

SECTION BR
BRAKE SYSTEM

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PRECAUTIONS

< PRECAUTION >

PRECAUTION

PRECAUTIONS

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

INFOID:000000009267516

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 SR and SB section of this Service Manual.

WARNING:

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SR section.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

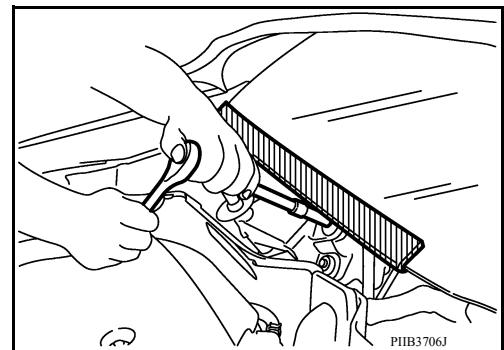
WARNING:

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

Precaution for Procedure without Cowl Top Cover

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



Precaution for Brake System

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WARNING:

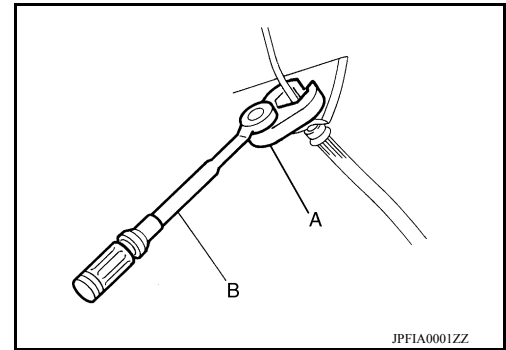
Clean any dust from the front brake and rear brake with a vacuum dust collector. Do not blow with compressed air.

- Brake fluid use refer to [MA-12. "Fluids and Lubricants"](#).
- Do not reuse drained brake fluid.
- Do not 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 confirm the specified tightening torque when installing the brake pipes.
- After pressing the brake pedal more deeply or harder than normal driving, such as air bleeding, check each item of brake pedal. Adjust brake pedal if it is outside the standard value.

PRECAUTIONS

< PRECAUTION >

- Always clean with new brake fluid when cleaning the brake caliper and other components.
- Do not 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 a crow-foot (A) and torque wrench (B).
- Brake system is an important safety part. If a brake fluid leak is detected, always disassemble the affected part. If a malfunction is detected, replace part with a new one.
- Always connect the battery terminals when moving the vehicle.
- Turn the ignition switch OFF and disconnect the hydraulic booster assembly harness 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-15, "BRAKE PAD : Inspection and Adjustment"](#).
- Front disc rotor: Refer to [BR-15, "DISC ROTOR : Inspection and Adjustment"](#).
- Rear brake lining: refer to [BR-17, "BRAKE LINING : Inspection and Adjustment"](#).
- Rear brake drum: [BR-17, "BRAKE DRUM : Inspection and Adjustment"](#).



PREPARATION

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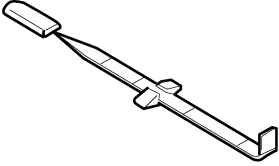
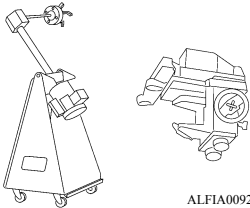
PREPARATION

PREPARATION

Special Service Tool

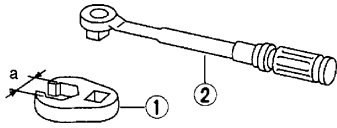
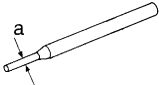

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The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
<p>— (J-46532) Brake and clutch pedal height measurement tool</p>  <p style="text-align: center;">LFIA0227E</p>	Measuring brake pedal height
<p>38-PFM90.5 (—) Pro-Cut PFM 90 On-Car Brake Lathe</p>  <p style="text-align: center;">ALFIA0092ZZ</p>	Turning rotors

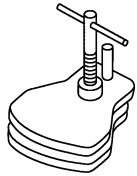

Commercial Service Tool

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Tool name	Description
<p>1. Flare nut crowfoot 2. Torque wrench</p>  <p style="text-align: center;">NT360</p>	<p>Removing and installing brake pipe and hose flare nuts a: 10 mm (0.39 in)/ 12 mm (0.47 in)</p>
<p>Pin punch</p>  <p style="text-align: center;">NT410</p>	<p>Removing and installing reservoir tank a: 4 mm (0.16 in)</p>
<p>Vacuum pump</p>  <p style="text-align: center;">ZZC1313D</p>	<ul style="list-style-type: none"> • Air tight • Inspection of check valve

PREPARATION

< PREPARATION >

Tool name	Description
Brake caliper wrench (front)  NNFIA0040ZZ	Return the piston
Power tool  PIIB1407E	Loosening nuts, screws and bolts

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

< SYMPTOM DIAGNOSIS >

SYMPTOM DIAGNOSIS

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

INFOID:000000009267521

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					
		Pads or lining damaged	Pads or lining uneven wear	Shims damaged	Rotor imbalance	Rotor or drum damage	Rotor runout	Rotor deformation	Rotor or drum deflection	Rotor or drum rust	Rotor thickness variation	Drum out of round		AXLE AND SUSPENSION	TIRE	ROAD WHEEL	DRIVE SHAFT	STEERING
	Noise	x	x	x														BR-15 , BR-17
	Shake				x													BR-15 , BR-17
	Shimmy, Shudder				x	x	x	x	x	x	x							BR-36 BR-15 BR-15 , BR-17 BR-15 BR-15 , BR-17 BR-15 BR-15 , BR-17 BR-15 BR-17
																		FAX-6 , " NVH Troubleshooting Chart " (front axle) RSU-4 , " NVH Troubleshooting Chart " (rear axle) FSU-5 , " NVH Troubleshooting Chart " (front suspension) RSU-4 , " NVH Troubleshooting Chart " (rear suspension) WT-37 , " NVH Troubleshooting Chart " (wheel and tire) WT-37 , " NVH Troubleshooting Chart " (wheel and tire) FAX-6 , " NVH Troubleshooting Chart " (front axle) ST-7 , " NVH Troubleshooting Chart " (steering system)

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BRAKE PEDAL

< PERIODIC MAINTENANCE >

PERIODIC MAINTENANCE

BRAKE PEDAL

Inspection and Adjustment

INFOID:000000009267522

INSPECTION

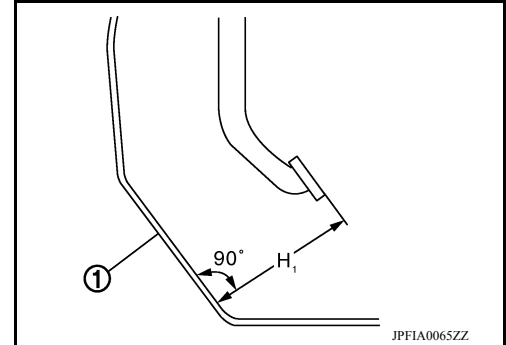
Brake Pedal Height

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

(H_1) : Refer to [BR-45, "Brake Pedal"](#).

CAUTION:

Remove the floor trim.



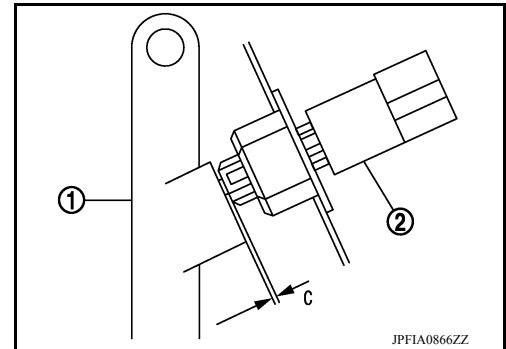
Stop Lamp Switch

Check the clearance (C) among the brake pedal lever (1) and the stop lamp switch (2) threaded end.

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

CAUTION:

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



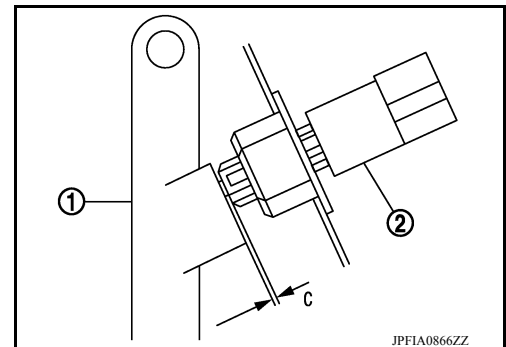
ASCD Cancel Switch

Check the clearance (C) among the brake pedal lever (1) and the ASCD cancel switch (2) threaded end.

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

CAUTION:

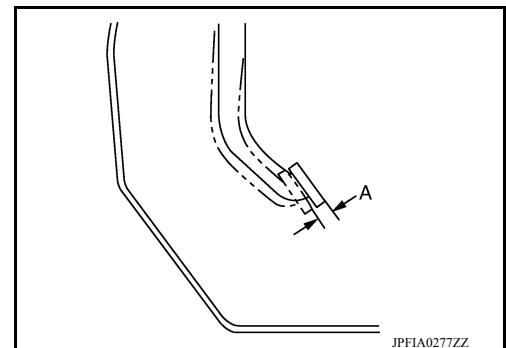
The stop lamp must turn off when the brake pedal is released.



Brake Pedal Play

Press the brake pedal. Check the brake pedal play (A) (stroke until fluid pressure occurs).

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



Depressed Brake Pedal Height

BRAKE PEDAL

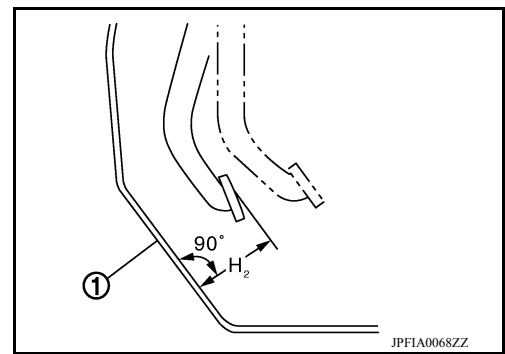
< PERIODIC MAINTENANCE >

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

(H₂) : Refer to [BR-45, "Brake Pedal"](#).

CAUTION:

Remove the floor trim.



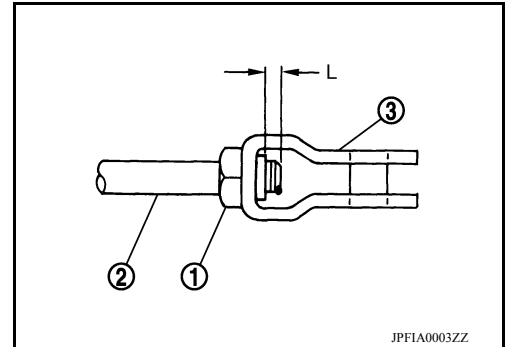
ADJUSTMENT

Brake Pedal Height

1. Remove instrument lower panel LH. Refer to [IP-20, "Removal and Installation"](#).
2. Disconnect the harness connector from stop lamp switch.
3. Loosen the stop lamp switch 45° counterclockwise.
4. Adjust the brake pedal height with the following procedure.
- a. Loosen the input rod lock nut (1).

CAUTION:

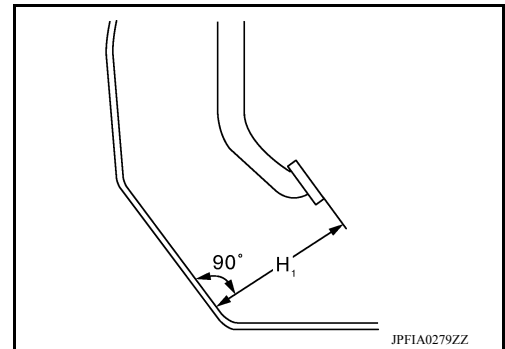
The threaded end of the input rod (2) must project to the inner side (L) of the clevis (3).



- b. Rotate the input rod, adjust the brake pedal to the specified height (H₁).

(H₁) : Refer to [BR-45, "Brake Pedal"](#).

- c. Tighten the lock nut. Refer to [BR-30, "Exploded View"](#).
5. Check the brake pedal play.



Stop Lamp Switch

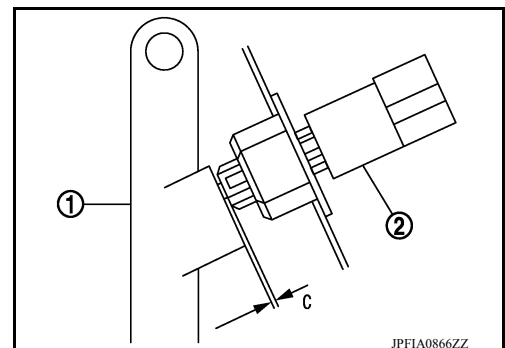
1. Remove instrument lower panel LH. Refer to [IP-20, "Removal and Installation"](#).
2. Disconnect the harness connector from stop lamp switch.
3. Loosen the stop lamp switch 45° counterclockwise.
4. Press-fit the stop lamp switch (2) until the stop lamp switch hits the brake pedal lever (1) 45° clockwise while pulling the brake pedal pad slightly.

CAUTION:

The clearance (C) between the brake pedal lever and stop lamp switch threaded and must be the specified value.

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

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



BRAKE PEDAL

< PERIODIC MAINTENANCE >

ASCD Cancel Switch

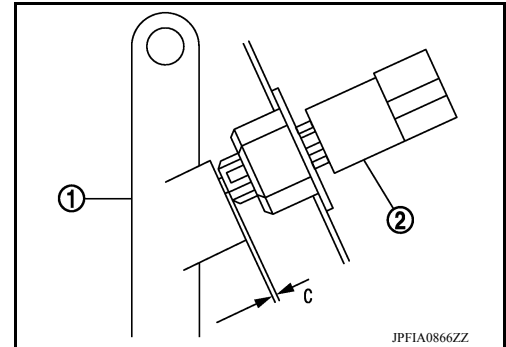
1. Remove instrument lower panel LH. Refer to [IP-20, "Removal and Installation"](#).
2. Disconnect the harness connector from ASCD cancel switch.
3. Loosen the stop lamp switch 45° counterclockwise.
4. Press-fit the ASCD cancel switch (2) until the ASCD cancel switch hits the brake pedal lever (1) 45° clockwise while pulling the brake pedal pad slightly.

CAUTION:

- The clearance (C) between the brake pedal lever and ASCD cancel switch threaded and must be the specified value.

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

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



BRAKE FLUID

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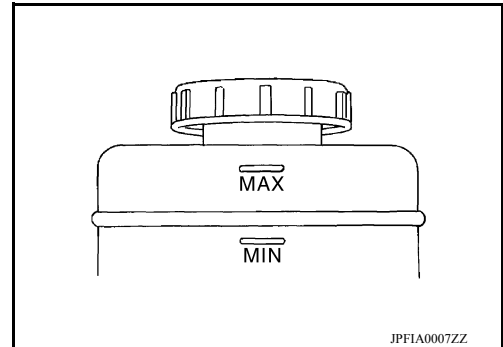
BRAKE FLUID

Inspection

INFOID:000000009267523

BRAKE FLUID LEVEL

- Check that the fluid level in the reservoir tank is within the specified range between the MAX – MIN lines as shown.
- 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.
- Check the reservoir tank for the mixing of foreign matter (e.g. dust) and oils other than brake fluid.

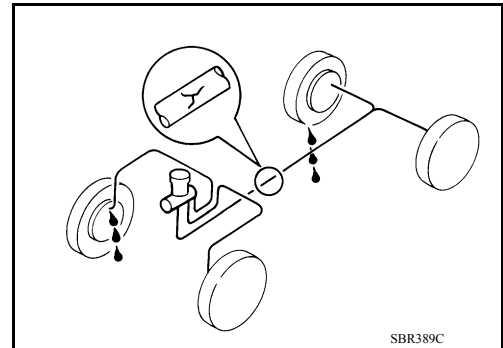


BRAKE LINE

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

CAUTION:

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



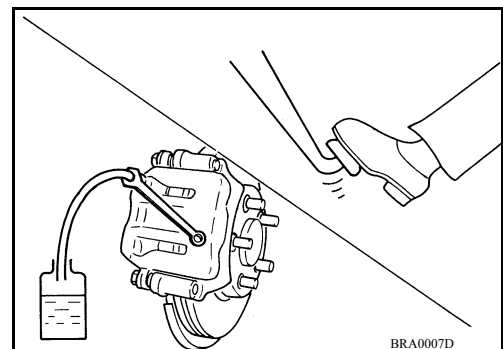
Draining

INFOID:000000009267524

CAUTION:

- Do not 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 battery negative terminal before performing work.

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:000000009267525

CAUTION:

- Turn the ignition switch OFF and disconnect battery negative terminal before performing work.
- Do not 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.

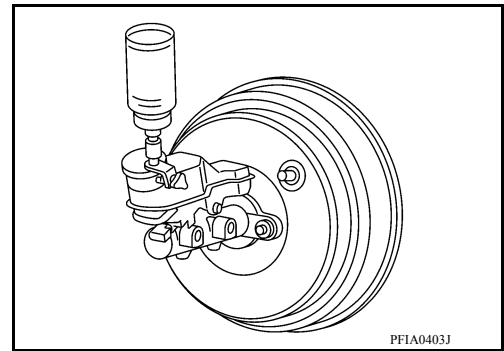
BRAKE FLUID

< PERIODIC MAINTENANCE >

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

CAUTION:

- Do not reuse drained brake fluid.
 - Do not allow foreign matter (e.g., dust) and oils other than brake fluid to enter the reservoir tank.
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 new 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

INFOID:000000009267526

CAUTION:

- Turn the ignition switch OFF and disconnect battery negative terminal before performing the work.
 - Monitor the fluid level in the reservoir tank while performing the air bleeding
 - Do not 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 use new brake fluid for refilling. Do not reuse the drained brake fluid.
 - Do not allow foreign matter (e.g. dust) and oils other than brake fluid to enter the reservoir tank.
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-36, "BRAKE CALIPER ASSEMBLY : Exploded View"](#).
 - Rear drum brake: refer to [BR-41, "Exploded View"](#).
 6. Perform steps 1 to 5. Occasionally fill with the brake fluid in order to keep the reservoir tank at least half of MAX line. Bleed air in the following order: 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"](#).
 8. Check each item of brake pedal. Adjust it if the measurement value is not the standard. Refer to [BR-8, "Inspection and Adjustment"](#).

BRAKE MASTER CYLINDER

< PERIODIC MAINTENANCE >

BRAKE MASTER CYLINDER

Inspection

INFOID:000000009267527

FLUID LEAK

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

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BRAKE BOOSTER

< PERIODIC MAINTENANCE >

BRAKE BOOSTER

Inspection

INFOID:000000009267528

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

1. Run the engine at idle 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 each time the brake pedal is depressed when performing this operation.
2. 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.

FRONT DISC BRAKE

< PERIODIC MAINTENANCE >

FRONT DISC BRAKE

BRAKE PAD

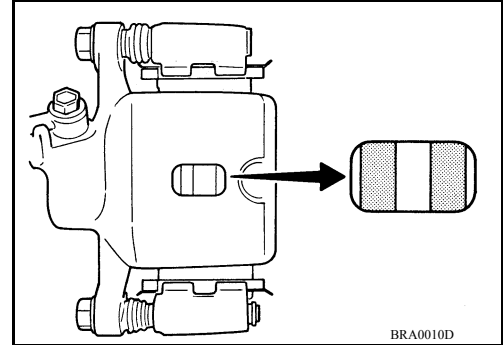
BRAKE PAD : Inspection and Adjustment

INFOID:000000009267529

INSPECTION

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

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



ADJUSTMENT

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

CAUTION:

- 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:000000009267530

INSPECTION

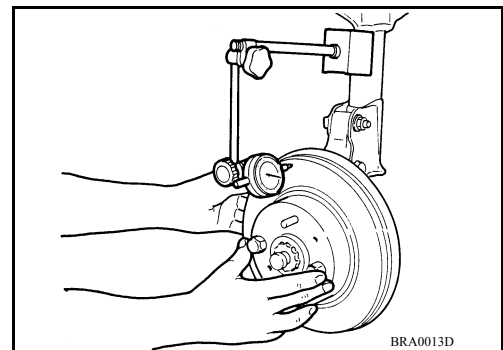
Appearance

Check surface of disc rotor for uneven wear, cracks, and serious damage. Replace it if necessary. Refer to [BR-15, "DISC ROTOR : Inspection and Adjustment"](#).

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-7, "Inspection"](#).
3. Inspect the runout with a dial indicator to measure at 10 mm (0.39 in) inside the disc edge.

Runout (with it attached to the vehicle) : Refer to [BR-45, "Front Disc Brake"](#).



4. Find the installation position that has 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. Refinish or replace the disc rotor if the runout is outside the limit even after performing the above operation.

CAUTION:

If the thickness is less than wear thickness + 0.3 mm (0.012 in), replace the disc rotor. Refer to [BR-37, "BRAKE CALIPER ASSEMBLY : Removal and Installation"](#).

FRONT DISC BRAKE

< PERIODIC MAINTENANCE >

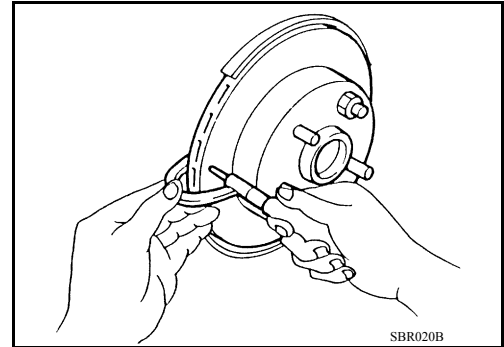
Wear thickness : Refer to [BR-45, "Front Disc Brake"](#).

Thickness

Check the thickness of the disc rotor using a micrometer. Replace the disc rotor if the thickness is below the wear limit. Refer to [BR-45, "Front Disc Brake"](#).

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

Thickness variation (measured at 8 positions) : Refer to [BR-45, "Front Disc Brake"](#).



ADJUSTMENT

Burnish contact surfaces between disc rotors and brake 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 firmly/securely 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 DRUM BRAKE

< PERIODIC MAINTENANCE >

REAR DRUM BRAKE BRAKE LINING

BRAKE LINING : Inspection and Adjustment

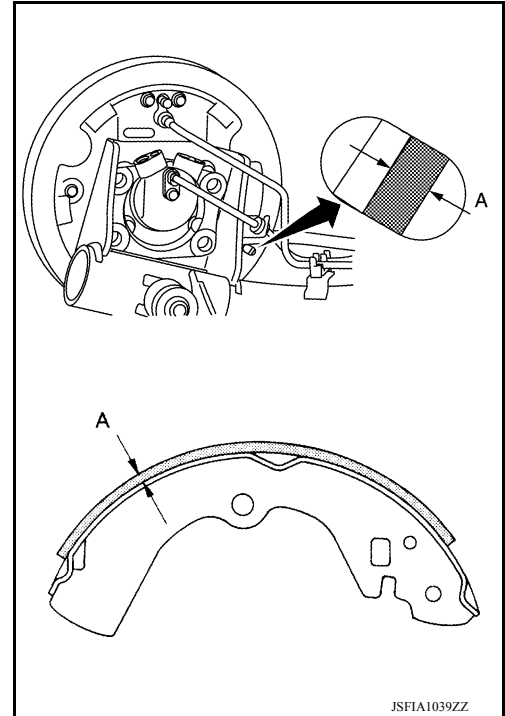
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INSPECTION

Brake Lining

1. Remove plug from back plate. Refer to [BR-41, "Exploded View"](#).
2. Check brake lining wear thickness (A) from an inspection hole on back plate. Check using a scale necessary.

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



ADJUSTMENT

Burnish contact surfaces between brake lining and brake drum according to the following procedure after refinishing or replacing brake lining, or if a soft pedal occurs at very low mileage.

CAUTION:

- **Be careful of vehicle speed because the brake does not operate firmly/securely until brake lining and brake drum 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 brake lining and brake drum are securely fitted.

BRAKE DRUM

BRAKE DRUM : Inspection and Adjustment

INFOID:000000009267532

INSPECTION

Appearance

Check surface of brake drum for uneven wear, cracks and serious damage. Replace it if necessary. Refer to [BR-41, "Removal and Installation"](#).

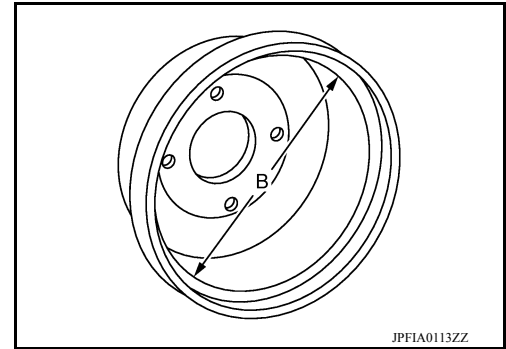
Brake Drum Inner Diameter

REAR DRUM BRAKE

< PERIODIC MAINTENANCE >

Check inner diameter (B) of the brake drum.

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



ADJUSTMENT

Burnish contact surfaces between brake drum and brake lining according to the following procedure after refinishing or replacing brake drum, or if a soft pedal occurs at very low mileage.

CAUTION:

- **Be careful of vehicle speed because the brake does not operate firmly/securely until brake drum and brake lining 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 brake drum and brake lining are securely fitted.

BRAKE PEDAL

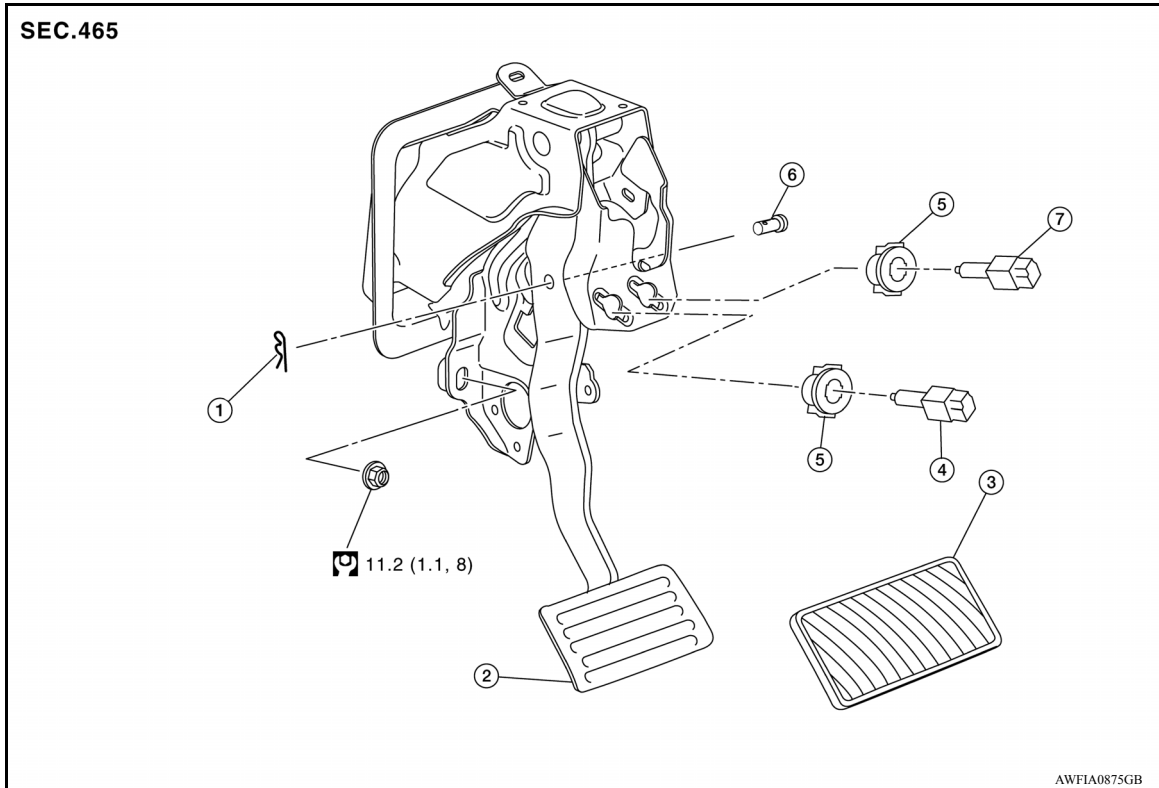
< REMOVAL AND INSTALLATION >

REMOVAL AND INSTALLATION

BRAKE PEDAL

Exploded View

INFOID:000000009267533



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

NOTE:

CVT and A/T brake pedal assemblies shown, M/T brake pedal assembly similar.

Removal and Installation

INFOID:000000009267534

REMOVAL

1. Remove instrument lower panel LH. Refer to [IP-20, "Removal and Installation"](#).
2. Disconnect the harness connectors from the stop lamp switch and ASCD cancel switch (if equipped).
3. Disconnect the harness connector from the accelerator pedal.
4. Separate the harness from brake pedal assembly.
5. Rotate the stop lamp switch counter clockwise to remove.
6. Rotate the ASCD cancel switch counter clockwise to remove (if equipped).
7. Remove snap pin and clevis pin from clevis.

CAUTION:

Do not reuse the snap pin and clevis pin.

8. Disconnect the power steering harness connector and position it aside.
9. Remove the brake pedal assembly.

CAUTION:

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

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

BRAKE PEDAL

< REMOVAL AND INSTALLATION >

11. Perform inspection after removal. Refer to [BR-20, "Inspection and Adjustment"](#).

INSTALLATION

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

CAUTION:

Do not reuse the snap pin and clevis pin.

- 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.
- Do not give any impact caused by dropping, interference with a tool, contact between parts or with rack to the brake pedal.
- Do not use a part that has been subject to an impact.
- Perform adjustment after installation. Refer to [BR-20, "Inspection and Adjustment"](#).

Inspection and Adjustment

INFOID:000000009267535

INSPECTION AFTER REMOVAL

- Check the brake pedal for bend, damage, and cracks on the welded parts, and replace the brake pedal assembly if necessary.

ADJUSTMENT AFTER INSTALLATION

- Adjust each item of brake pedal after installing the brake pedal assembly to the vehicle. Refer to [BR-8, "Inspection and Adjustment"](#).
- Perform the release position learning of the accelerator pedal. Refer to [EC-124, "Work Procedure"](#).

BRAKE PIPING

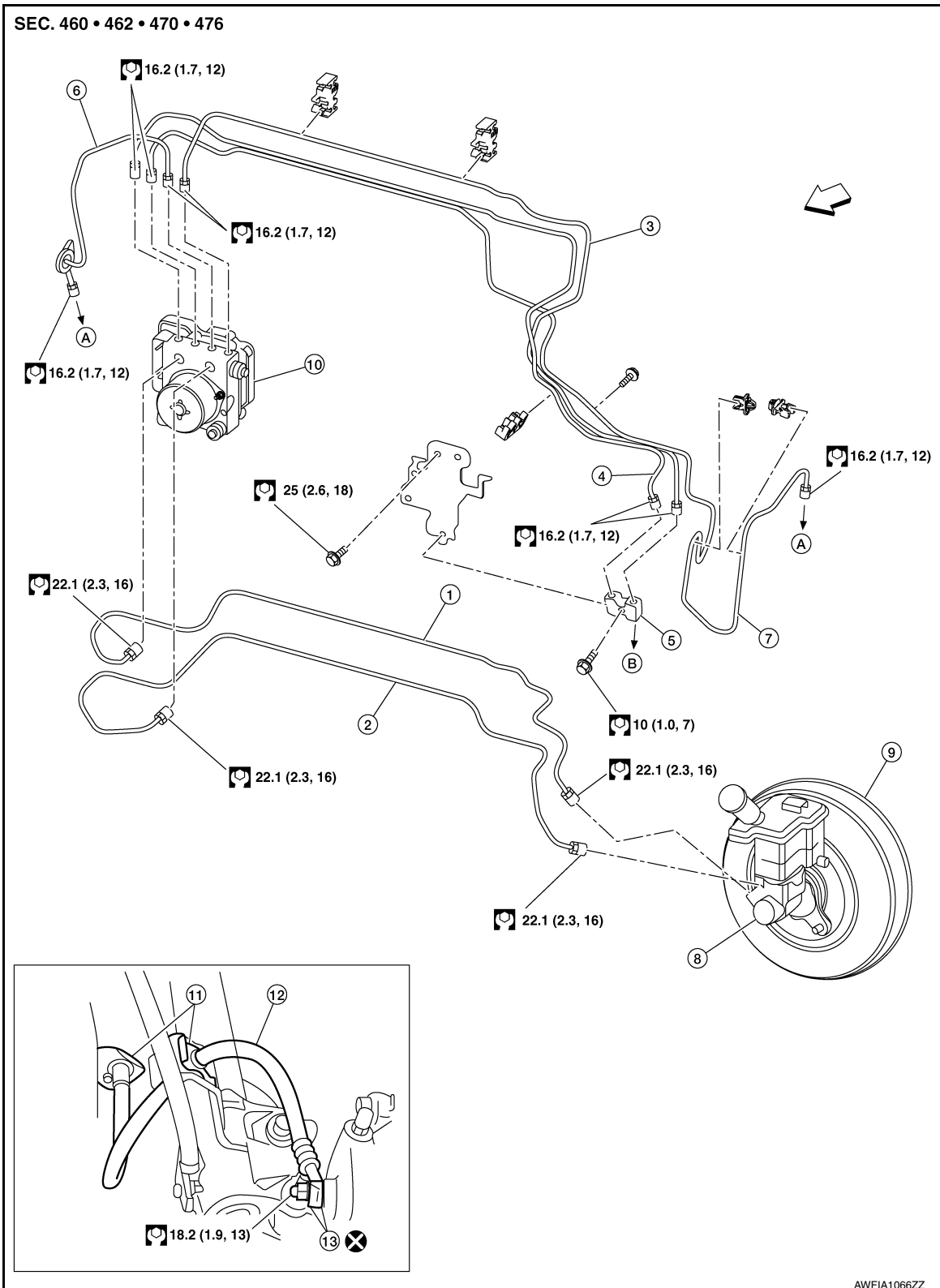
< REMOVAL AND INSTALLATION >

BRAKE PIPING

FRONT

FRONT : Exploded View

INFOID:000000009267536



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BRAKE PIPING

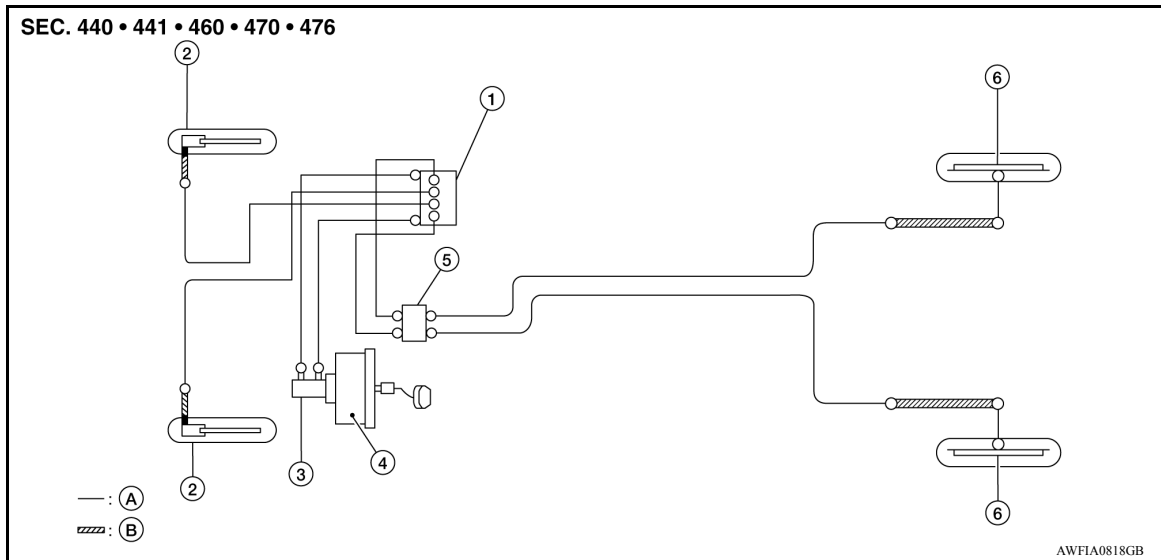
< REMOVAL AND INSTALLATION >

- | | | |
|---|---|---|
| 1. Master cylinder brake pipe assembly (front) | 2. Master cylinder brake pipe assembly (rear) | 3. ABS actuator to connector brake pipe assembly (RH) |
| 4. ABS actuator to connector brake pipe assembly (LH) | 5. Brake pipe connector | 6. Brake pipe assembly (RH front) |
| 7. Brake pipe assembly (LH front) | 8. Master cylinder assembly | 9. Brake booster |
| 10. ABS actuator and electric unit (control unit) | 11. Lock plate | 12. Front brake hose |
| 13. Copper sealing washer | A. To front brake hose | B. To rear brake pipe |

⇐ Front

FRONT : Hydraulic Piping

INFOID:000000009267537



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

○: Flare nut

■: Union bolt

CAUTION:

- All hoses and piping (tubes) must be free from excessive bending, twisting and pulling.
- Make sure there is no interference with other parts when turning steering both clockwise and counterclockwise.
- The brake piping is an important safety part. If a brake fluid leak is detected, always disassemble the parts. Replace applicable part with a new one, if necessary.
- Be careful not to splash brake fluid on painted areas; it may cause paint damage. If brake fluid is splashed on painted areas, wash it away with water immediately.
- Do not bend or twist brake hose sharply, or strongly pull it.
- When removing components, cover connections so that no dirt, dust, or other foreign matter gets in.
- Do not reuse drained brake fluid.
- After installation of the ABS actuator and electric unit (control unit), refill brake system with new brake fluid. Then bleed the air from the system. Refer to [BR-12, "Bleeding Brake System"](#).

FRONT : Removal and Installation

INFOID:000000009267538

NOTE:

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

BRAKE PIPING

< REMOVAL AND INSTALLATION >

REMOVAL

1. Remove the wheel and tire assemblies using power tool. Refer to [WT-39. "Adjustment"](#).
2. Drain brake fluid. Refer to [BR-11. "Draining"](#).
3. Loosen the flare nut with a flare nut wrench and separate the brake pipe from the hose.
CAUTION:
 - Do not scratch the flare nut and the brake pipe.
 - All brake hoses and pipes must be free from excessive bending, twisting and pulling.
4. Remove the union bolt and the brake hose from the brake caliper assembly. Remove and discard the copper sealing washers.
CAUTION:
Do not reuse copper sealing washers.
5. Remove the lock plate and remove the brake hose.

INSTALLATION

CAUTION:

Do not allow foreign matter (e.g. dust) and oils other than brake fluid to enter the reservoir tank.

1. Assemble the union bolt (A) and the copper sealing washers (1) to the brake hose and install it as an assembly to the caliper. Align the brake hose L-pin by aligning it with the brake caliper assembly hole, and tighten the union bolt (1) to the specified torque.

CAUTION:

Do not reuse copper sealing washers.

2. Install the brake pipe 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 the brake hoses and pipes are not bent or twisted.

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

CAUTION:

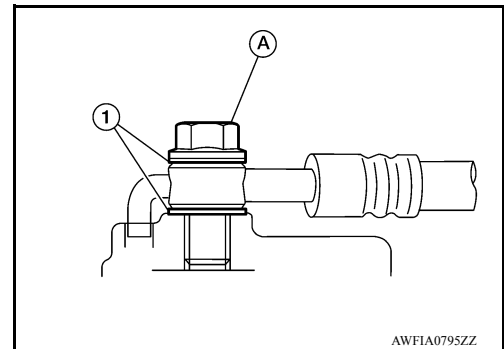
Do not scratch the flare nut and the brake tube.

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

CAUTION:

Do not reuse drained brake fluid.

5. Install the wheel and tire assemblies to the vehicle. Refer to [WT-39. "Adjustment"](#).
6. Perform inspection after installation. Refer to [BR-23. "FRONT : Inspection"](#).



FRONT : Inspection

INFOID:000000009267539

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.

CAUTION:

Clearance with brake hose and each parts being secured more than 10 mm (0.39 in) in unladen condition*.

***: Fuel, engine coolant and lubricant are full. Spare tire, jack, hand tools and mats are in designated positions.**

2. Depress the brake pedal with a force of 785 N (80.1 kg-f, 176.5 lb-f) 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.

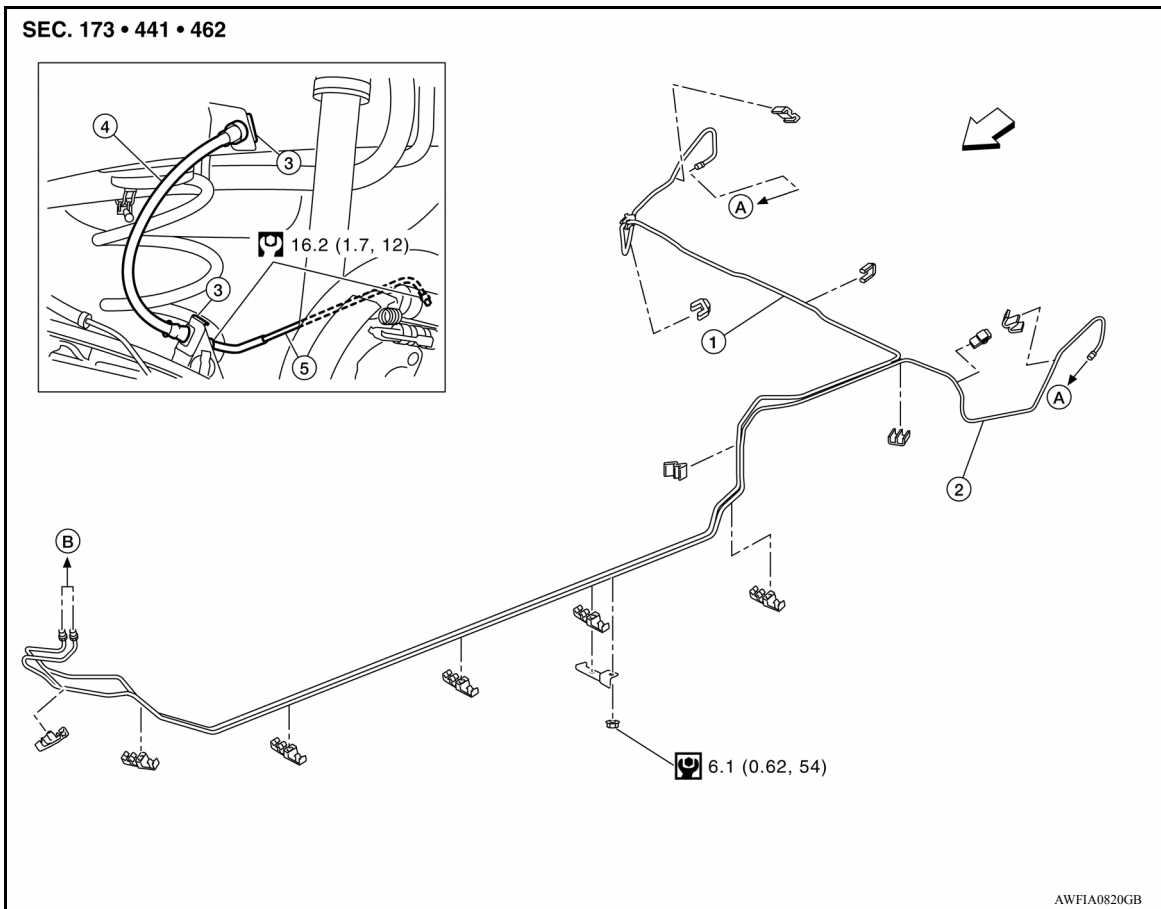
REAR

BRAKE PIPING

< REMOVAL AND INSTALLATION >

REAR : Exploded View

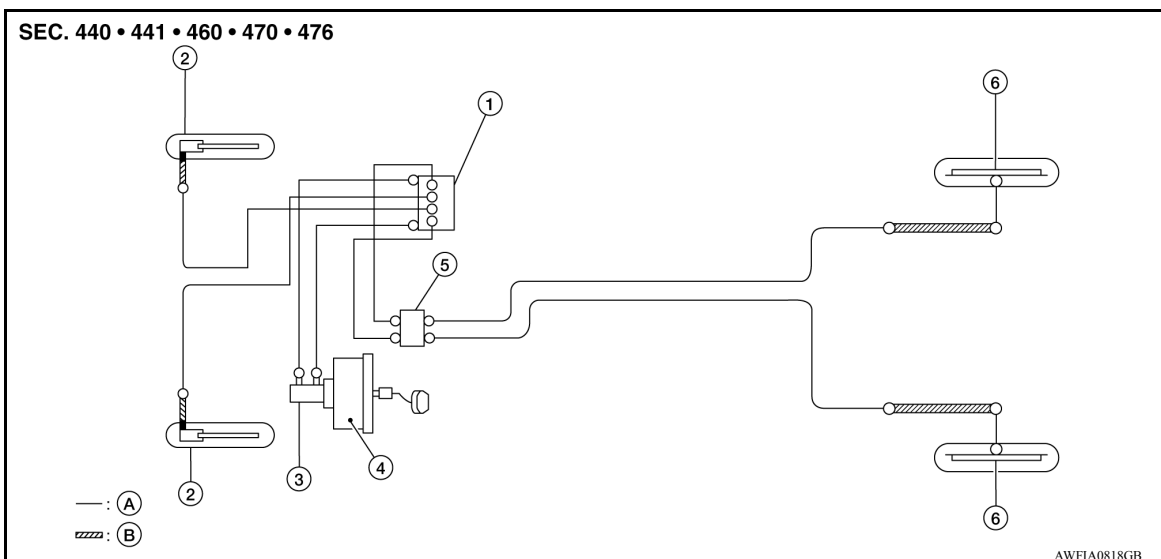
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- | | | |
|----------------------------------|---------------------------------------|-----------------------|
| 1. Rear brake pipe assembly (RH) | 2. Rear brake pipe assembly (LH) | 3. Lock plate |
| 4. Rear brake hose | 5. Wheel cylinder brake pipe assembly | A. To rear brake hose |
| B. To brake pipe connector | ↔ Front | |

REAR : Hydraulic Piping

INFOID:00000009267541



BRAKE PIPING

< REMOVAL AND INSTALLATION >

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

○: Flare nut

■: Union bolt

CAUTION:

- All hoses and piping (tubes) must be free from excessive bending, twisting and pulling.
- Make sure there is no interference with other parts when turning steering both clockwise and counterclockwise.
- The brake piping is an important safety part. If a brake fluid leak is detected, always disassemble the parts. Replace applicable part with a new one, if necessary.
- Be careful not to splash brake fluid on painted areas; it may cause paint damage. If brake fluid is splashed on painted areas, wash it away with water immediately.
- Do not bend or twist brake hose sharply, or strongly pull it.
- When removing components, cover connections so that no dirt, dust, or other foreign matter gets in.
- Do not reuse drained brake fluid.
- After installation of the ABS actuator and electric unit (control unit), refill brake system with new brake fluid. Then bleed the air from the system. Refer to [BR-12, "Bleeding Brake System"](#).

REAR : Removal and Installation

INFOID:000000009267542

REMOVAL

CAUTION:

Do not 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:

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

1. Remove the wheel and tire assemblies using power tool. Refer to [WT-39, "Adjustment"](#).
2. Drain brake fluid. Refer to [BR-11, "Draining"](#).
3. Loosen the flare nut with a flare nut wrench and separate the brake pipe from the brake hose.
CAUTION:
 - Do not scratch the flare nut and the brake pipe.
 - All brake hoses and pipes must be free from excessive bending, twisting and pulling.
4. Remove the lock plate and remove the brake hose from the vehicle.
5. Loosen the flare nut with a flare nut wrench and separate the brake pipe from the wheel cylinder, and remove the brake pipe.

INSTALLATION

1. Connect the brake pipe to the wheel cylinder, temporarily tighten the flare nut by hand until it does not rotate further.
2. Connect the brake hose to the brake pipe, 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 pipes are not bent or twisted.
3. Tighten the flare nut to the specified torque with a flare nut torque wrench.
CAUTION:
Do not scratch the flare nut and the brake tube.
4. Refill with new brake fluid and perform the air bleeding. Refer to [BR-12, "Bleeding Brake System"](#).
CAUTION:
Do not reuse drained brake fluid.
5. Install the wheel and tire assemblies to the vehicle. Refer to [WT-39, "Adjustment"](#).
6. Perform inspection after installation. Refer to [BR-26, "REAR : Inspection"](#).

BRAKE PIPING

< REMOVAL AND INSTALLATION >

REAR : Inspection

INFOID:000000009267543

INSPECTION AFTER INSTALLATION

1. Check the brake hoses and tubes for the following: no scratches; no twist and deformation; no looseness at connections.

CAUTION:

Clearance with brake hose and each parts being secured more than 10 mm (0.39 in) in unladen condition* .

***: Fuel, engine coolant and lubricant are full. Spare tire, jack, hand tools and mats are in designated positions.**

2. Depress the brake pedal with a force of 785 N (80.1 kg-f, 176.5 lb-f) 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.

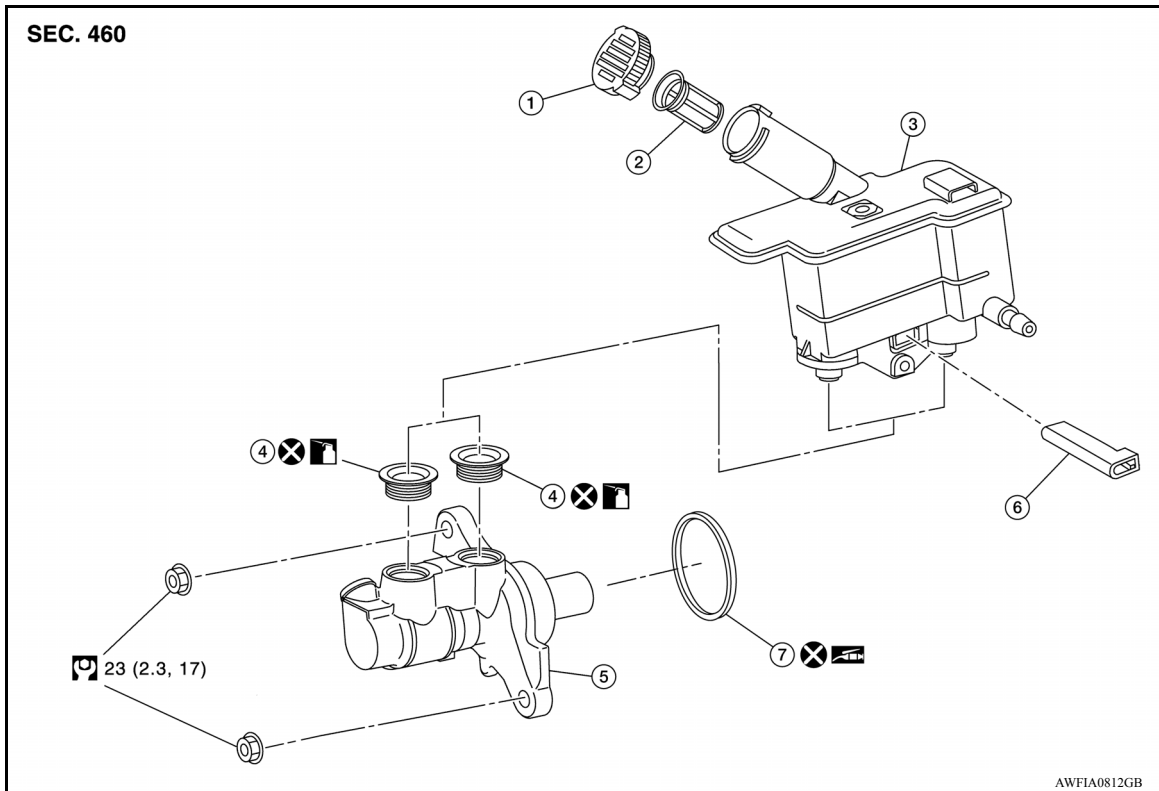
BRAKE MASTER CYLINDER

< REMOVAL AND INSTALLATION >

BRAKE MASTER CYLINDER

Exploded View

INFOID:000000009267544



- | | | |
|------------------|-------------------------|---|
| 1. Reservoir cap | 2. Brake fluid strainer | 3. Reservoir tank |
| 4. Grommet | 5. Cylinder body | 6. Brake fluid level switch |
| 7. O-ring | Apply brake fluid | PBC (Poly Butyl Cuprysil) grease or silicone-based grease |

Removal and Installation

INFOID:000000009267545

CAUTION:

- Be careful not to splash brake fluid on painted areas; it may cause paint damage. If brake fluid is splashed on painted areas, wash it away with water immediately.
- Do not scratch the piston of master cylinder when installing/removing because the piston is exposed. Check for any dust on the piston, and wash with brake fluid if needed.
- Hold the master cylinder body when handling the master cylinder assembly. Do not hold the piston because the piston might become detached if pulled strongly.
- Refill the reservoir tank with new brake fluid "DOT 3".
- Do not reuse drained brake fluid.
- Do not reuse master cylinder O-ring.

NOTE:

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

REMOVAL

1. Drain brake fluid. Refer to [BR-11. "Draining"](#).
2. Remove battery. Refer to [PG-63. "Removal and Installation"](#).
3. Remove air duct and air cleaner case. Refer to [EM-25. "Removal and Installation"](#).
4. Position the IPDM E/R aside to obtain access to the master cylinder. Refer to [PCS-56. "Removal and Installation"](#).
5. Disconnect the harness connector from the brake fluid level switch.

BRAKE MASTER CYLINDER

< REMOVAL AND INSTALLATION >

6. Disconnect the brake pipe from the master cylinder assembly with a flare nut wrench.

CAUTION:

Do not scratch the flare nut and the brake tube.

7. Remove the master cylinder assembly.

CAUTION:

- Do not deform or bend the brake pipes.
- Do not depress the brake pedal after the master cylinder assembly is removed.
- The piston of the master cylinder assembly is exposed. Do not damage it when removing the master cylinder.
- The piston may drop off when pulled out strongly. Do not hold the piston. Hold the cylinder body when handling the master cylinder assembly.

8. Remove and discard the O-ring.

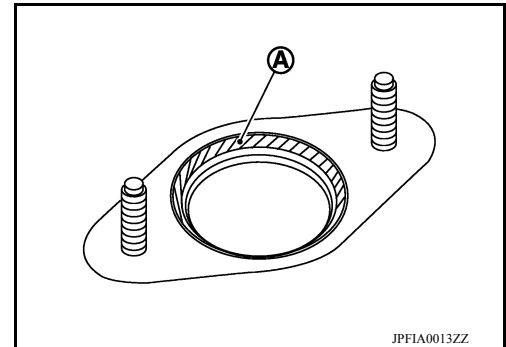
INSTALLATION

CAUTION:

- Do not 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.
- Do not reuse the O-ring.

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

- Do not depress the brake pedal after the master cylinder assembly is removed.
- Apply silicone grease to the brake booster location (A) prior to installing the master cylinder assembly to the brake booster.
- The piston of the master cylinder assembly is exposed. Do not 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. Do not hold the piston. Hold the cylinder body when handling the master cylinder assembly.
- Do not deform or bend the brake pipes.
- 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-21, "FRONT : Exploded View"](#).



CAUTION:

Do not scratch the flare nut and the brake tube.

- Do not allow foreign matter (e.g. dust) and oils other than brake fluid to enter the reservoir tank.
- After installation, perform the air bleeding. Refer to [BR-12, "Bleeding Brake System"](#)

CAUTION:

Do not reuse drained brake fluid.

- Perform inspection after installation. Refer to [BR-29, "Inspection"](#).

Disassembly and Assembly

INFOID:000000009267546

DISASSEMBLY

CAUTION:

- Do not disassemble the cylinder body.
- Remove the reservoir tank only when necessary.
- Do not drop the removed parts. The parts must not be reused if they are dropped.

Remove the reservoir tank and grommet from the cylinder body.

ASSEMBLY

CAUTION:

- Do not use mineral oils such as kerosene or gasoline and rubber grease during the cleaning and assembly process.
- Do not drop the when installing. The parts must not be reused if they are dropped.
- Do not allow foreign matter (e.g. dust) and oils other than brake fluid to enter the reservoir tank.

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

CAUTION:

Do not reuse the grommets.

2. Install the reservoir tank to the cylinder body.

BRAKE MASTER CYLINDER

< REMOVAL AND INSTALLATION >

Inspection

INFOID:000000009267547

INSPECTION AFTER INSTALLATION

Check the following items and replace if necessary.

- Check the master cylinder for deformation, twist, contact with other parts or looseness of connection.
- Check for fluid leakage from connection. Refer to [BR-23, "FRONT : Inspection"](#).

CAUTION:

If the fluid leakage is present, retighten to the specified torque. Replace if necessary.

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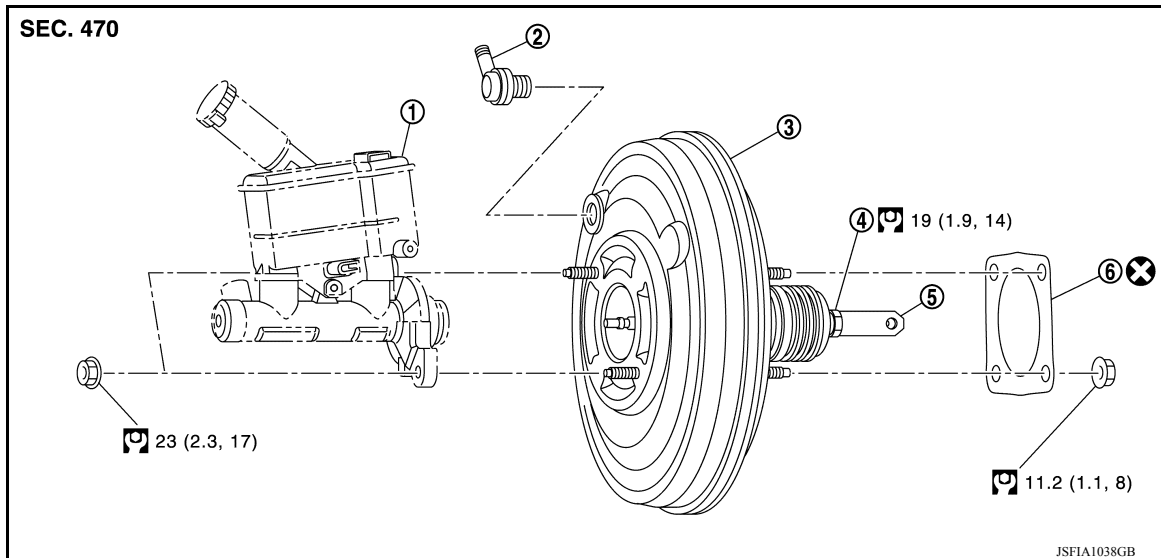
BRAKE BOOSTER AND CHECK VALVE

< REMOVAL AND INSTALLATION >

BRAKE BOOSTER AND CHECK VALVE

Exploded View

INFOID:000000009267548



- | | | |
|-----------------------------|----------------|------------------|
| 1. Master cylinder assembly | 2. Check valve | 3. Brake booster |
| 4. Lock nut | 5. Clevis | 6. Gasket |

Removal and installation

INFOID:000000009267549

REMOVAL

NOTE:

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

1. Remove brake master cylinder assembly. Refer to [BR-27, "Removal and Installation"](#).
2. Remove vacuum hose from check valve. Refer to [BR-33, "Removal and Installation"](#).
3. Remove and discard the clip (1) and clevis pin (2). Refer to [BR-19, "Exploded View"](#).

4. Remove nuts on brake booster and brake pedal assembly. Refer to [BR-19, "Exploded View"](#).

5. Remove brake booster from dash panel on engine room side.

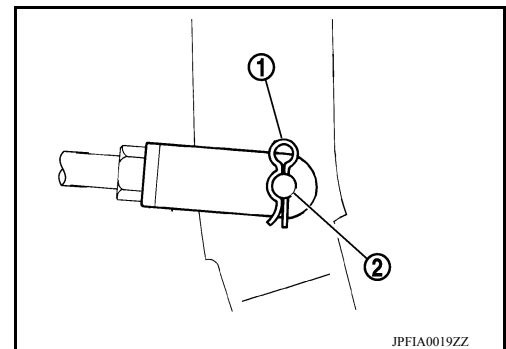
CAUTION:

Do not deform or bend the brake tubes.

NOTE:

If removing brake booster is difficult, remove clevis from brake booster.

6. Remove check valve from brake booster.
7. Perform inspection after removal. Refer to [BR-31, "Inspection and Adjustment"](#).



INSTALLATION

CAUTION:

Do not 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 in the reverse order of removal.

BRAKE BOOSTER AND CHECK VALVE

< REMOVAL AND INSTALLATION >

- Set check valve angle (A) as shown.

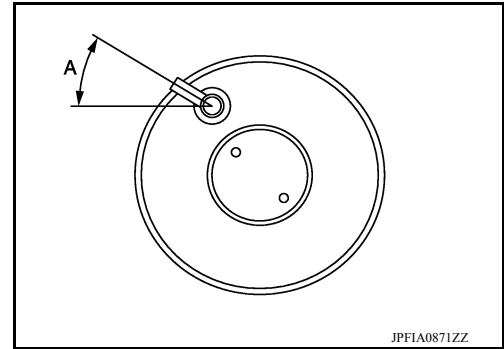
(A) : 45°

- Be careful not to damage brake booster stud bolt threads. If brake booster is tilted during installation, the dash panel may damage the threads.
- Do not deform or bend the brake tubes when installing the brake booster.
- Always use a new gasket between the brake booster and the dash panel.
- Replace the clevis pin and clip during installation. Refer to [BR-20, "Inspection and Adjustment"](#).
- Do not allow foreign matter (e.g. dust) and oils other than brake fluid to enter the reservoir tank.
- After installation, perform the air bleeding. Refer to [BR-12, "Bleeding Brake System"](#).

CAUTION:

Do not reuse drained brake fluid.

- Check each item of brake pedal. Adjust it if the measurement value is not the standard. Refer to [BR-8, "Inspection and Adjustment"](#).



Inspection and Adjustment

INFOID:000000009267550

INSPECTION BEFORE REMOVAL

Brake System Vacuum Inspection

CAUTION:

Check the vacuum condition when the master cylinder and the brake booster are installed.

1. Check the vacuum using a suitable tool.

At vacuum of -66.7 kPa (-500 mmHg, -19.69 inHg) : Vacuum should decrease within 3.3 kPa (24.8 mmHg, 0.98 inHg) for 15 seconds.

2. If the vacuum cannot be maintained, perform the following operation.
 - a. Check that dirt and dust are not present on the brake booster and brake master cylinder mating surfaces. Clean the mating surfaces if necessary.
 - b. Check the O-ring on the master cylinder. If anything is found, replace the O-ring. Refer to [BR-27, "Removal and Installation"](#).
 - c. Check the vacuum condition again. If the condition still cannot be maintained, replace the brake booster.

INSPECTION AFTER REMOVAL

Check Valve Vacuum Inspection

1. Check the vacuum using a suitable tool.

When connected to the booster side : Vacuum should decrease within 1.3 kPa (9.8 mmHg, 0.38 inHg) for 15 seconds under a vacuum of -66.7 kPa (-500 mmHg, -19.69 inHg).

When connected to the vacuum hose side : Vacuum should not exist.

2. If the vacuum still cannot be maintained, replace the check valve.

Input Rod Length Inspection

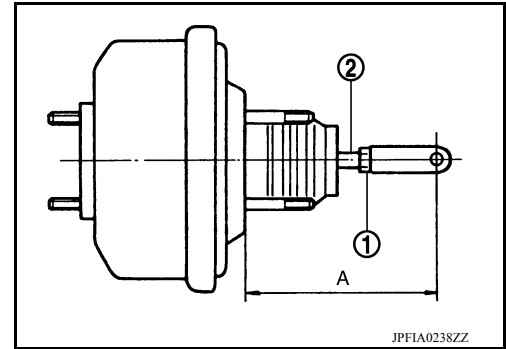
BRAKE BOOSTER AND CHECK VALVE

< REMOVAL AND INSTALLATION >

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

(A) : 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

1. Run the engine at idle 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 each time the brake pedal is depressed when performing this operation.
2. 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.

ADJUSTMENT AFTER INSTALLATION

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

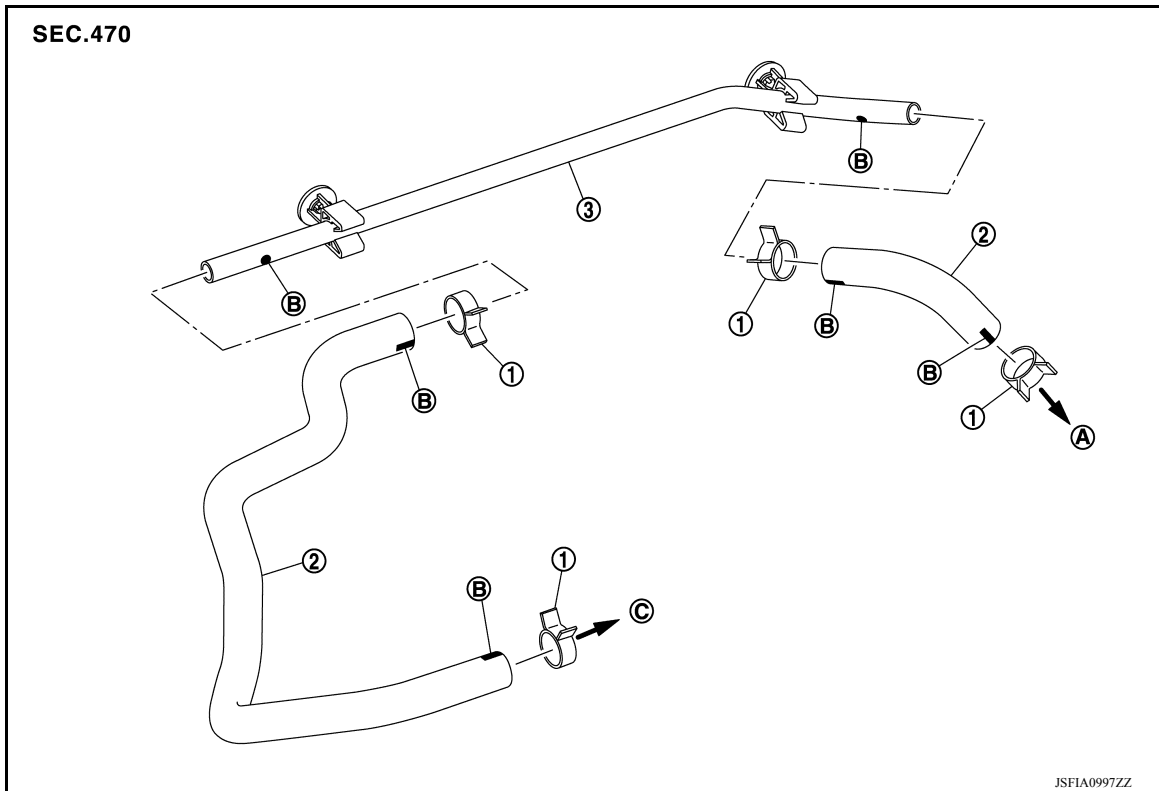
VACUUM LINES

< REMOVAL AND INSTALLATION >

VACUUM LINES

Exploded View

INFOID:000000009267551



- | | | |
|---------------------|----------------|-----------------------|
| 1. Clamp | 2. Vacuum hose | 3. Vacuum piping |
| A. To brake booster | B. Paint mark | C. To intake manifold |

Removal and Installation

INFOID:000000009267552

REMOVAL

1. Remove the air cleaner and duct assembly. Refer to [EM-25. "Exploded View"](#).
2. Remove the vacuum hose and vacuum piping.

INSTALLATION

Installation is in the reverse order of removal.

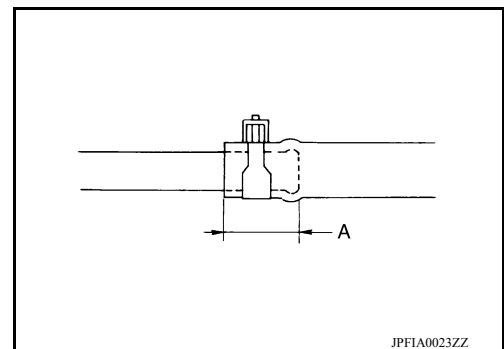
- When installing vacuum hose, insert it until its tip reaches the back-end of length (A) or further as shown.

CAUTION:

Do not use lubricating oil during assembly.

(A) : 24 mm (0.95 in) or more

- Face the paint mark of vacuum hose (intake manifold side) upward to assemble.
- Face the other paint marks of vacuum hose to the vehicle front side to assemble.



Inspection

INFOID:000000009267553

INSPECTION AFTER REMOVAL

Appearance

VACUUM LINES

< REMOVAL AND INSTALLATION >

Check for correct assembly, damage and deterioration.

FRONT DISC BRAKE

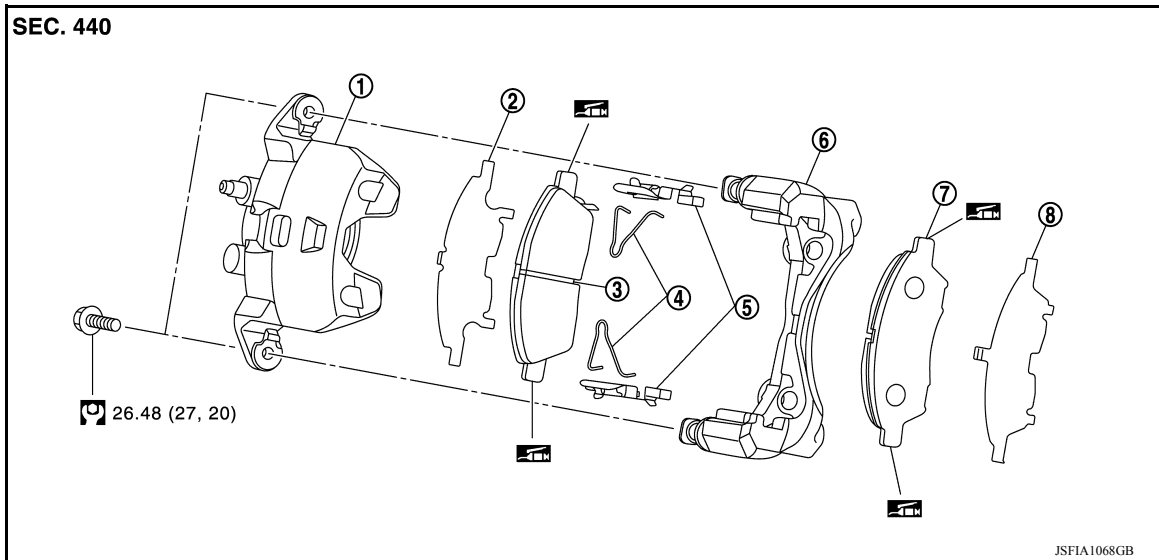
< REMOVAL AND INSTALLATION >

FRONT DISC BRAKE


BRAKE PAD

BRAKE PAD : Exploded View

INFOID:000000009267554



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

 Apply MOLYKOTE® 7439 or equivalent.

BRAKE PAD : Removal and Installation

INFOID:000000009267555

WARNING:

Clean dust on caliper and brake pad with a vacuum dust collector to minimize the hazard of air borne particles or other materials.

CAUTION:

- While removing caliper, do not depress brake pedal because piston will pop out.
- It is not necessary to remove bolts on torque member and brake hose except for disassembly or replacement of caliper assembly. In this case, hang caliper with a wire so as not to stretch brake hose.
- Do not damage piston boot.
- If any shim is subject to serious corrosion, replace it with a new one.
- Always replace shim and shim cover as a set when replacing brake pads.
- Keep rotor and pads free from brake fluid and grease.
- Burnish the brake pads and disc rotor mutually contacting surfaces, after refinishing or replacing rotors, after replacing pads, or if a soft pedal occurs at very low mileage. Refer to [BR-15, "BRAKE PAD : Inspection and Adjustment"](#).

REMOVAL

1. Remove the front wheel and tire assemblies using power tool. Refer to [WT-39, "Adjustment"](#).
2. Remove lower sliding pin bolt.
3. Suspend the cylinder body with suitable wire in a position so that the brake hose will not stretch. Then remove the pad return springs, brake pads, shims and pad retainers from the torque member.

CAUTION:

- Do not deform the pad return springs or pad retainers when servicing the brake pad.
 - Do not damage the piston boot.
 - Do not drop the brake pads and shims.
 - Note the position of the brake pads during removal to aid during installation.
4. Perform inspection after removal. Refer to [BR-36, "BRAKE PAD : Inspection"](#).

FRONT DISC BRAKE

< REMOVAL AND INSTALLATION >

INSTALLATION

1. Install the pad retainers to the torque member, if the pad retainers were removed during service.
2. Apply MOLYKOTE® 7439 or equivalent to the mating surfaces between the brake pads and the pad retainers.
3. Install the brake pads and shims to the torque member
4. Install the pad return springs to the brake pad.
CAUTION:
 - Do not deform the pad return spring.
 - Correctly insert the pad return spring in to the pad return spring hole on the brake pad.
5. Install cylinder body to torque member.
CAUTION:
 - Do not damage the piston boot.
 - When replacing brake 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 press piston into the cylinder body.
6. Install the lower sliding pin bolt and tighten it to the specified torque.
7. Depress the brake pedal several times to verify that brake drag does not exist for the front disc brake. Refer to [BR-36, "BRAKE PAD : Inspection"](#).
8. Install the front wheel and tire assemblies. Refer to [WT-39, "Adjustment"](#).

BRAKE PAD : Inspection

INFOID:000000009267556

INSPECTION AFTER REMOVAL

Replace the shims 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. Refer to [BR-35, "BRAKE PAD : Removal and Installation"](#).
3. Press the pistons. Refer to [BR-35, "BRAKE PAD : Removal and Installation"](#).
4. Install brake pads. Refer to [BR-35, "BRAKE PAD : Removal and Installation"](#).
5. Securely depress the brake pedal several times.
6. Check a drag of front disc brake again. If any drag is found, disassemble the cylinder body and replace if necessary. Refer to [BR-38, "BRAKE CALIPER ASSEMBLY : Disassembly and Assembly"](#)
7. Burnish contact surfaces brake pads and disc rotor after refinishing or replacing brake pads, or if a soft pedal occurs at very low mileage. Refer to [BR-15, "BRAKE PAD : Inspection and Adjustment"](#).

BRAKE CALIPER ASSEMBLY

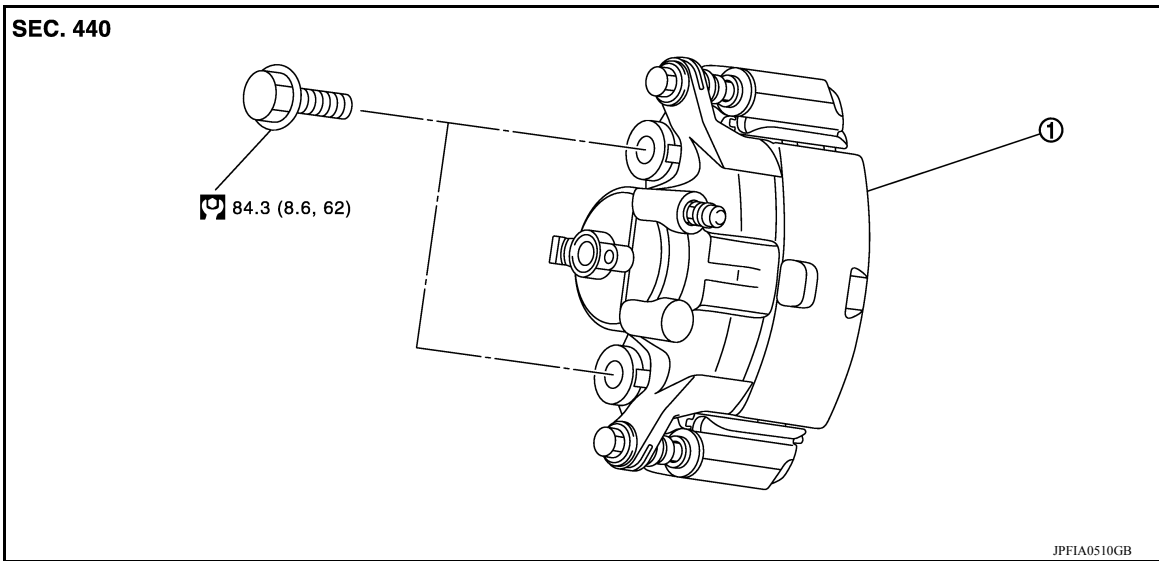
BRAKE CALIPER ASSEMBLY : Exploded View

INFOID:000000009267557

REMOVAL

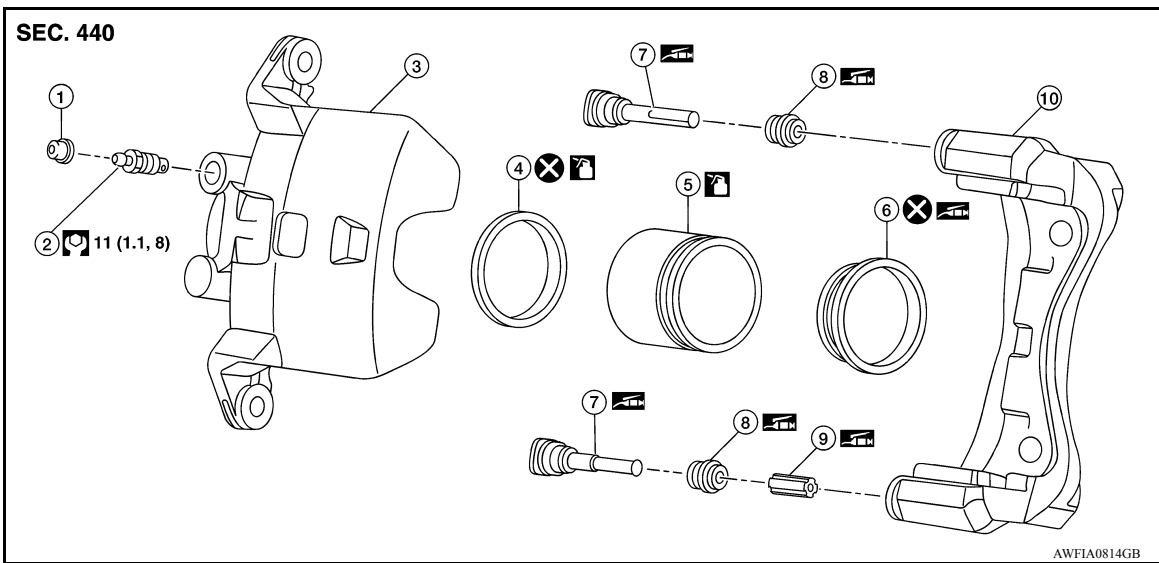
FRONT DISC BRAKE

< REMOVAL AND INSTALLATION >



1. Brake caliper assembly

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 |

NOTE:

LH front brake caliper shown, RH front brake caliper similar.

BRAKE CALIPER ASSEMBLY : Removal and Installation

INFOID:000000009267558

WARNING:

Clean dust on caliper and brake pad with a vacuum dust collector to minimize the hazard of air borne particles or other materials.

CAUTION:

- While removing caliper, do not depress the brake pedal because the piston will pop out.
- Do not damage piston boot.

FRONT DISC BRAKE

< REMOVAL AND INSTALLATION >

- Do not spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it out immediately and wash with water if it gets on a protect surface.
- Keep disc rotor free from brake fluid.
- Do not reuse drained brake fluid.

NOTE:

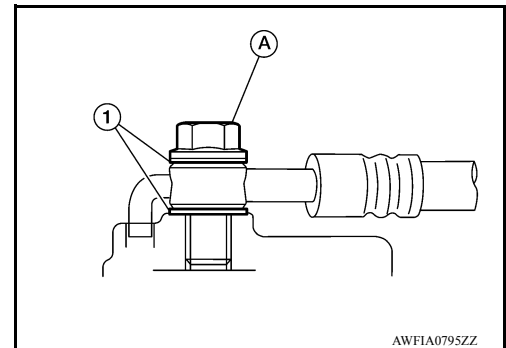
When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

REMOVAL

1. Remove the front wheel and tire assemblies using power tool. Refer to [WT-39, "Adjustment"](#).
2. Drain brake fluid. Refer to [BR-11, "Draining"](#).
3. Remove union bolt and disconnect brake hose from caliper assembly. Discard the copper sealing washers.
CAUTION:
Do not reuse copper sealing washers.
4. Remove torque member bolts, and remove brake caliper assembly.
CAUTION:
Do not drop brake pad and caliper assembly.
5. Remove disc rotor. If reusing the disc rotor, apply matching marks on the wheel hub and rotor do aid with installation.
CAUTION:
Put matching marks on wheel hub assembly and disc rotor, if it is necessary to remove disc rotor.

INSTALLATION

1. Install disc rotor, align the matching marks if installing the original disc rotor.
CAUTION:
Align the marks on disc rotor and wheel hub at the time of installation when reusing disc rotor.
2. Install the brake caliper assembly to the steering knuckle and tighten the torque member bolts to the specified torque.
CAUTION:
Do not allow oil or any moisture on all contact surfaces between steering knuckle and caliper assembly, bolts and washer.
3. Install brake hose to brake caliper assembly with new copper sealing washers (1). Tighten union bolt (A) to the specified torque. Refer to [BR-21, "FRONT : Exploded View"](#).
CAUTION:
 - Do not reuse copper sealing washers (1).
 - Union bolt (A).



4. Refill with new brake fluid and bleed air from the brake hydraulic system. Refer to [BR-12, "Bleeding Brake System"](#).
5. Check front disc brakes for drag.
6. Install the front wheel and tire assemblies. Refer to [WT-39, "Adjustment"](#).

BRAKE CALIPER ASSEMBLY : Disassembly and Assembly

INFOID:000000009267559

DISASSEMBLY

NOTE:

Do not remove the torque member, pad return springs, brake pads and pad retainers when disassembling and assembling the brake caliper assembly.

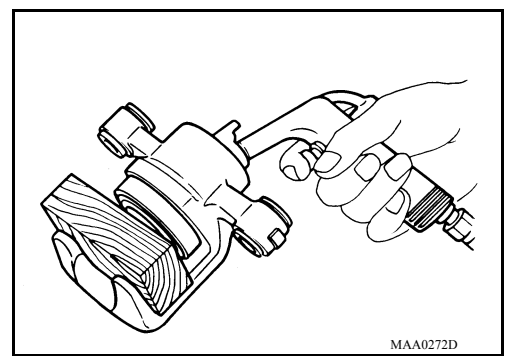
FRONT DISC BRAKE

< REMOVAL AND INSTALLATION >

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

WARNING:

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

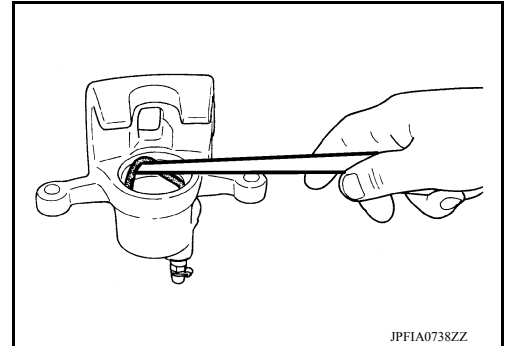


2. Remove piston seal from cylinder body using suitable tool.

CAUTION:

- Be careful not to damage a cylinder inner wall.
- Do not reuse piston seal.

3. Remove bleeder valve and cap.
4. Perform inspection after disassembly.



INSPECTION AFTER DISASSEMBLY

Caliper

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

CAUTION:

Clean the caliper using new brake fluid. Do not use mineral oils such as gasoline or kerosene.

Torque Member

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

Piston

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

CAUTION:

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

Sliding Pin Bolt, Sliding Pin Boot

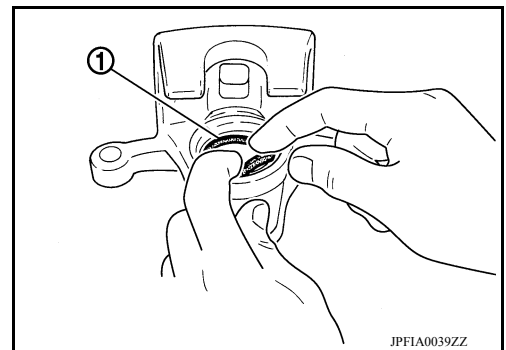
Check the sliding pin, sliding pin bolt, and sliding pin boot for wear, damage, and cracks. Replace as necessary.

ASSEMBLY

1. Install bleeder valve and cap.
2. Apply brake fluid to piston seal (1), and install to groove in cylinder body.

CAUTION:

Do not reuse piston seal.



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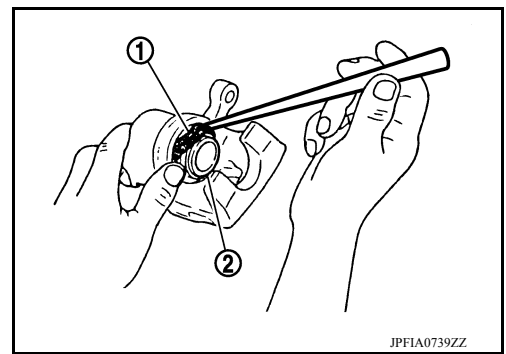
FRONT DISC BRAKE

< REMOVAL AND INSTALLATION >

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:

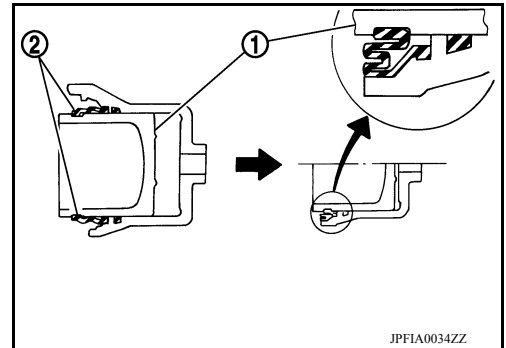
Do not reuse piston boot.



4. Push piston (1) 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.



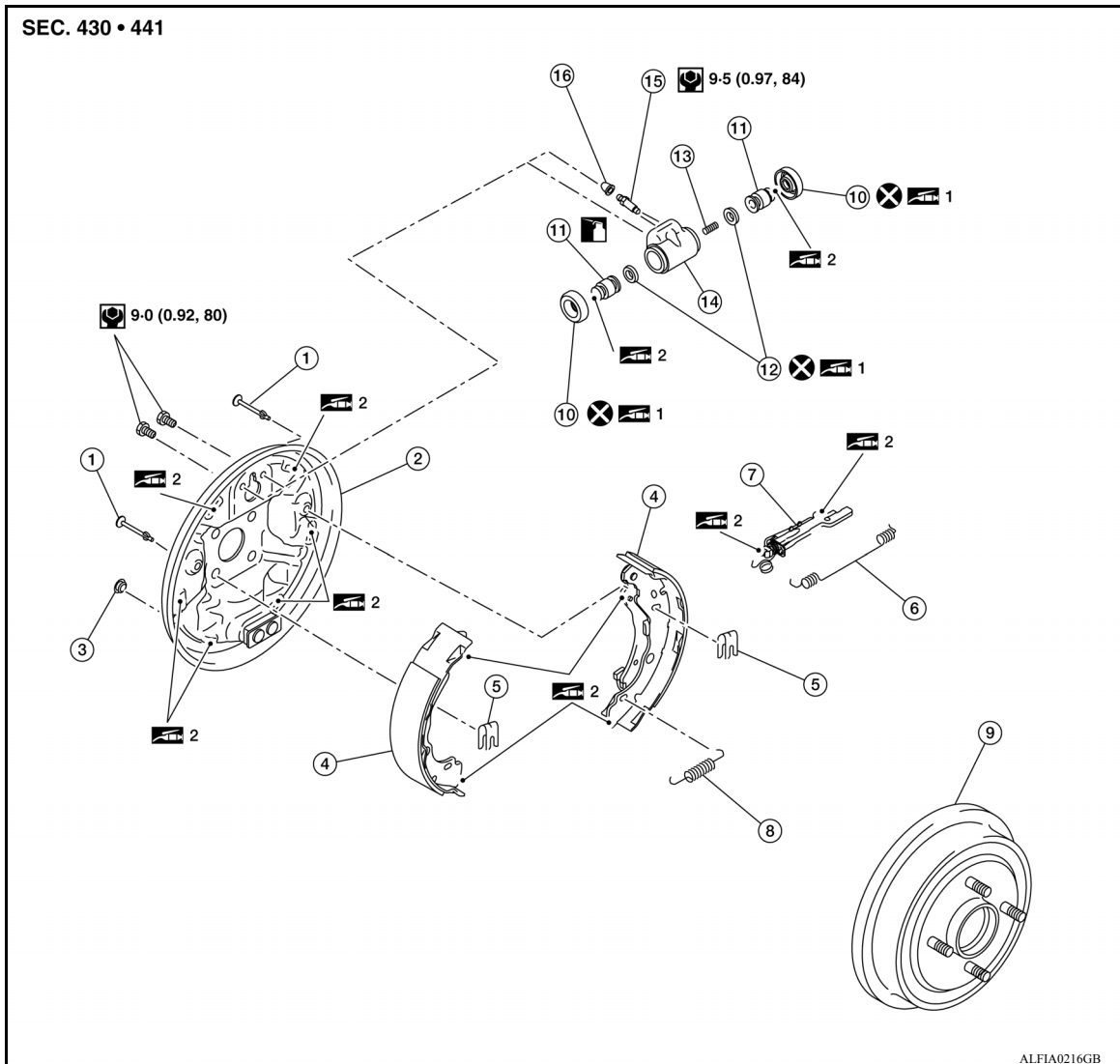
REAR DRUM BRAKE

< REMOVAL AND INSTALLATION >

REAR DRUM BRAKE

Exploded View

INFOID:00000009267560



- | | | |
|------------------|--------------------|-------------------|
| 1. Shoe hold pin | 2. Back plate | 3. Plug |
| 4. Brake shoe | 5. Spring | 6. Upper spring |
| 7. Adjuster | 8. Return spring | 9. Brake drum |
| 10. Boot | 11. Piston | 12. Piston cup |
| 13. Spring | 14. Wheel cylinder | 15. Bleeder valve |
| 16. Cap | | |

1: Apply rubber grease.

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

: Apply brake fluid

Removal and Installation

INFOID:00000009267561

WARNING:

Clean dust from brake drum and shoe assembly with a vacuum dust collector to minimize the hazard of air borne particles or other materials.

CAUTION:

- Do not depress the brake pedal while removing the brake drum because the pistons may pop out.

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REAR DRUM BRAKE

< REMOVAL AND INSTALLATION >

- Do not drop the removed parts.
- Do not spill or splash brake fluid on the brake drum.

NOTE:

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

REMOVAL

1. Remove the wheel and tire assemblies using power tool. Refer to [WT-39. "Adjustment"](#).
2. Drain the brake fluid when removing or disassembling the wheel cylinder is necessary. Refer to [BR-11. "Draining"](#).
3. Remove the brake drum. Refer to [RAX-6. "Exploded View"](#).

NOTE:

- Make sure the parking brake lever is fully released prior to removal of the brake drum.
- The rear wheel hub is housed inside the brake drum.

4. Remove the springs (1) by pushing them inward toward the vehicle and rotating, this will release the shoe hold pins, and the brake shoe assembly (brake shoes, each spring, and adjuster).

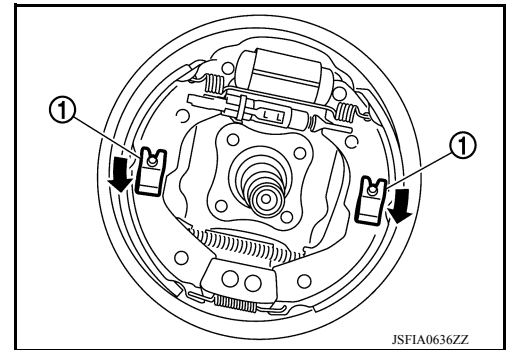
CAUTION:

Do not damage the boot of the wheel cylinder.

5. Disconnect the parking brake cable from operating lever.

CAUTION:

Do not bend the parking brake lever.



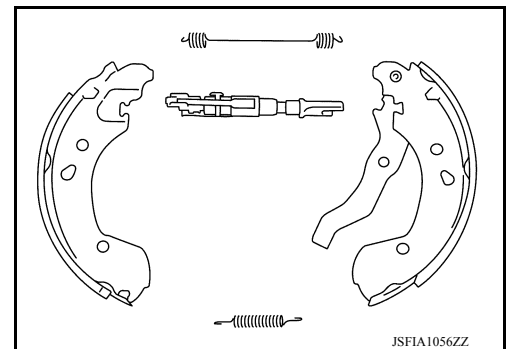
JSFIA0636ZZ

6. Disassemble the brake shoe assembly (brake shoe, each spring, and adjuster).

7. Remove the wheel cylinder with the following procedure.

- a. Disconnect the brake tube from the wheel cylinder.
- b. Remove the two bolts and the wheel cylinder from back plate.

8. Perform inspection after removal. Refer to [BR-43. "Inspection and Adjustment"](#).



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INSTALLATION

WARNING:

Since dust covering the rear brake has an affect on human body, the dust must be removed with a dust collector. Do not splatter the dust with an air blow gun.

CAUTION:

- Do not depress the brake pedal while removing the brake drum.
- Do not drop the removed parts.
- Do not spill or splash brake fluid on the brake drum.

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

- Check the difference between left and right wheel of adjuster.

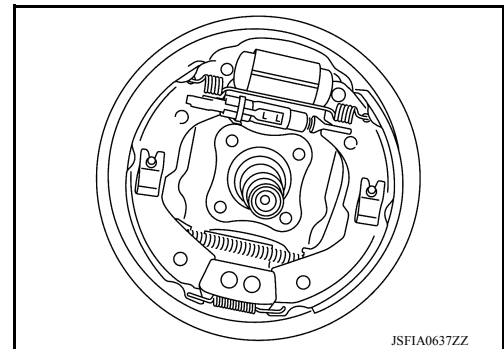
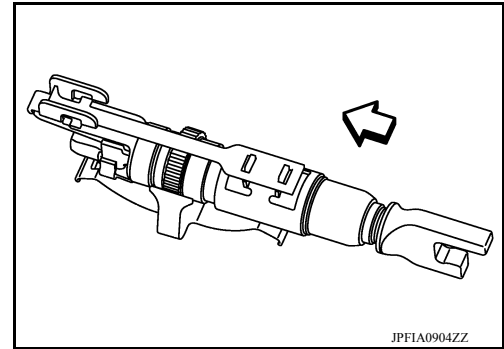
REAR DRUM BRAKE

< REMOVAL AND INSTALLATION >

⇐: Front

Adjuster	Direction
Left side	Left screw
Right side	Right screw

- Shorten the length of the adjuster by rotating it.
- Apply PBC (Poly Butyl Cuprysil) silicone-based grease to the mating surfaces between the adjusters and the brake shoes.
- Apply PBC (Poly Butyl Cuprysil) silicone-based grease to the mating surfaces between the back plates and the brake shoes.
- Apply PBC (Poly Butyl Cuprysil) silicone-based grease to the mating surfaces between the wheel cylinders and brake shoes.
- Apply PBC (Poly Butyl Cuprysil) silicone-based grease to the mating surfaces between the brake shoe anchor areas and brake shoes.
- Do not damage the wheel cylinder.
- Check the component parts of drum brake assembly are installed properly.
- Check the brake shoe sliding surface and brake drum inner surface for grease. Make sure that grease does not contact the lining material.
- Perform the air bleeding when removed or disassembled the wheel cylinder. Refer to [BR-12, "Bleeding Brake System"](#).
- Do not allow foreign matter (e.g. dust) and oils other than brake fluid to enter the reservoir tank.
- Adjust the brake shoe clearance (parking brake lever stroke) after install and air bleeding. Refer to [PB-4, "Inspection and Adjustment"](#).



Disassembly and Assembly

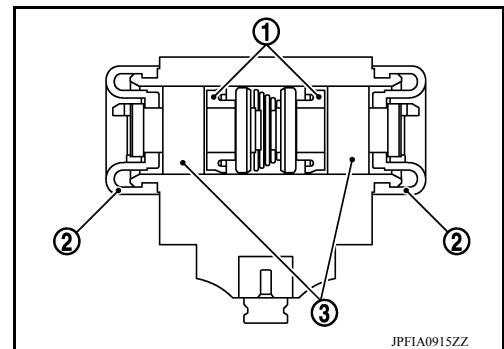
INFOID:000000009267562

DISASSEMBLY

1. Remove the boot from wheel cylinder. Refer to [BR-41, "Exploded View"](#).
2. Remove the piston, piston cup and spring from wheel cylinder.
CAUTION:
Pull the piston out from the wheel cylinder to prevent the wheel cylinder inner wall from being damaged.
3. Remove piston cup from piston.
4. Perform inspection after disassembly. Refer to [BR-43, "Inspection and Adjustment"](#).

ASSEMBLY

1. Apply rubber grease to the piston cup (1) and boot (2).
2. Install piston cup and boot to piston (3).
CAUTION:
 - Do not mistake the direction.
 - Do not reuse piston cup and boot.
3. Apply new brake fluid to piston and wheel cylinder inner wall, and install spring, piston cover, piston to wheel cylinder.
CAUTION:
Do not damage the wheel cylinder inner wall.
4. Install the boot to wheel cylinder. Refer to [BR-41, "Exploded View"](#).
5. Perform inspection after assembly. Refer to [BR-43, "Inspection and Adjustment"](#).



Inspection and Adjustment

INFOID:000000009267563

INSPECTION AFTER REMOVAL

Check the following items and replace if necessary.

REAR DRUM BRAKE

< REMOVAL AND INSTALLATION >

- Check the brake lining for excessive wear, damage, and peeling.
- Check the brake shoe sliding surface for excessive wear and damage.
- Check each spring for settling, excessive wear, damage, and rust.
- Check the adjuster for smoothness, and check it for excessive wear, damage, and rust.
- Check the back plate for damage, cracks, and deformation.
- Check the wheel cylinder for cracks, damage, and leakage of brake fluid.
- Visually check the brake drum for excessive wear, cracks, and damage with a pair of vernier calipers.
- Check the drum brake component parts for excessive wear, damage, and rust.

INSPECTION AFTER DISASSEMBLY

Check the following items and replace if necessary.

- Check the wheel cylinder inner wall for excessive wear, cracks, and damage.
- Check the piston for excessive wear and damage.

INSPECTION AFTER ASSEMBLY

Check that the piston moves smoothly.

INSPECTION AFTER INSTALLATION

1. Check that the component parts of drum brake assembly are installed properly.
2. Rotate the brake drum and check that there is no drag. Perform the following procedure if necessary.
3. Remove the brake shoe. Refer to [BR-41. "Removal and Installation"](#).
4. Push the piston.
CAUTION:
Push both side of the piston simultaneously.
5. Install the brake shoe. Refer to [BR-41. "Removal and Installation"](#).
6. Adjust the brake shoe clearance (parking brake lever stroke). Refer to [PB-4. "Inspection and Adjustment"](#).
7. Check a drag of rear drum brake again. If any drag is found, disassemble the wheel cylinder and replace if necessary. Refer to [BR-43. "Disassembly and Assembly"](#).
8. Burnish contact surface between brake lining and brake drum after refinishing or replacing brake lining or brake drum, or if a soft pedal occurs at very low mileage. Refer to [BR-17. "BRAKE LINING : Inspection and Adjustment"](#) (brake lining), [BR-17. "BRAKE DRUM : Inspection and Adjustment"](#) (brake drum).

ADJUSTMENT AFTER INSTALLATION

Adjust the brake shoe clearance (parking brake lever stroke). Refer to [PB-4. "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:000000009267564

Unit: mm (in)

Front brake	Cylinder bore diameter	54.025 (2.13)
	Pad length × width × thickness	115.0 × 41.0 × 9.0 (4.53 × 1.614 × 0.354)
	Rotor outer diameter × thickness	260 × 22.0 (10.24 × 0.87)
Rear brake	Cylinder bore diameter	19.05 (3/4)
	Lining length × width × thickness	Trailing: 172 × 37 × 4.8 (6.77 × 1.46 × 0.19) Leading: 155 × 37 × 4.8 (6.10 × 1.46 × 0.19)
	Drum inner diameter - new	203.2 (8.00)
Master cylinder	Cylinder bore diameter	19 (0.75)
Control valve	Valve type	Electric brake force distribution
Brake booster	Diaphragm diameter	255 (10)
Recommended brake fluid		Refer to MA-12, "Fluids and Lubricants" .

Brake Pedal

INFOID:000000009267565

Unit: mm (in)

Item	Standard
Brake pedal height	158 ±5 (6.22 ±0.20)
Clearance among the brake pedal lever and the stop lamp switch threaded end	0.2 – 1.96 (0.008 – 0.0772)
Brake pedal full stroke	128 (5.04)

Brake Booster

INFOID:000000009267566

Unit: mm (in)

Item	Standard
Input rod length	125 (4.92)

Front Disc Brake

INFOID:000000009267567

Unit: mm (in)

Item		Limit
Brake pad	Wear thickness	2.0 (0.08)
	Wear thickness	20.0 (0.787)
Disc rotor	Thickness variation (measured at 8 positions)	0.013 (0.001)
	Runout (with it attached to the vehicle)	0.055 (0.002)

Rear Drum Brake

INFOID:000000009267568

Unit: mm (in)

Item		Limit
Brake lining	Wear thickness	1.0 (0.04)
Brake drum	Wear inner diameter- maximum	204.2 (8.04)