
1. Remove engine cover. Refer to [EM-356, "Exploded View"](#).
2. Remove the vacuum hose and tube.

INSTALLATION

Note the following, and installation is the reverse order of removal.

CAUTION:

- Because vacuum hose contains a check valve, it must be installed the correct position. Refer to the stamp to confirm correct installation. Brake booster will not operate normally if the hose is installed in the wrong direction.
- Insert vacuum hose at least 24 mm (0.94 in) (A).
- Never use lubricating oil during assembly.
- Face the marking side up when assembling of vacuum hose.
- Face the marking side vehicle front when assembling of vacuum hose (vacuum pump side of a built in check valve).



M9R MODELS : Inspection

INFOID:000000001315038

INSPECTION AFTER REMOVAL

Appearance

Check for correct assembly, damage and deterioration.

Check Valve Airtightness

- Use a handy vacuum pump (A) to check.

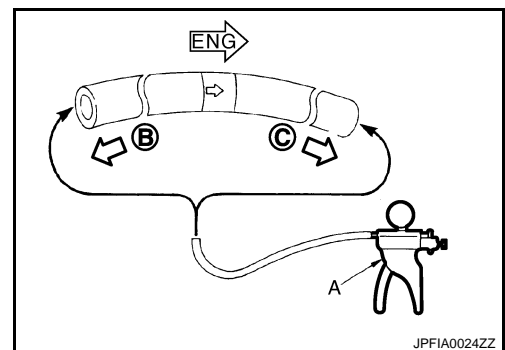
When connected to the brake booster side (B):

Vacuum should decrease within 1.3 kPa (10 mm-Hg, 0.39 inHg, 0.013 bar) for 15 seconds under a vacuum of -66.7 kPa (-500 mmHg, -19.70 inHg, -0.667 bar).

When connected to the engine side (C):

Vacuum should not exist.

- Replace vacuum hose assembly if vacuum hose and check valve are malfunctioning.



FRONT DISC BRAKE

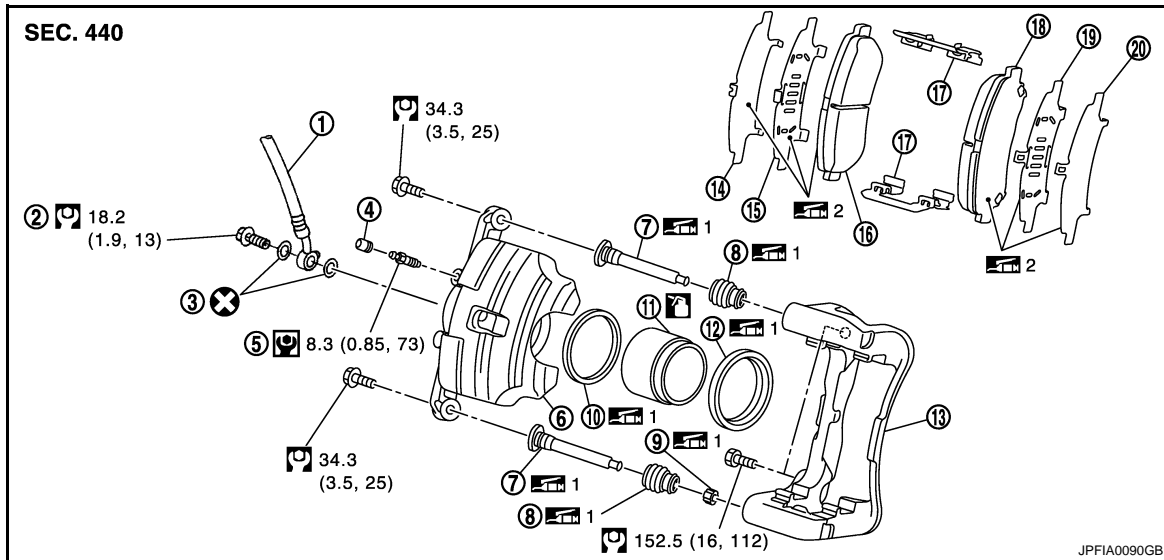
< ON-VEHICLE REPAIR >

[RHD]

FRONT DISC BRAKE BRAKE PAD

BRAKE PAD : Exploded View

INFOID:000000001374882



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

1: Apply rubber grease.

2: Apply copper based brake grease.

: Apply brake fluid.

Refer to [GI-4, "Components"](#) for symbols not described on the above.

BRAKE PAD : Removal and Installation

INFOID:000000001181580

REMOVAL

WARNING:

Clean any dust from the brake caliper and brake pads with a vacuum dust collector. Never blow with compressed air.

CAUTION:

- Never depress the brake pedal while removing the brake pads because the piston may pop out.
- Never spill or splash brake fluid on the disc rotor.

1. Remove tires.
2. Remove lower sliding pin bolt.
3. Suspend the cylinder body with suitable wire so that the brake hose will not stretch. Then remove the brake pad from the torque member.

CAUTION:

- Never deform the pad retainer when removing the pad retainer from the torque member.
- Never damage the piston boot.
- Never drop the brake pads, shims, and the shim covers.

INSTALLATION

FRONT DISC BRAKE

[RHD]

< ON-VEHICLE REPAIR >

WARNING:

Clean any dust from the brake caliper and brake pads with a vacuum dust collector. Never blow with compressed air.

CAUTION:

- Never depress the brake pedal while removing the brake pads or the cylinder body because the piston may pop out.
- Never spill or splash brake fluid on the disc rotor.

1. Install the pad retainer to the torque member if the pad retainers has been removed.

CAUTION:

- Securely assemble the pad retainers so that it will not be lifted up from the torque member.
- Never deform the pad retainers.

2. Apply copper based brake grease to the mating faces between the pads, shims and shim covers, and install them to the brake pad.

CAUTION:

Always replace the shims together with the shim covers when replacing the brake pad.

3. Install the cylinder body and brake pads to the torque member.

CAUTION:

- Never damage the piston boot.
- When replacing a pad with new one, check a brake fluid level in the reservoir tank because brake fluid returns to master cylinder reservoir tank when pressing piston in.

NOTE:

Use a disc brake piston tool to easily press piston.

4. Install the lower sliding pin bolt and tighten it to the specified torque.
5. Depress the brake pedal several times to check that no drag feel is present for the front disc brake.
6. Install tires.

BRAKE PAD : Inspection and Adjustment

INFOID:000000001181581

INSPECTION AFTER REMOVAL

Replace the shims and the shim covers if rust is excessively attached.

ADJUSTMENT AFTER INSTALLATION

Brake Burnishing Procedure

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

CAUTION:

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

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

BRAKE CALIPER ASSEMBLY

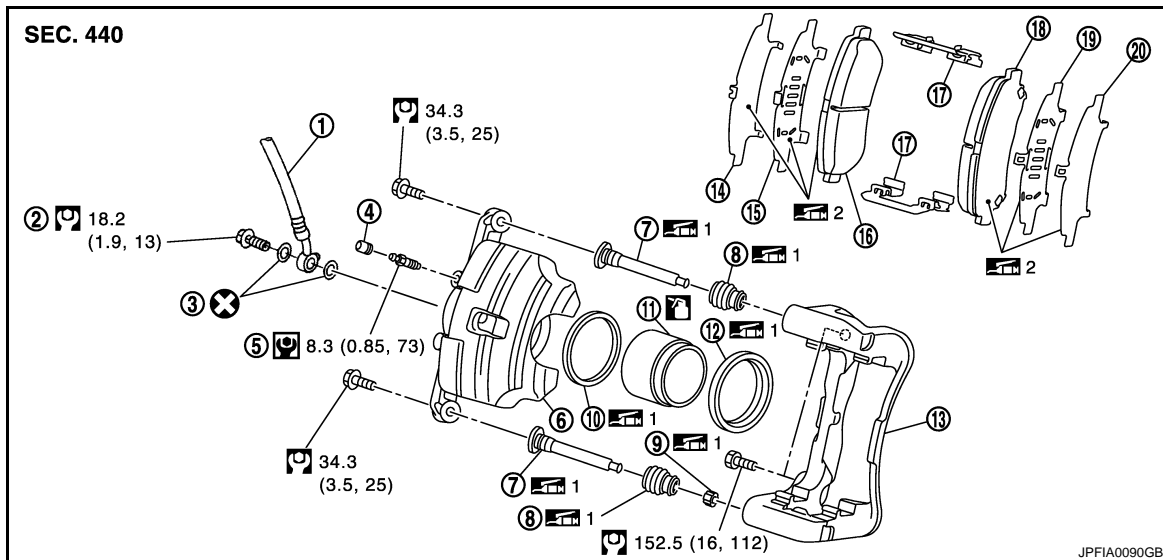
FRONT DISC BRAKE

< ON-VEHICLE REPAIR >

[RHD]

BRAKE CALIPER ASSEMBLY : Exploded View

INFOID:000000001181582



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

1: Apply rubber grease.

2: Apply copper based brake grease.

: Apply brake fluid.

Refer to [GI-4, "Components"](#) for symbols not described on the above.

BRAKE CALIPER ASSEMBLY : Removal and Installation

INFOID:000000001181583

REMOVAL

WARNING:

Clean any dust from the brake caliper and brake pads with a vacuum dust collector. Never blow with compressed air.

CAUTION:

Never depress the brake pedal. Brake fluid may splash while removing the brake hose.

1. Remove tires.
2. Fix the disc rotor using wheel nuts.
3. Drain brake fluid. Refer to [BR-11, "Draining"](#).

CAUTION:

Never spill or splash brake fluid on the disc rotor.

4. Remove union bolt, and then disconnect brake hose from caliper assembly.

FRONT DISC BRAKE

< ON-VEHICLE REPAIR >

[RHD]

5. Remove torque member mounting bolts, and remove brake caliper assembly.

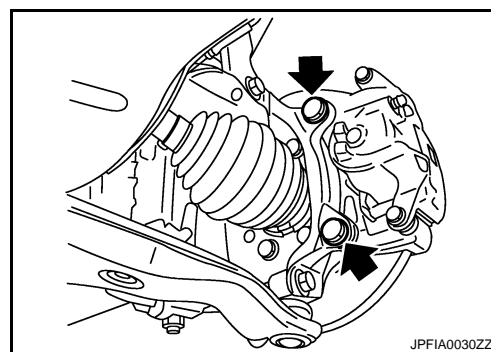
CAUTION:

Never drop brake pads and caliper assembly.

6. Remove disc rotor.

CAUTION:

- Put matching marks on the wheel hub and bearing assembly and the disc rotor before removing the disc rotor.
- Never drop disc rotor.



INSTALLATION

WARNING:

Clean any dust from the brake caliper and brake pads with a vacuum dust collector. Never blow with compressed air.

CAUTION:

Never depress the brake pedal. Brake fluid may splash while removing the brake hose.

1. Install disc rotor.

CAUTION:

Align the matching marks made during removal when reusing the disc rotor.

2. Install the brake caliper assembly to the vehicle and tighten the torque member mounting bolts to the specified torque.

CAUTION:

Never spill or splash any grease and moisture on the brake caliper assembly mounting face, threads, mounting bolts and washers. Wipe out any grease and moisture.

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

4. Refill with new brake fluid and perform the air bleeding. Refer to [BR-12. "Bleeding Brake System"](#).

CAUTION:

- Never reuse drained brake fluid.
- Never spill or splash brake fluid on the disc rotor.

5. Check that no drag feel is present for the front disc brake.

6. Install tires.

BRAKE CALIPER ASSEMBLY : Disassembly and Assembly

INFOID:000000001181584

DISASSEMBLY

NOTE:

Never remove the torque member, brake pads, shims, shim covers and pad retainers when disassembling and assembling the cylinder body.

1. Remove the sliding pin bolts, and remove the cylinder body from the torque member.

CAUTION:

Never drop pads, shims, shim covers and pad retainers from torque member.

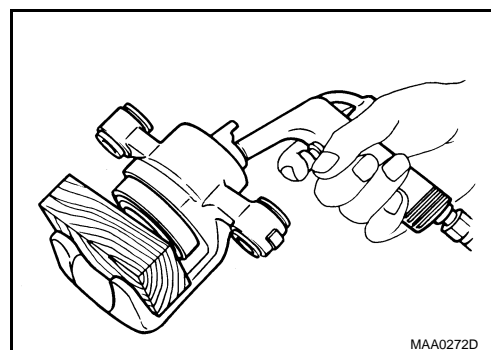
2. Remove sliding pins and sliding pin boots from torque member.

3. Remove bushing from sliding pin.

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

CAUTION:

Never get fingers caught in the piston.



FRONT DISC BRAKE

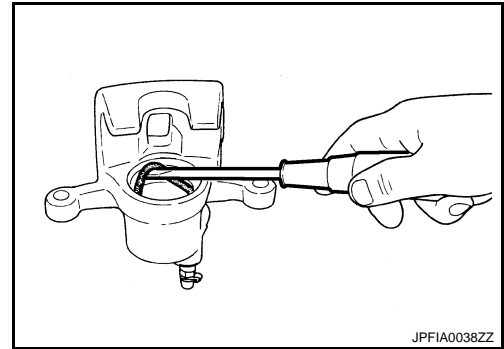
< ON-VEHICLE REPAIR >

[RHD]

5. Remove piston seal from cylinder body using suitable tool.

CAUTION:

Be careful not to damage a cylinder inner wall.



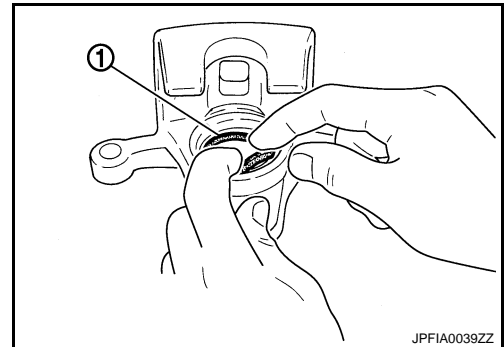
JPFIA0038ZZ

ASSEMBLY

1. Apply rubber grease to piston seal (1), and install to cylinder body.

CAUTION:

Never reuse piston seal.

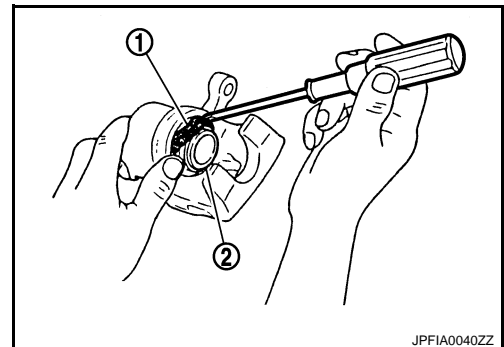


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2. Apply rubber grease to piston boot (1). Cover the piston (2) end with piston boot, and then install cylinder side lip on piston boot securely into a groove on cylinder body.

CAUTION:

Never reuse piston boot.



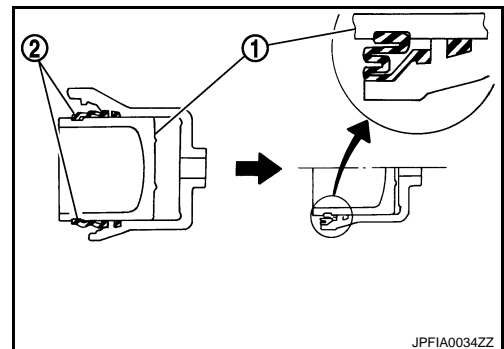
JPFIA0040ZZ

3. Apply brake fluid to piston (1). Push piston into cylinder body by hand and push piston boot (2) 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. Apply rubber grease to bushing, install bushing to sliding pin.
5. Apply rubber grease to sliding pins and sliding pin boots, install sliding pins and sliding pin boots to torque member.
6. Install the cylinder body to the torque member and tighten the sliding pin bolts to the specified torque.



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BRAKE CALIPER ASSEMBLY : Inspection and Adjustment

INFOID:000000001181585

INSPECTION AFTER DISASSEMBLY

Cylinder Body

Check the inner wall of the cylinder for rust, wear, cracks or damage. Replace the cylinder if any abnormal condition is detected.

CAUTION:

Always clean with new brake fluid. Never clean with mineral oil such as gasoline and light oil.

FRONT DISC BRAKE

[RHD]

< ON-VEHICLE REPAIR >

Torque Member

Check the torque member for rust, wear, cracks or damage. Replace the member if any abnormal condition is detected.

A

Piston

Check the surface of the piston for rust, wear, cracks or damage. Replace the piston if any abnormal condition is detected.

B

CAUTION:

A piston sliding surface is plated. Never polish with sandpaper.

C

Sliding Pin and Sliding Pin Boot

Check the sliding pins and sliding boots for rust, wear, cracks or damage. Replace the parts if any abnormal condition is detected.

D

ADJUSTMENT AFTER INSTALLATION

Brake Burnishing Procedure

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

E

CAUTION:

• Be careful of vehicle speed because the brake does not operate easily until pad and disc rotor are securely fitted.

BR

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

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

G

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REAR DISC BRAKE

[RHD]

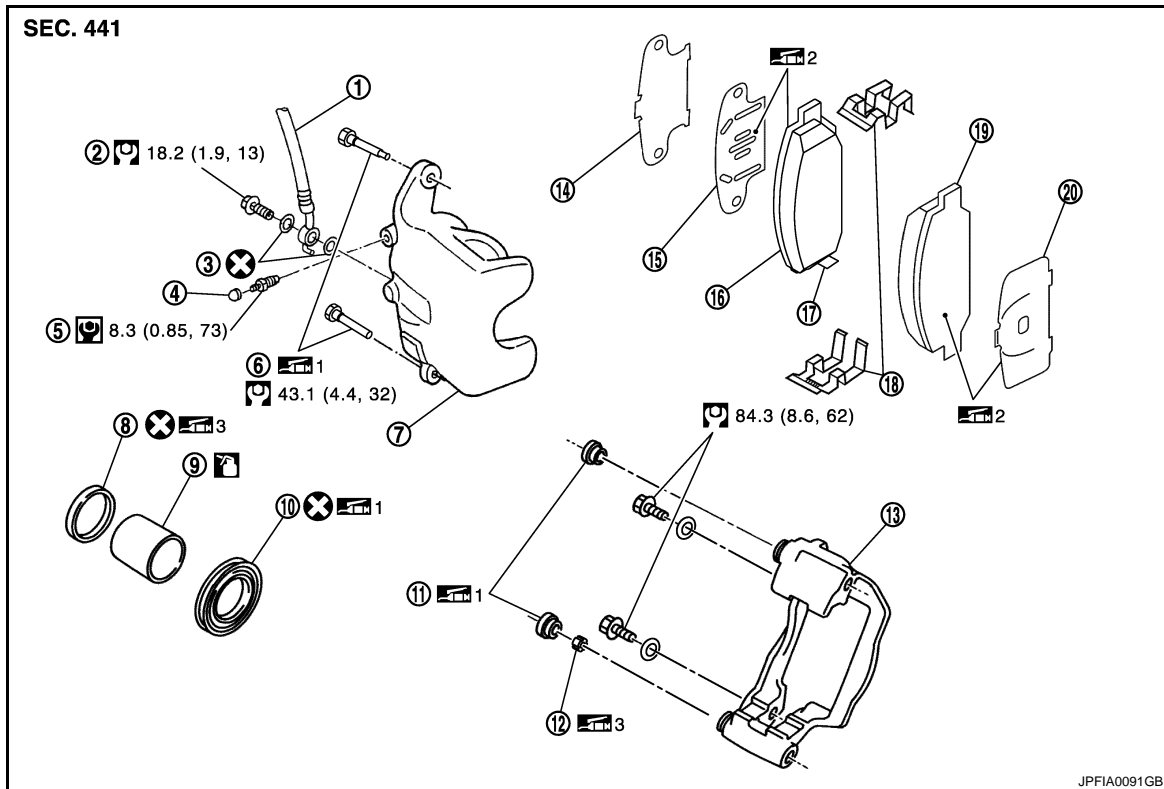
< ON-VEHICLE REPAIR >

REAR DISC BRAKE


BRAKE PAD


BRAKE PAD : Exploded View


INFOID:000000001374883




- | | | |
|-------------------|--|---------------------|
| 1. Brake hose | 2. Union bolt | 3. Copper washer |
| 4. Cap | 5. Bleeder valve | 6. Sliding pin bolt |
| 7. Cylinder body | 8. Piston seal | 9. Piston |
| 10. Piston boot | 11. Sliding pin boot | 12. Bushing |
| 13. Torque member | 14. Inner shim cover | 15. Inner shim |
| 16. Inner pad | 17. Pad wear sensor (RH inner side only) | 18. Pad retainer |
| 19. Outer pad | 20. Outer shim | |

 1: Apply rubber grease.

 2: Apply copper based brake grease.

 3: Apply polyglycol ether based lubricant.

: Apply brake fluid.

Refer to [GI-4, "Components"](#) for symbols not described on the above.

BRAKE PAD : Removal and Installation

INFOID:000000001181587

REMOVAL

WARNING:

Clean any dust from the brake caliper and brake pads with a vacuum dust collector. Never blow with compressed air.

CAUTION:

- Never depress the brake pedal while removing the brake pads or the cylinder body because the piston may pop out.
- Never spill or splash brake fluid on the disc rotor.

REAR DISC BRAKE

[RHD]

< ON-VEHICLE REPAIR >

1. Remove tires. A
2. Remove the lower sliding pin bolt. B
3. Suspend the cylinder body with suitable wire so that the brake hose will not stretch. Remove the brake pads from the torque member. C
CAUTION:
 - Never deform the pad retainers if removing the pad retainers.
 - Never damage the piston boot.
 - Never drop the brake pad, shims, and the shim cover.

INSTALLATION

WARNING:
Clean any dust from the brake caliper and brake pads with a vacuum dust collector. Never blow with compressed air. D

- CAUTION:**
- Never depress the brake pedal while removing the brake pads or the cylinder body because the piston may pop out. E
 - Never spill or splash brake fluid on the disc rotor.

1. Install the pad retainers to the torque member if the pad retainers has been removed. BR
CAUTION:
 - Securely assemble the pad retainers not to be lifted up from the torque member.
 - Never deform the pad retainers.
2. Apply copper based brake grease to the mating faces between the brake pads and the shims and install them to the brake pad. G

CAUTION:
Always replace the shims together with the shim cover when replacing the brake pad. H

3. Install cylinder body and brake pads to torque member. I
CAUTION:
 - Never damage the piston boot.
 - When replacing a pads with new one, check a brake fluid level in the reservoir tank because brake fluid returns to master cylinder reservoir tank when pressing piston in.

NOTE:

Use a disc brake piston tool to easily press piston. J

4. Install the lower sliding pin bolt and tighten it to the specified torque.
5. Depress the brake pedal several times to check that no drag feel is present for the rear disc brake. K
6. Install tires. L

BRAKE PAD : Inspection and Adjustment

INFOID:000000001181588

INSPECTION AFTER REMOVAL

Replace the shims and the shim cover if rust is excessively attached. M

ADJUSTMENT AFTER INSTALLATION

Brake Burnishing Procedure

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

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

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

BRAKE CALIPER ASSEMBLY

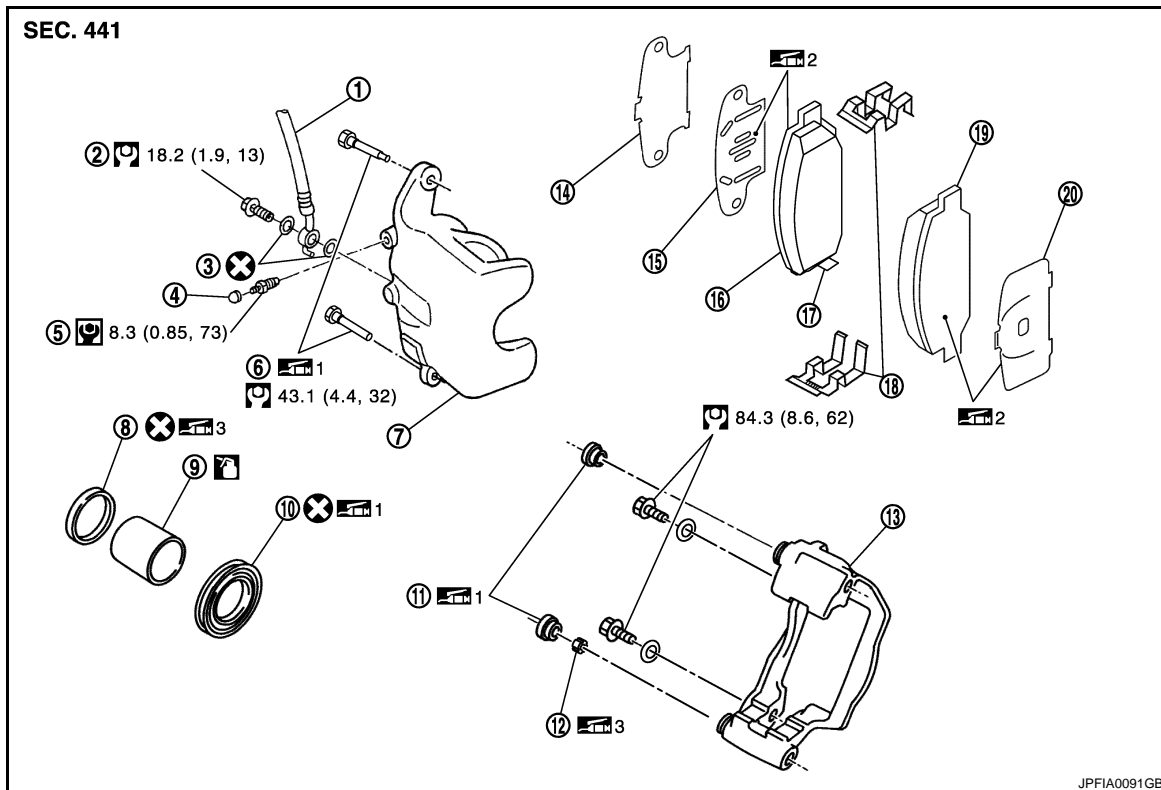
REAR DISC BRAKE

< ON-VEHICLE REPAIR >

[RHD]


BRAKE CALIPER ASSEMBLY : Exploded View


INFOID:000000001181589





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- | | | |
|-------------------|--|---------------------|
| 1. Brake hose | 2. Union bolt | 3. Copper washer |
| 4. Cap | 5. Bleeder valve | 6. Sliding pin bolt |
| 7. Cylinder body | 8. Piston seal | 9. Piston |
| 10. Piston boot | 11. Sliding pin boot | 12. Bushing |
| 13. Torque member | 14. Inner shim cover | 15. Inner shim |
| 16. Inner pad | 17. Pad wear sensor (RH inner side only) | 18. Pad retainer |
| 19. Outer pad | 20. Outer shim | |

 1: Apply rubber grease.

 2: Apply copper based brake grease.

 3: Apply polyglycol ether based lubricant.

 : Apply brake fluid.

Refer to [GI-4. "Components"](#) for symbols not described on the above.

BRAKE CALIPER ASSEMBLY : Removal and Installation

INFOID:000000001181590

REMOVAL

WARNING:

Clean any dust from the brake caliper and brake pads with a vacuum dust collector. Never blow with compressed air.

CAUTION:

Never depress the brake pedal. Brake fluid may splash while removing the brake hose.

1. Remove tires.
2. Fix the disc rotor using wheel nuts.
3. Drain brake fluid. Refer to [BR-11. "Draining"](#).

CAUTION:

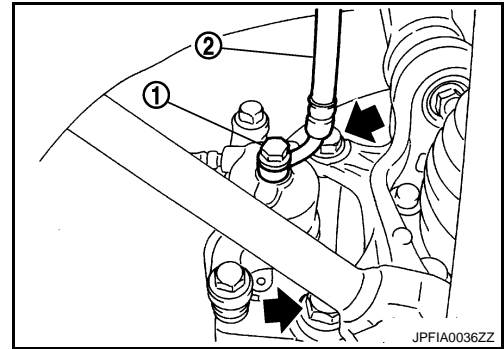
Never spill or splash brake fluid on the disc rotor.

REAR DISC BRAKE

[RHD]

< ON-VEHICLE REPAIR >

4. Remove union bolt (1) and then disconnect brake hose (2) from caliper assembly.
5. Remove torque member mounting bolts, and remove brake caliper assembly.
CAUTION:
Never drop brake pads and caliper assembly.
6. Remove disc rotor.
CAUTION:
 - Put matching marks on the wheel hub and bearing assembly and the disc rotor before removing the disc rotor.
 - Never drop disc rotor.



INSTALLATION

WARNING:

Clean any dust from the brake caliper and brake pads with a vacuum dust collector. Never blow with compressed air.

CAUTION:

Never depress the brake pedal. Brake fluid may splash while removing the brake hose.

1. Install disc rotor.
CAUTION:
Align the matching marks made during removal when reusing the disc rotor.
2. Install the brake caliper assembly to the vehicle and tighten the torque member mounting bolts to the specified torque.
CAUTION:
Never spill or splash any grease and moisture on the brake caliper assembly mounting face, threads, mounting bolts, and washers. Wipe out any grease and moisture.
3. Install brake hose to brake caliper assembly, and tighten union bolts to the specified torque.
4. Refill with new brake fluid and perform the air bleeding. Refer to [BR-12, "Bleeding Brake System"](#).
CAUTION:
 - Never reuse drained brake fluid.
 - Never spill or splash brake fluid on the disc rotor.
5. Check that no drag feel is present for the rear disc brake.
6. Install tires.

BRAKE CALIPER ASSEMBLY : Disassembly and Assembly

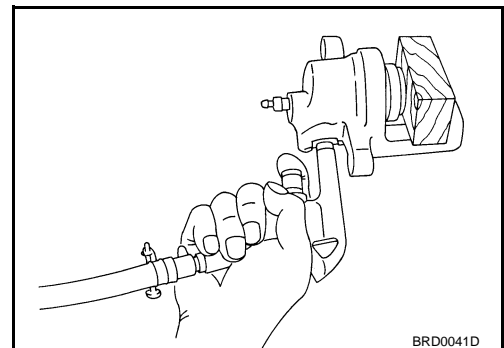
INFOID:000000001181591

DISASSEMBLY

NOTE:

Never remove the torque member, brake pads, shims, shim cover and pad retainers disassembling and assembling the cylinder body.

1. Remove the sliding pin bolts and remove the cylinder body from the torque member.
CAUTION:
Never drop pads, shims, shim cover and pad retainers from torque member.
2. Remove sliding pin boots from torque member.
3. Remove bushing from sliding pin bolt.
4. Place a wooden block as shown in the figure, and blow air from union bolt mounting hole to remove piston and piston boot.
CAUTION:
Never get fingers caught in the piston.



REAR DISC BRAKE

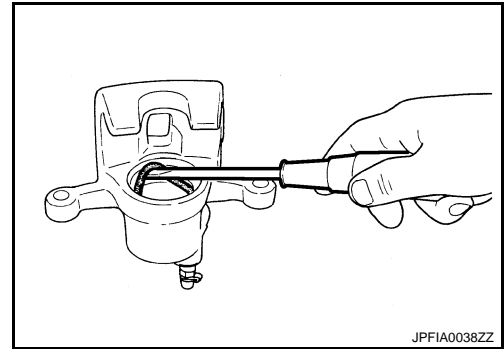
[RHD]

< ON-VEHICLE REPAIR >

5. Remove piston seal from cylinder body using suitable tool.

CAUTION:

Be careful not to damage a cylinder inner wall.

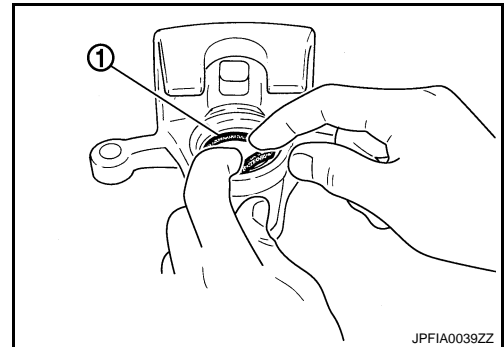


ASSEMBLY

1. Apply polyglycol ether based lubricant to piston seal (1), and install to cylinder body.

CAUTION:

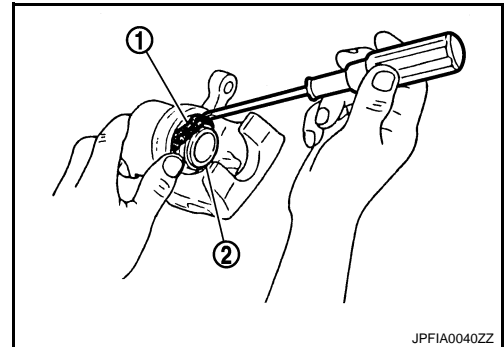
Never reuse piston seal.



2. Apply rubber grease to piston boot (1). Cover the piston (2) end with the piston boot, and then install cylinder side lip on the piston boot securely into the groove on cylinder body.

CAUTION:

Never reuse piston boot.

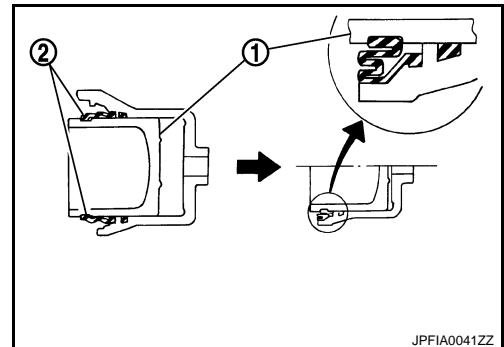


3. Apply brake fluid to piston (1). Push piston into cylinder body by hand and push piston boot (2) piston side lip into the piston groove.

CAUTION:

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

4. Apply polyglycol ether based lubricant to bushing, install bushing to sliding pin bolt.
5. Apply rubber grease to the sliding pin bolts and the sliding pin boots, install sliding pin boot to torque member.
6. Install the cylinder body to the torque member and tighten the sliding pin bolts to the specified torque.



BRAKE CALIPER ASSEMBLY : Inspection and Adjustment

INFOID:000000001181592

INSPECTION AFTER DISASSEMBLY

Cylinder Body

Check the inner wall of the cylinder for rust, wear, cracks or damage. Replace the cylinder if any abnormal condition is detected.

CAUTION:

Always clean with new brake fluid. Never clean with mineral oil such as gasoline and light oil.

REAR DISC BRAKE

[RHD]

< ON-VEHICLE REPAIR >

Torque Member

Check the torque member for rust, wear, cracks or damage. Replace the member if any abnormal condition is detected.

A

Piston

Check the piston for rust, wear, cracks or damage. Replace the piston if any abnormal condition is detected.

B

CAUTION:

A piston sliding surface is plated. Never polish with sandpaper.

Sliding Pin Bolt and Sliding Pin Boot

Check the sliding pin bolts and sliding pin boots for rust, wear, cracks or damage. Replace the parts if any abnormal condition is detected.

C

ADJUSTMENT AFTER INSTALLATION

D

Brake Burnishing Procedure

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

E

CAUTION:

• Be careful of vehicle speed because the brake does not operate easily until pad and disc rotor are securely fitted.

BR

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

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

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SERVICE DATA AND SPECIFICATIONS (SDS)

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[RHD]

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

General Specifications

INFOID:0000000001181593

Unit: mm (in.)

Front brake	Cylinder bore diameter	60.33 (2.375)
	Pad length × width × thickness	123.6 × 47.5 × 11.0 (4.87 × 1.870 × 0.433)
	Rotor outer diameter × thickness	296 × 26.0 (11.65 × 1.024)
Rear brake	Cylinder bore diameter	34.93 (1.375)
	Pad length × width × thickness	83.0 × 31.9 × 8.5 (3.268 × 1.256 × 0.335)
	Rotor outer diameter × thickness	292 × 9.0 (11.50 × 0.354)
Master cylinder	Cylinder bore diameter	23.8 (15/16)
Control valve	Valve type	Electric brake force distribution
Brake booster	Diaphragm diameter	250 (9.8)
Recommended brake fluid		DOT 4

Brake Pedal

INFOID:0000000001181594

Unit: mm (in.)

Brake pedal height (H1)	130.2 – 140.2 (5.13 – 5.52)
Clearance (C) between bracket and ASCD cancel switch/stop lamp switch threaded end	0.74 – 1.96 (0.0291 – 0.0772)
Brake pedal play (A)	—
Depressed brake pedal height (H2) [Depressing 490 N (50 kg, 110 lb) while turning the engine ON]	—

Brake Booster

INFOID:0000000001181595

Vacuum type

Unit: mm (in.)

Output rod length (A)	30.5 (1.201)
Input rod length (B)	124.5 – 125.5 (4.90 – 4.94)

Front Disc Brake

INFOID:0000000001181596

Unit: mm (in.)

Brake pad	Standard thickness	11.0 (0.433)
	Wear limit thickness	2.0 (0.079)
Disc rotor	Standard thickness	26.0 (1.024)
	Wear limit thickness	24.0 (0.945)
	Thickness variation (measured at 8 positions)	0.020 (0.0008)
	Runout limit (with it attached to the vehicle)	0.035 (0.0014)

Rear Disc Brake

INFOID:0000000001181597

Unit: mm (in.)

Brake pad	Standard thickness	8.5 (0.335)
	Wear limit thickness	2.0 (0.079)

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[RHD]

Disc rotor	Standard thickness	9.0 (0.354)
	Wear limit thickness	8.0 (0.315)
	Thickness variation (measured at 8 positions)	0.020 (0.0008)
	Runout limit (with it attached to the vehicle)	—

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