

SECTION **BR** BRAKE SYSTEM

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NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

< SYMPTOM DIAGNOSIS >

SYMPTOM DIAGNOSIS

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

INFOID:000000003811166

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		Reference page	
		Noise	×		Pads - damaged	BR-13 , BR-15		
		Shake	×		Pads - uneven wear	BR-13 , BR-15		
		Shimmy, Judder	×		Shims damaged	BR-34 , BR-40		
			×		Rotor imbalance	BR-13 , BR-15		
			×		Rotor damage	BR-13 , BR-15		
			×		Rotor runout	BR-13 , BR-15		
			×		Rotor deformation	BR-13 , BR-15		
			×		Rotor deflection	BR-13 , BR-15		
			×		Rotor rust	BR-13 , BR-15		
			×		Rotor thickness variation	BR-13 , BR-15		
			×		PROPELLER SHAFT	NVH in DLN section		
			×		DIFFERENTIAL	NVH in DLN section		
			×		AXLE AND SUSPENSION	NVH in FAX, RAX, FSU and RSU section		
			×		TIRE	NVH in WT section		
			×		ROAD WHEEL	NVH in WT section		
			×		DRIVE SHAFT	NVH in FAX section		
			×		STEERING	NVH in ST section		

×: Applicable

PRECAUTIONS

< PRECAUTION >

PRECAUTION

PRECAUTIONS

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

INFOID:000000003890160

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. Information necessary to service the system safely is included in the "SRS 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".
- Never 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:000000003890161

NOTE:

- Before removing and installing any control units, first turn the push-button ignition switch to the LOCK position, then disconnect both battery cables.
 - After finishing work, confirm that all control unit connectors are connected properly, then re-connect both battery cables.
 - Always use CONSULT-III to perform self-diagnosis as a part of each function inspection after finishing work. If a DTC is detected, perform trouble diagnosis according to self-diagnosis results.
- This vehicle is equipped with a push-button ignition switch and a steering lock unit.
If the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.
If turning the steering wheel is required with the battery disconnected or discharged, 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. Turn the push-button ignition switch to ACC position.
(At this time, the steering lock will be released.)
3. Disconnect both battery cables. The steering lock will remain released with both battery cables disconnected and the steering wheel can be turned.
4. Perform the necessary repair operation.
5. When the repair work is completed, re-connect both battery cables. With the brake pedal released, turn the push-button ignition switch from ACC position to ON position, then to LOCK position. (The steering wheel will lock when the push-button ignition switch is turned to LOCK position.)
6. Perform self-diagnosis check of all control units using CONSULT-III.

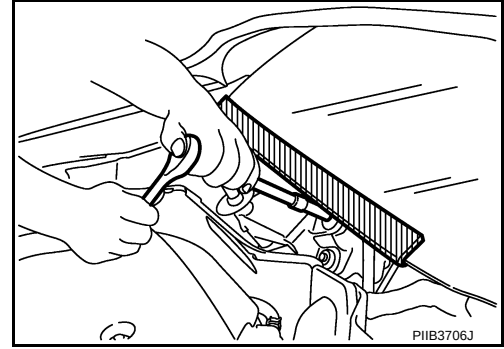
PRECAUTIONS

< PRECAUTION >

Precaution for Procedure without Cowl Top Cover

INFOID:000000003890162

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



Precaution for Brake System

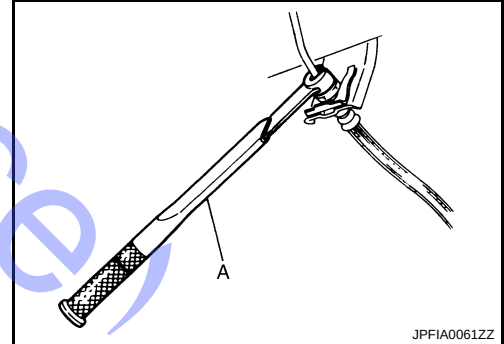
INFOID:000000003811170

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 3 or DOT 4" brake fluid. Refer to [MA-11, "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 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.
- Front brake pad: refer to [BR-13, "BRAKE PAD : Inspection and Adjustment"](#).
- Front disc rotor: refer to [BR-13, "DISC ROTOR : Inspection and Adjustment"](#).
- Rear brake pad: refer to [BR-15, "BRAKE PAD : Inspection and Adjustment"](#).
- Rear disc rotor: refer to [BR-15, "DISC ROTOR : Inspection and Adjustment"](#).



BRAKE PEDAL

< ON-VEHICLE MAINTENANCE >

ON-VEHICLE MAINTENANCE

BRAKE PEDAL

Inspection and Adjustment

INFOID:000000003811172

INSPECTION

Brake Pedal Height

Check the brake pedal height (H_1) between the dash lower panel (1) and the brake pedal upper surface.

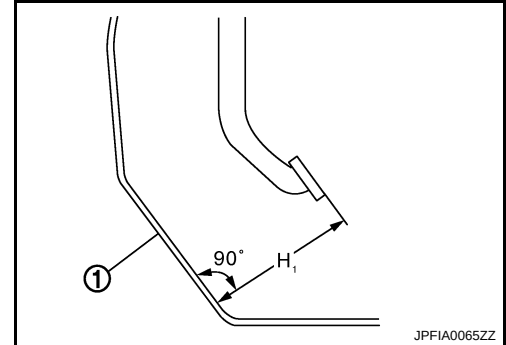
Standard

H_1

: Refer to [BR-45, "Brake Pedal"](#).

CAUTION:

Remove the floor trim.



Stop Lamp Switch and ASCD Brake Switch

Check the clearance (C) between stopper rubber (1) and stop lamp switch and ASCD brake switch (2) threaded end.

Standard

C

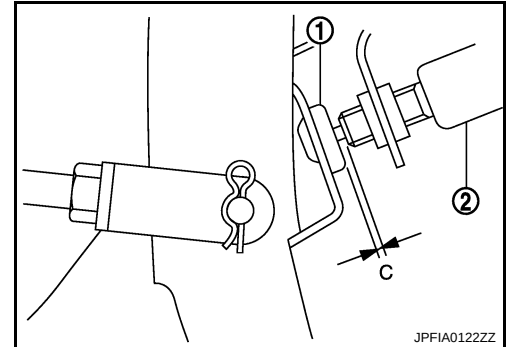
: Refer to [BR-45, "Brake Pedal"](#).

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 stopper rubber and stop lamp switch and ASCD brake switch threaded end.



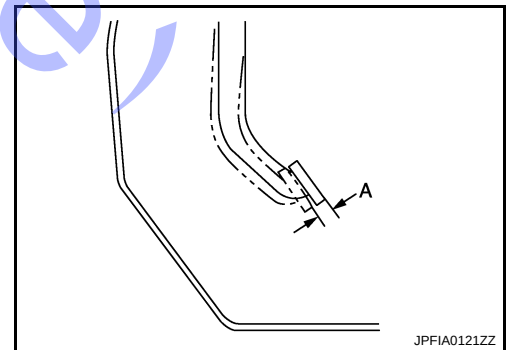
Brake Pedal Play

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

Standard

A

: Refer to [BR-45, "Brake Pedal"](#).



Depressed Brake Pedal Height

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

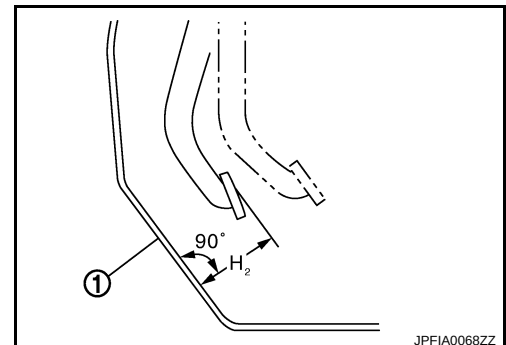
Standard

H_2

: Refer to [BR-45, "Brake Pedal"](#).

CAUTION:

Remove the floor trim.



BRAKE PEDAL

< ON-VEHICLE MAINTENANCE >

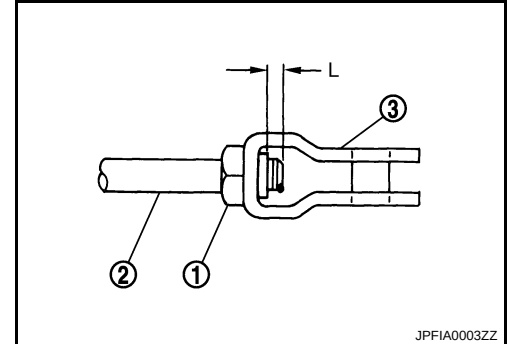
ADJUSTMENT

Brake Pedal Height

1. Remove instrument lower panel LH. Refer to [IP-11, "Exploded View"](#).
2. Disconnect the stop lamp switch and ASCD brake switch harness connector.
3. Turn the stop lamp switch and ASCD brake switch 45° counterclockwise.
4. Loosen the input rod lock nut (1). Adjust the brake pedal height (H₁) to the specification. Tighten the input rod lock nut to the specification. Refer to [BR-28, "Exploded View"](#).

CAUTION:

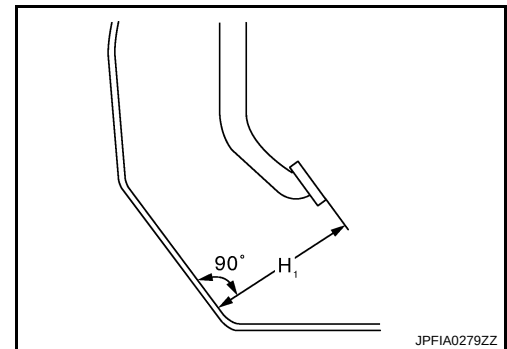
The threaded end of the input rod (2) must project to the inner side (L) of the clevis (3).



Standard

H₁

: Refer to [BR-45, "Brake Pedal"](#).

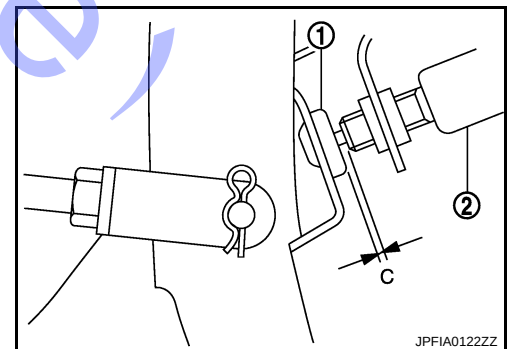


Stop Lamp Switch and ASCD Brake Switch

1. Remove instrument lower panel LH. Refer to [IP-11, "Exploded View"](#).
2. Disconnect the stop lamp switch and ASCD brake switch harness connector.
3. Turn the stop lamp switch and ASCD brake switch 45° counterclockwise.
4. Press-fit stop lamp switch and ASCD brake switch (2) until stop lamp switch and ASCD brake switch hits the stopper rubber (1) 45° clockwise.

CAUTION:

- The clearance (C) between the stopper rubber and stop lamp switch and ASCD brake switch threaded end must be the specified value. Refer to [BR-45, "Brake Pedal"](#).
- The stop lamp must be turned off when the brake pedal is released.



Brake Pedal Play

1. Remove instrument lower panel LH. Refer to [IP-11, "Exploded View"](#).
2. Disconnect the stop lamp switch and ASCD brake switch harness connector.
3. Turn the stop lamp switch and ASCD brake switch 45° counterclockwise.

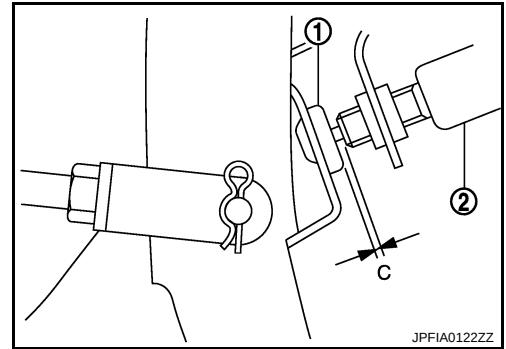
BRAKE PEDAL

< ON-VEHICLE MAINTENANCE >

4. Press-fit stop lamp switch and ASCD brake switch (2) until stop lamp switch and ASCD brake switch hits the stopper rubber (1) 45° clockwise.

CAUTION:

- The clearance (C) between the stopper rubber and stop lamp switch and ASCD brake switch threaded end must be the specified value. Refer to [BR-45, "Brake Pedal"](#).
- The stop lamp must be turned off when the brake pedal is released.



BRAKE FLUID

< ON-VEHICLE MAINTENANCE >

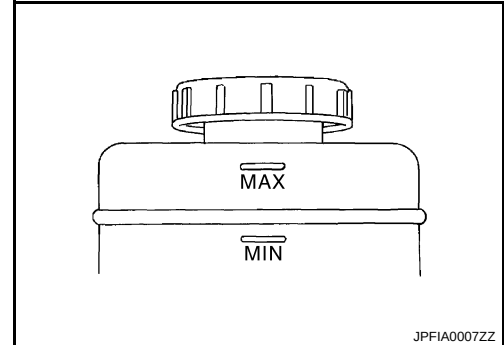
BRAKE FLUID

Inspection

INFOID:000000003811173

BRAKE FLUID LEVEL

- Check that the fluid level in the sub tank is within the specified range (MAX – MIN lines).
- Visually check for any brake fluid leakage around the sub tank, reservoir tank and hose.
- 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.

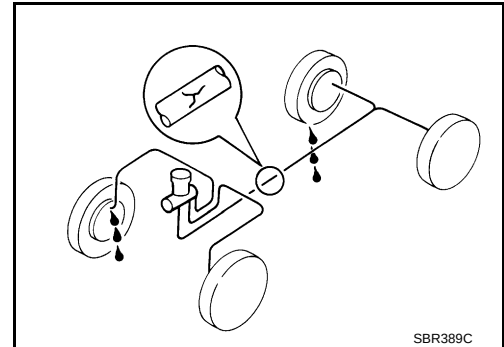


BRAKE LINE

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.



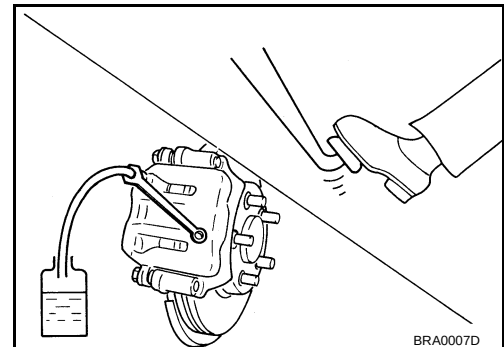
Draining

INFOID:000000003811174

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:000000003811175

CAUTION:

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

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

CAUTION:

Never reuse drained brake fluid.

BRAKE FLUID

< ON-VEHICLE MAINTENANCE >

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-10. "Bleeding Brake System"](#).

Bleeding Brake System

INFOID:000000003811176

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 sub 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.
 - Front disc brake: refer to [BR-34. "BRAKE CALIPER ASSEMBLY : Exploded View"](#).
 - Rear disc brake: refer to [BR-40. "BRAKE CALIPER ASSEMBLY : Exploded View"](#).
 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 sub tank is within the specified range after air bleeding. Refer to [BR-9. "Inspection"](#).

BRAKE MASTER CYLINDER

< ON-VEHICLE MAINTENANCE >

BRAKE MASTER CYLINDER

Inspection

INFOID:000000003811177

FLUID LEAK

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

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

@allyance,

BRAKE BOOSTER

< ON-VEHICLE MAINTENANCE >

BRAKE BOOSTER

Inspection

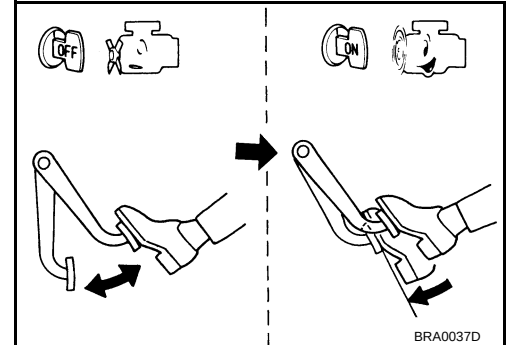
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OPERATION

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.

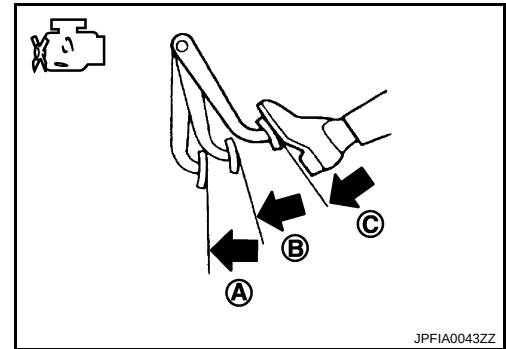
NOTE:

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

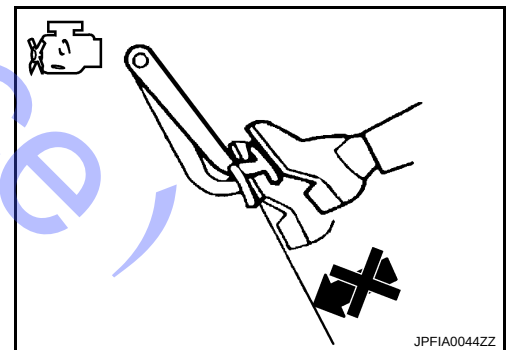
- Idle the engine for 1 minute to apply vacuum to the brake booster, and stop the engine. Then depress the brake pedal several times at 5-second intervals until the accumulated vacuum is released to atmospheric pressure. Check that the clearance between brake pedal and dash lower panel gradually increases (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 >

FRONT DISC BRAKE

BRAKE PAD

BRAKE PAD : Inspection and Adjustment

INFOID:000000003811179

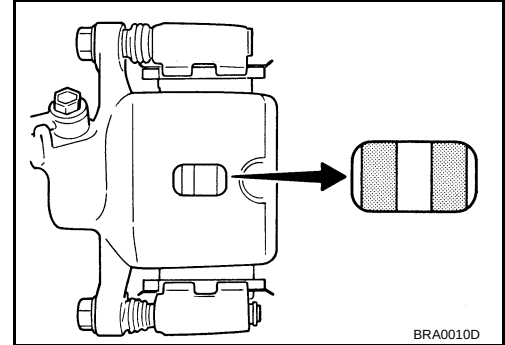
INSPECTION

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

Limit

Wear thickness

: Refer to [BR-45, "Front Disc Brake"](#).



ADJUSTMENT

CAUTION:

- Burnish contact surfaces between pads according to the following procedure after refinishing or replacing pads, or if a soft pedal occurs at very low mileage.
 - Be careful of vehicle speed because the brake does not operate firmly/securely 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.

DISC ROTOR

DISC ROTOR : Inspection and Adjustment

INFOID:000000003811180

INSPECTION

Appearance

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

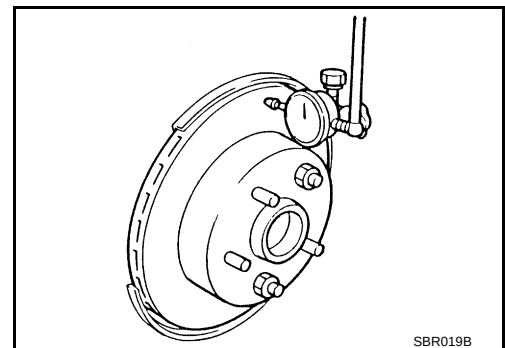
Runout

1. Fix the disc rotor to the wheel hub and bearing assembly with wheel nuts (2 points at least).
2. Check the wheel bearing axial end play before the inspection. Refer to [FAX-6, "Inspection"](#).
3. Inspect the runout with a dial indicator to measured at 10 mm (0.39 in) inside the disc edge.

Limit

Runout

: Refer to [BR-45, "Front Disc Brake"](#).



4. 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.
5. Replace or refinish the disc rotor if the runout is outside the limit even after performing the above operation.

Thickness

FRONT DISC BRAKE

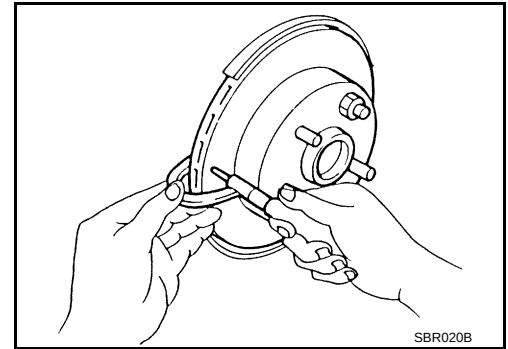
< ON-VEHICLE MAINTENANCE >

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

Limit

Wear thickness

: Refer to BR-45, "Front Disc Brake".



ADJUSTMENT

CAUTION:

- Burnish contact surfaces between pads according to the following procedure after refinishing or replacing pads, or if a soft pedal occurs at very low mileage.
 - Be careful of vehicle speed because the brake does not operate firmly/securely 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.

REAR DISC BRAKE

< ON-VEHICLE MAINTENANCE >

REAR DISC BRAKE

BRAKE PAD

BRAKE PAD : Inspection and Adjustment

INFOID:000000003811181

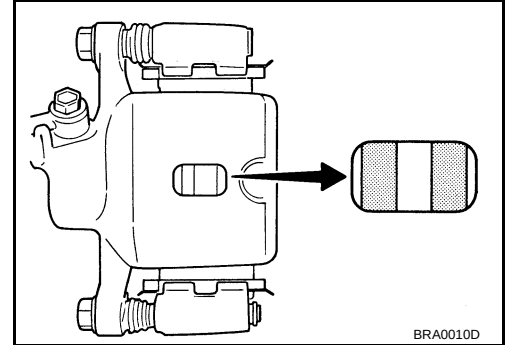
INSPECTION

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

Limit

Wear thickness

: Refer to [BR-45, "Rear Disc Brake"](#).



ADJUSTMENT

CAUTION:

- Burnish contact surfaces between pads according to the following procedure after refinishing or replacing pads, or if a soft pedal occurs at very low mileage.
 - Be careful of vehicle speed because the brake does not operate firmly/securely 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.

DISC ROTOR

DISC ROTOR : Inspection and Adjustment

INFOID:000000003811182

INSPECTION

Appearance

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

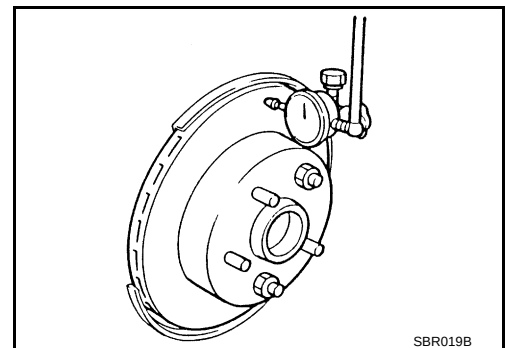
Runout

1. Fix the disc rotor to the wheel hub and bearing assembly with wheel nuts (2 points at least).
2. Check the wheel bearing axial end play before the inspection. Refer to [RAX-3, "Inspection"](#).
3. Inspect the runout with a dial indicator to measured at 10 mm (0.39 in) inside the disc edge.

Limit

Runout

: Refer to [BR-45, "Rear Disc Brake"](#).



4. 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.
5. Replace or refinish the disc rotor if the runout is outside the limit even after performing the above operation.

Thickness

REAR DISC BRAKE

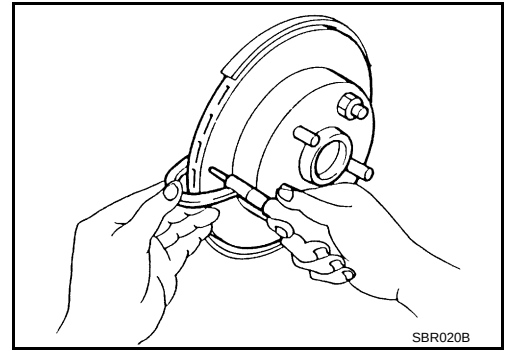
< ON-VEHICLE MAINTENANCE >

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

Limit

Wear thickness

: Refer to BR-45, "Rear Disc Brake".



ADJUSTMENT

CAUTION:

- Burnish contact surfaces between pads according to the following procedure after refinishing or replacing pads, or if a soft pedal occurs at very low mileage.
 - Be careful of vehicle speed because the brake does not operate firmly/securely 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 PEDAL

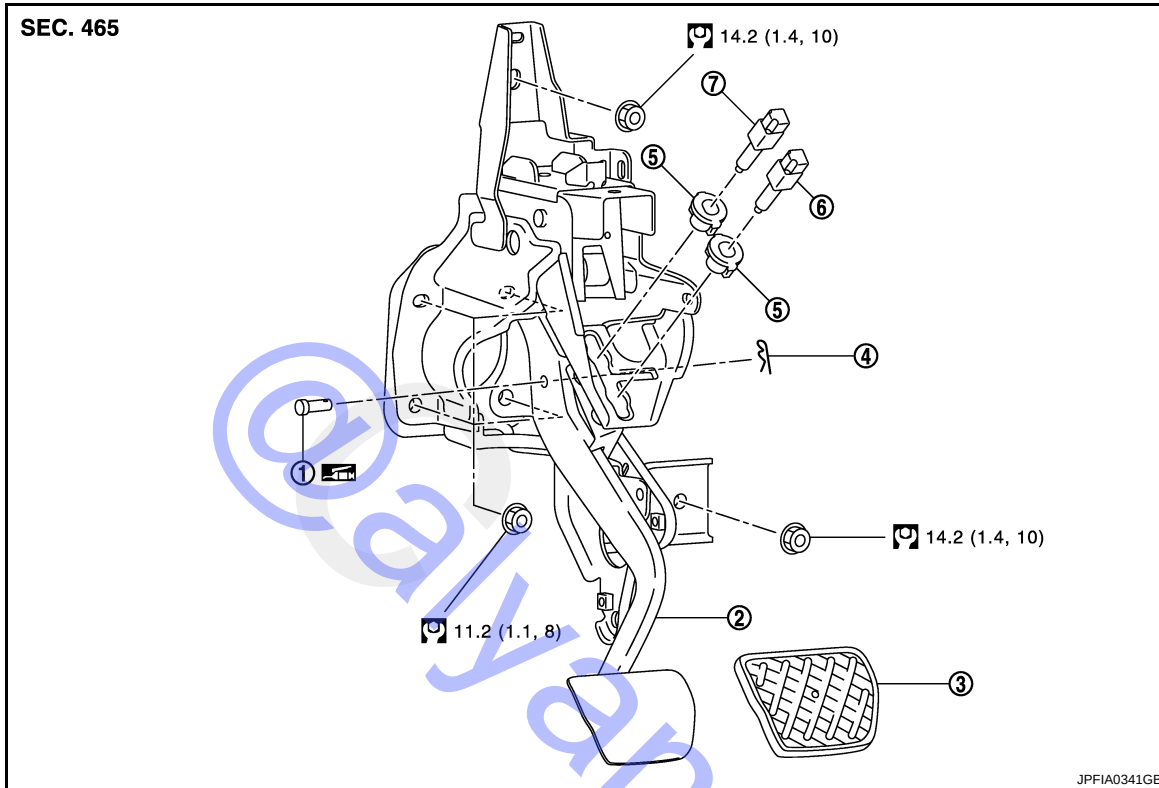
< ON-VEHICLE REPAIR >

ON-VEHICLE REPAIR

BRAKE PEDAL

Exploded View

INFOID:000000003811183



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

: Apply multi-purpose grease.

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

Removal and Installation

INFOID:000000003811184

REMOVAL

1. Remove instrument lower panel LH. Refer to [IP-11, "Exploded View"](#).
2. Disconnect the stop lamp switch and ASCD brake switch harness connectors.
3. Remove snap pin and clevis pin from clevis of brake booster.
4. Separate steering column assembly and lower shaft. Refer to [ST-13, "Exploded View"](#).
5. Remove the brake pedal assembly.

CAUTION:

Hold the brake booster and master cylinder so as not to drop out or contact them to other parts.

6. Remove accelerator pedal from brake pedal assembly. Refer to [ACC-3, "Exploded View"](#).

INSTALLATION

Note the following, and install the reverse order of removal.

- 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.

BRAKE PEDAL

< ON-VEHICLE REPAIR >

Inspection and Adjustment

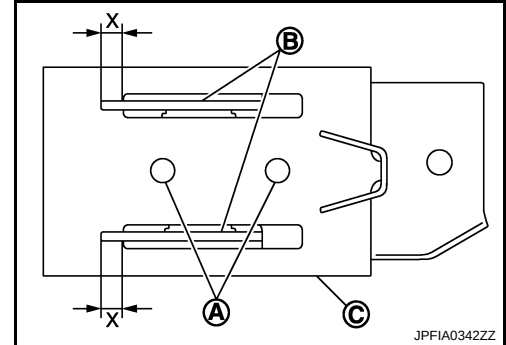
INFOID:000000003811185

INSPECTION AFTER REMOVAL

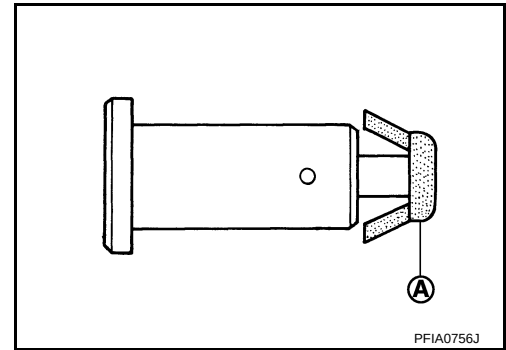
- Check the following items and replace the brake pedal assembly if necessary.
- Check the brake pedal upper rivet (made by aluminum) (A) for deformation.
- Check the brake pedal for bend, damage, and cracks on the welded parts.
- Check the lapping length (X) of sub-bracket (B) and slide plate (C).

Standard

X : 5.0 mm (0.197 in) or more



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



ADJUSTMENT AFTER INSTALLATION

- Perform the brake pedal adjustment after installing the brake pedal assembly. Refer to [BR-6, "Inspection and Adjustment"](#).
- Perform the accelerator pedal check after installing the accelerator pedal. Refer to [ACC-4, "Inspection"](#).

BRAKE PIPING

< ON-VEHICLE REPAIR >

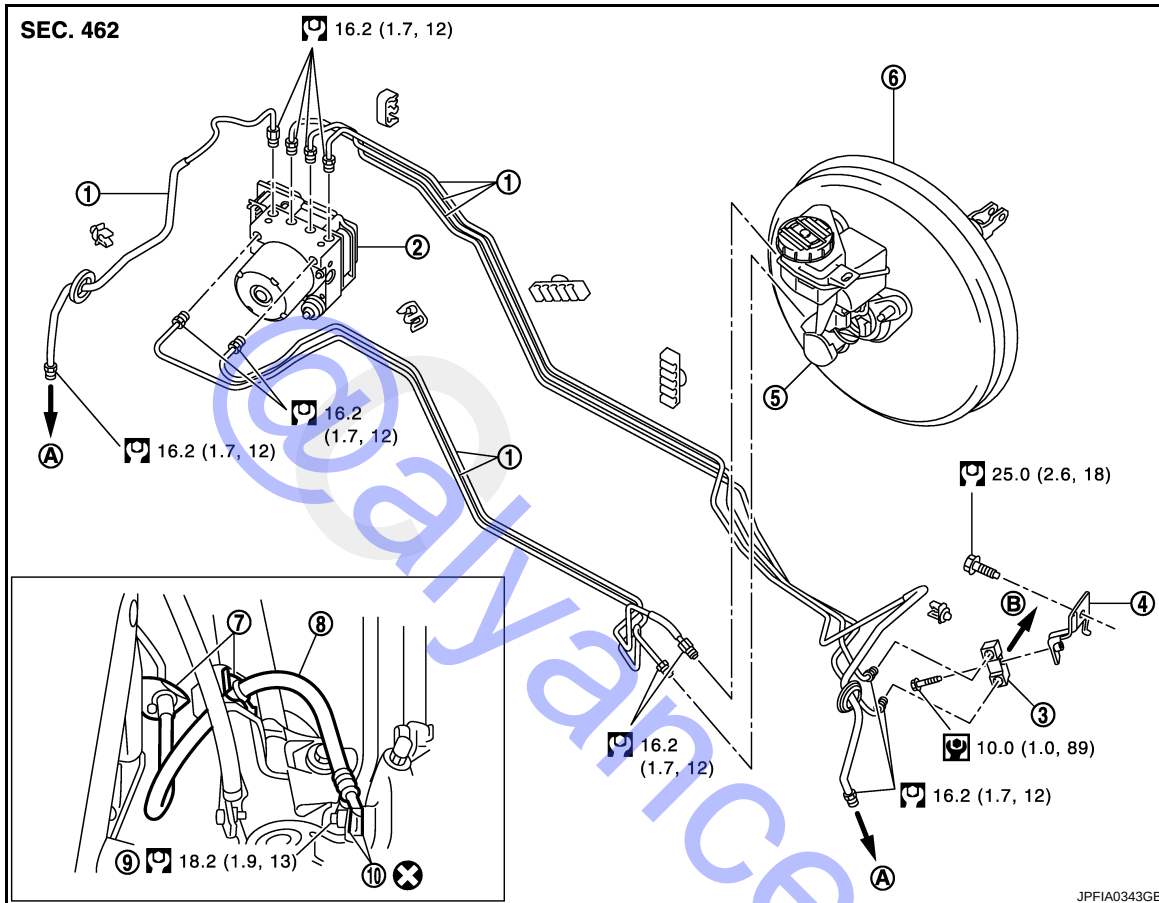
BRAKE PIPING

FRONT

FRONT : Exploded View

WITHOUT VDC

INFOID:000000003811186



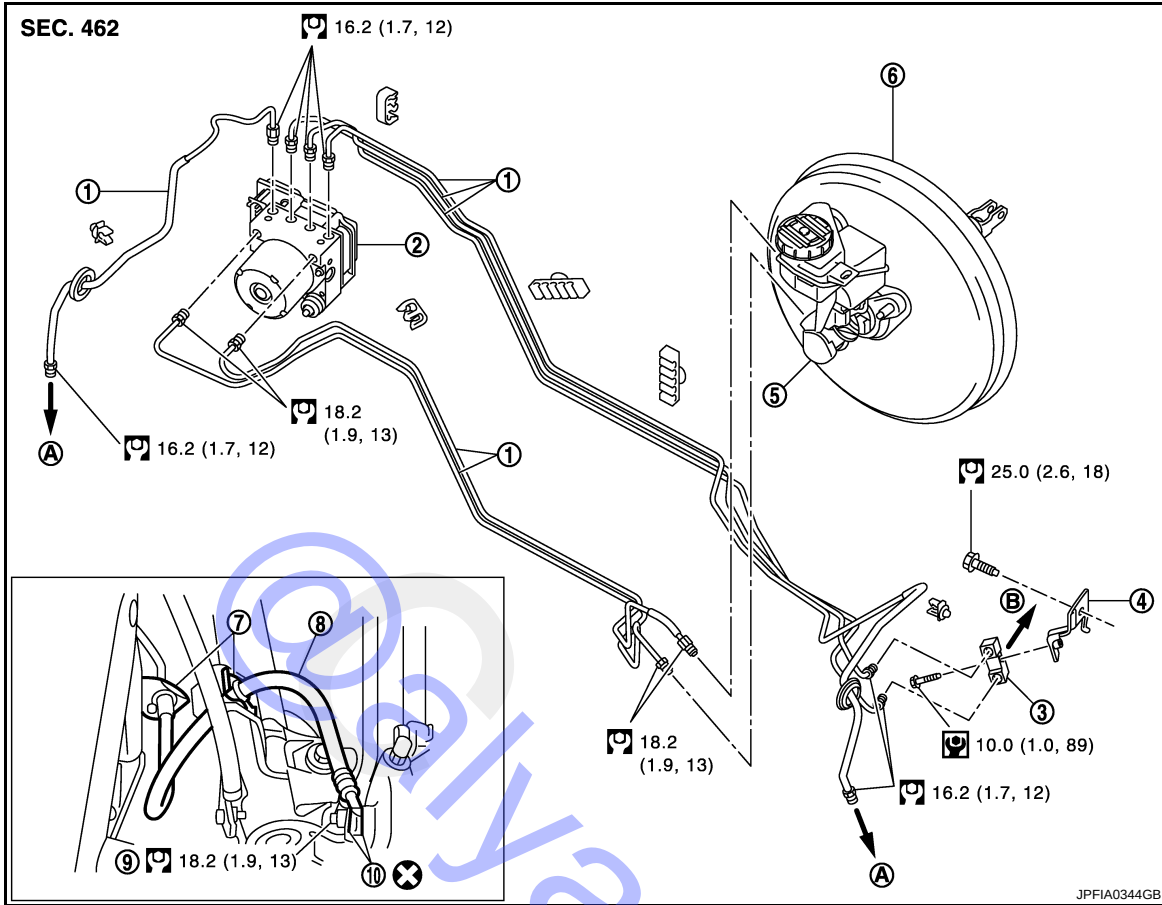
- | | | |
|------------------------|--|------------------|
| 1. Brake tube | 2. ABS actuator and electric unit (control unit) | 3. Connector |
| 4. Connector bracket | 5. Master cylinder assembly | 6. Brake booster |
| 7. Lock plate | 8. Brake hose | 9. Union bolt |
| 10. Copper washer | | |
| A. To front brake hose | B. To rear brake tube | |

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

WITH VDC

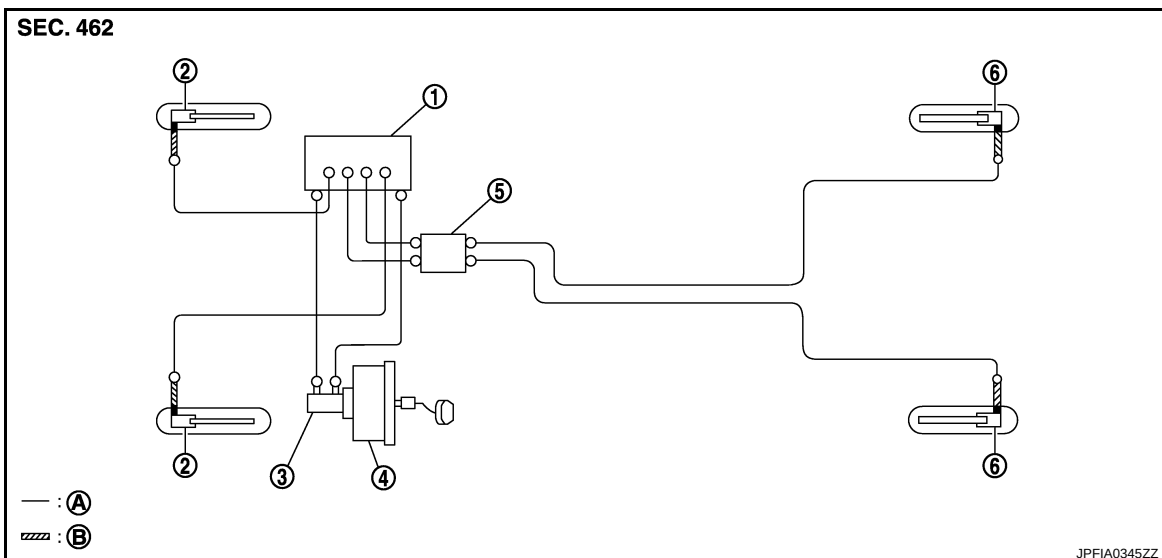
BRAKE PIPING

< ON-VEHICLE REPAIR >



FRONT : Hydraulic Piping

INFOID:000000003811187



BRAKE PIPING

< ON-VEHICLE REPAIR >

- | | | |
|--|---------------------|-----------------------------|
| 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

FRONT : Removal and Installation

INFOID:000000003811188

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-9. "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 copper washers, 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 washers to the brake hose.

CAUTION:

Never reuse the copper washer.

2. Align the brake hose pin to the projection (A) of the brake caliper assembly and tighten the union bolt (1) to the specified torque.
3. 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.

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

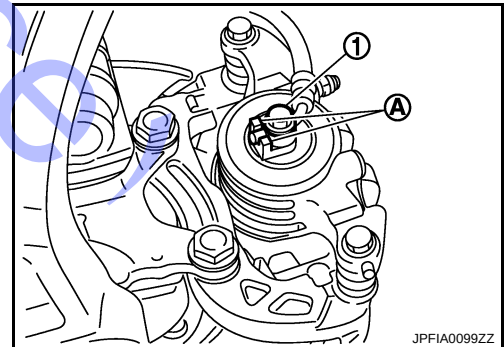
CAUTION:

Never scratch the flare nut and the brake tube.

5. Refill with new brake fluid and perform the air bleeding. Refer to [BR-10. "Bleeding Brake System"](#).

CAUTION:

Never reuse drained brake fluid.



FRONT : Inspection

INFOID:000000003811189

INSPECTION AFTER INSTALLATION

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 785N (80 kg, 177 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.

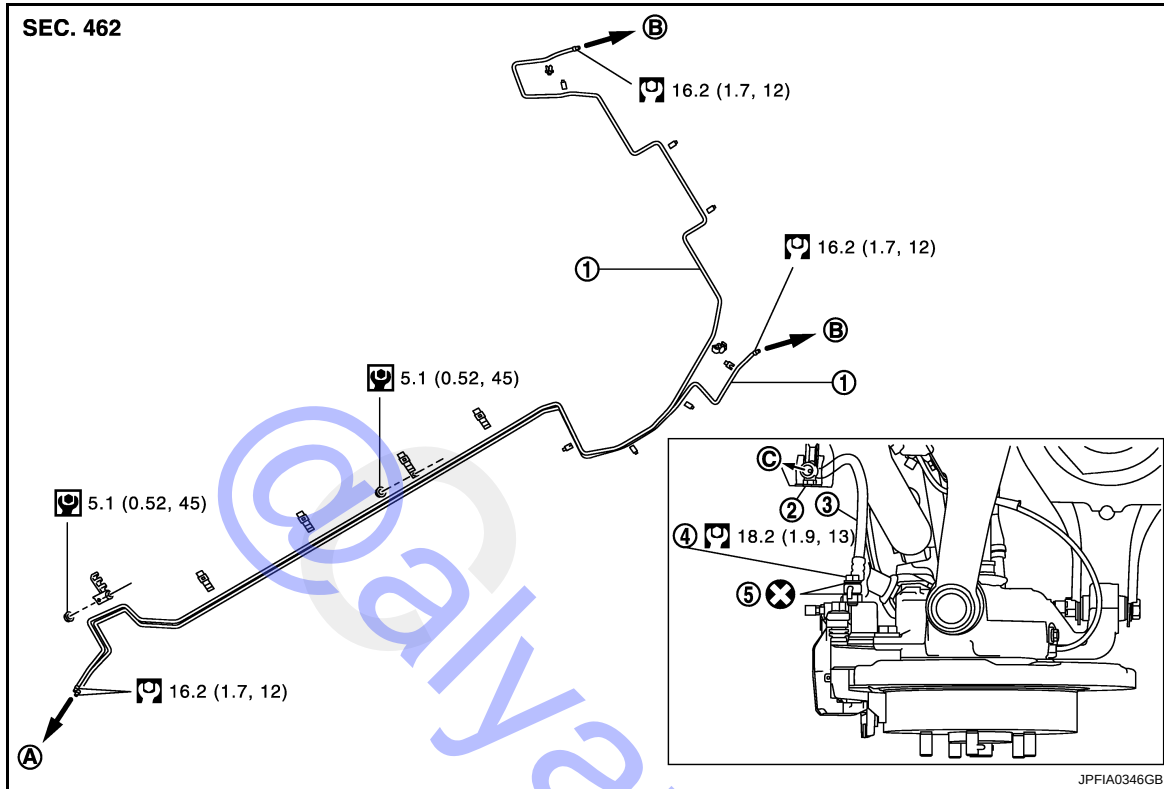
BRAKE PIPING

< ON-VEHICLE REPAIR >

REAR

REAR : Exploded View

INFOID:000000003811190

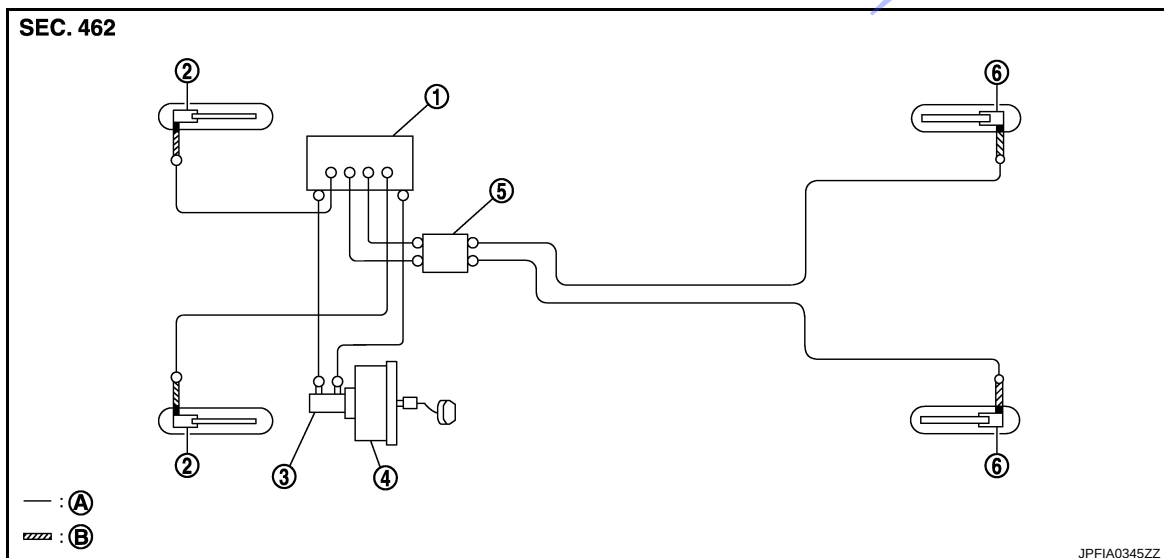


- | | | |
|-----------------|-----------------------|------------------|
| 1. Brake tube | 2. Lock plate | 3. Brake hose |
| 4. Union bolt | 5. Copper washer | |
| A. To connector | B. To rear brake hose | C. To brake tube |

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

REAR : Hydraulic Piping

INFOID:000000003811191



BRAKE PIPING

< ON-VEHICLE REPAIR >

- | | | |
|--|---------------------|-----------------------------|
| 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

REAR : Removal and Installation

INFOID:000000003811192

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-9, "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 copper washers, 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.

1. Assemble the union bolt and the copper washers 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 crowfoot and torque wrench.

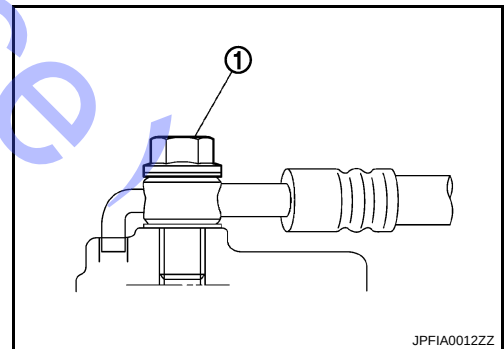
CAUTION:

Never scratch the flare nut and the brake tube.

5. Refill with new brake fluid and perform the air bleeding. Refer to [BR-10, "Bleeding Brake System"](#).

CAUTION:

Never reuse drained brake fluid.



REAR : Inspection

INFOID:000000003811193

INSPECTION AFTER INSTALLATION

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 785N (80 kg, 177 lb) and hold down the pedal for approximately 5 seconds with the engine running. Check for any fluid leakage.

CAUTION:

BRAKE PIPING

< ON-VEHICLE REPAIR >

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

@allyance,

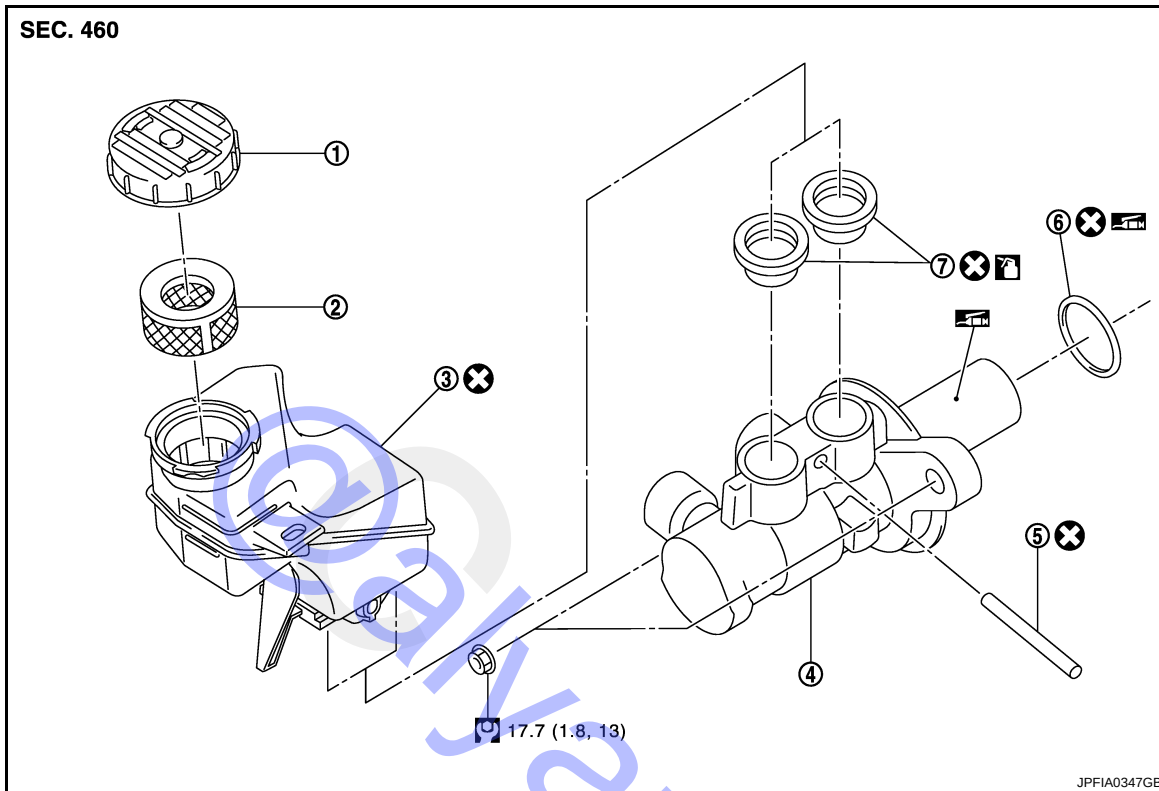
BRAKE MASTER CYLINDER

< ON-VEHICLE REPAIR >

BRAKE MASTER CYLINDER

Exploded View

INFOID:000000003811194



- | | | |
|------------------|-----------------|-------------------|
| 1. Reservoir cap | 2. Oil strainer | 3. Reservoir tank |
| 4. Cylinder body | 5. Pin | 6. O-ring |
| 7. 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:000000003811195

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-9, "Draining"](#).
2. Remove air duct and air cleaner case. Refer to [EM-26, "Exploded View"](#).
3. Separate the brake fluid level switch harness connector and harness clip.
4. Separate the brake tubes from the master cylinder assembly with a flare nut wrench.

CAUTION:

Never scratch the flare nut and the brake tube.

5. 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.

BRAKE MASTER CYLINDER

< ON-VEHICLE REPAIR >

- The piston may drop off when pulled out strongly. Never hold the piston. Hold the cylinder body when handling the master cylinder assembly.

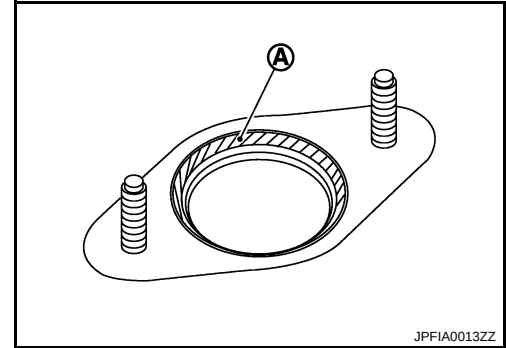
INSTALLATION

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 install the reverse order of removal.

- 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 crowfoot and torque wrench. Refer to [BR-19, "FRONT : Exploded View"](#).



CAUTION:

Never scratch the flare nut and the brake tube.

- After installation, perform the air bleeding. Refer to [BR-10, "Bleeding Brake System"](#).

CAUTION:

Never reuse drained brake fluid.

Disassembly and Assembly

INFOID:000000003811196

DISASSEMBLY

CAUTION:

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

1. Fix the master cylinder assembly to a vise.

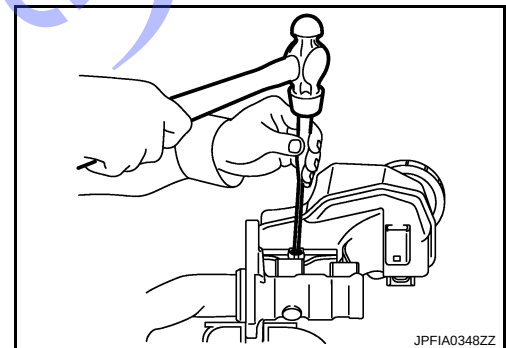
CAUTION:

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.



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.

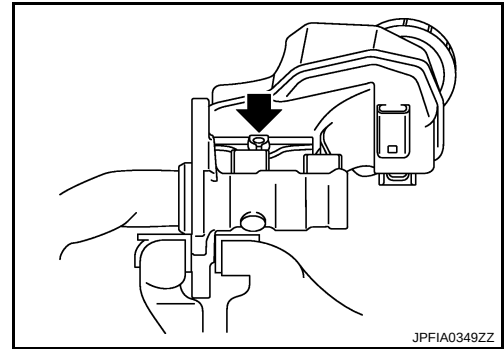
BRAKE MASTER CYLINDER

< ON-VEHICLE REPAIR >

3. Fix the cylinder body to a vise.

CAUTION:

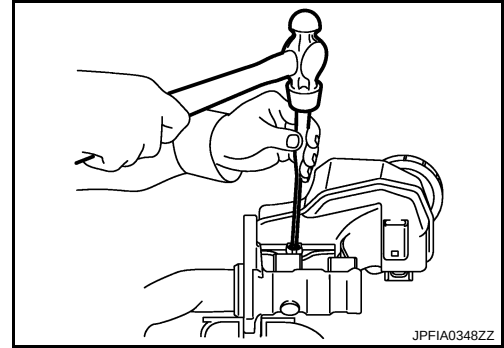
- Place the reservoir tank with the chamfered pin hole (↩) facing up.
- Always set copper plates or cloth between vise when fixing the cylinder body to a vise. Never overtighten the vise.



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.



INFOID:000000003811197

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.

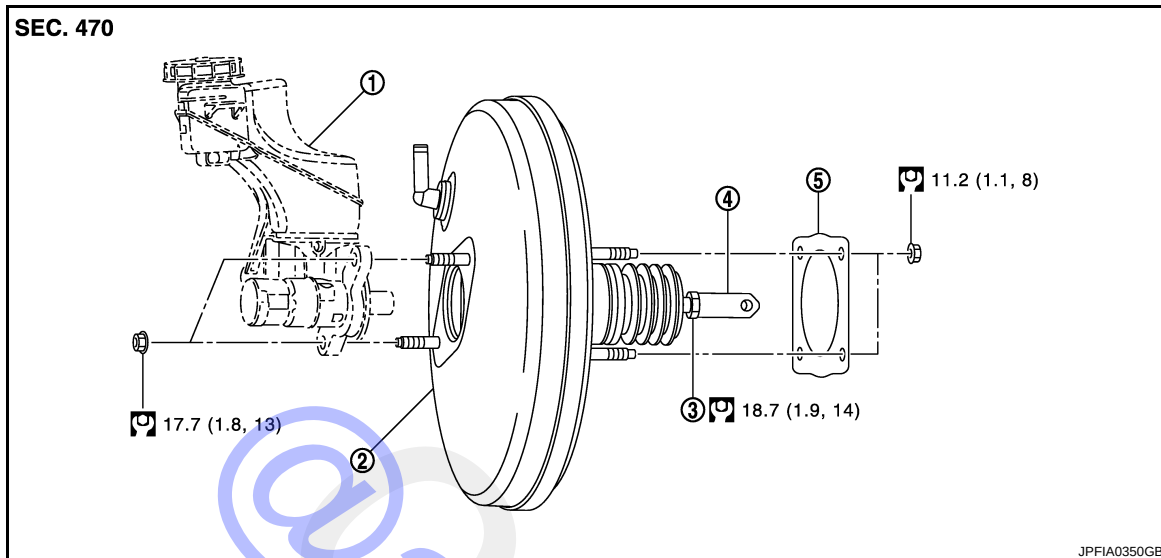
BRAKE BOOSTER

< ON-VEHICLE REPAIR >

BRAKE BOOSTER

Exploded View

INFOID:000000003811198



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

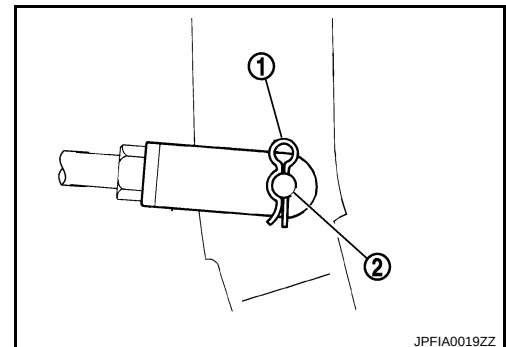
Refer to [GI-4, "Components"](#) for symbols in the figure.

Removal and installation

INFOID:000000003811199

REMOVAL

1. Remove brake master cylinder assembly. Refer to [BR-25, "Exploded View"](#).
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.
2. Remove vacuum hose from brake booster. Refer to [BR-31, "Exploded View"](#).
3. Remove snap pin (1) and clevis pin (2) from inside vehicle.
4. Remove nuts on brake booster and brake pedal assembly.
CAUTION:
Hold the brake booster so as to avoid dropping out.
5. Remove brake tube bracket and fuel feed tube bracket.
6. Remove brake booster from dash panel in engine room side.
CAUTION:
Never deform or bend the brake tubes.
NOTE:
If removing brake booster is difficult, remove clevis from brake booster.



INSTALLATION

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

- 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.

BRAKE BOOSTER

< ON-VEHICLE REPAIR >

- Replace the clevis pin if it is damaged. Refer to [BR-18, "Inspection and Adjustment"](#).
- After installation, perform the air bleeding. Refer to [BR-10, "Bleeding Brake System"](#).

CAUTION:

Never reuse drained brake fluid.

Inspection and Adjustment

INFOID:000000003811200

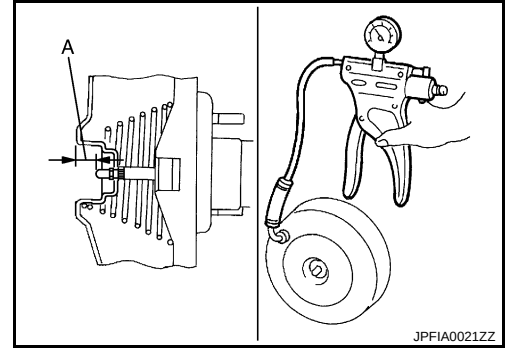
INSPECTION AFTER REMOVAL

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

A : Refer to [BR-45, "Brake Booster"](#).



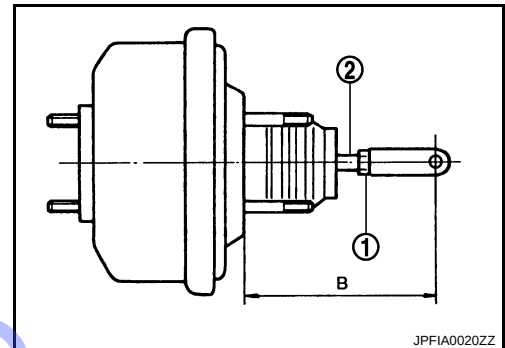
Input Rod Length Inspection

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

Standard

B : Refer to [BR-45, "Brake Booster"](#).

2. Tighten the lock nut to the specified torque.



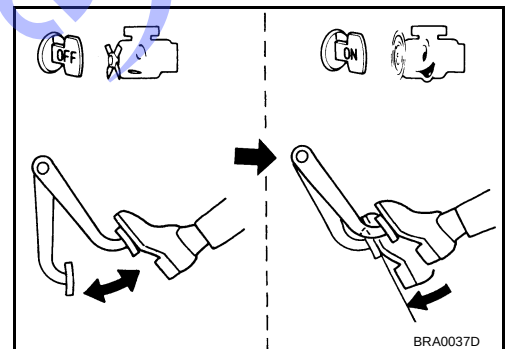
INSPECTION AFTER INSTALLATION

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.

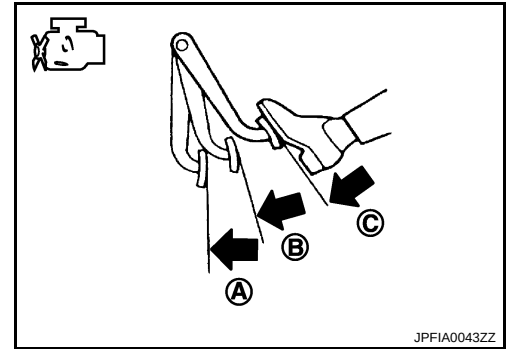


Air Tight

BRAKE BOOSTER

< ON-VEHICLE REPAIR >

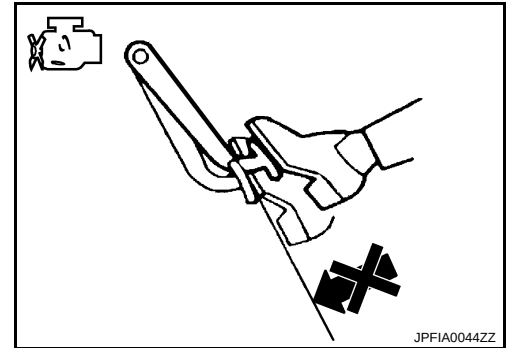
- Idle the engine for 1 minute to apply vacuum to the brake booster, and stop the engine. Then depress the brake pedal several times at 5-second intervals until the accumulated vacuum is released to atmospheric pressure. Check that the clearance between brake pedal and dash lower panel gradually increases (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 INSTALLATION

Perform the brake pedal adjustment after installing the brake pedal assembly. Refer to [BR-6, "Inspection and Adjustment"](#).

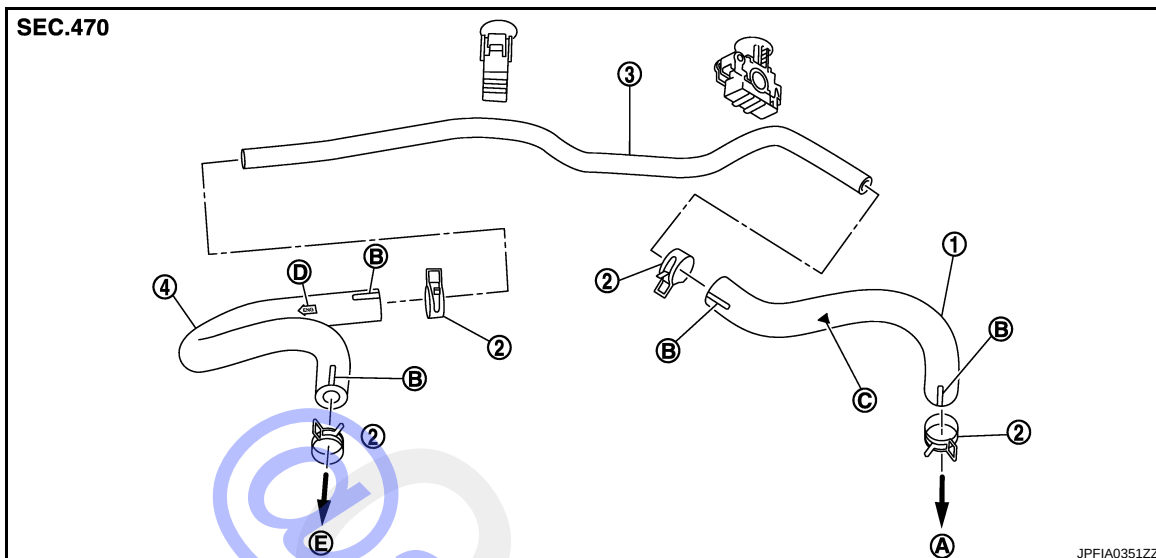
VACUUM LINES

< ON-VEHICLE REPAIR >

VACUUM LINES

Exploded View

INFOID:000000003811201



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

Removal and Installation

INFOID:000000003811202

REMOVAL

Remove the vacuum hose and tube.

INSTALLATION

Note the following, install the vacuum hose and tube.

- 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.
- When installing vacuum hose, insert it until its tip reaches the back-end of length (A) or further as shown in the figure.

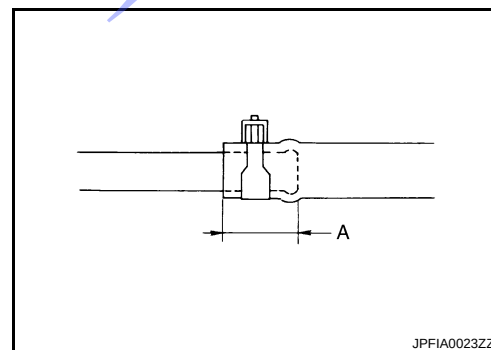
Standard

A : 24 mm (0.95 in) or more

- Face the marking side up when assembling of vacuum hose. (For both side of vacuum hose of intake manifold side.)
- Face the marking side vehicle front when assembling of vacuum hose. (For both side of vacuum hose of brake booster side)

CAUTION:

Never use lubricating oil during assembly.



Inspection

INFOID:000000003811203

INSPECTION AFTER REMOVAL

Appearance

Check for correct assembly, damage and deterioration.

Check Valve Airtightness

VACUUM LINES

< ON-VEHICLE REPAIR >

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

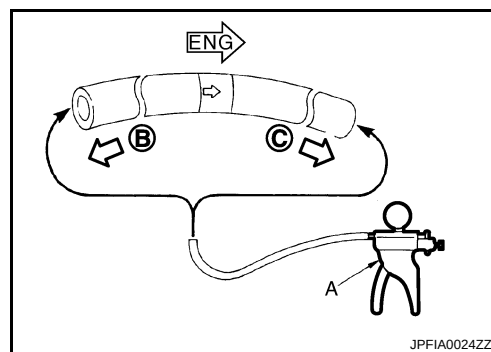
When connected to the brake booster side (B)

: Vacuum should decrease within 1.3 kPa (10 mmHg, 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.



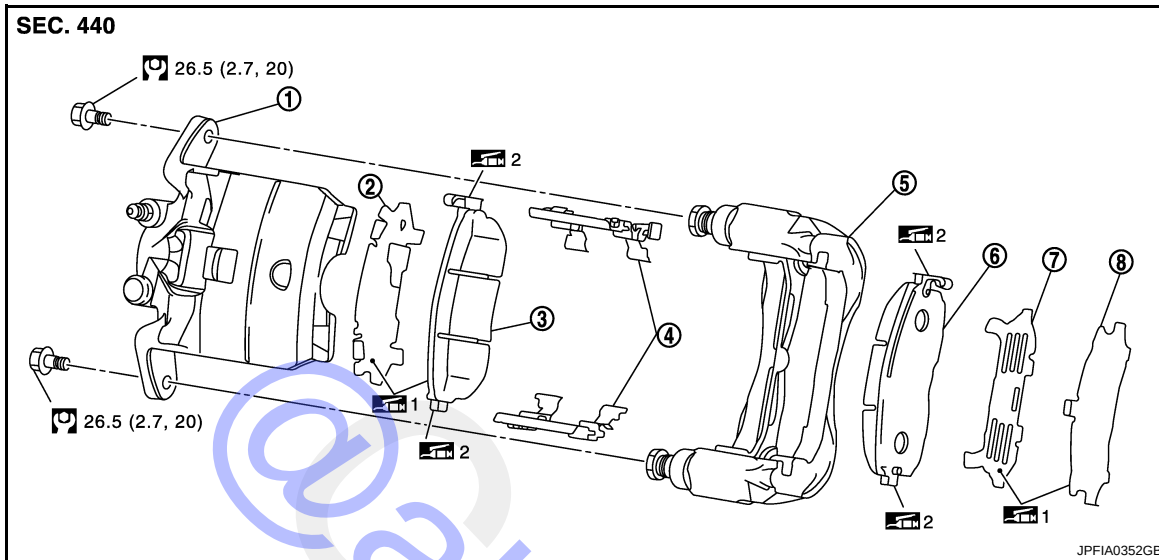
FRONT DISC BRAKE

< ON-VEHICLE REPAIR >

FRONT DISC BRAKE BRAKE PAD

BRAKE PAD : Exploded View

INFOID:000000003811204



- | | | |
|------------------|---------------------|-------------------------------------|
| 1. Cylinder body | 2. Inner shim | 3. Inner pad (with pad wear sensor) |
| 4. Pad retainer | 5. Torque member | 6. Outer pad (with pad wear sensor) |
| 7. Outer shim | 8. Outer shim cover | |

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

2: Apply copper based brake grease.

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

BRAKE PAD : Removal and Installation

INFOID:000000003811205

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 pads, shims and shim cover 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 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.

FRONT DISC BRAKE

< ON-VEHICLE REPAIR >

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 brake pads and pad retainers.
3. Apply PBC (Poly Butyl Cuprysil) grease or silicone-based grease to the mating faces between the brake pads, shims and shim cover, and install them to the brake pad.
CAUTION:
Always replace the shims together with the shim cover when replacing the brake pad.
4. 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.
5. Install the lower sliding pin bolt and tighten it to the specified torque.
6. Depress the brake pedal several times to check that no drag feel is present for the front disc brake. Refer to [BR-34, "BRAKE PAD : Inspection"](#).

BRAKE PAD : Inspection

INFOID:000000003811206

INSPECTION AFTER REMOVAL

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

INSPECTION AFTER INSTALLATION

1. Check a drag of front disc brake. If any drag is found, follow the procedure described below.
2. Remove brake pads.
3. Press the piston.
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 brake pads.
5. Depress the brake pedal several times.
6. Check a drag of front disc brake again. If any drag is found, disassemble the cylinder body. Refer to [BR-36, "BRAKE CALIPER ASSEMBLY : Disassembly and Assembly"](#).
7. Burnish contact surfaces after refinishing or replacing pads, or if a soft pedal occurs at very low mileage. Refer to [BR-13, "BRAKE PAD : Inspection and Adjustment"](#).

BRAKE CALIPER ASSEMBLY

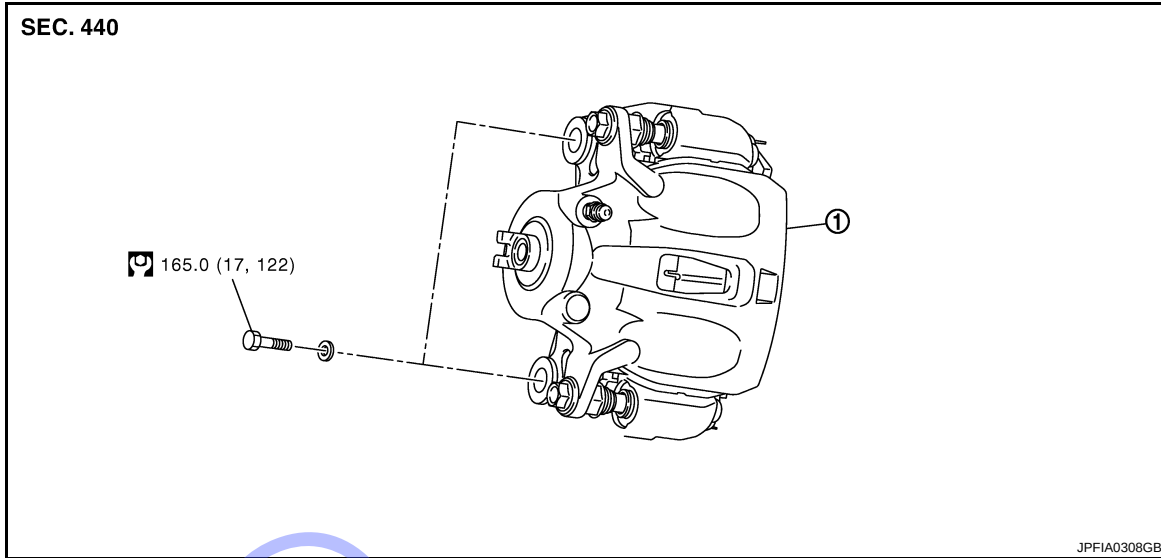
BRAKE CALIPER ASSEMBLY : Exploded View

INFOID:000000003811207

REMOVAL

FRONT DISC BRAKE

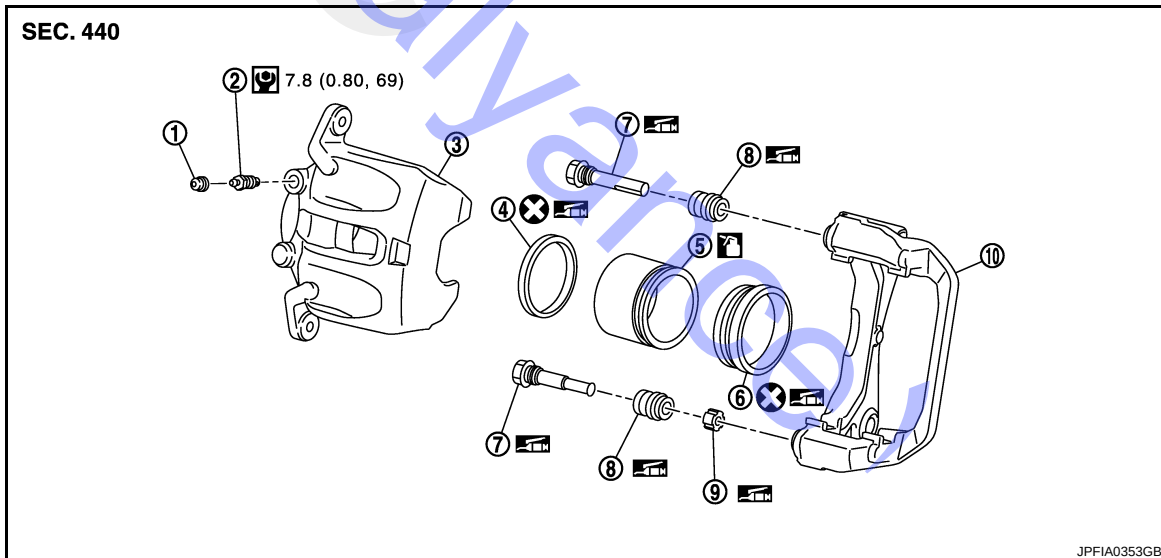
< ON-VEHICLE REPAIR >



1. Brake caliper assembly

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

DISASSEMBLY



- | | | |
|-------------------|---------------------|------------------|
| 1. Cap | 2. Bleeder valve | 3. Cylinder body |
| 4. Piston seal | 5. Piston | 6. Piston boot |
| 7. Sliding pin | 8. Sliding pin boot | 9. Bushing |
| 10. Torque member | | |

: Apply rubber grease.

: Apply brake fluid.

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

BRAKE CALIPER ASSEMBLY : Removal and Installation

INFOID:000000003811208

REMOVAL

WARNING:

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

FRONT DISC BRAKE

< ON-VEHICLE REPAIR >

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-9, "Draining"](#).

CAUTION:

Never spill or splash brake fluid on the disc rotor.

4. Remove union bolt and copper washers, and then disconnect brake hose from caliper assembly. Refer to [BR-19, "FRONT : Exploded View"](#).
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 put 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 and copper washers to brake caliper assembly, and tighten union bolts to the specified torque. Refer to [BR-19, "FRONT : Exploded View"](#).

CAUTION:

Never reuse copper washer.

4. Refill with new brake fluid and perform the air bleeding. Refer to [BR-10, "Bleeding Brake System"](#).

CAUTION:

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

5. Check a drag of front disc brake. If any drag is found, refer to [BR-38, "BRAKE CALIPER ASSEMBLY : Inspection"](#).

BRAKE CALIPER ASSEMBLY : Disassembly and Assembly

INFOID:000000003811209

DISASSEMBLY

NOTE:

Never remove the torque member 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 brake pads, shims, shim cover and pad retainers from torque member.

2. Remove brake pads, shims and shim cover. Refer to [BR-33, "BRAKE PAD : Exploded View"](#).
3. Remove sliding pins and sliding pin boots from torque member.
4. Remove bushing from sliding pin.

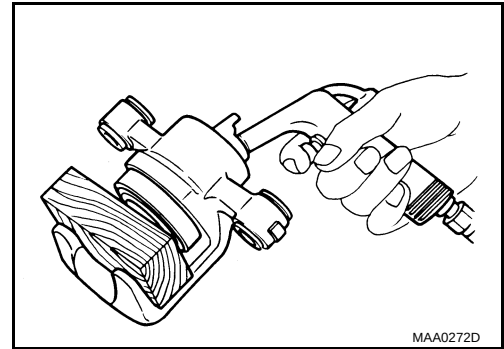
FRONT DISC BRAKE

< ON-VEHICLE REPAIR >

5. 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.

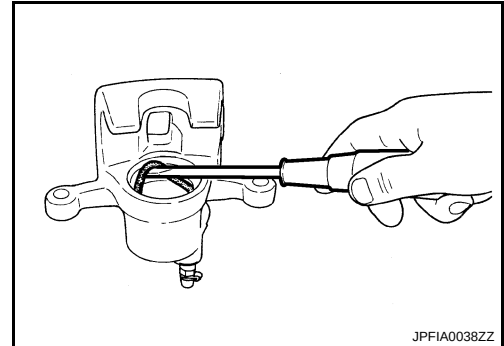


6. Remove piston seal from cylinder body using suitable tool.

CAUTION:

Be careful not to damage a cylinder inner wall.

7. Remove bleeder valve and cap.

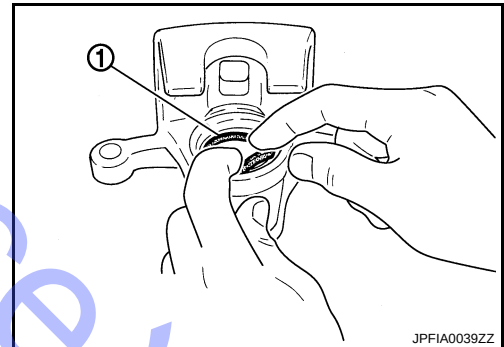


ASSEMBLY

1. Install bleeder valve and cap.
2. Apply rubber grease to piston seal (1), and install to cylinder body.

CAUTION:

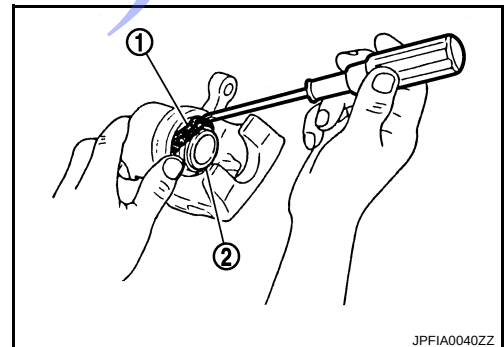
Never reuse piston seal.



3. 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.



FRONT DISC BRAKE

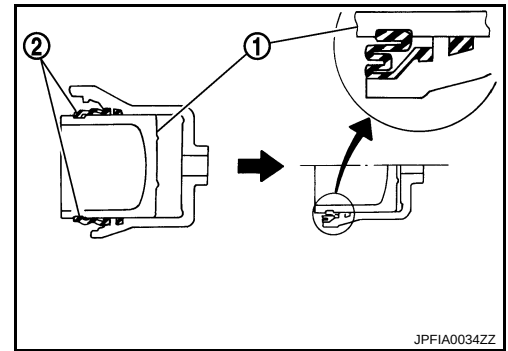
< ON-VEHICLE REPAIR >

4. 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.

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



BRAKE CALIPER ASSEMBLY : Inspection

INFOID:000000003811210

INSPECTION AFTER DISASSEMBLY

Cylinder Body

Check the inner wall of the cylinder for rust, wear, cracks or damage. Replace if necessary.

CAUTION:

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

Torque Member

Check the torque member for rust, wear, cracks or damage. Replace if necessary.

Piston

Check the surface of the piston for rust, wear, cracks or damage. Replace if necessary.

CAUTION:

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

Sliding Pin, Sliding Pin Boot and Bushing

Check the sliding pins, sliding boot and bushing for rust, wear, cracks or damage. Replace if necessary.

INSPECTION AFTER INSTALLATION

1. Check a drag of front disc brake. If any drag is found, follow the procedure described below.
2. Remove brake pads.
3. Press the piston.

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 brake pads.
5. Depress the brake pedal several times.
6. Check a drag of front disc brake again. If any drag is found, disassemble the cylinder body. Refer to [BR-36, "BRAKE CALIPER ASSEMBLY : Disassembly and Assembly"](#).
7. Burnish contact surfaces after refinishing or replacing disc rotors, or if a soft pedal occurs at very low mileage. Refer to [BR-13, "DISC ROTOR : Inspection and Adjustment"](#).

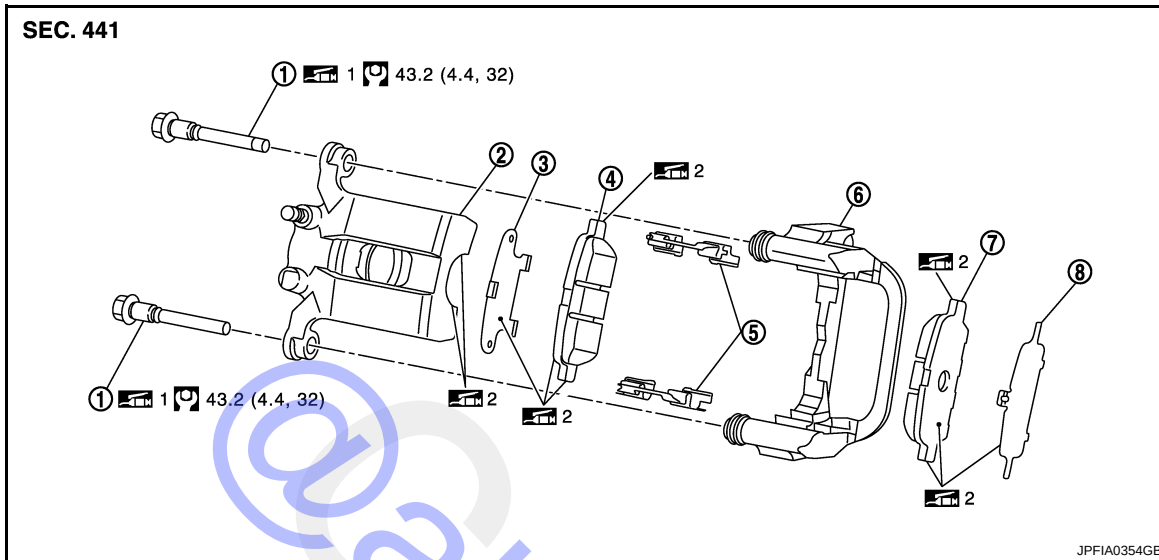
REAR DISC BRAKE

< ON-VEHICLE REPAIR >

REAR DISC BRAKE BRAKE PAD

BRAKE PAD : Exploded View

INFOID:000000003811211



BRAKE PAD : Removal and Installation

INFOID:000000003811212

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.

1. Remove tires.
2. Remove the upper sliding pin bolt.
3. Suspend the cylinder body with suitable wire so that the brake hose will not stretch. Remove the brake pads and shims 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 and shims.

INSTALLATION

WARNING:

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

CAUTION:

REAR DISC BRAKE

< ON-VEHICLE REPAIR >

- **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 PBC (Poly Butyl Cuprysil) grease or silicone-based grease to the mating faces between the brake pads, the shims and pawls part of cylinder body, and install them to the brake pad.
CAUTION:
Always replace the shims together when replacing the brake pad.
 3. Install cylinder body and brake pads to torque member.
CAUTION:
 - **Never damage the piston boot.**
 - **When replacing 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 upper 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. Refer to [BR-40, "BRAKE PAD : Inspection"](#).

BRAKE PAD : Inspection

INFOID:000000003811213

INSPECTION AFTER REMOVAL

Replace the shims if rust is excessively attached.

INSPECTION AFTER INSTALLATION

1. Check a drag of rear disc brake. If any drag is found, follow the procedure described below.
2. Remove brake pads.
3. Press the piston.
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 brake pads.
5. Depress the brake pedal several times.
6. Check a drag of rear disc brake again. If any drag is found, disassemble the cylinder body. Refer to [BR-42, "BRAKE CALIPER ASSEMBLY : Disassembly and Assembly"](#).
7. Burnish contact surfaces after refinishing or replacing pads, or if a soft pedal occurs at very low mileage. Refer to [BR-15, "BRAKE PAD : Inspection and Adjustment"](#).

BRAKE CALIPER ASSEMBLY

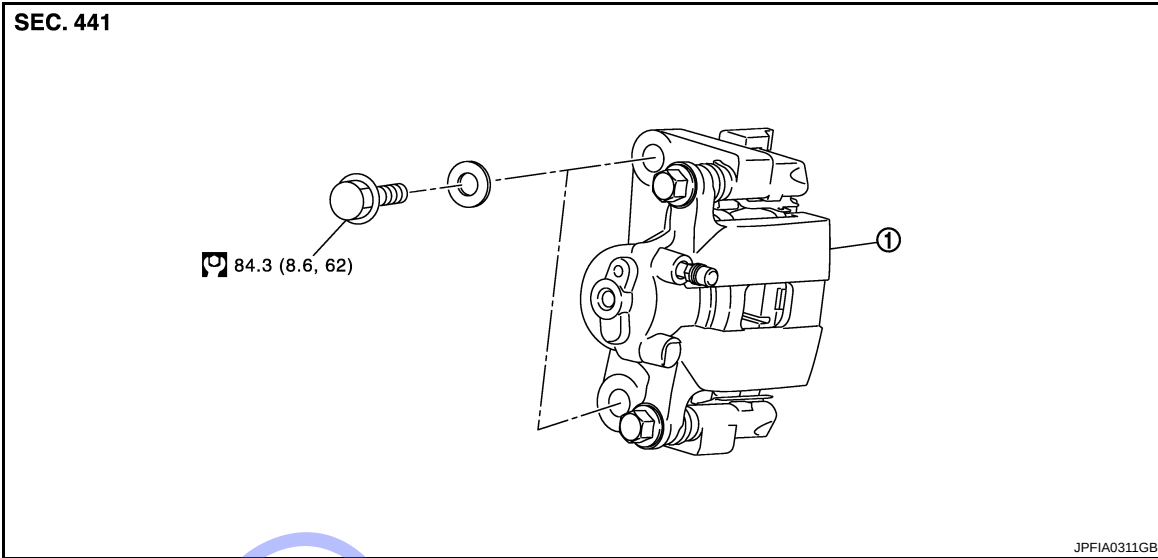
BRAKE CALIPER ASSEMBLY : Exploded View

INFOID:000000003811214

REMOVAL

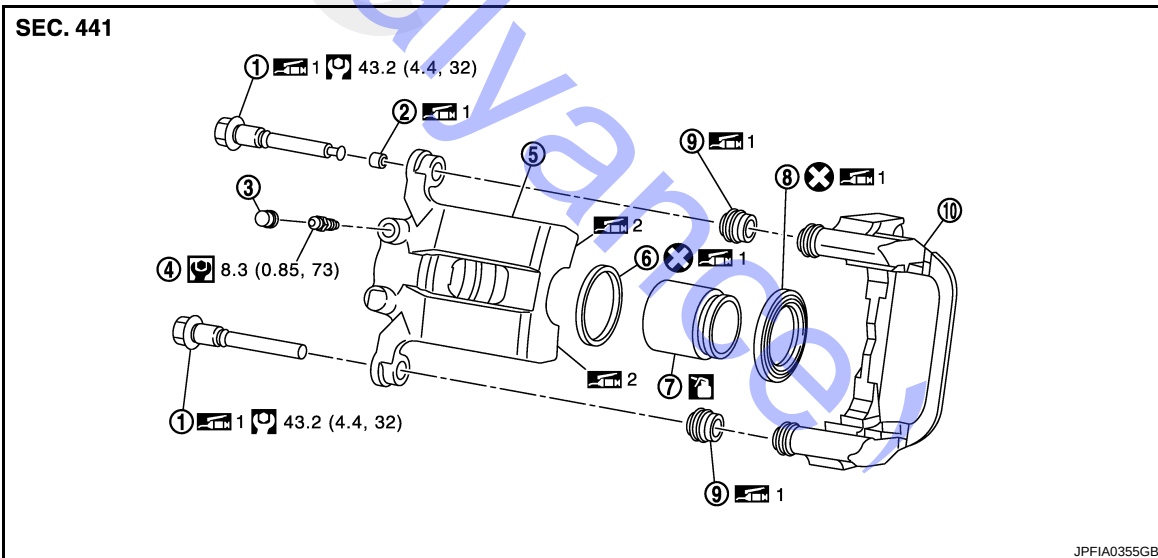
REAR DISC BRAKE

< ON-VEHICLE REPAIR >



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

DISASSEMBLY



- | | | |
|---------------------|------------------|---------------------|
| 1. Sliding pin bolt | 2. Bushing | 3. Cap |
| 4. Bleeder valve | 5. Cylinder body | 6. Piston seal |
| 7. Piston | 8. Piston boot | 9. Sliding pin boot |
| 10. Torque member | | |

1: Apply rubber grease.

2: 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.

BRAKE CALIPER ASSEMBLY : Removal and Installation

INFOID:000000003811215

REMOVAL

WARNING:

REAR DISC BRAKE

< ON-VEHICLE REPAIR >

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-9, "Draining"](#).

CAUTION:

Never spill or splash brake fluid on the disc rotor.

4. Remove union bolt and copper washers then disconnect brake hose 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 put 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 and copper washers to brake caliper assembly, and tighten union bolts to the specified torque. Refer to [BR-22, "REAR : Exploded View"](#).

CAUTION:

Never reuse copper washer.

4. Refill with new brake fluid and perform the air bleeding. Refer to [BR-10, "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. Refer to [BR-44, "BRAKE CALIPER ASSEMBLY : Inspection"](#).

BRAKE CALIPER ASSEMBLY : Disassembly and Assembly

INFOID:000000003811216

DISASSEMBLY

NOTE:

Never remove the torque member 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.
2. Remove brake pads and shims. Refer to [BR-39, "BRAKE PAD : Exploded View"](#).
3. Remove sliding pin boots from torque member.
4. Remove bushing from sliding pin bolt.

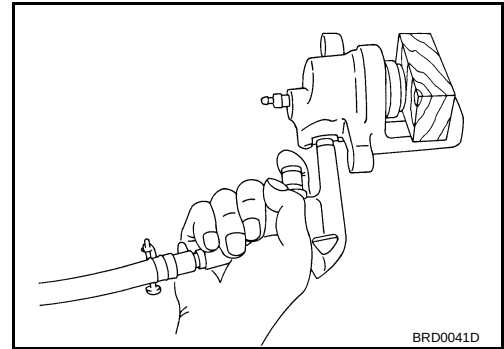
REAR DISC BRAKE

< ON-VEHICLE REPAIR >

5. 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.

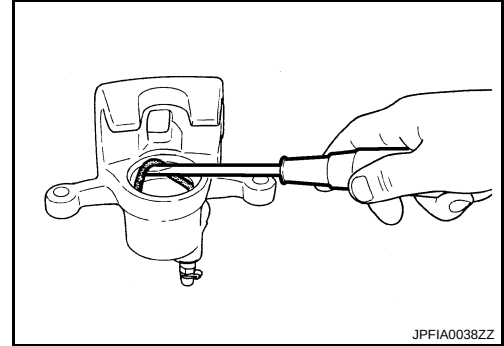


6. Remove piston seal from cylinder body using suitable tool.

CAUTION:

Be careful not to damage a cylinder inner wall.

7. Remove bleeder valve and cap.

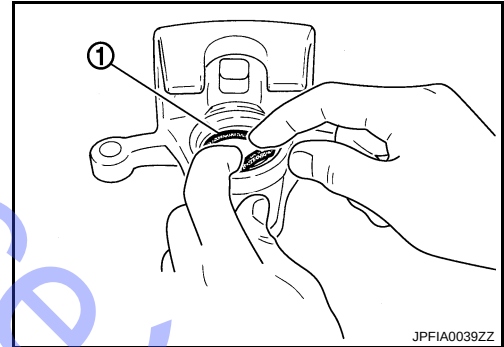


ASSEMBLY

1. Install bleeder valve and cap.
2. Apply rubber grease to piston seal (1), and install to cylinder body.

CAUTION:

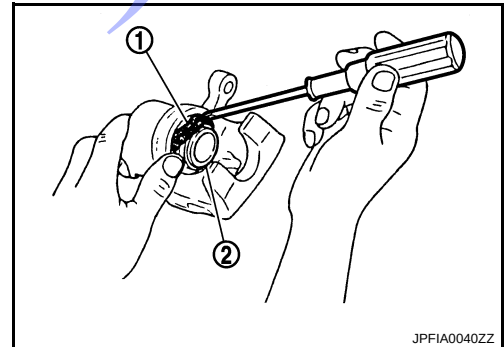
Never reuse piston seal.



3. 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.



REAR DISC BRAKE

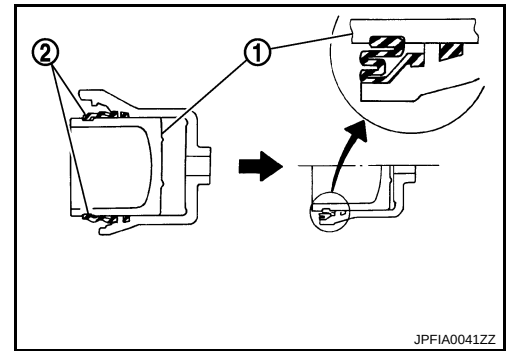
< ON-VEHICLE REPAIR >

4. 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.

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



BRAKE CALIPER ASSEMBLY : Inspection

INFOID:000000003811217

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.

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, Sliding Pin Boot and Bushing

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

INSPECTION AFTER INSTALLATION

1. Check a drag of rear disc brake. If any drag is found, follow the procedure described below.
2. Remove brake pads.
3. Press the piston.

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 brake pads.
5. Depress the brake pedal several times.
6. Check a drag of rear disc brake again. If any drag is found, disassemble the cylinder body. Refer to [BR-42, "BRAKE CALIPER ASSEMBLY : Disassembly and Assembly"](#).
7. Burnish contact surfaces after refinishing or replacing disc rotors, or if a soft pedal occurs at very low mileage. Refer to [BR-15, "DISC ROTOR : Inspection and Adjustment"](#).

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

General Specifications

INFOID:000000003811218

Unit: mm (in)

Front brake	Cylinder bore diameter	57.2 (2.252)
	Pad length × width × thickness	126.0 × 46.0 × 11.0 (4.96 × 1.811 × 0.433)
	Rotor outer diameter × thickness	296 × 26.0 (11.65 × 1.024)
Rear brake	Cylinder bore diameter	34.93 (1.3752)
	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	278 (10.94)
Recommended brake fluid		DOT 3 or DOT 4

Brake Pedal

INFOID:000000003811219

Unit: mm (in)

Item	Standard
Brake pedal height	191.7 – 201.7 (7.55 – 7.94)
Clearance between stopper rubber and stop lamp switch and ASCD brake switch threaded end	0.74 – 1.96 (0.0291 – 0.0772)
Brake pedal play	3.0 – 11.0 (0.118 – 0.433)
Depressed brake pedal height [Depressing 490 N (50 kg, 110 lb) while turning the engine ON]	103 (4.06) or more

Brake Booster

INFOID:000000003811220

Unit: mm (in)

Item	Standard
Output rod length	30.4 – 30.6 (11.97 – 12.05)
Input rod length	126.5 (4.98)

Front Disc Brake

INFOID:000000003811221

Unit: mm (in)

Item		Limit
Brake pad	Wear thickness	2.0 (0.079)
	Wear thickness	24.0 (0.945)
Disc rotor	Runout (with it attached to the vehicle)	0.040 (0.0016) or less

Rear Disc Brake

INFOID:000000003811222

Unit: mm (in)

Item		Limit
Brake pad	Wear thickness	2.0 (0.079)
	Wear thickness	8.0 (0.315)
Disc rotor	Runout (with it attached to the vehicle)	0.050 (0.0020) or less