

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:000000013465635

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 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, it is recommended that all maintenance and repair be performed by an authorized NISSAN/INFINITI dealer.
- Improper repair, 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

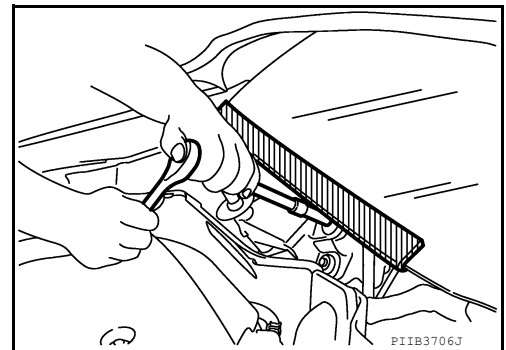
WARNING:

- When working near the Air Bag Diagnosis Sensor Unit or other Air Bag 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 or batteries, and wait at least three 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

INFOID:000000013198573

WARNING:

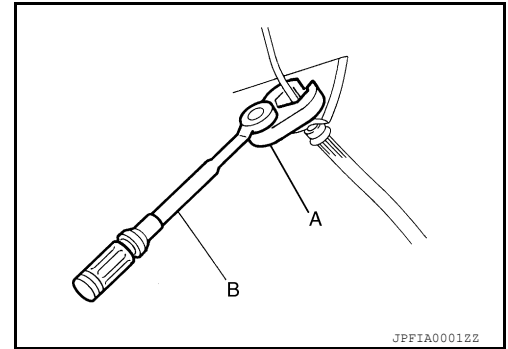
Clean any dust from the front brake and rear brake using a vacuum dust collector. Do not blow by compressed air.

- Brake fluid use refer to [MA-13. "VK56VD Gasoline Engine : Fluids and Lubricants"](#) or [MA-59. "Cummins \(5.0L V8D\) Engine : 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 clean with new brake fluid when cleaning the master cylinder, 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.

PRECAUTIONS

< PRECAUTION >

- Tighten the brake tube flare nut to the specified torque with a flare nut crowfoot (A) and torque wrench (B).
- 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.
- Always connect the battery terminal when moving the vehicle.
- Check that no brake fluid leakage is present after replacing the parts.
- Check for bends, cracks and damage to the brake pedal. Adjust brake pedal if it is outside the standard value.
- 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-16, "BRAKE PAD : Brake Burnishing"](#).
- Front disc brake rotor: refer to [BR-17, "DISC BRAKE ROTOR : Brake Burnishing"](#).
- Rear brake pad: refer to [BR-18, "BRAKE PAD : Brake Burnishing"](#).
- Rear disc brake rotor: refer to [BR-19, "DISC BRAKE ROTOR : Brake Burnishing"](#).



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PREPARATION

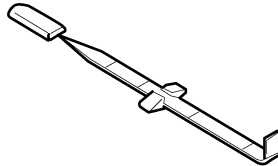
PREPARATION

Special Service Tools

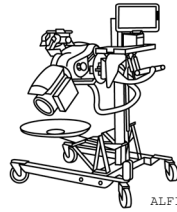
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The actual shape of the tools may differ from those illustrated here.

Tool number (TechMate No.) Tool name	Description
— (J-46532) Brake height tool	Measuring brake pedal height
38-PFM92 (—) Pro-Cut™ PFM Series Lathe	Refinishing rotors



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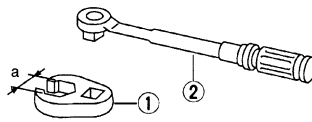


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Commercial Service Tools

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Tool name	Description
1. Flare nut crowfoot 2. Torque wrench	Tightening brake tube flare nuts a: 10 mm (0.39 in) / 12 mm (0.47 in)
Power tool	Loosening nuts, screws and bolts



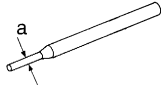
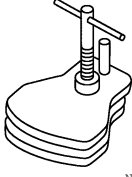
S-NT360



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PREPARATION

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<p>Pin punch</p>  <p>NT410</p>	<p>Removing and installing reservoir tank a: 4 mm (0.16 in)</p>
<p>Brake caliper wrench</p>  <p>NNFIA00402Z</p>	<p>Return the piston</p>

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

< SYMPTOM DIAGNOSIS >

SYMPTOM DIAGNOSIS

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

INFOID:0000000013053601

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

Symptom		Possible cause and SUSPECTED PARTS														Reference page	
		Pads damaged	Pads uneven wear	Shims damaged	Rotor imbalance	Rotor damage	Rotor runout	Rotor deformation	Rotor deflection	Rotor rust	Rotor thickness variation	AXLE AND SUSPENSION	TIRE	ROAD WHEEL	AXLE SHAFT		STEERING
BRAKE	Noise	x	x	x								x	x	x	x	x	BR-16, BR-18
	Shake				x							x	x	x	x		BR-8, BR-9, BR-16, BR-18 BR-8, BR-9, BR-16, BR-18 BR-16, BR-18 BR-16, BR-18 BR-16, BR-18 BR-16, BR-18 BR-8, BR-9, BR-16, BR-18
	Shimmy, Judder				x	x	x	x	x	x	x	x	x	x			FAX-5, RAX-4 FSU-5, RSU-4 WT-64 WT-64 FAX-5 ST-32

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FRONT DISC BRAKE

< BASIC INSPECTION >

BASIC INSPECTION

FRONT DISC BRAKE

DISC ROTOR

DISC ROTOR : Inspection

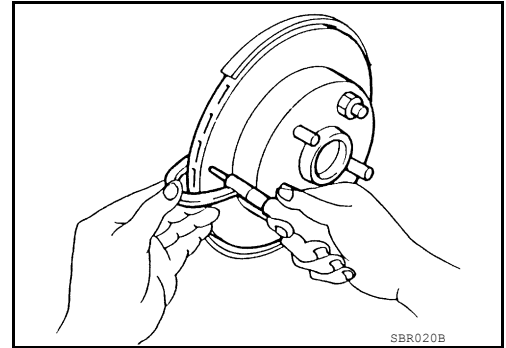
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INSPECTION

Uneven wear

Check for uneven wear of the disc rotor using a micrometer. Replace the disc rotor if the thickness is below the wear limit. Refer to [BR-36, "DISC BRAKE ROTOR : Removal and Installation"](#).

Thickness variation (measured at 8 positions) : Refer to [BR-53, "Front Disc Brake"](#).



REAR DISC BRAKE

< BASIC INSPECTION >

REAR DISC BRAKE

DISC ROTOR

DISC ROTOR : Inspection

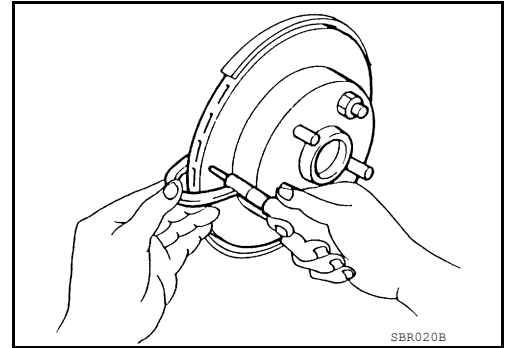
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INSPECTION

Uneven wear

Check for uneven wear of the disc rotor using a micrometer. Replace the disc rotor if the thickness is below the wear limit. Refer to [BR-41, "DISC BRAKE ROTOR : Removal and Installation"](#).

Thickness variation : Refer to [BR-53, "Rear Disc Brake"](#).
(measured at 8 positions)



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BRAKE PEDAL

< PERIODIC MAINTENANCE >

PERIODIC MAINTENANCE

BRAKE PEDAL

Inspection

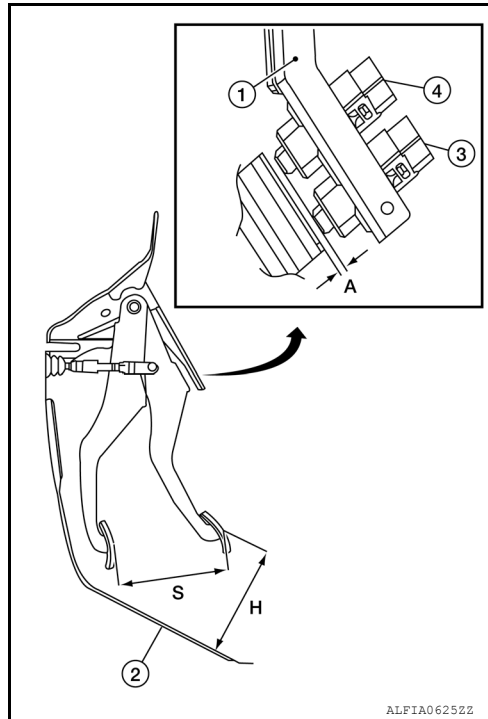
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BRAKE PEDAL HEIGHT

Check the brake pedal height (H) between the dash lower panel (2) and the brake pedal upper surface.

CAUTION:

Check the brake pedal height with the floor trim removed.



Brake pedal height (H) from dash lower panel (2)	Refer to BR-52, "Brake Pedal" .
Clearance (A) between brake pedal bracket (1), stop lamp switch (3) and brake pedal position switch (4) contact ends	Refer to BR-52, "Brake Pedal" .
Brake pedal full stroke (S)	Refer to BR-52, "Brake Pedal" .

Adjustment

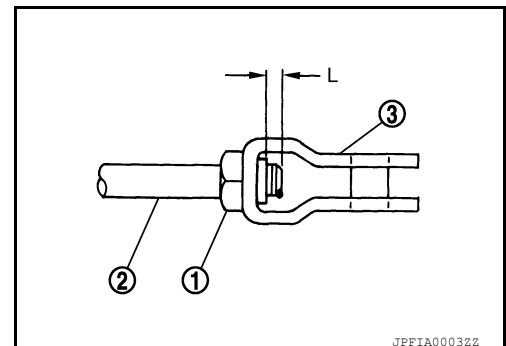
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BRAKE PEDAL HEIGHT

1. Remove instrument lower panel LH. Refer to [IP-22, "Removal and Installation"](#).
2. Disconnect harness connectors from the stop lamp switch and brake pedal position switch.
3. Turn stop lamp switch and brake pedal position switch 45° counterclockwise.
4. Loosen input rod lock nut (1).

CAUTION:

- Check the height with the floor trim removed.
- The threaded end of the input rod (2) must project to the inner side (L) of the clevis (3).



BRAKE PEDAL

< PERIODIC MAINTENANCE >

5. Adjust brake pedal height to specification. Refer to [BR-52, "Brake Pedal"](#).
6. Tighten input rod lock nut to specification. Refer to [BR-29, "Exploded View"](#).
7. Turn stop lamp switch and brake pedal position switch 45° clockwise.
8. Connect harness connectors to stop lamp switch and brake pedal position switch.
9. Check brake pedal for smooth operation.

CAUTION:

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

10. Install instrument lower panel LH. Refer to [IP-22, "Removal and Installation"](#).

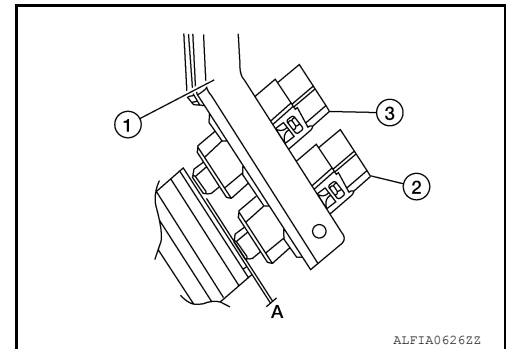
STOP LAMP SWITCH AND BRAKE PEDAL POSITION SWITCH

1. Remove instrument lower panel LH. Refer to [IP-22, "Removal and Installation"](#).
2. Disconnect the harness connectors from the stop lamp switch and brake pedal position switch.
3. Turn the stop lamp switch and brake pedal position switch 45° counterclockwise.

4. With threaded ends of stop lamp switch (2) and brake pedal position switch (3) contacting pedal bracket (1), turn switches 45° clockwise to lock in place. Check that both stop lamp switch and brake pedal position switch contact ends to brake pedal bracket clearance (A) are within specification.

CAUTION:

- Make sure that the clearance between the brake pedal bracket, stop lamp switch and the brake pedal position switch contact ends are within specification.
- The stop lamp must turn off when the brake pedal is released.



Clearance (A) : Refer to [BR-52, "Brake Pedal"](#).

5. Connect harness connectors to stop lamp switch and brake pedal position switch.
6. Install instrument lower panel LH. Refer to [IP-22, "Removal and Installation"](#).

BRAKE FLUID

< PERIODIC MAINTENANCE >

BRAKE FLUID

Inspection

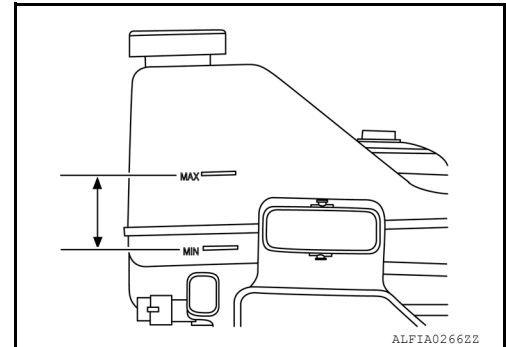
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BRAKE FLUID LEVEL

- Make sure that the brake fluid level in the reservoir tank is between the MAX and MIN lines.

NOTE:

Since brake fluid is in the accumulator in pressurized condition, the reservoir tank brake fluid level should be lower than the MAX line.



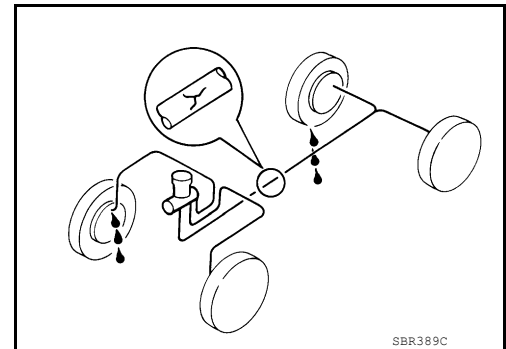
- Visually check around the reservoir tank for brake fluid leaks.
- If the brake fluid level is excessively low, check the brake system for leaks.
- If brake warning lamp remains illuminated after parking brake pedal is released, check the brake system for brake fluid leaks.
- Check the reservoir tank for the mixing of foreign matter (e.g. dust) and oils other than brake fluid.

BRAKE LINE

1. Check brake line (tubes 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:

If brake fluid leak occurs around joints, retighten or replace damaged parts as necessary.



Drain and Refill

INFOID:000000013053606

CAUTION:

- If the brake fluid adheres to the brake caliper assembly and disc rotor, quickly wipe it off.
- 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 operate the brake pedal with the reservoir cap removed. Failure to do this may cause a discharge of brake fluid from the reservoir cap opening.
- Do not operate the brake pedal excessively during the work procedure.

DRAINING

1. Turn the ignition switch ON.
2. Connect a vinyl tube to the bleeder valve.
3. Depress the brake pedal and loosen the bleeder valve.
4. Depress the brake pedal several times and gradually discharge brake fluid.

REFILLING

CAUTION:

Monitor the brake fluid level in the reservoir tank while performing the refilling.

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

BRAKE FLUID

< PERIODIC MAINTENANCE >

CAUTION:

- Do not reuse drained brake fluid.
- Do not allow oils other than brake fluid to enter the reservoir tank.

2. Turn the ignition switch ON.
3. Connect a vinyl tube to the bleeder valve.
4. Depress the brake pedal and loosen the bleeder valve.
5. Depress the brake pedal several times until the refilled brake fluid is discharged and tighten the bleeder valve to the specified torque with the brake pedal depressed. Refer to [BR-37, "BRAKE PAD : Exploded View"](#).
6. Bleed the brake system. Refer to [BR-13, "Bleeding Brake System"](#).

Bleeding Brake System

INFOID:000000013053608

CAUTION:

- If the brake fluid adheres to the brake caliper assembly and disc rotor, quickly wipe it off.
- 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 operate the brake pedal with the reservoir cap removed. Failure to do this may cause a discharge of brake fluid from the reservoir cap opening.
- Do not operate the brake pedal excessively during the work procedure.
- Monitor the brake fluid level in the reservoir tank while performing the air bleeding.
- Check that there is no foreign material in the reservoir tank.
- Do not reuse drained brake fluid.
- Do not allow oils other than brake fluid to enter the reservoir tank.

NOTE:

When the ignition switch is ON, the brake warning lamp may turn ON even when the parking brake pedal is released with the brake fluid within the specified level. This indicates the decrease in accumulator fluid pressure.

1. Turn the ignition switch OFF and fill the reservoir tank to MAX line with brake fluid.
2. Turn the ignition switch ON.
NOTE:
The motor is activated and automatically stops.
3. Turn the ignition switch OFF.
4. Depress the brake pedal 20 times or more.
NOTE:
The pressure loss in the accumulator results in a large brake pedal stroke. In addition to this, the brake pedal depression becomes lighter in initial stage.
5. Repeat steps 2 to 4 for 5 times.
6. Turn the ignition switch ON to check that the time between motor activation and automatic stop is less than 18 seconds. If the time is 18 seconds or more, repeat from Step 2 to 4 for 5 times.
7. With the ignition switch ON, connect vinyl tubes to the front and rear bleeder valves.
8. Depress the brake pedal. Loosen the front bleeder valve to bleed air in brake line, then tighten front bleeder valve. Refer to [BR-33, "BRAKE CALIPER ASSEMBLY : Exploded View"](#).
9. Repeat steps 1 to 9 until all of the air is out of the front brake line.
10. Release the brake pedal.
11. Depress and hold the brake pedal. Loosen rear bleeder valve to discharge 100 cc (3.4 US fl oz, 3.5 Imp fl oz), bleed air in brake line, and then tighten rear bleeder valve. Refer to [BR-37, "BRAKE PAD : Exploded View"](#).
12. Repeat until air is out of brake lines.
13. Bleed the air in the following order: front (RH), front (LH), rear (RH), rear (LH).

BRAKE FLUID LEVEL ADJUSTMENT AFTER AIR BLEEDING

1. Turn the ignition switch OFF.
2. Depress the brake pedal 20 times or more.
NOTE:

BRAKE FLUID

< PERIODIC MAINTENANCE >

The pressure loss in the accumulator results in a large brake pedal stroke. In addition to this, the brake pedal depression becomes lighter in initial stage.

3. Adjust brake fluid level to the reservoir tank MAX line.

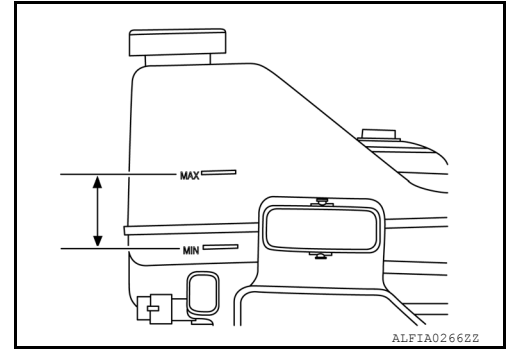
CAUTION:

Do not adjust with the ignition switch ON.

4. Turn the ignition switch ON.
5. Check that the reservoir tank brake fluid level is within 6 – 14 mm (0.24 – 0.55 in) lower than the MAX line center.

NOTE:

Since brake fluid is in the accumulator in pressurized condition, the reservoir tank brake fluid level should be lower than the MAX line.



HYDRAULIC BOOSTER ASSEMBLY

< PERIODIC MAINTENANCE >

HYDRAULIC BOOSTER ASSEMBLY

Inspection

INFOID:000000013053609

OPERATION CHECK

1. Turn the ignition switch OFF.
2. Depress the brake pedal 20 times or more.
NOTE:
The pressure loss in the accumulator results in a large brake pedal stroke. In addition to this, the brake pedal depression becomes lighter in initial stage.
3. Check that the brake fluid level in the reservoir tank is within the specified range. Refer to [BR-12. "Inspection"](#)
4. Position the shift selector in P range to release the parking brake.
5. Turn the ignition switch ON to check the time between motor activation and motor stop.

Motor operating time : 18 seconds or less

6. After the motor is stopped, check that the ABS warning lamp and the VDC warning lamp in the combination meter are OFF when the engine is started.
7. Stop the engine (ignition switch OFF).
8. Turn the ignition switch ON and depress the brake pedal 4 to 5 times to check the time between motor activation and motor stop.

Motor operating time : 2 – 11 seconds

9. Turn the ignition switch OFF. Turn the ignition switch ON again. Check that the VDC warning lamp turns ON when the brake pedal is depressed 15 to 20 times.
10. Check that the VDC warning lamp turns ON when the brake pedal is depressed 15 to 20 times after the lapse of 120 seconds or more after the ignition switch is turned ON again.
11. Perform the self-diagnosis for "ABS" with CONSULT and erase self-diagnosis results.

FUNCTION CHECK

1. Turn the ignition switch OFF.
2. Depress the brake pedal 20 times or more.
NOTE:
The pressure loss in the accumulator results in a large brake pedal stroke. In addition to this, the brake pedal depression becomes lighter in initial stage.
3. Turn the ignition switch ON with the brake pedal depressed to check that the clearance between the brake pedal and the dash lower panel decreases.

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FRONT DISC BRAKE

< PERIODIC MAINTENANCE >

FRONT DISC BRAKE

BRAKE PAD

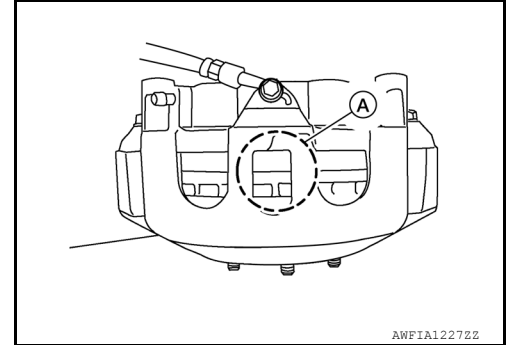
BRAKE PAD : Inspection

INFOID:000000013197474

INSPECTION

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

Wear thickness : Refer to [BR-53, "Front Disc Brake"](#).



BRAKE PAD : Brake Burnishing

INFOID:000000013197475

CAUTION:

- Burnish contact surfaces between brake pads and disc brake rotor according to the following procedure after refinishing the disc brake rotor, replacing brake pads or if a soft pedal occurs at very low mileage.
- Be careful of vehicle speed. Brakes do not operate firmly/securely until pads and disc brake rotor are securely seated.
- Only perform this procedure under safe road and traffic conditions. Use extreme caution.

1. Drive vehicle on straight, flat road.
2. Depress brake pedal until vehicle stops.
3. Release brake pedal for a few minutes to allow brake components to cool.
4. Repeat steps 1 through 3 until pad and disc brake rotor are securely seated.

DISC BRAKE ROTOR

DISC BRAKE ROTOR : Inspection

INFOID:000000013197404

APPEARANCE

Check surface of disc brake rotor for uneven wear, cracks, or damage. Replace it if necessary. Refer to [BR-36, "DISC BRAKE ROTOR : Removal and Installation"](#).

RUNOUT

1. Check wheel bearing axial end play before inspection. Refer to [FAX-25, "Wheel Hub and Bearing Assembly"](#).
2. Secure disc brake rotor to wheel hub and bearing with wheel nuts at two wheel nut locations.
3. Measure runout using a dial indicator to 20 mm (0.79 in) from disc brake rotor edge.

Runout : Refer to [BR-53, "Rear Disc Brake"](#).

4. Find installation position with a minimum runout by shifting the disc brake rotor-to-wheel hub and bearing installation position by one hole at a time if runout exceeds limit value.
5. Refinish disc brake rotor if runout is outside limit even after performing above operation. When refinishing, use Tool.

Tool number : 38-PFM92 (—)

CAUTION:

- Check in advance that the thickness of the disc brake rotor is wear thickness + 0.3 mm (0.012 in) or more.

FRONT DISC BRAKE

< PERIODIC MAINTENANCE >

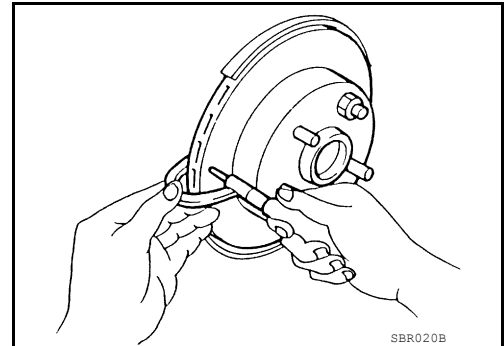
- If the thickness is less than wear thickness + 0.3 mm (0.012 in), replace the disc brake rotor.

Wear thickness : Refer to [BR-53, "Rear Disc Brake"](#).

THICKNESS

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

Wear thickness : Refer to [BR-53, "Rear Disc Brake"](#).



DISC BRAKE ROTOR : Brake Burnishing

INFOID:000000013197472

CAUTION:

- Burnish contact surfaces between brake pads and disc brake rotor according to the following procedure after refinishing the disc brake rotor, replacing brake pads or if a soft pedal occurs at very low mileage.
 - Be careful of vehicle speed. Brakes do not operate firmly/securely until pads and disc brake rotor are securely seated.
 - Only perform this procedure under safe road and traffic conditions. Use extreme caution.
1. Drive vehicle on straight, flat road.
 2. Depress brake pedal until vehicle stops.
 3. Release brake pedal for a few minutes to allow brake components to cool.
 4. Repeat steps 1 through 3 until pad and disc brake rotor are securely seated.

REAR DISC BRAKE

< PERIODIC MAINTENANCE >

REAR DISC BRAKE BRAKE PAD

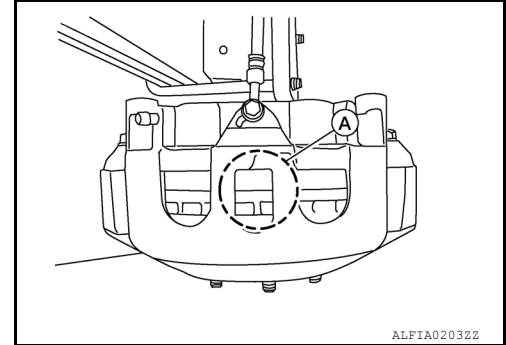
BRAKE PAD : Inspection

INFOID:000000013197406

INSPECTION

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

Wear thickness : Refer to [BR-53, "Rear Disc Brake"](#).



BRAKE PAD : Brake Burnishing

INFOID:000000013197407

CAUTION:

- **Burnish contact surfaces between brake pads and disc brake rotor according to the following procedure after refinishing the disc brake rotor, replacing brake pads or if a soft pedal occurs at very low mileage.**
 - **Be careful of vehicle speed. Brakes do not operate firmly/securely until pads and disc brake rotor are securely seated.**
 - **Only perform this procedure under safe road and traffic conditions. Use extreme caution.**
1. Drive vehicle on straight, flat road.
 2. Depress brake pedal until vehicle stops.
 3. Release brake pedal for a few minutes to allow brake components to cool.
 4. Repeat steps 1 through 3 until pad and disc brake rotor are securely seated.

DISC BRAKE ROTOR

DISC BRAKE ROTOR : Inspection

INFOID:000000013197408

APPEARANCE

Check surface of disc brake rotor for uneven wear, cracks, or damage. Replace it if necessary. Refer to [BR-41, "DISC BRAKE ROTOR : Removal and Installation"](#).

RUNOUT

1. Check wheel bearing axial end play before inspection. Replace if necessary.
2. Secure disc brake rotor to wheel hub and bearing with wheel nuts at two wheel nut locations.
3. Measure runout using a dial gauge 20 mm (0.79 in) from disc brake rotor edge.

Runout : Refer to [BR-53, "Rear Disc Brake"](#).

4. Find installation position with a minimum runout by shifting disc brake rotor-to-wheel hub and bearing installation position by one hole at a time if runout exceeds limit value.
5. Refinish disc brake rotor if runout is outside limit even after performing above operation. When refinishing, use Tool.

Tool number : 38-PFM92 (—)

CAUTION:

- **Check in advance that the thickness of the disc brake rotor is wear thickness + 0.3 mm (0.012 in) or more.**
- **If the thickness is less than wear thickness + 0.3 mm (0.012 in), replace the disc brake rotor.**

REAR DISC BRAKE

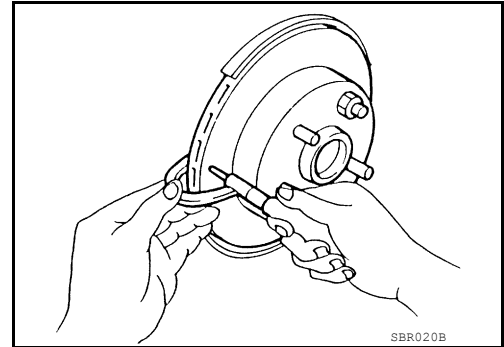
< PERIODIC MAINTENANCE >

Wear thickness : Refer to [BR-53, "Rear Disc Brake"](#).

THICKNESS

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

Wear thickness : Refer to [BR-53, "Rear Disc Brake"](#).



DISC BRAKE ROTOR : Brake Burnishing

INFOID:000000013197409

CAUTION:

- Burnish contact surfaces between brake pads and disc brake rotor according to the following procedure after refinishing the disc brake rotor, replacing brake pads or if a soft pedal occurs at very low mileage.
 - Be careful of vehicle speed. Brakes do not operate firmly/securely until pads and disc brake rotor are securely seated.
 - Only perform this procedure under safe road and traffic conditions. Use extreme caution.
1. Drive vehicle on straight, flat road.
 2. Depress brake pedal until vehicle stops.
 3. Release brake pedal for a few minutes to allow brake components to cool.
 4. Repeat steps 1 through 3 until pad and disc brake rotor are securely seated.

BRAKE PEDAL

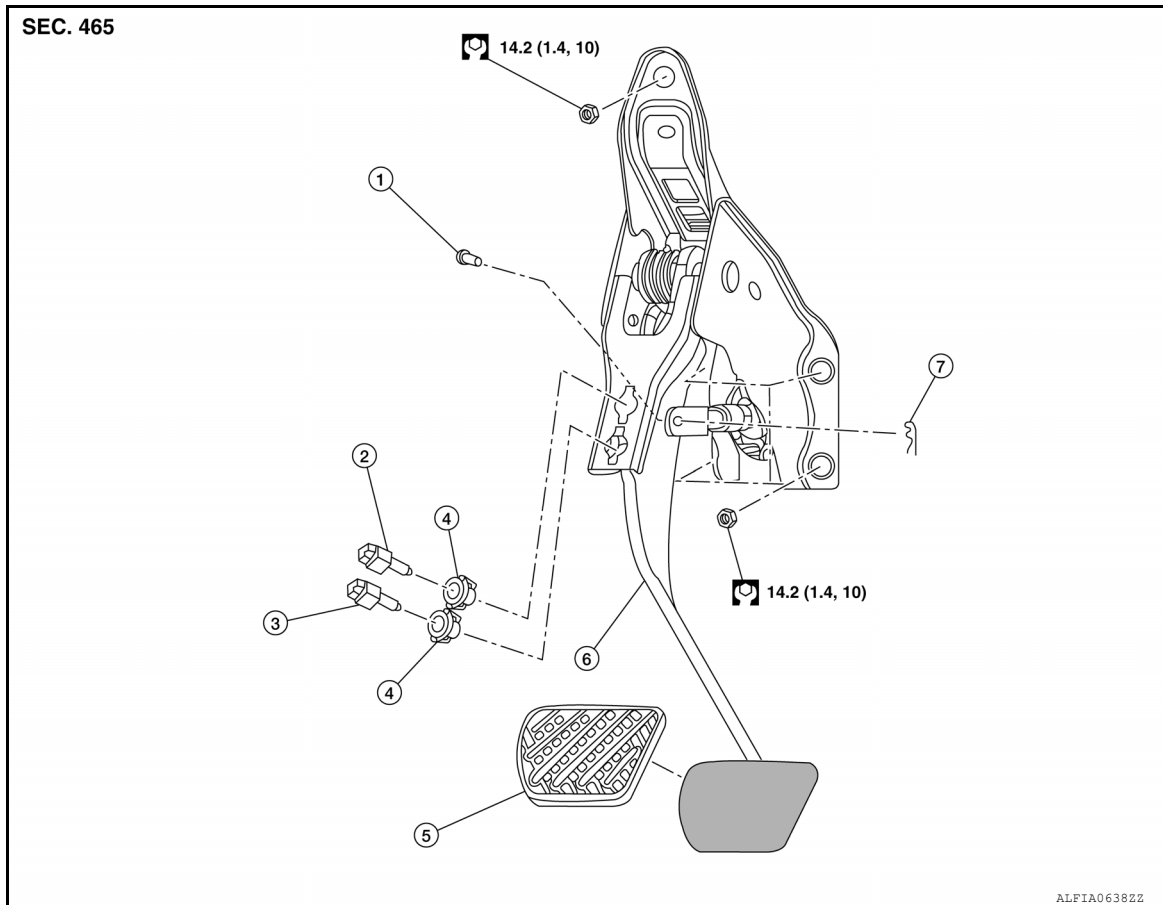
< REMOVAL AND INSTALLATION >

REMOVAL AND INSTALLATION

BRAKE PEDAL

Exploded View

INFOID:000000013053614



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

Removal and Installation

INFOID:000000013053615

REMOVAL

1. Remove the instrument lower panel LH. Refer to [IP-22, "Removal and Installation"](#).
2. Disconnect the harness connectors from the stop lamp switch and brake pedal position switch.
3. Remove the stop lamp switch and the brake pedal position switch.
4. Remove the snap pin and clevis pin from the clevis of brake booster.
5. Remove the brake pedal assembly nuts.

CAUTION:

Support the hydraulic booster assembly to prevent contact with other parts.

NOTE:

Remove brake pedal assembly top nut first.

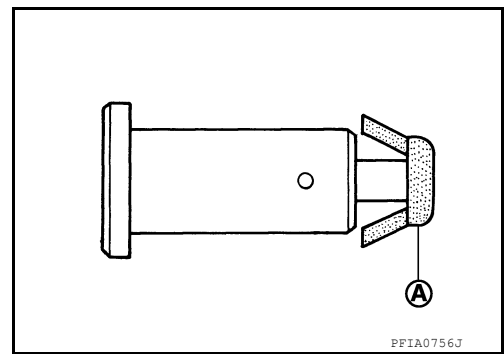
6. Remove the brake pedal assembly.

INSPECTION AFTER REMOVAL

BRAKE PEDAL

< REMOVAL AND INSTALLATION >

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



INSTALLATION

Installation is in the reverse order of removal.

- Apply the multi-purpose grease to the clevis pin.
- Perform inspection after installation. Refer to [BR-10, "Inspection"](#).
- Perform adjustment after installation. Refer to [BR-10, "Adjustment"](#).

NOTE:

The clevis pin may be inserted in either direction

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BRAKE PIPING

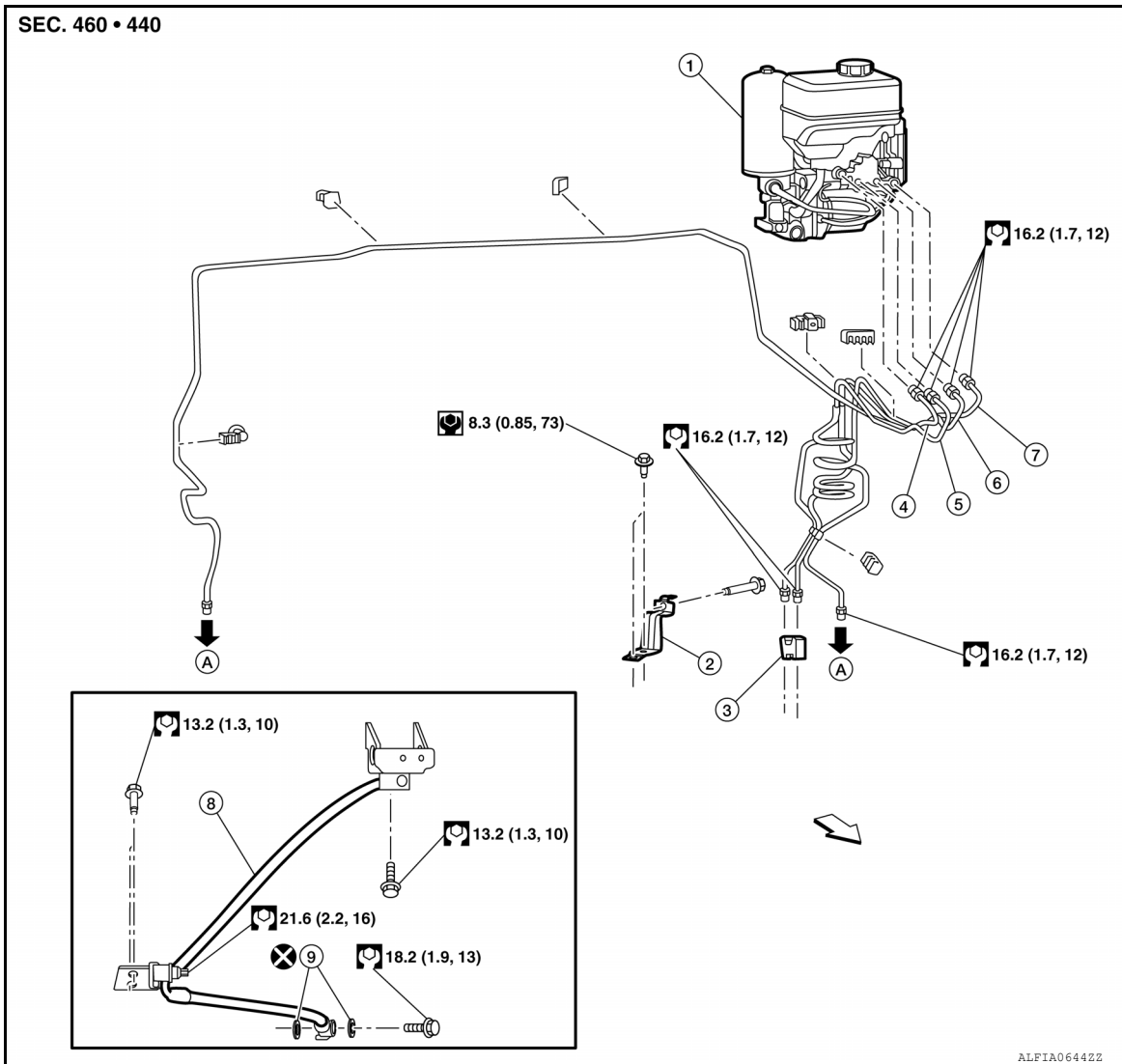
< REMOVAL AND INSTALLATION >

BRAKE PIPING

FRONT

FRONT : Exploded View

INFOID:000000013197372



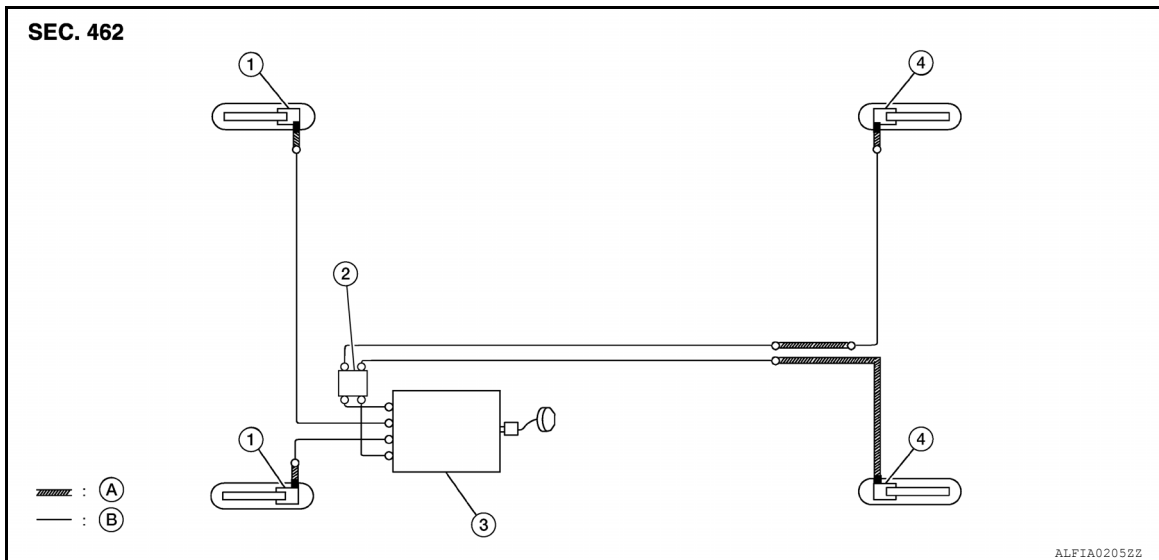
- | | | |
|-------------------------------|------------------------|---------------------------|
| 1. Hydraulic booster assembly | 2. Connector bracket | 3. Connector |
| 4. Brake tube rear RH | 5. Brake tube front RH | 6. Brake tube front LH |
| 7. Brake tube rear LH | 8. Front brake hose | 9. Copper sealing washers |
| A. To front brake hose | ← Front | |

BRAKE PIPING

< REMOVAL AND INSTALLATION >

FRONT : Hydraulic Piping

INFOID:000000013053617



- | | | |
|---------------------|---------------|-------------------------------|
| 1. Front disc brake | 2. Connector | 3. Hydraulic booster assembly |
| 4. Rear disc brake | A. Brake hose | B. Brake tube |
| ○ Flare nut | ■ Union bolt | |

FRONT : Removal and Installation

INFOID:000000013053618

CAUTION:

- All hoses and piping (tubes) must be free from excessive bending, twisting and pulling.
- If the brake fluid adheres to the brake caliper assembly and disc rotor, quickly wipe it off.
- Make sure there is no interference with other parts when turning steering both clockwise and counterclockwise
- 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 depress the brake pedal while brake lines or hoses are disconnected.
- Do not allow foreign matter (e.g. dust) and oils other than brake fluid to enter the reservoir tank.

NOTE:

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

REMOVAL

1. Remove cap from reservoir tank.
2. Remove the wheels and tires using power tool. Refer to [WT-69. "Removal and Installation"](#).
3. Loosen the flare nut with a flare nut wrench and separate the brake tube and the brake hose.

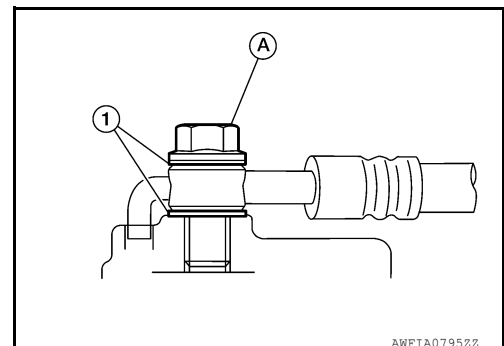
CAUTION:

- Do not scratch the flare nut and the brake tube.
- Do not bend sharply, twist or strongly pull out the brake hose or brake tube.

4. Remove the union bolt (A) and copper sealing washers (1), and remove the brake hose from the brake caliper assembly.

CAUTION:

Do not reuse copper sealing washers.



BRAKE PIPING

< REMOVAL AND INSTALLATION >

5. Remove the brake hose from the bracket.
6. Remove the brake hose bracket.

INSTALLATION

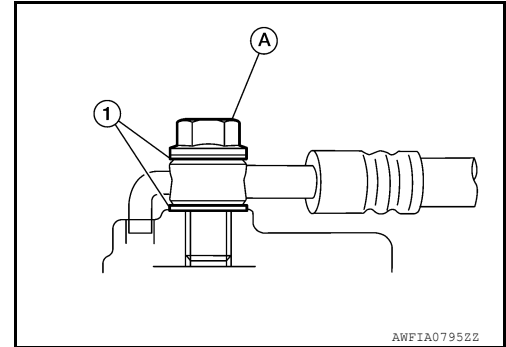
CAUTION:

- If the brake fluid adheres to the brake caliper assembly and disc rotor, quickly wipe it off.
- 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 depress the brake pedal while brake lines or hoses are disconnected.
- Do not allow foreign matter (e.g. dust) and oils other than brake fluid to enter the reservoir tank.

1. Install the brake hose bracket.
2. Assemble the union bolt (A) and the copper sealing washers (1) to the brake hose.

CAUTION:

Do not reuse the copper sealing washers.



3. Install the brake hose L-pin by aligning it with the brake caliper assembly positioning hole, and tighten the union bolt (A) to the specified torque. Refer to [BR-22, "FRONT : Exploded View"](#).
4. Install the brake tube to the brake hose, temporarily tighten the flare nut by hand until it does not rotate further, and secure the brake hose to the bracket.
CAUTION:
Check that all brake hoses or brake tubes are not twisted or bent.
5. Tighten the flare nut to the specified torque with a flare nut crowfoot and torque wrench.
CAUTION:
Do not scratch the flare nut and the brake tube.
6. Tighten the brake hose nuts to the specified torque. Refer to [BR-23, "FRONT : Removal and Installation"](#).
CAUTION:
Do not reuse the brake hose nuts.
7. Bleed the brake system. Refer to [BR-13, "Bleeding Brake System"](#).
8. Install the wheels and tires. Refer to [WT-69, "Removal and Installation"](#).
9. Perform inspection after installation. Refer to [BR-24, "FRONT : Inspection"](#).

FRONT : Inspection

INFOID:000000013053619

INSPECTION AFTER INSTALLATION

1. Check the brake hoses and tubes for the following: no scratches; no twist or deformation; no interference with other components when steering the steering wheel; no looseness at connections.
2. Depress the brake pedal with a force of 785 N (80 kg-f, 176 lb-f) and hold down the pedal for approx. 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

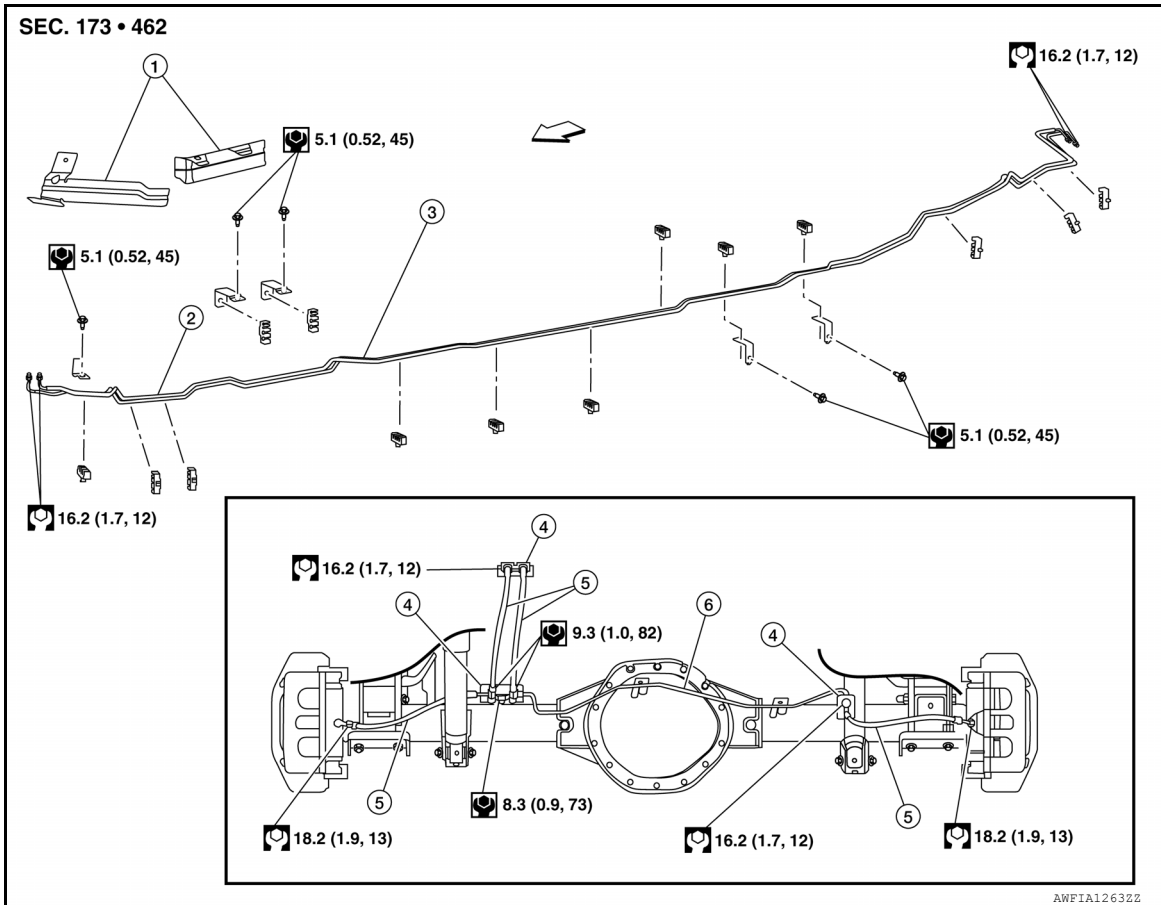
BRAKE PIPING

< REMOVAL AND INSTALLATION >

REAR : Exploded View

INFOID:000000013197373

Cummins 5.0L



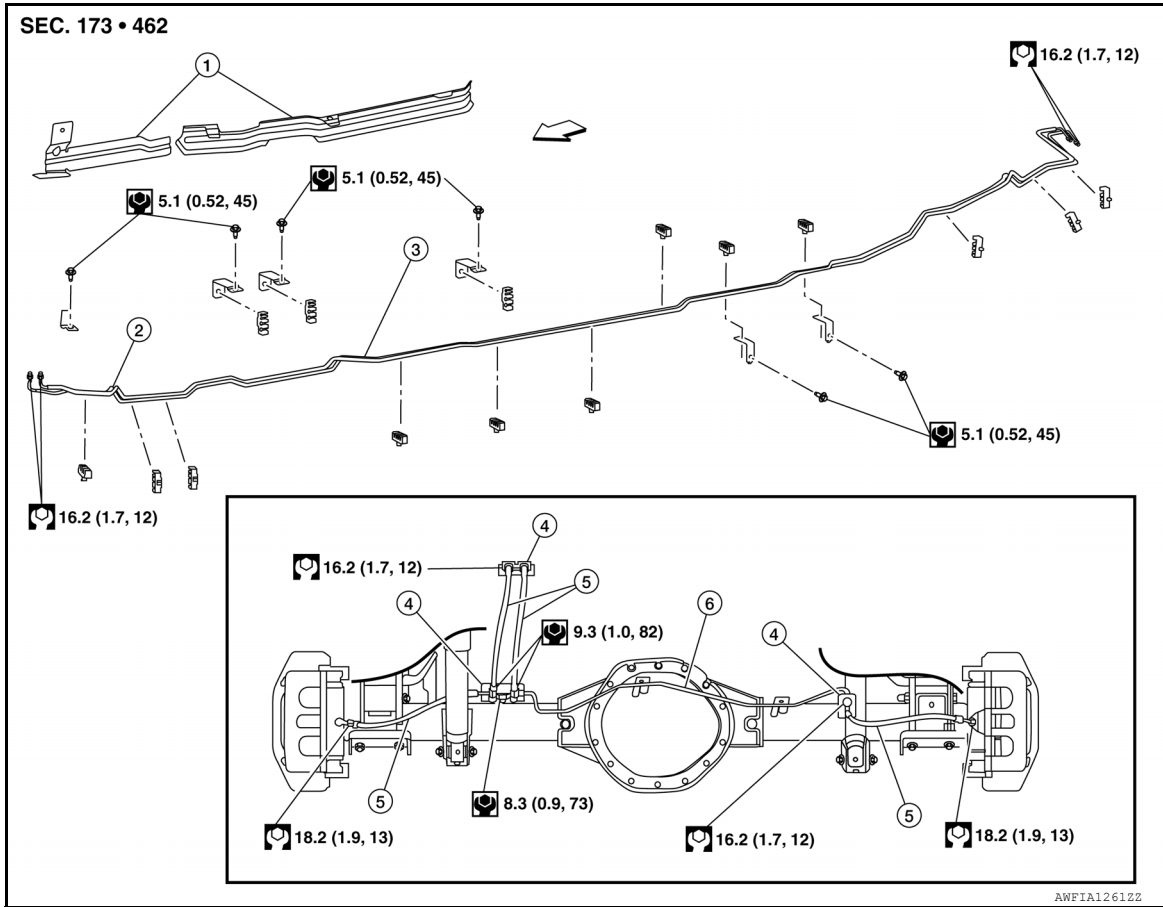
- | | | |
|-------------------|-------------------------|-------------------------|
| 1. Fuel protector | 2. Rear brake pipe (RH) | 3. Rear brake pipe (LH) |
| 4. Lock plate | 5. Rear brake hose | 6. Rear brake pipe |
- ← Front

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BRAKE PIPING

< REMOVAL AND INSTALLATION >

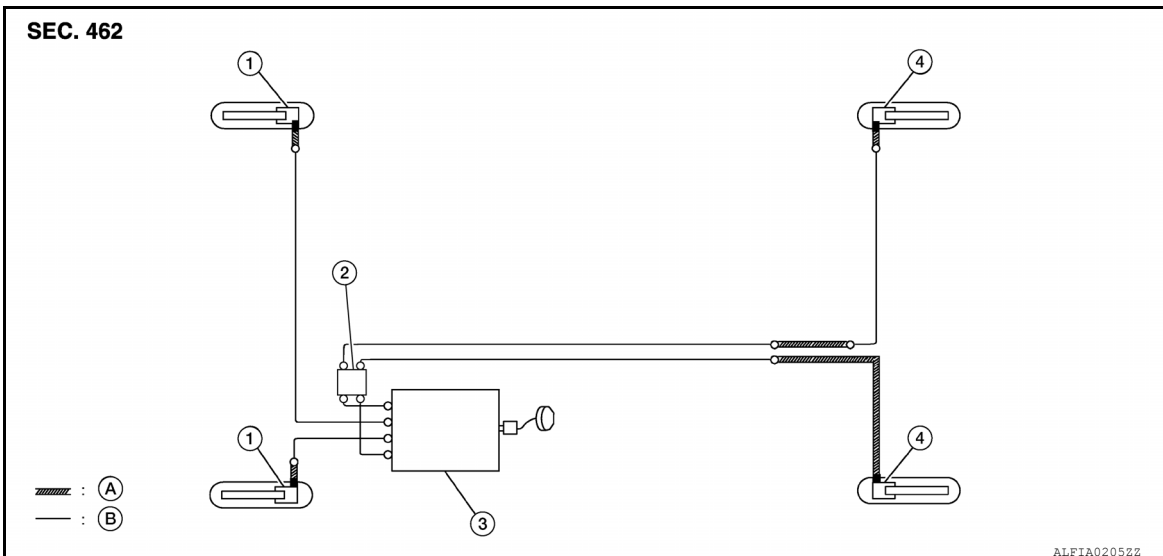
VK56VD



- | | | |
|-------------------|-------------------------|-------------------------|
| 1. Fuel protector | 2. Rear brake pipe (RH) | 3. Rear brake pipe (LH) |
| 4. Lock plate | 5. Rear brake hose | 6. Rear brake pipe |
- ← Front

REAR : Hydraulic Piping

INFOID:000000013053620



- | | | |
|---------------------|--------------|-------------------------------|
| 1. Front disc brake | 2. Connector | 3. Hydraulic booster assembly |
|---------------------|--------------|-------------------------------|

BRAKE PIPING

< REMOVAL AND INSTALLATION >

4. Rear disc brake

○ Flare nut

A. Brake hose

■ Union bolt

B. Brake tube

REAR : Removal and Installation

INFOID:000000013053621

CAUTION:

- All hoses and piping (tubes) must be free from excessive bending, twisting and pulling.
- If the brake fluid adheres to the brake caliper assembly and disc rotor, quickly wipe it off.
- 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 depress the brake pedal while brake lines or hoses are disconnected.
- Do not allow foreign matter (e.g. dust) and oils other than brake fluid to enter the reservoir tank.

NOTE:

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

REMOVAL

1. Remove the wheels and tires using power tool. Refer to [WT-69. "Removal and Installation"](#).
2. Loosen the flare nut with a flare nut wrench and separate the brake tubes and the brake hoses.

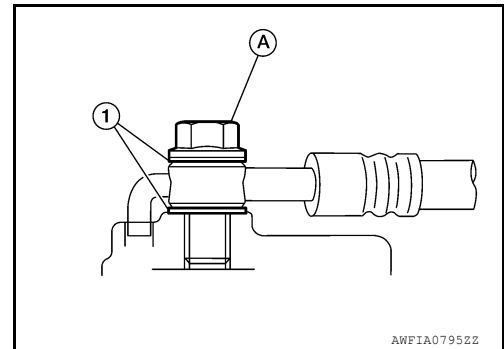
CAUTION:

- Do not scratch the flare nut and the brake tube.
- Do not bend sharply, twist or strongly pull out the brake hose or brake tube.
- Cover open end of brake hose or brake tube when disconnecting to prevent entrance of dirt.

3. Remove the union bolt (A) and copper sealing washers (1), and remove the brake hose from the brake caliper assembly.

CAUTION:

Do not reuse copper sealing washers.



4. Remove the lock plate and remove the brake hose.

INSTALLATION

CAUTION:

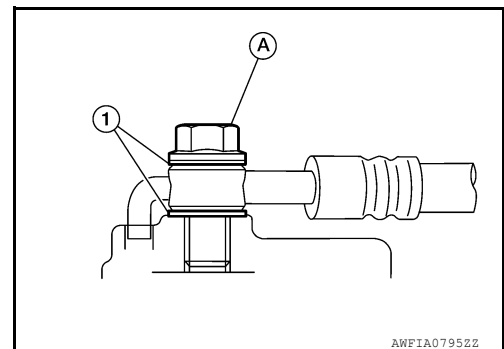
- If the brake fluid adheres to the brake caliper assembly and disc rotor, quickly wipe it off.
- Do not spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.
- Do not depress the brake pedal while brake lines or hoses are disconnected.

1. Assemble the union bolt (A) and the copper sealing washers (1) to the brake hose.

CAUTION:

Do not reuse the copper sealing washers.

2. Align the brake hose pin to the projection of the brake caliper assembly and tighten the union bolt (A) 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 secure the brake hose to the bracket with the lock plate.

CAUTION:

Check that all brake hose or brake tube are not twisted and bent.

BRAKE PIPING

< REMOVAL AND INSTALLATION >

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

CAUTION:

Do not scratch the flare nut and the brake tube.

5. Bleed the brake system. Refer to [BR-13, "Bleeding Brake System"](#).
6. Install the wheels and tires. Refer to [WT-69, "Removal and Installation"](#).
7. Perform inspection after installation. Refer to [BR-28, "REAR : Inspection"](#).

REAR : Inspection

INFOID:000000013053622

INSPECTION AFTER INSTALLATION

1. Check the brake hoses and tubes for the following: no scratches; no twist or deformation; no interference with other components when steering the steering wheel; no looseness at connections.
2. Depress the brake pedal with a force of 785 N (80 kg-f, 176 lb-f) and hold down the pedal for approx. 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.

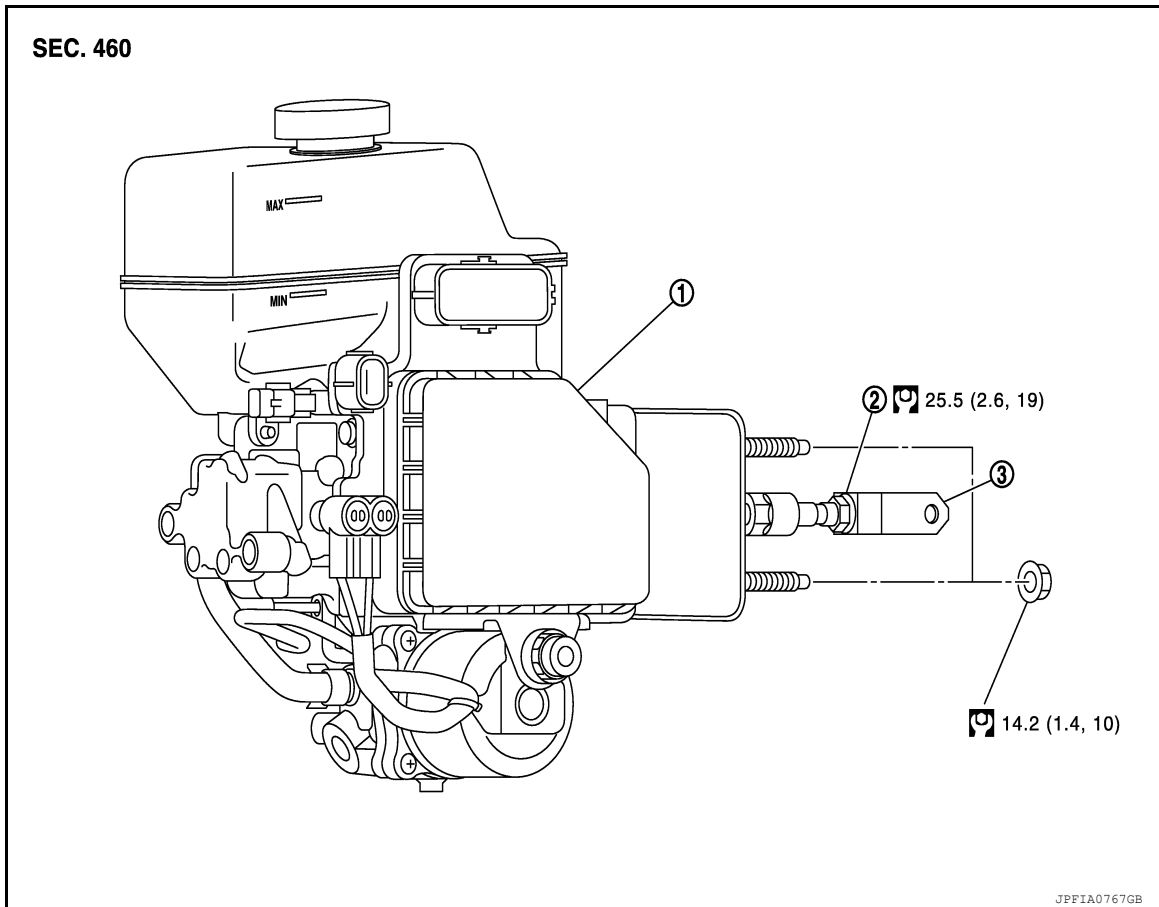
HYDRAULIC BOOSTER ASSEMBLY

< REMOVAL AND INSTALLATION >

HYDRAULIC BOOSTER ASSEMBLY

Exploded View

INFOID:000000013189388



1. Hydraulic booster assembly

2. Lock nut

3. Clevis

Removal and Installation

INFOID:000000013053623

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 turn the ignition switch ON before the completion of the installation.

NOTE:

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

REMOVAL

1. Turn the ignition switch OFF.

CAUTION:

Do not turn the ignition switch ON before the completion of the installation procedure.

2. Depress the brake pedal 20 times or more to release the pressure from the accumulator.

CAUTION:

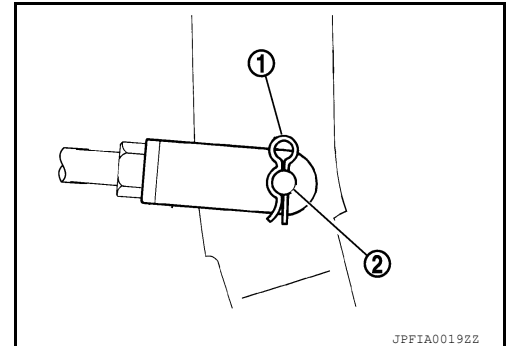
Always perform this step before removing the hydraulic booster assembly.

3. Drain brake fluid. Refer to [BR-12. "Drain and Refill"](#).
4. Remove air cleaner and air duct assembly. Refer to [EM-212. "Exploded View"](#).
5. Remove cowl top extension. Refer to [EXT-27. "Removal and Installation - Cowl Top Extension"](#).
6. Disconnect the harness connector from the hydraulic booster assembly.

HYDRAULIC BOOSTER ASSEMBLY

< REMOVAL AND INSTALLATION >

7. Disconnect the harness connector from the brake fluid level sensor.
8. Separate the brake tube from the hydraulic booster assembly with a flare nut wrench. Refer to [BR-23, "FRONT : Removal and Installation"](#).
9. Remove brake tube from clip.
10. Remove instrument lower panel LH. Refer to [IP-22, "Removal and Installation"](#).
11. Remove snap pin (1) and clevis pin (2) from clevis.



12. Remove nuts on hydraulic booster assembly and brake pedal assembly.

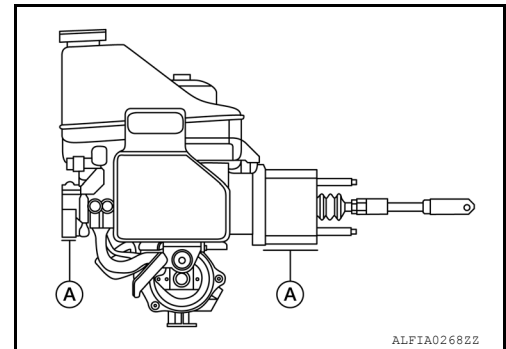
CAUTION:

Support the hydraulic booster assembly to prevent contact with other parts.

13. Remove hydraulic booster assembly.

CAUTION:

- Always hold the spacer block and front part of ABS actuator and electric unit (control unit) (A) when removing the hydraulic booster assembly.
- Do not deform or bend the brake tubes when removing the hydraulic booster assembly.
- Always use a cushion or equivalent to place the hydraulic booster assembly. Failure to do this may cause uneven loads or impact that may result in a malfunction.



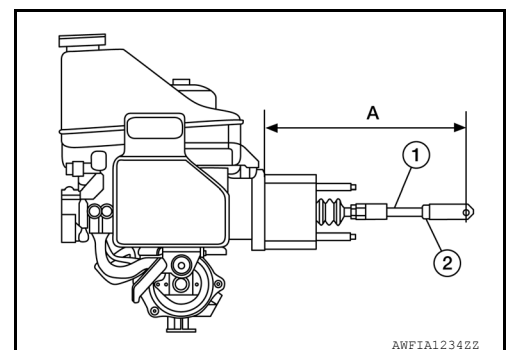
14. After replacing hydraulic booster assembly, always follow the accumulator disposal procedure to discard the hydraulic booster assembly. Refer to [BR-31, "Disposal"](#).

ADJUSTMENT BEFORE INSTALLATION

Input Rod Length adjustment

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

Input rod length (A) : Refer to [BR-52, "Brake Booster"](#).



2. Tighten the lock nut to the specified torque.

INSTALLATION

Installation is in the reverse order of removal.

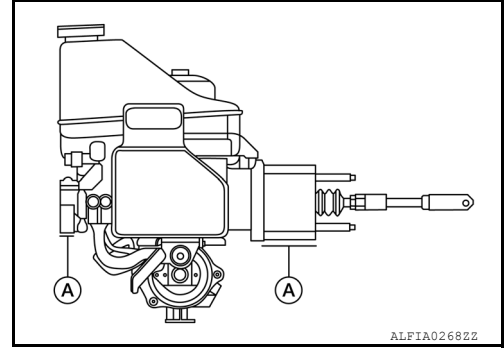
CAUTION:

- Be careful not to damage hydraulic booster assembly stud bolt threads. If hydraulic booster assembly is tilted during installation, the dash panel may damage the threads.

HYDRAULIC BOOSTER ASSEMBLY

< REMOVAL AND INSTALLATION >

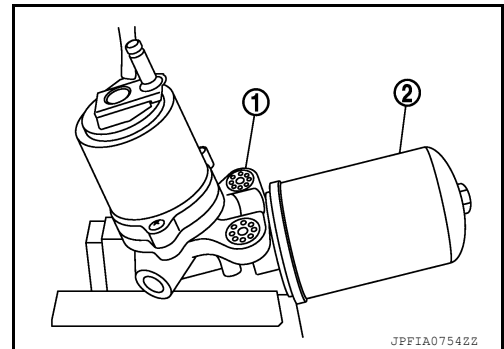
- Do not reuse a hydraulic booster assembly after an excessive impact. (Slight impulse caused during installation work is acceptable.)
- Always hold the spacer block and front part of ABS actuator and electric unit (control unit) (A) when installing the hydraulic booster assembly.
- Do not deform or bend the brake tubes when installing the hydraulic booster assembly.
- Always use a new gasket between the hydraulic booster assembly, spacer and the dash panel.
- Replace the clevis pin if it is damaged.
- Bleed the brake system. Refer to [BR-13, "Bleeding Brake System"](#).
- Perform the brake pedal adjustment after installing the brake pedal assembly and hydraulic booster assembly. Refer to [BR-10, "Inspection"](#).
- Perform inspection after installation. Refer to [BR-15, "Inspection"](#).



Disposal

INFOID:000000013053625

1. Remove accumulator (2) from motor/accumulator assembly (1).



2. Secure the accumulator (1) to a vise.
CAUTION:
 - Always set copper plates or cloth between vise grips when securing the accumulator to a vise.
 - Do not overtighten the vise.
3. Make a slit in the area (A) with a saw to release filler gas.

Area (A) : 50 mm (1.97 in)

WARNING:

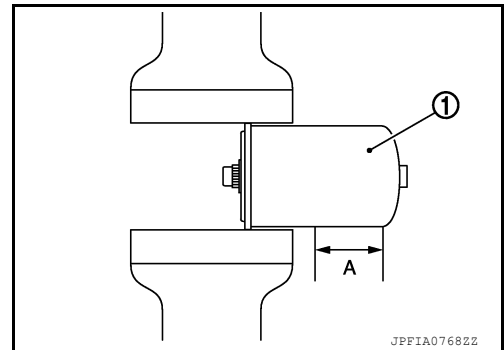
- Wear eye protection (safety glasses).
- Wear gloves.

CAUTION:

- A cut in the area must be made perpendicularly.
- Perform the procedure slowly.
- Cover with cloth to avoid spatter.

NOTE:

The gas is clear colorless, odorless, and harmless.



FRONT DISC BRAKE

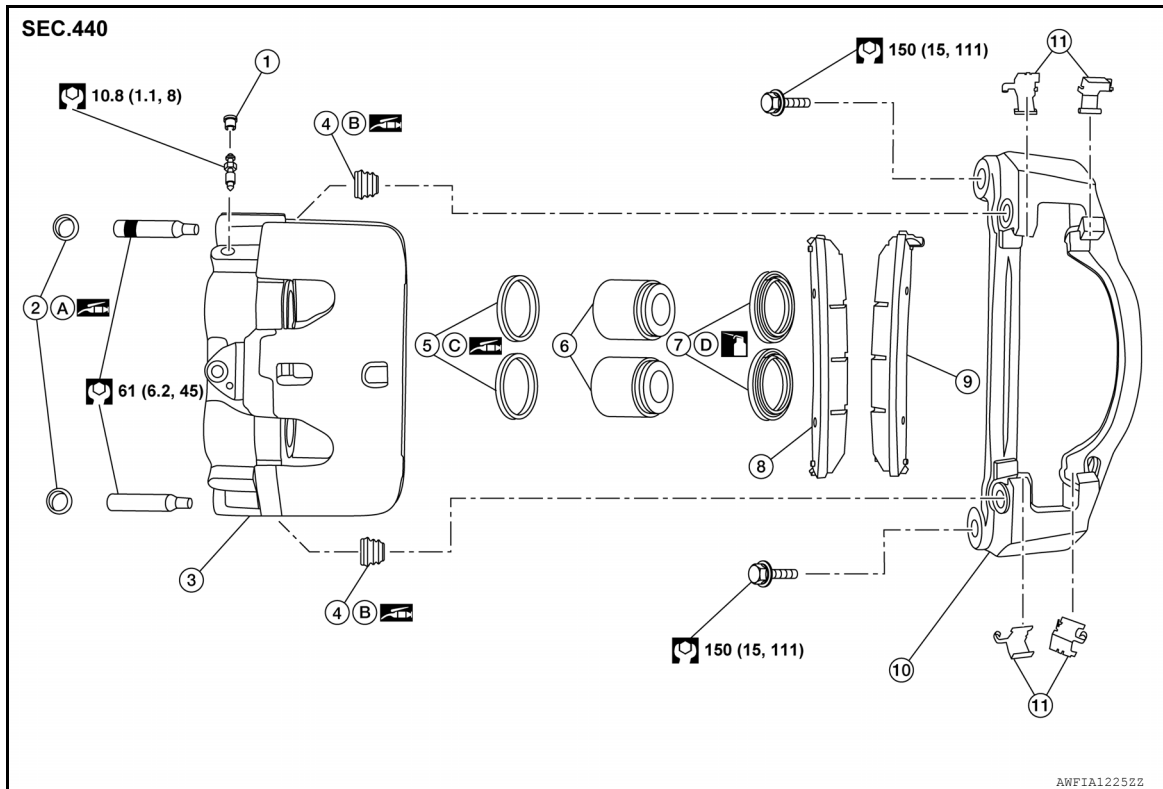
< REMOVAL AND INSTALLATION >

FRONT DISC BRAKE

BRAKE PAD

BRAKE PAD : Exploded View

INFOID:000000013053626



- | | | |
|--------------------|------------------|-----------------|
| 1. Bleeder cap | 2. Guide pin cap | 3. Caliper body |
| 4. Guide pin boots | 5. Piston seals | 6. Pistons |
| 7. Piston boots | 8. Outer pad | 9. Inner pad |
| 10. Torque member | 11. Pad retainer | A. CCI #20 |
| B. Niglube RM | C. Rubber grease | D. Brake fluid |

BRAKE PAD : Removal and Installation

INFOID:000000013053627

WARNING:

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

CAUTION:

- Do not remove guide pin caps, guide pins or cylinder body from the torque member unless replacement is necessary.
- Do not depress the brake pedal while removing the brake pads because the piston may pop out.
- If the brake fluid or grease adheres to the brake caliper assembly and disc rotor, quickly wipe it off.
- Do not reuse drained brake fluid.

REMOVAL

1. Observe brake fluid level in reservoir tank. Partially drain brake fluid if necessary. Refer to [BR-12. "Drain and Refill"](#).
2. Remove the wheel and tire using power tool. Refer to [WT-69. "Removal and Installation"](#).
3. Remove torque member bolts. Leaving brake hose attached, reposition brake caliper aside with a wire.
4. Remove the brake pads and pad retainers.

INSTALLATION

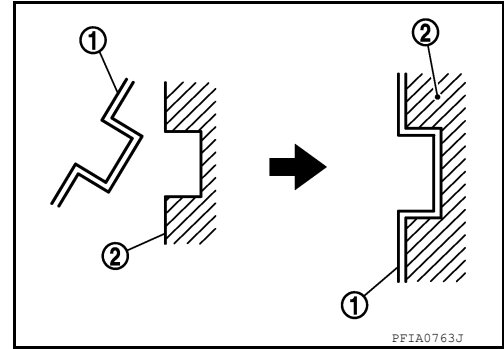
FRONT DISC BRAKE

< REMOVAL AND INSTALLATION >

1. Install the brake pads to pad retainers.

CAUTION:

- Securely assemble the pad retainers (1) so that it will not be lifted up from the torque member (2).
- Do not deform the pad retainers.



2. Using suitable tool, press caliper pistons and install brake pads to the brake caliper.

CAUTION:

- Do not damage the piston boot.
- When replacing brake pads with new ones, check the brake fluid level in the reservoir tank because brake fluid returns to reservoir tank when the caliper pistons are pressed into the caliper body.

3. Install torque member bolts and tighten to specification.
4. Depress the brake pedal several times then perform inspection after installation. Refer to [BR-16. "BRAKE PAD : Inspection"](#).
5. Install the wheel and tire. Refer to [WT-69. "Removal and Installation"](#).

INSPECTION AFTER INSTALLATION

1. Check drag of front disc brake. If any drag is found, follow the procedure described below.
2. Remove brake pads.
3. Using a suitable tool, press the pistons into brake caliper body.

CAUTION:
Do not damage the piston boots.
4. Install brake pads.
5. Depress brake pedal several times.
6. Check drag of front disc brake again. If any drag is found, disassemble brake caliper body. Refer to [BR-33. "BRAKE CALIPER ASSEMBLY : Exploded View"](#).
7. Burnish contact surfaces after refinishing or replacing disc brake rotors or if a soft pedal occurs at very low mileage. Refer to [BR-16. "BRAKE PAD : Brake Burnishing"](#).

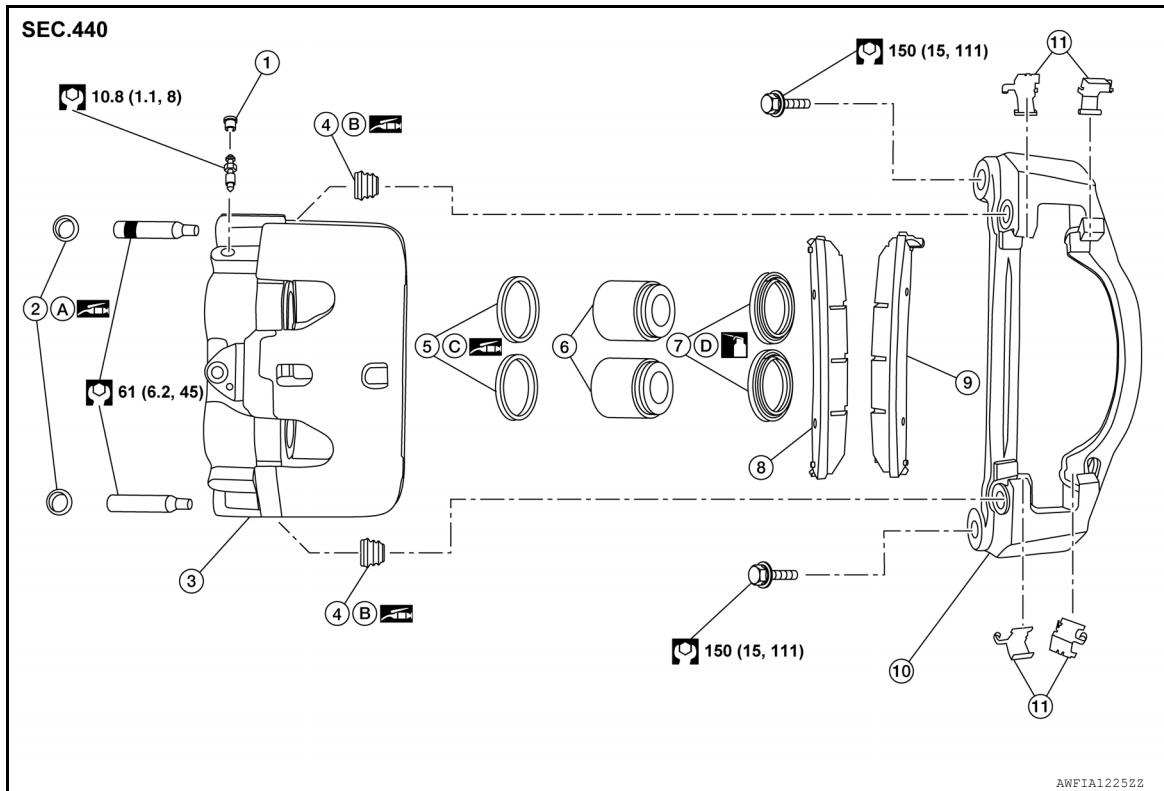
BRAKE CALIPER ASSEMBLY

BRAKE CALIPER ASSEMBLY : Exploded View

INFOID:000000013053630

FRONT DISC BRAKE

< REMOVAL AND INSTALLATION >



- | | | |
|--------------------|------------------|-----------------|
| 1. Bleeder cap | 2. Guide pin cap | 3. Caliper body |
| 4. Guide pin boots | 5. Piston seals | 6. Pistons |
| 7. Piston boots | 8. Outer pad | 9. Inner pad |
| 10. Torque member | 11. Pad retainer | A. CCI #20 |
| B. Niglube RM | C. Rubber grease | D. Brake fluid |

BRAKE CALIPER ASSEMBLY : Removal and Installation

INFOID:000000013053631

WARNING:

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

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 press brake pedal when lines or hoses are disconnected.
- If the brake fluid or grease adheres to the brake caliper assembly and disc rotor, quickly wipe it off.

NOTE:

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

REMOVAL

1. Remove cap from the reservoir tank.
2. Remove the wheel and tire using power tool. Refer to [WT-69. "Removal and Installation"](#).
3. Secure the disc rotor using wheel nuts.
4. Remove brake hose from the brake caliper. Discard the copper sealing washers. Refer to [BR-22. "FRONT : Exploded View"](#).

CAUTION:

Do not reuse copper sealing washers.

5. Remove torque member bolts and remove brake caliper and torque member from the vehicle as an assembly.

CAUTION:

Do not drop brake pad and brake caliper assembly.

FRONT DISC BRAKE

< REMOVAL AND INSTALLATION >

6. Remove brake pads and retainers from brake caliper assembly.

INSTALLATION

1. Install brake pads and retainers from brake caliper assembly.
2. Install the brake caliper assembly to the steering knuckle and tighten the torque member bolts to the specified torque.

CAUTION:

Do not spill or splash any grease and moisture on the torque member mounting face, threads or bolts. Wipe out any grease and moisture.

3. Install brake hose to brake caliper assembly. Refer to [BR-22, "FRONT : Exploded View"](#).

CAUTION:

Do not reuse copper sealing washers.

4. Bleed the brake system. Refer to [BR-13, "Bleeding Brake System"](#).
5. Install the wheel and tire. Refer to [WT-69, "Removal and Installation"](#).

INSPECTION AFTER INSTALLATION

1. Check drag of front disc brake. If any drag is found, follow procedure described below.
2. Remove brake pads.
3. Using a suitable tool, press the pistons into brake caliper body.

CAUTION:

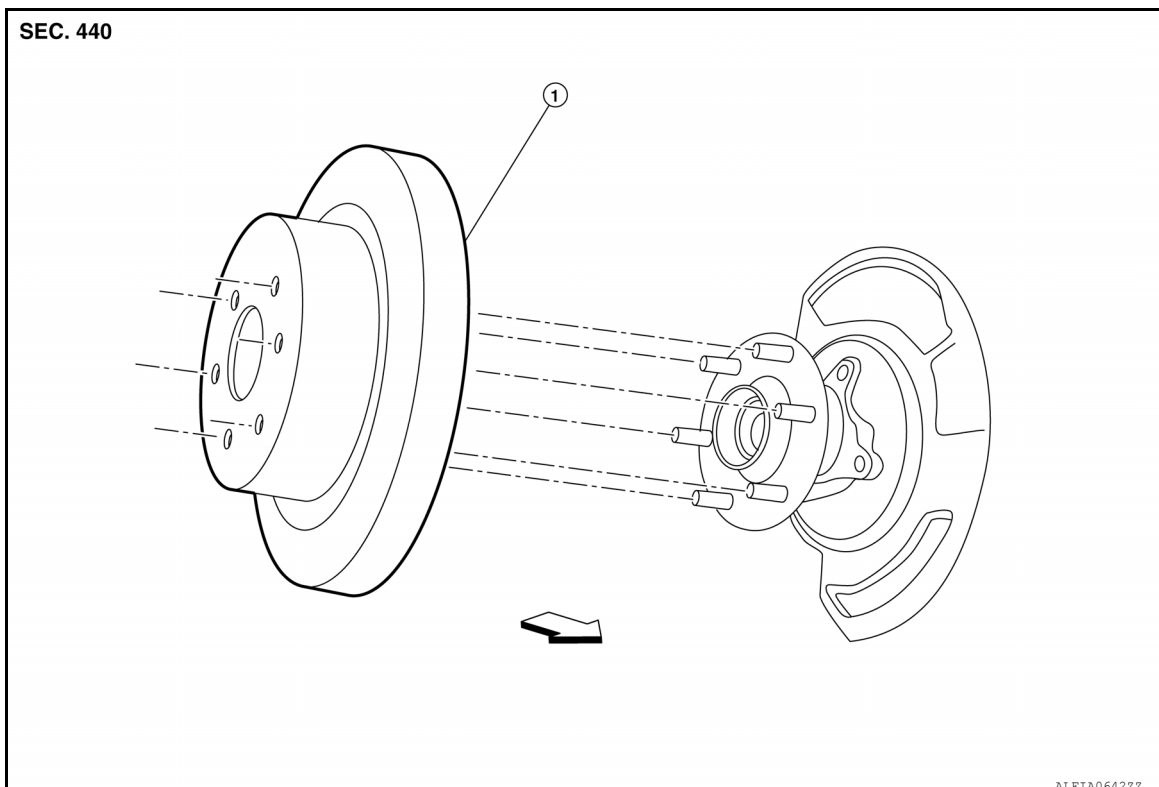
Do not damage the piston boots.

4. Install brake pads.
5. Depress brake pedal several times.
6. Check drag of front disc brake again. If any drag is found, disassemble brake caliper body. Refer to [BR-45, "Disassembly and Assembly"](#).
7. Burnish contact surfaces after refinishing or replacing disc brake rotors or if a soft pedal occurs at very low mileage. Refer to [BR-17, "DISC BRAKE ROTOR : Brake Burnishing"](#).

DISC BRAKE ROTOR


DISC BRAKE ROTOR : Exploded View

INFOID:000000013053633



FRONT DISC BRAKE

< REMOVAL AND INSTALLATION >

1. Front disc brake rotor  Front

DISC BRAKE ROTOR : Removal and Installation

INFOID:0000000013053634

REMOVAL

1. Remove cap from the reservoir tank.
2. Remove front wheels and tires using power tool. Refer to [WT-69, "Removal and Installation"](#).
3. Remove front brake caliper torque member bolts. Leaving brake hose attached, reposition brake caliper aside with wire. Refer to [BR-33, "BRAKE CALIPER ASSEMBLY : Exploded View"](#).
4. Place alignment marks on front disc brake rotor and wheel hub and bearing, then remove front disc brake rotor.

CAUTION:

Do not drop the disc brake rotor.

5. Compress the caliper piston.

INSTALLATION

Installation is in the reverse order of removal.

REAR DISC BRAKE

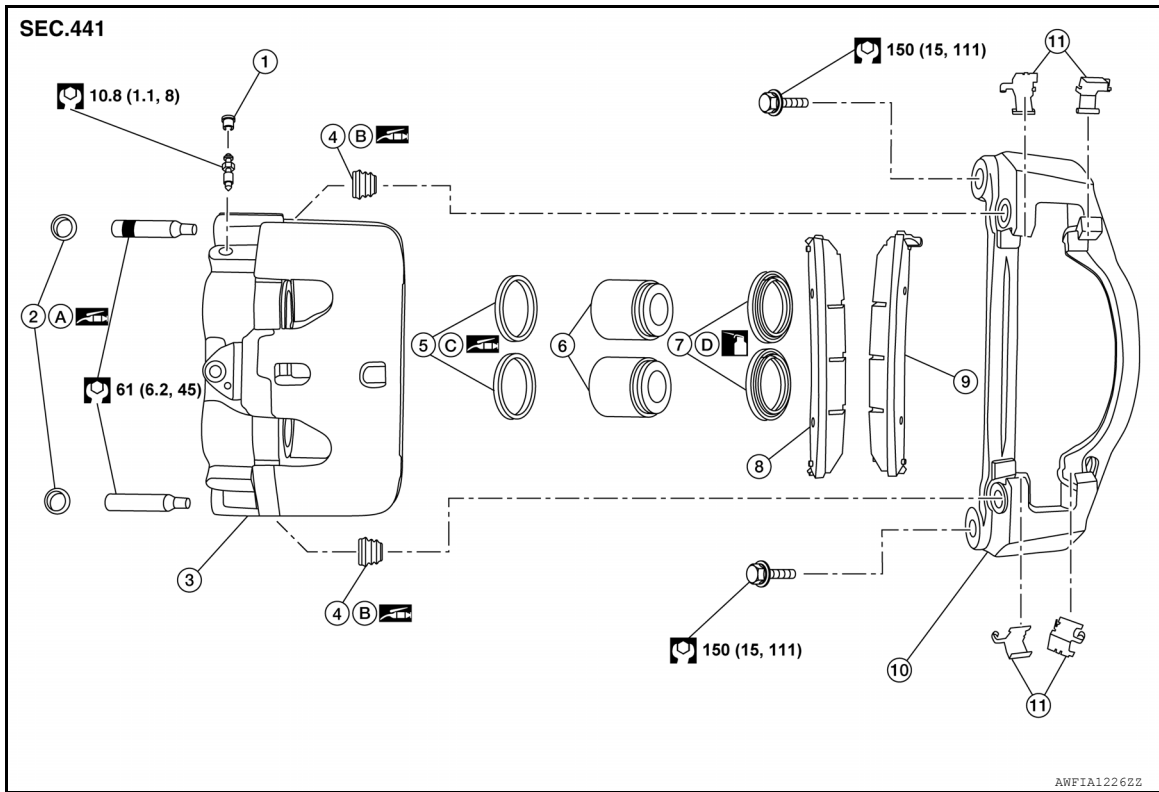
< REMOVAL AND INSTALLATION >

REAR DISC BRAKE

BRAKE PAD

BRAKE PAD : Exploded View

INFOID:000000013053635



- | | | |
|--------------------|------------------|-----------------|
| 1. Bleeder cap | 2. Guide pin cap | 3. Caliper body |
| 4. Guide pin boots | 5. Piston seals | 6. Pistons |
| 7. Piston boots | 8. Outer pad | 9. Inner pad |
| 10. Torque member | 11. Pad retainer | |
| A. CCI #20 | | |
| B. Niglube RM | C. Rubber grease | D. Brake fluid |

BRAKE PAD : Removal and Installation

INFOID:000000013053636

WARNING:

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

CAUTION:

- Do not remove guide pin caps, guide pins or cylinder body from the torque member unless replacement is necessary.
- Do not depress the brake pedal while removing the brake pads because the piston may pop out.
- If the brake fluid or grease adheres to the brake caliper assembly and disc rotor, quickly wipe it off.
- Do not reuse drained brake fluid.

REMOVAL

1. Observe brake fluid level in reservoir tank. Partially drain brake fluid if necessary. Refer to [BR-12. "Drain and Refill"](#).
2. Remove the wheel and tire using power tool. Refer to [WT-69. "Removal and Installation"](#).
3. Remove torque member bolts. Leaving brake hose attached, reposition brake caliper aside with a wire.
4. Remove the brake pads and pad retainers.

INSTALLATION

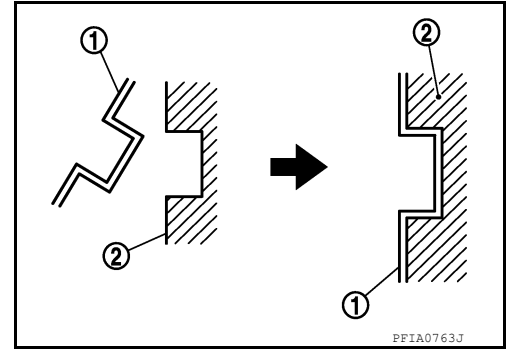
REAR DISC BRAKE

< REMOVAL AND INSTALLATION >

1. Install the brake pads to pad retainers.

CAUTION:

- Securely assemble the pad retainers (1) so that it will not be lifted up from the torque member (2).
- Do not deform the pad retainers.



2. Using suitable tool, press caliper pistons and install brake pads to the brake caliper.

CAUTION:

- Do not damage the piston boot.
- When replacing brake pads with new ones, check the brake fluid level in the reservoir tank because brake fluid returns to reservoir tank when the caliper pistons are pressed into the caliper body.

3. Install torque member bolts and tighten to specification.
4. Depress the brake pedal several times then perform inspection after installation. Refer to [BR-18, "BRAKE PAD : Inspection"](#).
5. Install the wheel and tire. Refer to [WT-69, "Removal and Installation"](#).

INSPECTION AFTER INSTALLATION

1. Check drag of rear disc brake. If any drag is found, follow the procedure described below.
2. Remove brake pads.
3. Using a suitable tool, press the pistons into brake caliper body.

CAUTION:
Do not damage the piston boots.
4. Install brake pads.
5. Depress brake pedal several times.
6. Check drag of rear disc brake again. If any drag is found, disassemble brake caliper body. Refer to [BR-38, "BRAKE CALIPER ASSEMBLY : Exploded View"](#).
7. Burnish contact surfaces after refinishing or replacing disc brake rotors or if a soft pedal occurs at very low mileage. Refer to [BR-18, "BRAKE PAD : Brake Burnishing"](#).

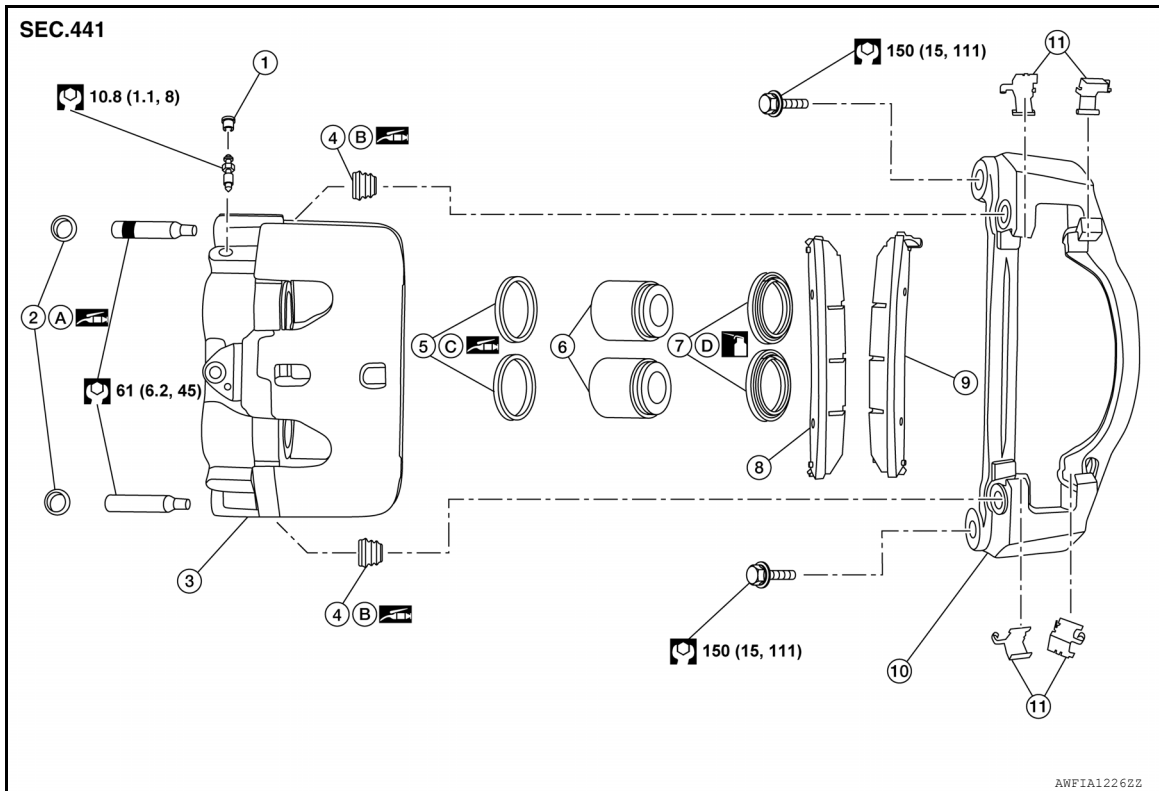
BRAKE CALIPER ASSEMBLY

BRAKE CALIPER ASSEMBLY : Exploded View

INFOID:000000013053639

REAR DISC BRAKE

< REMOVAL AND INSTALLATION >



- | | | |
|--------------------|-------------------|------------------|
| 1. Bleeder cap | 2. Guide pin cap | 3. Caliper body |
| 4. Guide pin boots | 5. Piston seals | 6. Pistons |
| 7. Piston boots | 8. Outer pad | 9. Inner pad |
| 10. Torque member | 11. Pad retainers | |
| A. CCI #20 | B. Niglube RM | C. Rubber grease |
| D. Brake fluid | | |

BRAKE CALIPER ASSEMBLY : Removal and Installation

INFOID:000000013053640

WARNING:

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

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 press brake pedal when lines or hoses are disconnected.
- If the brake fluid or grease adheres to the brake caliper assembly and disc rotor, quickly wipe it off.

NOTE:

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

REMOVAL

1. Remove cap from the reservoir tank.
2. Remove the wheel and tire using power tool. Refer to [WT-69. "Removal and Installation"](#).
3. Secure the disc rotor using wheel nuts.
4. Remove brake hose from the brake caliper. Discard the copper sealing washers. Refer to [BR-25. "REAR : Exploded View"](#).
CAUTION:
Do not reuse copper sealing washers.
5. Remove torque member bolts and remove brake caliper and torque member from the vehicle as an assembly.
CAUTION:
Do not drop brake pad and brake caliper assembly.

REAR DISC BRAKE

< REMOVAL AND INSTALLATION >

6. Remove brake pads and pad retainers.

INSTALLATION

1. Install brake pads and pad retainers.
2. Install the brake caliper assembly to the steering knuckle and tighten the torque member bolts to the specified torque.

CAUTION:

Do not spill or splash any grease and moisture on the torque member mounting face, threads or bolts. Wipe out any grease and moisture.

3. Install brake hose to brake caliper assembly. Refer to [BR-25, "REAR : Exploded View"](#).

CAUTION:

Do not reuse copper sealing washers.

4. Bleed the brake system. Refer to [BR-13, "Bleeding Brake System"](#).
5. Install the wheel and tire. Refer to [WT-69, "Removal and Installation"](#).

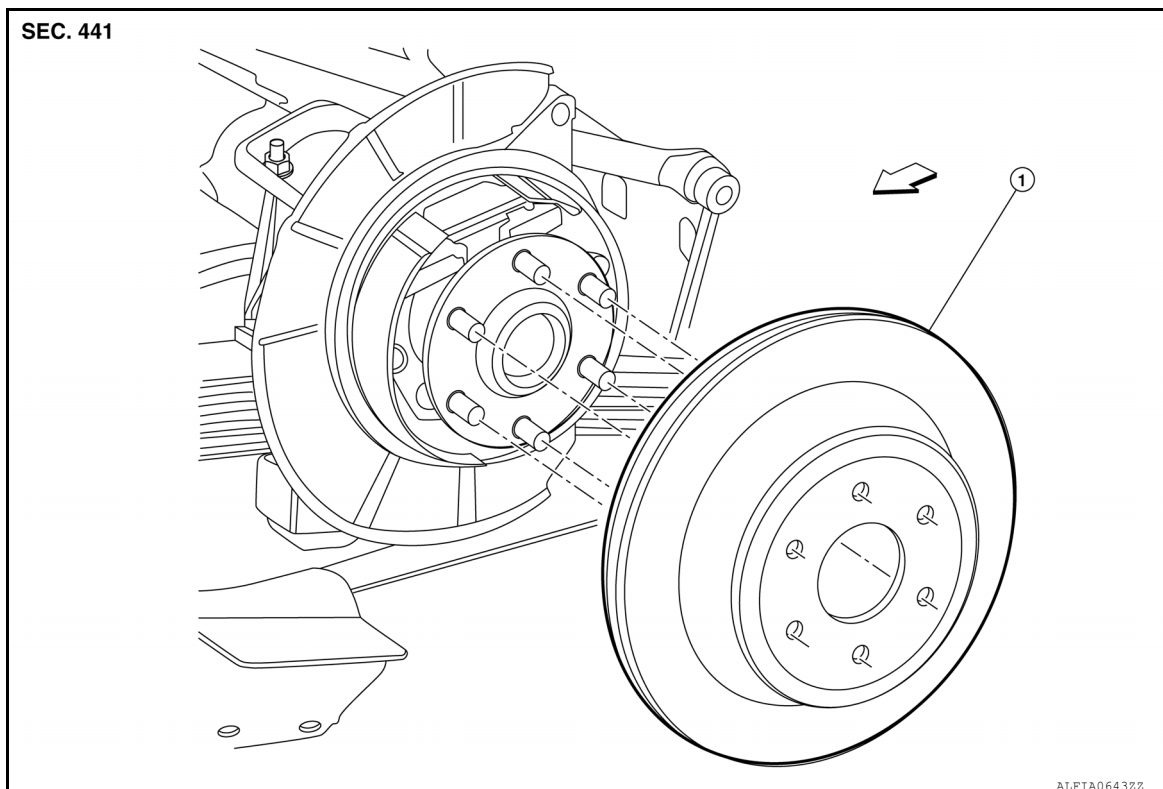
INSPECTION AFTER INSTALLATION

1. Check drag of rear disc brake. If any drag is found, follow procedure described below.
2. Remove brake pads.
3. Using a suitable tool, press the pistons into brake caliper body.
CAUTION:
Do not damage the piston boots.
4. Install brake pads.
5. Depress brake pedal several times.
6. Check drag of rear disc brake again. If any drag is found, disassemble brake caliper body. Refer to [BR-48, "Disassembly and Assembly"](#).
7. Burnish contact surfaces after refinishing or replacing disc brake rotors or if a soft pedal occurs at very low mileage. Refer to [BR-19, "DISC BRAKE ROTOR : Brake Burnishing"](#).

DISC BRAKE ROTOR

DISC BRAKE ROTOR : Exploded View

INFOID:000000013053642



REAR DISC BRAKE

< REMOVAL AND INSTALLATION >

2. Rear disc brake rotor ← Front

A

DISC BRAKE ROTOR : Removal and Installation

INFOID:000000013053643

B

REMOVAL

1. Remove cap from the reservoir tank.
2. Remove rear wheels and tires using power tool. Refer to [WT-69, "Removal and Installation"](#).
3. Remove rear brake caliper torque member bolts. Leaving brake hose attached, reposition brake caliper aside with wire. Refer to [BR-38, "BRAKE CALIPER ASSEMBLY : Exploded View"](#).
4. Place alignment marks on rear disc brake rotor and axle shaft, then remove rear disc brake rotor.

C

D

CAUTION:

Do not drop the disc brake rotor.

5. Compress the caliper piston.

E

INSTALLATION

Installation is in the reverse order of removal.

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HYDRAULIC BOOSTER ASSEMBLY

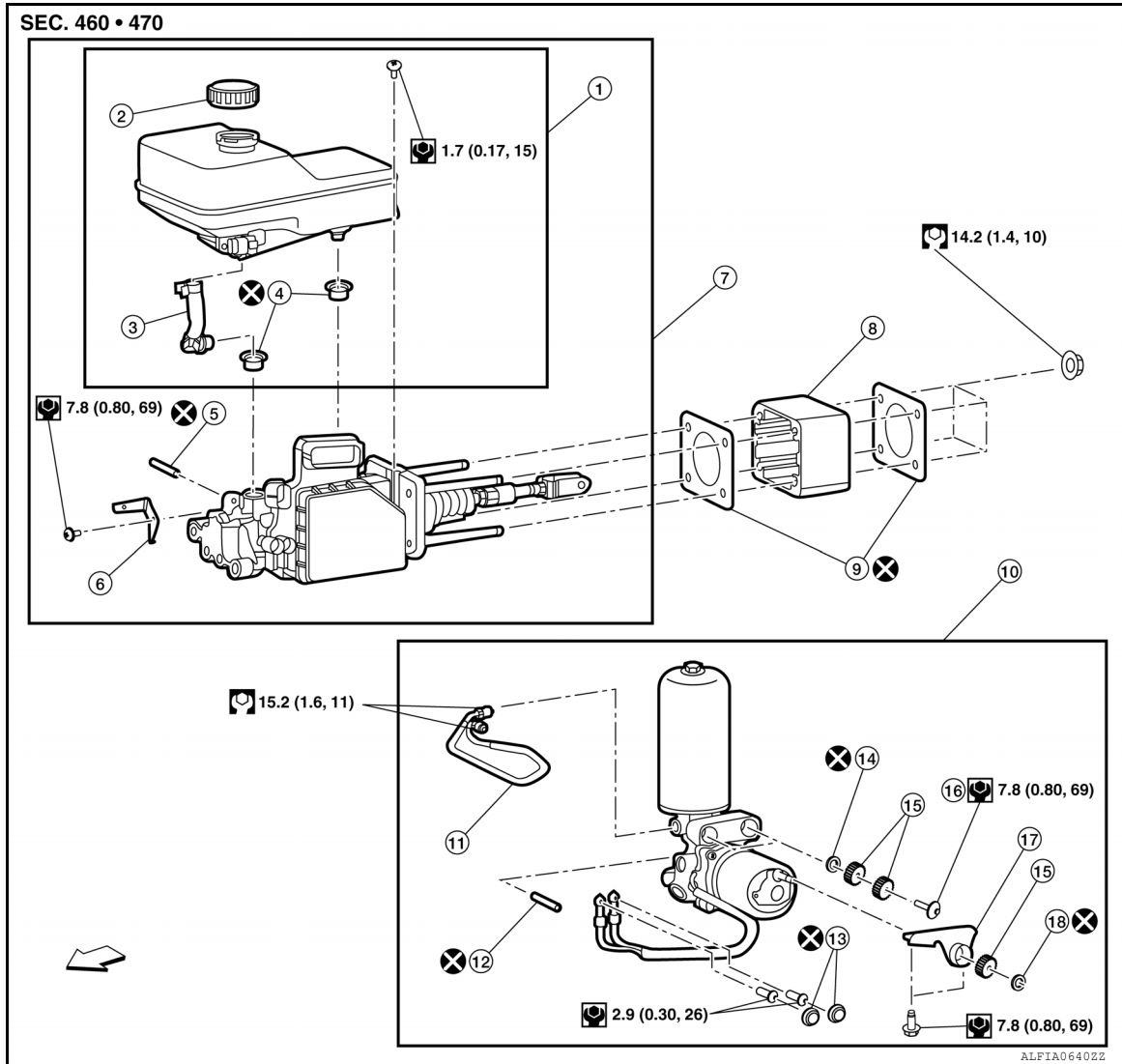
< UNIT DISASSEMBLY AND ASSEMBLY >

UNIT DISASSEMBLY AND ASSEMBLY

HYDRAULIC BOOSTER ASSEMBLY

Exploded View

INFOID:000000013053644



- | | | |
|---|---------------------------|-------------------------------------|
| 1. Reservoir tank | 2. Reservoir cap | 3. Reservoir hose |
| 4. Reservoir seal | 5. Pin | 6. Reservoir tank connector bracket |
| 7. ABS actuator and electric unit (control unit) assembly | 8. Spacer | 9. Gaskets |
| 10. Motor/accumulator assembly | 11. Brake tube | 12. Pin |
| 13. Grommet | 14. Collar | 15. Bushing |
| 16. Pin | 17. Brake booster bracket | 18. Cap |

Disassembly and Assembly

INFOID:000000013053645

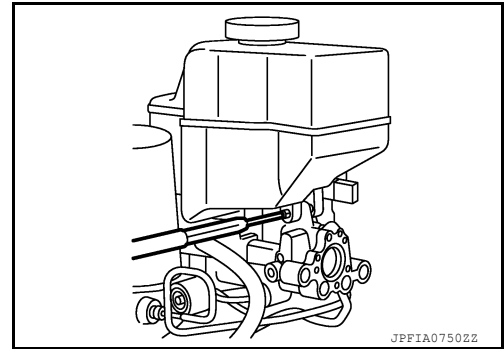
DISASSEMBLY

1. Remove gaskets and spacer from hydraulic booster assembly.

HYDRAULIC BOOSTER ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

2. Remove pin from reservoir tank using a suitable tool.



3. Remove the bolt, disconnect the harness connector, disconnect the reservoir hose and remove the reservoir tank.

CAUTION:

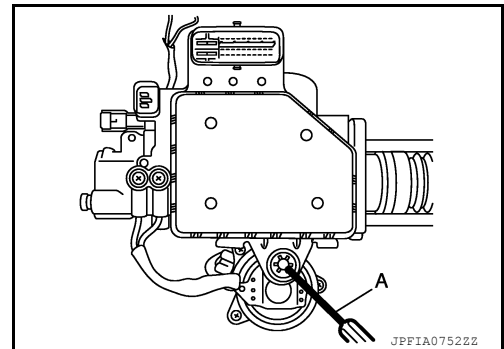
Do not drop components. Components must not be reused if they are dropped.

4. Remove and discard the reservoir seals.
5. Slide the clamp and remove the reservoir hose from the reservoir tank.
6. Remove the brake tube using flare nut wrench.

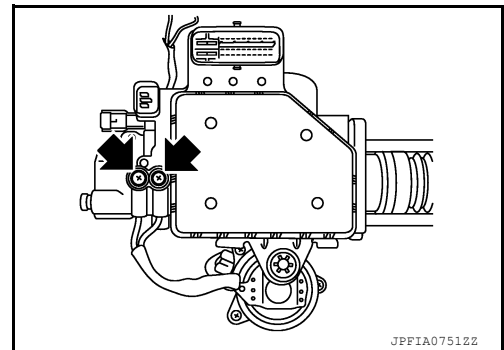
CAUTION:

Do not scratch the flare nut or the brake tube.

7. Remove the cap and bushing from the brake booster bracket using a suitable tool (A).



8. Remove grommets and screws (←) and disconnect the harness connector from the brake booster bracket.



9. Remove motor/accumulator assembly from ABS actuator and electric unit (control unit).
10. Remove the bushings and collars from the motor/accumulator assembly.
11. Remove the brake booster bracket and reservoir tank connector bracket from ABS actuator and electric unit (control unit).
12. Remove the pin from the ABS actuator and electric unit (control unit).
13. After replacing motor/accumulator assembly, always follow the accumulator disposal procedure to discard the motor/accumulator assembly. Refer to [BR-31, "Disposal"](#).

ASSEMBLY

Assembly in the reverse order of disassembly.

CAUTION:

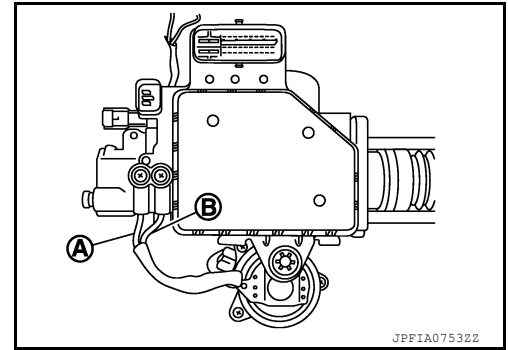
HYDRAULIC BOOSTER ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

- Do not use mineral oils such as kerosene or gasoline and rubber grease during the cleaning and assembly process.
- Apply new brake fluid to new reservoir seals.
- Do not drop the removed parts 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.
- Do not reuse reservoir seals.
- Do not reuse pin for reservoir tank.
- Do not reuse pin for RH rear side of motor/accumulator assembly.
- Do not reuse gaskets.
- Do not reuse grommets.
- Do not reuse collar.
- Do not reuse bushing.
- Do not reuse cap.
- Apply new brake fluid to grommets between reservoir tank and ABS actuator and electric unit (control unit).
- When connecting motor/accumulator assembly harness, check the order of harness colors.

(A) : Black

(B) : Red



- Temporarily tighten the brake tube flare nut to the motor/accumulator assembly and ABS actuator and electric unit (control unit) by hand. Then tighten it to the specified torque with a flare nut crowfoot and torque wrench.

CAUTION:

Do not scratch the flare nut and the brake tube.

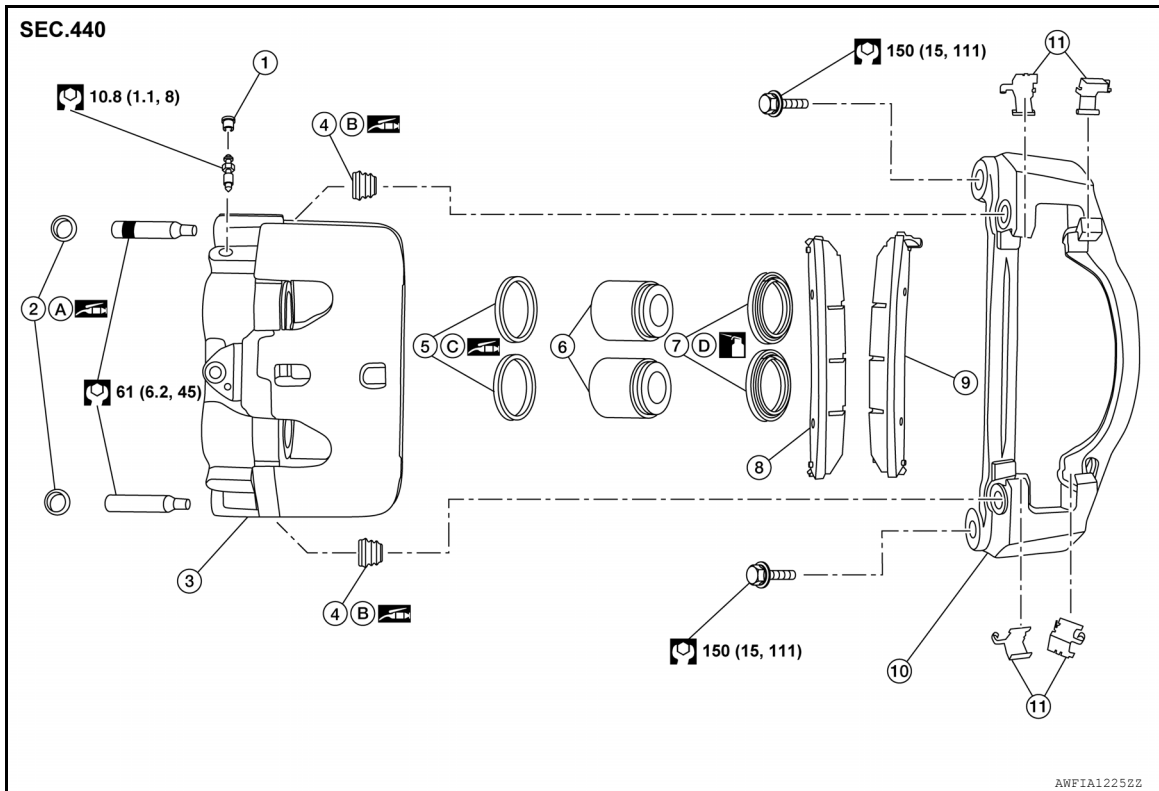
FRONT BRAKE CALIPER

< UNIT DISASSEMBLY AND ASSEMBLY >

FRONT BRAKE CALIPER

Exploded View

INFOID:000000013053646



- | | | |
|--------------------|------------------|-----------------|
| 1. Bleeder cap | 2. Guide pin cap | 3. Caliper body |
| 4. Guide pin boots | 5. Piston seals | 6. Pistons |
| 7. Piston boots | 8. Outer pad | 9. Inner pad |
| 10. Torque member | 11. Pad retainer | A. CCI #20 |
| B. Niglube RM | C. Rubber grease | D. Brake fluid |

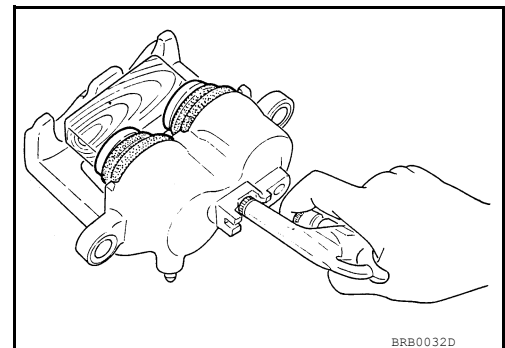
Disassembly and Assembly

INFOID:000000013053647

DISASSEMBLY

- Remove the brake caliper from the vehicle. Refer to [BR-34. "BRAKE CALIPER ASSEMBLY : Removal and Installation"](#).
- Remove the brake pads
CAUTION:
Do not remove guide pin caps, guide pins or cylinder body from the torque member unless replacement is necessary
- Remove guide pins and guide pin boots from torque member.
- Place a wooden block in brake caliper body and blow air from union bolt hole to remove pistons and piston boots.

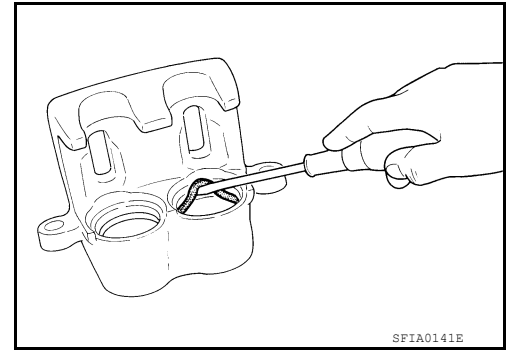
WARNING:
Do not get fingers caught between pistons and brake caliper body.
CAUTION:
Do not reuse piston boots.



FRONT BRAKE CALIPER

< UNIT DISASSEMBLY AND ASSEMBLY >

- Remove piston seals from brake caliper body using suitable tool.
CAUTION:
 - Do not damage cylinder inner wall.
 - Do not reuse piston seals.
- Remove bleeder valve and cap.



INSPECTION AFTER DISASSEMBLY

Brake Caliper Body

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

CAUTION:

Always clean with new brake fluid. Do not clean with mineral oil such as gasoline and light oil.

Torque Member

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

Piston

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

CAUTION:

Piston sliding surface is plated. Do not polish with sandpaper.

Guide Pin and Guide Pin Boot

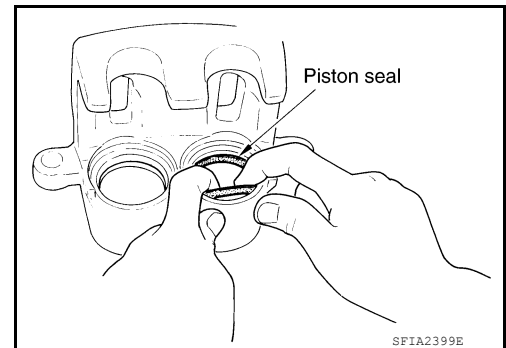
Check the guide pins and guide pin boots for rust, wear, cracks or damage. Replace the parts if any abnormal condition is detected.

ASSEMBLY

- Install bleeder valve and cap.
- Apply rubber grease to each piston seal (1), and install them to the brake caliper body.

CAUTION:

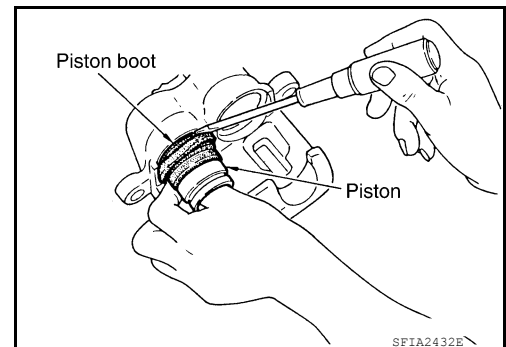
Do not reuse piston seal.



- Apply brake fluid to the piston boots. Cover each piston end with a piston boot, and then install cylinder side lip on piston boot securely into a groove on brake caliper body.

CAUTION:

Do not reuse piston boots.



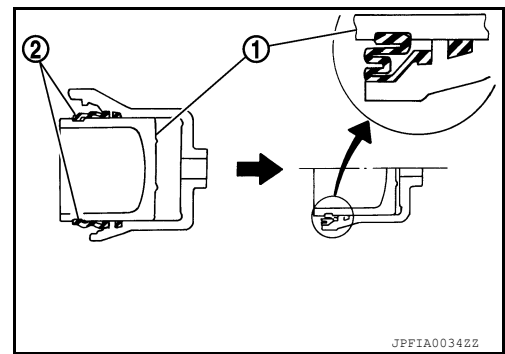
FRONT BRAKE CALIPER

< UNIT DISASSEMBLY AND ASSEMBLY >

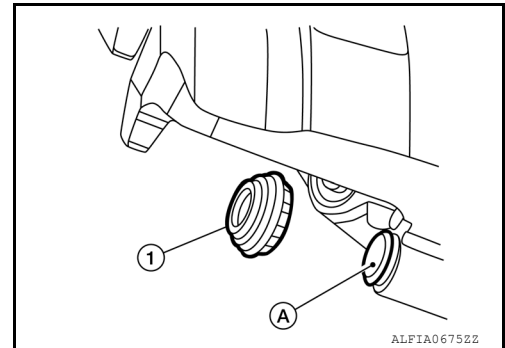
4. Apply brake fluid to each piston (1). Push each piston into cylinder body by hand and push piston boot (2) piston-side lip into the piston groove.

CAUTION:

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



5. Apply Niglube RM grease to thread, conical portion and sliding portion of new guide pins.
6. Apply Niglube RM grease to pin sliding holes on caliper body.
7. Attach new pin boots (1) to groove portion (A) of the caliper body. Large diameter opening is attached to the body.



8. Insert guide pins into pin sliding holes on the caliper body. The guide pin with rubber bushing goes into the bleeder side pin hole (top hole when mounted to vehicle).
9. Hand tighten both guide pins to torque member first. Make sure the guide pins are attached without pinching the pin boots.
10. Tighten the pins to the specified torque. Refer to [BR-45, "Exploded View"](#).
11. Put the new pin caps on.
12. Install the brake pads.
13. Install the brake caliper to the vehicle. Refer to [BR-34, "BRAKE CALIPER ASSEMBLY : Removal and Installation"](#).

INSPECTION AFTER INSTALLATION

1. Check the drag of front disc brake. If any drag is found, follow the procedure described below.
2. Remove brake pads.
3. Using a suitable tool, press the pistons into the brake caliper body.
CAUTION:
Do not damage the piston boots.
4. Install brake pads.
5. Depress the brake pedal several times.
6. Check the drag of front disc brake again. If any drag is found, disassemble the brake caliper body. Refer to [BR-33, "BRAKE CALIPER ASSEMBLY : Exploded View"](#).
7. Burnish contact surfaces after refinishing or replacing disc brake rotors or if a soft pedal occurs at very low mileage. Refer to [BR-17, "DISC BRAKE ROTOR : Brake Burnishing"](#).

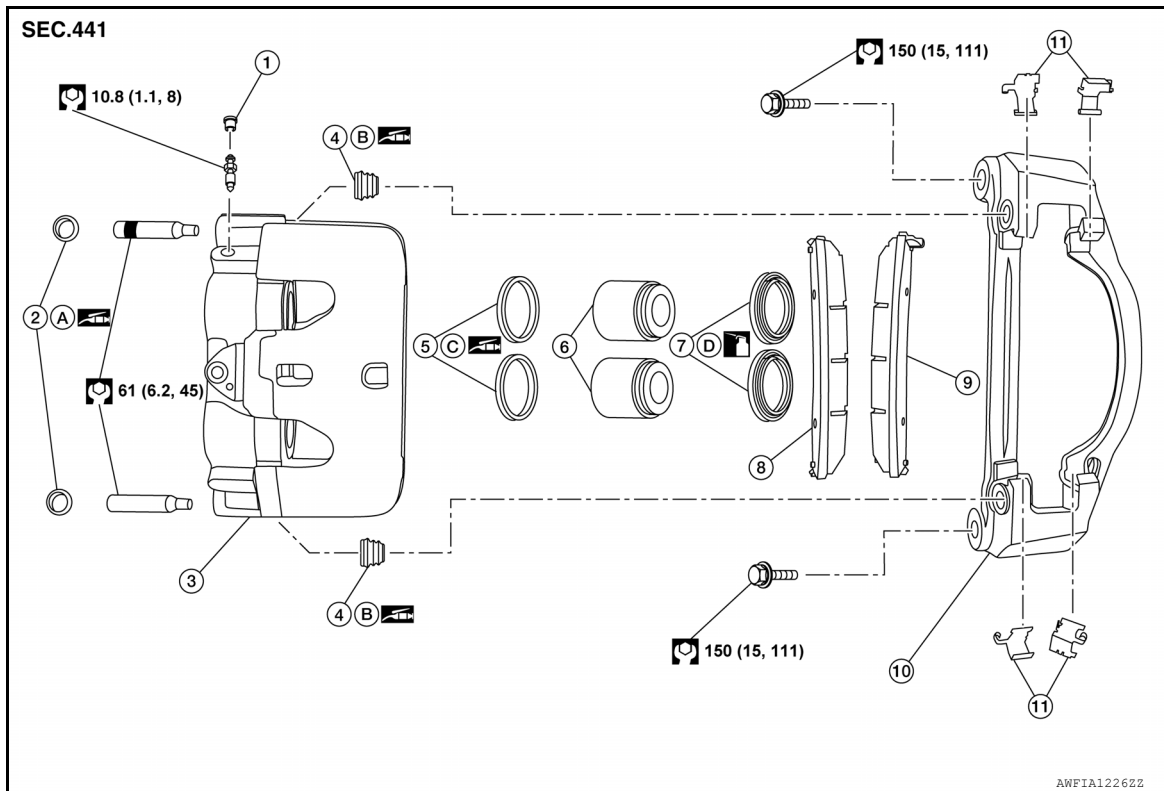
REAR BRAKE CALIPER

< UNIT DISASSEMBLY AND ASSEMBLY >

REAR BRAKE CALIPER

Exploded View

INFOID:000000013053648



- | | | |
|--------------------|------------------|-----------------|
| 1. Bleeder cap | 2. Guide pin cap | 3. Caliper body |
| 4. Guide pin boots | 5. Piston seals | 6. Pistons |
| 7. Piston boots | 8. Outer pad | 9. Inner pad |
| 10. Torque member | 11. Pad retainer | A. CCI #20 |
| B. Niglube RM | C. Rubber grease | D. Brake fluid |

Disassembly and Assembly

INFOID:000000013053649

DISASSEMBLY

1. Remove the brake caliper from the vehicle. Refer to [BR-39, "BRAKE CALIPER ASSEMBLY : Removal and Installation"](#).
2. Remove the brake pads.
CAUTION:
Do not remove guide pin caps, guide pins or cylinder body from the torque member unless replacement is necessary
3. Remove guide pins and guide pin boots from torque member.

REAR BRAKE CALIPER

< UNIT DISASSEMBLY AND ASSEMBLY >

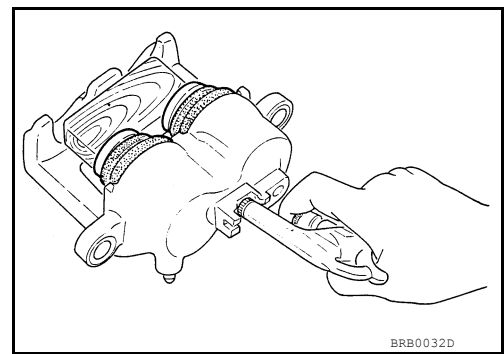
- Place a wooden block in brake caliper body and blow air from union bolt hole to remove pistons and piston boots.

WARNING:

Do not get fingers caught between pistons and brake caliper body.

CAUTION:

Do not reuse piston boots.

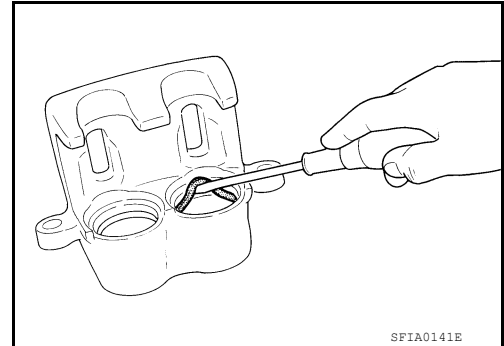


- Remove piston seals from brake caliper body using suitable tool.

CAUTION:

- Do not damage cylinder inner wall.
- Do not reuse piston seals.

- Remove bleeder valve and cap.



INSPECTION AFTER DISASSEMBLY

Brake Caliper Body

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

CAUTION:

Always clean with new brake fluid. Do not clean with mineral oil such as gasoline and light oil.

Torque Member

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

Piston

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

CAUTION:

Piston sliding surface is plated. Do not polish with sandpaper.

Guide Pin and Guide Pin Boot

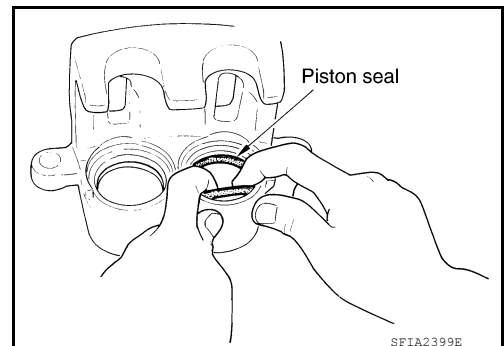
Check the guide pins and guide pin boots for rust, wear, cracks or damage. Replace the parts if any abnormal condition is detected.

ASSEMBLY

- Install bleeder valve and cap.
- Apply rubber grease to each piston seal (1), and install them to the brake caliper body.

CAUTION:

Do not reuse piston seal.



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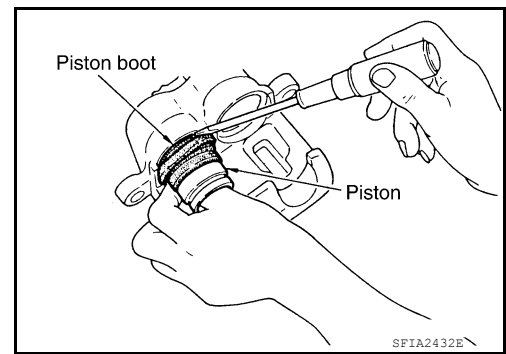
REAR BRAKE CALIPER

< UNIT DISASSEMBLY AND ASSEMBLY >

3. Apply brake fluid to the piston boots. Cover each piston end with a piston boot, and then install cylinder side lip on piston boot securely into a groove on brake caliper body.

CAUTION:

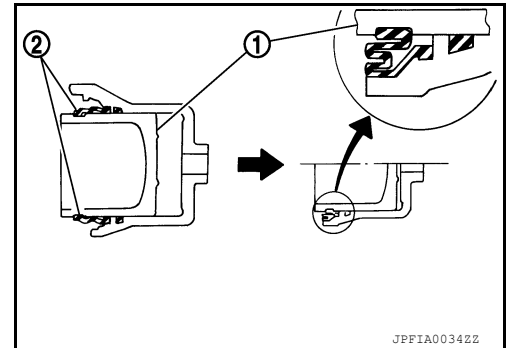
Do not reuse piston boots.



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

CAUTION:

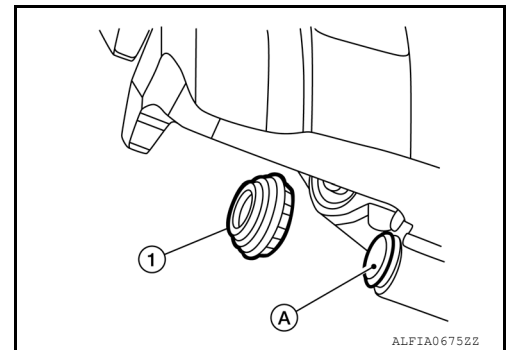
Press the piston evenly and vary the pressing point to prevent cylinder inner wall from being rubbed.



5. Apply Niglube RM grease to thread, conical portion and sliding portion of new guide pins.

6. Apply Niglube RM grease to pin sliding holes on caliper body.

7. Attach new pin boots (1) to groove portion (A) of the caliper body. Large diameter opening is attached to the body.



8. Insert guide pins into pin sliding holes on the caliper body. The guide pin with rubber bushing goes into the bleeder side pin hole (top hole when mounted to vehicle).
9. Hand tighten both guide pins to torque member first. Make sure the guide pins are attached without pinching the pin boots.
10. Tighten the pins to the specified torque. Refer to [BR-45, "Exploded View"](#).
11. Put the new pin caps on.
12. Install the brake pads.
13. Install the brake caliper to the vehicle. Refer to [BR-39, "BRAKE CALIPER ASSEMBLY : Removal and Installation"](#).

INSPECTION AFTER INSTALLATION

1. Check the drag of rear disc brake. If any drag is found, follow the procedure described below.
2. Remove brake pads.
3. Using a suitable tool, press the pistons into the brake caliper body.
CAUTION:
Do not damage the piston boots.
4. Install brake pads.
5. Depress the brake pedal several times.

REAR BRAKE CALIPER

< UNIT DISASSEMBLY AND ASSEMBLY >

6. Check the drag of rear disc brake again. If any drag is found, disassemble the brake caliper body. Refer to [BR-38, "BRAKE CALIPER ASSEMBLY : Exploded View"](#).
7. Burnish contact surfaces after refinishing or replacing disc brake rotors or if a soft pedal occurs at very low mileage. Refer to [BR-19, "DISC BRAKE ROTOR : Brake Burnishing"](#).

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SERVICE DATA AND SPECIFICATIONS (SDS)

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SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

General Specification

INFOID:0000000013053650

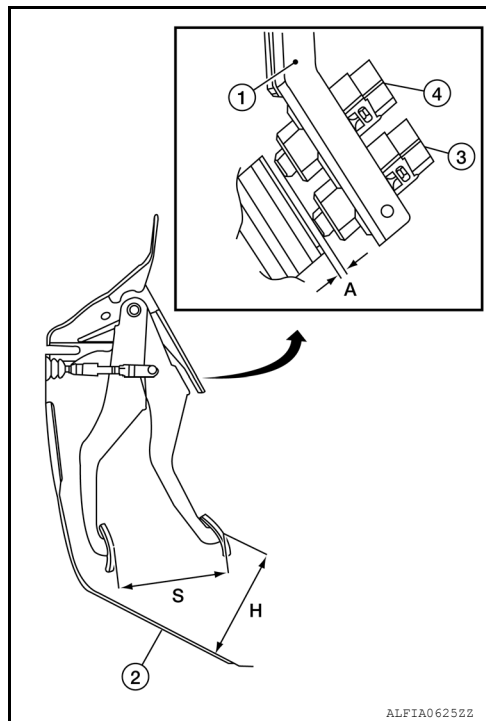
Unit: mm (in)

Front brake	Cylinder bore diameter	57.15 (2.25) × 2
	Pad length × width × thickness	192.0 (7.56) × 45.6 (1.80) × 13.0 (0.51)
	Rotor outer diameter × thickness	359.75 (14.16) × 38.0 (1.50)
Rear brake	Cylinder bore diameter	42.86 (1.69) × 2
	Pad length × width × thickness	192.0 (7.56) × 45.6 (1.80) × 11.0 (0.43)
	Rotor outer diameter × thickness	364.75 (14.36) × 30.0 (1.18)
Control valve	Valve type	Electric brake force distribution
Recommended brake fluid		Refer to MA-13. "VK56VD Gasoline Engine : Fluids and Lubricants" or MA-59. "Cummins (5.0L V8D) Engine : Fluids and Lubricants" .

Brake Pedal

INFOID:0000000013053651

Unit: mm (in)



Item	Standard
Brake pedal height (H) from dash lower panel (2)	142.3 (5.60)
Brake pedal full stroke (S)	175.6 (6.91)
Clearance (A) between brake pedal bracket (1), stop lamp switch (3), and brake pedal position switch (4) contact ends	0.74 (0.0291) – 1.96 (0.0772)

Brake Booster

INFOID:0000000013053652

Unit: mm (in)

Item	Standard
Input rod length	170.5 ± 0.5 (6.71 ± 0.02)

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

Front Disc Brake

INFOID:000000013053653

Unit: mm (in)

Item		Limit
Brake pad	Standard thickness (new)	13.0 (0.51)
	Wear thickness	1.0 (0.04)
Disc rotor	Standard thickness (new)	38.0 (1.50)
	Wear thickness	36.5 (1.44)
	Thickness variation (measured at 8 positions)*	0.004 (0.0002)
	Runout (with it attached to the vehicle)	0.04 (0.0016)

*To check if rotor imbalance, rotor runout or rotor deformation exists.

Rear Disc Brake

INFOID:000000013053654

Unit: mm (in)

Item		Limit
Brake pad	Standard thickness	11.0 (0.43)
	Wear thickness	1.0 (0.04)
Disc rotor	Standard thickness	30.0 (1.18)
	Wear thickness	28.5 (1.12)
	Thickness variation (measured at 8 positions)*	0.007 (0.0003)
	Runout (with it attached to the vehicle)	0.070 (0.0028)

*To check if rotor imbalance, rotor runout or rotor deformation exists.