

SECTION **BR**  
BRAKE SYSTEM

A  
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D  
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# PRECAUTIONS

< PRECAUTION >

## PRECAUTION

### PRECAUTIONS

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

INFOID:000000007093463

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SR and SB section of this Service Manual.

#### **WARNING:**

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

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

#### **WARNING:**

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

#### Precaution for Brake system

INFOID:000000006920555

#### **WARNING:**

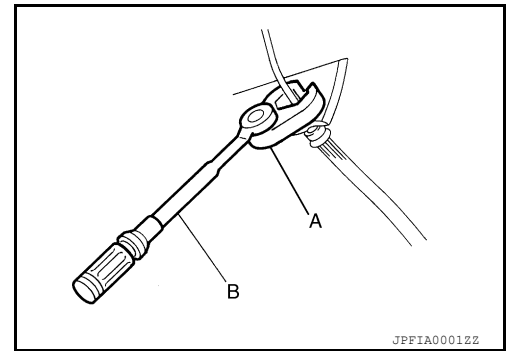
Clean any dust from the front brake and rear brake with a vacuum dust collector. Do not blow with compressed air.

- Brake fluid use refer to [MA-13, "Fluids and Lubricants"](#).
- Do not reuse drained brake fluid.
- Do not spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.
- Always confirm the specified tightening torque when installing the brake pipes.
- After pressing the brake pedal more deeply or harder than normal driving, such as air bleeding, check each item of brake pedal. Adjust brake pedal if it is outside the standard value.
- Always clean with new brake fluid when cleaning the brake caliper and other components.
- Do not use mineral oils such as gasoline or light oil to clean. They may damage rubber parts and cause improper operation.
- Always loosen the brake tube flare nut with a flare nut wrench.

## PRECAUTIONS

### < PRECAUTION >

- Tighten the brake tube flare nut to the specified torque with a crow-foot (A) and torque wrench (B).
- Brake system is an important safety part. If a brake fluid leak is detected, always disassemble the affected part. If a malfunction is detected, replace part with a new one.
- Always connect the battery terminals when moving the vehicle.
- Turn the ignition switch OFF and disconnect the hydraulic booster assembly harness connector or the battery negative terminal before performing the work.
- Check that no brake fluid leakage is present after replacing the parts.
- Burnish the brake contact surfaces after refinishing or replacing rotors, after replacing pads, or if a soft pedal occurs at very low mileage.
- Front brake pad: Refer to [BR-15, "BRAKE PAD : Inspection and Adjustment"](#).
- Front disc rotor: Refer to [BR-15, "DISC ROTOR : Inspection and Adjustment"](#).
- Rear brake pad: refer to [BR-17, "BRAKE PAD : Inspection and Adjustment"](#).
- Rear disc rotor: [BR-17, "DISC ROTOR : Inspection and Adjustment"](#).



# PREPARATION

< PREPARATION >

## PREPARATION

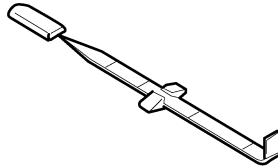
### PREPARATION

#### Special Service Tools

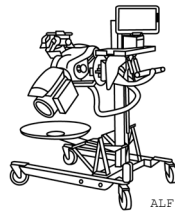
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The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
— (J-46532) Brake and clutch pedal height measurement tool	Measuring brake pedal height
38-PFM92-GYX/5 ( — ) GYR On-Car Brake Lathe Package with 5 Adapters	Refinish rotors



LFIA0227E



ALFIA02192Z

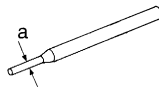
#### Commercial Service Tools

INFOID:000000006920556

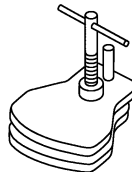
Tool name	Description
Power tool	Loosening nuts, screws and bolts
Pin punch a: 4 mm (0.16 in)	Removing and installing reservoir tank
Brake caliper wrench	Return the piston



PIIB1407E



NT410



NNFIA00402Z

# NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

< SYMPTOM DIAGNOSIS >

## SYMPTOM DIAGNOSIS

### NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

#### NVH Troubleshooting Chart

INFOID:000000006920557

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

Symptom		BRAKE	Possible cause and SUSPECTED PARTS													Reference page						
			Pads damaged	Pads uneven wear	Shims damaged	Rotor imbalance	Rotor damage	Rotor runout	Rotor deformation	Rotor deflection	Rotor rust	Rotor thickness variation	PROPELLER SHAFT	DIFFERENTIAL	AXLE AND SUSPENSION	TIRE	ROAD WHEEL	AXLE SHAFT	STEERING			
	Noise	x	x	x																	BR-15, BR-17	
	Shake				x																	BR-15, BR-17
	Shimmy, Shudder				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	BR-30, BR-34 BR-15, BR-17 BR-15, BR-17 BR-15, BR-17 BR-15, BR-17 BR-15, BR-17 BR-15, BR-17 BR-15, BR-17 BR-15, BR-17 BR-15, BR-17 BR-15, BR-17 BR-15, BR-17 BR-15, BR-17 NVH in DLN section NVH in DLN section NVH in FAX, RAX and FSU, RSU section NVH in WT section NVH in WT section NVH in RAX section NVH in ST section

x: Applicable

# BRAKE PEDAL

< PERIODIC MAINTENANCE >

## PERIODIC MAINTENANCE

### BRAKE PEDAL

#### Inspection and Adjustment

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#### INSPECTION

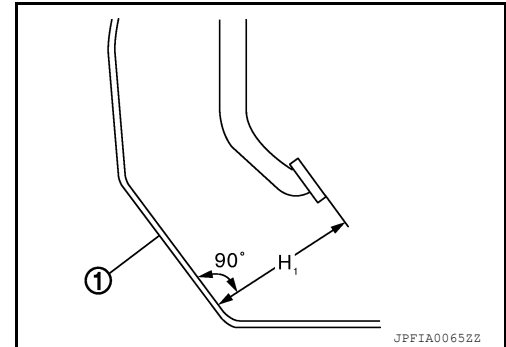
##### Brake Pedal Height

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

**Brake pedal height ( $H_1$ )** : Refer to [BR-42, "Brake Pedal"](#).

#### CAUTION:

Check the height with the floor trim removed.



##### Stop Lamp Switch and ASCD Brake Switch (if equipped)

Check the clearance ( $C$ ) between the brake pedal bracket (1) and the stop lamp switch and ASCD brake switch (2) (if equipped) threaded end.

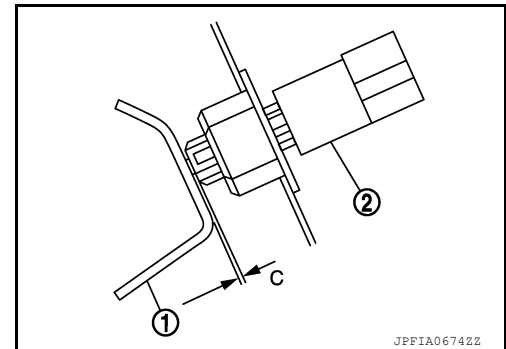
**Clearance ( $C$ )** Refer to [BR-42, "Brake Pedal"](#)

#### 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 ASCD brake switch (if equipped) threaded end and the brake pedal bracket.



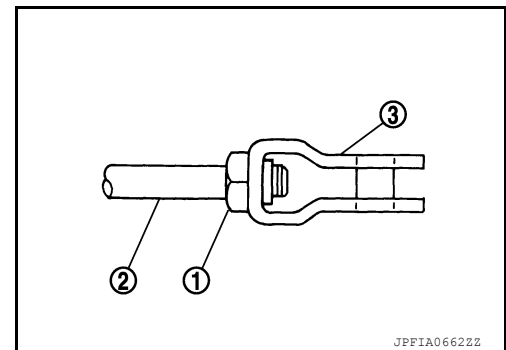
#### ADJUSTMENT

##### Brake Pedal Height

1. Disconnect the stop lamp switch harness connector and the ASCD brake switch harness connector.
2. Loosen the stop lamp switch and ASCD brake switch (if equipped) by turning it 45° counterclockwise.
3. Loosen the input rod lock nut (1).
4. Rotate the input rod (2), and adjust the brake pedal to the specified height.

#### CAUTION:

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

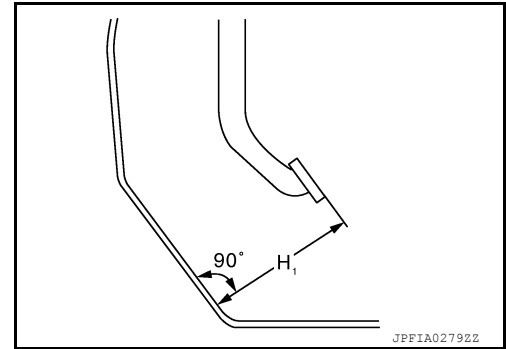


# BRAKE PEDAL

## < PERIODIC MAINTENANCE >

**Brake pedal height (H<sub>1</sub>)** : Refer to [BR-42, "Brake Pedal"](#).

5. Tighten the lock nut. Refer to [BR-25, "Removal and Installation"](#).
6. Adjust the clearance between the brake pedal bracket and the stop lamp switch and ASCD brake switch (if equipped) threaded end after adjusting the brake pedal height.



### Stop Lamp Switch and ASCD Brake Switch (if equipped)

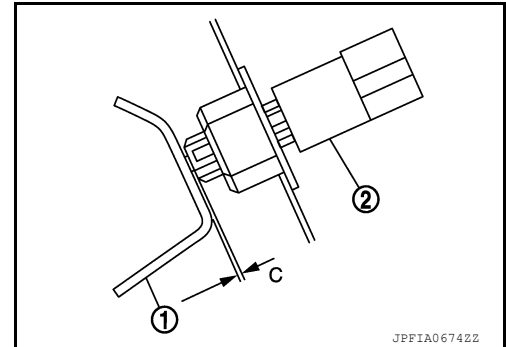
1. Disconnect the stop lamp switch harness connector and the ASCD brake switch harness connector.
2. Loosen the stop lamp switch and ASCD brake switch (if equipped) by turning it 45° counterclockwise.
3. Press-fit the stop lamp switch and ASCD brake switch (2) (if equipped) until the stop lamp switch and ASCD brake switch hits the brake pedal bracket (1) then rotate stop lamp switch and ASCD brake switch (if equipped) 45° clockwise to lock in position while pulling up on the brake pedal pad slightly.

#### **CAUTION:**

- The clearance (C) between the brake pedal bracket and stop lamp switch and ASCD brake switch (if equipped) threaded end must be within the specified value.

**Clearance (C)** : Refer to [BR-42, "Brake Pedal"](#).

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





# BRAKE FLUID

< PERIODIC MAINTENANCE >

## BRAKE FLUID

### Inspection

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#### BRAKE FLUID LEVEL

- Check that the fluid level in the reservoir tank is within the specified range (MAX – MIN lines).

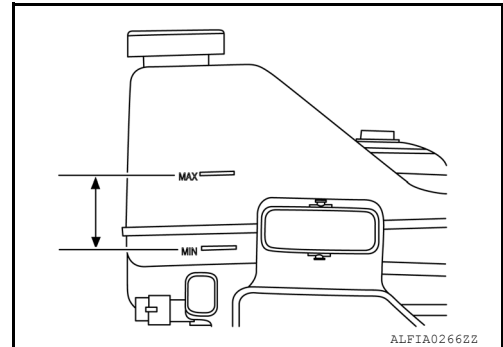
**CAUTION:**

**Turn OFF the ignition switch and depress the brake pedal 20 times or more to check brake fluid level.**

**NOTE:**

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

- Visually check for any brake fluid leakage around the reservoir tank.
- Check the brake system for any leakage if the brake fluid level is extremely low (lower than MIN).
- Check the brake system for brake 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.



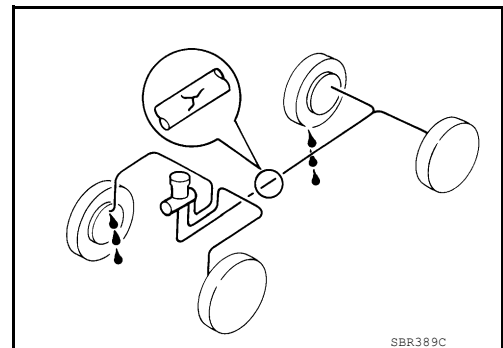
#### BRAKE LINE

1. Check brake line (tubes and hoses) for cracks, deterioration or other damage. Replace any damaged parts.

**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.**

2. Depress the brake pedal with a force of 490 N (50 kg-f, 110 lb-f) and hold down the pedal for approximately 5 seconds with the engine running. Check for any fluid leakage.



### Draining

INFOID:000000006920560

#### FRONT BRAKE

**CAUTION:**

- If the brake fluid adheres to the brake caliper assembly and disc rotor, quickly wipe it off.
- Do not spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.
- Do not operate the brake pedal with the reservoir cap removed. Failure to do this may cause a discharge of brake fluid from the reservoir cap opening.
- Do not operate the brake pedal excessively during the work procedure.

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

#### REAR BRAKE

**CAUTION:**

- If the brake fluid adheres to the brake caliper assembly and disc rotor, quickly wipe it off.
- Do not spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.
- Do not operate the brake pedal with the reservoir cap removed. Failure to do this may cause a discharge of brake fluid from the reservoir cap opening.
- Do not operate the brake pedal excessively during the work procedure.

1. Turn the ignition switch ON.
2. Connect a vinyl tube to the bleeder valve.

# BRAKE FLUID

## < PERIODIC MAINTENANCE >

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3. Depress the brake pedal and loosen the bleeder valve to gradually discharge brake fluid.

**NOTE:**

Since brake fluid is conveyed by the motor, the brake pedal is not necessarily depressed.

## Refilling

INFOID:000000006920561

### FRONT BRAKE

**CAUTION:**

- If the brake fluid adheres to the brake caliper assembly and disc rotor, quickly wipe it off.
- Do not spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.
- Do not operate the brake pedal with the reservoir cap removed. Failure to do this may cause a discharge of brake fluid from the reservoir cap opening.
- Do not operate the brake pedal excessively during the work procedure.
- Monitor the brake fluid level in the reservoir tank while performing the refilling.

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

**CAUTION:**

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

2. Turn the ignition switch ON.
3. Connect a vinyl tube to the bleeder valve.
4. Depress the brake pedal and loosen the bleeder valve.
5. Depress the brake pedal several times until the refilled brake fluid is discharged and tighten the bleeder valve to the specified torque with the brake pedal depressed. Refer to [BR-33, "Exploded View"](#).
6. Bleed the brake system. Refer to [BR-10, "Bleeding Brake System"](#).

### REAR BRAKE

**CAUTION:**

- If the brake fluid adheres to the brake caliper assembly and disc rotor, quickly wipe it off.
- Do not spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.
- Do not operate the brake pedal with the reservoir cap removed. Failure to do this may cause a discharge of brake fluid from the reservoir cap opening.
- Do not operate the brake pedal excessively during the work procedure.
- Monitor the brake fluid level in the reservoir tank while performing the refilling.

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

**CAUTION:**

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

2. Turn the ignition switch ON.
3. Connect a vinyl tube to the bleeder valve.
4. Depress the brake pedal and loosen the bleeder valve.
5. Depress the brake pedal several times until the refilled brake fluid is discharged and tighten the bleeder valve to the specified torque with the brake pedal depressed. Refer to [BR-10, "Refilling"](#).

**NOTE:**

Since brake fluid is conveyed by the motor, the brake pedal is not necessarily depressed.

6. Bleed the brake system. Refer to [BR-10, "Bleeding Brake System"](#).

## Bleeding Brake System

INFOID:000000006920562

**CAUTION:**

- Bleed air in the following order: motor/accumulator assembly → front right brake → front left brake → rear left brake → and rear right brake.
- The VDC warning lamp, ABS warning lamp and brake warning lamp turn ON and DTC "C118E" may be detected in self-diagnosis result for "ABS" with CONSULT when the brake pedal is excessively operated, such as air bleeding. This is not a system malfunction because this occurs due to the temporary decrease in accumulator fluid pressure. The system returns to normal condition when the accumulator fluid pressure reaches the specified pressure with the ignition switch ON and the VDC

# BRAKE FLUID

## < PERIODIC MAINTENANCE >

warning lamp, ABS warning lamp, and brake warning lamp turn OFF. After these steps, erase self-diagnosis results for "ABS" with CONSULT.

- DTC other than "C118E" is detected: Refer to [BRC-44, "DTC Index"](#).

### NOTE:

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

## MOTOR/ACCUMULATOR ASSEMBLY

### CAUTION:

- If the brake fluid adheres to the brake caliper assembly and disc rotor, quickly wipe it off.
- Do not spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.
- Do not operate the brake pedal with the reservoir cap removed. Failure to do this may cause a discharge of brake fluid from the reservoir cap opening.
- Do not operate the brake pedal excessively during the work procedure.
- Monitor the brake fluid level in the reservoir tank while performing the air bleeding.
- Bleed air in the following order: motor/accumulator assembly → front right brake → front left brake → rear left brake → and rear right brake.

1. Turn the ignition switch OFF.
2. Depress the brake pedal 20 times or more.
3. Check that there is no foreign material in the reservoir tank, and refill with new brake fluid.

### CAUTION:

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

4. Turn the ignition switch ON.

### NOTE:

The motor is activated and automatically stops.

5. Turn the ignition switch OFF.

6. Depress the brake pedal 20 times or more.

### NOTE:

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

7. Repeat steps 4 to 6 for 5 times.
8. Turn the ignition switch ON to check that the time between motor activation and automatic stop is less than 18 seconds. If the time is 18 seconds or more, repeat from Step 4 to 8.

## FRONT BRAKE

### CAUTION:

- If the brake fluid adheres to the brake caliper assembly and disc rotor, quickly wipe it off.
- Do not spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.
- Do not operate the brake pedal with the reservoir cap removed. Failure to do this may cause a discharge of brake fluid from the reservoir cap opening.
- Do not operate the brake pedal excessively during the work procedure.
- Monitor the brake fluid level in the reservoir tank while performing the air bleeding.
- Bleed air in the following order: motor/accumulator assembly → front right brake → front left brake → rear left brake → and rear right brake.

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

### NOTE:

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

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

### CAUTION:

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

4. Turn the ignition switch ON.

# BRAKE FLUID

## < PERIODIC MAINTENANCE >

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5. Connect a vinyl tube to the bleeder valve.
6. Depress the brake pedal and loosen the bleeder valve.
7. Repeat steps 1 to 6 until all of the air is out of the brake line and tighten the bleeder valve to the specified torque with the brake pedal depressed. Refer to [BR-29, "Exploded View"](#).
8. Check that no drag feel is present for the front disc brake. Refer to [BR-31, "Inspection Brake Caliper Assembly and Disc Rotor"](#).
9. Check each item of brake pedal. Adjust it if the measurement value is not the standard. Refer to [BR-7, "Inspection and Adjustment"](#).

## REAR BRAKE

### **CAUTION:**

- If the brake fluid adheres to the brake caliper assembly and disc rotor, quickly wipe it off.
- Do not spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.
- Do not operate the brake pedal with the reservoir cap removed. Failure to do this may cause a discharge of brake fluid from the reservoir cap opening.
- Do not operate the brake pedal excessively during the work procedure.
- Monitor the brake fluid level in the reservoir tank while performing the air bleeding.
- Bleed air in the following order: motor/accumulator assembly → front right brake → front left brake → rear left brake → and rear right brake.

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

### **NOTE:**

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

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

### **CAUTION:**

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

4. Turn the ignition switch ON.
  5. Connect a vinyl tube to the bleeder valve.
  6. Depress the brake pedal and loosen the bleeder valve.
  7. Depress and hold the brake pedal depression to discharge 100 cc of brake fluid before tightening the bleeder valve to the specified torque. Refer to [BR-33, "Exploded View"](#).
- ### **NOTE:**
- Since brake fluid is conveyed by the motor, the brake pedal is not necessarily depressed.
8. Release the brake pedal.
  9. Repeat steps 1 to 8 until all of the air is out of the brake line and tighten the bleeder valve to the specified torque with the brake pedal depressed. Refer to [BR-33, "Exploded View"](#).
  10. Check that no drag feel is present for the rear disc brake. Refer to [BR-36, "Inspection Brake Caliper Assembly and Disc Rotor"](#).
  11. Check each item of brake pedal. Adjust it if the measurement value is not the standard. Refer to [BR-7, "Inspection and Adjustment"](#).

## BRAKE FLUID LEVEL ADJUSTMENT AFTER AIR BLEEDING

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

### **NOTE:**

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

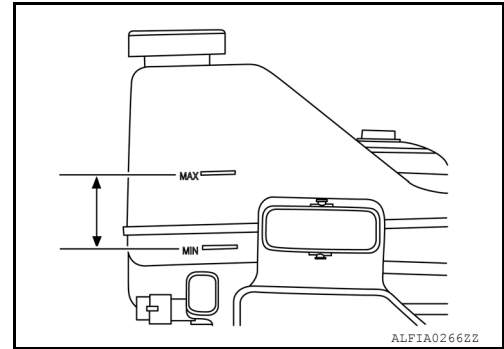
## BRAKE FLUID

### < PERIODIC MAINTENANCE >

- Adjust brake fluid level to the reservoir tank MAX line.  
**CAUTION:**  
**Do not adjust with the ignition switch ON.**
- Turn the ignition switch ON.
- Check that the reservoir tank brake fluid level is 4 – 12 mm (0.16 – 0.47 in) lower than the MAX line.

**NOTE:**

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



A

B

C

D

E

BR

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O

P

# HYDRAULIC BOOSTER ASSEMBLY

< PERIODIC MAINTENANCE >

## HYDRAULIC BOOSTER ASSEMBLY

---

### Inspection

INFOID:000000006920563

#### OPERATION CHECK

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

**NOTE:**

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

3. Check that the brake fluid level in the reservoir tank is within the specified range. Refer to [BR-9. "Inspection"](#)
4. Position the shift selector in P range to release the parking brake.
5. Turn the ignition switch ON to check the time between motor activation and motor stop.

**Motor operating time : 18 seconds or less**

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

**Motor operating time : 2 – 11 seconds**

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

#### FUNCTION CHECK

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

**NOTE:**

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

3. Turn the ignition switch ON with the brake pedal depressed to check that the clearance between the brake pedal and the dash lower panel decreases.

# FRONT DISC BRAKE

< PERIODIC MAINTENANCE >

## FRONT DISC BRAKE

### BRAKE PAD

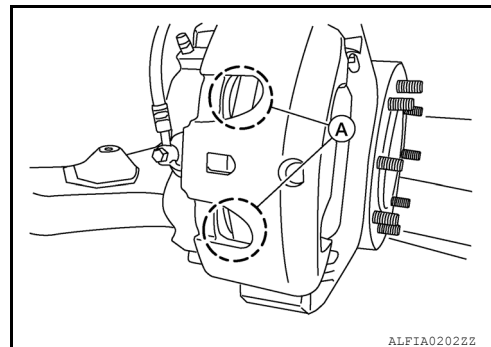
#### BRAKE PAD : Inspection and Adjustment

INFOID:000000006920564

#### INSPECTION

Check the thickness of brake pad using the inspection hole (A) on brake caliper assembly. Check using a scale if necessary.

**Wear thickness** : Refer to [BR-42, "Front Disc Brake"](#).



#### ADJUSTMENT

##### CAUTION:

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

1. Drive vehicle on straight, flat road.
2. Depress brake pedal 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 brakes.
4. Repeat steps 1 to 3 until pad and disc rotor are securely seated.

### DISC ROTOR

#### DISC ROTOR : Inspection and Adjustment

INFOID:000000006920565

#### INSPECTION

##### Appearance

Check surface of disc rotor for uneven wear, cracks, and serious damage. Replace it if necessary. Refer to [BR-31, "Removal and Installation of Brake Caliper Assembly and Rotor"](#).

##### Runout

1. Secure the disc rotor to the wheel hub and bearing assembly with wheel nuts (2 points at least).
2. Check the wheel bearing axial end play before the inspection. Refer to [RAX-6, "Removal and Installation"](#).
3. Inspect the runout with a dial indicator to measure at 20 mm (0.79 in) inside the disc edge.

**Runout** : Refer to [BR-42, "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. When refinishing, using Tool.

**Tool number** : 38-PFM92-GYX/5  
( — )

##### CAUTION:

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

# FRONT DISC BRAKE

## < PERIODIC MAINTENANCE >

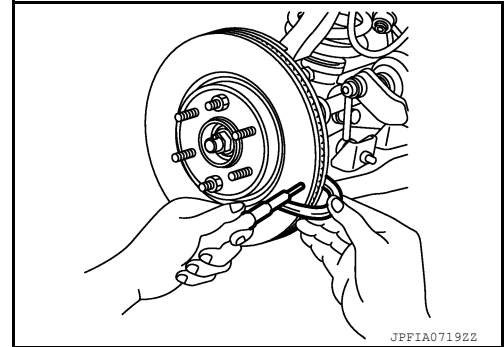
- If the thickness is less than wear thickness + 0.3 mm (0.012 in), replace the disc rotor. Refer to [BR-31, "Removal and Installation of Brake Caliper Assembly and Rotor"](#).

**Wear thickness** : Refer to [BR-42, "Front Disc Brake"](#).

### Thickness

Check the thickness of the disc rotor using a micrometer. Replace the disc rotor if the wear thickness is below the limit. Refer to [BR-31, "Removal and Installation of Brake Caliper Assembly and Rotor"](#).

**Wear thickness** : Refer to [BR-42, "Front Disc Brake"](#).



## ADJUSTMENT

### CAUTION:

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



# REAR DISC BRAKE

< PERIODIC MAINTENANCE >

## REAR DISC BRAKE

### BRAKE PAD

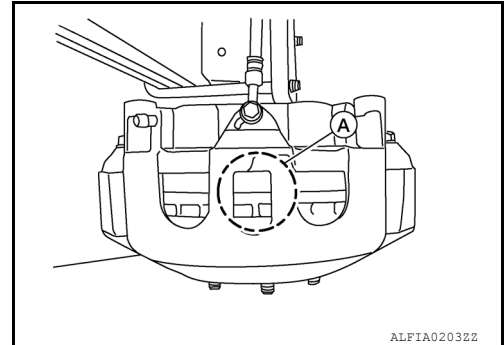
#### BRAKE PAD : Inspection and Adjustment

INFOID:000000006920566

#### INSPECTION

Check the thickness of brake pad from the inspection hole (A) on brake caliper assembly. Check using a scale if necessary.

**Wear thickness** : Refer to [BR-42, "Rear Disc Brake"](#).



#### ADJUSTMENT

##### CAUTION:

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

1. Drive vehicle on straight, flat road.
2. Depress brake pedal 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 brakes
4. Repeat steps 1 to 3 until pad and disc rotor are securely seated.

### DISC ROTOR

#### DISC ROTOR : Inspection and Adjustment

INFOID:000000006920567

#### INSPECTION

##### Appearance

Check surface of disc rotor for uneven wear, cracks, and serious damage. Replace it if necessary. Refer to [BR-42, "Rear Disc Brake"](#).

##### Runout

1. Secure the disc rotor to the wheel hub and bearing assembly with wheel nuts (2 points at least).
2. Check the wheel bearing axial end play before the inspection. Refer to [FAX-8, "Wheel Bearing"](#).
3. Inspect the runout with a dial indicator to measure at 20 mm (0.79 in) inside the disc edge.

**Runout** : Refer to [BR-42, "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. When refinishing, using Tool.

**Tool number** : 38-PFM92-GYX/5  
( — )

##### CAUTION:

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

## REAR DISC BRAKE

### < PERIODIC MAINTENANCE >

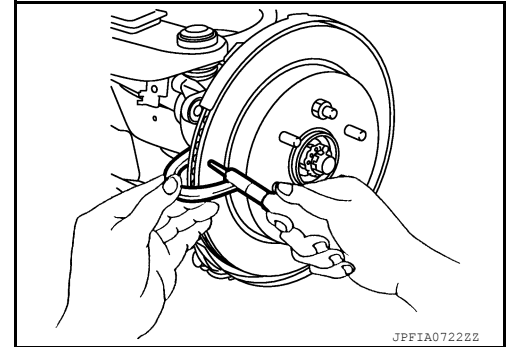
- If the thickness is less than wear thickness + 0.3 mm (0.012 in), replace the disc rotor. Refer to [BR-42, "General Specification"](#).

**Wear thickness** : Refer to [BR-42, "Rear Disc Brake"](#).

#### Thickness

Check the thickness of the disc rotor using a micrometer. Replace the disc rotor if the wear thickness is below the limit. Refer to [BR-35, "Removal and Installation of Brake Caliper Assembly and Rotor"](#).

**Wear thickness** : Refer to [BR-42, "Rear Disc Brake"](#).



### ADJUSTMENT

#### CAUTION:

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

# BRAKE PEDAL

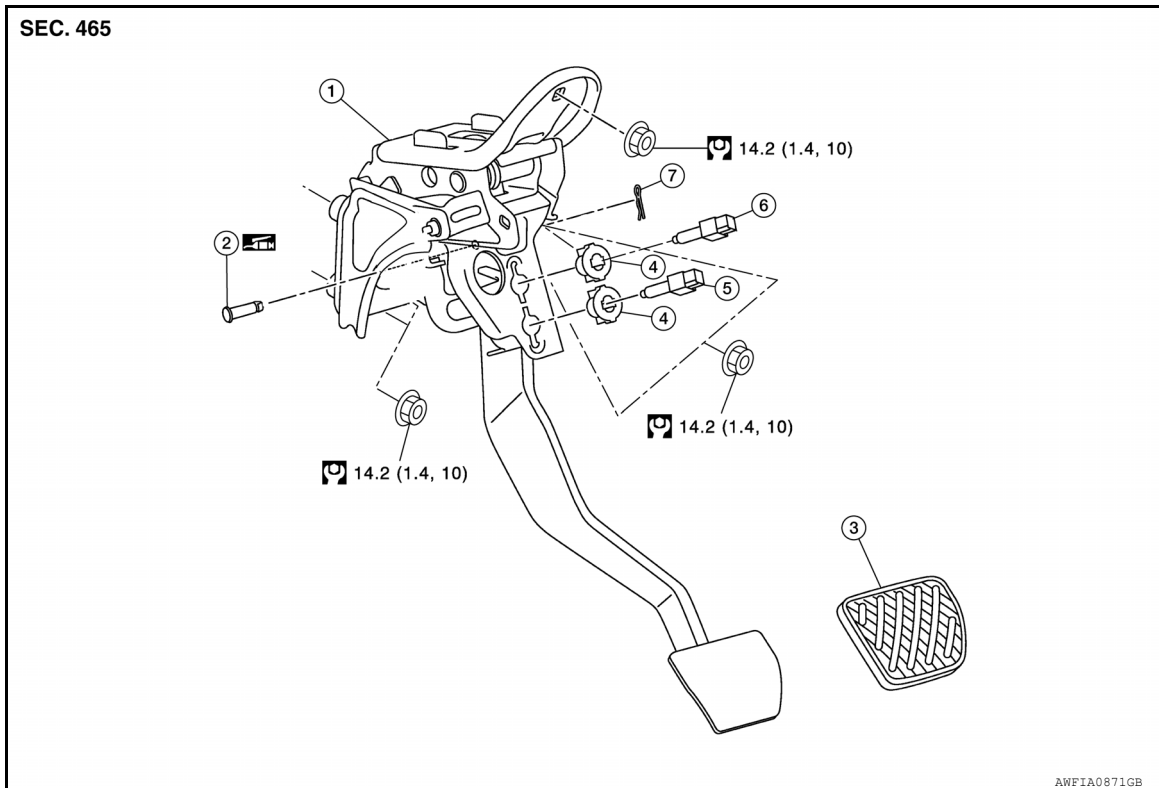
< REMOVAL AND INSTALLATION >

## REMOVAL AND INSTALLATION

### BRAKE PEDAL

#### Exploded View

INFOID:000000006920568



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

#### Removal and Installation

INFOID:000000006920569

##### REMOVAL

1. Remove the instrument lower panel LH. Refer to [IP-18, "Removal and Installation"](#).
2. Disconnect the stop lamp switch harness connector and ASCD brake switch harness connector, (if equipped).
3. Rotate the stop lamp switch and the ASCD brake switch (if equipped) counterclockwise to remove.
4. Remove the snap pin, and then remove the clevis pin from the clevis of brake booster.
5. Remove the brake pedal assembly.  
**CAUTION:**  
**Secure the hydraulic booster assembly so it will not drop into engine compartment or contact other parts.**
6. Perform inspection after removal. Refer to [BR-20, "Inspection and Adjustment"](#).

##### INSTALLATION

Installation is in the reverse order of removal.

- Apply the multi-purpose grease to the clevis pin and the matching faces.
- Install the brake pedal assembly and hydraulic booster assembly nuts, and tighten it to the specified torque. Refer to [BR-19, "Exploded View"](#).
- Perform adjustment after installation. Refer to [BR-7, "Inspection and Adjustment"](#).

**NOTE:**

# BRAKE PEDAL

## < REMOVAL AND INSTALLATION >

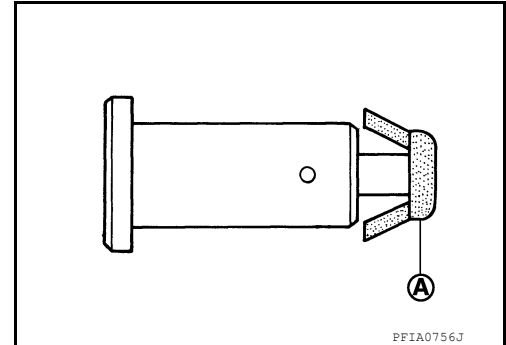
The clevis pin may be inserted in either direction.

### Inspection and Adjustment

INFOID:000000006920570

#### INSPECTION AFTER REMOVAL

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



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#### ADJUSTMENT AFTER INSTALLATION

Perform the brake pedal adjustment after installing the brake pedal assembly. Refer to [BR-7, "Inspection and Adjustment"](#).

# BRAKE PIPING

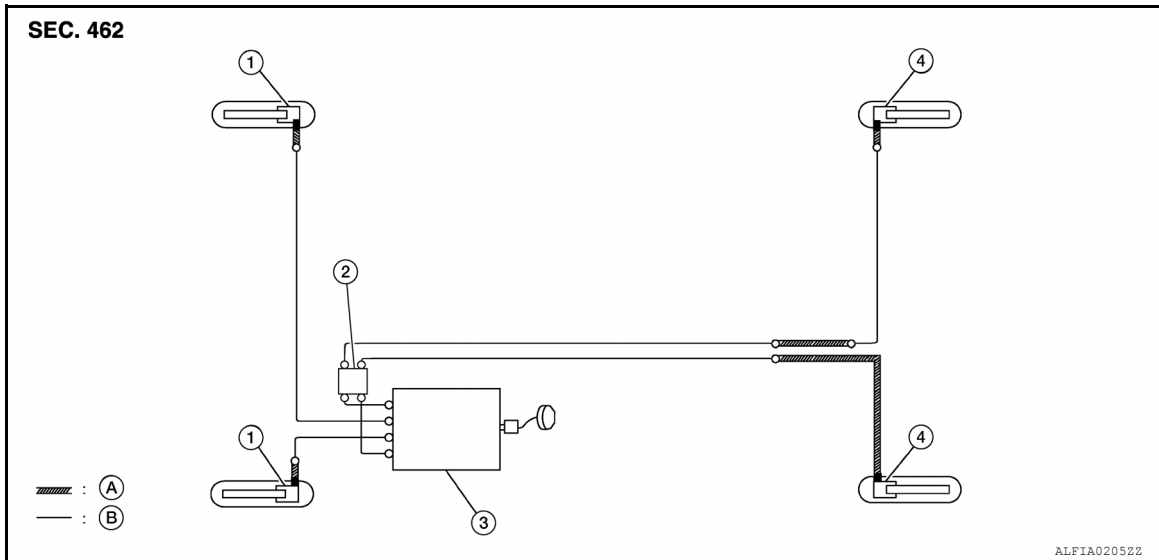
< REMOVAL AND INSTALLATION >

## BRAKE PIPING

### FRONT

#### FRONT : Hydraulic Piping

INFOID:000000006920572



- |   |  |                               |
|---|--|-------------------------------|
| 1. Front disc brake                           | 2. Connector                               | 3. Hydraulic booster assembly |
| 4. Rear disc brake                            | A. Brake hose                              | B. Brake tube                 |
| ○ Flare nut M10 16.2 N·m (1.7 kg·m, 12 ft·lb) | ■ Union bolt 18.2 N·m (1.9 kg·m, 13 ft·lb) |                               |

#### FRONT : Removal and Installation

INFOID:000000006920573

##### CAUTION:

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

##### NOTE:

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

##### REMOVAL

1. Remove the wheel and tire assembly using power tool.
2. Loosen the flare nut with a flare nut wrench and separate the brake tube and the brake hose.

##### CAUTION:

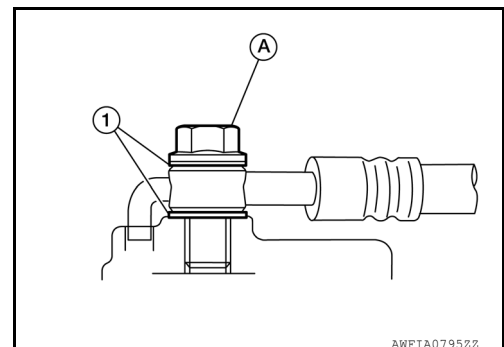
- Do not scratch the flare nut and the brake tube.
- Do not bend sharply, twist or strongly pull out the brake hose or brake tube.

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

##### CAUTION:

Discard copper sealing washers.

4. Remove the brake hose nut.
5. Remove the lock plate and remove the brake hose from the bracket.
6. Remove the brake hose bracket.



##### INSTALLATION

# BRAKE PIPING

## < REMOVAL AND INSTALLATION >

### CAUTION:

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

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

### CAUTION:

**Do not reuse the copper sealing washers.**

3. Install the brake hose L-pin by aligning it with the brake caliper assembly positioning hole, and tighten the union bolt (A) to the specified torque.
4. Install the brake tube to the brake hose, temporarily tighten the flare nut by hand until it does not rotate further, and secure the brake hose to the bracket with the lock plate.

### CAUTION:

**Check that all brake hoses or brake tubes are not twisted or bent.**

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

### CAUTION:

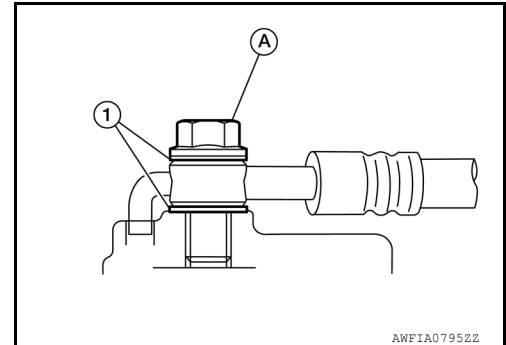
**Do not scratch the flare nut and the brake tube.**

6. Tighten the brake hose nuts to the specified torque. Refer to [BR-21, "FRONT : Removal and Installation"](#).

### CAUTION:

**Do not reuse the brake hose nuts.**

7. Bleed the brake system. Refer to [BR-10, "Bleeding Brake System"](#).
8. Install the wheel and tire assembly using power tool. Refer to [WT-63, "Adjustment"](#).
9. Perform inspection after installation. Refer to [BR-22, "FRONT : Inspection"](#).



## FRONT : Inspection

INFOID:000000006920574

### INSPECTION AFTER INSTALLATION

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

### CAUTION:

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

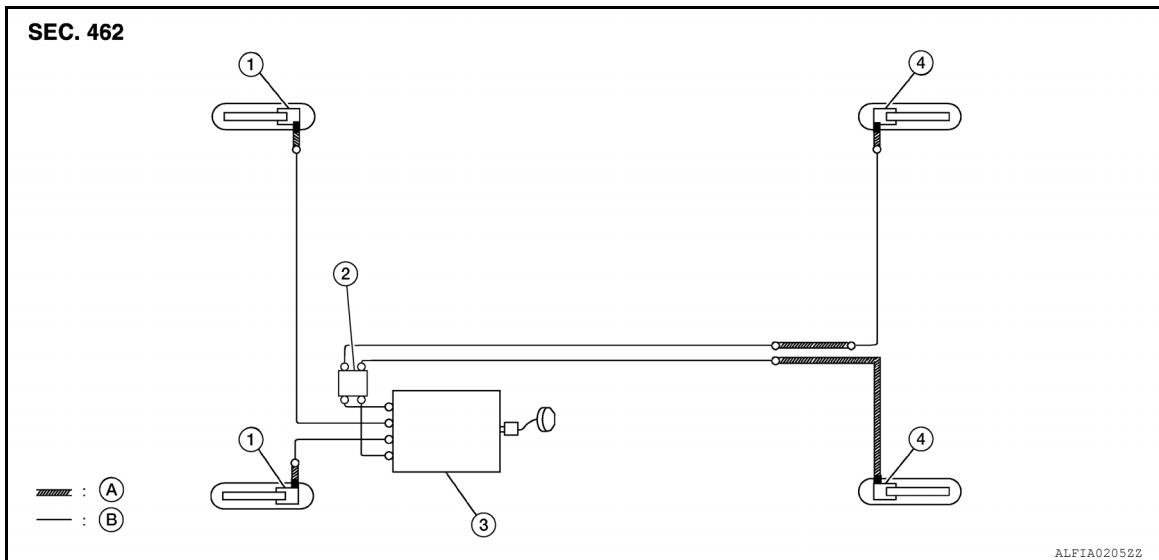
## REAR

# BRAKE PIPING

< REMOVAL AND INSTALLATION >

REAR : Hydraulic Piping

INFOID:000000006920576



- |                     |               |                               |
|---------------------|---------------|-------------------------------|
| 1. Front disc brake | 2. Connector  | 3. Hydraulic booster assembly |
| 4. Rear disc brake  | A. Brake hose | B. Brake tube                 |
- : Flare nut M10 16.2 N·m (1.7 kg-m, 12 ft-lb)    ■ Union bolt 18.2 N·m (1.9 kg-m, 13 ft-lb)

REAR : Removal and Installation

INFOID:000000006920577

## CAUTION:

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

## NOTE:

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

## REMOVAL

1. Remove the wheel and tire assembly using power tool.
2. Loosen the flare nut with a flare nut wrench and separate the brake tubes and the brake hoses.

### CAUTION:

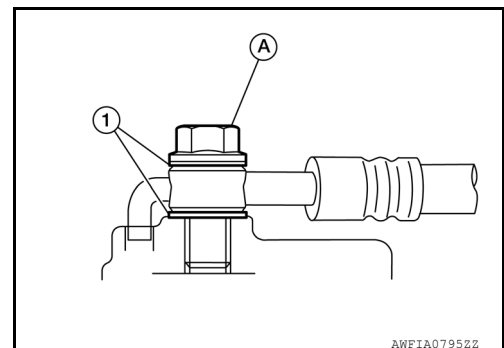
- Do not scratch the flare nut and the brake tube.
- Do not bend sharply, twist or strongly pull out the brake hose or brake tube.
- Cover open end of brake hose or brake tube when disconnecting to prevent entrance of dirt.

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

### CAUTION:

Discard copper sealing washers.

4. Remove brake hose connector nut.
5. Remove the lock plate and remove the brake hose from the bracket.



## INSTALLATION

### CAUTION:

- If the brake fluid adheres to the brake caliper assembly and disc rotor, quickly wipe it off.

# BRAKE PIPING

## < REMOVAL AND INSTALLATION >

- Do not spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.
- Do not depress the brake pedal while brake lines or hoses are disconnected.

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

**CAUTION:**

**Do not reuse the copper sealing washers.**

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

**CAUTION:**

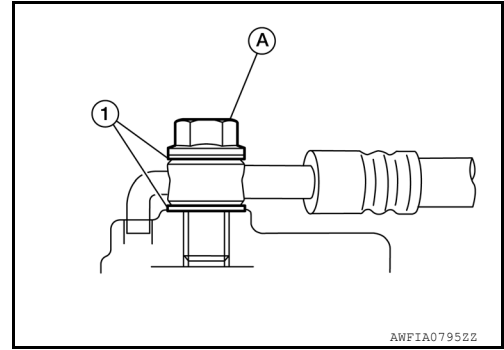
**Check that all brake hose or brake tube are not twisted and bent.**

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

**CAUTION:**

**Do not scratch the flare nut and the brake tube.**

5. Bleed the brake system. Refer to [BR-10, "Bleeding Brake System"](#).
6. Install the wheel and tire assembly using power tool. Refer to [WT-63, "Adjustment"](#).
7. Perform inspection after installation. Refer to [BR-24, "REAR : Inspection"](#).



## REAR : Inspection

INFOID:000000006920578

## INSPECTION AFTER INSTALLATION

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

**CAUTION:**

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



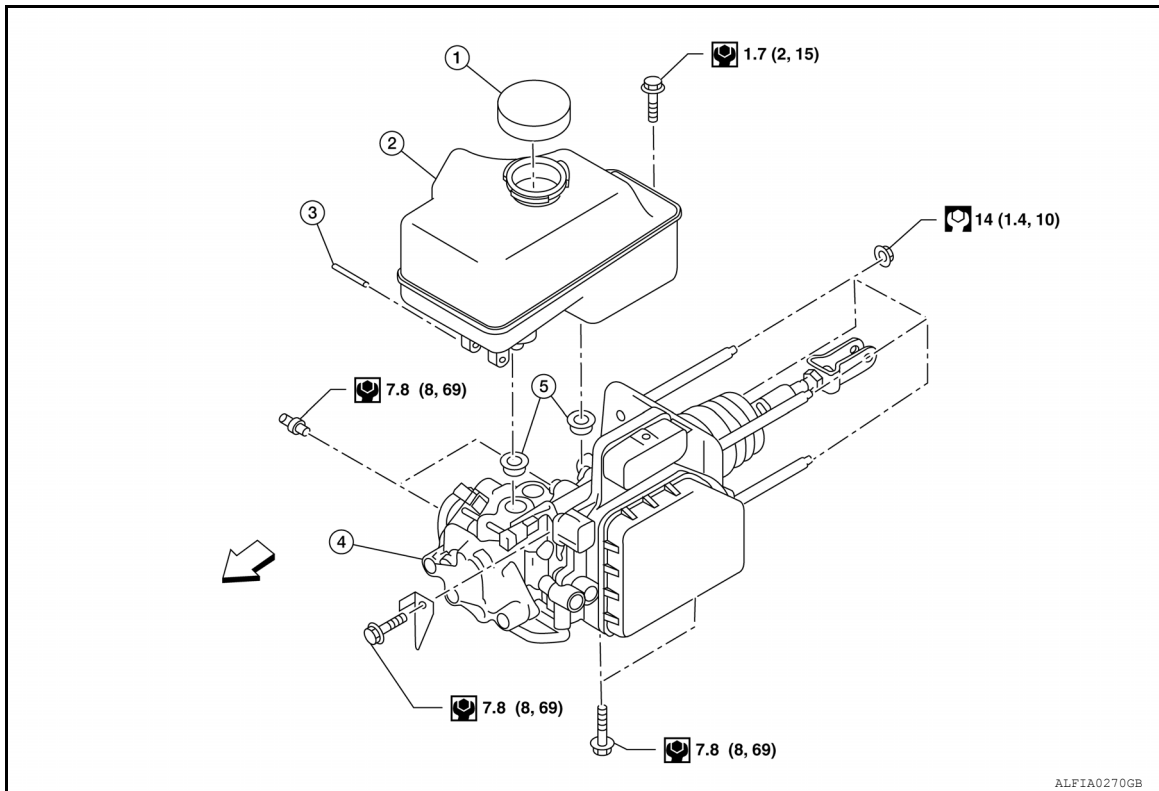
# HYDRAULIC BOOSTER ASSEMBLY

< REMOVAL AND INSTALLATION >

## HYDRAULIC BOOSTER ASSEMBLY

### Removal and Installation

INFOID:000000006920580



- |                               |                   |         |
|-------------------------------|-------------------|---------|
| 1. Reservoir cap              | 2. Reservoir tank | 3. Pin  |
| 4. Hydraulic booster assembly | 5. Grommet        | ⇐ Front |

#### CAUTION:

Do not spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.

#### NOTE:

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

#### REMOVAL

1. Turn the ignition switch OFF.

#### CAUTION:

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

2. Drain brake fluid. Refer to [BR-9, "Draining"](#).
3. Depress the brake pedal 20 times or more to release the pressure from the accumulator.

#### CAUTION:

Always perform this step before removing the hydraulic booster assembly.

4. Remove air cleaner and air duct assembly. Refer to [EM-24, "Exploded View"](#) (VQ40DE) or [EM-164, "Exploded View"](#) (VK56DE).
5. Disconnect hydraulic booster assembly harness connector.
6. Disconnect brake fluid level sensor harness connector.
7. Separate the brake tube from hydraulic booster assembly with a flare nut wrench. Refer to [BR-21, "FRONT : Removal and Installation"](#).
8. Remove brake tube from clip.
9. Remove instrument lower panel LH. Refer to [IP-18, "Removal and Installation"](#).

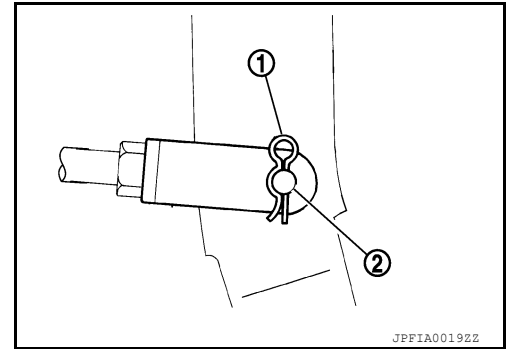
# HYDRAULIC BOOSTER ASSEMBLY

## < REMOVAL AND INSTALLATION >

10. Remove snap pin (1) and clevis pin (2) from clevis.
11. Remove nuts on hydraulic booster assembly and brake pedal assembly.

**CAUTION:**

Secure the hydraulic booster assembly so it will not drop in to the engine compartment or contact other parts.

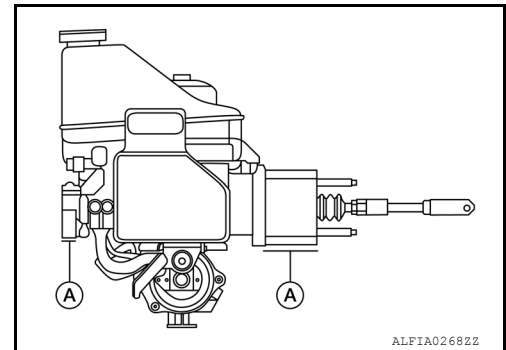


12. Remove hydraulic booster assembly.

**CAUTION:**

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

13. After replacing hydraulic booster assembly, always follow the accumulator disposal procedure to discard the hydraulic booster assembly. Refer to [BR-28. "Disposal"](#).

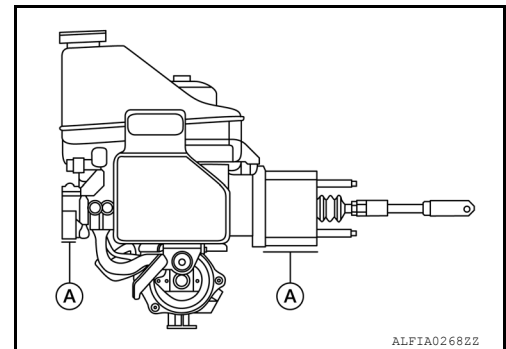


## INSTALLATION

Installation is in the reverse order of removal.

**CAUTION:**

- Do not turn the ignition switch ON before the completion of the installation procedure.
- Be careful not to damage hydraulic booster assembly stud bolt threads. If hydraulic booster assembly is tilted during installation, the dash panel may damage the threads.
- Perform adjustment before installation. Refer to [BR-26. "Inspection and Adjustment"](#).
- Do not reuse a hydraulic booster assembly after an excessive impact. (Slight impulse caused during installation work is acceptable.)
- Always hold the spacer block and front part of ABS actuator and electric unit (control unit) (A) when removing the hydraulic booster assembly.
- Do not deform or bend the brake tubes when installing the hydraulic booster assembly.
- Always use a new gasket between the hydraulic booster assembly, spacer and the dash panel.
- Replace the clevis pin if it is damaged. Refer to [BR-20. "Inspection and Adjustment"](#).
- Bleed the brake system. Refer to [BR-10. "Bleeding Brake System"](#).
- Perform the brake pedal adjustment after installing the brake pedal assembly and hydraulic booster assembly. Refer to [BR-7. "Inspection and Adjustment"](#).
- Perform inspection after installation. Refer to [BR-26. "Inspection and Adjustment"](#).



## Inspection and Adjustment

INFOID:000000006920582

## ADJUSTMENT BEFORE INSTALLATION

Input Rod Length adjustment

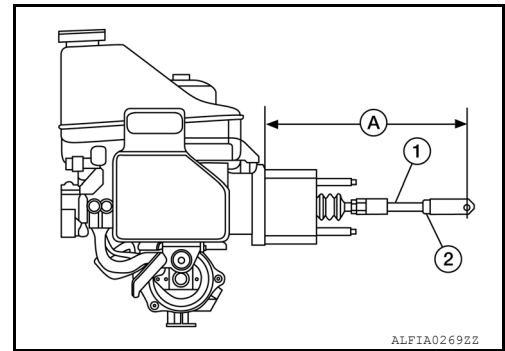
# HYDRAULIC BOOSTER ASSEMBLY

## < REMOVAL AND INSTALLATION >

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

**Input rod length (A) : Refer to [BR-42, "Brake Booster"](#).**

2. Tighten the lock nut to the specified torque.



## INSPECTION AFTER INSTALLATION

### Operation Check

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

#### **NOTE:**

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

3. Check that the brake fluid level in the reservoir tank is within the specified range. Refer to [BR-9, "Inspection"](#).
4. Position the shift selector in P range to release the parking brake.
5. Turn the ignition switch ON to check the time between motor activation and motor stop.

**Motor operating time : 18 seconds or less**

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

**Motor operating time : 2 – 11 seconds**

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

### Function Check

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

#### **NOTE:**

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

3. Turn the ignition switch ON with the brake pedal depressed to check that the clearance between the brake pedal and the dash lower panel decreases.

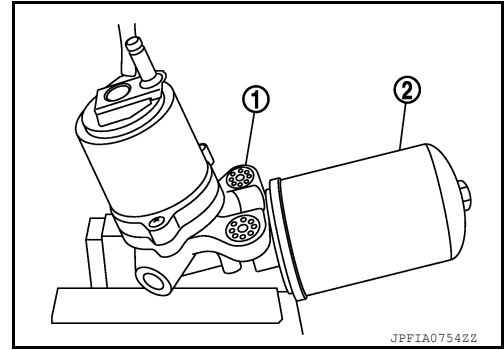
# HYDRAULIC BOOSTER ASSEMBLY

< REMOVAL AND INSTALLATION >

## Disposal

INFOID:000000006920583

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



2. Secure the accumulator (1) to a vise.

**CAUTION:**

- Always set copper plates or cloth between vise grips when securing the accumulator to a vise.
- Do not overtighten the vise.

3. Make a slit in the area (A) with a saw to release filler gas.

**Area (A) : 50 mm (1.97 in)**

**WARNING:**

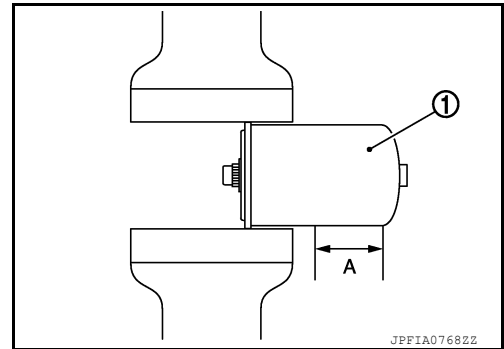
- Wear eye protection (safety glasses).
- Wear gloves.

**CAUTION:**

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

**NOTE:**

The gas is clear colorless, odorless, and harmless.



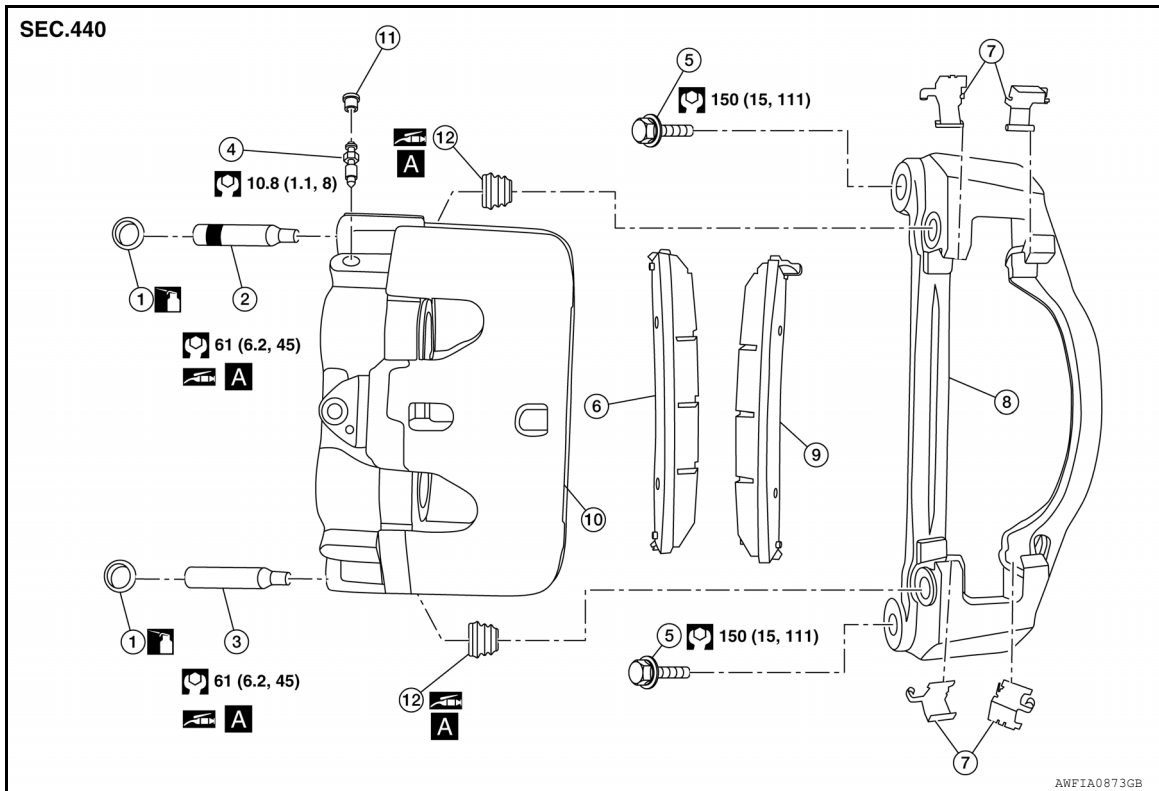
# FRONT DISC BRAKE

< REMOVAL AND INSTALLATION >

## FRONT DISC BRAKE

Exploded View

INFOID:000000006920584



- |                   |                        |                     |
|-------------------|------------------------|---------------------|
| 1. Guide pin cap  | 2. Upper guide pin     | 3. Lower guide pin  |
| 4. Bleeder valve  | 5. Torque member bolts | 6. Inner pad        |
| 7. Pad retainer   | 8. Torque member       | 9. Outer pad        |
| 10. Cylinder body | 11. Bleeder cap        | 12. Guide pin boots |
| A. Rubber grease  |                        |                     |

### Removal and Installation of Brake Pads

INFOID:000000006920585

#### **WARNING:**

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

#### **CAUTION:**

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

#### REMOVAL

1. Remove brake fluid reservoir cap.
2. Remove the wheel and tire assembly using power tool.
3. Remove torque member bolts and suspend the caliper assembly with suitable wire so that the brake hose will not stretch.
4. Remove the brake pads.
5. Remove the brake pad retainers.

#### INSTALLATION

#### **WARNING:**

# FRONT DISC BRAKE

## < REMOVAL AND INSTALLATION >

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

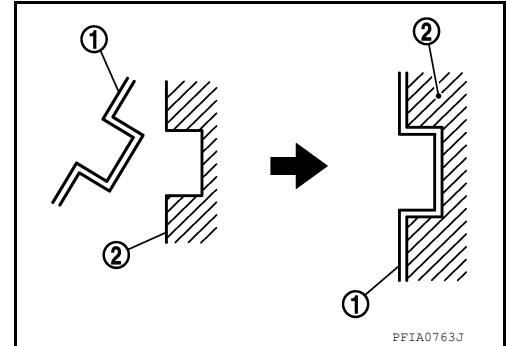
### CAUTION:

- Do not 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 retainers if the pad retainers have been removed.

### CAUTION:

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



2. Press caliper pistons using suitable tool and install brake pads to the caliper assembly.

### CAUTION:

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

3. Lower the caliper assembly into position, install torque member bolts and tighten to specification.
4. Depress the brake pedal several times then perform inspection after installation. Refer to [BR-30, "Inspection Brake Pads"](#).
5. Install the wheel and tire assembly using power tool. Refer to [WT-63, "Adjustment"](#).

## Inspection Brake Pads

INFOID:000000006920586

### INSPECTION AFTER REMOVAL

Eliminate rust on the pad retainers and the torque member. Replace them if rust is excessively attached.

### INSPECTION AFTER INSTALLATION

1. Check for drag of front disc brake. If any drag is found, follow the procedure described below.
2. Remove brake pads. Refer to [BR-29, "Removal and Installation of Brake Pads"](#).
3. Press the pistons. Refer to [BR-29, "Removal and Installation of Brake Pads"](#).
4. Install brake pads. Refer to [BR-29, "Removal and Installation of Brake Pads"](#).
5. Depress the brake pedal several times.
6. Check for drag of front disc brake again. If any drag is found, replace the caliper. Refer to [BR-31, "Removal and Installation of Brake Caliper Assembly and Rotor"](#).
7. Perform brake burnishing procedure after replacement of brake pads or disc rotor refinishing, replacement, or if a soft pedal occurs at very low mileage.

## Brake Burnishing Procedure

INFOID:000000007028716

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

### CAUTION:

- Be careful of vehicle speed due to the fact that the brakes do not operate properly until pads and disc rotor are securely seated.
  - Only perform this procedure under safe road and traffic conditions. Use extreme caution.
1. Drive vehicle on straight, flat road.
  2. Depress brake pedal 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 through 3 until pad and disc rotor are securely seated.

# FRONT DISC BRAKE

< REMOVAL AND INSTALLATION >

## Removal and Installation of Brake Caliper Assembly and Rotor

INFOID:000000006920588

### **WARNING:**

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

### **CAUTION:**

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

### **NOTE:**

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

### REMOVAL

1. Remove brake fluid reservoir cap.
2. Remove the wheel and tire assembly using power tool.
3. Secure the disc rotor using wheel nuts.
4. Separate brake hose from brake caliper assembly. Refer to [BR-21, "FRONT : Removal and Installation"](#).

### **CAUTION:**

**Discard copper sealing washers.**

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

### **CAUTION:**

**Do not drop brake pad and brake caliper assembly.**

6. Remove disc rotor. Refer to [BR-31, "Removal and Installation of Brake Caliper Assembly and Rotor"](#).

### INSTALLATION

### **WARNING:**

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

### **CAUTION:**

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

1. Install disc rotor. Refer to [BR-31, "Removal and Installation of Brake Caliper Assembly and Rotor"](#).
2. Install the brake caliper assembly to the steering knuckle and tighten the torque member bolts to the specified torque.

### **CAUTION:**

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

3. Install brake hose to brake caliper assembly. Refer to [BR-21, "FRONT : Removal and Installation"](#).

### **CAUTION:**

**Do not reuse copper sealing washers.**

4. Bleed the brake system. Refer to [BR-10, "Bleeding Brake System"](#).
5. Perform inspection after installation. Refer to [BR-31, "Inspection Brake Caliper Assembly and Disc Rotor"](#).
6. Install the wheel and tire assembly using power tool. Refer to [WT-63, "Adjustment"](#).

## Inspection Brake Caliper Assembly and Disc Rotor

INFOID:000000006920590

### INSPECTION AFTER REMOVAL

Check the following items and replace if necessary.

Torque Member

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

Sliding Pin Boots

Check the sliding pin boots for cracks or damage.

## FRONT DISC BRAKE

### < REMOVAL AND INSTALLATION >

---

#### INSPECTION AFTER INSTALLATION

1. Check for drag of front disc brake. If any drag is found, follow the procedure described below.
2. Remove brake pads. Refer to [BR-29, "Removal and Installation of Brake Pads"](#).
3. Press the pistons. Refer to [BR-29, "Removal and Installation of Brake Pads"](#).
4. Install brake pads. Refer to [BR-29, "Removal and Installation of Brake Pads"](#).
5. Depress the brake pedal several times.
6. Check for drag of front disc brakes again. If any drag is found, replace the caliper. Refer to [BR-31, "Removal and Installation of Brake Caliper Assembly and Rotor"](#).
7. Perform brake burnishing procedure after replacement of brake pads or disc rotor refinishing, replacement, or if a soft pedal occurs at very low mileage. Refer to [BR-30, "Brake Burnishing Procedure"](#).



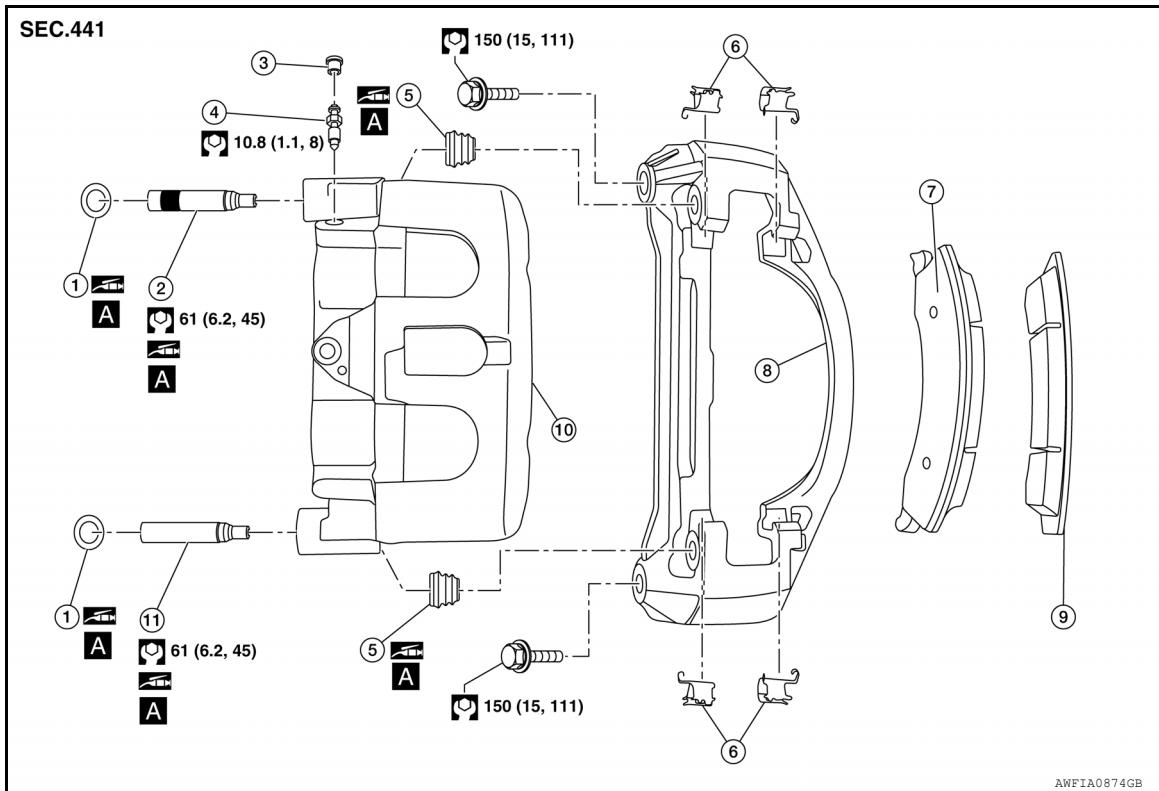
# REAR DISC BRAKE

< REMOVAL AND INSTALLATION >

## REAR DISC BRAKE

### Exploded View

INFOID:000000006920591



- |                   |                     |                  |
|-------------------|---------------------|------------------|
| 1. Guide pin caps | 2. Upper guide pin  | 3. Bleeder cap   |
| 4. Bleeder valve  | 5. Guide pin boot   | 6. Pad retainers |
| 7. Inner pad      | 8. Torque member    | 9. Outer pad     |
| 10. Cylinder body | 11. Lower guide pin | A. Rubber grease |

### Removal and Installation of Brake Pads

INFOID:000000006920592

#### **WARNING:**

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

#### **CAUTION:**

- Do not depress the brake pedal while removing the brake pads because the piston may pop out.
- If the brake fluid or grease adheres to the brake caliper assembly and disc rotor, quickly wipe it off.

#### REMOVAL

1. Remove brake fluid reservoir cap.
2. Remove the wheel and tire assembly using power tool.
3. Remove torque member bolts and suspend the caliper assembly with suitable wire so that the brake hose will not stretch.
4. Remove the brake pads from the caliper assembly.

#### **CAUTION:**

- Do not damage the piston boot.
- Do not drop the brake pads.
- Remember each position of the removed brake pads.

## REAR DISC BRAKE

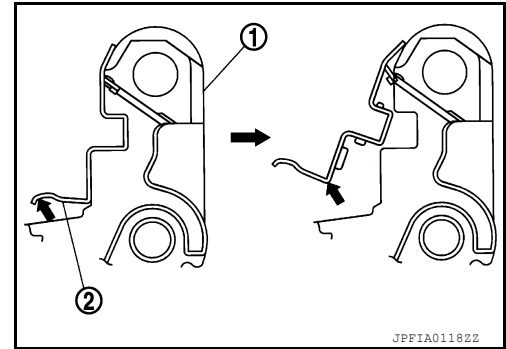
### < REMOVAL AND INSTALLATION >

5. Remove the brake pad retainers (2).

**CAUTION:**

Do not deform the pad retainer when removing the pad retainers (2) from the torque member (1).

6. Perform inspection after removal. Refer to [BR-30, "Inspection Brake Pads"](#).



### INSTALLATION

**WARNING:**

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

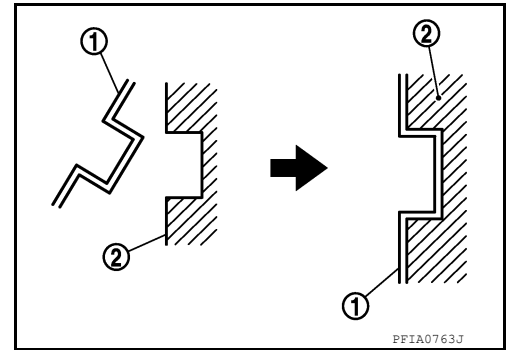
**CAUTION:**

- Do not depress the brake pedal while removing the brake pads because the piston may pop out.
- If the brake fluid or grease adheres to the brake caliper assembly and disc rotor, quickly wipe it off.

1. Install the pad retainers if the pad retainers have been removed.

**CAUTION:**

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



2. Press caliper pistons using suitable tool and install brake pads to the caliper assembly.

**CAUTION:**

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

3. Lower the caliper assembly into position and tighten torque member bolts to specification.
4. Depress the brake pedal several times then perform inspection after installation. Refer to [BR-30, "Inspection Brake Pads"](#).
5. Install the wheel and tire assembly using power tool. Refer to [WT-63, "Adjustment"](#).

### Inspection Brake Pads

INFOID:000000006920593

### INSPECTION AFTER REMOVAL

Eliminate rust on the pad retainers and the torque member. Replace them if rust is excessively attached.

### INSPECTION AFTER INSTALLATION

1. Check for drag of rear disc brake. If any drag is found, follow the procedure described below.
2. Remove brake pads. Refer to [BR-33, "Removal and Installation of Brake Pads"](#).
3. Press the piston. Refer to [BR-33, "Removal and Installation of Brake Pads"](#).
4. Install brake pads. Refer to [BR-33, "Removal and Installation of Brake Pads"](#).
5. Depress the brake pedal several times.
6. Check for drag of rear disc brake again. If any drag is found, replace the caliper. Refer to [BR-35, "Removal and Installation of Brake Caliper Assembly and Rotor"](#).

# REAR DISC BRAKE

## < REMOVAL AND INSTALLATION >

7. Perform brake burnishing procedure after replacement of brake pads or disc rotor refinishing, replacement, or if a soft pedal occurs at very low mileage. Refer to [BR-35, "Brake Burnishing Procedure"](#).

### Brake Burnishing Procedure

INFOID:000000007028717

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

#### **CAUTION:**

- **Be careful of vehicle speed because the brakes do not operate easily until pad and disc rotor are securely seated.**
- **Only perform this procedure under safe road and traffic conditions. Use extreme caution.**
  1. Drive vehicle on straight, flat road.
  2. Depress brake pedal 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 through 3 until pad and disc rotor are securely seated.

### Removal and Installation of Brake Caliper Assembly and Rotor

INFOID:000000006920595

#### **WARNING:**

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

#### **CAUTION:**

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

#### **NOTE:**

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

### REMOVAL

1. Remove brake fluid reservoir cap.
  2. Remove the wheel and tire assembly using power tool.
  3. Secure the disc rotor using wheel nuts.
  4. Separate brake hose from brake caliper assembly. Refer to [BR-23, "REAR : Removal and Installation"](#).
- CAUTION:**  
**Discard copper sealing washers.**
5. Remove torque member bolts, and remove brake caliper assembly.  
**CAUTION:**  
**Do not drop brake pad and caliper assembly.**
  6. Remove disc rotor. Refer to [BR-35, "Removal and Installation of Brake Caliper Assembly and Rotor"](#).

### INSTALLATION

#### **WARNING:**

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

#### **CAUTION:**

- **Do not spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.**
  - **Do not press brake pedal when lines or hoses are disconnected.**
  - **If the brake fluid or grease adheres to the brake caliper assembly and disc rotor, quickly wipe it off.**
1. Install disc rotor. Refer to [BR-35, "Removal and Installation of Brake Caliper Assembly and Rotor"](#).
  2. Install the brake caliper assembly to the axle housing and tighten the torque member bolts to the specified torque.  
**CAUTION:**  
**Do not spill or splash any grease and moisture on the brake caliper assembly mounting face, threads, bolts. Wipe out any grease and moisture.**
  3. Install brake hose to brake caliper assembly. Refer to [BR-31, "Removal and Installation of Brake Caliper Assembly and Rotor"](#).

#### **CAUTION:**

# REAR DISC BRAKE

## < REMOVAL AND INSTALLATION >

---

**Do not reuse copper sealing washers.**

4. Bleed the brake system. Refer to [BR-10, "Bleeding Brake System"](#).
5. Check for drag of rear disc brake. If any drag is found, refer to [BR-36, "Inspection Brake Caliper Assembly and Disc Rotor"](#).
6. Install the wheel and tire assembly using power tool. Refer to [WT-63, "Adjustment"](#).

## Inspection Brake Caliper Assembly and Disc Rotor

INFOID:000000006920597

### INSPECTION AFTER REMOVAL

Check the following items and replace if necessary.

Torque Member

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

Sliding Pin Boot

Check the sliding pin boots for cracks or damage.

### INSPECTION AFTER INSTALLATION

1. Check for drag of rear disc brake. If any drag is found, follow the procedure described below.
2. Remove brake pads. Refer to [BR-33, "Removal and Installation of Brake Pads"](#).
3. Press the piston. Refer to [BR-33, "Removal and Installation of Brake Pads"](#).
4. Install brake pads. Refer to [BR-33, "Removal and Installation of Brake Pads"](#).
5. Depress the brake pedal several times.
6. Check for drag of rear disc brakes again. If any drag is found, replace the caliper. Refer to [BR-35, "Removal and Installation of Brake Caliper Assembly and Rotor"](#).
7. Perform brake burnishing procedure after replacement of brake pads or disc rotor refinishing, replacement, or if a soft pedal occurs at very low mileage. Refer to [BR-17, "BRAKE PAD : Inspection and Adjustment"](#).

# HYDRAULIC BOOSTER ASSEMBLY

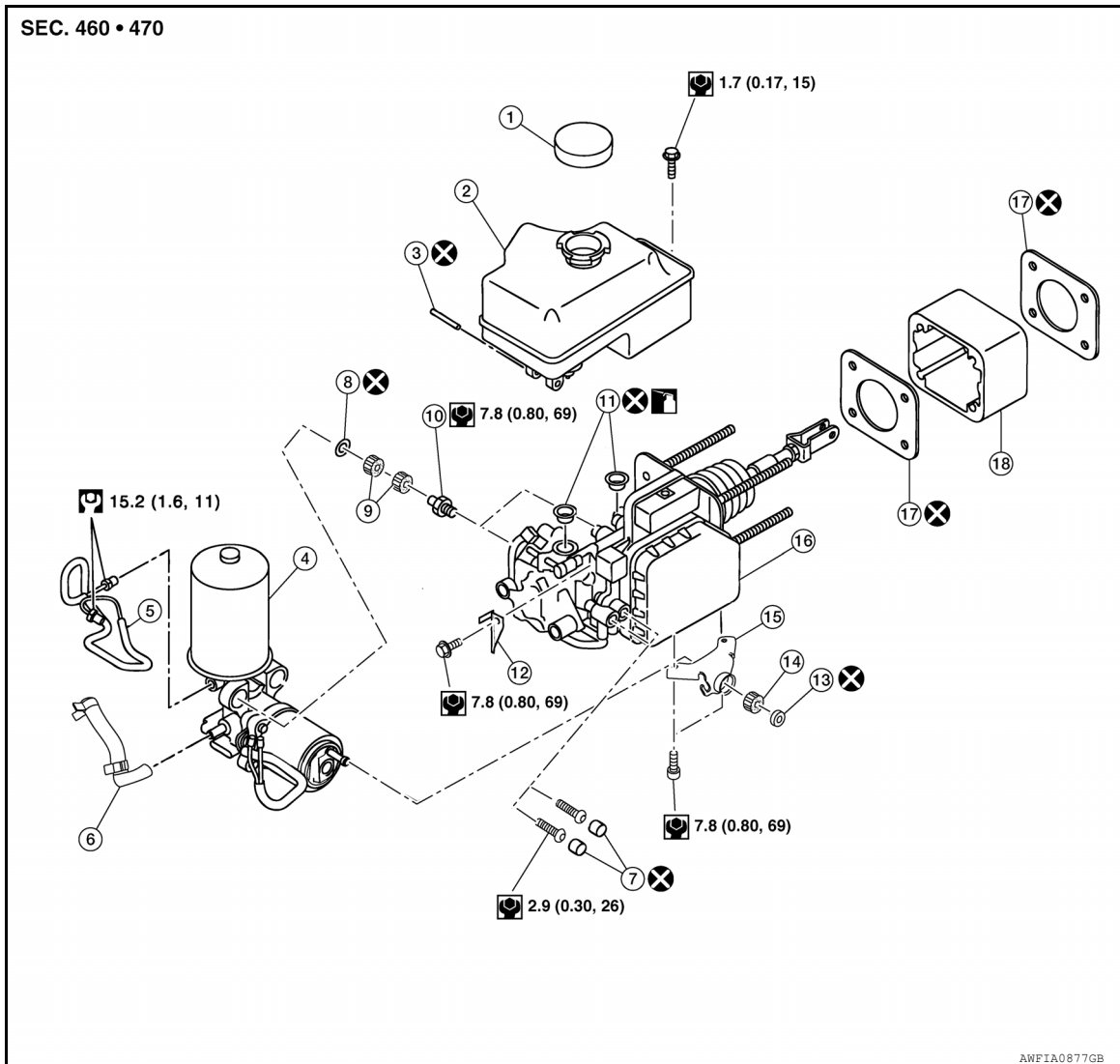
< UNIT DISASSEMBLY AND ASSEMBLY >

## UNIT DISASSEMBLY AND ASSEMBLY

### HYDRAULIC BOOSTER ASSEMBLY

Exploded View

INFOID:000000007028439



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

 Brake fluid.

### Disassembly and Assembly

INFOID:000000006920581

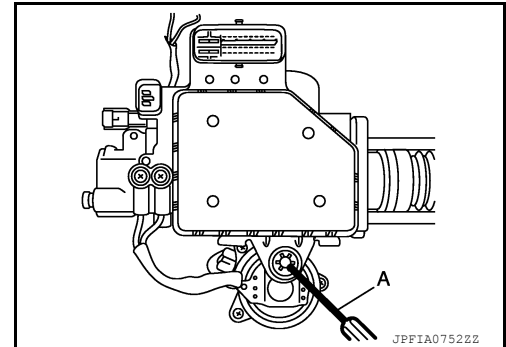
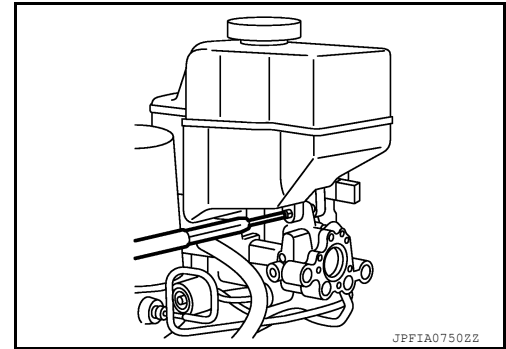
#### DISASSEMBLY

1. Remove gaskets and spacer from hydraulic booster assembly.

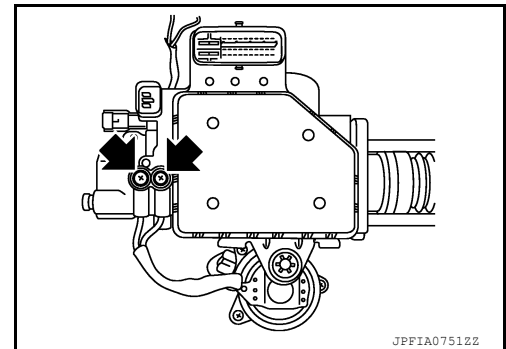
# HYDRAULIC BOOSTER ASSEMBLY

## < UNIT DISASSEMBLY AND ASSEMBLY >

2. Remove the reservoir tank pin using a suitable tool.
3. Remove the bolt, disconnect the electrical connector, disconnect the reservoir hose assembly and remove the reservoir tank.  
**CAUTION:**  
**Do not drop components. Components must not be reused if they are dropped.**
4. Remove and discard the grommets from the ABS actuator and electric unit (control unit).
5. Slide the clamp and remove the reservoir hose assembly from the reservoir tank.
6. Remove the brake tube using a suitable tool.  
**CAUTION:**  
**Do not scratch the flare nut or the brake tube.**
7. Remove the cap and grommet from the brake booster bracket using a suitable tool (A).



8. Remove the screws (←) and disconnect the motor/accumulator assembly harness from the brake booster bracket.
9. Remove motor/accumulator assembly from ABS actuator and electric unit (control unit).
10. Remove the bushings and collars from the motor/accumulator assembly.
11. Remove the brake booster bracket and reservoir tank connector bracket from ABS actuator and electric unit (control unit).
12. Remove the pin mounts from the ABS actuator and electric unit (control unit).
13. After replacing motor/accumulator assembly, always follow the accumulator disposal procedure to discard the motor/accumulator assembly. Refer to [BR-28. "Disposal"](#).



## ASSEMBLY

Note the following, and assembly in the reverse order of disassembly.

- Do not use mineral oils such as kerosene or gasoline and rubber grease during the cleaning and assembly process.
- Do not drop the removed parts when installing. The parts must not be reused if they are dropped.
- Do not allow foreign matter (e.g. dust) and oils other than brake fluid to enter the reservoir tank.
- For non reusable parts, refer to [BR-37. "Exploded View"](#).
- When connecting motor/accumulator assembly harness, check the order of harness colors.

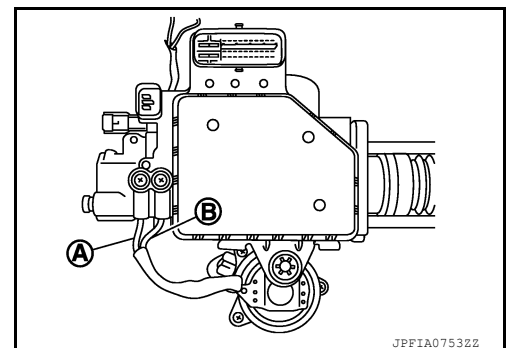
A : Black

B : Red

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

**CAUTION:**

**Do not scratch the flare nut and the brake tube.**



# HYDRAULIC BOOSTER ASSEMBLY

## < UNIT DISASSEMBLY AND ASSEMBLY >

---

- Apply new brake fluid to grommet of between reservoir tank and grommet and ABS actuator and electric unit (control unit).

A

B

C

D

E

**BR**

G

H

I

J

K

L

M

N

O

P

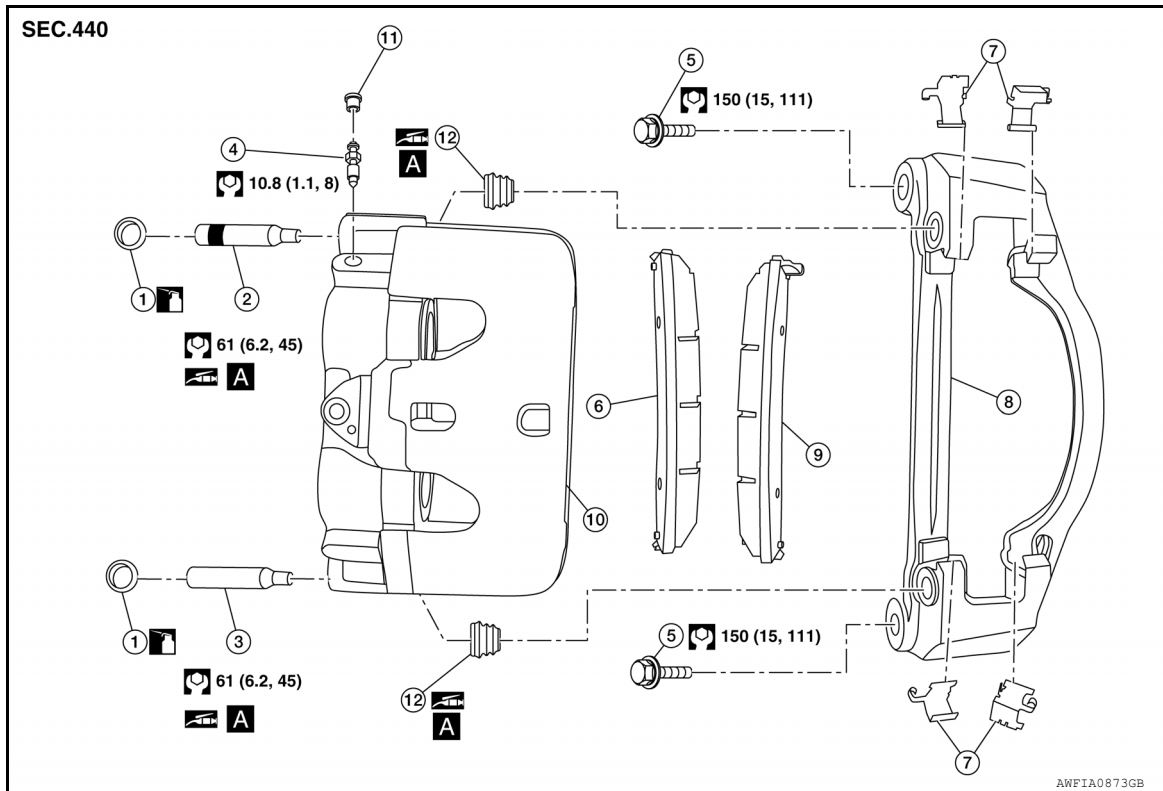
# FRONT BRAKE CALIPER

< UNIT DISASSEMBLY AND ASSEMBLY >

## FRONT BRAKE CALIPER

Exploded View

INFOID:000000007272834



- |                   |                        |                     |
|-------------------|------------------------|---------------------|
| 1. Guide pin cap  | 2. Upper guide pin     | 3. Lower guide pin  |
| 4. Bleeder valve  | 5. Torque member bolts | 6. Inner pad        |
| 7. Pad retainer   | 8. Torque member       | 9. Outer pad        |
| 10. Cylinder body | 11. Bleeder cap        | 12. Guide pin boots |
| A. Rubber grease  |                        |                     |

## Disassembly and Assembly

INFOID:000000007272832

### DISASSEMBLY

1. Remove the caliper assembly. Refer to [BR-31, "Removal and Installation of Brake Caliper Assembly and Rotor"](#).
2. Remove the brake pads.
3. Remove the guide pin caps.
4. Remove the guide pins, using suitable tool.
5. Remove guide pin boots.

### ASSEMBLY

Assembly is in the reverse order of disassembly.



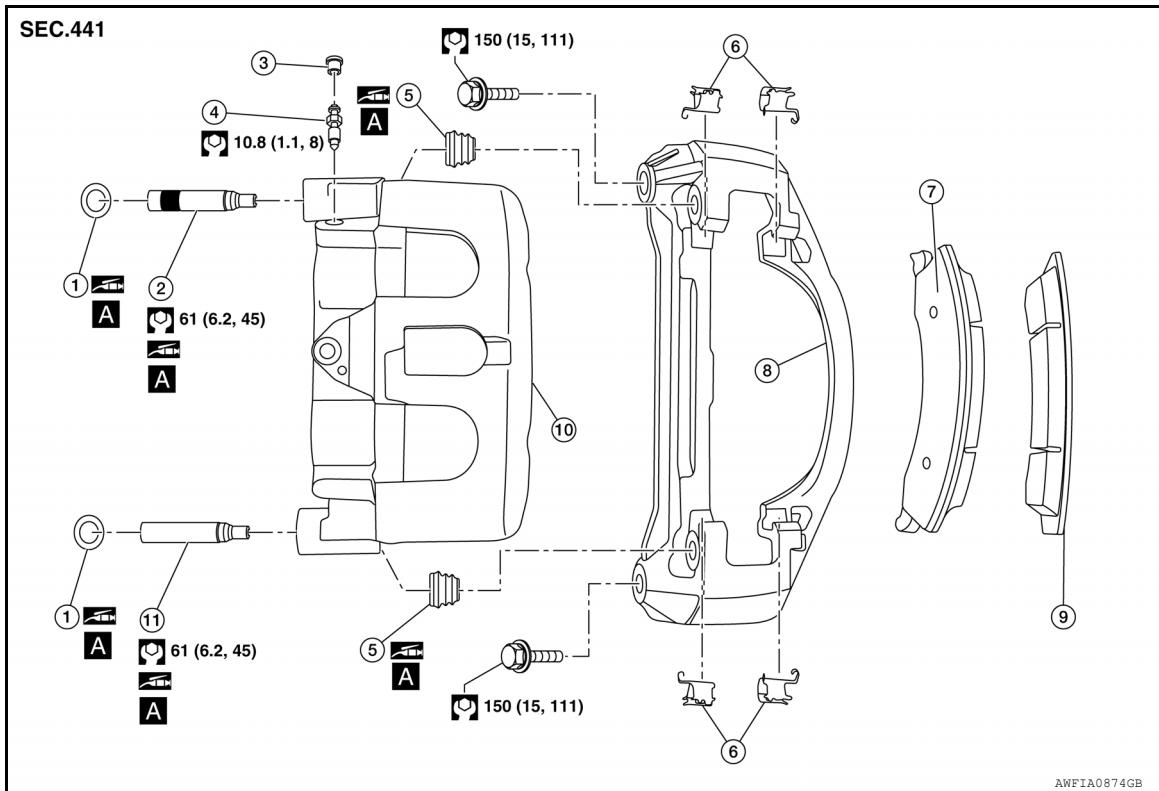
# REAR BRAKE CALIPER

< UNIT DISASSEMBLY AND ASSEMBLY >

## REAR BRAKE CALIPER

Exploded View

INFOID:000000007272835



- |                   |                     |                  |
|-------------------|---------------------|------------------|
| 1. Guide pin caps | 2. Upper guide pin  | 3. Bleeder cap   |
| 4. Bleeder valve  | 5. Guide pin boot   | 6. Pad retainers |
| 7. Inner pad      | 8. Torque member    | 9. Outer pad     |
| 10. Cylinder body | 11. Lower guide pin | A. Rubber grease |

### Disassembly and Assembly

INFOID:000000007272835

#### DISASSEMBLY

1. Remove the caliper assembly. Refer to [BR-31. "Removal and Installation of Brake Caliper Assembly and Rotor"](#).
2. Remove the brake pads.
3. Remove the guide pin caps.
4. Remove the guide pins, using suitable tool.
5. Remove guide pin boots.

#### ASSEMBLY

Assembly is in the reverse order of disassembly.

## SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

# SERVICE DATA AND SPECIFICATIONS (SDS)

## SERVICE DATA AND SPECIFICATIONS (SDS)

### General Specification

INFOID:000000006920598

Unit: mm (in)

Front brake	Cylinder bore diameter	57.15 (2.250) × 2
	Pad length × width × thickness	192.0 (7.56) × 39.5 (1.555) × 14.0 (0.551)
	Rotor outer diameter × thickness	359.75 (14.16) × 38.0 (1.496)
Rear brake	Cylinder bore diameter	42.86 (1.687) × 2
	Pad length × width × thickness	192.0 (7.56) × 61.7 (2.429) × 11.0 (0.433)
	Rotor outer diameter × thickness	364.75 (14.36) × 30.0 (1.181)
Control valve	Valve type	Electric brake force distribution
Recommended brake fluid		Refer to <a href="#">MA-13. "Fluids and Lubricants"</a> .

### Brake Pedal

INFOID:000000006920599

Unit: mm (in)

Item	Standard
Brake pedal height	191 (7.52) – 201 (7.91)
Clearance between brake pedal bracket and the threaded end of stop lamp switch and ASCD brake switch (if equipped).	0.74 (0.0291) – 1.96 (0.0772)

### Brake Booster

INFOID:000000006920600

Unit: mm (in)

Item	Standard
Input rod length	181.2 ± 0.05 (7.13)

### Front Disc Brake

INFOID:000000006920601

Unit: mm (in)

Item	Limit	
Brake pad	Wear thickness	1.0 (0.039)
	Wear thickness	36.5 (1.437)
Disc rotor	Thickness variation (measured at 8 positions)	0.010 (0.0004)
	Runout (with it attached to the vehicle)	0.040 (0.0016)

### Rear Disc Brake

INFOID:000000006920602

Unit: mm (in)

Item	Limit	
Brake pad	Wear thickness	1.0 (0.039)
	Wear thickness	28.5 (1.122)
Disc rotor	Thickness variation (measured at 8 positions)	0.010 (0.0004)
	Runout (with it attached to the vehicle)	0.070 (0.0028)