SECTION BR
BRAKE SYSTEM

CONTENTS

LHD

PRECAUTION

PRECAUTIONS

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

INFOID:0000000011022305

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. Information necessary to service the system safely is included in the “SRS AIR BAG” and “SEAT BELT” of this Service Manual.

WARNING:

Always observe the following items for preventing accidental activation.

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that 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 “SRS AIR BAG”.**
- **Never use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

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

WARNING:

Always observe the following items for preventing accidental activation.

- **When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, never use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.**
- **When using air or electric power tools or hammers, always switch the ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.**

Precaution Necessary for Steering Wheel Rotation After Battery Disconnect

INFOID:0000000011022306

CAUTION:

Comply with the following cautions to prevent any error and malfunction.

- **Before removing and installing any control units, first turn the ignition power source and accessory power source to the OFF, then disconnect both battery cables.**
- **After finishing work, confirm that all control unit connectors are connected properly, then re-connect both battery cables.**
- **Always use CONSULT to perform self-diagnosis as a part of each function inspection after finishing work. If a DTC is detected, perform trouble diagnosis according to self-diagnosis results.**

For vehicle with steering lock unit, if the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.

If turning the steering wheel is required with the battery disconnected or discharged, follow the operation procedure below before starting the repair operation.

OPERATION PROCEDURE

1. Connect both battery cables.
   NOTE:
   Supply power using jumper cables if battery is discharged.
2. Open driver door.
3. Turn the ignition switch to the ON position.
   (At this time, the steering lock will be released.)
4. Turn the ignition switch to OFF position with driver door open.
5. Wait for 3 minutes or longer with driver door open.
   NOTE:
   - Do not close driver door because the steering wheel locks when driver door is closed.

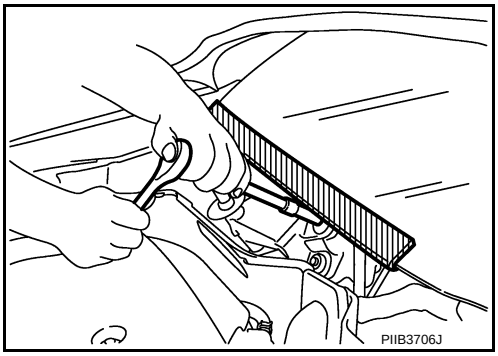
- The auto acc function is adapted to this vehicle. For this reason, even when the ignition switch is turned to OFF position, the accessory power source does not turned OFF and continues to be supplied for a certain amount of time.

6. Disconnect both battery cables. The steering lock will remain released with both battery cables disconnected and the steering wheel can be turned.
7. Perform the necessary repair operation.
8. When the repair work is completed, re-connect both battery cables. With the brake pedal released, turn the ignition switch from OFF position to ON position, then to LOCK position. (The steering wheel will lock when the ignition switch is turned to LOCK position.)
9. Perform self-diagnosis check of all control units using CONSULT.

Precaution for Procedure without Cowl Top Cover

INFOID:0000000011022307

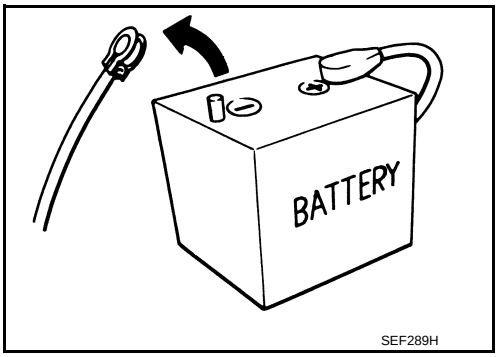
When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc to prevent damage to windshield.



Precautions for Removing Battery Terminal

INFOID:0000000011062349

- With the adoption of Auto ACC function, ACC power is automatically supplied by operating the intelligent key or remote keyless entry or by opening/closing the driver side door. In addition, ACC power is supplied even after the ignition switch is turned to the OFF position, i.e. ACC power is supplied for a certain fixed time.
- When disconnecting the 12V battery terminal, turn off the ACC power before disconnecting the 12V battery terminal, observing “How to disconnect 12V battery terminal” described below.
  NOTE:
  Some ECUs operate for a certain fixed time even after ignition switch is turned OFF and ignition power supply is stopped. If the battery terminal is disconnected before ECU stops, accidental DTC detection or ECU data damage may occur.
- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.
  NOTE:
  If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.
- After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.
  NOTE:
  The removal of 12V battery may cause a DTC detection error.



HOW TO DISCONNECT 12V BATTERY TERMINAL

Disconnect 12V battery terminal according to Instruction 1 or Instruction 2 described below.
For vehicles parked by ignition switch OFF, refer to Instruction 2.

INSTRUCTION 1

1. Open the hood.
2. Turn key switch to the OFF position with the driver side door opened.
3. Get out of the vehicle and close the driver side door.
4. Wait at least 3 minutes. For vehicle with the engine listed below, remove the battery terminal after a lapse of the specified time.

D4D engine	: 20 minutes
HRA2DDT	: 12 minutes

K9K engine : 4 minutes
M9R engine : 4 minutes
R9M engine : 4 minutes
V9X engine : 4 minutes

CAUTION:
While waiting, never operate the vehicle such as locking, opening, and closing doors. Violation of this caution results in the activation of ACC power supply according to the Auto ACC function.

5. Remove 12V battery terminal.
CAUTION:
After installing 12V battery, always check self-diagnosis results of all ECUs and erase DTC.

INSTRUCTION 2 (FOR VEHICLES PARKED BY IGNITION SWITCH OFF)

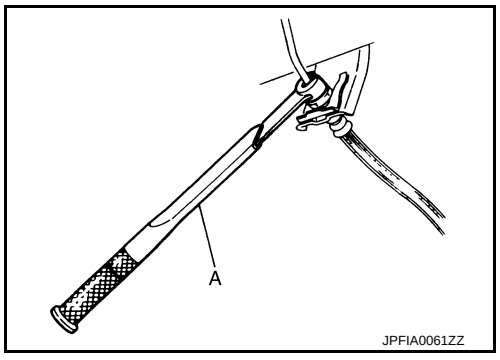
1. Unlock the door with intelligent key or remote keyless entry.
NOTE:
At this moment, ACC power is supplied.
2. Open the driver side door.
3. Open the hood.
4. Close the driver side door.
5. Wait at least 3 minutes.
CAUTION:
While waiting, never operate the vehicle such as locking, opening, and closing doors. Violation of this caution results in the activation of ACC power supply according to the Auto ACC function.
6. Remove 12V battery terminal.
CAUTION:
After installing 12V battery, always check self-diagnosis results of all ECUs and erase DTC.

Precaution for Brake System

INFOID:0000000010838491

WARNING:
Since dust covering the front and rear brakes has an affect on human body, the dust must be removed with a dust collector. Never splatter the dust with an air blow gun.

- Brake fluid use refer to MA-6, "General Maintenance".
- Never reuse drained brake fluid.
- Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface. For brake component parts, never wash them with water.
- 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.
- Always clean with new brake fluid when cleaning the master cylinder, brake caliper and other components.
- Never use mineral oils such as gasoline or light oil to clean. They may damage rubber parts and cause improper operation.
- Always loosen the brake tube flare nut with a flare nut wrench.
- Tighten the brake tube flare nut to the specified torque with a flare nut torque wrench (A).
- Turn the ignition switch OFF and disconnect the ABS actuator and electric unit (control unit) 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-17, "BRAKE PAD : Inspection and Adjustment".
  - Front disc rotor: Refer to BR-17, "DISC ROTOR : Inspection and Adjustment".
  - Rear brake pad: Refer to BR-19, "BRAKE PAD : Inspection and Adjustment".
  - Rear disc rotor: Refer to BR-19, "DISC ROTOR : Inspection and Adjustment".

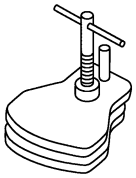
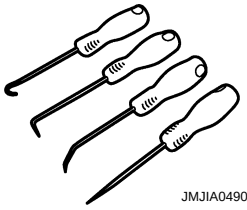


PREPARATION

PREPARATION

Commercial Service Tool

INFOID:0000000010838492

Tool name	Description
Handy vacuum pump  ZZC1313D	• Air tight • Inspection of check valve
Brake caliper wrench  NNFIA0040ZZ	Return the piston
Pick tool  JMJIA0490ZZ	Removing piston seal and piston boot

Lubricant or/and Sealant

INFOID:0000000010838493

Name	Description	Note
Multi-purpose grease	Clevis pin of brake pedal	—
Polyglycol ether based lubricant	• Master cylinder assembly	—
MOLYKOTE® AS880N or silicone-based grease	• Front brake	Molykote is a registered of Dow Corning Corporation
MOLYKOTE® 7439 or equivalent	• Front brake • Rear brake	Molykote is a registered of Dow Corning Corporation
Rubber grease	• Front brake • Rear brake	—

SYSTEM DESCRIPTION

SYSTEM

WARNING/INDICATOR/CHIME LIST

WARNING/INDICATOR/CHIME LIST : Warning Lamp/Indicator Lamp

INFOID:0000000010838494

Name	Design	Layout/Function
Brake warning lamp		For layout: Refer to MWI-10, "METER SYSTEM : Design". For function: Refer to MWI-26, "WARNING LAMPS/INDICATOR LAMPS : Brake Warning Lamp (Red)".

SYMPTOM DIAGNOSIS

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

INFOID:0000000010838495

Use the chart below to find the cause of the symptom. If necessary, repair or replace these 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	DRIVE SHAFT	STEERING
			Possible cause and SUSPECTED PARTS	BR-17, BR-19	BR-17, BR-19	BR-46, BR-49, BR-62	BR-17, BR-19	BR-17, BR-19	BR-17, BR-19	BR-17, BR-19	BR-17, BR-19	BR-17, BR-19	BR-17, BR-19	NVH in FAX, RAX and FSU, RSU section	NVH in WT section	NVH in WT section	NVH in FAX section	NVH in ST section
Symptom	BRAKE	Noise		×	×	×						×		×	×	×	×	×
		Shake					×							×	×	×	×	×
		Shimmy, Judder					×	×	×	×	×	×	×	×	×	×		×

×: Applicable

PERIODIC MAINTENANCE

BRAKE PEDAL

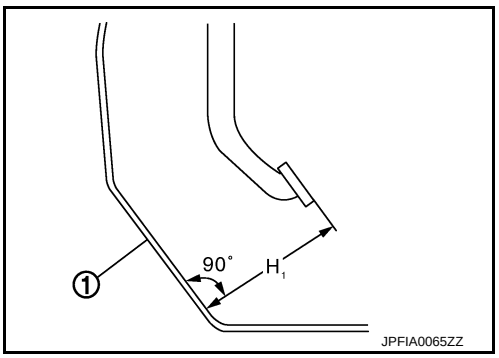
Inspection and Adjustment

INFOID:0000000010838496

INSPECTION

Brake Pedal Height

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

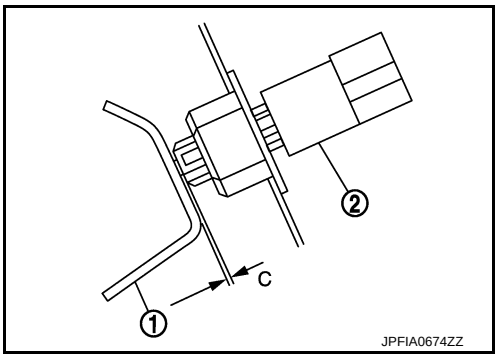


H_1 : Refer to BR-67, "Brake Pedal".

CAUTION:
Remove the floor carpet.

Stop Lamp Switch and Brake Pedal Position Switch (with ASCD).

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

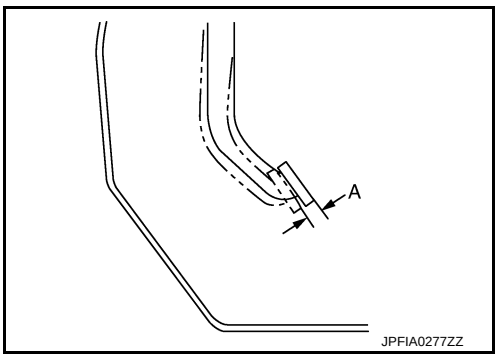


C : Refer to BR-67, "Brake Pedal".

CAUTION:
The stop lamp must turn off when the brake pedal is released.
NOTE:
Pull the brake pedal pad to make the clearance between the stop lamp switch and brake pedal position switch (with ASCD) threaded end and the brake pedal lever.

Brake Pedal Play

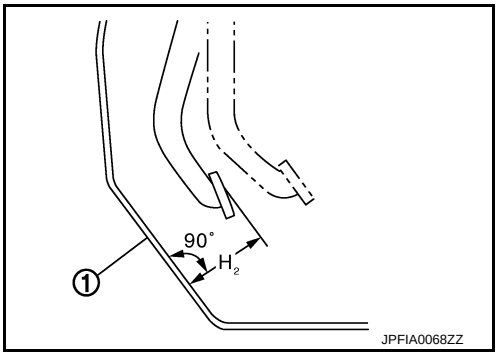
Press the brake pedal. Check the brake pedal play (A) (stroke until fluid pressure occurs).



A : Refer to BR-67, "Brake Pedal".

Depressed Brake Pedal Height

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



H_2 : Refer to BR-67, "Brake Pedal".

CAUTION:
Remove the floor carpet.

ADJUSTMENT

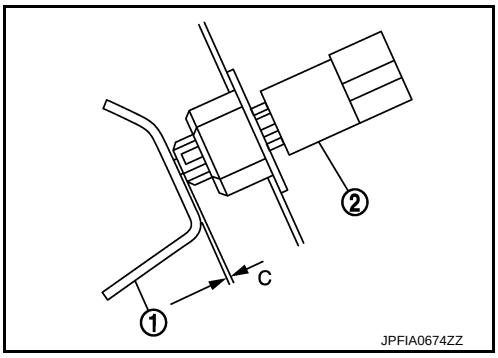
Brake Pedal Height

Perform the following procedure when brake pedal height is not within the specified value because brake pedal height is not adjustable.

1. Check input rod length. Refer to BR-38, "Inspection and Adjustment".
2. Replace brake pedal assembly when input rod length is within specified value.

Stop Lamp Switch and Brake Pedal Position Switch (with ASCD).

1. Remove instrument lower panel. Refer to IP-14, "Removal and Installation".
2. Disconnect the harness connector from stop lamp switch and brake pedal position switch (with ASCD).
3. Loosen the stop lamp switch and brake pedal position switch (with ASCD) 45° counterclockwise.
4. Press-fit the stop lamp switch and brake position switch (with ASCD) ② until the stop lamp switch and brake pedal position switch (with ASCD) hits the brake pedal bracket ① 45° clockwise while pulling the brake pedal pad slightly.



CAUTION:

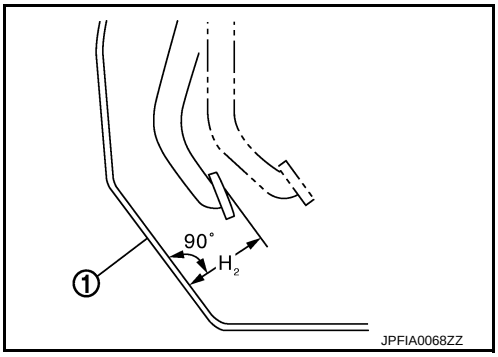
- **The clearance (C) between the brake pedal bracket and stop lamp switch and brake pedal position switch (with ASCD) threaded end must be the specified value.**

  C : Refer to BR-67, "Brake Pedal".

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

Depressed Brake Pedal Height

1. Perform the air bleeding. Refer to BR-14, "Bleeding Brake System".
2. Check the height between the dash lower panel ① and the brake pedal upper surface (H_2) when depressing the brake pedal at 490 N (50 kg, 110 lb) while turning engine ON.



H_2 : Refer to BR-67, "Brake Pedal".

CAUTION:

Remove the floor carpet.

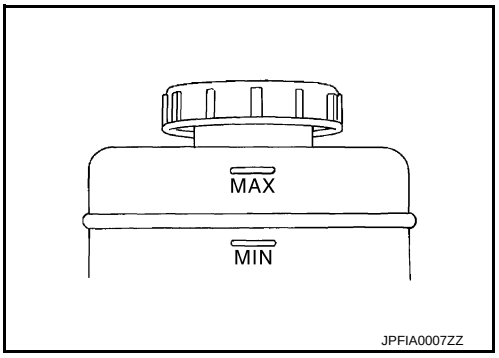
BRAKE FLUID

Inspection

INFOID:0000000010838497

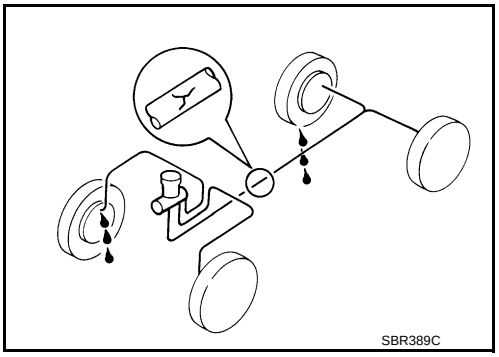
BRAKE FLUID LEVEL

- Check that the brake fluid level in the reservoir tank is within the standard (between MAX – MIN lines).
- Visually check for any brake fluid leakage around the reservoir tank.
- Check the brake system for any leakage if the fluid level is extremely low (lower than MIN).
- Check the brake system for fluid leakage if the warning lamp remains illuminated even after the parking brake is released.
- 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. Depress the brake pedal with a force of 785 N (80 kg, 176 lb) and hold down the pedal for approximately 5 seconds with the engine running. Check for any fluid leakage.
   CAUTION:
   Retighten the applicable connection to the specified torque and repair any abnormal (damaged, worn or deformed) part if any brake fluid leakage is present.

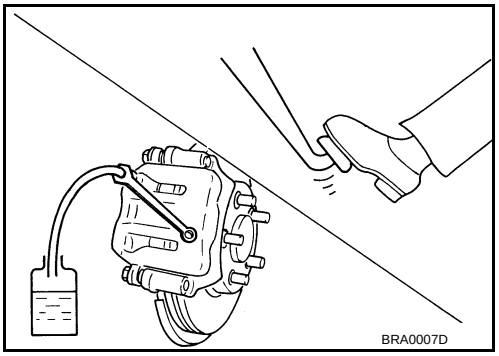


Draining

INFOID:0000000010838498

CAUTION:
- **Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface. For brake component parts, never wash them with water.**
- **Turn the ignition switch OFF and disconnect the ABS actuator and electric unit (control unit) harness connector or the 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.



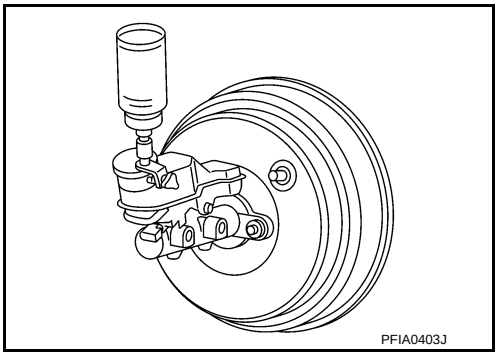
Refilling

INFOID:0000000010838499

CAUTION:
- **Turn the ignition switch OFF and disconnect the ABS actuator and electric unit (control unit) harness connector or the battery negative terminal before performing work.**

- **Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface. For brake component parts, never wash them with water.**

1. Check that there is no foreign material in the reservoir tank, and refill with new brake fluid.
   CAUTION:
   - **Never reuse drained brake fluid.**
   - **Never 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-14, "Bleeding Brake System".


PFIA0403J

Bleeding Brake System

INFOID:0000000010838500

CAUTION:
- **Turn the ignition switch OFF and disconnect the ABS actuator and electric unit (control unit) harness connector or the battery negative terminal before performing the work.**
- **Monitor the fluid level in the reservoir tank while performing the air bleeding**
- **Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface. For brake component parts, never wash them with water.**
- **Never allow foreign matter (e.r.dust) and oil 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 3 and 4 until all of the air is out of the brake line.
5. Tighten the bleeder valve to the specified torque.
   - Front disc brake
   - 1 piston type: Refer to BR-50, "BRAKE CALIPER ASSEMBLY (1 PISTON TYPE) : Exploded View".
   - 2 piston type: Refer to BR-55, "BRAKE CALIPER ASSEMBLY (2 PISTON TYPE) : Exploded View".
   - Rear disc brake: Refer to BR-62, "BRAKE CALIPER ASSEMBLY : Exploded View".
6. Perform steps 2 to 6. Occasionally fill with the brake fluid in order to keep it in 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-13, "Inspection".
8. Check each item of brake pedal. Adjust it if the measurement value is not the standard. Refer to BR-11, "Inspection and Adjustment".

BRAKE MASTER CYLINDER

Inspection

INFOID:0000000010838501

FLUID LEAK

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

BRAKE BOOSTER

Inspection

INFOID:0000000010838502

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.

AIR TIGHT

1. Run the engine at idle for 1 minute to apply vacuum to the brake booster, and stop the engine.
2. 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.
3. 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

BRAKE PAD

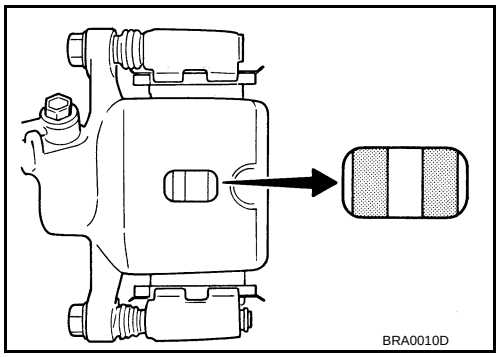
BRAKE PAD : Inspection and Adjustment

INFOID:0000000010838503

INSPECTION

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

Wear thickness : Refer to BR-67, "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:0000000010838504

INSPECTION

Appearance

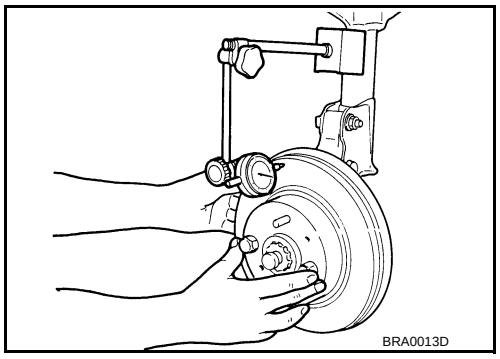
Check surface of disc rotor for uneven wear, cracks, and serious damage. Replace it if necessary.

- For 2WD, refer to FAX-11, "Removal and Installation".
- For 4WD, refer to FAX-72, "Removal and Installation".

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.
   - For 2WD, refer to FAX-16, "Inspection".
   - For 4WD, refer to FAX-77, "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-67, "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 the disc rotor if the runout is outside the limit even after performing the above operation.

CAUTION:

- **Check in advance that the thickness of the disc 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 rotor.**

- For 2WD, refer to FAX-11, "Removal and Installation".
- For 4WD, refer to FAX-72, "Removal and Installation".

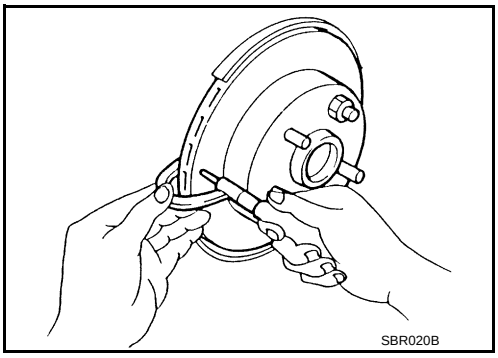
Wear thickness : Refer to BR-67, "Front Disc Brake".

Thickness

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

- For 2WD, refer to FAX-11, "Removal and Installation".
- For 4WD, refer to FAX-72, "Removal and Installation".

Wear thickness : Refer to BR-67, "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 DISC BRAKE

BRAKE PAD

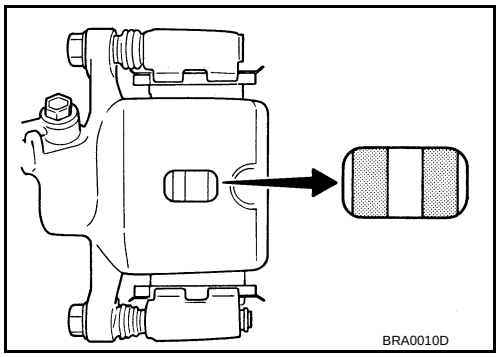
BRAKE PAD : Inspection and Adjustment

INFOID:0000000010838505

INSPECTION

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

Wear thickness : Refer to BR-67, "Rear 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:0000000010838506

INSPECTION

Appearance

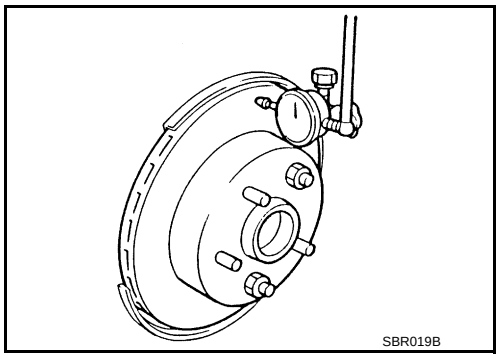
Check surface of disc rotor for uneven wear, cracks, and serious damage. Replace it if necessary.

- For 2WD, refer to RAX-7, "Removal and Installation".
- For 4WD, refer to RAX-18, "Removal and Installation".

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.
   - For 2WD, refer to RAX-9, "Inspection".
   - For 4WD, refer to RAX-21, "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-67, "Rear 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 the disc rotor if the runout is outside the limit even after performing the above operation.

CAUTION:

- **Check in advance that the thickness of the disc 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 rotor.**
  - **For 2WD, refer to RAX-7, "Removal and Installation".**
  - **For 4WD, refer to RAX-18, "Removal and Installation".**

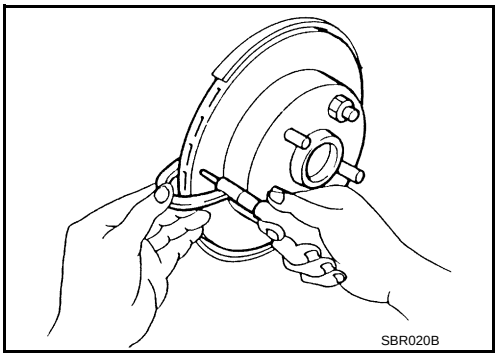
Wear thickness : Refer to BR-67, "Rear Disc Brake".

Thickness

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

- For 2WD, refer to RAX-7, "Removal and Installation".
- For 4WD, refer to RAX-18, "Removal and Installation".

Wear thickness : Refer to BR-67, "Rear 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.**

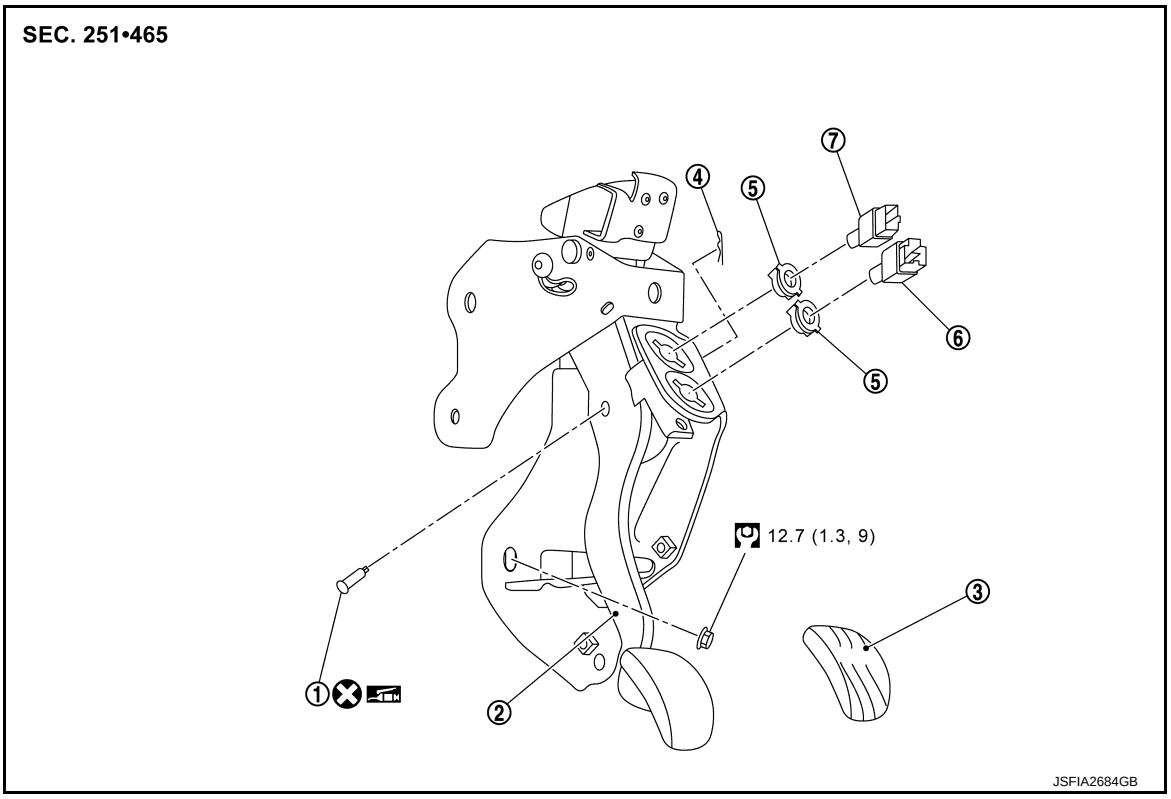
1. Drive vehicle on straight, flat road.
2. Depress brake pedal with the power to stop vehicle within 3 to 5 seconds until the vehicle stops.
3. Drive without depressing brake for a few minutes to cool the brake.
4. Repeat steps 1 to 3 until pad and disc rotor are securely fitted.

REMOVAL AND INSTALLATION

BRAKE PEDAL

Exploded View

INFOID:0000000010838507



① Clevis pin
② Brake pedal assembly
③ Brake pedal pad
④ Snap pin
⑤ Clip
⑥ Stop lamp switch
⑦ Brake pedal position switch (with AS-CD)

: Apply multi-purpose grease.

: N·m (kg-m, ft-lb)

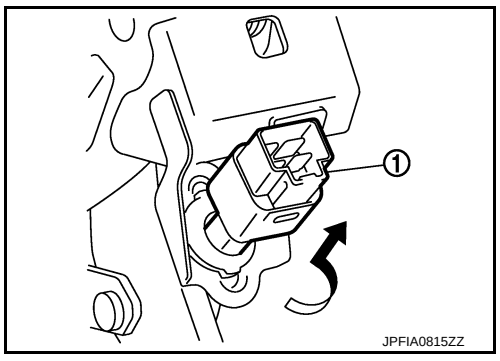
: Always replace after every disassembly.

Removal and Installation

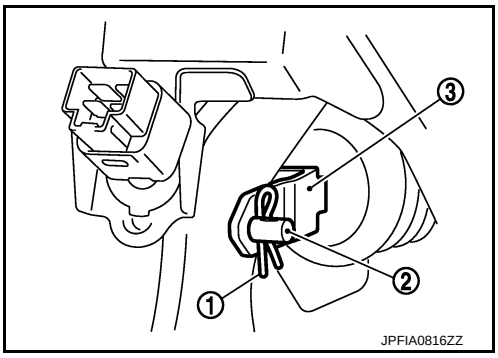
INFOID:0000000010838508

REMOVAL

1. Remove instrument lower panel. Refer to IP-14, "Removal and Installation".
2. Disconnect the stop lamp switch and the brake pedal position switch (with ASCD) harness connectors.
3. Rotate the stop lamp switch and the brake pedal switch (with ASCD) ① counterclockwise to remove.



4. Disconnect the accelerator pedal harness connector.
5. Remove snap pin ① and clevis pin ② from clevis of brake booster ③.



6. 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.
7. Remove the accelerator pedal from the brake pedal assembly. Refer to ACC-4, "Removal and Installation".
8. Perform inspection after removal. Refer to BR-22, "Inspection and Adjustment".

INSTALLATION

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

- Never reuse the clevis pin and snap 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.
- Never impact brake pedal such as drop and interference with tools and parts.
- Replace brake pedal when impacting brake pedal.
- Perform adjustment after installation. Refer to BR-22, "Inspection and Adjustment".

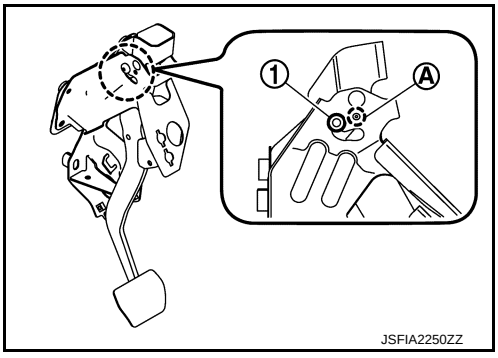
Inspection and Adjustment

INFOID:0000000010838509

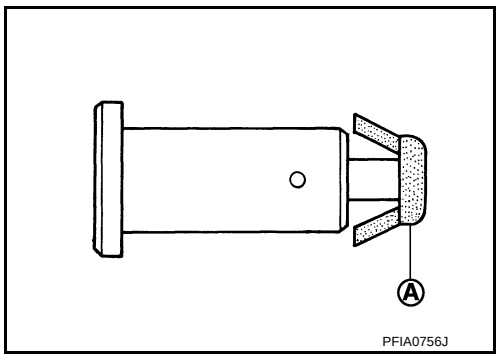
INSPECTION AFTER REMOVAL

Check for the following items and replace the brake pedal assembly if necessary.

- Check rivet Ⓐ for deformation, crack, and damage.
- Check the brake pedal for bend, damage, and cracks on the welded parts.
  CAUTION:
  Never loose bolt ①.



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



ADJUSTMENT AFTER INSTALLATION

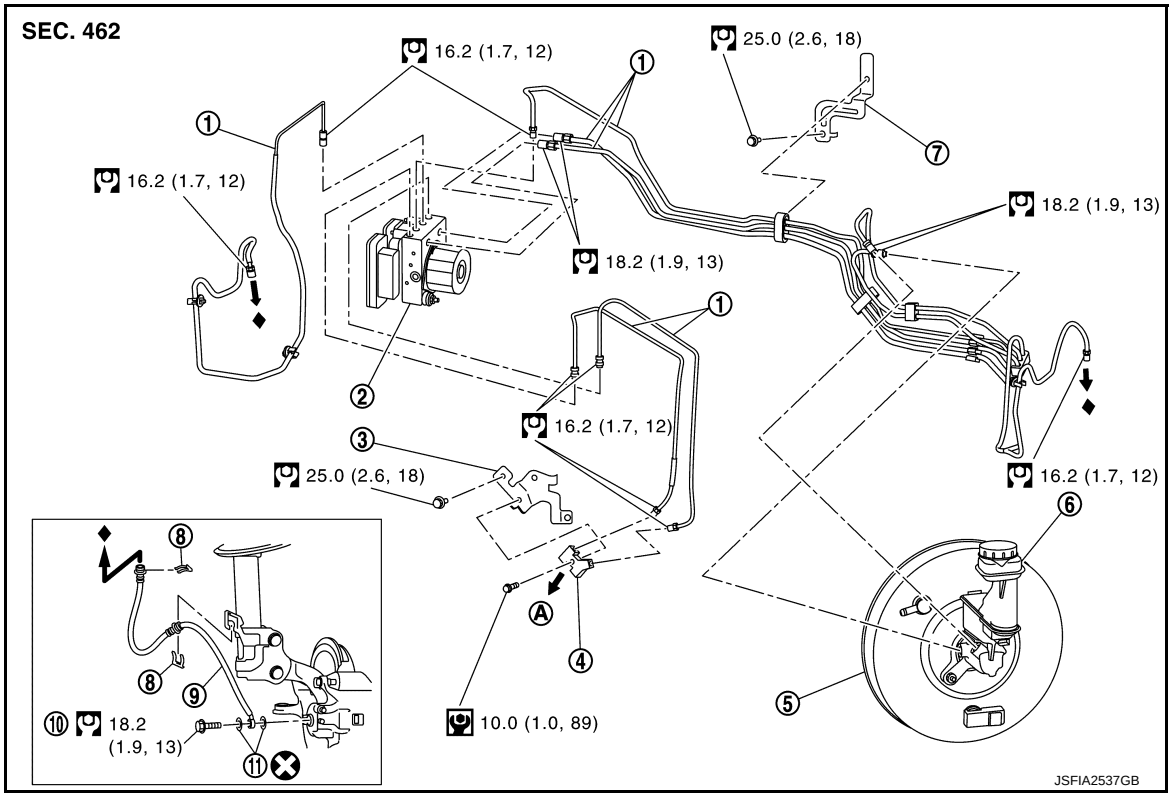
- Adjust each item of brake pedal after installing the brake pedal assembly to the vehicle. Refer to BR-11, "Inspection and Adjustment".
- Perform the release position learning of the accelerator pedal.
- MR20DD: Refer to EC-144, "Work Procedure".
- QR25DE: Refer to EC-553, "Work Procedure".
- R9M: Refer to EC-961, "Work Procedure".

BRAKE PIPING

FRONT

FRONT : Exploded View

INFOID:0000000010838510



① Brake tube	② ABS actuator and electric unit (control unit)	③ Connector bracket
④ Connector	⑤ Brake booster	⑥ Master cylinder assembly
⑦ Brake tube bracket	⑧ Lock plate	⑨ Brake hose
⑩ Union bolt	⑪ Copper washer	
Ⓐ To rear brake tube		

◆: Indicates that the part is connected at points with same symbol in actual vehicle.

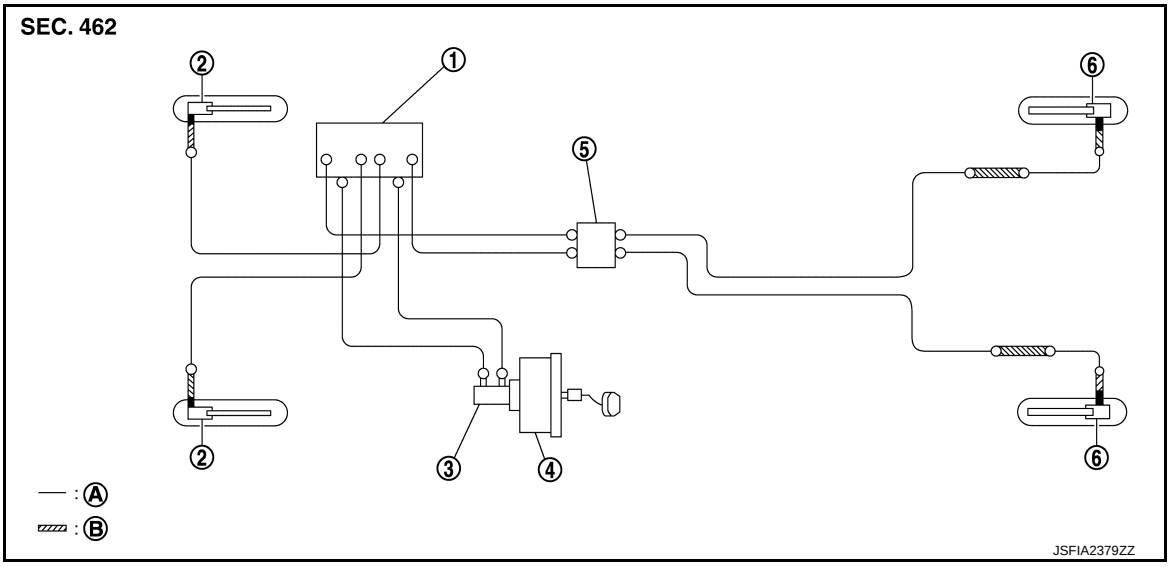
: N·m (kg-m, ft-lb)

: N·m (kg-m, in-lb)

: Always replace after every disassembly.

FRONT : Hydraulic Piping

INFOID:0000000010838511



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

◯: Flare nut

■: Union bolt

FRONT : Removal and Installation

INFOID:0000000010838512

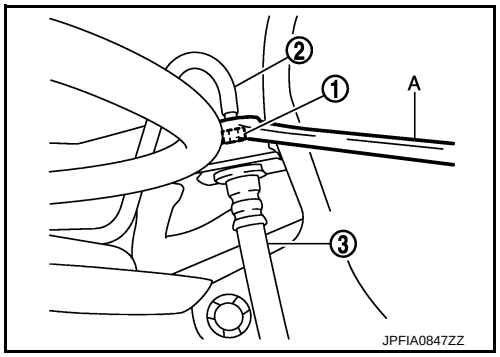
REMOVAL

CAUTION:

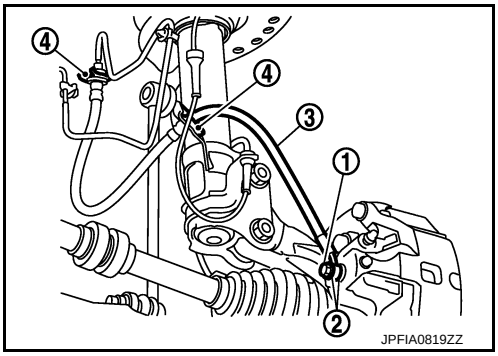
- **Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface. For brake component parts, never wash them with water.**
- **Never depress the brake pedal while removing the brake hose or brake tube. If this is not complied with, brake fluid may splash.**

1. Remove tires. Refer to WT-61, "Removal and Installation".
2. Drain brake fluid. Refer to BR-13, "Draining".
3. Loosen the flare nut ① with a flare nut wrench (A) and separate the brake tube ② from the brake hose ③.

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



4. Remove the union bolt ① and copper washers ②, and remove the brake hose ③ from the brake caliper assembly.
5. Remove the lock plate ④ and remove the brake hose.

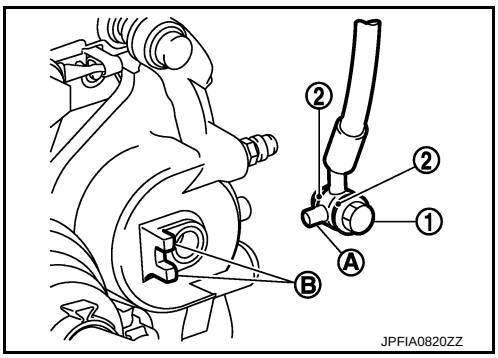


INSTALLATION

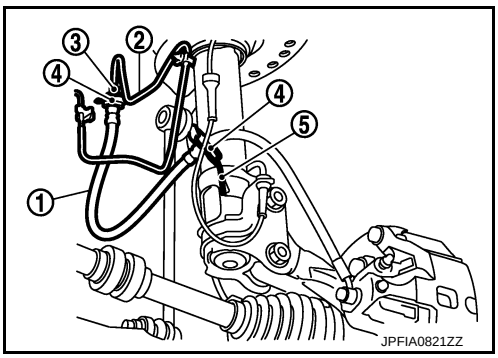
CAUTION:

- **Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface. For brake component parts, never wash them with water.**
- **Never depress the brake pedal while removing the brake hose or brake tube. If this is not complied with, brake fluid may splash.**
- **Never allow foreign matter (e.g. dust) and oils other than brake fluid to enter the reservoir tank.**

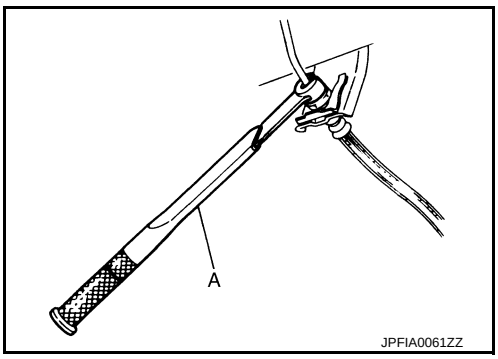
1. Assemble the union bolt ① and the copper washer ② to the brake hose.
   CAUTION:
   Never reuse the copper washer.
2. Align the brake hose pin Ⓐ with the brake caliper assembly projection Ⓑ, and tighten the union bolt to the specified torque.



3. Install the brake tube ② to the brake hose ①, temporarily tighten the flare nut ③ by hand until it does not rotate further, and fix the brake hose to the bracket ⑤ with the lock plate ④.
   CAUTION:
   Check that all brake hoses and brake tubes are not twisted and bent.



4. Tighten the flare nut to the specified torque with a flare nut torque wrench (A).
   CAUTION:
   Never scratch the flare nut and the brake tube.
5. Refill with new brake fluid and perform the air bleeding. Refer to BR-14, "Bleeding Brake System".
   CAUTION:
   Never reuse drained brake fluid.
6. Install tires. Refer to WT-61, "Removal and Installation".
7. Perform inspection after installation. Refer to BR-27, "FRONT : Inspection".



FRONT : Inspection

INFOID:0000000010838513

INSPECTION AFTER INSTALLATION

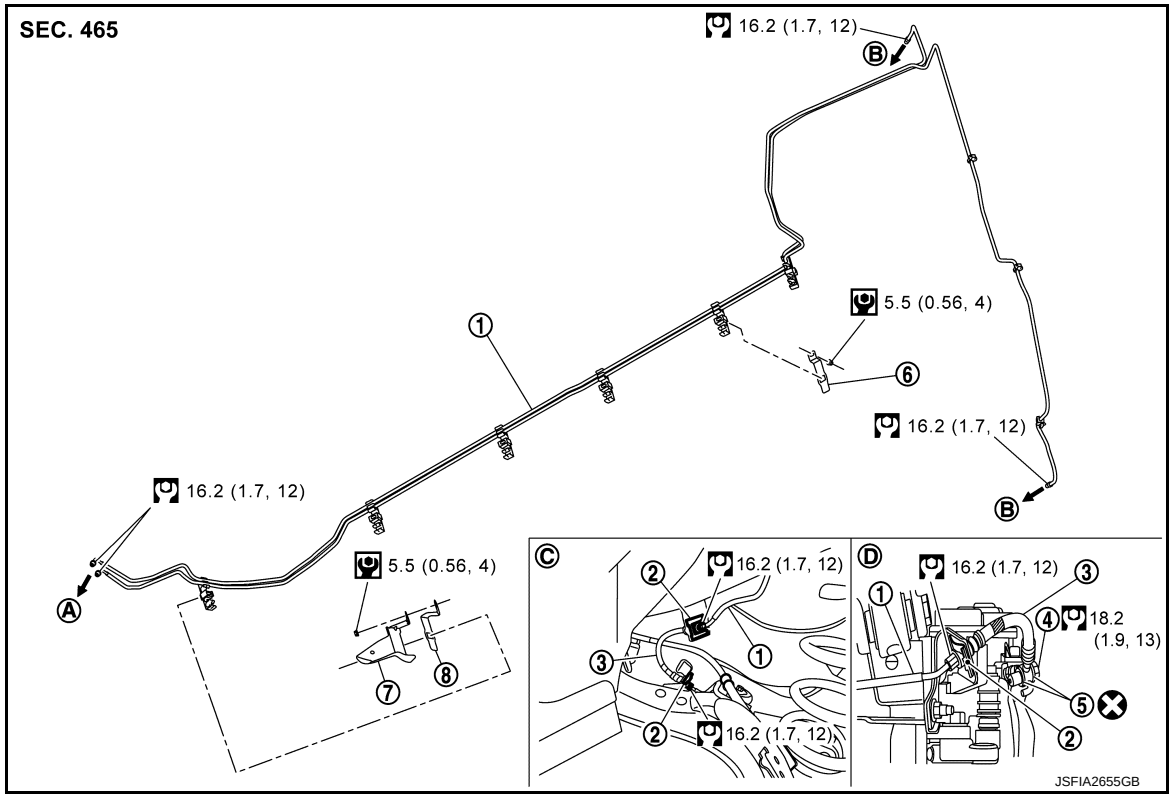
1. Check the brake hoses and tubes for the following: no scratches; no twist and deformation; no interference with other components when steering the steering wheel; no looseness at connections.
   CAUTION:
   Clearance with brake hose and each parts being secured more than 10 mm (0.39 in) in unladen condition*.
   ***: Fuel, engine coolant and lubricant are quantity to specified. Spare tire, jack, hand tools and mats are brought out of vehicle.**
2. Depress the brake pedal with a force of 785 N (80 kg, 176 lb) and hold down the pedal for approximately 5 seconds with the engine running. Check for any fluid leakage.
   CAUTION:
   Retighten the applicable connection to the specified torque and repair any abnormal (damaged, worn or deformed) part if any brake fluid leakage is present.

REAR

REAR : Exploded View

INFOID:0000000010838514

MR20DD

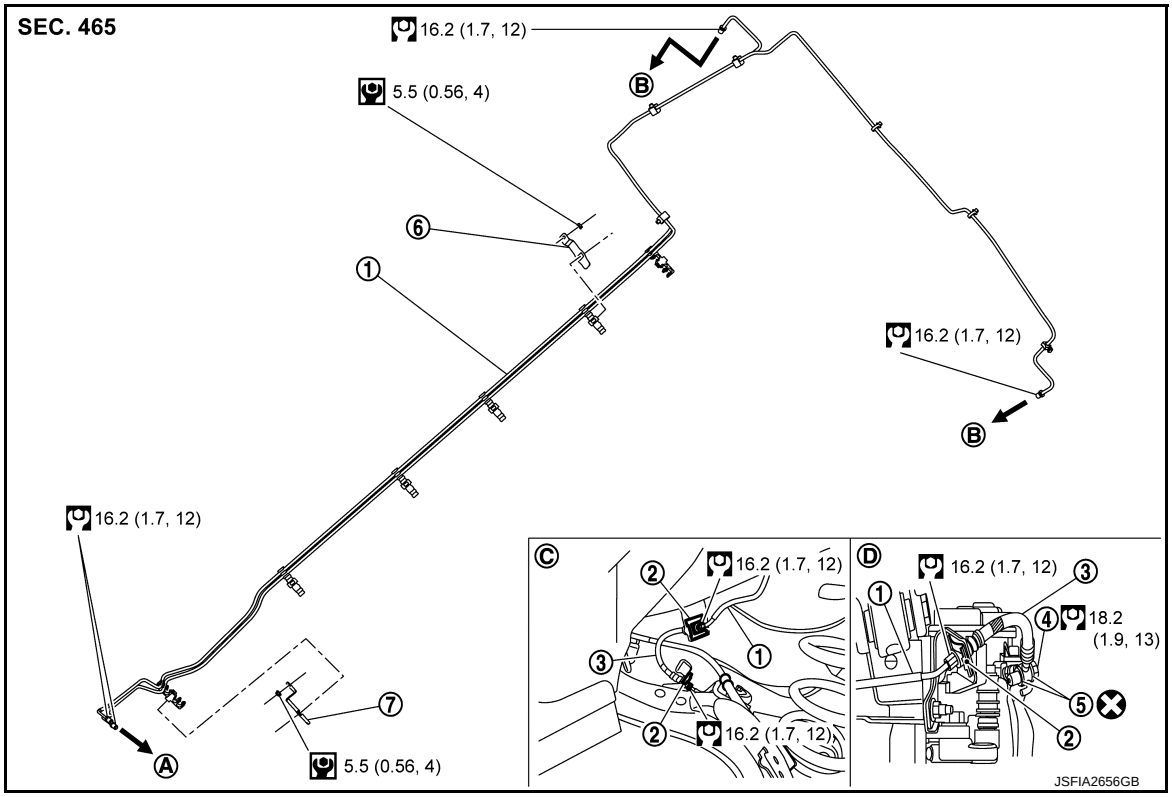


① Brake tube	② Lock plate	③ Brake hose
④ Union bolt	⑤ Copper washer	⑥ Brake tube bracket
⑦ Brake tube bracket	⑧ Brake tube bracket	
Ⓐ To connector	Ⓑ To rear brake hose	Ⓒ Floor side
Ⓓ Caliper side		

: N·m (kg-m, ft-lb)

: N·m (kg-m, in-lb)

: Always replace after every disassembly.



① Brake tube	② Lock plate	③ Brake hose
④ Union bolt	⑤ Copper washer	⑥ Brake tube bracket
⑦ Brake tube bracket		
Ⓐ To connector	Ⓑ To rear brake hose	Ⓒ Floor side
Ⓓ Caliper side		

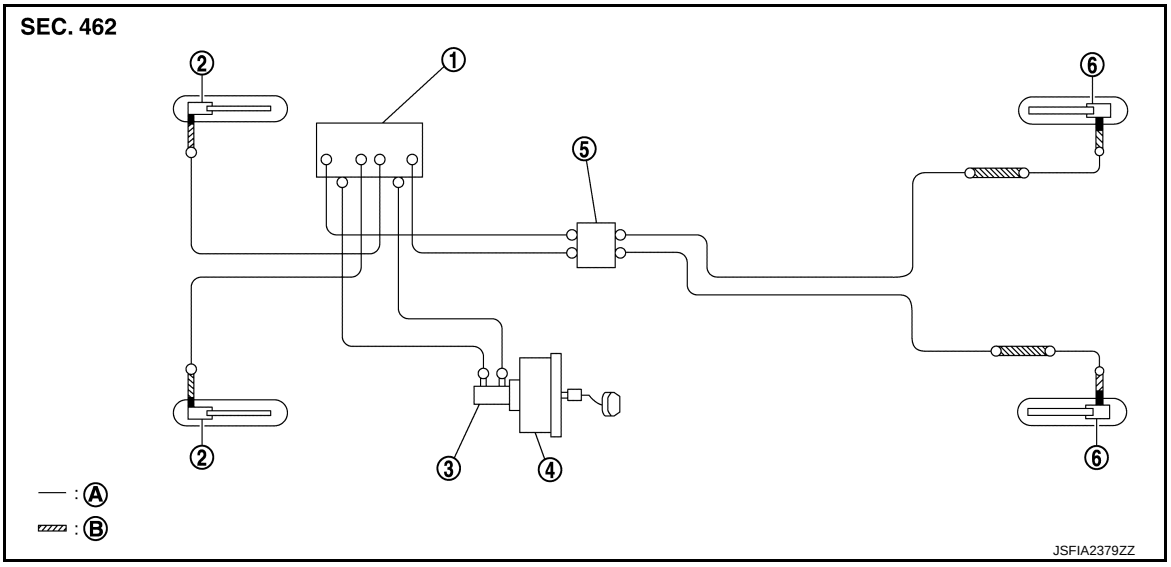
: N·m (kg-m, ft-lb)

: N·m (kg-m, in-lb)

: Always replace after every disassembly.

REAR : Hydraulic Piping

INFOID:0000000010838515



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

◯: Flare nut

■: Union bolt

REAR : Removal and Installation

INFOID:0000000010838516

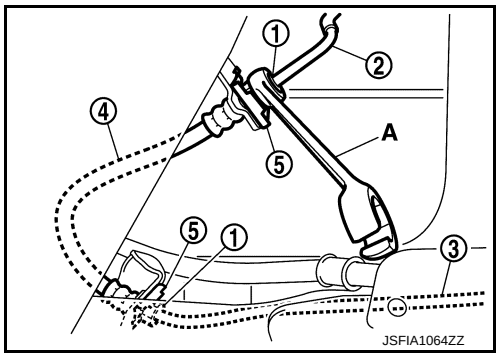
REMOVAL

CAUTION:

- **Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface. For brake component parts, never wash them with water.**
- **Never depress the brake pedal while removing the brake hose or brake tube. If this is not complied with, brake fluid may splash.**
- **Wipe off immediately when attaching brake fluid with disc rotor and caliper assembly.**

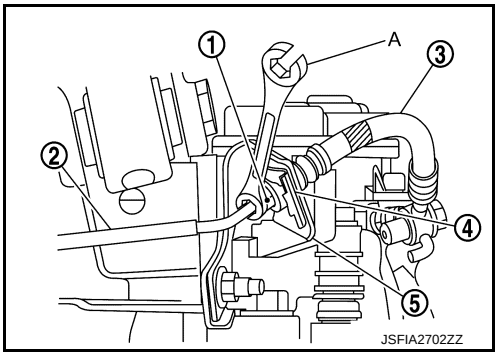
1. Remove tires. Refer to WT-61, "Removal and Installation".
2. Drain brake fluid. Refer to BR-13, "Draining".
3. Loosen the flare nut ① with a flare nut wrench (A) and separate the brake tube ② from the hose ③.

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

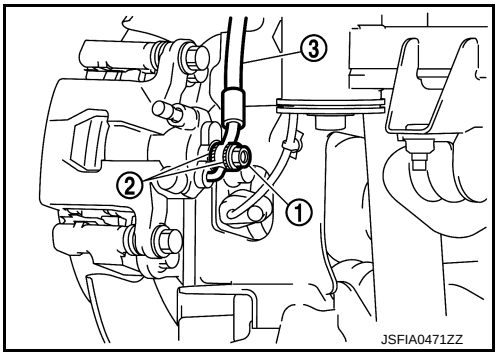


4. Disconnect the lock plate ⑤, then remove the brake hose.

5. Loosen the flare nut ① with a flare nut wrench (A) and separate the brake tube ② from the hose ③.
   CAUTION:
   - **Never scratch the flare nut and the brake tube.**
   - **Never bend sharply, twist or strongly pull out the brake hoses and tubes.**
   - **Cover open end of brake tubes and hoses when disconnecting to prevent entrance of dirt.**
6. Disconnect the lock plate ④, then remove the brake hose from the brake hose bracket ⑤.



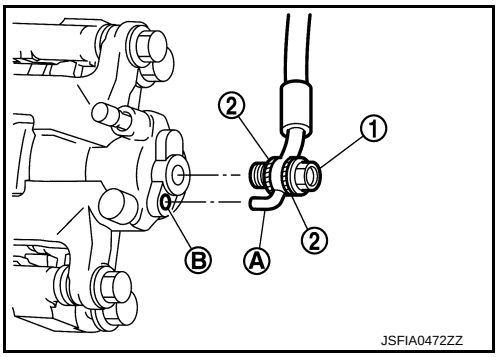
7. Remove the union bolt ① and copper washers ②, and remove the brake hose ③ from the brake caliper assembly.



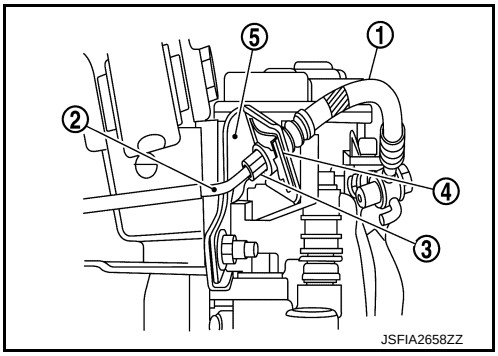
INSTALLATION

CAUTION:
- **Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface. For brake component parts, never wash them with water.**
- **Never depress the brake pedal while removing the brake hose or brake tube. If this is not complied with, brake fluid may splash.**
- **Never allow foreign matter (e.g. dust) and oils other than brake fluid to enter the reservoir tank.**
- **Wipe off immediately when attaching brake fluid with disc rotor and caliper assembly.**

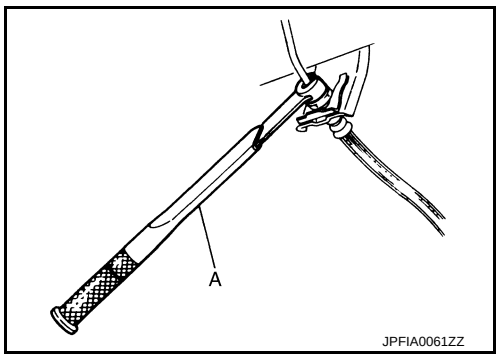
1. Assemble the union bolt ① and copper washers ② to the brake hose.
   CAUTION:
   Never reuse the copper washer.
2. Align the brake hose L-pin Ⓐ with the brake caliper assembly hole Ⓑ, and tighten the union bolt to the specified torque.



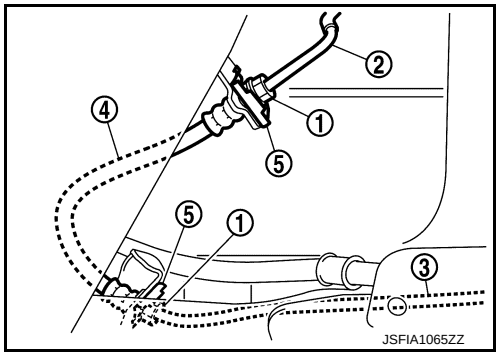
3. Install the brake hose ① to the brake tube ②, temporarily tighten the flare nut ③ by hand until it does not rotate further, and fix the brake hose to the brake hose bracket ⑤ with the lock plate ④.
   CAUTION:
   Check that all brake hoses and brake tubes are not twisted and bent.



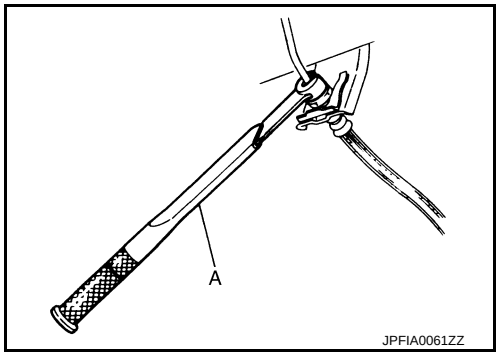
4. Tighten the flare nut to the specified torque with a flare nut torque wrench (A).
CAUTION:
Never scratch the flare nut and the brake tube.



5. Install the brake hose ④ to the brake tube ② and the brake tube ③, temporarily tighten the flare nut ① by hand until it does not rotate further, and fix the brake hose to brake hose brackets with the lock plate ⑤.
CAUTION:
Check that all brake hoses and brake tubes are not twisted and bent.



6. Tighten the flare nut to the specified torque with a flare nut torque wrench (A).
CAUTION:
Never scratch the flare nut and the brake tube.
7. Refill with new brake fluid and perform the air bleeding. Refer to BR-14, "Bleeding Brake System".
CAUTION:
Never reuse drained brake fluid.
8. Install tires. Refer to WT-61, "Removal and Installation".
9. Perform inspection after installation. Refer to BR-31, "REAR : Inspection".



REAR : Inspection

INFOID:0000000010838517

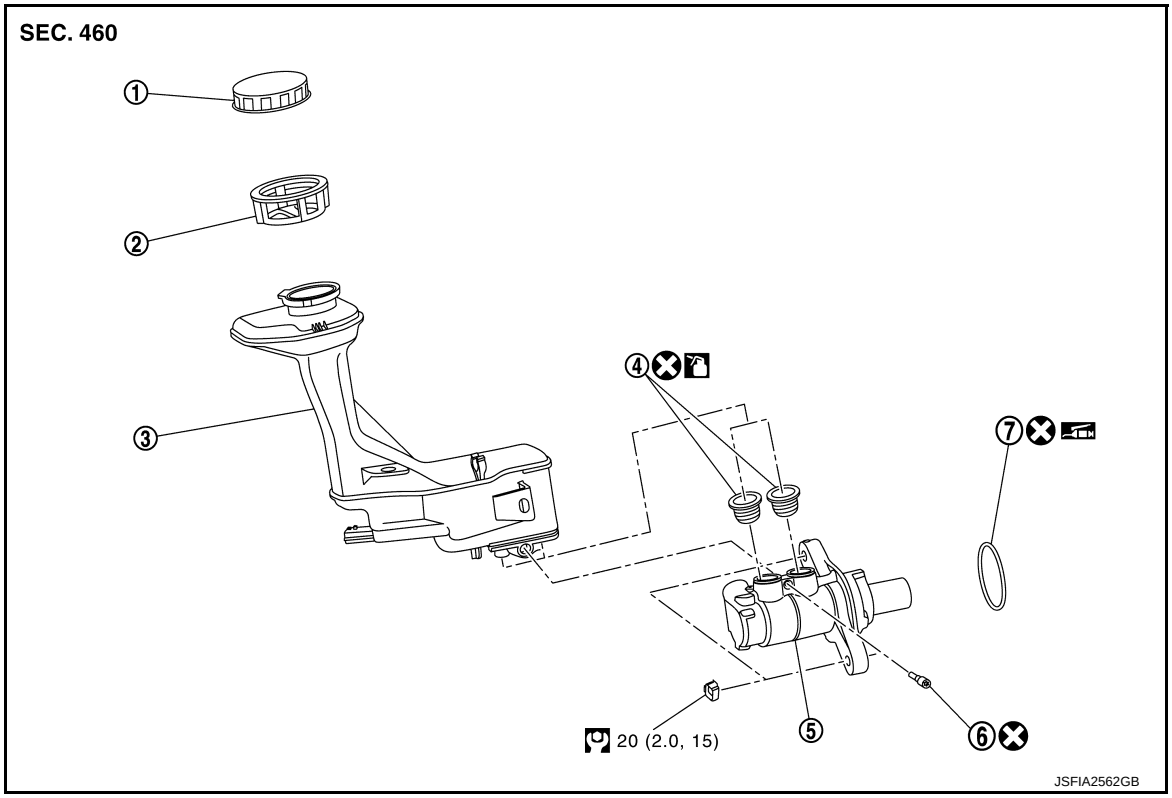
INSPECTION AFTER INSTALLATION

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 quantity to specified. Spare tire, jack, hand tools and mats are brought out of vehicle.**
2. Depress the brake pedal with a force of 785 N (80 kg, 176 lb) and hold down the pedal for approximately 5 seconds with the engine running. Check for any fluid leakage.
CAUTION:
Retighten the applicable connection to the specified torque and repair any abnormal (damaged, worn or deformed) part if any brake fluid leakage is present.

BRAKE MASTER CYLINDER

Exploded View

INFOID:0000000010838518



① Reservoir cap ② Oil strainer ③ Reservoir tank
④ Grommet ⑤ Cylinder body ⑥ Screw
⑦ O-ring

: Apply polyglycol ether based lubricant.
: Apply brake fluid.
: N·m (kg-m, ft-lb)
: Always replace after every disassembly.

Removal and Installation

INFOID:0000000010838519

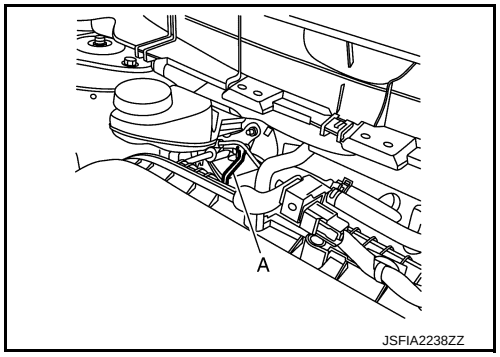
REMOVAL

CAUTION:

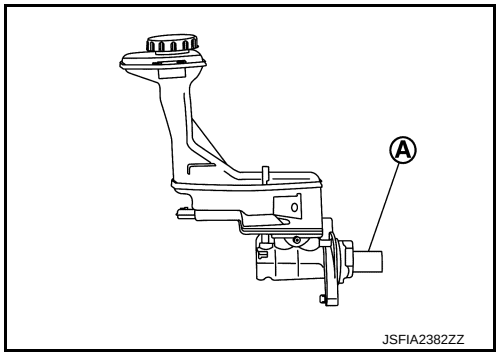
- **Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface. For brake component parts, never wash them with water.**
- **Depress the brake pedal several times to release the vacuum pressure from the brake booster. Then remove the master cylinder assembly.**
- **Never depress the brake pedal while removing the brake tube. If this is not complied with, brake fluid may splash.**

1. Perform inspection before removal. Refer to BR-35, "Inspection".
2. Drain brake fluid. Refer to BR-13, "Draining".
3. Remove the battery. Refer to PG-142, "EXCEPT FOR R9M : Removal and Installation".
4. Remove the TCM (as a set with bracket). Refer to TM-415, "Removal and Installation".

5. Remove the air duct assembly, the air duct 1, the air duct 2, the air cleaner cover, the cleaner element, the air cleaner body, and the mass air flow sensor.
   - For MR20DD, refer to EM-31, "Removal and Installation".
   - For QR25DE, refer to EM-175, "Removal and Installation".
   - For R9M, refer to EM-308, "Removal and Installation".
6. Remove the engine cover.
   - For R9M, refer to EM-306, "Removal and Installation".
7. Disconnect the brake fluid level switch harness connector and the harness clip.
8. Separate the brake tube from the master cylinder assembly with a flare nut wrench (A).
   CAUTION:
   Never scratch the flare nut and the brake tube.



9. Remove the master cylinder assembly.
   CAUTION:
   - **Never deform or bend the brake tubes.**
   - **Never depress the brake pedal after the master cylinder assembly is removed.**
   - **The piston Ⓐ of the master cylinder assembly is exposed. Never damage it when removing the master cylinder.**
   - **The piston may drop off when pulled out strongly. Never hold the piston. Hold the cylinder body when handling the master cylinder assembly.**



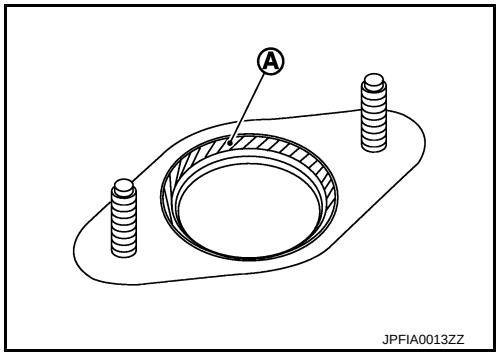
10. Remove the O-ring.

INSTALLATION

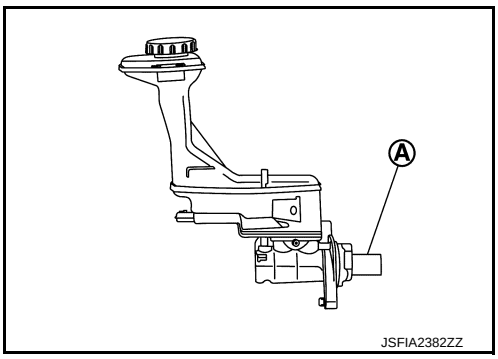
CAUTION:
Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface. For brake component parts, never wash them with water.

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

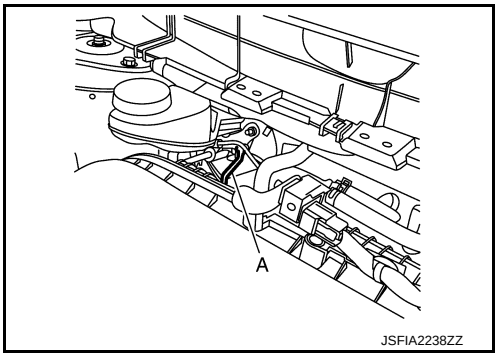
- Never reuse the O-ring.
- Never depress the brake pedal after the master cylinder assembly is removed.
- Apply polyglycol ether based lubricant to the brake booster [see Ⓐ in the figure] when installing the master cylinder assembly to the brake booster.



- The piston Ⓐ of the master cylinder assembly is exposed. Never damage it when handling the master cylinder.
- Check that no dirt and dust are present on the piston before installation. Clean it with new brake fluid if necessary.
- The piston may drop off when pulled strongly. Never hold the piston. Hold the cylinder body when handling the master cylinder assembly.
- Never deform or bend the brake tubes.



- 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 (A). Refer to BR-32, "Exploded View".
- Perform the air bleeding. Refer to BR-14, "Bleeding Brake System".
- Perform inspection after installation. Refer to BR-35, "Inspection".



Disassembly and Assembly

INFOID:0000000010838520

DISASSEMBLY

CAUTION:
- **Never disassemble the cylinder body.**
- **Remove the reservoir tank only when necessary.**
- **Never drop parts to remove. Replace new parts when dropping.**

1. Fix the master cylinder assembly to a vise.
   CAUTION:
   - **Always set copper plates or cloth between vise grips when fixing the cylinder body to a vise.**
   - **Never overtighten the vise.**
2. Remove the reservoir tank mounting screw.
3. Remove the reservoir tank and grommet from the cylinder body.

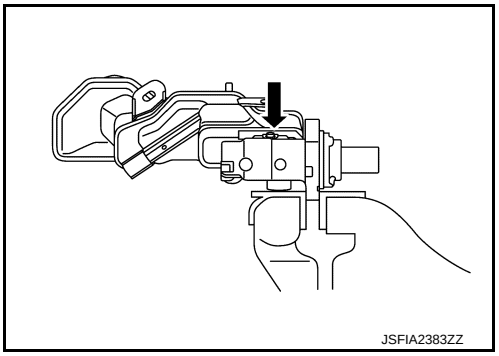
ASSEMBLY

CAUTION:
- **Never use mineral oils such as kerosene or gasoline and rubber grease during the cleaning and assembly process.**
- **Never allow foreign matter (e.g. dust) and oils other than brake fluid to enter the reservoir tank.**
- **Never drop when installing. The parts must not be reused if they are dropped.**

1. Apply new brake fluid to the grommet and install it to the cylinder body.
   CAUTION:
   Never reuse grommets.
2. Install the reservoir tank to the cylinder body.
3. Fix the cylinder body to a vise.
   CAUTION:

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

4. Tilt the reservoir tank so that a mounting screw can be fixed. Assemble with screw.



Inspection

INFOID:0000000010838521

INSPECTION BEFORE REMOVAL

Check the brake fluid level switch. Refer to BRC-159, "Component Inspection".

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-27, "FRONT : Inspection".

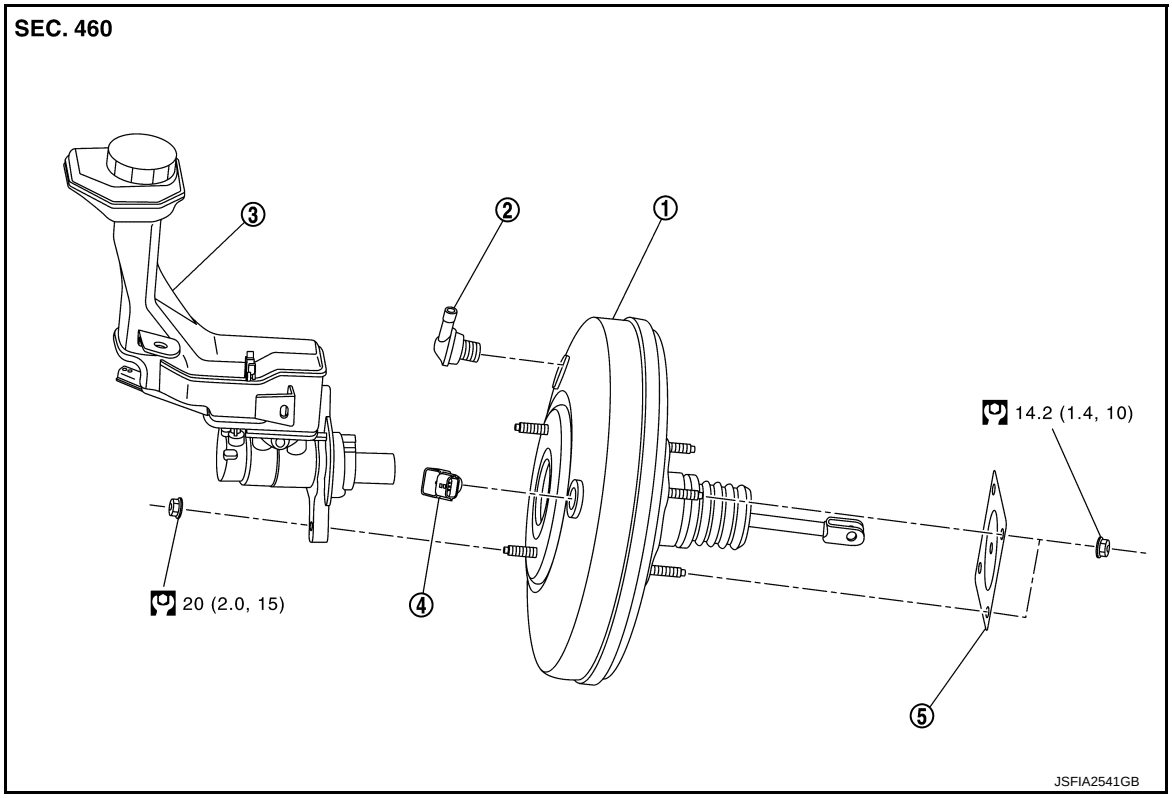
CAUTION:

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

BRAKE BOOSTER

Exploded View

INFOID:0000000010838522



① Brake booster ② Check valve ③ Master cylinder assembly
④ Vacuum sensor ⑤ Gasket

: N·m (kg-m, ft-lb)

Removal and installation

INFOID:0000000010838523

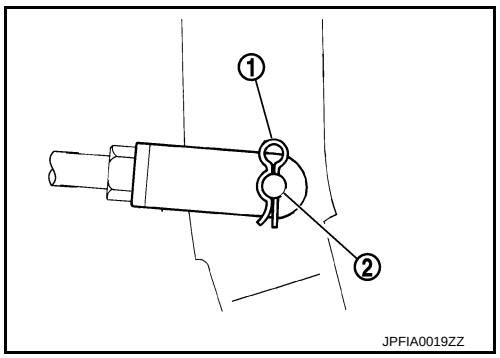
REMOVAL

CAUTION:

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

1. Perform inspection before removal. Refer to BR-38, "Inspection and Adjustment".
2. Drain brake fluid. Refer to BR-13, "Draining".
3. Remove brake master cylinder assembly. Refer to BR-32, "Removal and Installation".
4. Remove vacuum hose from check valve.
   - For MR20DD, refer to BR-40, "MR20DD : Removal and Installation".
   - For QR25DE, refer to BR-41, "QR25DE : Removal and Installation".
   - For R9M, refer to BR-42, "R9M : Removal and Installation".
5. Remove cowl top extension. Refer to EXT-25, "Removal and Installation".
6. Remove brake tube between master cylinder assembly and ABS actuator and electric unit (control unit). Refer to BR-24, "FRONT : Exploded View".

7. Remove snap pin ① and clevis pin ②.



8. Remove nuts on brake booster and brake pedal assembly.
   CAUTION:
   Hold the brake booster so as to avoid dropping out.
9. Remove brake booster.
   CAUTION:
   Never deform or bend the brake tubes.
10. Remove check valve from brake booster.
11. Perform inspection after removal. Refer to BR-38, "Inspection and Adjustment".

INSTALLATION

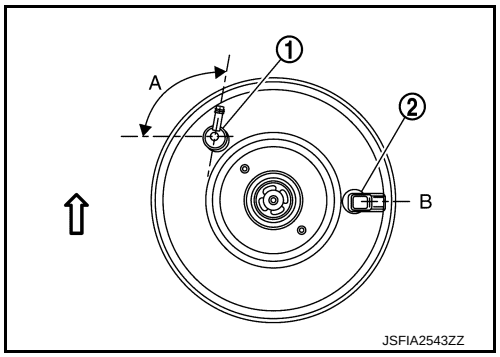
CAUTION:
Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface. For brake component parts, never wash them with water.

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

- Install check valve ① and vacuum sensor ② as shown in figure.

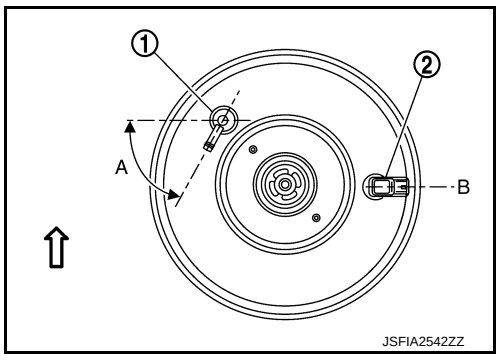
- Except R9M

A	:98°± 5°
B	:0°±5°
⇦	: Vehicle upper side



- R9M

A	: 70°±5°
B	: 0°±5°
⇦	: Vehicle upper side



- Be careful not to damage brake booster stud bolt threads. If brake booster is tilted during installation, the dash panel may damage threads.
- Never deform or bend the brake tubes when installing the brake booster.
- Always use new gasket between the brake booster and the dash panel.
- Replace clevis pin when found damage.
- Never allow foreign matter (e.g.dust) and oil other than brake fluid to enter reservoir tank.
- Perform the air bleeding. Refer to BR-13, "Draining".

CAUTION:
Never reuse brake fluid to drain.

- Check each item of brake pedal. Adjust it if the measurement value is not the standard. Refer to BR-11, "Inspection and Adjustment".

Inspection and Adjustment

INFOID:0000000010838524

INSPECTION BEFORE REMOVAL

Air Tight

CAUTION:
Check the air tight condition when the master cylinder and the brake booster is installed.

1. Check the air tight use a handy vacuum pump.

At vacuum of –66.7 kPa (–500 mmHg, –19.69 inHg, –0.067 bar)	**: Vacuum should decrease within 3.3 kPa (24.8 mmHg, 0.98 inHg, 0.033 bar) for 15 seconds.**

2. If the air tight condition cannot be maintained, perform the following operation.

a. Check the no dirt and dust are present on the brake booster and brake master cylinder mating faces. Clean it if necessary.

b. Check the O-ring on the master cylinder. If anything is found, replace the O-ring. Refer to BR-32, "Removal and Installation".

c. Check the air tight condition again. If the condition still cannot be maintained, replace the brake booster.

INSPECTION AFTER REMOVAL

Check Valve Inspection

1. Check the check valve to use a handy vacuum pump.

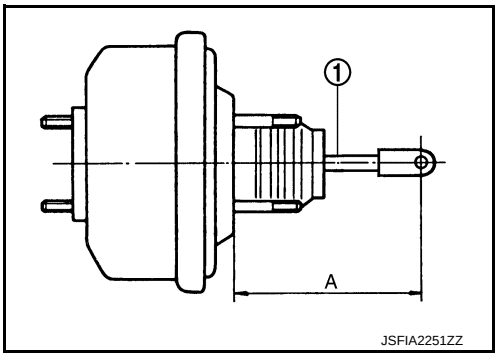
In the case of connecting to brake booster	**: Vacuum should decrease within 3.3 kPa (24.8 mmHg, 0.98 inHg, 0.033 bar) for 15 seconds at vacuum of –66.7 kPa (–500 mmHg, –19.69 inHg, –0.067 bar).**
In the case of connecting to vacuum hose	**: Vacuum should not exist.**

Input Rod Length rod Inspection

1. Check the input length (A).

① :Input rod

A : Refer to BR-67, "Brake Booster".



2. Replace the brake booster if the input rod length is not the standard.

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 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 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.

2. 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.
3. 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-11, "Inspection and Adjustment".

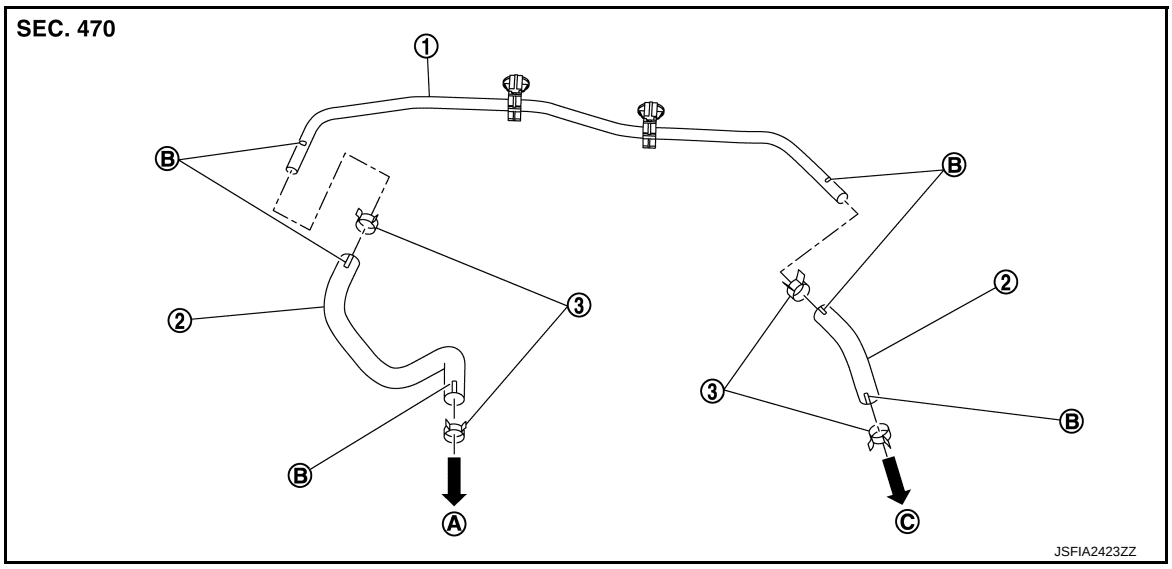
VACUUM LINES

MR20DD

MR20DD : Exploded View

INFOID:0000000010838525

MR20DD



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

MR20DD : Removal and Installation

INFOID:0000000010838526

REMOVAL

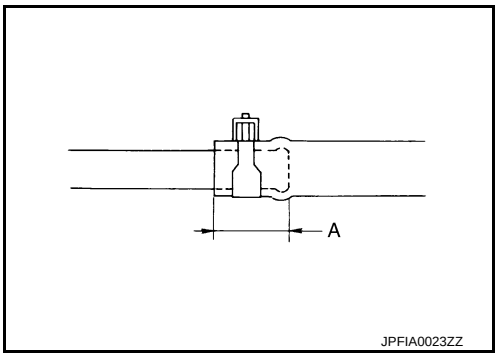
1. Remove the vacuum hose and vacuum piping.
2. Perform inspection after removal. Refer to BR-40, "MR20DD : Inspection".

INSTALLATION

Note the following, install the vacuum hose.

- When installing vacuum hose, insert it until its tip reaches the back-end of length (A) or further as shown in the figure.
  CAUTION:
  Never use lubricating oil during assembly.

  A : 24 mm (0.95 in) or more



- Face the paint mark of vacuum hose (built-in check valve) to upward to assemble.
- Face the paint mark of vacuum piping (intake manifold side) to upward to assemble.
- Face the other paint marks to vehicle front side to assemble.
- For clamp mounting direction (the orientation of pawl), refer to BR-40, "MR20DD : Exploded View".

MR20DD : Inspection

INFOID:0000000010838527

INSPECTION AFTER REMOVAL

Appearance

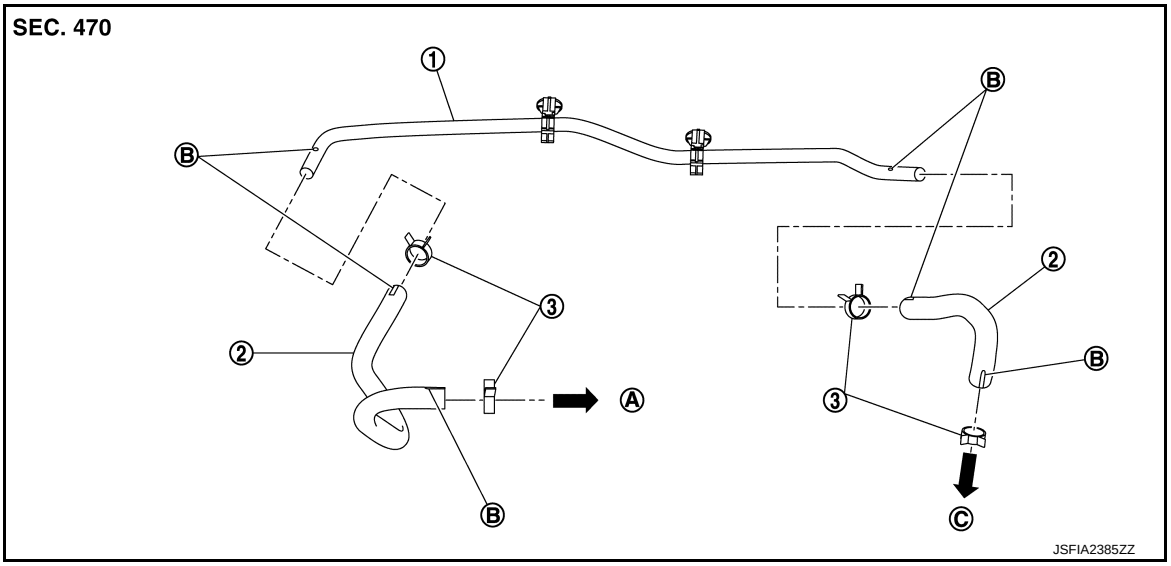
Check for correct assembly, damage and deterioration.

QR25DE

QR25DE : Exploded View

INFOID:0000000010838528

QR25DE



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

QR25DE : Removal and Installation

INFOID:0000000010838529

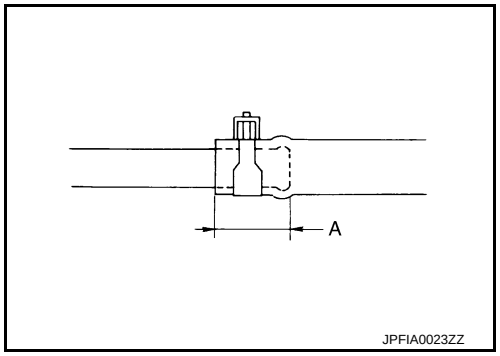
REMOVAL

1. Remove the vacuum hose and vacuum piping.
2. Perform inspection after removal. Refer to BR-41, "QR25DE : Inspection".

INSTALLATION

Note the following, install the vacuum hose.

- When installing vacuum hose, insert it until its tip reaches the back-end of length (A) or further as shown in the figure.
  CAUTION:
  Never use lubricating oil during assembly.



A : 24 mm (0.95 in) or more

- Face the paint mark of vacuum hose (built-in check valve) to upward to assemble.
- Face the paint mark of vacuum piping (intake manifold side) to upward to assemble.
- Face the other paint marks to vehicle front side to assemble.
- For clamp mounting direction (the orientation of pawl), refer to BR-41, "QR25DE : Exploded View".

QR25DE : Inspection

INFOID:0000000010838530

INSPECTION AFTER REMOVAL

Appearance

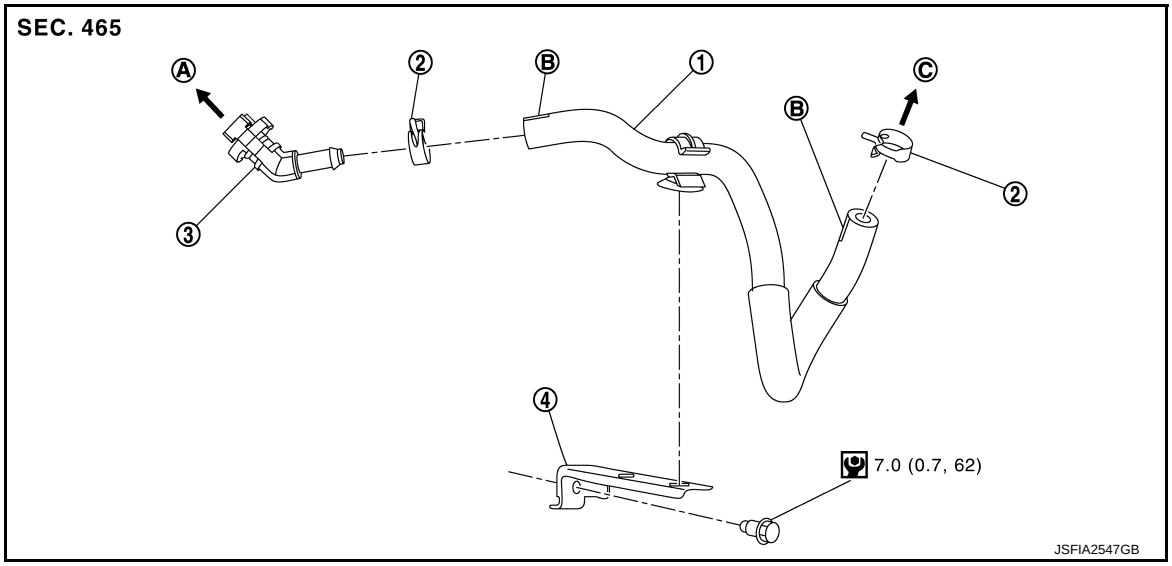
Check for correct assembly, damage and deterioration.

R9M

R9M : Exploded View

INFOID:0000000010838983

R9M



① Vacuum hose	② Clamp	③ Connector
④ Vacuum hose bracket		
Ⓐ To vacuum pump	Ⓑ Paint mark	Ⓒ To brake booster

: N·m (kg-m, in-lb)

R9M : Removal and Installation

INFOID:0000000010838984

REMOVAL

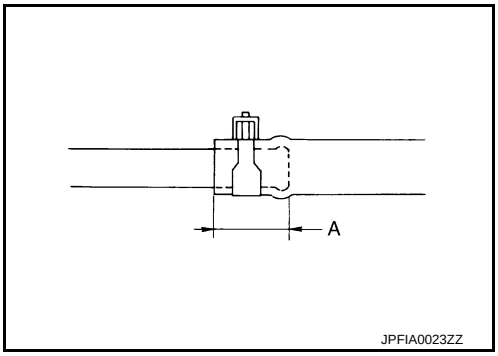
1. Remove engine cover. Refer to EM-306, "Removal and Installation".
2. Remove the vacuum hose and vacuum piping.
3. Perform inspection after removal. Refer to BR-42, "R9M : Inspection".

INSTALLATION

Note the following, install the vacuum hose.

- When installing vacuum hose, insert it until its tip reaches the back-end of length (A) or further as shown in the figure.
  CAUTION:
  Never use lubricating oil during assembly.

  A : 24 mm (0.95 in) or more



- Face the paint mark of vacuum hose (built-in check valve) to upward to assemble.
- Face the paint mark of vacuum piping (intake manifold side) to upward to assemble.
- Face the other paint marks to vehicle front side to assemble.
- For clamp mounting direction (the orientation of pawl), refer to BR-42, "R9M : Exploded View".

R9M : Inspection

INFOID:0000000010838985

INSPECTION AFTER REMOVAL

Appearance

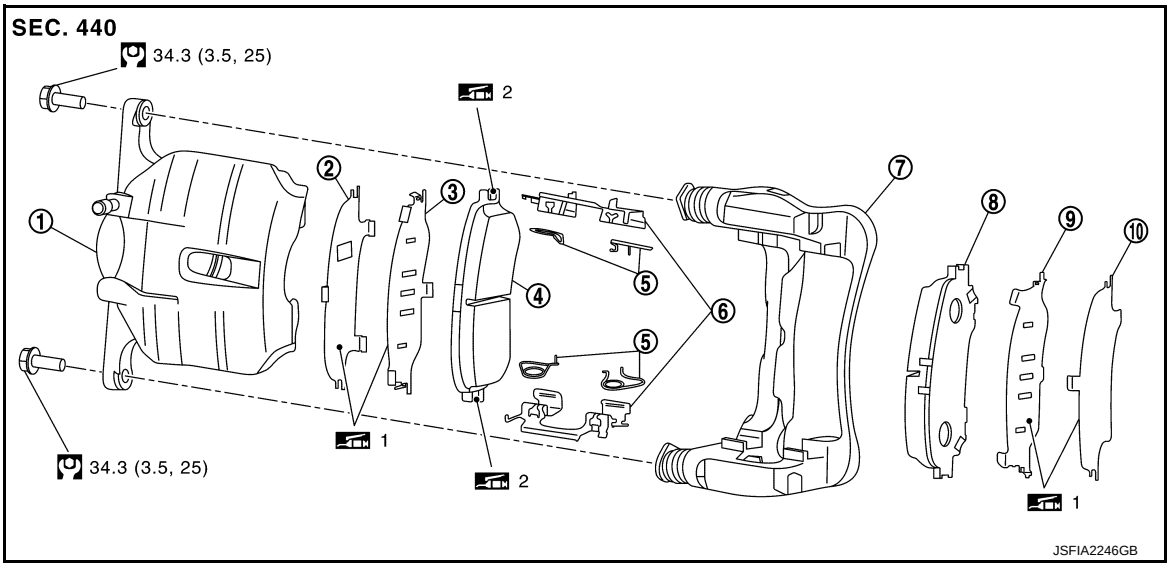
Check for correct assembly, damage and deterioration.

FRONT DISC BRAKE

BRAKE PAD (1 PISTON TYPE)

BRAKE PAD (1 PISTON TYPE) : Exploded View

INFOID:0000000010838531



① Cylinder body	② Inner shim cover	③ Inner shim
④ Inner pad (with pad wear sensor)	⑤ Return spring	⑥ Pad retainer
⑦ Torque member	⑧ Outer pad	⑨ Outer shim
⑩ Outer shim cover		

1: Apply MOLYKOTE® AS 880N or silicone-based grease.

2: Apply MOLYKOTE® 7439 or equivalent.

: N·m (kg-m, ft-lb)

Molykote is a registered trademark of Dow Corning Corporation.

BRAKE PAD (1 PISTON TYPE) : Removal and Installation

INFOID:0000000010838532

REMOVAL

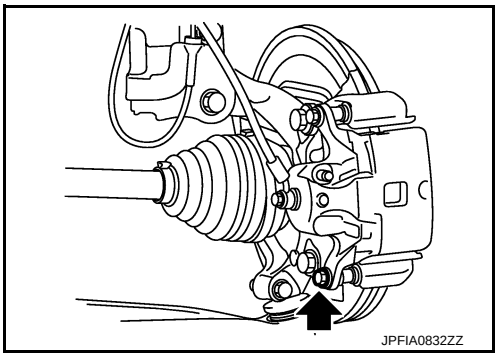
WARNING:

Since dust covering the front and rear brakes has an affect on human body, the dust must be removed with a dust collector. Never splatter the dust with an air blow gun.

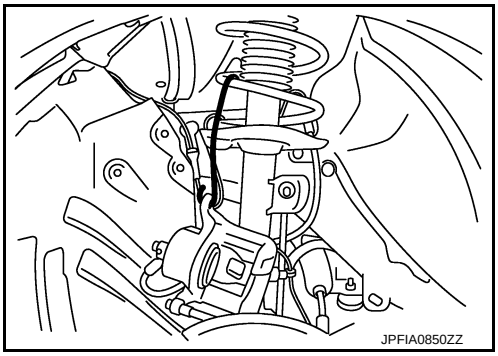
CAUTION:

- **Never 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.**

1. Remove tires with power tool.
2. Remove lower sliding pin bolt.

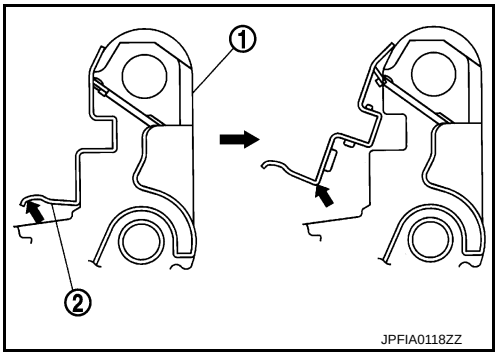


3. Suspend the cylinder body with suitable wire so that the brake hose will not stretch.



4. Remove the brake pads, shims, shim covers and pad retainer (as a set with pad return spring) ② from the torque member ①.

CAUTION:
- **Remove pad retainer together with pad return springs.**
- **Never deform the pad return springs and pad retainer when removing the pad retainer from the torque member.**
- **Never damage the piston boots.**
- **Never drop the brake pads, shims and shim covers.**
- **Remember each position of the removed brake pads.**

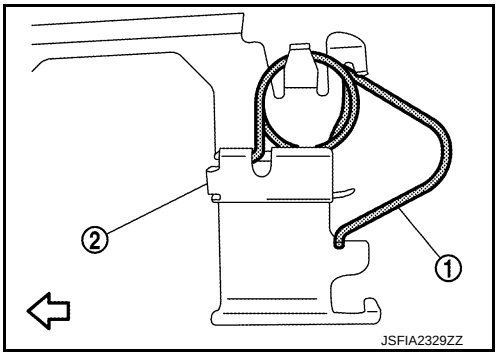


5. Remove the pad return springs ① from the pad retainer ②.

⇦ : Disc rotor side

CAUTION:
Never deform the pad return springs when removing the pad return springs from the pad retainer.

6. Perform inspection after removal. Refer to BR-46, "BRAKE PAD (1 PISTON TYPE) : Inspection".



INSTALLATION

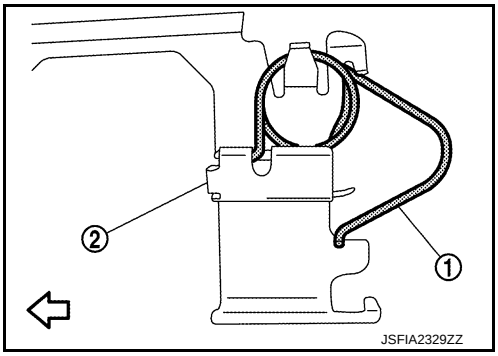
WARNING:
Since dust covering the front and rear brakes has an affect on human body, the dust must be removed with a dust collector. Never splatter the dust with an air blow gun.

CAUTION:
- **Never 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.**

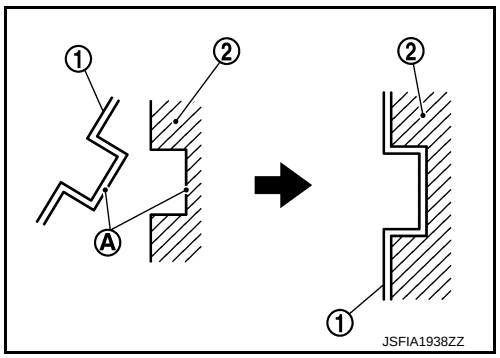
1. Install the pad return springs ① to pad retainer ② if the pad return springs has been removed.

⇦ : Disc rotor side

CAUTION:
Never deform the pad return springs.

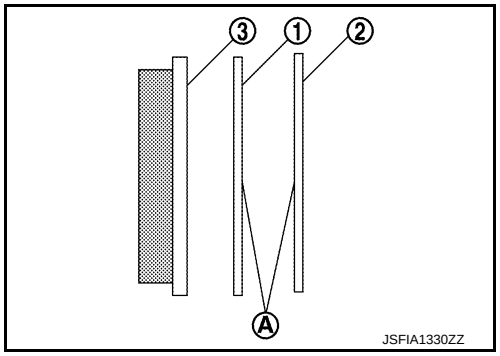


2. Apply MOLYKOTE® 7439 or equivalent to the match face Ⓐ between the pad retainers ① and torque member ② if the pad retainers has been removed.
Molykote is a registered trademark of Dow Corning Corporation.

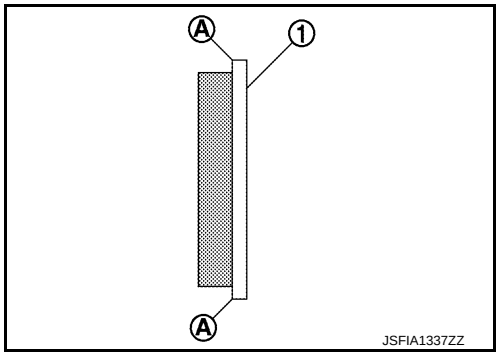


3. Install the pad retainer (upper side with pad return spring) to torque member if the pad retainers has been removed.
CAUTION:
- **Securely assemble the pad retainers so that it will not be lifted up from the torque member.**
- **Never deform the pad retainers and pad return springs.**

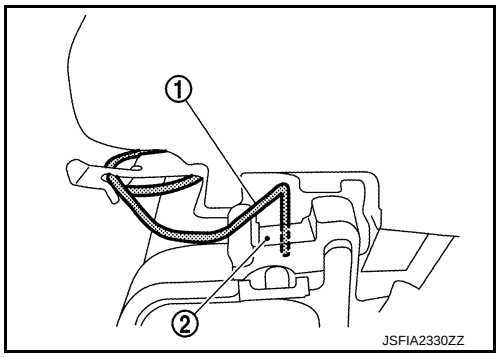
4. Apply MOLYKOTE® AS880N or silicone-based grease to the matching faces Ⓐ between the shim ① and the shim cover ②, and install the shim and the shim covers to the brake pad ③.
CAUTION:
Always replace the shims and shim covers when replacing the brake pad.
Molykote is a registered trademark of Dow Corning Corporation.



5. Apply MOLYKOTE® 7439 or equivalent to the match face Ⓐ between the brake pad ① and torque member ②.
Molykote is a registered trademark of Dow Corning Corporation.



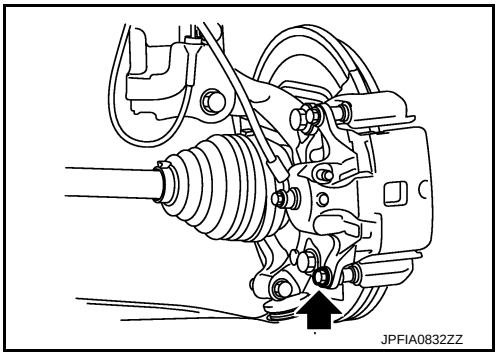
6. Install the brake pads to the torque member.
CAUTION:
Both inner and outer pads have a pad return system. Securely push the pad return spring ① into the disc rotor side of brake pad ②.



7. Install cylinder body to torque member.
CAUTION:
- **Never 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 reservoir tank when pressing piston in.**

NOTE:
Use a disc brake piston tool to easily press piston.

8. Install the lower sliding pin bolt and tighten it to the specified torque.



9. Depress the brake pedal several times to check that no drag feel is present for the front disc brake. Refer to BR-46, "BRAKE PAD (1 PISTON TYPE) : Inspection".
10. Install tires. Refer to WT-61, "Removal and Installation".

BRAKE PAD (1 PISTON TYPE) : Inspection

INFOID:0000000010838533

INSPECTION AFTER REMOVAL

- Replace the shims and shim covers if rust is excessively attached.
- Eliminate rust on the pad return spring, pad retainers and the torque member. Replace them if rust is excessively attached.

INSPECTION AFTER INSTALLATION

- Check a drag of front disc brake. If any drag is found, follow the procedure described below.

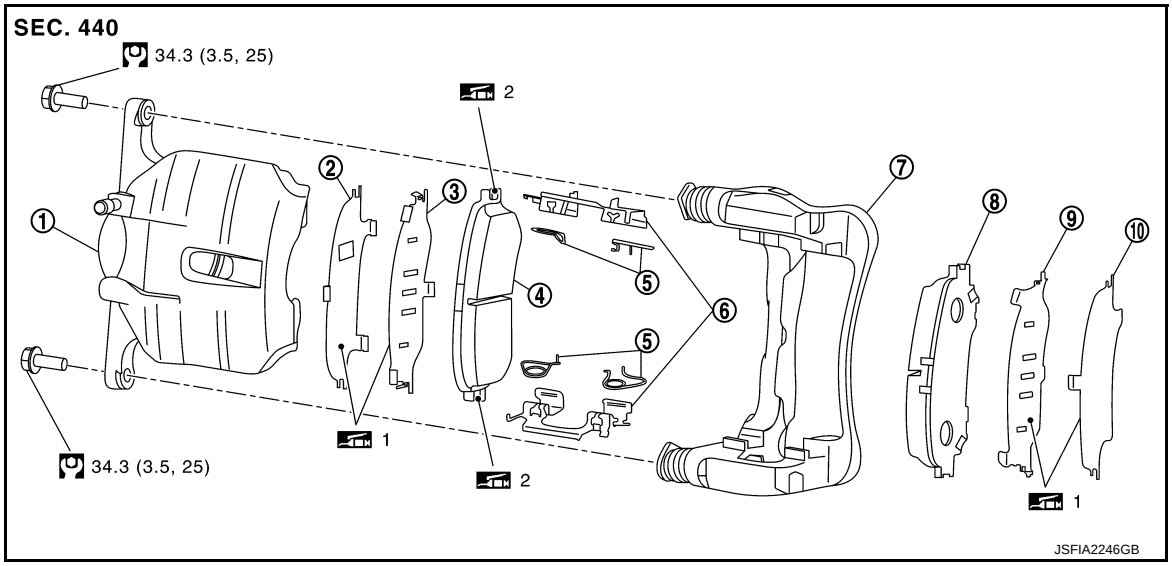
1. Remove brake pads. Refer to BR-43, "BRAKE PAD (1 PISTON TYPE) : Removal and Installation".
2. Press the pistons. Refer to BR-43, "BRAKE PAD (1 PISTON TYPE) : Removal and Installation".
3. Install brake pads. Refer to BR-43, "BRAKE PAD (1 PISTON TYPE) : Removal and Installation".
4. Depress the brake pedal several times.
5. Check a drag of front disc brake again. If any drag is found, disassemble the cylinder body and replace if necessary. Refer to BR-52, "BRAKE CALIPER ASSEMBLY (1 PISTON TYPE) : Disassembly and Assembly".

- 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-17, "BRAKE PAD : Inspection and Adjustment".

BRAKE PAD (2 PISTON TYPE)

BRAKE PAD (2 PISTON TYPE) : Exploded View

INFOID:0000000010838597



① Cylinder body ② Inner shim cover ③ Inner shim
④ Inner pad (with pad wear sensor) ⑤ Return spring ⑥ Pad retainer
⑦ Torque member ⑧ Outer pad ⑨ Outer shim
⑩ Outer shim cover

: 1: Apply MOLYKOTE® AS 880N or silicone-based grease.

: 2: Apply MOLYKOTE® 7439 or equivalent.

: N·m (kg-m, ft-lb)

Molykote is a registered trademark of Dow Corning Corporation.

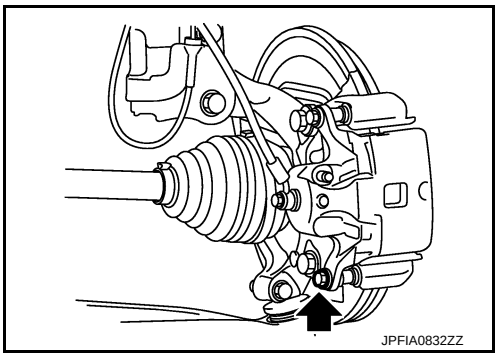
BRAKE PAD (2 PISTON TYPE) : Removal and Installation

INFOID:0000000010838598

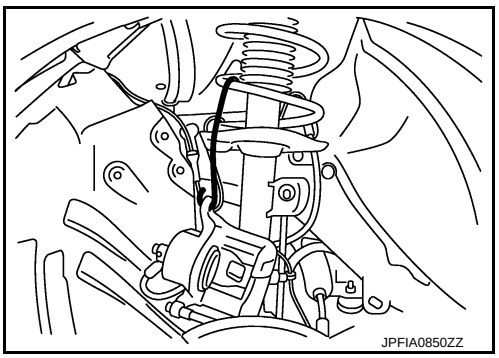
REMOVAL

WARNING:
Since dust covering the front and rear brakes has an affect on human body, the dust must be removed with a dust collector. Never splatter the dust with an air blow gun.
CAUTION:
- **Never 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.**

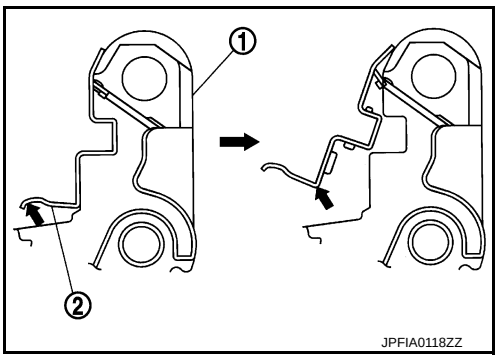
1. Remove tires with power tool.
2. Remove lower sliding pin bolt.


JPFIA0832ZZ

3. Suspend the cylinder body with suitable wire so that the brake hose will not stretch.


JPFIA0850ZZ

4. Remove the brake pads, shims, shim covers and pad retainer (as a set with pad return spring) ② from the torque member ①.
CAUTION:
- **Remove pad retainer together with pad return springs.**
- **Never deform the pad return springs and pad retainer when removing the pad retainer from the torque member.**
- **Never damage the piston boots.**
- **Never drop the brake pads, shims and shim covers.**
- **Remember each position of the removed brake pads.**



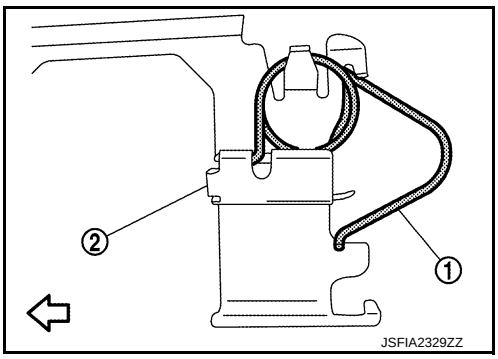
JPFIA0118ZZ

5. Remove the pad return springs ① from the pad retainer ②.

⇦ : Disc rotor side

CAUTION:
Never deform the pad return springs when removing the pad return springs from the pad retainer.

6. Perform inspection after removal. Refer to BR-49, "BRAKE PAD (2 PISTON TYPE) : Inspection".



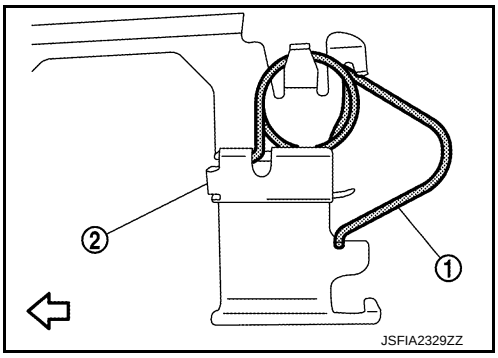
INSTALLATION

WARNING:
Since dust covering the front and rear brakes has an affect on human body, the dust must be removed with a dust collector. Never splatter the dust with an air blow gun.
CAUTION:
- **Never 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.**

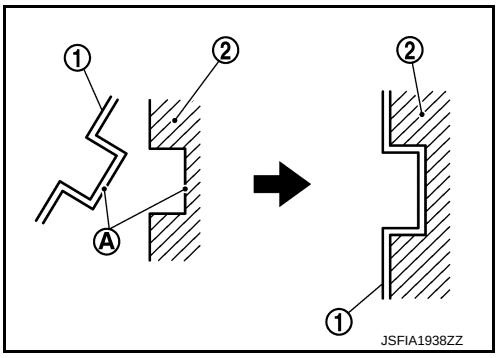
1. Install the pad return springs ① to pad retainer ② if the pad return springs has been removed.

⇦ : Disc rotor side

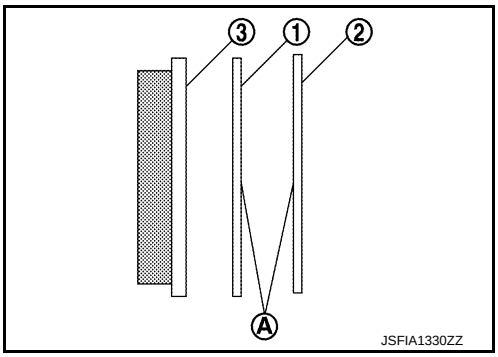
CAUTION:
Never deform the pad return springs.



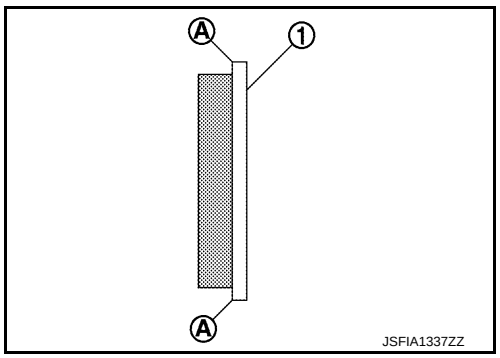
2. Apply MOLYKOTE® 7439 or equivalent to the match face Ⓐ between the pad retainers ① and torque member ② if the pad retainers has been removed.
Molykote is a registered trademark of Dow Corning Corporation.
3. Install the pad retainer (upper side with pad return spring) to torque member if the pad retainers has been removed.
CAUTION:
- **Securely assemble the pad retainers so that it will not be lifted up from the torque member.**
- **Never deform the pad retainers and pad return springs.**



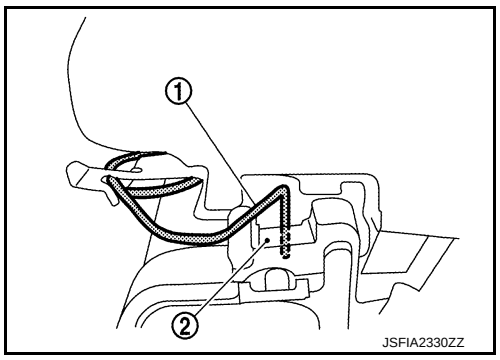
4. Apply MOLYKOTE® AS880N or silicone-based grease to the matching faces Ⓐ between the shim ① and the shim cover ②, and install the shim and the shim covers to the brake pad ③.
CAUTION:
Always replace the shims and shim covers when replacing the brake pad.
Molykote is a registered trademark of Dow Corning Corporation.



5. Apply MOLYKOTE® 7439 or equivalent to the match face Ⓐ between the brake pad ① and torque member ②.
Molykote is a registered trademark of Dow Corning Corporation.



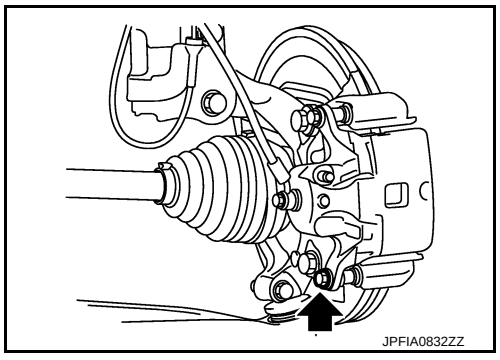
6. Install the brake pads to the torque member.
CAUTION:
Both inner and outer pads have a pad return system. Securely push the pad return spring ① into the disc rotor side of brake pad ②.



7. Install cylinder body to torque member.
CAUTION:
- **Never 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 reservoir tank when pressing piston in.**

NOTE:
Use a disc brake piston tool to easily press piston.

8. Install the lower sliding pin bolt and tighten it to the specified torque.



9. Depress the brake pedal several times to check that no drag feel is present for the front disc brake. Refer to BR-49, "BRAKE PAD (2 PISTON TYPE) : Inspection".
10. Install tires. Refer to WT-61, "Removal and Installation".

BRAKE PAD (2 PISTON TYPE) : Inspection

INFOID:0000000010838599

INSPECTION AFTER REMOVAL

- Replace the shims and shim covers if rust is excessively attached.
- Eliminate rust on the pad return spring, pad retainers and the torque member. Replace them if rust is excessively attached.

INSPECTION AFTER INSTALLATION

- Check a drag of front disc brake. If any drag is found, follow the procedure described below.

1. Remove brake pads. Refer to BR-47, "BRAKE PAD (2 PISTON TYPE) : Removal and Installation".
2. Press the pistons. Refer to BR-47, "BRAKE PAD (2 PISTON TYPE) : Removal and Installation".
3. Install brake pads. Refer to BR-47, "BRAKE PAD (2 PISTON TYPE) : Removal and Installation".
4. Depress the brake pedal several times.
5. Check a drag of front disc brake again. If any drag is found, disassemble the cylinder body and replace if necessary. Refer to BR-57, "BRAKE CALIPER ASSEMBLY (2 PISTON TYPE) : Disassembly and Assembly".

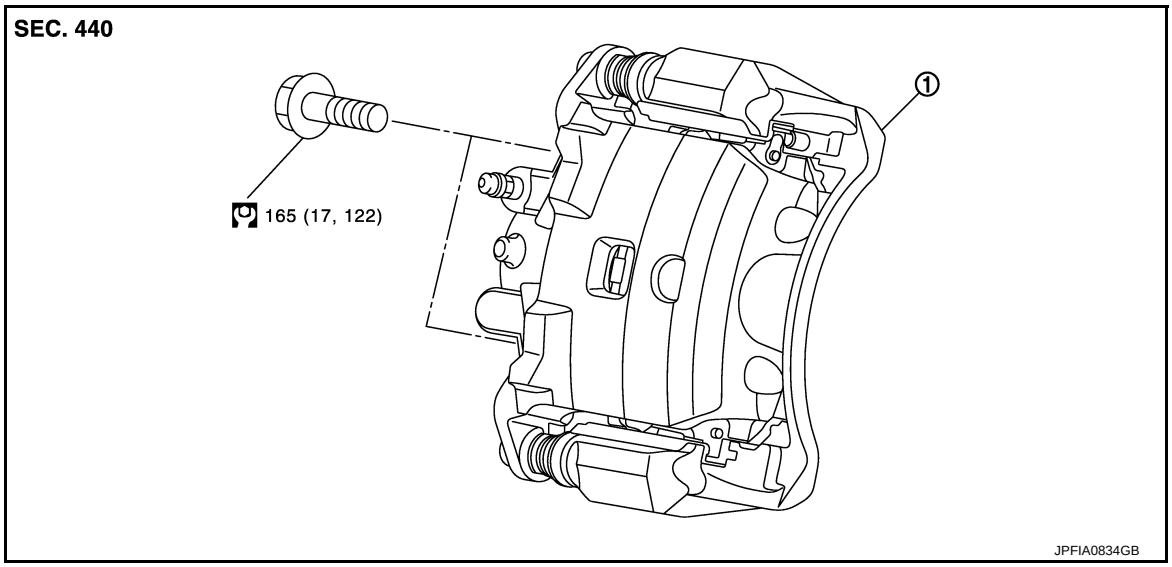
- Burnish contact surfaces brake pads and disc rotor after refinishing or replacing brake pads, or if a soft pedal occurs at very low mileage. Refer to BR-17, "BRAKE PAD : Inspection and Adjustment".

BRAKE CALIPER ASSEMBLY (1 PISTON TYPE)

BRAKE CALIPER ASSEMBLY (1 PISTON TYPE) : Exploded View

INFOID:0000000010838534

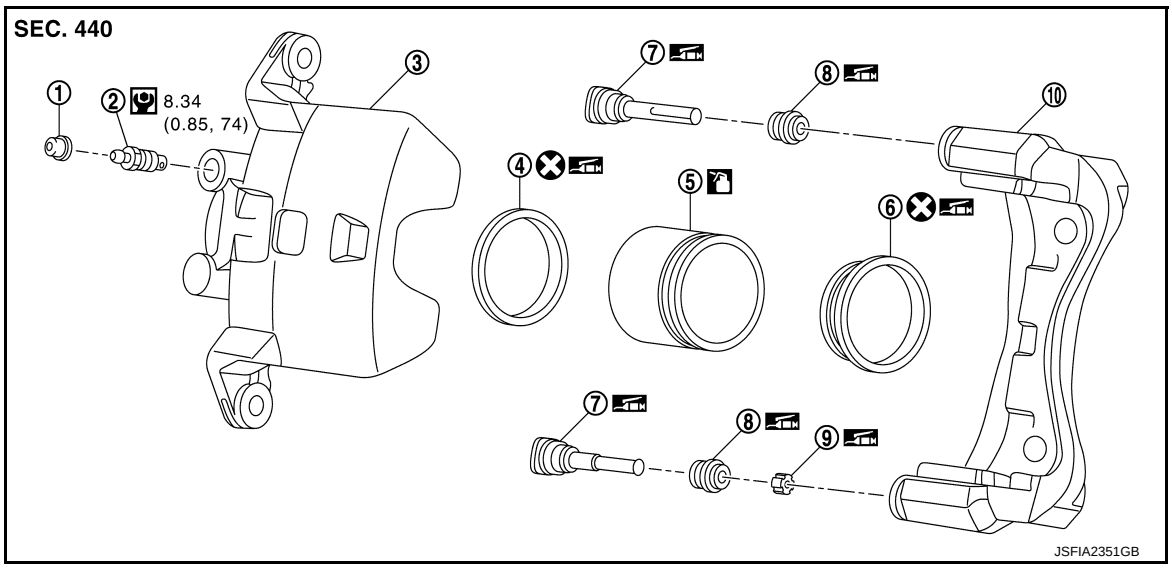
REMOVAL



① Brake caliper assembly

: N·m (kg-m, ft-lb)

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.
: N·m (kg-m, in-lb)
: Always replace after every disassembly.

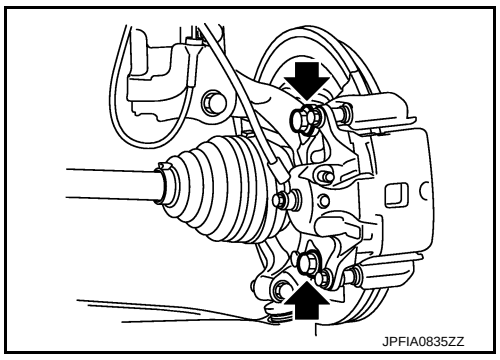
BRAKE CALIPER ASSEMBLY (1 PISTON TYPE) : Removal and Installation

INFOID:0000000010838535

REMOVAL

WARNING:
Since dust covering the front and rear brakes has an affect on human body, the dust must be removed with a dust collector. Never splatter the dust with an air blow gun.
CAUTION:
- **Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface. However avoid washing brake components with water.**
- **Never 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.**

1. Remove tires with power tool.
2. Fix the disc rotor using wheel nuts.
3. Drain brake fluid. Refer to BR-13, "Draining".
4. Remove union bolt and copper washer, and separate brake hose from brake caliper assembly. Refer to BR-25, "FRONT : Removal and Installation".
5. Remove torque member mounting bolts, and remove brake caliper assembly.
   CAUTION:
   Never drop brake pad and brake caliper assembly.
6. Remove disc rotor.
   - 2WD: Refer to FAX-11, "Removal and Installation".
   - 4WD: Refer to FAX-72, "Removal and Installation".

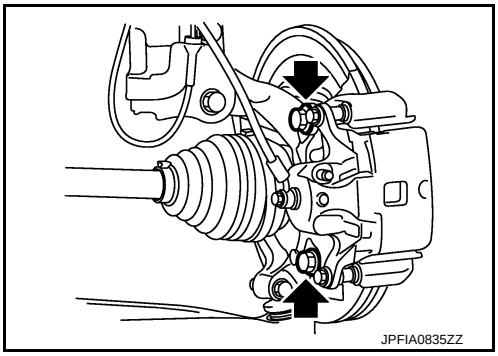

JPFIA0835ZZ

INSTALLATION

WARNING:
Since dust covering the front and rear brakes has an affect on human body, the dust must be removed with a dust collector. Never splatter the dust with an air blow gun.
CAUTION:
- **Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface. However avoid washing brake components with water.**
- **Never 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.**
- **Never allow foreign matter (e.g.dust) and oils other than brake fluid to enter the reservoir tank.**

1. Install disc rotor.
   - 2WD: Refer to FAX-11, "Removal and Installation".
   - 4WD: Refer to FAX-72, "Removal and Installation".

2. Install the brake caliper assembly to the steering knuckle and tighten the torque member mounting bolts to the specified torque.
CAUTION:
Never spill or splash any grease and moisture on the brake caliper assembly mounting face, threads, mounting bolts and washers. Wipe out any grease and moisture.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3. Install brake hose and copper washers to brake caliper assembly. Refer to BR-25, "FRONT : Removal and Installation".
CAUTION:
Never reuse copper washer.
4. Refill with new brake fluid and perform the air bleeding. Refer to BR-14, "Bleeding Brake System".
CAUTION:
- **Never reuse brake fluid.**
- **Never spill or splash brake fluid on the surface of disc rotor.**
5. Check a drag of front disc brake. If any drag is found, refer to BR-54, "BRAKE CALIPER ASSEMBLY (1 PISTON TYPE) : Inspection".
6. Install tires. Refer to WT-61, "Removal and Installation"
7. Perform inspection after installation. Refer to BR-54, "BRAKE CALIPER ASSEMBLY (1 PISTON TYPE) : Inspection".

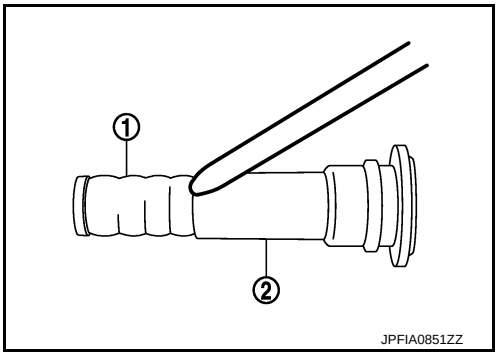
BRAKE CALIPER ASSEMBLY (1 PISTON TYPE) : Disassembly and Assembly

INFOID:0000000010838536

DISASSEMBLY

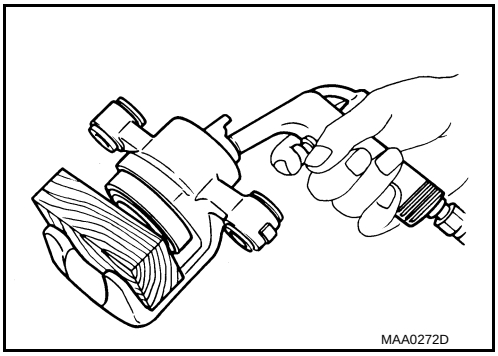
NOTE:
Never remove the torque member, brake pad and pad retainers when disassembling and assembling the cylinder body.

1. Remove the sliding pin bolt, and remove the cylinder body from the torque member. Refer to BR-43, "BRAKE PAD (1 PISTON TYPE) : Removal and Installation".
CAUTION:
Fix the brake pad at suitable tape so that the brake pad will not drop.
2. Remove sliding pins and sliding pin boots from torque member.
3. Remove bushing ① from sliding pin ②.



JPFIA0851ZZ

4. Place a wooden block as shown in the figure, and blow air from union bolt mounting hole to remove pistons and piston boots.
CAUTION:
Never get fingers caught in the pistons.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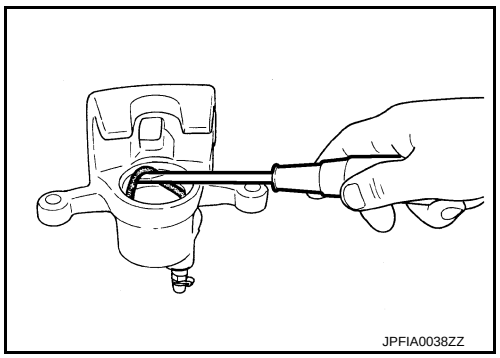
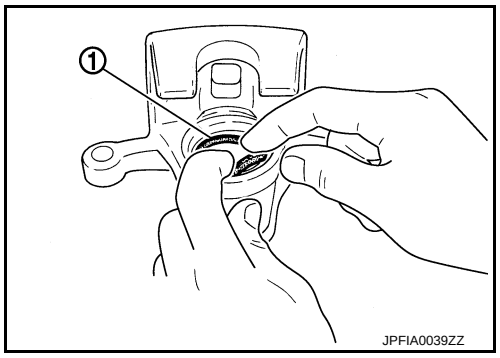
5. Remove piston seals from cylinder body using seal pick tool.
CAUTION:
Be careful not to damage a cylinder inner wall.
6. Remove bleeder valve and cap.
7. Perform inspection after disassembly. Refer to BR-54, "BRAKE CALIPER ASSEMBLY (1 PISTON TYPE) : Inspection".

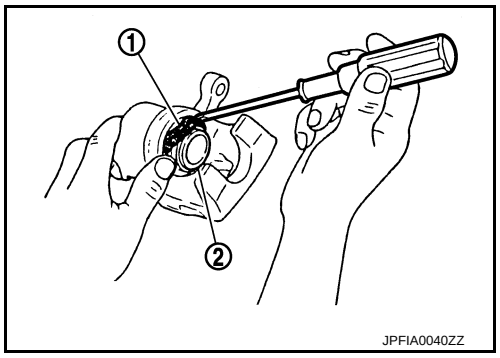


ASSEMBLY

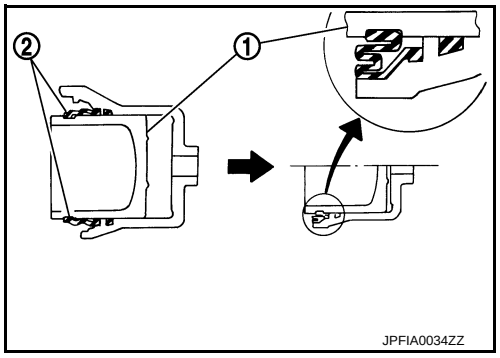
1. Install bleeder valve and cap.
2. Apply new brake fluid to piston seals ①, and install them to cylinder body.
CAUTION:
Never reuse piston seals.



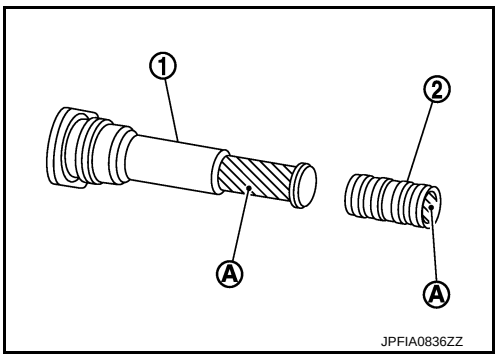
3. Apply rubber grease to piston boots ①. Cover the piston ② end with piston boot, and then install cylinder side lip on piston boot securely into a groove on cylinder body.
CAUTION:
Never reuse piston boots.



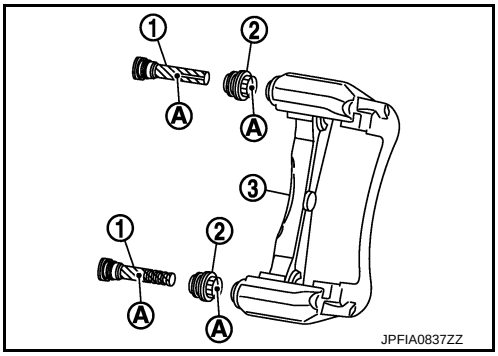
4. apply new brake fluid to pistons ①. Push piston into cylinder body by hand and push piston boot ② piston-side lip into the piston groove.
CAUTION:
Press the pistons evenly and vary the pressing point to prevent cylinder inner wall from being rubbed.



5. Apply rubber grease to mating faces Ⓐ between sliding pin ① and bushing ②, and install bushing to sliding pin.



6. Apply rubber grease to mating faces Ⓐ between sliding pins ① and sliding pin boots ②, and install sliding pins and sliding pin boots to torque member ③.
7. Install the cylinder body to tighten sliding pin bolts to the specified torque.



BRAKE CALIPER ASSEMBLY (1 PISTON TYPE) : Inspection

INFOID:0000000010838537

INSPECTION AFTER DISASSEMBLY

Check the following items and replace if necessary.

Cylinder Body

Check the cylinder inner wall for rust, wear, cracks or damage.

CAUTION:

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

Torque Member

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

Pistons

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

CAUTION:

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

Sliding Pin, Sliding Pin Boot and Bushing

Check the sliding pins, sliding pin boots and bushing for rust, wear, cracks or damage.

INSPECTION AFTER INSTALLATION

- Check a drag of front disc brake. If any drag is found, follow the procedure described below.

1. Remove brake pads. Refer to BR-43, "BRAKE PAD (1 PISTON TYPE) : Removal and Installation".
2. Press the pistons. Refer to BR-43, "BRAKE PAD (1 PISTON TYPE) : Removal and Installation".
3. Install brake pads. Refer to BR-43, "BRAKE PAD (1 PISTON TYPE) : Removal and Installation".
4. Depress the brake pedal several times.
5. Check a drag of front disc brake again. When any drag is found, disassemble the cylinder body and replace if necessary. Refer to BR-52, "BRAKE CALIPER ASSEMBLY (1 PISTON TYPE) : Disassembly and Assembly".

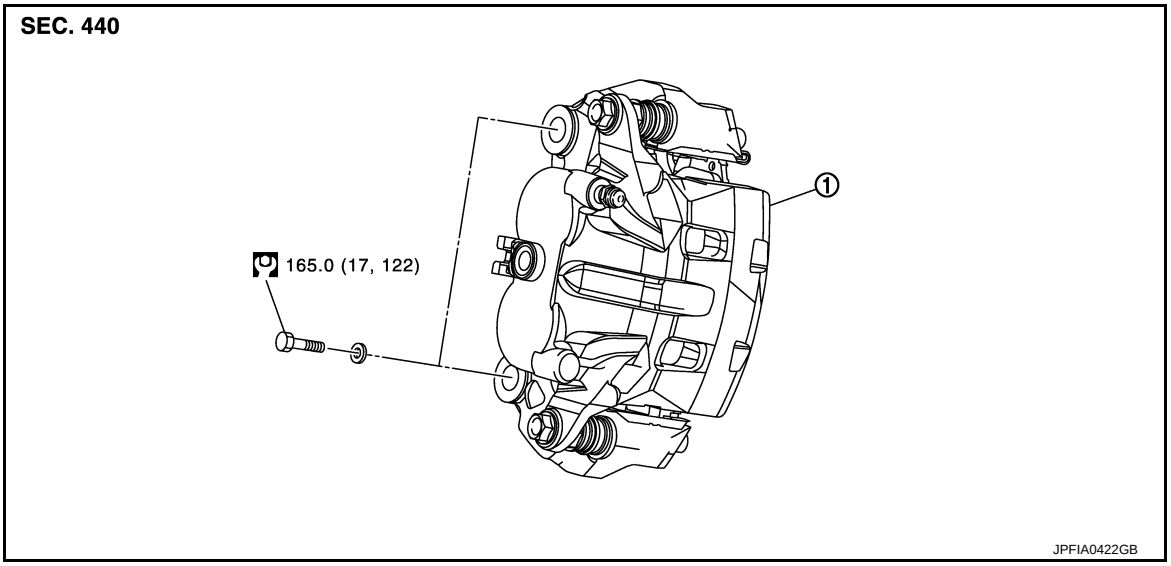
- Burnish contact surfaces brake pads and disc rotor after refinishing or replacing disc rotor, or if a soft pedal occurs at very low mileage. Refer to BR-17, "BRAKE PAD : Inspection and Adjustment".

BRAKE CALIPER ASSEMBLY (2 PISTON TYPE)

BRAKE CALIPER ASSEMBLY (2 PISTON TYPE) : Exploded View

INFOID:0000000010838604

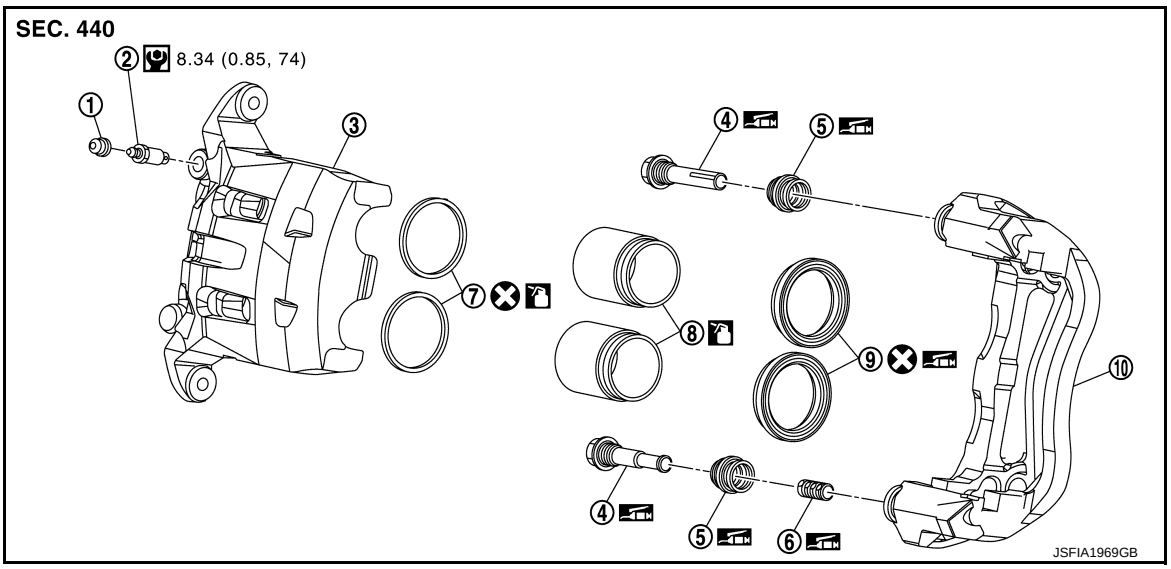
REMOVAL



① Brake caliper assembly

: N·m (kg-m, ft-lb)

DISASSEMBLY



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

: Apply rubber grease.

: Apply brake fluid.

: N·m (kg-m, in-lb)

: Always replace after every disassembly.

BRAKE CALIPER ASSEMBLY (2 PISTON TYPE) : Removal and Installation

INFOID:0000000010838605

REMOVAL

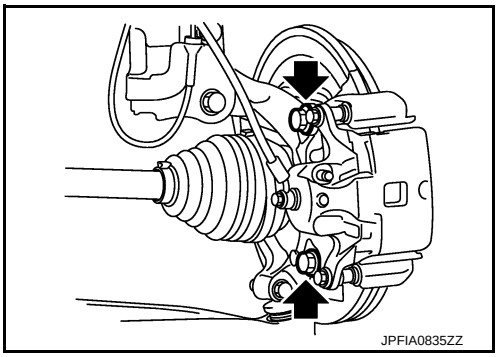
WARNING:

Since dust covering the front and rear brakes has an affect on human body, the dust must be removed with a dust collector. Never splatter the dust with an air blow gun.

CAUTION:

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

1. Remove tires with power tool.
2. Fix the disc rotor using wheel nuts.
3. Drain brake fluid. Refer to BR-13, "Draining".
4. Remove union bolt and copper washer, and separate brake hose from brake caliper assembly. Refer to BR-25, "FRONT : Removal and Installation".
5. Remove torque member mounting bolts, and remove brake caliper assembly.
   CAUTION:
   Never drop brake pad and brake caliper assembly.
6. Remove disc rotor.
   - 2WD: Refer to FAX-11, "Removal and Installation".
   - 4WD: Refer to FAX-72, "Removal and Installation".



INSTALLATION

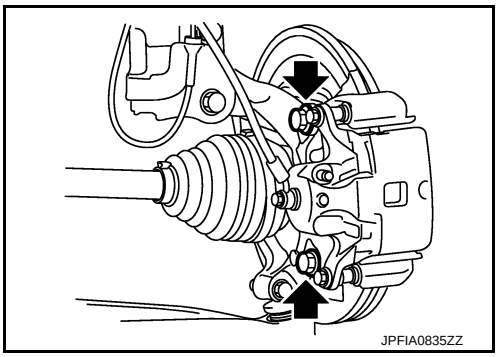
WARNING:

Since dust covering the front and rear brakes has an affect on human body, the dust must be removed with a dust collector. Never splatter the dust with an air blow gun.

CAUTION:

- **Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface. However avoid washing brake components with water.**
- **Never 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.**
- **Never allow foreign matter (e.g.dust) and oils other than brake fluid to enter the reservoir tank.**

1. Install disc rotor.
   - 2WD: Refer to FAX-11, "Removal and Installation".
   - 4WD: Refer to FAX-72, "Removal and Installation".
2. Install the brake caliper assembly to the steering knuckle and tighten the torque member mounting bolts to the specified torque.
   CAUTION:
   Never spill or splash any grease and moisture on the brake caliper assembly mounting face, threads, mounting bolts and washers. Wipe out any grease and moisture.
3. Install brake hose and copper washers to brake caliper assembly. Refer to BR-25, "FRONT : Removal and Installation".
   CAUTION:
   Never reuse copper washer.
4. Refill with new brake fluid and perform the air bleeding. Refer to BR-14, "Bleeding Brake System".
   CAUTION:



- **Never reuse brake fluid.**
- **Never spill or splash brake fluid on the surface of disc rotor.**

5. Check a drag of front disc brake. If any drag is found, refer to BR-59, "BRAKE CALIPER ASSEMBLY (2 PISTON TYPE) : Inspection".
6. Install tires. Refer to WT-61, "Removal and Installation"
7. Perform inspection after installation. Refer to BR-59, "BRAKE CALIPER ASSEMBLY (2 PISTON TYPE) : Inspection".

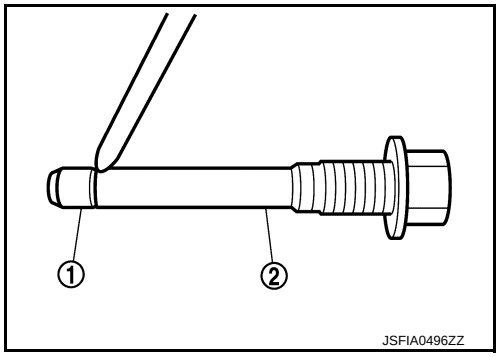
BRAKE CALIPER ASSEMBLY (2 PISTON TYPE) : Disassembly and Assembly

INFOID:0000000010838606

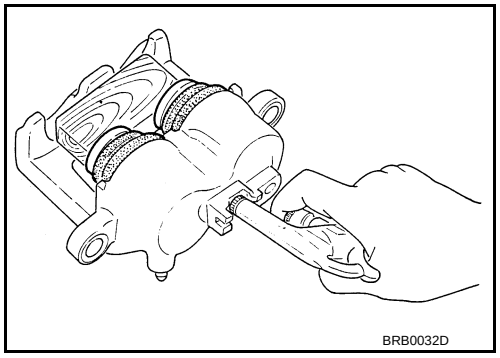
DISASSEMBLY

NOTE:
Never remove the torque member, brake pad and pad retainers when disassembling and assembling the cylinder body.

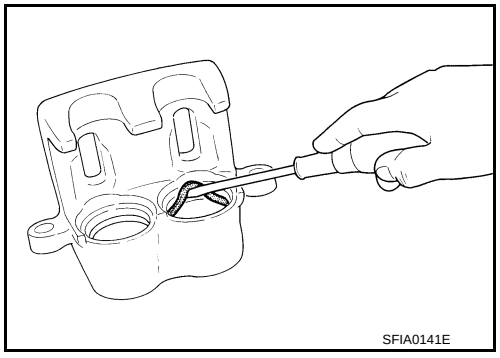
1. Remove the sliding pin bolt, and remove the cylinder body from the torque member. Refer to BR-47, "BRAKE PAD (2 PISTON TYPE) : Removal and Installation".
   CAUTION:
   Fix the brake pad at suitable tape so that the brake pad will not drop.
2. Remove sliding pins and sliding pin boots from torque member.
3. Remove bushing ① from sliding pin ②.



4. Place a wooden block as shown in the figure, and blow air from union bolt mounting hole to remove pistons and piston boots.
   CAUTION:
   Never get fingers caught in the pistons.



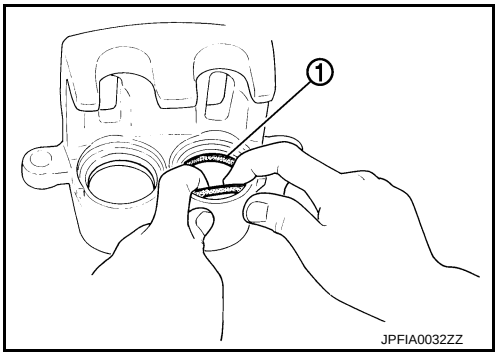
5. Remove piston seals from cylinder body using seal pick tool.
   CAUTION:
   Be careful not to damage a cylinder inner wall.
6. Remove bleeder valve and cap.
7. Perform inspection after disassembly. Refer to BR-59, "BRAKE CALIPER ASSEMBLY (2 PISTON TYPE) : Inspection".



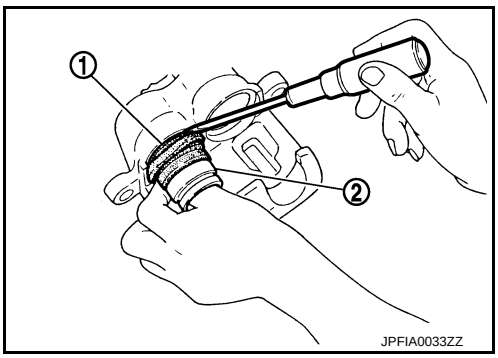
ASSEMBLY

1. Install bleeder valve and cap.

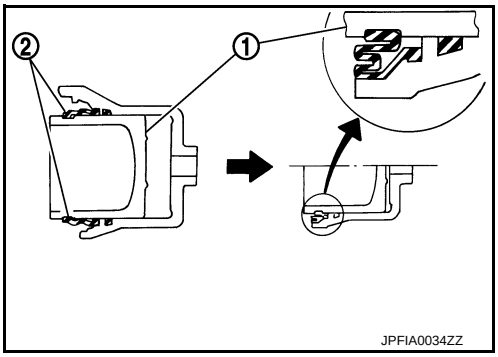
2. Apply new brake fluid to piston seals ①, and install them to cylinder body.
CAUTION:
Never reuse piston seals.



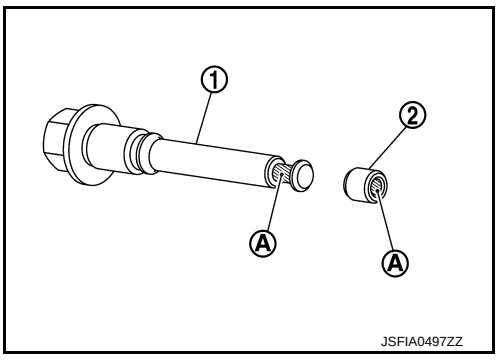
3. Apply rubber grease to piston boots ①. Cover the piston ② end with piston boot, and then install cylinder side lip on piston boot securely into a groove on cylinder body.
CAUTION:
Never reuse piston boots.



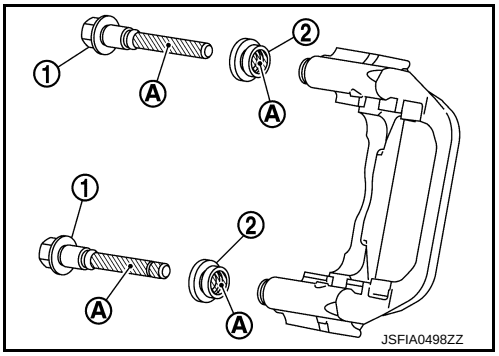
4. apply new brake fluid to pistons ①. Push piston into cylinder body by hand and push piston boot ② piston-side lip into the piston groove.
CAUTION:
Press the pistons evenly and vary the pressing point to prevent cylinder inner wall from being rubbed.



5. Apply rubber grease to mating faces Ⓐ between sliding pin ① and bushing ②, and install bushing to sliding pin.



6. Apply rubber grease to mating faces Ⓐ between sliding pins ① and sliding pin boots ②, and install sliding pins and sliding pin boots to torque member ③.
7. Install the cylinder body to tighten sliding pin bolts to the specified torque.



BRAKE CALIPER ASSEMBLY (2 PISTON TYPE) : Inspection

INFOID:0000000010838607

INSPECTION AFTER DISASSEMBLY

Check the following items and replace if necessary.

Cylinder Body

Check the cylinder inner wall for rust, wear, cracks or damage.

CAUTION:

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

Torque Member

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

Pistons

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

CAUTION:

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

Sliding Pin, Sliding Pin Boot and Bushing

Check the sliding pins, sliding pin boots and bushing for rust, wear, cracks or damage.

INSPECTION AFTER INSTALLATION

- Check a drag of front disc brake. If any drag is found, follow the procedure described below.

1. Remove brake pads. Refer to BR-47, "BRAKE PAD (2 PISTON TYPE) : Removal and Installation".
2. Press the pistons. Refer to BR-47, "BRAKE PAD (2 PISTON TYPE) : Removal and Installation".
3. Install brake pads. Refer to BR-47, "BRAKE PAD (2 PISTON TYPE) : Removal and Installation".
4. Depress the brake pedal several times.
5. Check a drag of front disc brake again. When any drag is found, disassemble the cylinder body and replace if necessary. Refer to BR-57, "BRAKE CALIPER ASSEMBLY (2 PISTON TYPE) : Disassembly and Assembly".

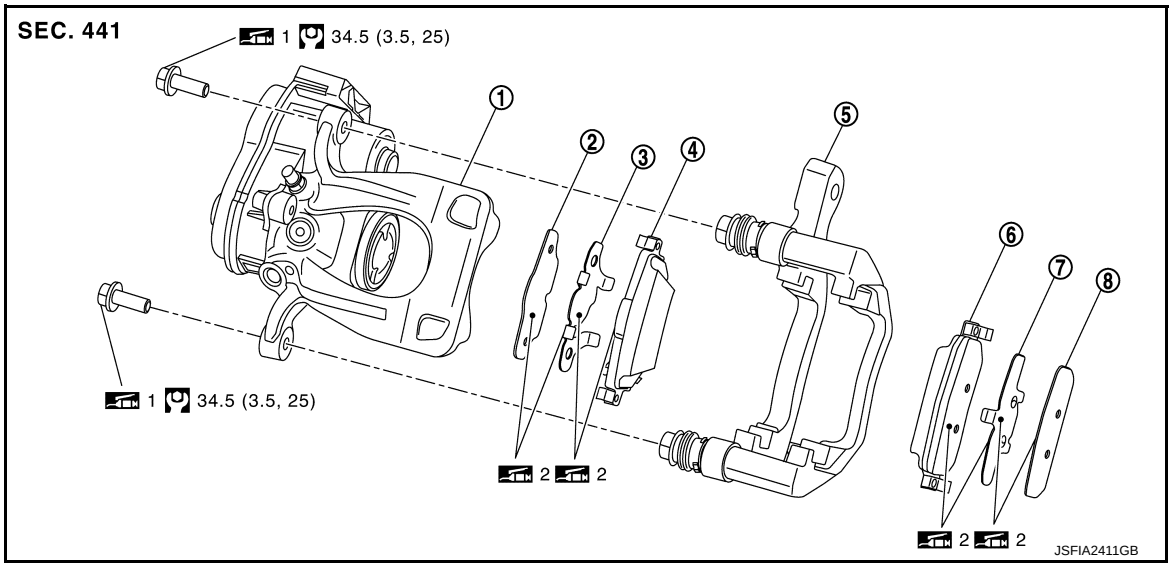
- Burnish contact surfaces brake pads and disc rotor after refinishing or replacing disc rotor, or if a soft pedal occurs at very low mileage. Refer to BR-17, "BRAKE PAD : Inspection and Adjustment".

REAR DISC BRAKE

BRAKE PAD

BRAKE PAD : Exploded View

INFOID:0000000010838611



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

1: Apply rubber grease.

2 : Apply MOLYKOTE® AS 880N or silicone-based grease.

: N·m (kg-m, ft-lb)

Molykote is a registered trademark of Dow Corning Corporation.

BRAKE PAD : Removal and Installation

INFOID:0000000010838612

REMOVAL

WARNING:

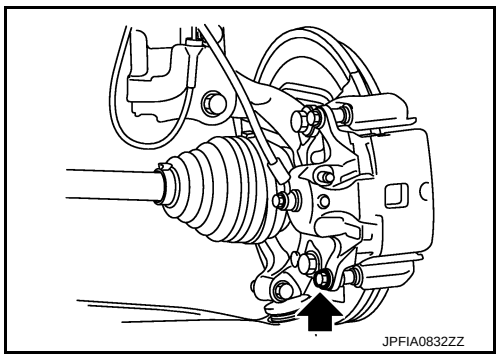
Since dust covering the front and rear brakes has an affect on human body, the dust must be removed with a dust collector. Never splatter the dust with an air blow gun.

CAUTION:

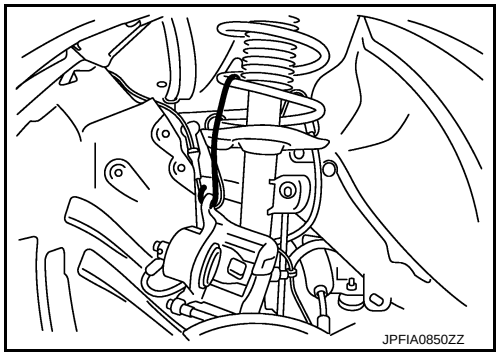
- **Never depress the brake pedal while removing the brake pads because the piston may pop out.**
- **If the brake fluid or grease adheres to the brake caliper assembly and disc rotor, quickly wipe it off.**

1. Release the parking brake.
2. Must be performed additional service when replacing brake pad. Refer to PB-52, "Work Procedure".
3. Remove tires.

4. Remove lower sliding pin bolt.


JPFIA0832ZZ

5. Suspend the cylinder body with suitable wire so that the brake hose and the electric parking brake harness will not stretch.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6. Remove the brake pads, shims and shim covers.

CAUTION:
- **Never damage the piston boots.**
- **Never drop the brake pads, shims and shim covers.**
- **Remember each position of the removed brake pads.**
- **Never damage the electric parking brake harness and bracket.**

7. Perform inspection after removal. Refer to BR-62, "BRAKE PAD : Inspection and Adjustment".

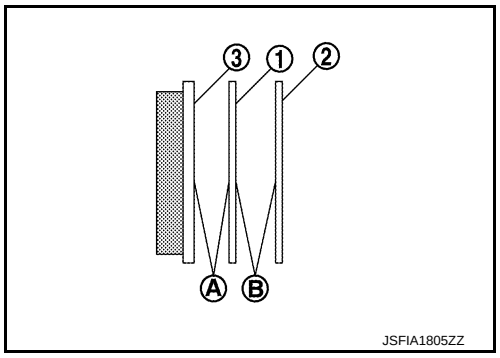
INSTALLATION

WARNING:
Since dust covering the front and rear brakes has an affect on human body, the dust must be removed with a dust collector. Never splatter the dust with an air blow gun.

CAUTION:
- **Never 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.**

1. Apply MOLYKOTE® AS880N or silicone-based grease to the mating faces Ⓐ between the shim ① and the pad ③, and the mating faces Ⓑ between the shim ① and the shim cover ②, and then install the shim and shim cover to the pad.

CAUTION:
Always replace the shims and shim covers when replacing the brake pad.
Molykote is a registered trademark of Dow Corning Corporation.



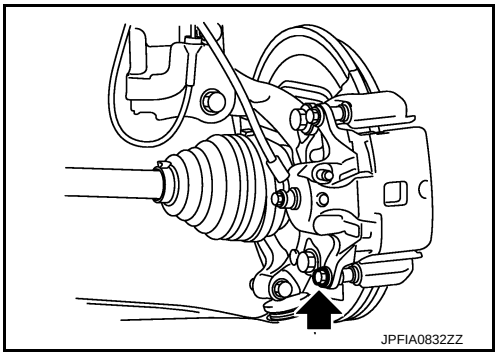
JSFIA1805ZZ

2. Install the brake pads to the torque member.
3. Apply rubber grease to the cylinder body mounting bolts, and then install the cylinder body to torque member.

CAUTION:

- **Never 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 reservoir tank when pressing piston in.**

4. Install the lower sliding pin bolt and tighten it to the specified torque.



5. Must be performed additional service when removing and installing/replacing brake pad.

When removing and installing brake pad
1. Perform “BRAKE OPERATION”. Refer to PB-61, "Work Procedure".
2. Perform “BRAKE RELEASE”. Refer to PB-63, "Work Procedure".

When replacing brake pad
- Refer to PB-52, "Work Procedure".

6. Depress the brake pedal several times to check that no drag feel is present for the front disc brake. Refer to BR-62, "BRAKE PAD : Inspection and Adjustment".
7. Install tires. Refer to WT-61, "Removal and Installation".

BRAKE PAD : Inspection and Adjustment

INFOID:0000000010838613

INSPECTION AFTER REMOVAL

- Replace the shims and shim covers if rust is excessively attached.
- Eliminate rust on the pad and the torque member. Replace them if rust is excessively attached.

INSPECTION AFTER INSTALLATION

- Check a drag of rear disc brake. If any drag is found, follow the procedure described below.

1. Remove brake pads. Refer to BR-60, "BRAKE PAD : Removal and Installation".
2. Press the pistons. Refer to BR-60, "BRAKE PAD : Removal and Installation".
3. Install brake pads. Refer to BR-60, "BRAKE PAD : Removal and Installation".
4. Depress the brake pedal several times.
5. Check a drag of rear disc brake again. If any drag is found, disassemble the cylinder body and replace if necessary. Refer to BR-65, "BRAKE CALIPER ASSEMBLY : Disassembly and Assembly".

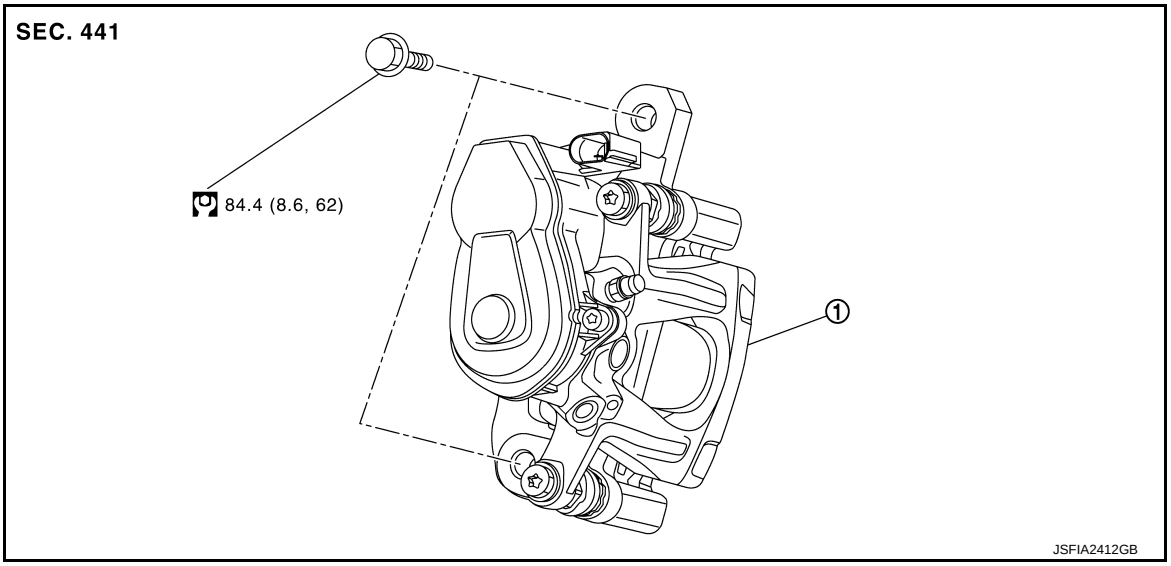
- Burnish contact surfaces brake pads and disc rotor after refinishing or replacing brake pads, or if a soft pedal occurs at very low mileage. Refer to BR-19, "BRAKE PAD : Inspection and Adjustment".

BRAKE CALIPER ASSEMBLY

BRAKE CALIPER ASSEMBLY : Exploded View

INFOID:0000000010838618

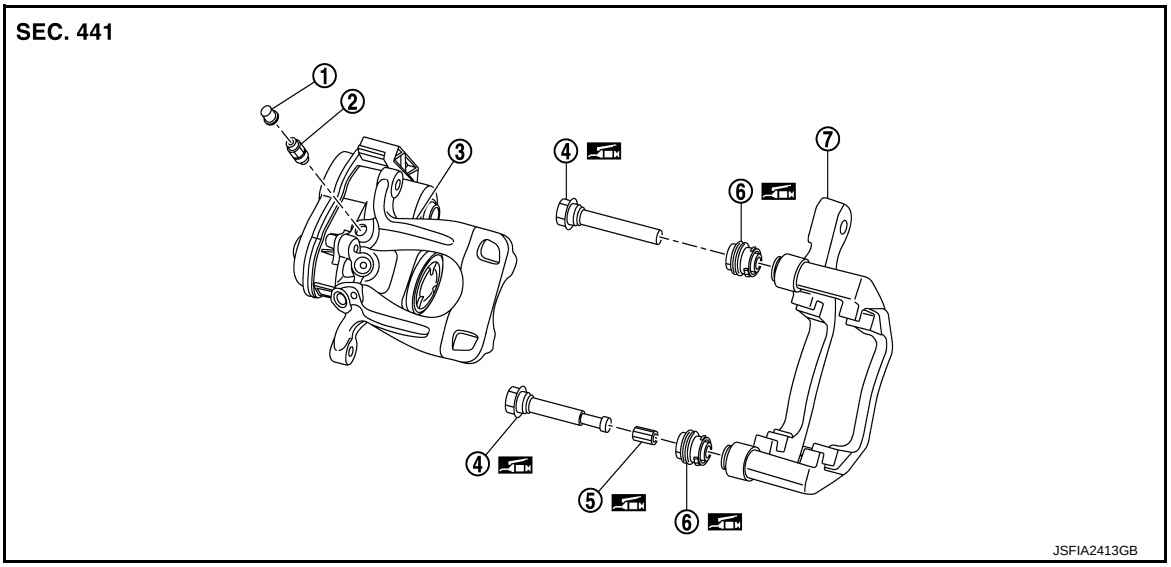
REMOVAL



① Brake caliper assembly

: N·m (kg-m, ft-lb)

DISASSEMBLY



① Cap
② Bleeder valve
③ Cylinder body
④ Sliding pin
⑤ Bushing
⑥ Bushing
⑦ Torque member

: Apply rubber grease.

BRAKE CALIPER ASSEMBLY : Removal and Installation

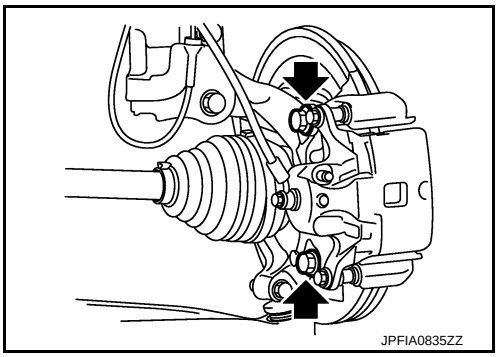
INFOID:0000000010838619

REMOVAL

WARNING:
Since dust covering the front and rear brakes has an affect on human body, the dust must be removed with a dust collector. Never splatter the dust with an air blow gun.
CAUTION:

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

1. Release the parking brake.
2. Must be performed additional service when replacing brake calipper. Refer to PB-55, "Work Procedure".
3. Remove tires.
4. Fix the disc rotor using wheel nuts.
5. Drain brake fluid. Refer to BR-13, "Draining".
6. Remove union bolt and copper washer, and separate brake hose from brake caliper assembly. Refer to BR-29, "REAR : Removal and Installation".
7. Remove torque member mounting bolts, and remove brake caliper assembly.
   CAUTION:
   - **Never drop brake pad and brake caliper assembly.**
   - **Never damage the electric parking brake harness and bracket.**
8. Remove disc rotor.
   - 2WD: Refer to RAX-7, "Removal and Installation".
   - 4WD: Refer to RAX-18, "Removal and Installation".

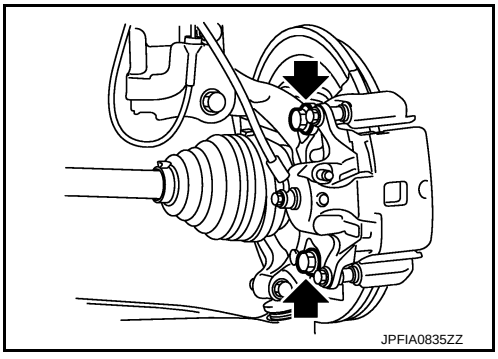


INSTALLATION

WARNING:
Since dust covering the front and rear brakes has an affect on human body, the dust must be removed with a dust collector. Never splatter the dust with an air blow gun.
CAUTION:

- **Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface. However avoid washing brake components with water.**
- **Never 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.**
- **Never allow foreign matter (e.g.dust) and oils other than brake fluid to enter the reservoir tank.**

1. Install disc rotor.
   - 2WD: Refer to RAX-7, "Removal and Installation".
   - 4WD: Refer to RAX-18, "Removal and Installation".
2. Install the brake caliper assembly to the steering knuckle and tighten the torque member mounting bolts to the specified torque.
   CAUTION:
   Never spill or splash any grease and moisture on the brake caliper assembly mounting face, threads, mounting bolts and washers. Wipe out any grease and moisture.
3. Install brake hose and copper washers to brake caliper assembly. Refer to BR-29, "REAR : Removal and Installation".
   CAUTION:
   Never reuse copper washer.



4. Must be performed additional service when removing and installing/replacing brake pad.

   When removing and installing brake pad
   1. Perform “BRAKE OPERATION”. Refer to PB-61, "Work Procedure".
   2. Perform “BRAKE RELEASE”. Refer to PB-63, "Work Procedure".

   When replacing brake pad
   - Refer to PB-52, "Work Procedure".
5. Refill with new brake fluid and perform the air bleeding. Refer to BR-14, "Bleeding Brake System".

CAUTION:
- **Never reuse brake fluid.**
- **Never spill or splash brake fluid on the surface of disc rotor.**

6. Check a drag of rear disc brake. If any drag is found, refer to BR-66, "BRAKE CALIPER ASSEMBLY : Inspection and Adjustment".
7. Install tires. Refer to WT-61, "Removal and Installation"
8. Perform inspection after installation. Refer to BR-66, "BRAKE CALIPER ASSEMBLY : Inspection and Adjustment".

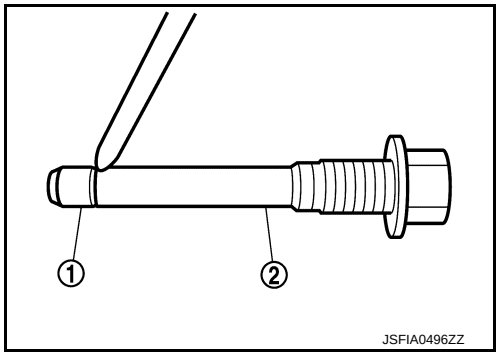
BRAKE CALIPER ASSEMBLY : Disassembly and Assembly

INFOID:0000000010838620

DISASSEMBLY

NOTE:
Never remove the torque member and brake pad when disassembling and assembling the cylinder body.

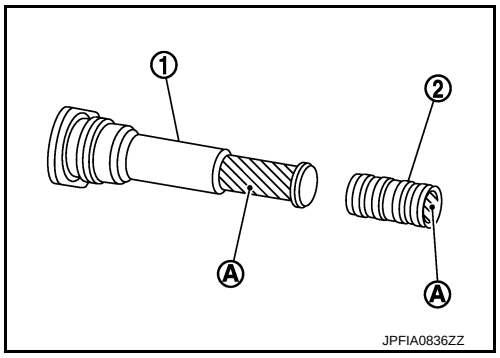
1. Remove the sliding pin bolt, and remove the cylinder body from the torque member. Refer to BR-60, "BRAKE PAD : Removal and Installation".
   CAUTION:
   Fix the brake pad at suitable tape so that the brake pad will not drop.
2. Remove sliding pins and sliding pin boots from torque member.
3. Remove bushing ① from sliding pin ②.



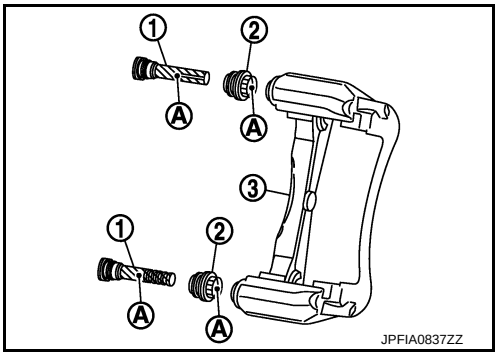
4. Remove bleeder valve and cap.
5. Perform inspection after disassembly. Refer to BR-66, "BRAKE CALIPER ASSEMBLY : Inspection and Adjustment".

ASSEMBLY

1. Install bleeder valve and cap.
2. Apply rubber grease to mating faces Ⓐ between sliding pin ① and bushing ②, and install bushing to sliding pin.



3. Apply rubber grease to mating faces Ⓐ between sliding pins ① and sliding pin boots ②, and install sliding pins and sliding pin boots to torque member ③.



4. Install the cylinder body to tighten cylinder body mounting bolts to the specified torque. Refer to BR-60, "BRAKE PAD : Exploded View".

BRAKE CALIPER ASSEMBLY : Inspection and Adjustment

INFOID:0000000010838621

INSPECTION AFTER DISASSEMBLY

Check the following items and replace if necessary.

Cylinder Body

Check the cylinder inner wall for rust, wear, cracks or damage.

CAUTION:

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

Torque Member

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

Sliding Pin, Sliding Pin Boot and Bushing

Check the sliding pins, sliding pin boots and bushing for rust, wear, cracks or damage.

INSPECTION AFTER INSTALLATION

- Check a drag of rear disc brake. If any drag is found, follow the procedure described below.

1. Remove brake pads. Refer to BR-60, "BRAKE PAD : Removal and Installation".
2. Press the pistons. Refer to BR-60, "BRAKE PAD : Removal and Installation".
3. Install brake pads. Refer to BR-60, "BRAKE PAD : Removal and Installation".
4. Depress the brake pedal several times.
5. Check a drag of rear disc brake again. When any drag is found, disassemble the cylinder body and replace if necessary. Refer to BR-65, "BRAKE CALIPER ASSEMBLY : Disassembly and Assembly".

- Burnish contact surfaces brake pads and disc rotor after refinishing or replacing disc rotor, or if a soft pedal occurs at very low mileage. Refer to BR-19, "BRAKE PAD : Inspection and Adjustment".

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

General Specifications

INFOID:0000000010838545

Unit: mm (in)

Front brake	Caliper type	1 piston type	2 piston type
	Cylinder bore diameter	60.33 (2.3752)	44.45 × 2 (1.7500 × 2)
	Pad length × width × thickness	123.6 × 47.5 × 10.5 (4.87 × 1.870 × 0.413)	133.6 × 48.5 × 10.0 (5.26 × 1.909 × 0.39)
	Rotor outer diameter × thickness	296 × 26.0 (11.65 × 1.024)	320 × 28.0 (12.60 × 1.102)
Rear brake	Cylinder bore diameter	38.2 (1.504)	
	Pad length × width × thickness	82.9 × 39.8 × 9.0 (3.263 × 1.567 × 0.354)	
	Rotor outer diameter × thickness	292 × 16.0 (11.50 × 0.630)	
Master cylinder	Cylinder bore diameter	23.81 (0.9374)	
Control valve	Valve type	Electric brake force distribution	
Brake booster	Diaphragm diameter	275 (10.83)	
Recommended brake fluid		Refer to MA-23, "Fluids and Lubricants".	

Brake Pedal

INFOID:0000000010838546

Unit: mm (in)

Item	Standard
Brake pedal height	175.9 – 185.9 (6.93 – 7.32)
Depressed brake pedal height [Depressing 490 N (50 kg, 110 lb) while turning the engine ON]	75.0 (2.95) or more
Clearance between stop lamp switch and brake pedal position switch (with ASCD) threaded end and the brake pedal lever	0.20 – 1.96 (0.0079 – 0.0772)
Brake pedal play	3 – 11 (0.12 – 0.43)

Brake Booster

INFOID:0000000010838547

Unit: mm (in)

Item	Standard
Input rod length	158.95 – 160.45 (6.26 –6.32)

Front Disc Brake

INFOID:0000000010838548

Unit: mm (in)

Item		Limit	
Brake caliper type		1 piston type	2 piston type
Brake pad	Wear thickness	2.0 (0.079)	2.0 (0.079)
Disc rotor	Wear thickness	24.0 (0.945)	26.0 (1.0236)
	Thickness variation (measured at 8 positions)	0.020 (0.0008)	0.020 (0.0008)
	Runout (with it attached to the vehicle)	0.035 (0.0014)	0.035 (0.0014)

Rear Disc Brake

INFOID:0000000010838549

Unit: mm (in)

Item		Limit
Brake pad	Wear thickness	2.0 (0.079)
Disc rotor	Wear thickness	14.0 (0.551)
	Thickness variation (measured at 8 positions)	0.020 (0.0008)
	Runout (with it attached to the vehicle)	0.070 (0.0028)

PRECAUTION

PRECAUTIONS

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

INFOID:0000000011022310

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. Information necessary to service the system safely is included in the “SRS AIR BAG” and “SEAT BELT” of this Service Manual.

WARNING:

Always observe the following items for preventing accidental activation.

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that 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 “SRS AIR BAG”.**
- **Never use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

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

WARNING:

Always observe the following items for preventing accidental activation.

- **When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, never use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.**
- **When using air or electric power tools or hammers, always switch the ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.**

Precaution Necessary for Steering Wheel Rotation After Battery Disconnect

INFOID:0000000011022309

CAUTION:

Comply with the following cautions to prevent any error and malfunction.

- **Before removing and installing any control units, first turn the ignition power source and accessory power source to the OFF, then disconnect both battery cables.**
- **After finishing work, confirm that all control unit connectors are connected properly, then re-connect both battery cables.**
- **Always use CONSULT to perform self-diagnosis as a part of each function inspection after finishing work. If a DTC is detected, perform trouble diagnosis according to self-diagnosis results.**

For vehicle with steering lock unit, if the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.

If turning the steering wheel is required with the battery disconnected or discharged, follow the operation procedure below before starting the repair operation.

OPERATION PROCEDURE

1. Connect both battery cables.
   NOTE:
   Supply power using jumper cables if battery is discharged.
2. Open driver door.
3. Turn the ignition switch to the ON position.
   (At this time, the steering lock will be released.)
4. Turn the ignition switch to OFF position with driver door open.
5. Wait for 3 minutes or longer with driver door open.
   NOTE:
   - Do not close driver door because the steering wheel locks when driver door is closed.

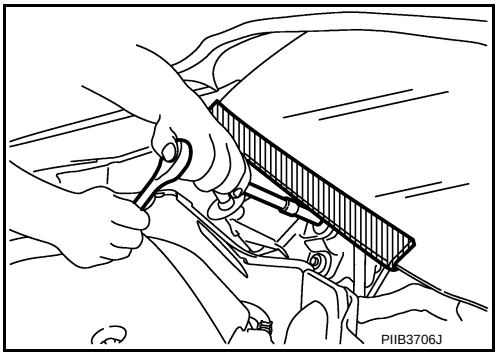
- The auto acc function is adapted to this vehicle. For this reason, even when the ignition switch is turned to OFF position, the accessory power source does not turned OFF and continues to be supplied for a certain amount of time.

6. Disconnect both battery cables. The steering lock will remain released with both battery cables disconnected and the steering wheel can be turned.
7. Perform the necessary repair operation.
8. When the repair work is completed, re-connect both battery cables. With the brake pedal released, turn the ignition switch from OFF position to ON position, then to LOCK position. (The steering wheel will lock when the ignition switch is turned to LOCK position.)
9. Perform self-diagnosis check of all control units using CONSULT.

Precaution for Procedure without Cowl Top Cover

INFOID:0000000011022308

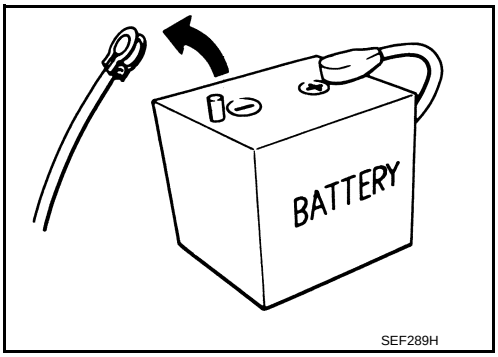
When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc to prevent damage to windshield.



Precautions for Removing Battery Terminal

INFOID:0000000011062270

- With the adoption of Auto ACC function, ACC power is automatically supplied by operating the intelligent key or remote keyless entry or by opening/closing the driver side door. In addition, ACC power is supplied even after the ignition switch is turned to the OFF position, i.e. ACC power is supplied for a certain fixed time.
- When disconnecting the 12V battery terminal, turn off the ACC power before disconnecting the 12V battery terminal, observing “How to disconnect 12V battery terminal” described below.
  NOTE:
  Some ECUs operate for a certain fixed time even after ignition switch is turned OFF and ignition power supply is stopped. If the battery terminal is disconnected before ECU stops, accidental DTC detection or ECU data damage may occur.
- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.
  NOTE:
  If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.
- After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.
  NOTE:
  The removal of 12V battery may cause a DTC detection error.



HOW TO DISCONNECT 12V BATTERY TERMINAL

Disconnect 12V battery terminal according to Instruction 1 or Instruction 2 described below.
For vehicles parked by ignition switch OFF, refer to Instruction 2.

INSTRUCTION 1

1. Open the hood.
2. Turn key switch to the OFF position with the driver side door opened.
3. Get out of the vehicle and close the driver side door.
4. Wait at least 3 minutes. For vehicle with the engine listed below, remove the battery terminal after a lapse of the specified time.

D4D engine	: 20 minutes
HRA2DDT	: 12 minutes

K9K engine : 4 minutes
M9R engine : 4 minutes
R9M engine : 4 minutes
V9X engine : 4 minutes

CAUTION:
While waiting, never operate the vehicle such as locking, opening, and closing doors. Violation of this caution results in the activation of ACC power supply according to the Auto ACC function.

5. Remove 12V battery terminal.
CAUTION:
After installing 12V battery, always check self-diagnosis results of all ECUs and erase DTC.

INSTRUCTION 2 (FOR VEHICLES PARKED BY IGNITION SWITCH OFF)

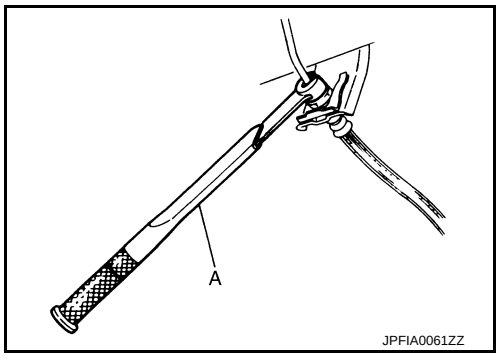
1. Unlock the door with intelligent key or remote keyless entry.
NOTE:
At this moment, ACC power is supplied.
2. Open the driver side door.
3. Open the hood.
4. Close the driver side door.
5. Wait at least 3 minutes.
CAUTION:
While waiting, never operate the vehicle such as locking, opening, and closing doors. Violation of this caution results in the activation of ACC power supply according to the Auto ACC function.
6. Remove 12V battery terminal.
CAUTION:
After installing 12V battery, always check self-diagnosis results of all ECUs and erase DTC.

Precaution for Brake System

INFOID:0000000010838554

WARNING:
Since dust covering the front and rear brakes has an affect on human body, the dust must be removed with a dust collector. Never splatter the dust with an air blow gun.

- Brake fluid use refer to MA-6, "General Maintenance".
- Never reuse drained brake fluid.
- Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface. For brake component parts, never wash them with water.
- 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.
- Always clean with new brake fluid when cleaning the master cylinder, brake caliper and other components.
- Never use mineral oils such as gasoline or light oil to clean. They may damage rubber parts and cause improper operation.
- Always loosen the brake tube flare nut with a flare nut wrench.
- Tighten the brake tube flare nut to the specified torque with a flare nut torque wrench (A).
- Turn the ignition switch OFF and disconnect the ABS actuator and electric unit (control unit) 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-81, "BRAKE PAD : Inspection and Adjustment".
  - Front disc rotor: Refer to BR-81, "DISC ROTOR : Inspection and Adjustment".
  - Rear brake pad: Refer to BR-83, "BRAKE PAD : Inspection and Adjustment".
  - Rear disc rotor: Refer to BR-83, "DISC ROTOR : Inspection and Adjustment".

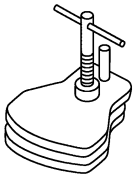
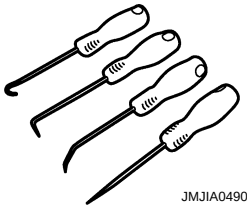


PREPARATION

PREPARATION

Commercial Service Tool

INFOID:0000000010838555

Tool name	Description
Handy vacuum pump  ZZC1313D	• Air tight • Inspection of check valve
Brake caliper wrench  NNFIA0040ZZ	Return the piston
Pick tool  JMJIA0490ZZ	Removing piston seal and piston boot

Lubricant or/and Sealant

INFOID:0000000010838556

Name	Description	Note
Multi-purpose grease	Clevis pin of brake pedal	—
Polyglycol ether based lubricant	• Master cylinder assembly	—
MOLYKOTE® AS880N or silicone-based grease	• Front brake	Molykote is a registered of Dow Corning Corporation
MOLYKOTE® 7439 or equivalent	• Front brake • Rear brake	Molykote is a registered of Dow Corning Corporation
Rubber grease	• Front brake • Rear brake	—

SYSTEM DESCRIPTION

SYSTEM

WARNING/INDICATOR/CHIME LIST

WARNING/INDICATOR/CHIME LIST : Warning Lamp/Indicator Lamp

INFOID:0000000010838557

Name	Design	Layout/Function
Brake warning lamp		For layout: Refer to MWI-10, "METER SYSTEM : Design". For function: Refer to MWI-26, "WARNING LAMPS/INDICATOR LAMPS : Brake Warning Lamp (Red)".

SYMPTOM DIAGNOSIS

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

INFOID:0000000010838558

Use the chart below to find the cause of the symptom. If necessary, repair or replace these 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	DRIVE SHAFT	STEERING
			Possible cause and SUSPECTED PARTS	BR-81, BR-83	BR-81, BR-83	BR-103, BR-107, BR-120	BR-81, BR-83	BR-81, BR-83	BR-81, BR-83	BR-81, BR-83	BR-81, BR-83	BR-81, BR-83	BR-81, BR-83	NVH in FAX, RAX and FSU, RSU section	NVH in WT section	NVH in WT section	NVH in FAX section	NVH in ST section
Symptom	BRAKE	Noise		×	×	×						×		×	×	×	×	×
		Shake					×							×	×	×	×	×
		Shimmy, Judder					×	×	×	×	×	×	×	×	×	×		×

×: Applicable

PERIODIC MAINTENANCE

BRAKE PEDAL

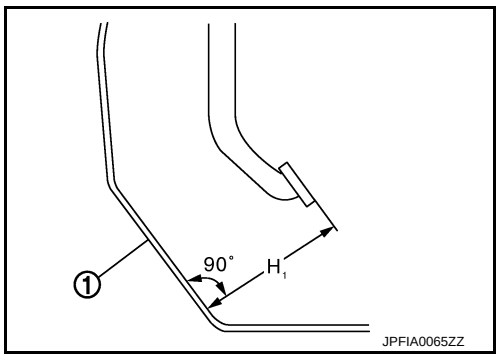
Inspection and Adjustment

INFOID:0000000010838559

INSPECTION

Brake Pedal Height

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

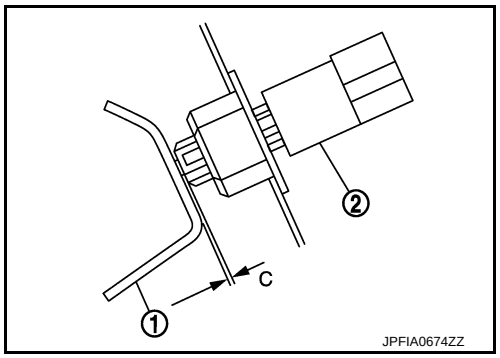


H_1 : Refer to BR-127, "Brake Pedal".

CAUTION:
Remove the floor carpet.

Stop Lamp Switch and Brake Pedal Position Switch (with ASCD).

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

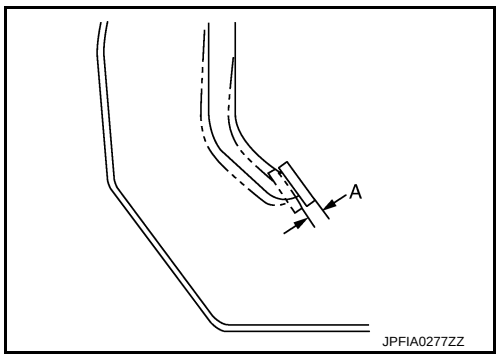


C : Refer to BR-127, "Brake Pedal".

CAUTION:
The stop lamp must turn off when the brake pedal is released.
NOTE:
Pull the brake pedal pad to make the clearance between the stop lamp switch and brake pedal position switch (with ASCD) threaded end and the brake pedal lever.

Brake Pedal Play

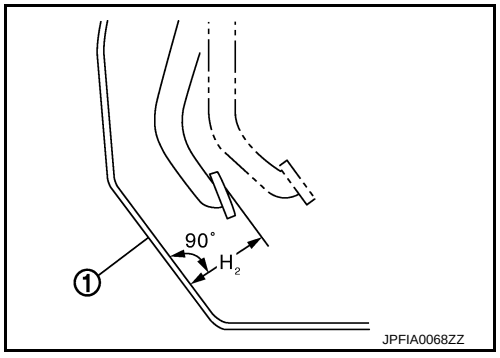
Press the brake pedal. Check the brake pedal play (A) (stroke until fluid pressure occurs).



A : Refer to BR-127, "Brake Pedal".

Depressed Brake Pedal Height

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



H_2 : Refer to BR-127, "Brake Pedal".

CAUTION:
Remove the floor carpet.

ADJUSTMENT

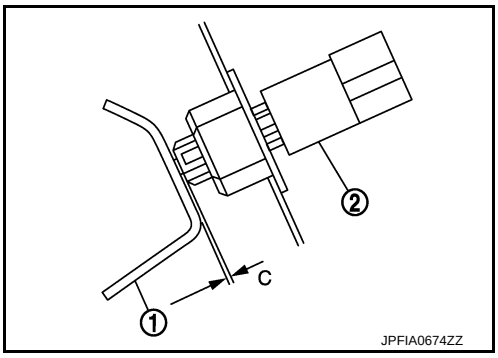
Brake Pedal Height

Perform the following procedure when brake pedal height is not within the specified value because brake pedal height is not adjustable.

1. Check input rod length. Refer to BR-99, "Removal and installation".
2. Replace brake pedal assembly when input rod length is within specified value.

Stop Lamp Switch and Brake Pedal Position Switch (with ASCD).

1. Remove instrument lower panel. Refer to IP-41, "Removal and Installation".
2. Disconnect the harness connector from stop lamp switch and brake pedal position switch (with ASCD).
3. Loosen the stop lamp switch and brake pedal position switch (with ASCD) 45° counterclockwise.
4. Press-fit the stop lamp switch and brake position switch (with ASCD) ② until the stop lamp switch and brake pedal position switch (with ASCD) hits the brake pedal bracket ① 45° clockwise while pulling the brake pedal pad slightly.



CAUTION:

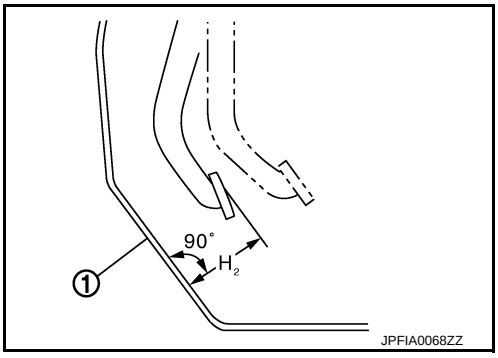
- **The clearance (C) between the brake pedal bracket and stop lamp switch and brake pedal position switch (with ASCD) threaded end must be the specified value.**

  C : Refer to BR-127, "Brake Pedal".

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

Depressed Brake Pedal Height

1. Perform the air bleeding. Refer to BR-78, "Bleeding Brake System".
2. Check the height between the dash lower panel ① and the brake pedal upper surface (H_2) when depressing the brake pedal at 490 N (50 kg, 110 lb) while turning engine ON.



H_2 : Refer to BR-127, "Brake Pedal".

CAUTION:

Remove the floor carpet.

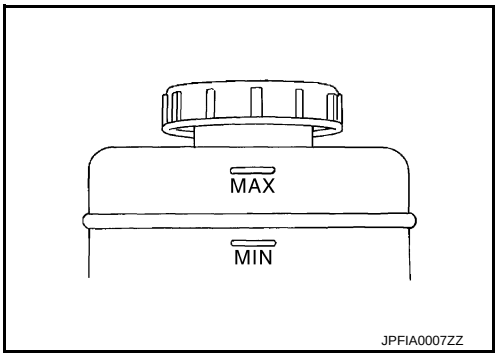
BRAKE FLUID

Inspection

INFOID:0000000010838560

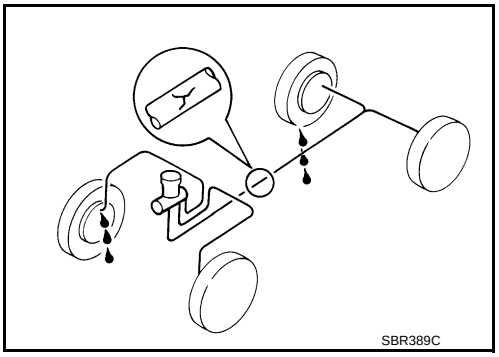
BRAKE FLUID LEVEL

- Check that the brake fluid level in the reservoir tank is within the standard (between MAX – MIN lines).
- Visually check for any brake fluid leakage around the reservoir tank.
- Check the brake system for any leakage if the fluid level is extremely low (lower than MIN).
- Check the brake system for fluid leakage if the warning lamp remains illuminated even after the parking brake is released.
- 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. Depress the brake pedal with a force of 785 N (80 kg, 176 lb) and hold down the pedal for approximately 5 seconds with the engine running. Check for any fluid leakage.
   CAUTION:
   Retighten the applicable connection to the specified torque and repair any abnormal (damaged, worn or deformed) part if any brake fluid leakage is present.

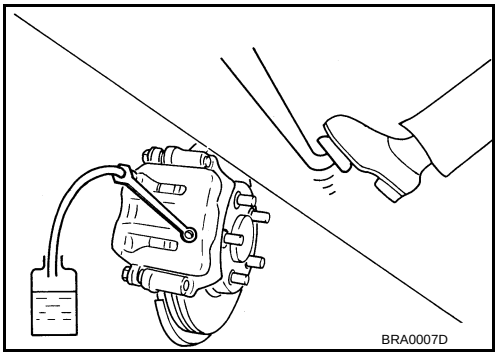


Draining

INFOID:0000000010838561

CAUTION:
- **Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface. For brake component parts, never wash them with water.**
- **Turn the ignition switch OFF and disconnect the ABS actuator and electric unit (control unit) harness connector or the 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.



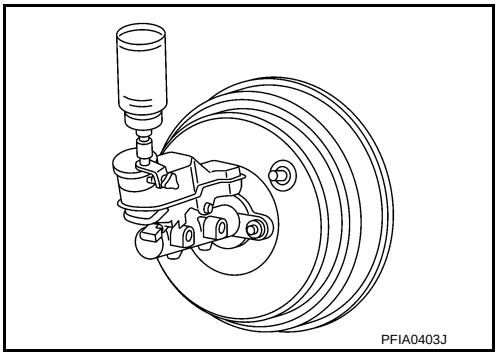
Refilling

INFOID:0000000010838562

CAUTION:
- **Turn the ignition switch OFF and disconnect the ABS actuator and electric unit (control unit) harness connector or the battery negative terminal before performing work.**

- **Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface. For brake component parts, never wash them with water.**

1. Check that there is no foreign material in the reservoir tank, and refill with new brake fluid.
   CAUTION:
   - **Never reuse drained brake fluid.**
   - **Never 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-78, "Bleeding Brake System".


PFIA0403J

Bleeding Brake System

INFOID:0000000010838563

CAUTION:
- **Turn the ignition switch OFF and disconnect the ABS actuator and electric unit (control unit) harness connector or the battery negative terminal before performing the work.**
- **Monitor the fluid level in the reservoir tank while performing the air bleeding**
- **Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface. For brake component parts, never wash them with water.**
- **Never allow foreign matter (e.r.dust) and oil other than brake fluid to enter the reservoir tank.**

1. Connect a vinyl tube to the bleeder valve of the rear left brake.
2. Fully depress the brake pedal 4 to 5 times.
3. Loosen the bleeder valve and bleed air with the brake pedal depressed, and then quickly tighten the bleeder valve.
4. Repeat steps 3 and 4 until all of the air is out of the brake line.
5. In case of rear brake caliper with electric parking brake system, operate parking brake 5 times to bleed the air.
6. Tighten the bleeder valve to the specified torque.
   - Front disc brake (1 piston type) : Refer to BR-110, "BRAKE CALIPER ASSEMBLY (1 PISTON TYPE) : Exploded View".
   - Front disc brake (2 piston type) : Refer to BR-115, "BRAKE CALIPER ASSEMBLY (2 PISTON TYPE) : Exploded View".
   - Rear disc brake: Refer to BR-122, "BRAKE CALIPER ASSEMBLY : Exploded View".
7. Perform steps 2 to 6. Occasionally fill with the brake fluid in order to keep it in 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.
8. Check that the fluid level in the reservoir tank is within the specified range after air bleeding. Refer to BR-77, "Inspection".
9. Check each item of brake pedal. Adjust it if the measurement value is not the standard. Refer to BR-75, "Inspection and Adjustment".

BRAKE MASTER CYLINDER

Inspection

INFOID:0000000010838564

FLUID LEAK

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

BRAKE BOOSTER

Inspection

INFOID:0000000010838565

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.

AIR TIGHT

1. Run the engine at idle for 1 minute to apply vacuum to the brake booster, and stop the engine.
2. 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.
3. 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

BRAKE PAD

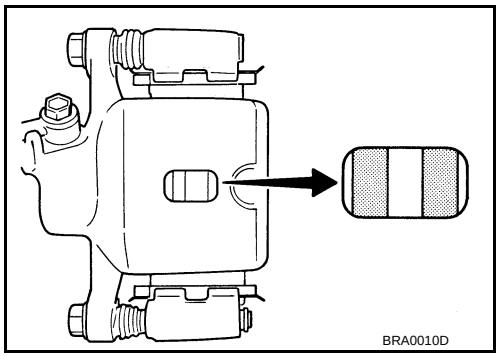
BRAKE PAD : Inspection and Adjustment

INFOID:0000000010838566

INSPECTION

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

Wear thickness : Refer to BR-127, "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:0000000010838567

INSPECTION

Appearance

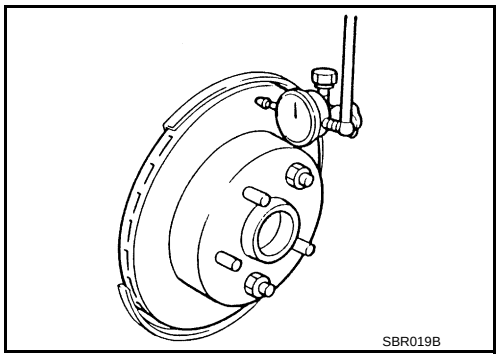
Check surface of disc rotor for uneven wear, cracks, and serious damage. Replace it if necessary.

- For 2WD, refer to FAX-11, "Removal and Installation".
- For 4WD, refer to FAX-72, "Removal and Installation".

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.
   - For 2WD, refer to FAX-16, "Inspection".
   - For 4WD, refer to FAX-77, "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-127, "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 the disc rotor if the runout is outside the limit even after performing the above operation.

CAUTION:

- **Check in advance that the thickness of the disc 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 rotor.**

- For 2WD, refer to FAX-11, "Removal and Installation".
- For 4WD, refer to FAX-72, "Removal and Installation".

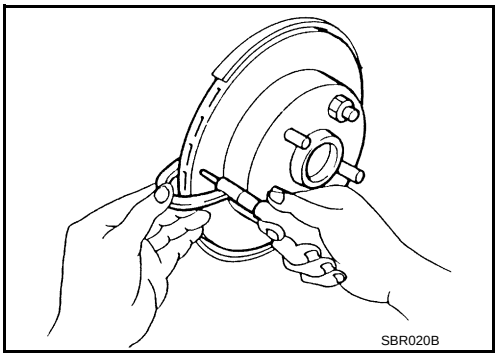
Wear thickness : Refer to BR-127, "Front Disc Brake".

Thickness

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

- For 2WD, refer to FAX-11, "Removal and Installation".
- For 4WD, refer to FAX-72, "Removal and Installation".

Wear thickness : Refer to BR-127, "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 DISC BRAKE

BRAKE PAD

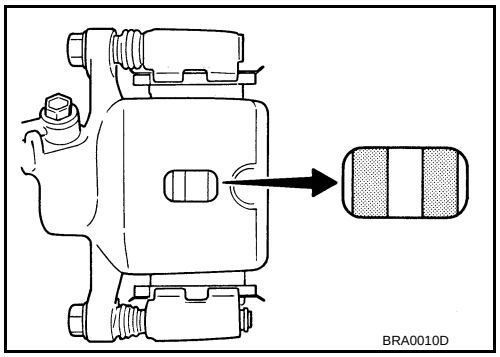
BRAKE PAD : Inspection and Adjustment

INFOID:0000000010838568

INSPECTION

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

Wear thickness : Refer to BR-128, "Rear 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:0000000010838569

INSPECTION

Appearance

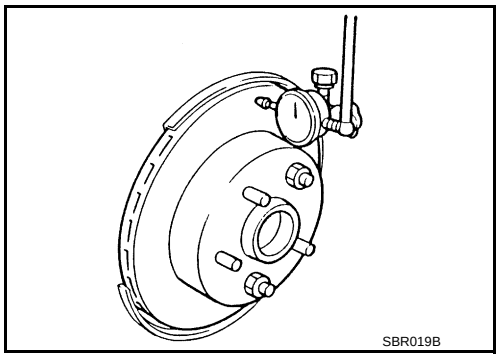
Check surface of disc rotor for uneven wear, cracks, and serious damage. Replace it if necessary.

- For 2WD, refer to RAX-7, "Removal and Installation".
- For 4WD, refer to RAX-18, "Removal and Installation".

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.
   - For 2WD, refer to RAX-9, "Inspection".
   - For 4WD, refer to RAX-21, "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-128, "Rear 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 the disc rotor if the runout is outside the limit even after performing the above operation.

CAUTION:

- **Check in advance that the thickness of the disc 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 rotor.**
  - **For 2WD, refer to RAX-7, "Removal and Installation".**
  - **For 4WD, refer to RAX-18, "Removal and Installation".**

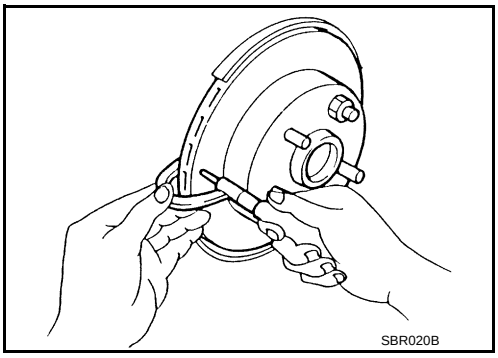
Wear thickness : Refer to BR-128, "Rear Disc Brake".

Thickness

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

- For 2WD, refer to RAX-7, "Removal and Installation".
- For 4WD, refer to RAX-18, "Removal and Installation".

Wear thickness : Refer to BR-128, "Rear 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.**

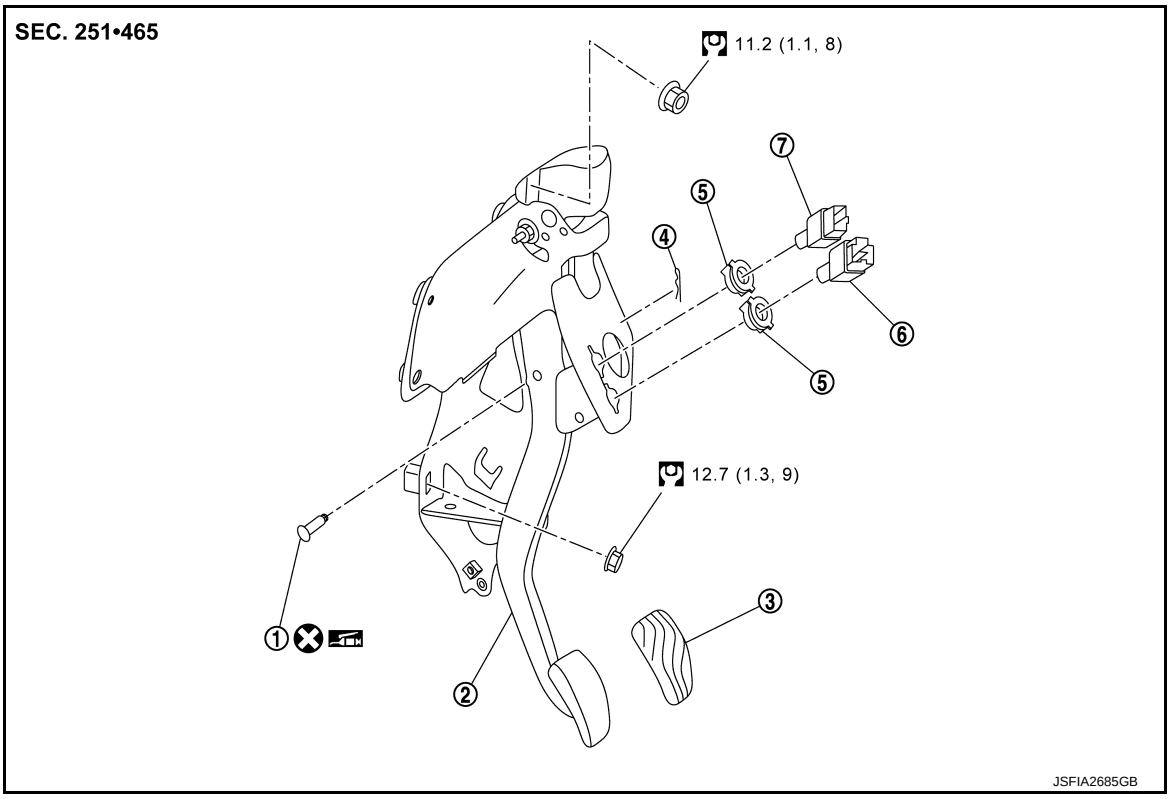
1. Drive vehicle on straight, flat road.
2. Depress brake pedal with the power to stop vehicle within 3 to 5 seconds until the vehicle stops.
3. Drive without depressing brake for a few minutes to cool the brake.
4. Repeat steps 1 to 3 until pad and disc rotor are securely fitted.

REMOVAL AND INSTALLATION

BRAKE PEDAL

Exploded View

INFOID:0000000010838570



① Clevis pin
② Brake pedal assembly
③ Brake pedal pad
④ Snap pin
⑤ Clip
⑥ Stop lamp switch
⑦ Brake pedal position switch (with AS-CD)

: Apply multi-purpose grease.

: N·m (kg-m, ft-lb)

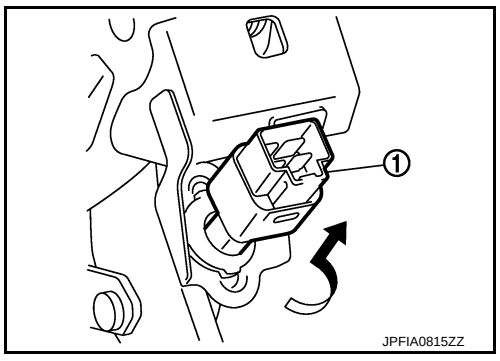
: Always replace after every disassembly.

Removal and Installation

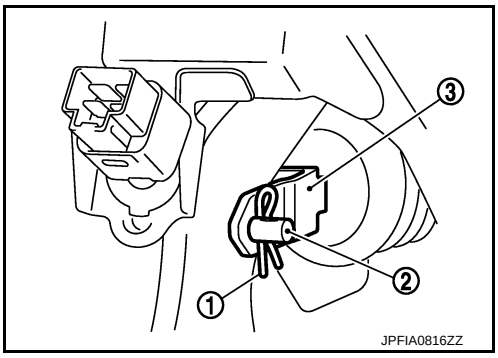
INFOID:0000000010838571

REMOVAL

1. Remove instrument lower panel. Refer to IP-41, "Removal and Installation".
2. Disconnect the stop lamp switch and the brake pedal position switch (with ASCD) harness connectors.
3. Rotate the stop lamp switch and the brake pedal switch (with ASCD) ① counterclockwise to remove.



4. Disconnect the accelerator pedal harness connector.
5. Remove snap pin ① and clevis pin ② from clevis of brake booster ③.



6. 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.
7. Remove the accelerator pedal from the brake pedal assembly. Refer to ACC-4, "Removal and Installation".
8. Perform inspection after removal. Refer to BR-86, "Inspection and Adjustment".

INSTALLATION

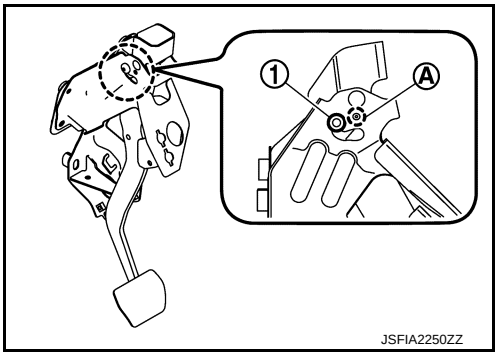
Note the following, and install in the reverse order of removal.
- Never reuse the clevis pin and snap pin.
- Apply the multi-purpose grease to the clevis pin and the mating faces. (Not necessary if grease has been already applied)
  NOTE:
  The clevis pin may be inserted in either direction.
- Never impact brake pedal such as drop and interference with tools and parts.
- Replace brake pedal when impacting brake pedal.
- Perform adjustment after installation. Refer to BR-86, "Inspection and Adjustment".

Inspection and Adjustment

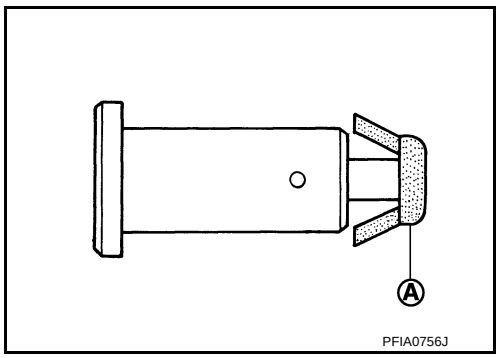
INFOID:0000000010838572

INSPECTION AFTER REMOVAL

Check for the following items and replace the brake pedal assembly if necessary.
- Check rivet Ⓐ for deformation, crack, and damage.
- Check the brake pedal for bend, damage, and cracks on the welded parts.
  CAUTION:
  Never loose bolt ①.



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



ADJUSTMENT AFTER INSTALLATION

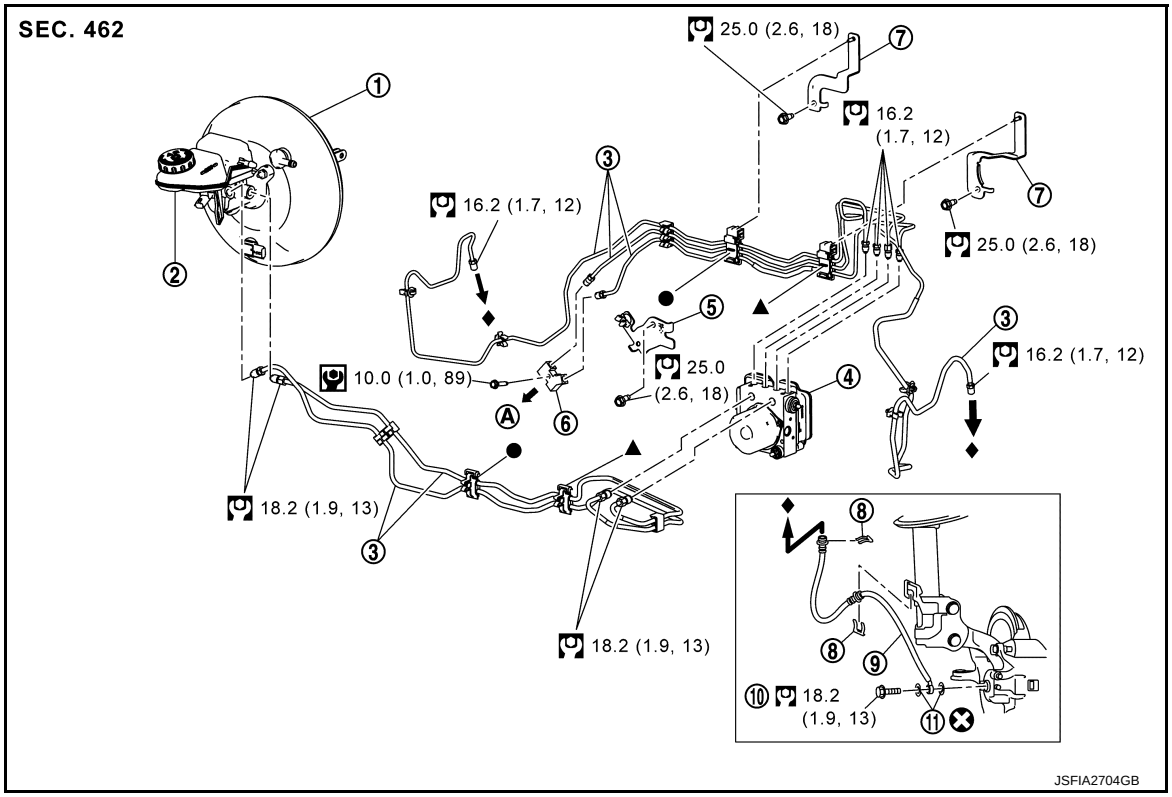
- Adjust each item of brake pedal after installing the brake pedal assembly to the vehicle. Refer to BR-75, "Inspection and Adjustment".
- Perform the release position learning of the accelerator pedal.Refer to EC-961, "Work Procedure".

BRAKE PIPING

FRONT

FRONT : Exploded View

INFOID:0000000010838573



① Brake booster	② Master cylinder assembly	③ Brake tube
④ ABS actuator and electric unit (control unit)	⑤ Connector bracket	⑥ Connector
⑦ Brake tube bracket	⑧ Lock plate	⑨ Brake hose
⑩ Union bolt	⑪ Copper washer	
Ⓐ To rear brake tube		

◆,●,▲: Indicates that the part is connected at points with same symbol in actual vehicle.

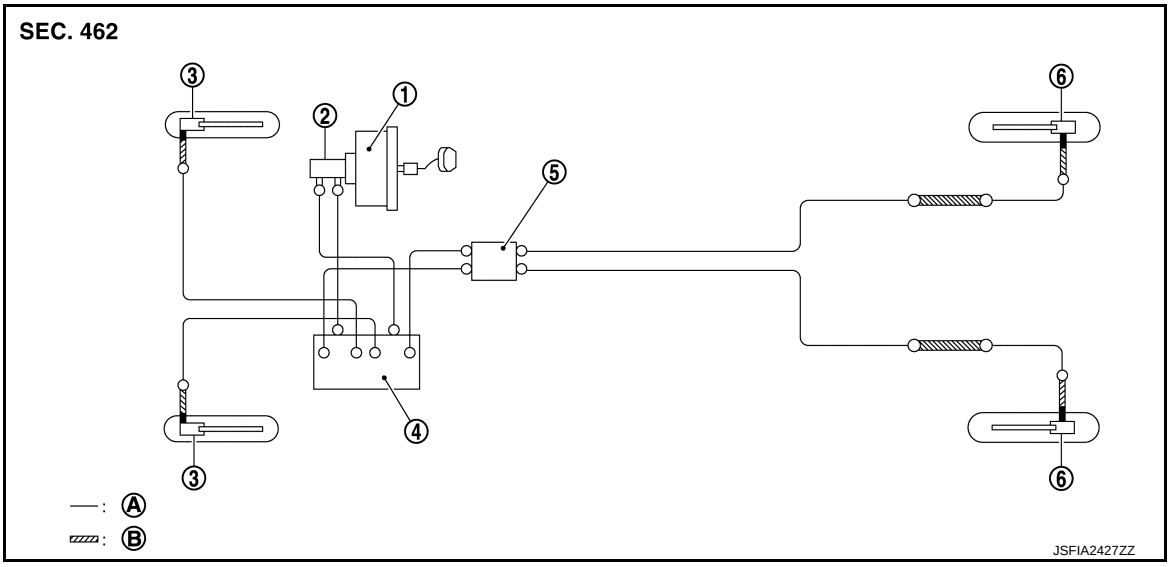
: N·m (kg-m, ft-lb)

: N·m (kg-m, in-lb)

: Always replace after every disassembly.

FRONT : Hydraulic Piping

INFOID:0000000010838574



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

◯: Flare nut

■: Union bolt

FRONT : Removal and Installation

INFOID:0000000010838575

REMOVAL

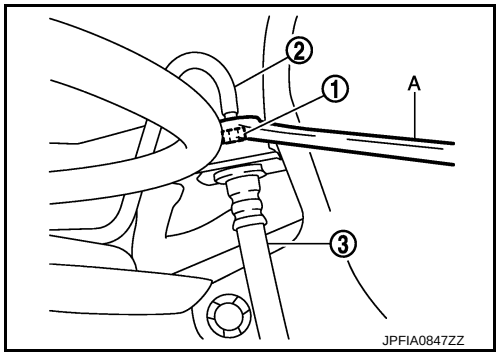
CAUTION:

- **Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface. For brake component parts, never wash them with water.**
- **Never depress the brake pedal while removing the brake hose or brake tube. If this is not complied with, brake fluid may splash.**

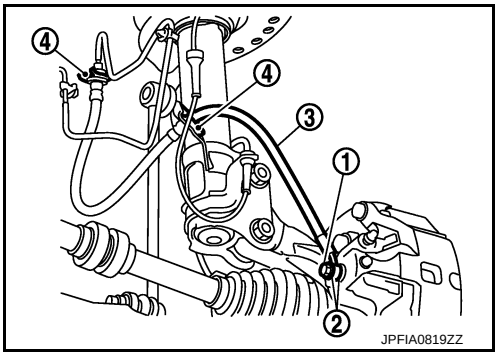
1. Remove tires. Refer to WT-61, "Removal and Installation".
2. Drain brake fluid. Refer to BR-77, "Draining".
3. Loosen the flare nut ① with a flare nut wrench (A) and separate the brake tube ② from the brake hose ③.

   CAUTION:

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



4. Remove the union bolt ① and copper washers ②, and remove the brake hose ③ from the brake caliper assembly.
5. Remove the lock plate ④ and remove the brake hose.

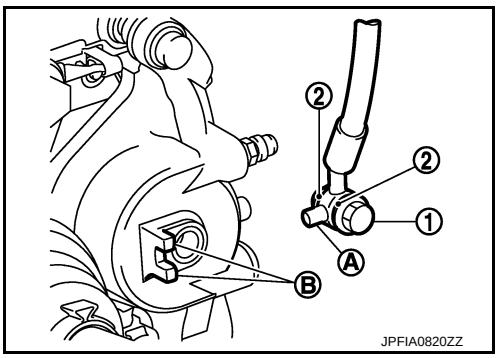


INSTALLATION

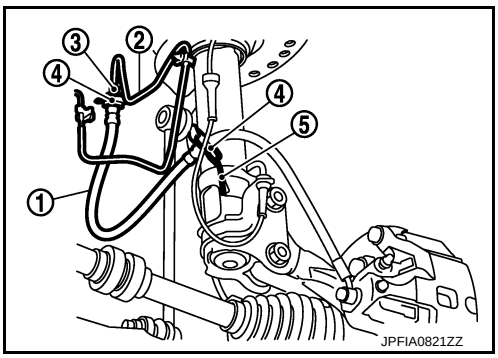
CAUTION:

- **Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface. For brake component parts, never wash them with water.**
- **Never depress the brake pedal while removing the brake hose or brake tube. If this is not complied with, brake fluid may splash.**
- **Never allow foreign matter (e.g. dust) and oils other than brake fluid to enter the reservoir tank.**

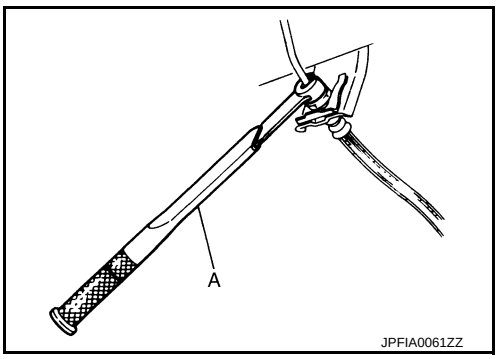
1. Assemble the union bolt ① and the copper washer ② to the brake hose.
   CAUTION:
   Never reuse the copper washer.
2. Align the brake hose pin Ⓐ with the brake caliper assembly projection Ⓑ, and tighten the union bolt to the specified torque.



3. Install the brake tube ② to the brake hose ①, temporarily tighten the flare nut ③ by hand until it does not rotate further, and fix the brake hose to the bracket ⑤ with the lock plate ④.
   CAUTION:
   Check that all brake hoses and brake tubes are not twisted and bent.



4. Tighten the flare nut to the specified torque with a flare nut torque wrench (A).
   CAUTION:
   Never scratch the flare nut and the brake tube.
5. Refill with new brake fluid and perform the air bleeding. Refer to BR-77, "Refilling".
   CAUTION:
   Never reuse drained brake fluid.
6. Install tires. Refer to WT-61, "Removal and Installation".
7. Perform inspection after installation. Refer to BR-91, "FRONT : Inspection".



FRONT : Inspection

INFOID:0000000010838576

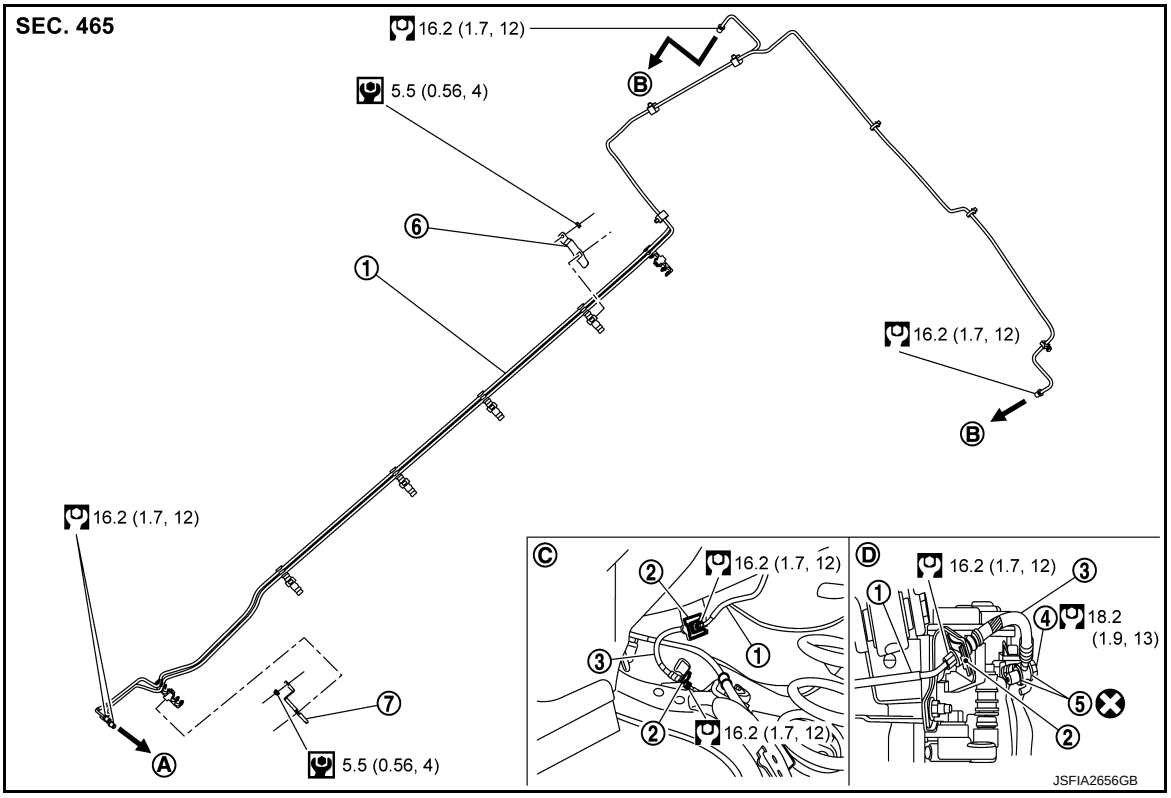
INSPECTION AFTER INSTALLATION

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 quantity to specified. Spare tire, jack, hand tools and mats are brought out of vehicle.**
2. Depress the brake pedal with a force of 785 N (80 kg, 176 lb) and hold down the pedal for approximately 5 seconds with the engine running. Check for any fluid leakage.
   CAUTION:
   Retighten the applicable connection to the specified torque and repair any abnormal (damaged, worn or deformed) part if any brake fluid leakage is present.

REAR

REAR : Exploded View

INFOID:0000000010838577



① Brake tube	② Lock plate	③ Brake hose
④ Union bolt	⑤ Copper washer	⑥ Brake tube bracket
⑦ Brake tube bracket		
Ⓐ To connector	Ⓑ To rear brake hose	Ⓒ Floor side
Ⓓ Caliper side		

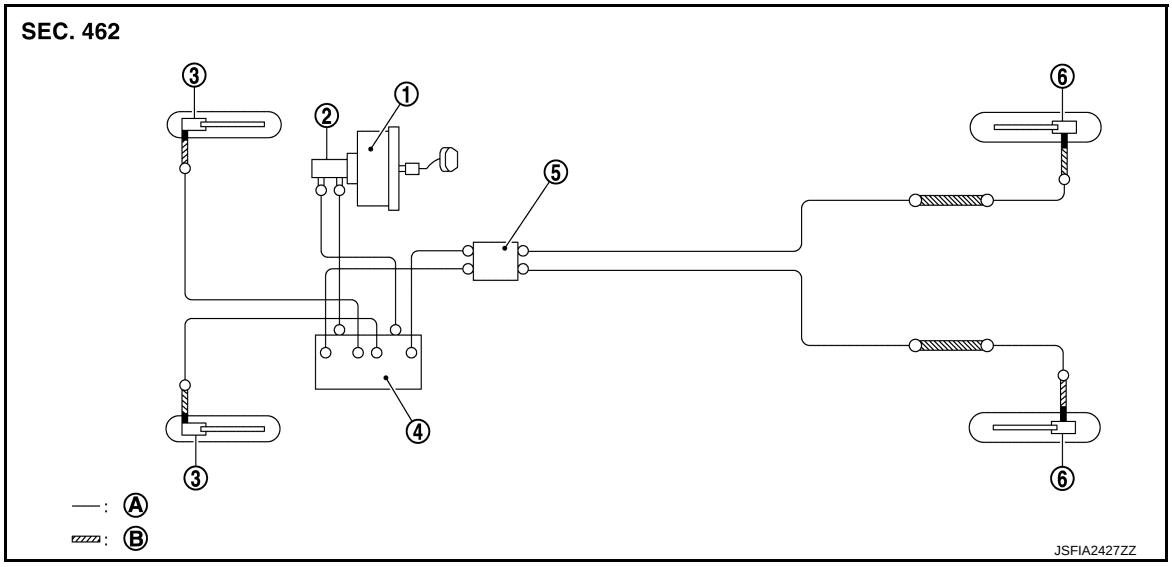
: N·m (kg-m, ft-lb)

: N·m (kg-m, in-lb)

: Always replace after every disassembly.

REAR : Hydraulic Piping

INFOID:0000000010838578



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

◯: Flare nut

■: Union bolt

REAR : Removal and Installation

INFOID:0000000010838579

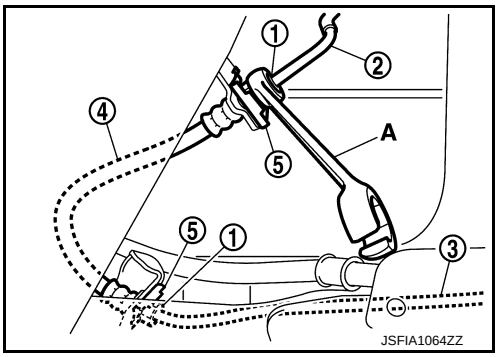
REMOVAL

CAUTION:

- **Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface. For brake component parts, never wash them with water.**
- **Never depress the brake pedal while removing the brake hose or brake tube. If this is not complied with, brake fluid may splash.**
- **Wipe off immediately when attaching brake fluid with disc rotor and caliper assembly.**

1. Remove tires. Refer to WT-61, "Removal and Installation".
2. Drain brake fluid. Refer to BR-77, "Draining".
3. Loosen the flare nut ① with a flare nut wrench (A) and separate the brake tube ② from the hose ③.

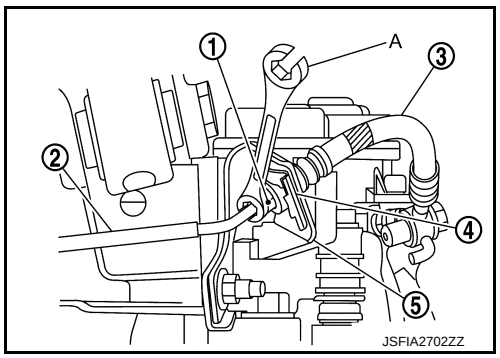
   CAUTION:
   - **Never scratch the flare nut and the brake tube.**
   - **Never bend sharply, twist or strongly pull out the brake hoses and tubes.**
   - **Cover open end of brake tubes and hoses when disconnecting to prevent entrance of dirt.**



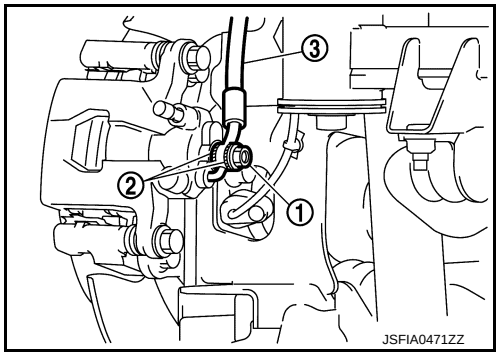
4. Disconnect the lock plate ⑤, then remove the brake hose.

5. Loosen the flare nut ① with a flare nut wrench (A) and separate the brake tube ② from the hose ③.
CAUTION:
- **Never scratch the flare nut and the brake tube.**
- **Never bend sharply, twist or strongly pull out the brake hoses and tubes.**
- **Cover open end of brake tubes and hoses when disconnecting to prevent entrance of dirt.**

6. Disconnect the lock plate ④, then remove the brake hose from the brake hose bracket ⑤.



7. Remove the union bolt ① and copper washers ②, and remove the brake hose ③ from the brake caliper assembly.

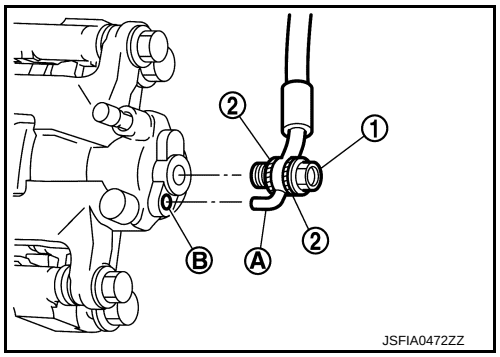


INSTALLATION

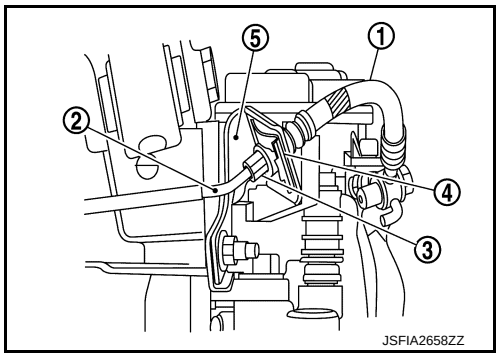
CAUTION:
- **Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface. For brake component parts, never wash them with water.**
- **Never depress the brake pedal while removing the brake hose or brake tube. If this is not complied with, brake fluid may splash.**
- **Never allow foreign matter (e.g. dust) and oils other than brake fluid to enter the reservoir tank.**
- **Wipe off immediately when attaching brake fluid with disc rotor and caliper assembly.**

1. Assemble the union bolt ① and copper washers ② to the brake hose.
CAUTION:
Never reuse the copper washer.

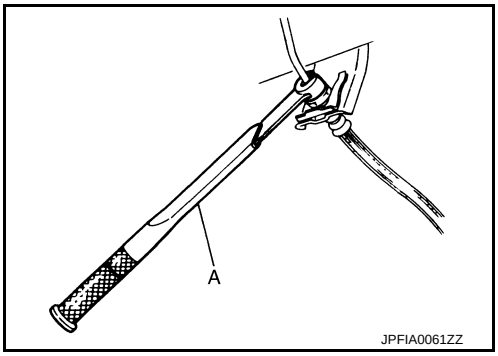
2. Align the brake hose L-pin Ⓐ with the brake caliper assembly hole Ⓑ, and tighten the union bolt to the specified torque.



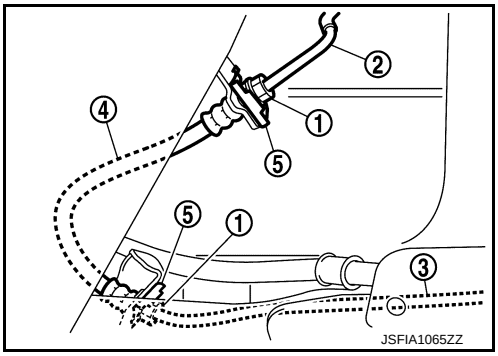
3. Install the brake hose ① to the brake tube ②, temporarily tighten the flare nut ③ by hand until it does not rotate further, and fix the brake hose to the brake hose bracket ⑤ with the lock plate ④.
CAUTION:
Check that all brake hoses and brake tubes are not twisted and bent.



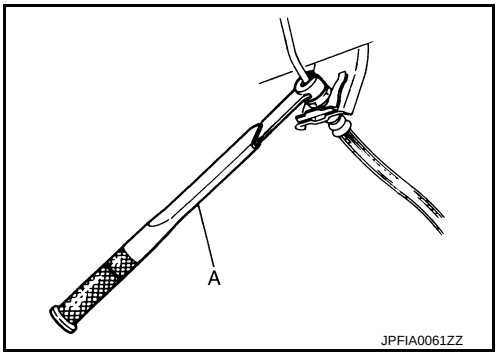
4. Tighten the flare nut to the specified torque with a flare nut torque wrench (A).
CAUTION:
Never scratch the flare nut and the brake tube.



5. Install the brake hose ④ to the brake tube ② and the brake tube ③, temporarily tighten the flare nut ① by hand until it does not rotate further, and fix the brake hose to brake hose brackets with the lock plate ⑤.
CAUTION:
Check that all brake hoses and brake tubes are not twisted and bent.



6. Tighten the flare nut to the specified torque with a flare nut torque wrench (A).
CAUTION:
Never scratch the flare nut and the brake tube.
7. Refill with new brake fluid and perform the air bleeding. Refer to BR-78, "Bleeding Brake System".
CAUTION:
Never reuse drained brake fluid.
8. Install tires. Refer to WT-61, "Removal and Installation".
9. Perform inspection after installation. Refer to BR-94, "REAR : Inspection".



REAR : Inspection

INFOID:0000000010838580

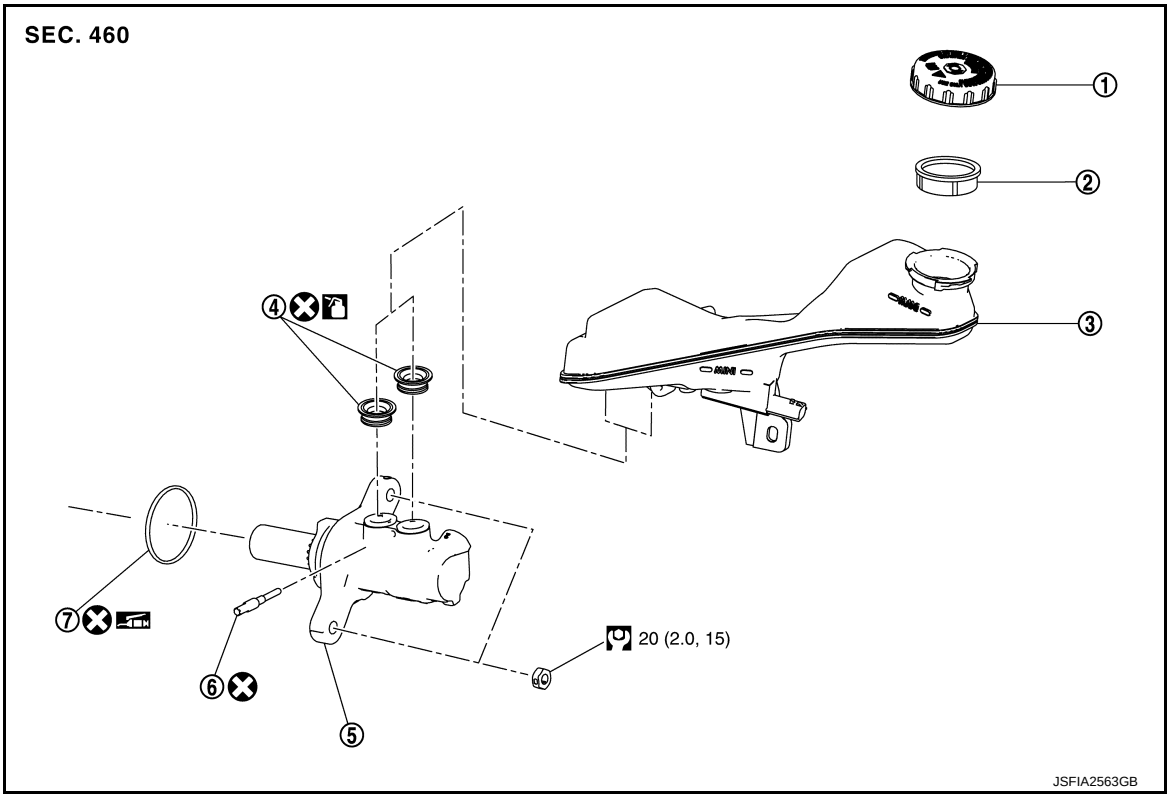
INSPECTION AFTER INSTALLATION

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 quantity to specified. Spare tire, jack, hand tools and mats are brought out of vehicle.**
2. Depress the brake pedal with a force of 785 N (80 kg, 176 lb) and hold down the pedal for approximately 5 seconds with the engine running. Check for any fluid leakage.
CAUTION:
Retighten the applicable connection to the specified torque and repair any abnormal (damaged, worn or deformed) part if any brake fluid leakage is present.

BRAKE MASTER CYLINDER

Exploded View

INFOID:0000000010838581



① Reservoir cap	② Oil strainer	③ Reservoir tank
④ Grommet	⑤ Cylinder body	⑥ Screw
⑦ O-ring		

: Apply polyglycol ether based lubricant.

: Apply brake fluid.

: N·m (kg-m, ft-lb)

: Always replace after every disassembly.

Removal and Installation

INFOID:0000000010838582

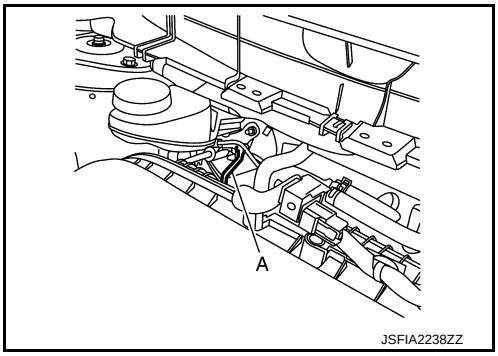
REMOVAL

CAUTION:

- **Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface. For brake component parts, never wash them with water.**
- **Depress the brake pedal several times to release the vacuum pressure from the brake booster. Then remove the master cylinder assembly.**
- **Never depress the brake pedal while removing the brake tube. If this is not complied with, brake fluid may splash.**

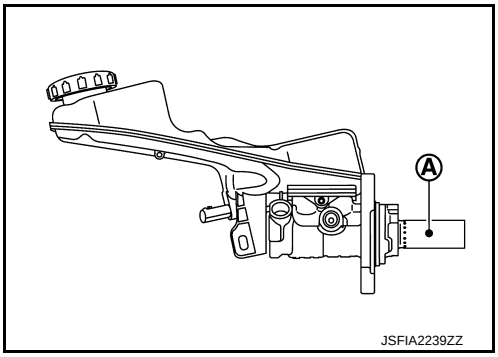
1. Perform inspection before removal. Refer to BR-98, "Inspection".
2. Drain brake fluid. Refer to BR-77, "Draining".
3. Disconnect the brake fluid level switch harness connector.

4. Separate the brake tube from the master cylinder assembly with a flare nut wrench (A).
CAUTION:
Never scratch the flare nut and the brake tube.



5. Remove the master cylinder assembly.
CAUTION:
- **Never deform or bend the brake tubes.**
- **Never depress the brake pedal after the master cylinder assembly is removed.**

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

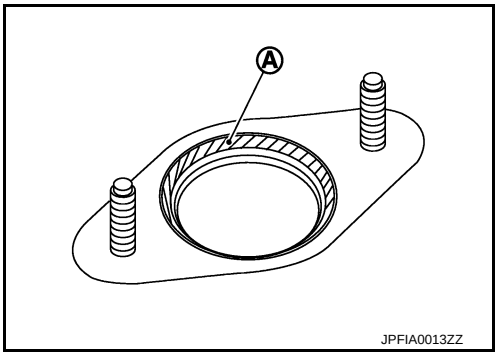


6. Remove the O-ring.

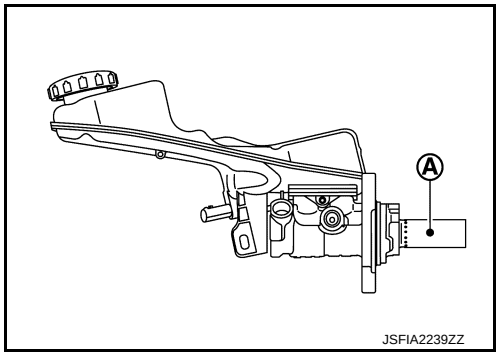
INSTALLATION

CAUTION:
Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface. For brake component parts, never wash them with water.

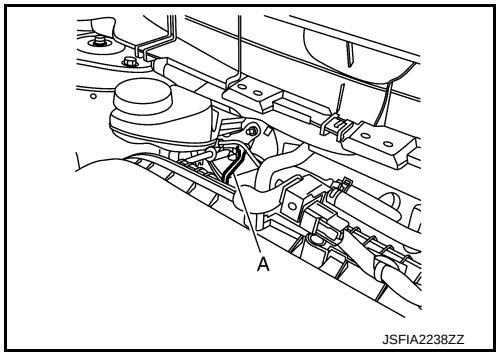
Note the following, and install in the reverse order of removal.
- Never reuse the O-ring.
- Never depress the brake pedal after the master cylinder assembly is removed.
- Apply polyglycol ether based lubricant to the brake booster [see Ⓐ in the figure] when installing the master cylinder assembly to the brake booster.



- The piston Ⓐ of the master cylinder assembly is exposed. Never damage it when handling the master cylinder.
- Check that no dirt and dust are present on the piston before installation. Clean it with new brake fluid if necessary.
- The piston may drop off when pulled strongly. Never hold the piston. Hold the cylinder body when handling the master cylinder assembly.
- Never deform or bend the brake tubes.



- 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 (A). Refer to BR-95, "Exploded View".
- Perform the air bleeding. Refer to BR-78, "Bleeding Brake System"
- Perform inspection after installation. Refer to BR-98, "Inspection".



Disassembly and Assembly

INFOID:0000000010838583

DISASSEMBLY

CAUTION:
- **Never disassemble the cylinder body.**
- **Remove the reservoir tank only when necessary.**
- **Never drop parts to remove. Replace new parts when dropping.**

1. Fix the master cylinder assembly to a vise.
   CAUTION:
   - **Always set copper plates or cloth between vise grips when fixing the cylinder body to a vise.**
   - **Never overtighten the vise.**
2. Remove the reservoir tank mounting screw.
3. Remove the reservoir tank and grommet from the cylinder body.

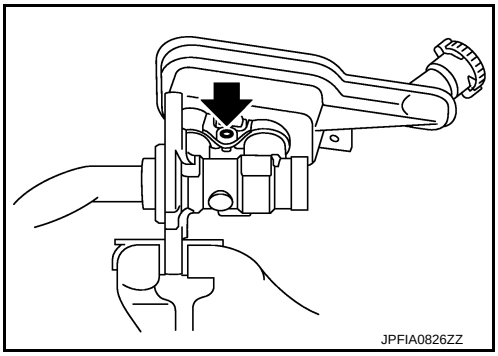
ASSEMBLY

CAUTION:
- **Never use mineral oils such as kerosene or gasoline and rubber grease during the cleaning and assembly process.**
- **Never allow foreign matter (e.g. dust) and oils other than brake fluid to enter the reservoir tank.**
- **Never drop when installing. The parts must not be reused if they are dropped.**

1. Apply new brake fluid to the grommet and install it to the cylinder body.
   CAUTION:
   Never reuse grommets.
2. Install the reservoir tank to the cylinder body.
3. Fix the cylinder body to a vise.
   CAUTION:

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

4. Tilt the reservoir tank so that a mounting screw can be fixed. Assemble with screw.



Inspection

INFOID:0000000010838584

INSPECTION BEFORE REMOVAL

Check the brake fluid level switch. Refer to BRC-159, "Component Inspection".

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-91, "FRONT : Inspection".

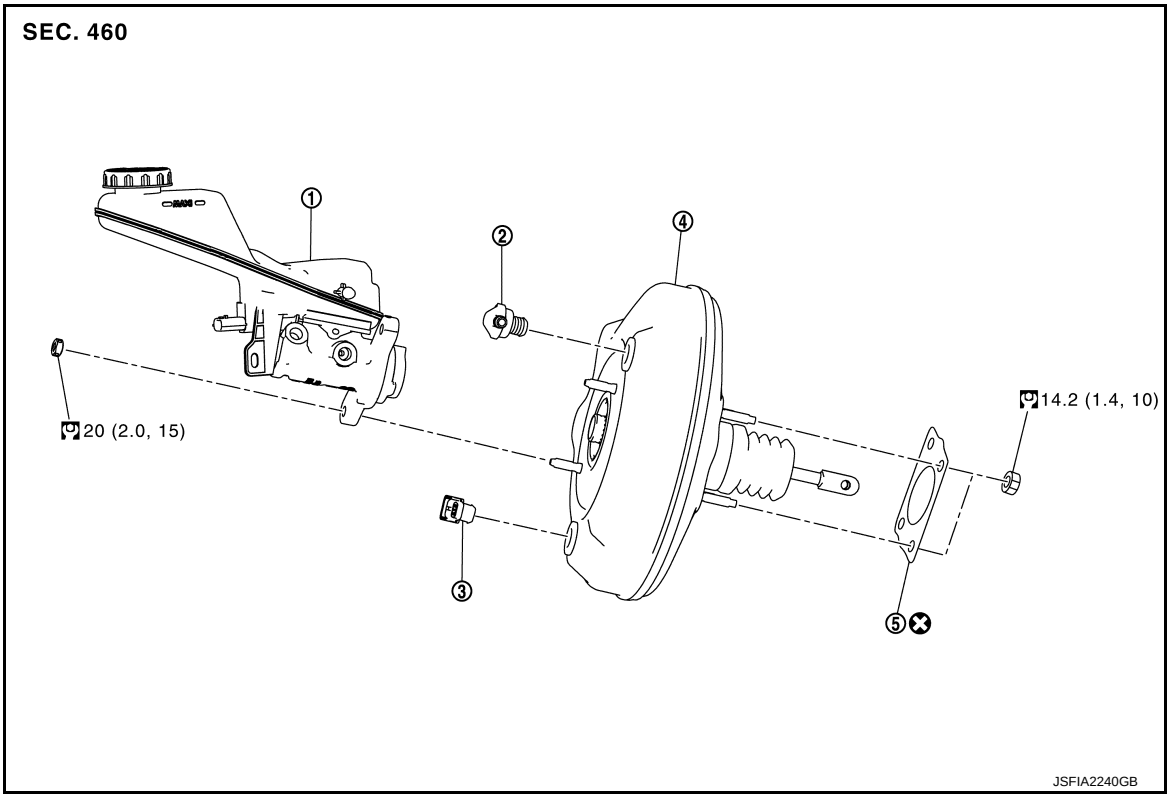
CAUTION:

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

BRAKE BOOSTER

Exploded View

INFOID:0000000010838585



① Master cylinder assembly ② Check valve ③ Vacuum sensor
④ Brake booster ⑤ Gasket

: N·m (kg-m, ft-lb)

Removal and installation

INFOID:0000000010838586

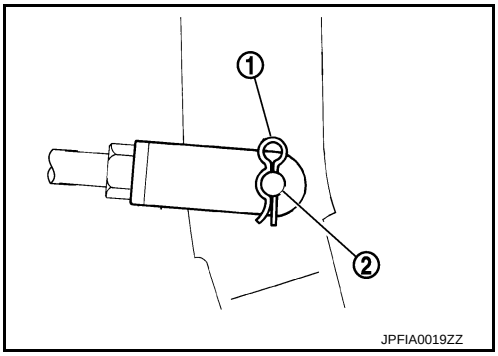
REMOVAL

CAUTION:

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

1. Perform inspection before removal. Refer to BR-100, "Inspection and Adjustment".
2. Drain brake fluid. Refer to BR-77, "Draining".
3. Disconnect vacuum sensor harness connector.
4. Remove brake master cylinder assembly. Refer to BR-95, "Removal and Installation".
5. Remove vacuum hose from check valve. Refer to BR-102, "Removal and Installation".
6. Remove cowl top extension. Refer to EXT-25, "Removal and Installation".
7. Remove brake tube between master cylinder assembly and ABS actuator and electric unit (control unit). Refer to BR-88, "FRONT : Exploded View".

8. Remove snap pin ① and clevis pin ②.



9. Remove nuts on brake booster and brake pedal assembly.
   CAUTION:
   Hold the brake booster so as to avoid dropping out.
10. Remove brake booster.
    CAUTION:
    Never deform or bend the brake tubes.
11. Remove check valve from brake booster.
12. Remove vacuum sensor from brake booster.
13. Perform inspection after removal. Refer to BR-100, "Inspection and Adjustment".

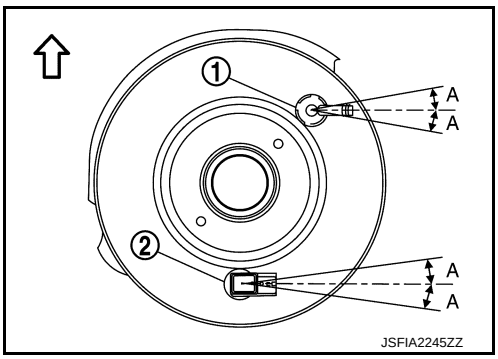
INSTALLATION

CAUTION:
Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface. For brake component parts, never wash them with water.

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

- Install check valve ① and vacuum sensor ② as shown in figure.

A	:±15°
⇦	:Vehicle upper side



- Be careful not to damage brake booster stud bolt threads. If brake booster is tilted during installation, the dash panel may damage threads.
- Never deform or bend the brake tubes when installing the brake booster.
- Always use new gasket between the brake booster and the dash panel.
- Replace clevis pin when found damage.
- Never allow foreign matter (e.g.dust) and oil other than brake fluid to enter reservoir tank.
- Perform the air bleeding. Refer to BR-78, "Bleeding Brake System".
  CAUTION:
  Never reuse brake fluid to drain.
- Check each item of brake pedal.

Inspection and Adjustment

INFOID:0000000010838587

INSPECTION BEFORE REMOVAL

Air Tight

CAUTION:
Check the air tight condition when the master cylinder and the brake booster is installed.

1. Check the air tight use a handy vacuum pump.

At vacuum of –66.7 kPa (–500 mmHg, –19.69 inHg, –0.067 bar)	**: Vacuum should decrease within 3.3 kPa (24.8 mmHg, 0.98 inHg, 0.033 bar) for 15 seconds.**

2. If the air tight condition cannot be maintained, perform the following operation.

a. Check the no dirt and dust are present on the brake booster and brake master cylinder mating faces. Clean it if necessary.

b. Check the O-ring on the master cylinder. If anything is found, replace the O-ring. Refer to BR-95, "Removal and Installation".

c. Check the air tight condition again. If the condition still cannot be maintained, replace the brake booster.

INSPECTION AFTER REMOVAL

Check Valve Inspection

1. Check the check valve to use a handy vacuum pump.

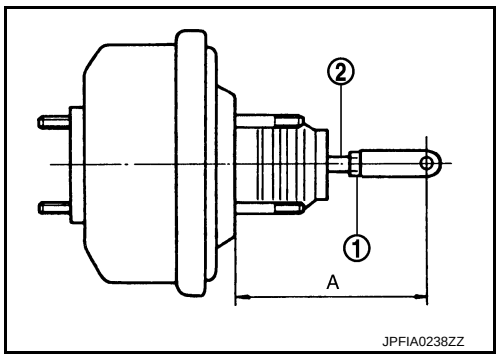
In the case of connecting to brake booster	**: Vacuum should decrease within 3.3 kPa (24.8 mmHg, 0.98 inHg, 0.033 bar) for 15 seconds at vacuum of –66.7 kPa (–500 mmHg, –19.69 inHg, –0.067 bar).**
In the case of connecting to vacuum hose	**: Vacuum should not exist.**

Input Rod Length rod Inspection

1. Check the input length (A).

① :Input rod

A : Refer to BR-127, "Brake Booster".



2. Replace the brake booster if the input rod length is not the standard.

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 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 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.
2. 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.
3. 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.

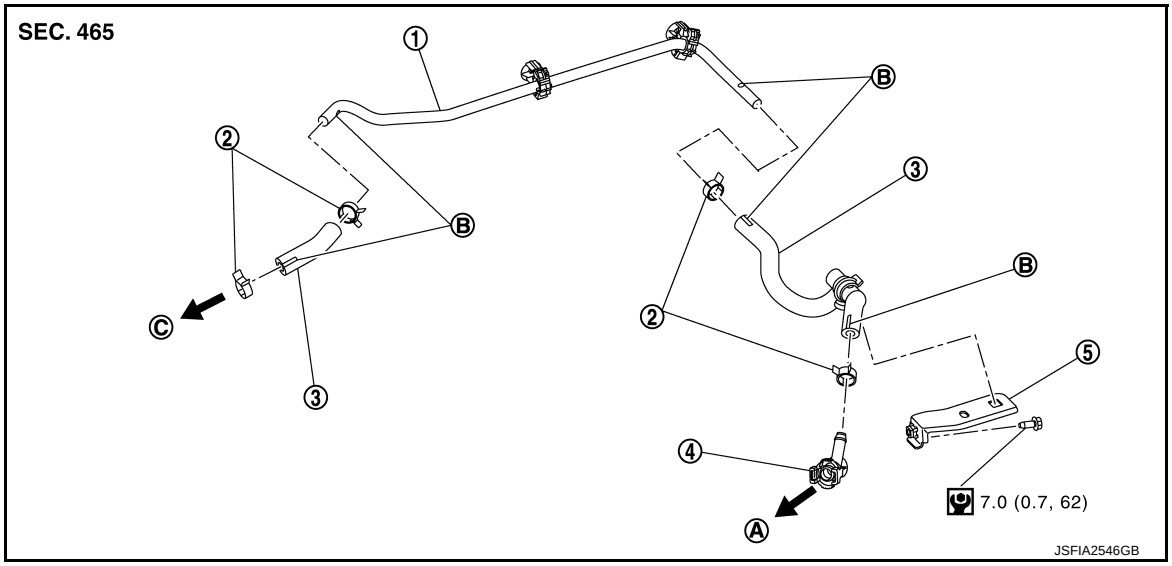
ADJUSTMENT AFTER INSTALLATION

Perform the brake pedal adjustment after installing the brake assembly. Refer to BR-75, "Inspection and Adjustment".

VACUUM LINES

Exploded View

INFOID:0000000010838986



① Vacuum piping	② Clamp	③ Vacuum hose
④ Connector	⑤ Vacuum hose bracket	
Ⓐ To vacuum pump	Ⓑ Paint mark	Ⓒ To brake booster

: N·m (kg-m, in-lb)

Removal and Installation

INFOID:0000000010838987

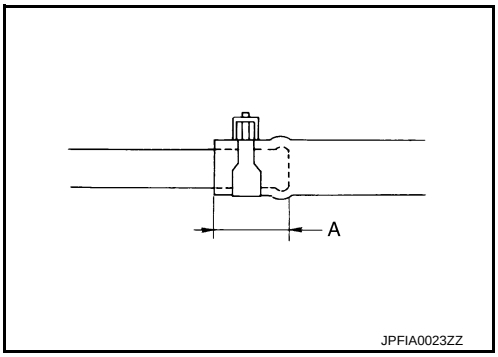
REMOVAL

1. Remove engine cover. Refer to EM-306, "Removal and Installation".
2. Remove the vacuum hose and vacuum piping.
3. Perform inspection after removal. Refer to BR-102, "Inspection".

INSTALLATION

Note the following, install the vacuum hose.

- When installing vacuum hose, insert it until its tip reaches the back-end of length (A) or further as shown in the figure.
  CAUTION:
  Never use lubricating oil during assembly.



A : 24 mm (0.95 in) or more

- Face the paint mark of vacuum hose (built-in check valve) to upward to assemble.
- Face the paint mark of vacuum piping (intake manifold side) to upward to assemble.
- Face the other paint marks to vehicle front side to assemble.
- For clamp mounting direction (the orientation of pawl), refer to BR-102, "Exploded View".

Inspection

INFOID:0000000010838988

INSPECTION AFTER REMOVAL

Appearance

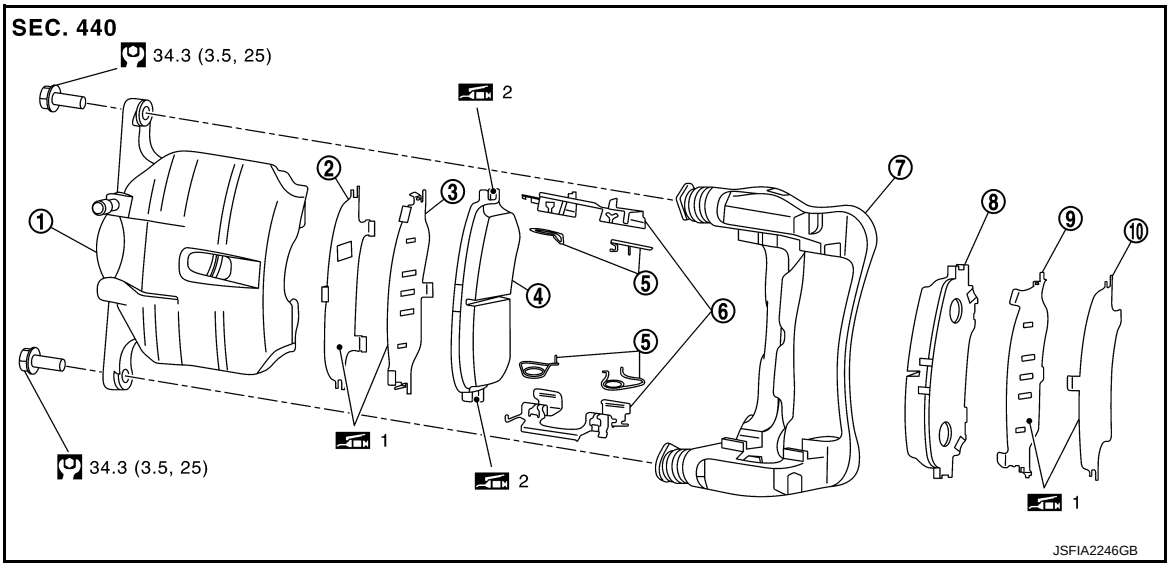
Check for correct assembly, damage and deterioration.

FRONT DISC BRAKE

BRAKE PAD (1 PISTON TYPE)

BRAKE PAD (1 PISTON TYPE) : Exploded View

INFOID:0000000010838594



① Cylinder body	② Inner shim cover	③ Inner shim
④ Inner pad (with pad wear sensor)	⑤ Return spring	⑥ Pad retainer
⑦ Torque member	⑧ Outer pad	⑨ Outer shim
⑩ Outer shim cover		

1: Apply MOLYKOTE® AS 880N or silicone-based grease.

2: Apply MOLYKOTE® 7439 or equivalent.

: N·m (kg-m, ft-lb)

Molykote is a registered trademark of Dow Corning Corporation.

BRAKE PAD (1 PISTON TYPE) : Removal and Installation

INFOID:0000000010838595

REMOVAL

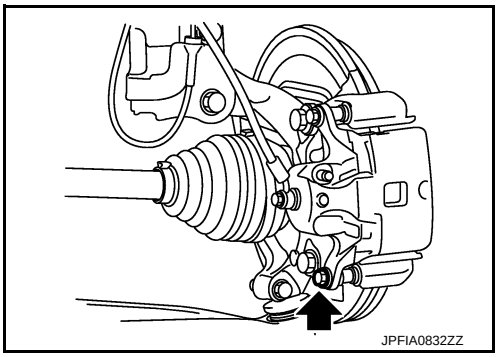
WARNING:

Since dust covering the front and rear brakes has an affect on human body, the dust must be removed with a dust collector. Never splatter the dust with an air blow gun.

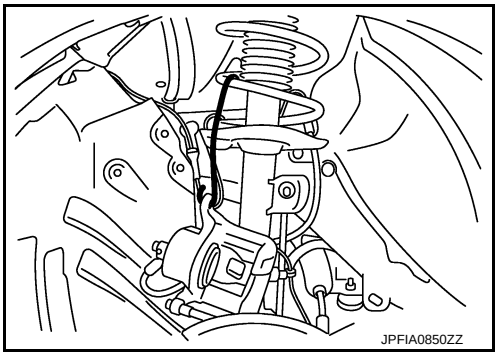
CAUTION:

- **Never 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.**

1. Remove tires with power tool.
2. Remove lower sliding pin bolt.

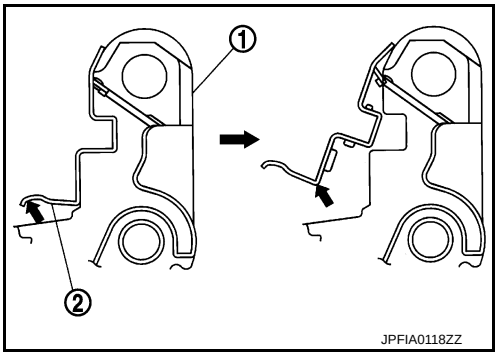


3. Suspend the cylinder body with suitable wire so that the brake hose will not stretch.



4. Remove the brake pads, shims, shim covers and pad retainer (as a set with pad return spring) ② from the torque member ①.

CAUTION:
- **Remove pad retainer together with pad return springs.**
- **Never deform the pad return springs and pad retainer when removing the pad retainer from the torque member.**
- **Never damage the piston boots.**
- **Never drop the brake pads, shims and shim covers.**
- **Remember each position of the removed brake pads.**

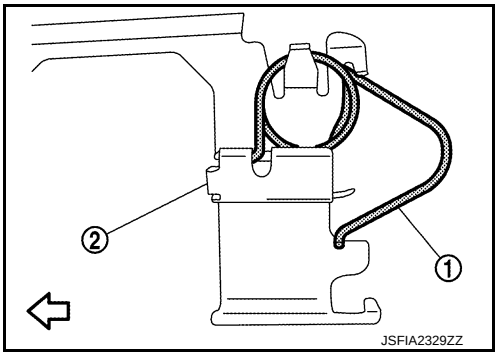


5. Remove the pad return springs ① from the pad retainer ②.

⇦ : Disc rotor side

CAUTION:
Never deform the pad return springs when removing the pad return springs from the pad retainer.

6. Perform inspection after removal. Refer to BR-106, "BRAKE PAD (1 PISTON TYPE) : Inspection".



INSTALLATION

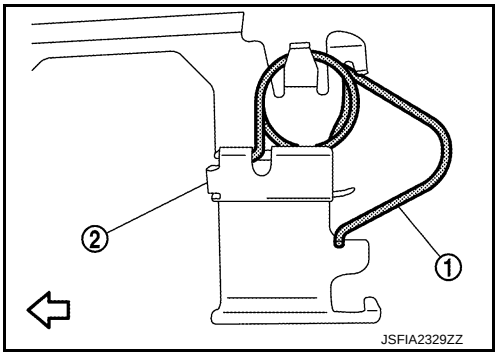
WARNING:
Since dust covering the front and rear brakes has an affect on human body, the dust must be removed with a dust collector. Never splatter the dust with an air blow gun.

CAUTION:
- **Never 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.**

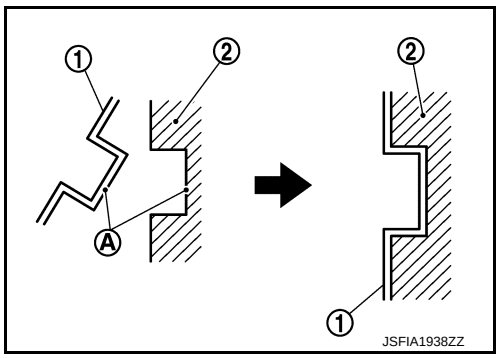
1. Install the pad return springs ① to pad retainer ② if the pad return springs has been removed.

⇦ : Disc rotor side

CAUTION:
Never deform the pad return springs.

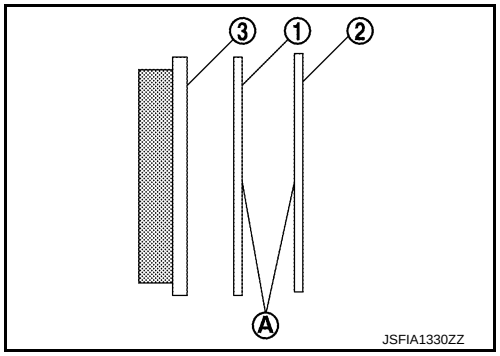


2. Apply MOLYKOTE® 7439 or equivalent to the match face Ⓐ between the pad retainers ① and torque member ② if the pad retainers has been removed.
Molykote is a registered trademark of Dow Corning Corporation.

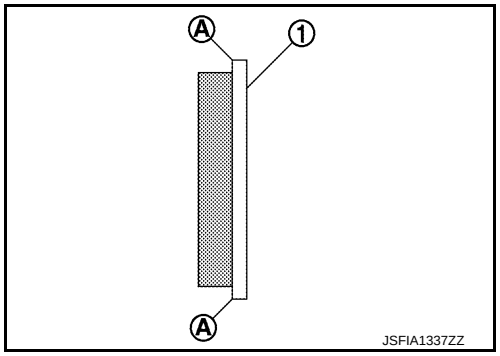


3. Install the pad retainer (upper side with pad return spring) to torque member if the pad retainers has been removed.
CAUTION:
- **Securely assemble the pad retainers so that it will not be lifted up from the torque member.**
- **Never deform the pad retainers and pad return springs.**

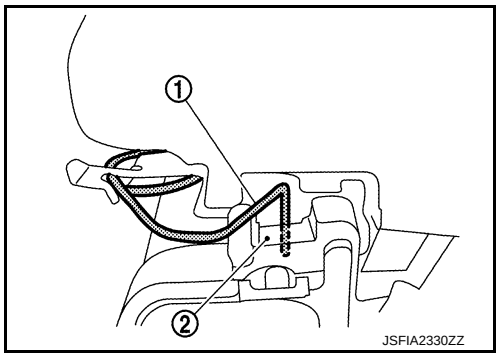
4. Apply MOLYKOTE® AS880N or silicone-based grease to the matching faces Ⓐ between the shim ① and the shim cover ②, and install the shim and the shim covers to the brake pad ③.
CAUTION:
Always replace the shims and shim covers when replacing the brake pad.
Molykote is a registered trademark of Dow Corning Corporation.



5. Apply MOLYKOTE® 7439 or equivalent to the match face Ⓐ between the brake pad ① and torque member ②.
Molykote is a registered trademark of Dow Corning Corporation.



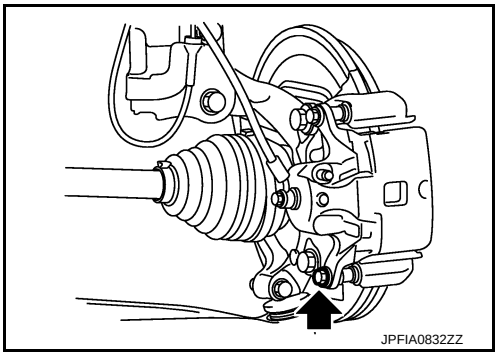
6. Install the brake pads to the torque member.
CAUTION:
Both inner and outer pads have a pad return system. Securely push the pad return spring ① into the disc rotor side of brake pad ②.



7. Install cylinder body to torque member.
CAUTION:
- **Never 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 reservoir tank when pressing piston in.**

NOTE:
Use a disc brake piston tool to easily press piston.

8. Install the lower sliding pin bolt and tighten it to the specified torque.



9. Depress the brake pedal several times to check that no drag feel is present for the front disc brake. Refer to BR-106, "BRAKE PAD (1 PISTON TYPE) : Inspection".
10. Install tires. Refer to WT-61, "Removal and Installation".

BRAKE PAD (1 PISTON TYPE) : Inspection

INFOID:0000000010838596

INSPECTION AFTER REMOVAL

- Replace the shims and shim covers if rust is excessively attached.
- Eliminate rust on the pad return spring, pad retainers and the torque member. Replace them if rust is excessively attached.

INSPECTION AFTER INSTALLATION

- Check a drag of front disc brake. If any drag is found, follow the procedure described below.

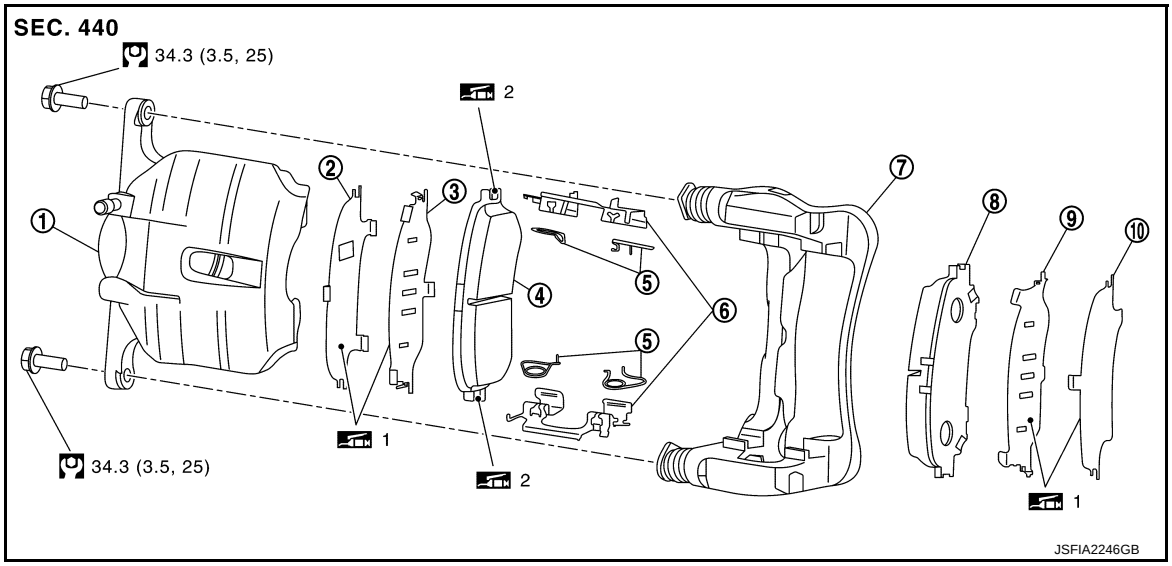
1. Remove brake pads. Refer to BR-103, "BRAKE PAD (1 PISTON TYPE) : Removal and Installation".
2. Press the pistons. Refer to BR-103, "BRAKE PAD (1 PISTON TYPE) : Removal and Installation".
3. Install brake pads. Refer to BR-103, "BRAKE PAD (1 PISTON TYPE) : Removal and Installation".
4. Depress the brake pedal several times.
5. Check a drag of front disc brake again. If any drag is found, disassemble the cylinder body and replace if necessary. Refer to BR-112, "BRAKE CALIPER ASSEMBLY (1 PISTON TYPE) : Disassembly and Assembly".

- 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-81, "BRAKE PAD : Inspection and Adjustment".

BRAKE PAD (2 PISTON TYPE)

BRAKE PAD (2 PISTON TYPE) : Exploded View

INFOID:0000000010838969



① Cylinder body ② Inner shim cover ③ Inner shim
④ Inner pad (with pad wear sensor) ⑤ Return spring ⑥ Pad retainer
⑦ Torque member ⑧ Outer pad ⑨ Outer shim
⑩ Outer shim cover

: 1: Apply MOLYKOTE® AS 880N or silicone-based grease.

: 2: Apply MOLYKOTE® 7439 or equivalent.

: N·m (kg-m, ft-lb)

Molykote is a registered trademark of Dow Corning Corporation.

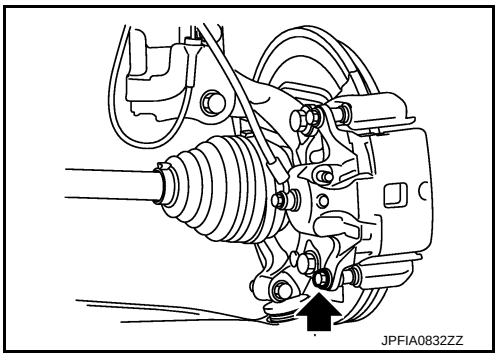
BRAKE PAD (2 PISTON TYPE) : Removal and Installation

INFOID:0000000010838970

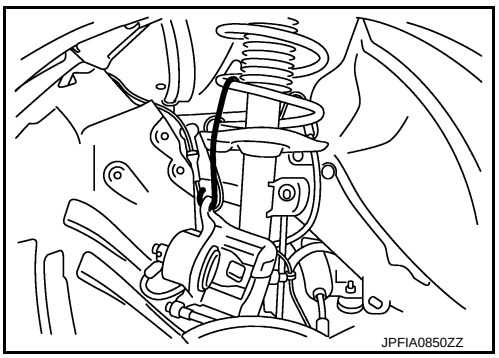
REMOVAL

WARNING:
Since dust covering the front and rear brakes has an affect on human body, the dust must be removed with a dust collector. Never splatter the dust with an air blow gun.
CAUTION:
- **Never 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.**

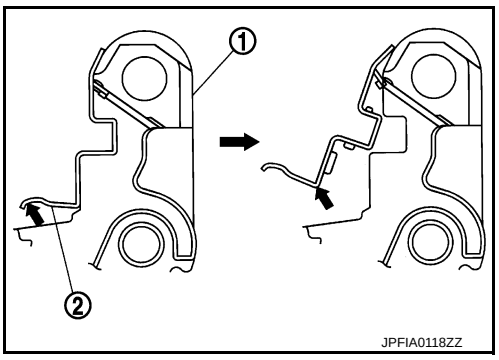
1. Remove tires with power tool.
2. Remove lower sliding pin bolt.


JPFIA0832ZZ

3. Suspend the cylinder body with suitable wire so that the brake hose will not stretch.


JPFIA0850ZZ

4. Remove the brake pads, shims, shim covers and pad retainer (as a set with pad return spring) ② from the torque member ①.
CAUTION:
- **Remove pad retainer together with pad return springs.**
- **Never deform the pad return springs and pad retainer when removing the pad retainer from the torque member.**
- **Never damage the piston boots.**
- **Never drop the brake pads, shims and shim covers.**
- **Remember each position of the removed brake pads.**



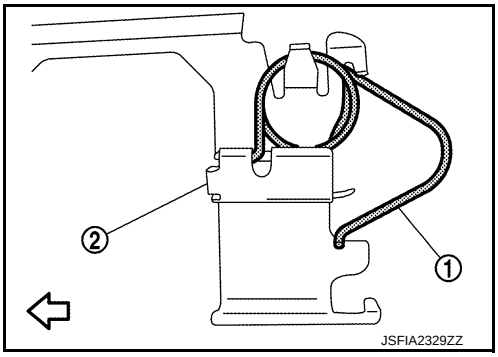
JPFIA0118ZZ

5. Remove the pad return springs ① from the pad retainer ②.

⇦ : Disc rotor side

CAUTION:
Never deform the pad return springs when removing the pad return springs from the pad retainer.

6. Perform inspection after removal. Refer to BR-109, "BRAKE PAD (2 PISTON TYPE) : Inspection".



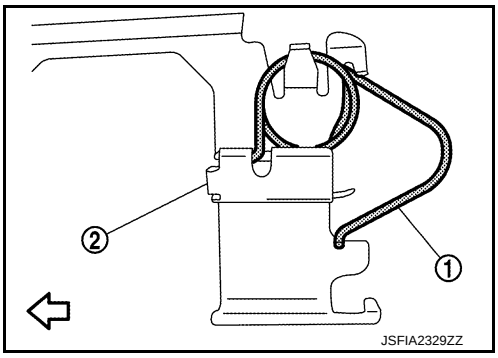
INSTALLATION

WARNING:
Since dust covering the front and rear brakes has an affect on human body, the dust must be removed with a dust collector. Never splatter the dust with an air blow gun.
CAUTION:
- **Never 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.**

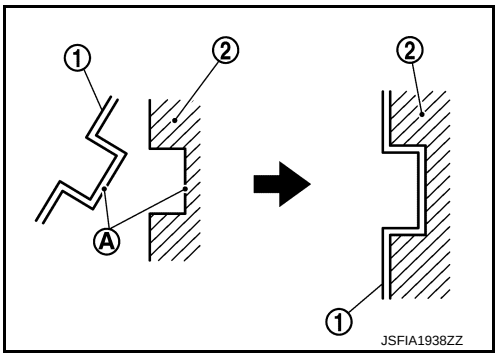
1. Install the pad return springs ① to pad retainer ② if the pad return springs has been removed.

⇦ : Disc rotor side

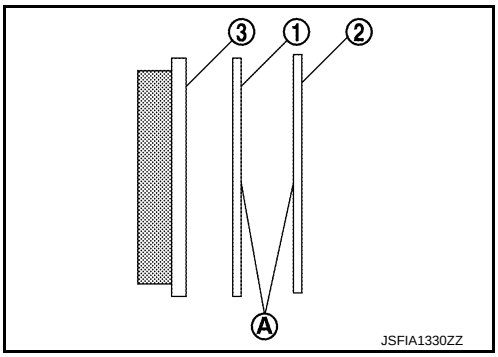
CAUTION:
Never deform the pad return springs.



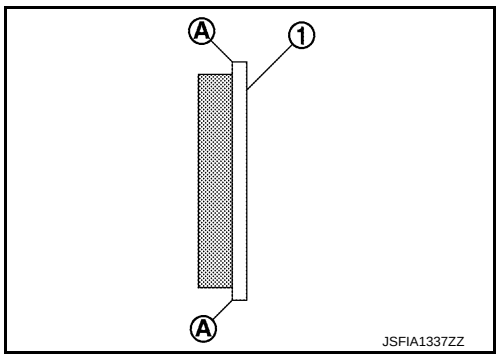
2. Apply MOLYKOTE® 7439 or equivalent to the match face Ⓐ between the pad retainers ① and torque member ② if the pad retainers has been removed.
Molykote is a registered trademark of Dow Corning Corporation.
3. Install the pad retainer (upper side with pad return spring) to torque member if the pad retainers has been removed.
CAUTION:
- **Securely assemble the pad retainers so that it will not be lifted up from the torque member.**
- **Never deform the pad retainers and pad return springs.**



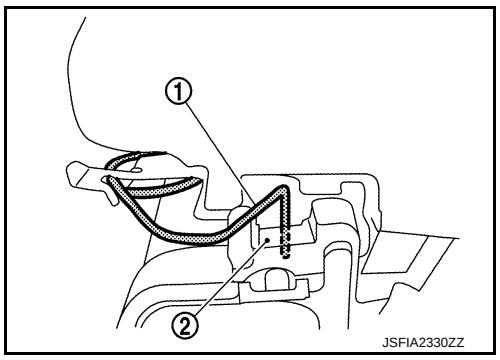
4. Apply MOLYKOTE® AS880N or silicone-based grease to the matching faces Ⓐ between the shim ① and the shim cover ②, and install the shim and the shim covers to the brake pad ③.
CAUTION:
Always replace the shims and shim covers when replacing the brake pad.
Molykote is a registered trademark of Dow Corning Corporation.



5. Apply MOLYKOTE® 7439 or equivalent to the match face Ⓐ between the brake pad ① and torque member ②.
Molykote is a registered trademark of Dow Corning Corporation.



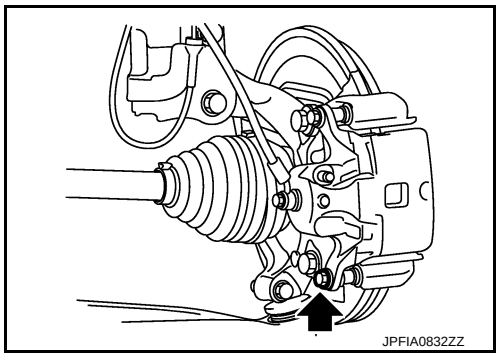
6. Install the brake pads to the torque member.
CAUTION:
Both inner and outer pads have a pad return system. Securely push the pad return spring ① into the disc rotor side of brake pad ②.



7. Install cylinder body to torque member.
CAUTION:
- **Never 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 reservoir tank when pressing piston in.**

NOTE:
Use a disc brake piston tool to easily press piston.

8. Install the lower sliding pin bolt and tighten it to the specified torque.



9. Depress the brake pedal several times to check that no drag feel is present for the front disc brake. Refer to BR-109, "BRAKE PAD (2 PISTON TYPE) : Inspection".
10. Install tires. Refer to WT-61, "Removal and Installation".

BRAKE PAD (2 PISTON TYPE) : Inspection

INFOID:0000000010838971

INSPECTION AFTER REMOVAL

- Replace the shims and shim covers if rust is excessively attached.
- Eliminate rust on the pad return spring, pad retainers and the torque member. Replace them if rust is excessively attached.

INSPECTION AFTER INSTALLATION

- Check a drag of front disc brake. If any drag is found, follow the procedure described below.

1. Remove brake pads. Refer to BR-107, "BRAKE PAD (2 PISTON TYPE) : Removal and Installation".
2. Press the pistons. Refer to BR-107, "BRAKE PAD (2 PISTON TYPE) : Removal and Installation".
3. Install brake pads. Refer to BR-107, "BRAKE PAD (2 PISTON TYPE) : Removal and Installation".
4. Depress the brake pedal several times.
5. Check a drag of front disc brake again. If any drag is found, disassemble the cylinder body and replace if necessary. Refer to BR-117, "BRAKE CALIPER ASSEMBLY (2 PISTON TYPE) : Disassembly and Assembly".

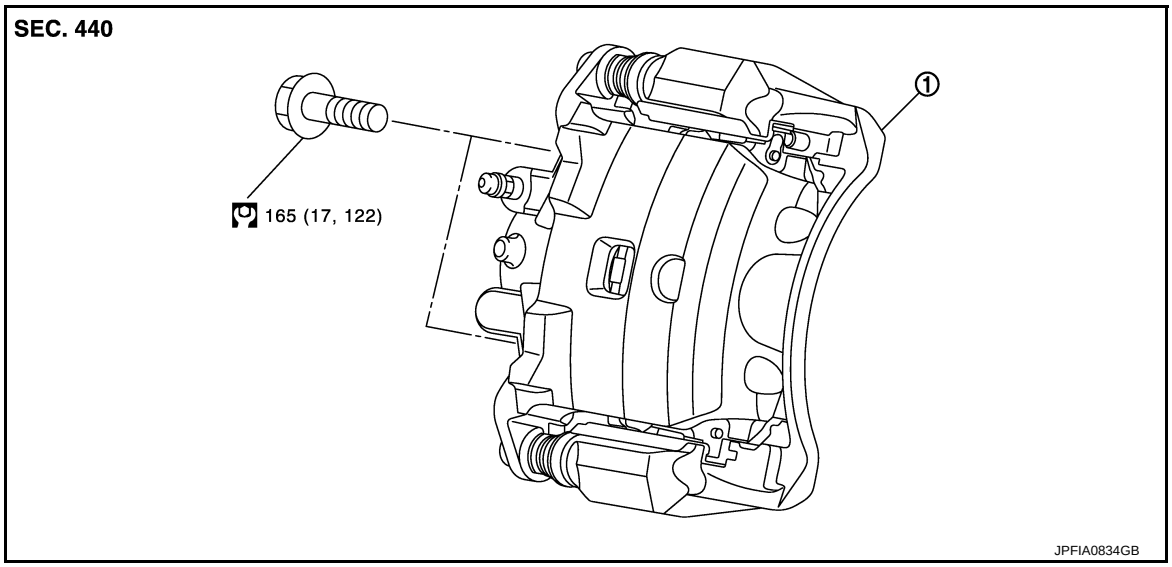
- Burnish contact surfaces brake pads and disc rotor after refinishing or replacing brake pads, or if a soft pedal occurs at very low mileage. Refer to BR-81, "BRAKE PAD : Inspection and Adjustment".

BRAKE CALIPER ASSEMBLY (1 PISTON TYPE)

BRAKE CALIPER ASSEMBLY (1 PISTON TYPE) : Exploded View

INFOID:0000000010838600

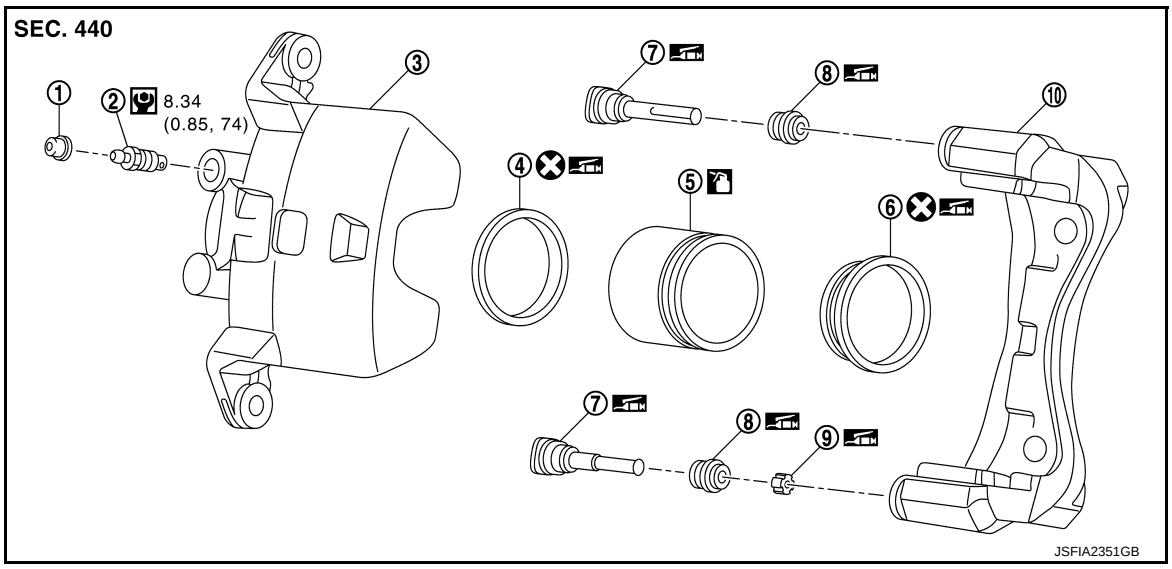
REMOVAL



① Brake caliper assembly

: N·m (kg-m, ft-lb)

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.
: N·m (kg-m, in-lb)
: Always replace after every disassembly.

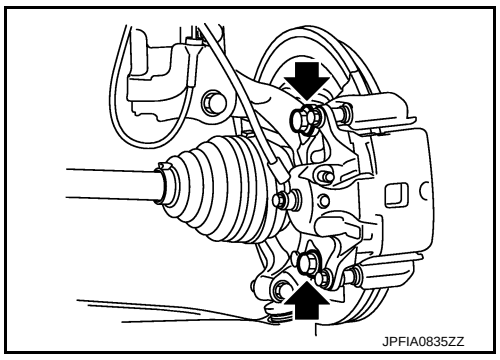
BRAKE CALIPER ASSEMBLY (1 PISTON TYPE) : Removal and Installation

INFOID:0000000010838601

REMOVAL

WARNING:
Since dust covering the front and rear brakes has an affect on human body, the dust must be removed with a dust collector. Never splatter the dust with an air blow gun.
CAUTION:
- **Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface. However avoid washing brake components with water.**
- **Never 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.**

1. Remove tires with power tool.
2. Fix the disc rotor using wheel nuts.
3. Drain brake fluid. Refer to BR-77, "Draining".
4. Remove union bolt and copper washer, and separate brake hose from brake caliper assembly. Refer to BR-89, "FRONT : Removal and Installation".
5. Remove torque member mounting bolts, and remove brake caliper assembly.
   CAUTION:
   Never drop brake pad and brake caliper assembly.
6. Remove disc rotor.
   - 2WD: Refer to FAX-11, "Removal and Installation".
   - 4WD: Refer to FAX-72, "Removal and Installation".

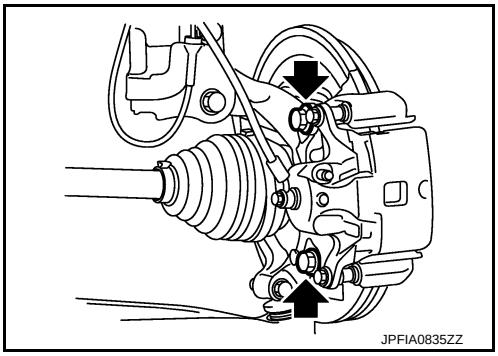

JPFIA0835ZZ

INSTALLATION

WARNING:
Since dust covering the front and rear brakes has an affect on human body, the dust must be removed with a dust collector. Never splatter the dust with an air blow gun.
CAUTION:
- **Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface. However avoid washing brake components with water.**
- **Never 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.**
- **Never allow foreign matter (e.g.dust) and oils other than brake fluid to enter the reservoir tank.**

1. Install disc rotor.
   - 2WD: Refer to FAX-11, "Removal and Installation".
   - 4WD: Refer to FAX-72, "Removal and Installation".

2. Install the brake caliper assembly to the steering knuckle and tighten the torque member mounting bolts to the specified torque.
CAUTION:
Never spill or splash any grease and moisture on the brake caliper assembly mounting face, threads, mounting bolts and washers. Wipe out any grease and moisture.



3. Install brake hose and copper washers to brake caliper assembly. Refer to BR-89, "FRONT : Removal and Installation".
CAUTION:
Never reuse copper washer.
4. Refill with new brake fluid and perform the air bleeding. Refer to BR-78, "Bleeding Brake System".
CAUTION:
- **Never reuse brake fluid.**
- **Never spill or splash brake fluid on the surface of disc rotor.**
5. Check a drag of front disc brake. If any drag is found, refer to BR-114, "BRAKE CALIPER ASSEMBLY (1 PISTON TYPE) : Inspection".
6. Install tires. Refer to WT-61, "Removal and Installation"
7. Perform inspection after installation. Refer to BR-106, "BRAKE PAD (1 PISTON TYPE) : Inspection".

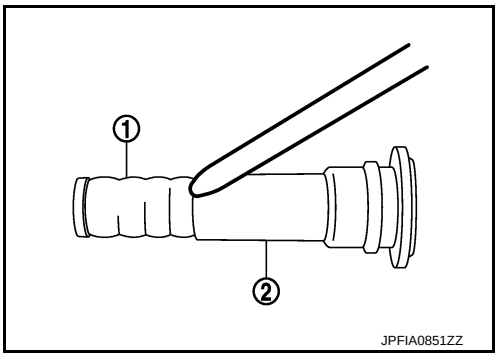
BRAKE CALIPER ASSEMBLY (1 PISTON TYPE) : Disassembly and Assembly

INFOID:0000000010838602

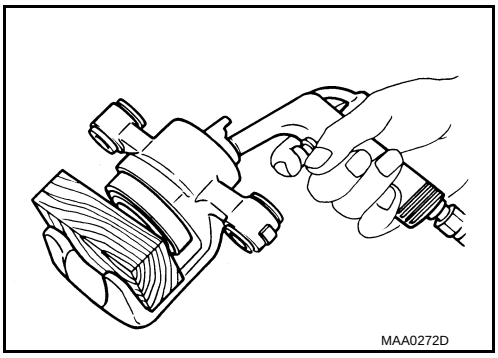
DISASSEMBLY

NOTE:
Never remove the torque member, brake pad and pad retainers when disassembling and assembling the cylinder body.

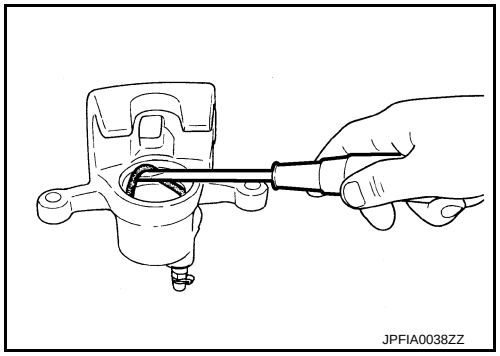
1. Remove the sliding pin bolt, and remove the cylinder body from the torque member. Refer to BR-103, "BRAKE PAD (1 PISTON TYPE) : Removal and Installation".
CAUTION:
Fix the brake pad at suitable tape so that the brake pad will not drop.
2. Remove sliding pins and sliding pin boots from torque member.
3. Remove bushing ① from sliding pin ②.



4. Place a wooden block as shown in the figure, and blow air from union bolt mounting hole to remove pistons and piston boots.
CAUTION:
Never get fingers caught in the pistons.

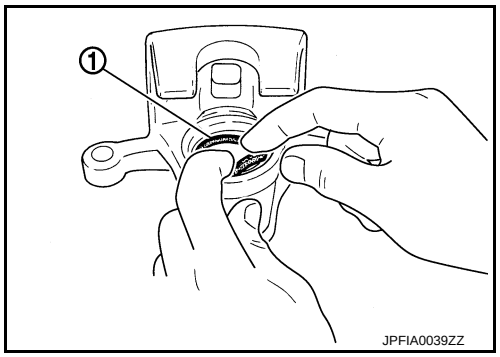


5. Remove piston seals from cylinder body using seal pick tool.
CAUTION:
Be careful not to damage a cylinder inner wall.
6. Remove bleeder valve and cap.
7. Perform inspection after disassembly. Refer to BR-114, "BRAKE CALIPER ASSEMBLY (1 PISTON TYPE) : Inspection".

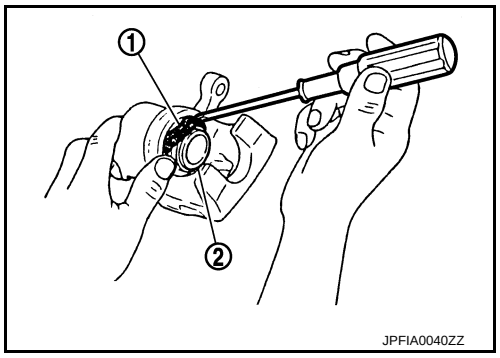


ASSEMBLY

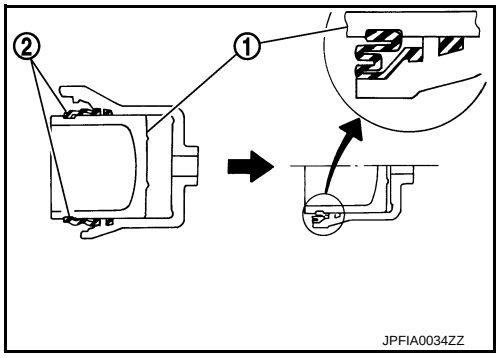
1. Install bleeder valve and cap.
2. Apply new brake fluid to piston seals ①, and install them to cylinder body.
CAUTION:
Never reuse piston seals.



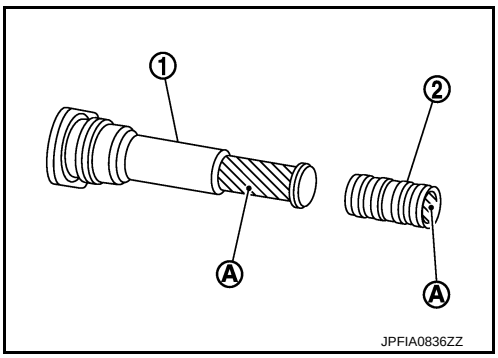
3. Apply rubber grease to piston boots ①. Cover the piston ② end with piston boot, and then install cylinder side lip on piston boot securely into a groove on cylinder body.
CAUTION:
Never reuse piston boots.



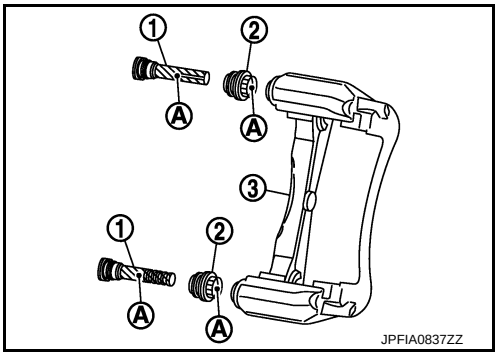
4. apply new brake fluid to pistons ①. Push piston into cylinder body by hand and push piston boot ② piston-side lip into the piston groove.
CAUTION:
Press the pistons evenly and vary the pressing point to prevent cylinder inner wall from being rubbed.



5. Apply rubber grease to mating faces Ⓐ between sliding pin ① and bushing ②, and install bushing to sliding pin.



6. Apply rubber grease to mating faces Ⓐ between sliding pins ① and sliding pin boots ②, and install sliding pins and sliding pin boots to torque member ③.
7. Install the cylinder body to tighten sliding pin bolts to the specified torque.



BRAKE CALIPER ASSEMBLY (1 PISTON TYPE) : Inspection

INFOID:0000000010838603

INSPECTION AFTER DISASSEMBLY

Check the following items and replace if necessary.

Cylinder Body

Check the cylinder inner wall for rust, wear, cracks or damage.

CAUTION:

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

Torque Member

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

Pistons

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

CAUTION:

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

Sliding Pin, Sliding Pin Boot and Bushing

Check the sliding pins, sliding pin boots and bushing for rust, wear, cracks or damage.

INSPECTION AFTER INSTALLATION

- Check a drag of front disc brake. If any drag is found, follow the procedure described below.

1. Remove brake pads. Refer to BR-103, "BRAKE PAD (1 PISTON TYPE) : Removal and Installation".
2. Press the pistons. Refer to BR-103, "BRAKE PAD (1 PISTON TYPE) : Removal and Installation".
3. Install brake pads. Refer to BR-103, "BRAKE PAD (1 PISTON TYPE) : Removal and Installation".
4. Depress the brake pedal several times.
5. Check a drag of front disc brake again. When any drag is found, disassemble the cylinder body and replace if necessary. Refer to BR-112, "BRAKE CALIPER ASSEMBLY (1 PISTON TYPE) : Disassembly and Assembly".

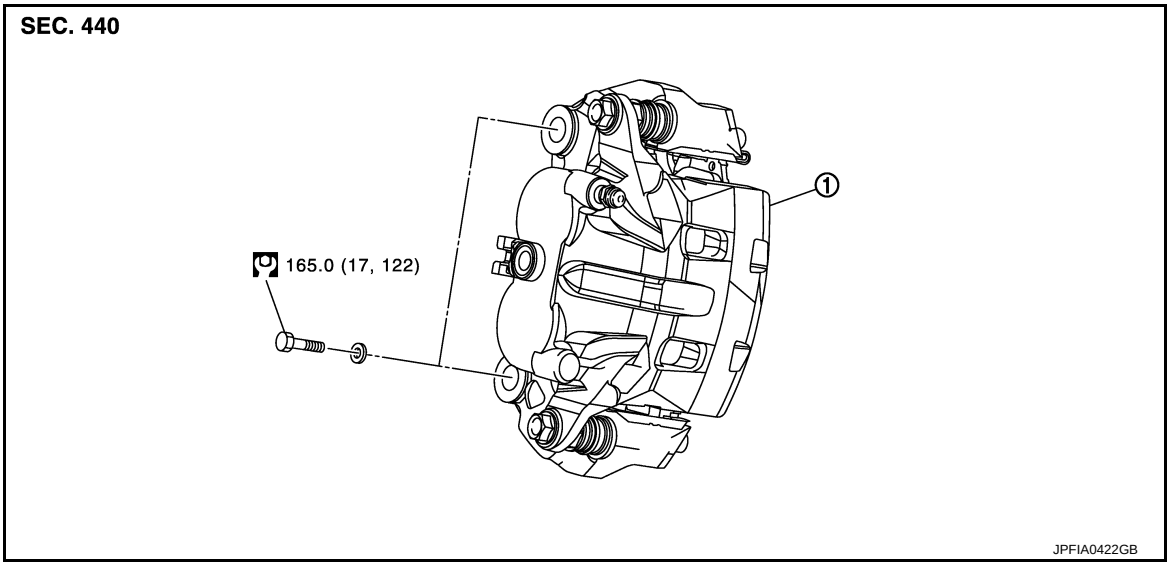
- Burnish contact surfaces brake pads and disc rotor after refinishing or replacing disc rotor, or if a soft pedal occurs at very low mileage. Refer to BR-81, "BRAKE PAD : Inspection and Adjustment".

BRAKE CALIPER ASSEMBLY (2 PISTON TYPE)

BRAKE CALIPER ASSEMBLY (2 PISTON TYPE) : Exploded View

INFOID:0000000010838972

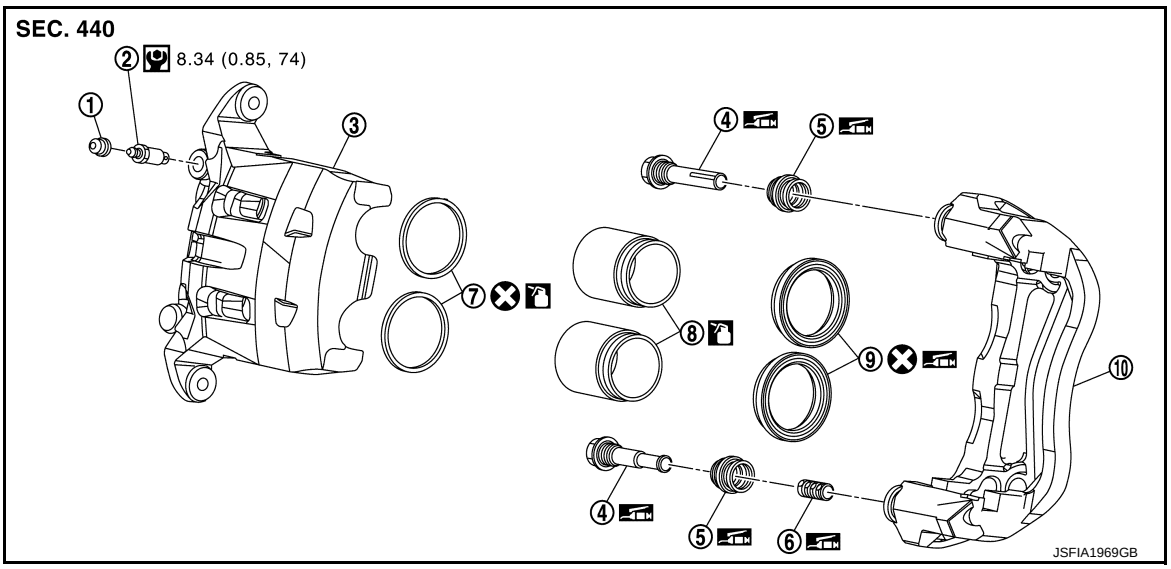
REMOVAL



① Brake caliper assembly

: N·m (kg-m, ft-lb)

DISASSEMBLY



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

: Apply rubber grease.

: Apply brake fluid.

: N·m (kg-m, in-lb)

: Always replace after every disassembly.

BRAKE CALIPER ASSEMBLY (2 PISTON TYPE) : Removal and Installation

INFOID:0000000010838973

REMOVAL

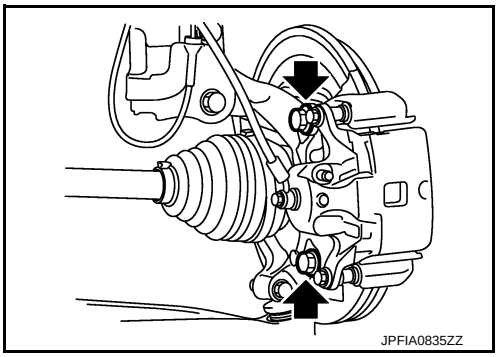
WARNING:

Since dust covering the front and rear brakes has an affect on human body, the dust must be removed with a dust collector. Never splatter the dust with an air blow gun.

CAUTION:

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

1. Remove tires with power tool.
2. Fix the disc rotor using wheel nuts.
3. Drain brake fluid. Refer to BR-77, "Draining".
4. Remove union bolt and copper washer, and separate brake hose from brake caliper assembly. Refer to BR-89, "FRONT : Removal and Installation".
5. Remove torque member mounting bolts, and remove brake caliper assembly.
   CAUTION:
   Never drop brake pad and brake caliper assembly.
6. Remove disc rotor.
   - 2WD: Refer to FAX-11, "Removal and Installation".
   - 4WD: Refer to FAX-72, "Removal and Installation".



INSTALLATION

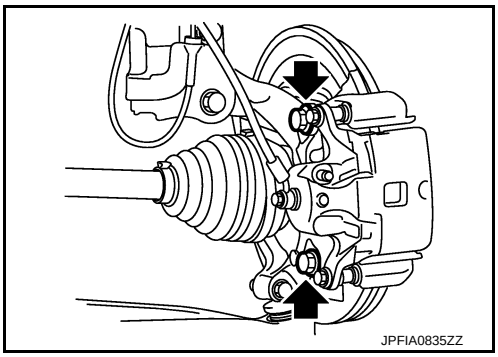
WARNING:

Since dust covering the front and rear brakes has an affect on human body, the dust must be removed with a dust collector. Never splatter the dust with an air blow gun.

CAUTION:

- **Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface. However avoid washing brake components with water.**
- **Never 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.**
- **Never allow foreign matter (e.g.dust) and oils other than brake fluid to enter the reservoir tank.**

1. Install disc rotor.
   - 2WD: Refer to FAX-11, "Removal and Installation".
   - 4WD: Refer to FAX-72, "Removal and Installation".
2. Install the brake caliper assembly to the steering knuckle and tighten the torque member mounting bolts to the specified torque.
   CAUTION:
   Never spill or splash any grease and moisture on the brake caliper assembly mounting face, threads, mounting bolts and washers. Wipe out any grease and moisture.
3. Install brake hose and copper washers to brake caliper assembly. Refer to BR-89, "FRONT : Removal and Installation".
   CAUTION:
   Never reuse copper washer.
4. Refill with new brake fluid and perform the air bleeding. Refer to BR-78, "Bleeding Brake System".
   CAUTION:



- **Never reuse brake fluid.**
- **Never spill or splash brake fluid on the surface of disc rotor.**

5. Check a drag of front disc brake. If any drag is found, refer to BR-119, "BRAKE CALIPER ASSEMBLY (2 PISTON TYPE) : Inspection".
6. Install tires. Refer to WT-61, "Removal and Installation"
7. Perform inspection after installation. Refer to BR-119, "BRAKE CALIPER ASSEMBLY (2 PISTON TYPE) : Inspection".

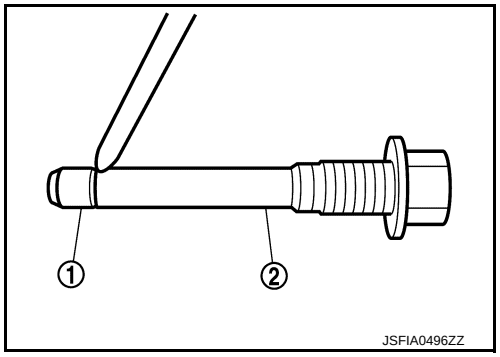
BRAKE CALIPER ASSEMBLY (2 PISTON TYPE) : Disassembly and Assembly

INFOID:0000000010838974

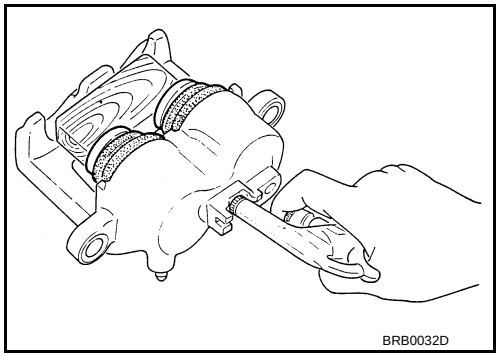
DISASSEMBLY

NOTE:
Never remove the torque member, brake pad and pad retainers when disassembling and assembling the cylinder body.

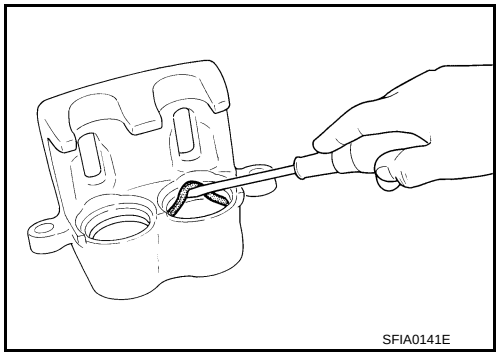
1. Remove the sliding pin bolt, and remove the cylinder body from the torque member. Refer to BR-107, "BRAKE PAD (2 PISTON TYPE) : Removal and Installation".
   CAUTION:
   Fix the brake pad at suitable tape so that the brake pad will not drop.
2. Remove sliding pins and sliding pin boots from torque member.
3. Remove bushing ① from sliding pin ②.



4. Place a wooden block as shown in the figure, and blow air from union bolt mounting hole to remove pistons and piston boots.
   CAUTION:
   Never get fingers caught in the pistons.



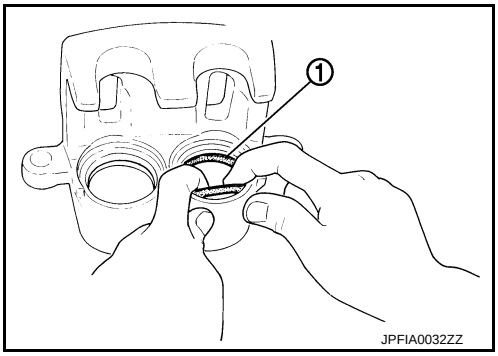
5. Remove piston seals from cylinder body using seal pick tool.
   CAUTION:
   Be careful not to damage a cylinder inner wall.
6. Remove bleeder valve and cap.
7. Perform inspection after disassembly. Refer to BR-119, "BRAKE CALIPER ASSEMBLY (2 PISTON TYPE) : Inspection".



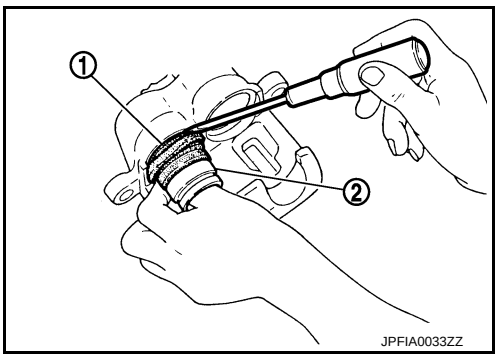
ASSEMBLY

1. Install bleeder valve and cap.

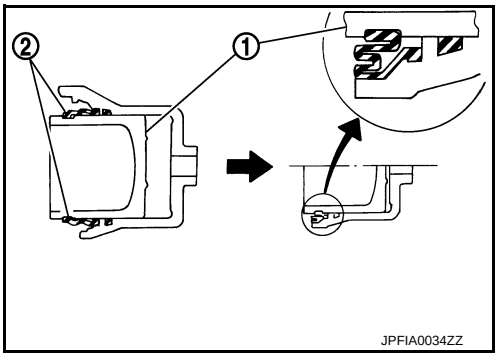
2. Apply new brake fluid to piston seals ①, and install them to cylinder body.
CAUTION:
Never reuse piston seals.



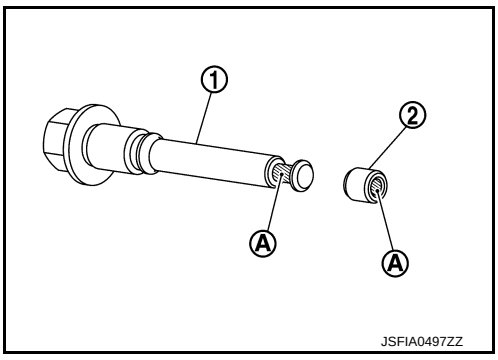
3. Apply rubber grease to piston boots ①. Cover the piston ② end with piston boot, and then install cylinder side lip on piston boot securely into a groove on cylinder body.
CAUTION:
Never reuse piston boots.



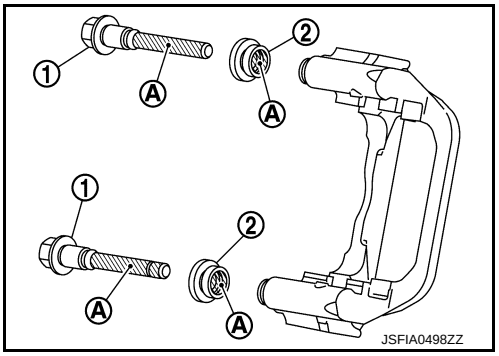
4. apply new brake fluid to pistons ①. Push piston into cylinder body by hand and push piston boot ② piston-side lip into the piston groove.
CAUTION:
Press the pistons evenly and vary the pressing point to prevent cylinder inner wall from being rubbed.



5. Apply rubber grease to mating faces Ⓐ between sliding pin ① and bushing ②, and install bushing to sliding pin.



6. Apply rubber grease to mating faces Ⓐ between sliding pins ① and sliding pin boots ②, and install sliding pins and sliding pin boots to torque member ③.
7. Install the cylinder body to tighten sliding pin bolts to the specified torque.



BRAKE CALIPER ASSEMBLY (2 PISTON TYPE) : Inspection

INFOID:0000000010838975

INSPECTION AFTER DISASSEMBLY

Check the following items and replace if necessary.

Cylinder Body

Check the cylinder inner wall for rust, wear, cracks or damage.

CAUTION:

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

Torque Member

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

Pistons

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

CAUTION:

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

Sliding Pin, Sliding Pin Boot and Bushing

Check the sliding pins, sliding pin boots and bushing for rust, wear, cracks or damage.

INSPECTION AFTER INSTALLATION

- Check a drag of front disc brake. If any drag is found, follow the procedure described below.

1. Remove brake pads. Refer to BR-107, "BRAKE PAD (2 PISTON TYPE) : Removal and Installation".
2. Press the pistons. Refer to BR-107, "BRAKE PAD (2 PISTON TYPE) : Removal and Installation".
3. Install brake pads. Refer to BR-107, "BRAKE PAD (2 PISTON TYPE) : Removal and Installation".
4. Depress the brake pedal several times.
5. Check a drag of front disc brake again. When any drag is found, disassemble the cylinder body and replace if necessary. Refer to BR-117, "BRAKE CALIPER ASSEMBLY (2 PISTON TYPE) : Disassembly and Assembly".

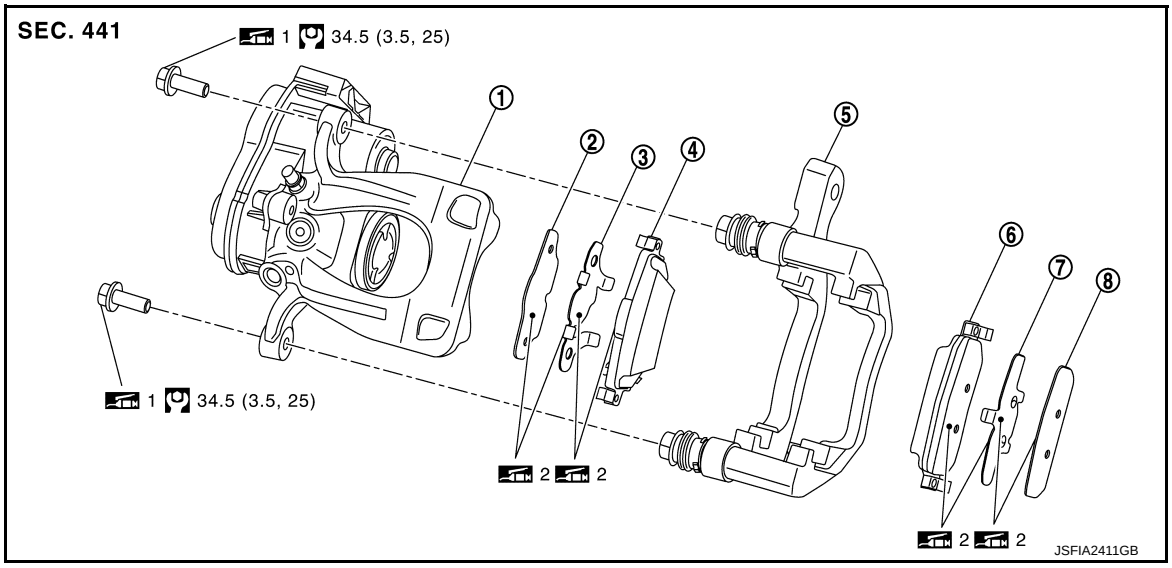
- Burnish contact surfaces brake pads and disc rotor after refinishing or replacing disc rotor, or if a soft pedal occurs at very low mileage. Refer to BR-81, "BRAKE PAD : Inspection and Adjustment".

REAR DISC BRAKE

BRAKE PAD

BRAKE PAD : Exploded View

INFOID:0000000010838976



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

1: Apply rubber grease.

2 : Apply MOLYKOTE® AS 880N or silicone-based grease.

: N·m (kg-m, ft-lb)

Molykote is a registered trademark of Dow Corning Corporation.

BRAKE PAD : Removal and Installation

INFOID:0000000010838977

REMOVAL

WARNING:

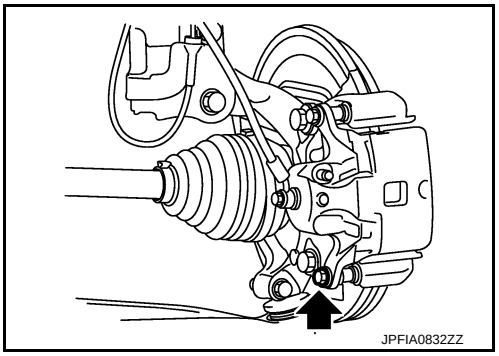
Since dust covering the front and rear brakes has an affect on human body, the dust must be removed with a dust collector. Never splatter the dust with an air blow gun.

CAUTION:

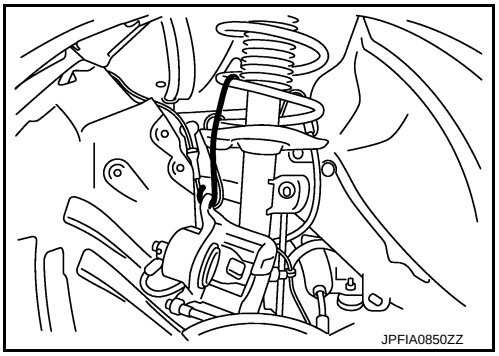
- **Never depress the brake pedal while removing the brake pads because the piston may pop out.**
- **If the brake fluid or grease adheres to the brake caliper assembly and disc rotor, quickly wipe it off.**

1. Release the parking brake.
2. Must be performed additional service when replacing brake pad. Refer to PB-52, "Work Procedure".
3. Remove tires.

4. Remove lower sliding pin bolt.


JPFIA0832ZZ

5. Suspend the cylinder body with suitable wire so that the brake hose and the electric parking brake harness will not stretch.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6. Remove the brake pads, shims and shim covers.

CAUTION:
- **Never damage the piston boots.**
- **Never drop the brake pads, shims and shim covers.**
- **Remember each position of the removed brake pads.**
- **Never damage the electric parking brake harness and bracket.**

7. Perform inspection after removal. Refer to BR-122, "BRAKE PAD : Inspection and Adjustment".

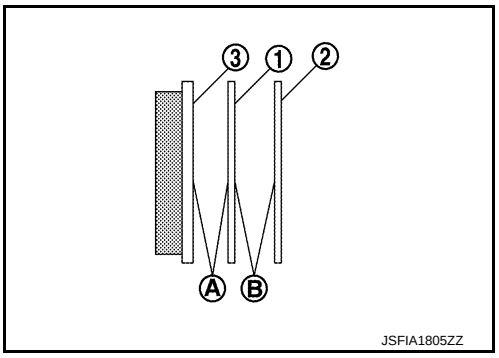
INSTALLATION

WARNING:
Since dust covering the front and rear brakes has an affect on human body, the dust must be removed with a dust collector. Never splatter the dust with an air blow gun.

CAUTION:
- **Never 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.**

1. Apply MOLYKOTE® AS880N or silicone-based grease to the mating faces Ⓐ between the shim ① and the pad ③, and the mating faces Ⓑ between the shim ① and the shim cover ②, and then install the shim and shim cover to the pad.

CAUTION:
Always replace the shims and shim covers when replacing the brake pad.
Molykote is a registered trademark of Dow Corning Corporation.



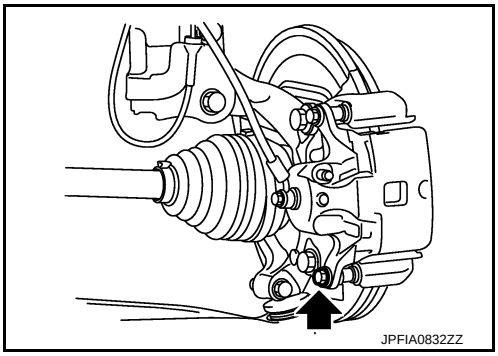
JSFIA1805ZZ

2. Install the brake pads to the torque member.
3. Apply rubber grease to the cylinder body mounting bolts, and then install the cylinder body to torque member.

CAUTION:

- **Never 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 reservoir tank when pressing piston in.**

4. Install the lower sliding pin bolt and tighten it to the specified torque.



5. Must be performed additional service when removing and installing/replacing brake pad.

When removing and installing brake pad
1. Perform “BRAKE OPERATION”. Refer to PB-61, "Work Procedure".
2. Perform “BRAKE RELEASE”. Refer to PB-63, "Work Procedure".

When replacing brake pad
- Refer to PB-52, "Work Procedure".

6. Depress the brake pedal several times to check that no drag feel is present for the front disc brake. Refer to BR-122, "BRAKE PAD : Inspection and Adjustment".
7. Install tires. Refer to WT-61, "Removal and Installation".

BRAKE PAD : Inspection and Adjustment

INFOID:0000000010838978

INSPECTION AFTER REMOVAL

- Replace the shims and shim covers if rust is excessively attached.
- Eliminate rust on the pad and the torque member. Replace them if rust is excessively attached.

INSPECTION AFTER INSTALLATION

- Check a drag of rear disc brake. If any drag is found, follow the procedure described below.

1. Remove brake pads. Refer to BR-120, "BRAKE PAD : Removal and Installation".
2. Press the pistons. Refer to BR-120, "BRAKE PAD : Removal and Installation".
3. Install brake pads. Refer to BR-120, "BRAKE PAD : Removal and Installation".
4. Depress the brake pedal several times.
5. Check a drag of rear disc brake again. If any drag is found, disassemble the cylinder body and replace if necessary. Refer to BR-125, "BRAKE CALIPER ASSEMBLY : Disassembly and Assembly".

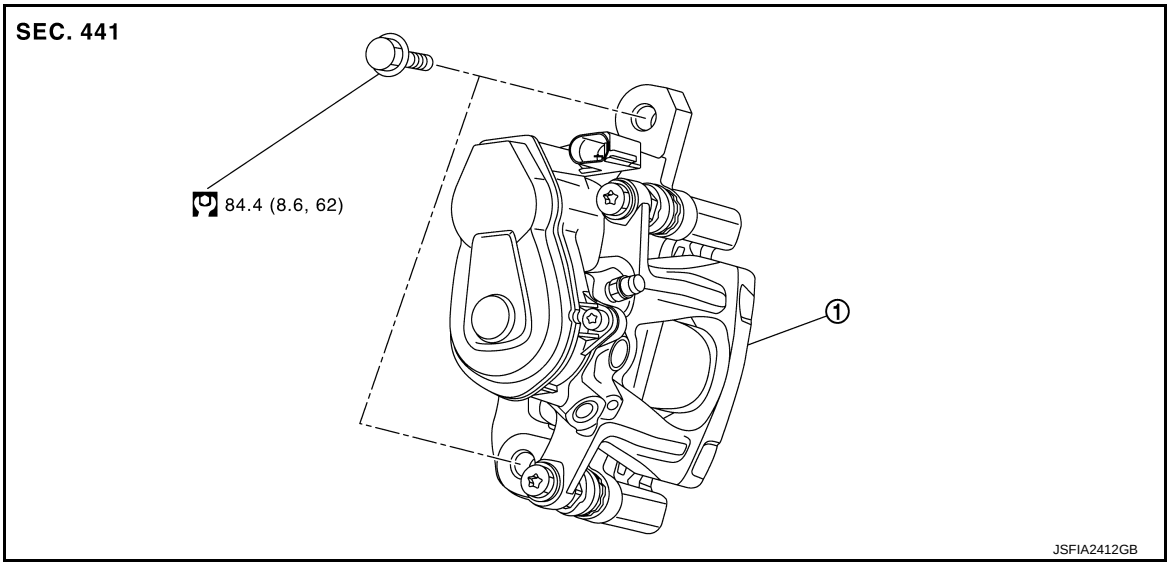
- Burnish contact surfaces brake pads and disc rotor after refinishing or replacing brake pads, or if a soft pedal occurs at very low mileage. Refer to BR-83, "BRAKE PAD : Inspection and Adjustment".

BRAKE CALIPER ASSEMBLY

BRAKE CALIPER ASSEMBLY : Exploded View

INFOID:0000000010838979

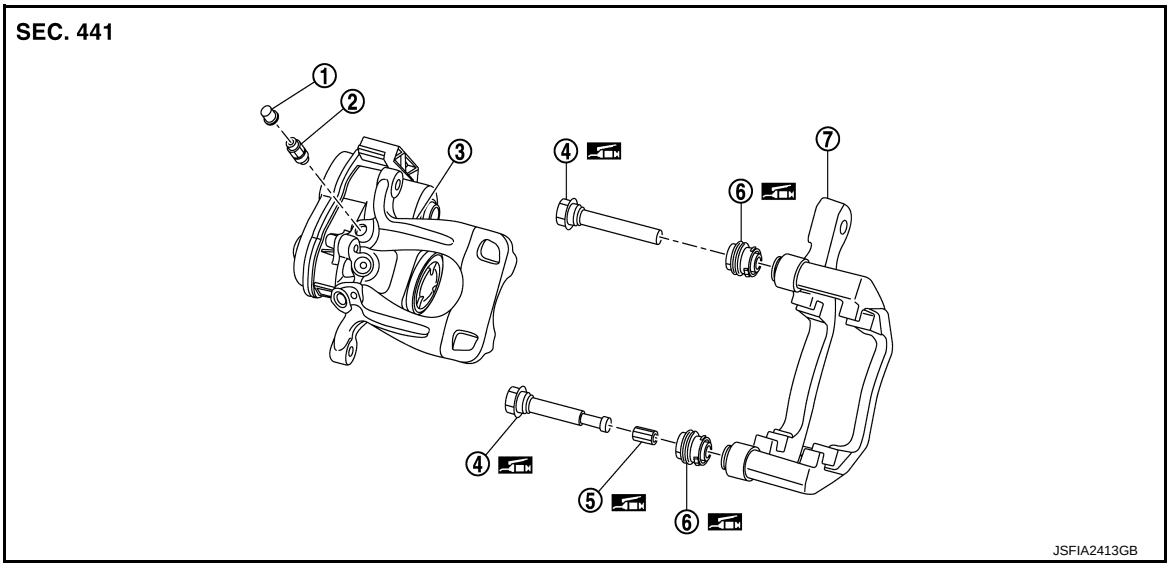
REMOVAL



① Brake caliper assembly

: N·m (kg-m, ft-lb)

DISASSEMBLY



① Cap
② Bleeder valve
③ Cylinder body
④ Sliding pin
⑤ Bushing
⑥ Bushing
⑦ Torque member

: Apply rubber grease.

BRAKE CALIPER ASSEMBLY : Removal and Installation

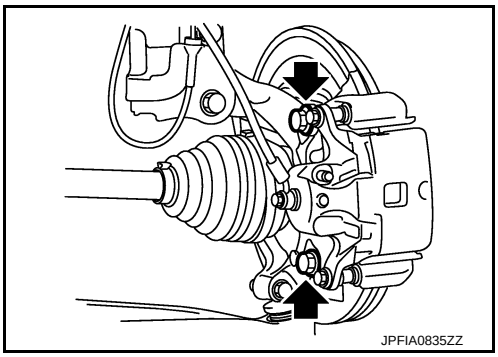
INFOID:0000000010838980

REMOVAL

WARNING:
Since dust covering the front and rear brakes has an affect on human body, the dust must be removed with a dust collector. Never splatter the dust with an air blow gun.
CAUTION:

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

1. Release the parking brake.
2. Must be performed additional service when replacing brake calipper. Refer to PB-55, "Work Procedure".
3. Remove tires.
4. Fix the disc rotor using wheel nuts.
5. Drain brake fluid. Refer to BR-77, "Draining".
6. Remove union bolt and copper washer, and separate brake hose from brake caliper assembly. Refer to BR-92, "REAR : Removal and Installation".
7. Remove torque member mounting bolts, and remove brake caliper assembly.
   CAUTION:
   - **Never drop brake pad and brake caliper assembly.**
   - **Never damage the electric parking brake harness and bracket.**
8. Remove disc rotor.
   - 2WD: Refer to RAX-7, "Removal and Installation".
   - 4WD: Refer to RAX-18, "Removal and Installation".

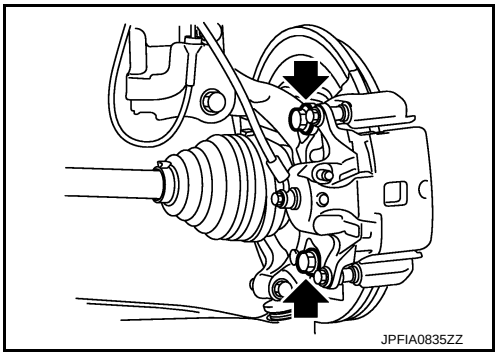


INSTALLATION

WARNING:
Since dust covering the front and rear brakes has an affect on human body, the dust must be removed with a dust collector. Never splatter the dust with an air blow gun.
CAUTION:

- **Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface. However avoid washing brake components with water.**
- **Never 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.**
- **Never allow foreign matter (e.g.dust) and oils other than brake fluid to enter the reservoir tank.**

1. Install disc rotor.
   - 2WD: Refer to RAX-7, "Removal and Installation".
   - 4WD: Refer to RAX-18, "Removal and Installation".
2. Install the brake caliper assembly to the steering knuckle and tighten the torque member mounting bolts to the specified torque.
   CAUTION:
   Never spill or splash any grease and moisture on the brake caliper assembly mounting face, threads, mounting bolts and washers. Wipe out any grease and moisture.
3. Install brake hose and copper washers to brake caliper assembly. Refer to BR-92, "REAR : Removal and Installation".
   CAUTION:
   Never reuse copper washer.



4. Must be performed additional service when removing and installing/replacing brake pad.

   When removing and installing brake pad
   1. Perform “BRAKE OPERATION”. Refer to PB-61, "Work Procedure".
   2. Perform “BRAKE RELEASE”. Refer to PB-63, "Work Procedure".

   When replacing brake pad
   - Refer to PB-52, "Work Procedure".
5. Refill with new brake fluid and perform the air bleeding. Refer to BR-78, "Bleeding Brake System".

CAUTION:
- **Never reuse brake fluid.**
- **Never spill or splash brake fluid on the surface of disc rotor.**

6. Check a drag of rear disc brake. If any drag is found, refer to BR-126, "BRAKE CALIPER ASSEMBLY : Inspection and Adjustment".
7. Install tires. Refer to WT-61, "Removal and Installation"
8. Perform inspection after installation. Refer to BR-126, "BRAKE CALIPER ASSEMBLY : Inspection and Adjustment".

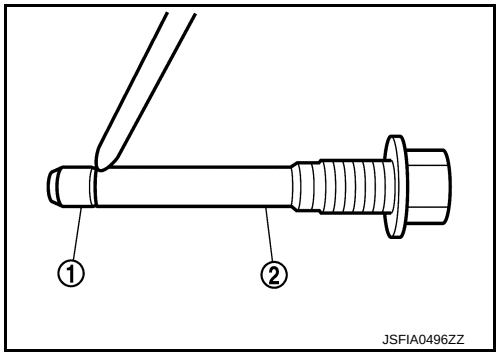
BRAKE CALIPER ASSEMBLY : Disassembly and Assembly

INFOID:0000000010838981

DISASSEMBLY

NOTE:
Never remove the torque member and brake pad when disassembling and assembling the cylinder body.

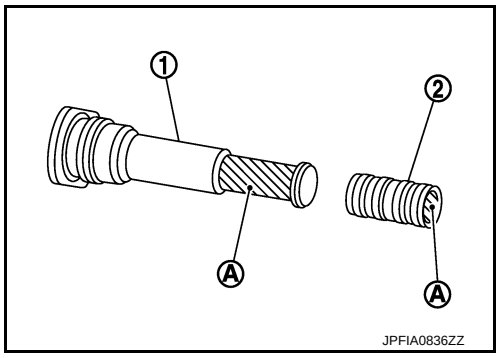
1. Remove the sliding pin bolt, and remove the cylinder body from the torque member. Refer to BR-120, "BRAKE PAD : Removal and Installation".
   CAUTION:
   Fix the brake pad at suitable tape so that the brake pad will not drop.
2. Remove sliding pins and sliding pin boots from torque member.
3. Remove bushing ① from sliding pin ②.



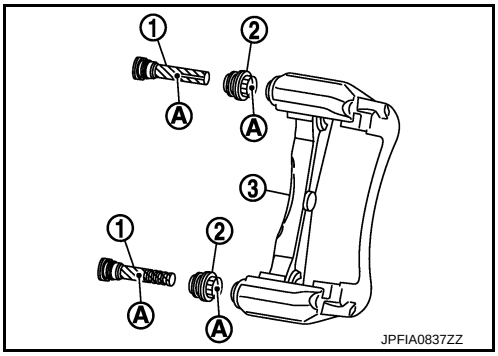
4. Remove bleeder valve and cap.
5. Perform inspection after disassembly. Refer to BR-126, "BRAKE CALIPER ASSEMBLY : Inspection and Adjustment".

ASSEMBLY

1. Install bleeder valve and cap.
2. Apply rubber grease to mating faces Ⓐ between sliding pin ① and bushing ②, and install bushing to sliding pin.



3. Apply rubber grease to mating faces Ⓐ between sliding pins ① and sliding pin boots ②, and install sliding pins and sliding pin boots to torque member ③.



4. Install the cylinder body to tighten cylinder body mounting bolts to the specified torque. Refer to BR-120, "BRAKE PAD : Exploded View".

BRAKE CALIPER ASSEMBLY : Inspection and Adjustment

INFOID:0000000010838982

INSPECTION AFTER DISASSEMBLY

Check the following items and replace if necessary.

Cylinder Body

Check the cylinder inner wall for rust, wear, cracks or damage.

CAUTION:

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

Torque Member

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

Sliding Pin, Sliding Pin Boot and Bushing

Check the sliding pins, sliding pin boots and bushing for rust, wear, cracks or damage.

INSPECTION AFTER INSTALLATION

- Check a drag of rear disc brake. If any drag is found, follow the procedure described below.

1. Remove brake pads. Refer to BR-120, "BRAKE PAD : Removal and Installation".
2. Press the pistons. Refer to BR-120, "BRAKE PAD : Removal and Installation".
3. Install brake pads. Refer to BR-120, "BRAKE PAD : Removal and Installation".
4. Depress the brake pedal several times.
5. Check a drag of rear disc brake again. When any drag is found, disassemble the cylinder body and replace if necessary. Refer to BR-125, "BRAKE CALIPER ASSEMBLY : Disassembly and Assembly".

- Burnish contact surfaces brake pads and disc rotor after refinishing or replacing disc rotor, or if a soft pedal occurs at very low mileage. Refer to BR-83, "BRAKE PAD : Inspection and Adjustment".

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

General Specifications

INFOID:0000000010930899

Unit: mm (in)

Front brake	Caliper type	1 piston type	2 piston type
	Cylinder bore diameter	60.33 (2.3752)	44.45 × 2 (1.7500 × 2)
	Pad length × width × thickness	123.6 × 47.5 × 10.5 (4.87 × 1.870 × 0.413)	133.6 × 48.5 × 10.0 (5.26 × 1.909 × 0.39)
	Rotor outer diameter × thickness	296 × 26.0 (11.65 × 1.024)	320 × 28.0 (12.60 × 1.102)
Rear brake	Cylinder bore diameter	38.2 (1.504)	
	Pad length × width × thickness	82.9 × 39.8 × 9.0 (3.263 × 1.567 × 0.354)	
	Rotor outer diameter × thickness	292 × 16.0 (11.50 × 0.630)	
Master cylinder	Cylinder bore diameter	23.81 (0.9374)	
Control valve	Valve type	Electric brake force distribution	
Brake booster	Diaphragm diameter	250 (0.9374)	
Recommended brake fluid		Refer to MA-23, "Fluids and Lubricants".	

Brake Pedal

INFOID:0000000010838623

Unit: mm (in)

Item	Standard
Brake pedal height	175.0 – 185.0 (6.89 – 7.28)
Depressed brake pedal height [Depressing 490 N (50 kg, 110 lb) while turning the engine ON]	85.0 (3.35) or more
Clearance between stop lamp switch and brake pedal position switch (with ASCD) threaded end and the brake pedal lever	0.20 – 1.96 (0.0079 – 0.0772)
Brake pedal play	3 – 11 (0.12 – 0.43)

Brake Booster

INFOID:0000000010838624

Unit: mm (in)

Item	Standard
Input rod length	124.25 – 125.75 (4.89 – 4.95)

Front Disc Brake

INFOID:0000000010930900

Unit: mm (in)

Item		Limit	
Brake caliper type		1 piston type	2 piston type
Brake pad	Wear thickness	2.0 (0.079)	2.0 (0.079)
Disc rotor	Wear thickness	24.0 (0.945)	26.0 (1.0236)
	Thickness variation (measured at 8 positions)	0.020 (0.0008)	0.020 (0.0008)
	Runout (with it attached to the vehicle)	0.035 (0.0014)	0.035 (0.0014)

Rear Disc Brake

INFOID:0000000010930901

Unit: mm (in)

Item		Limit
Brake pad	Wear thickness	2.0 (0.079)
Disc rotor	Wear thickness	14.0 (0.551)
	Thickness variation (measured at 8 positions)	0.020 (0.0008)
	Runout (with it attached to the vehicle)	0.070 (0.0028)