

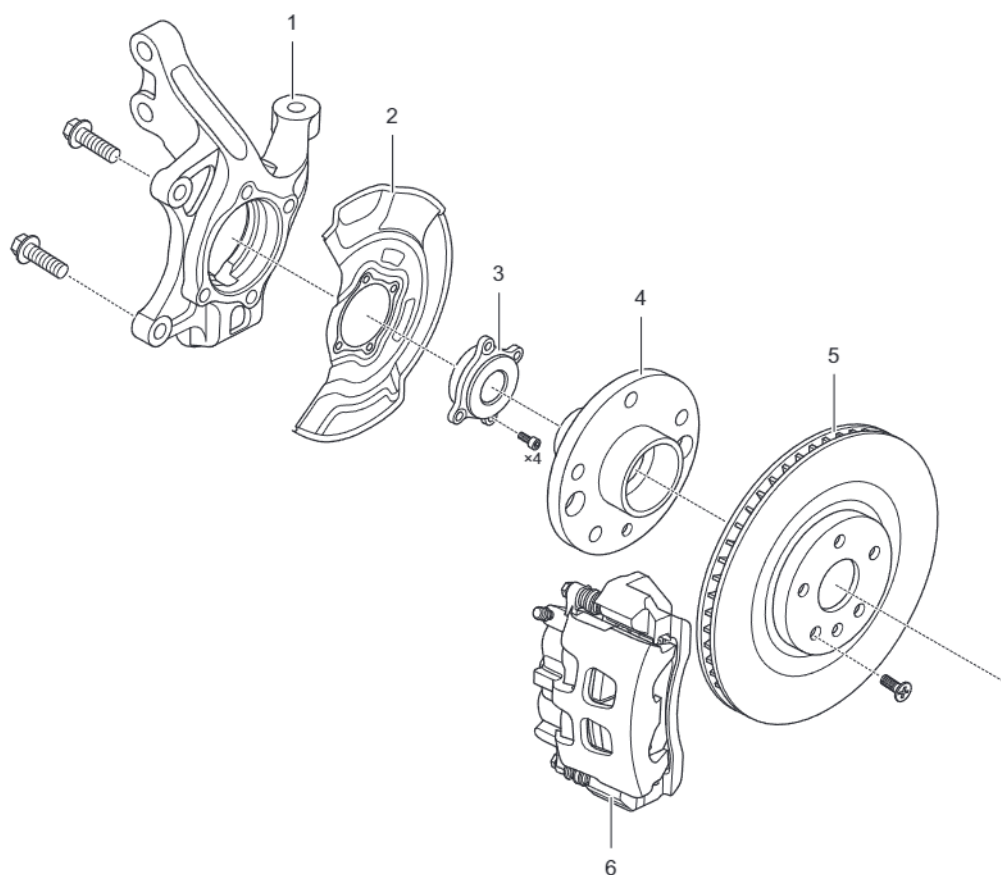
BRAKE

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GENERAL INFORMATION

Description

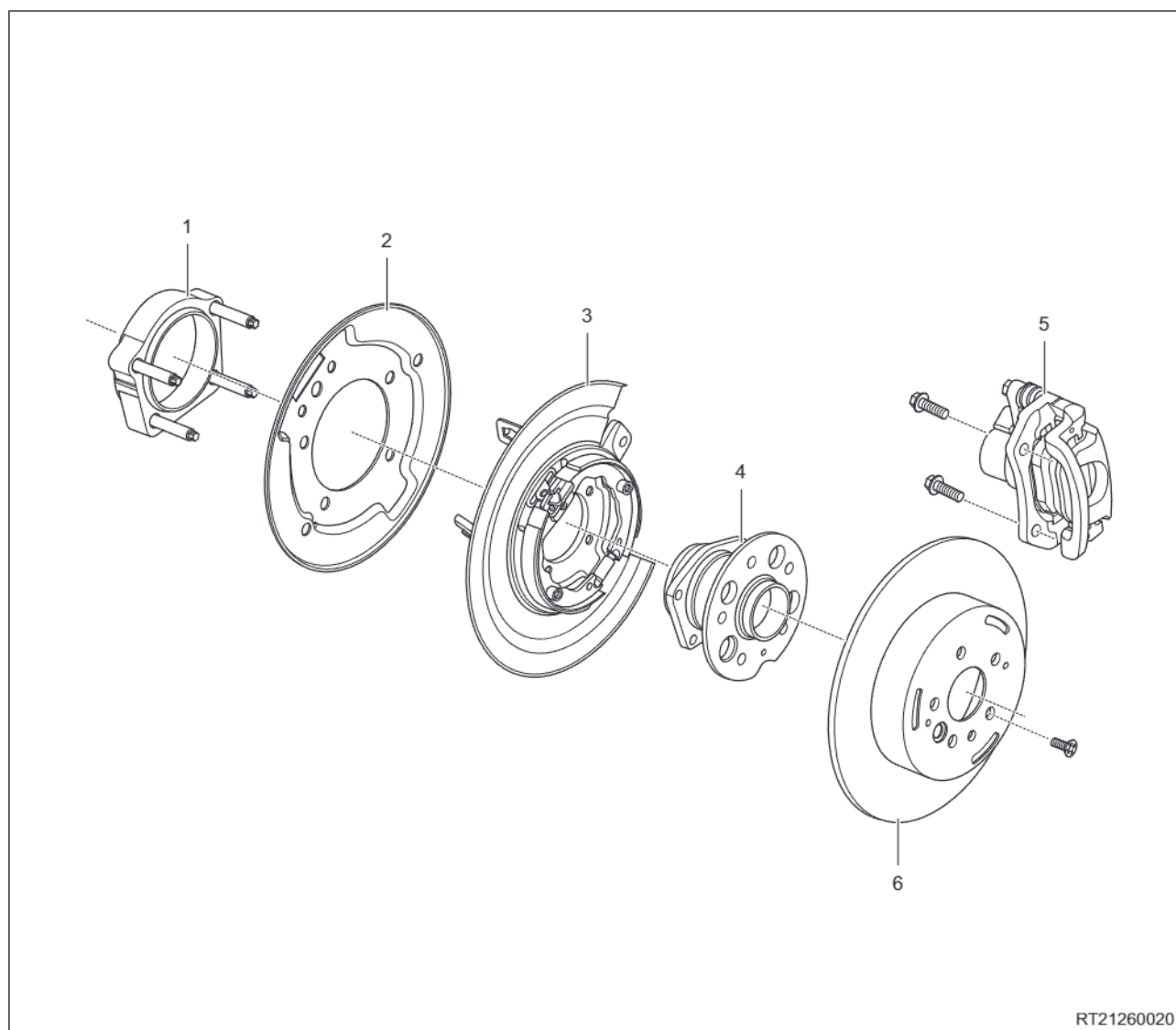
Front Disc Brake Assembly



RT21260010

1 - Front Steering Knuckle	2 - Front Wheel Mudguard
3 - Front Hub Bearing	4 - Front Hub Assembly
5 - Front Brake Disc	6 - Front Brake Caliper Assembly

Rear DIH (Drum-in-hat)



RT21260020

1 - Connecting Plate Assembly	2 - Rear Brake Bottom Board
3 - Rear Brake Assembly	4 - Rear Hub Bearing Unit
5 - Rear Brake Caliper Assembly	6 - Rear Brake Disc

Brake system uses following configuration: disc brake is used for front wheels, and DIH (Drum-in-hat) is used for rear wheels (disc brake is used for driving brake, and drum brake is used for parking brake).

Using lever principle, brake pedal pushes pushrod into vacuum booster, which boosts the force of pushrod by using vacuum and then transmits the force to brake master cylinder assembly. Hydraulic pressure, produced in the brake master cylinder assembly, is transmitted to ABS Hydraulic Control Unit (HCU) through brake tube, and then distributed to individual brake calipers. The brake calipers apply force to brake linings using hydraulic pressure. The brake linings will cause wheel speed to decrease or stop depending on amount of brake pressure applied.

Specifications

Torque Specifications

Description	Torque (N·m)
Wheel Mounting Bolt	110 ± 10
Coupling Nut Between Brake Fluid Reservoir Assembly and Body	9 ± 1
Coupling Plug Between Brake Master Cylinder Assembly and Brake Pipe	16 ± 2
Coupling Nut Between Brake Master Cylinder Assembly and Vacuum Booster Assembly	21 - 25
Coupling Bolt Between Brake Fluid Reservoir Assembly and Brake Master Cylinder Assembly	3 - 5
Coupling Nut Between Vacuum Booster Assembly and Brake Pedal Assembly	25 ± 3
Coupling Nut Between Brake Pedal Assembly and Body	25 ± 3
Coupling Bolt Between Front Brake Caliper Assembly and Front Brake Hose Assembly	27 ± 2
Coupling Bolt Between Front Brake Caliper Assembly and Front Steering Knuckle Assembly	100 ± 10
Front Brake Disc Positioning Screw	10 ± 1
Front Brake Caliper Bleeder Plug	9 - 11
Locating Bolt Between Front Brake Caliper Fixing Bracket and Front Brake Cylinder Assembly	25 ± 3
Coupling Plug Between Front Brake Hose Assembly and Front Brake Pipe	16 ± 2
Coupling Bolt Between Rear Brake Caliper Assembly and Rear Brake Hose Assembly	20 ± 2
Coupling Bolt Between Rear Brake Caliper Assembly and Rear Brake Bottom Board Assembly	100 ± 10
Rear Brake Disc Positioning Screw	10 ± 1
Rear Brake Caliper Bleeder Plug	9 - 11
Locating Bolt Between Rear Brake Caliper Fixing Bracket and Rear Brake Cylinder Assembly	25 ± 3
Coupling Plug Between Rear Brake Hose Assembly and Brake Pipe	16 ± 2

Front Disc Brake

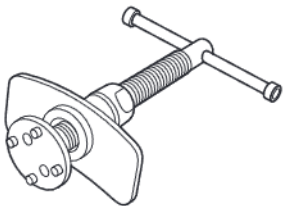
Description	Standard Thickness (mm)	Minimum Thickness (mm)	Maximum Runout (mm)
Front Brake Disc	25	23	0.06
Front Brake Lining	9.2	2	-

Rear DIH (Drum-in-hat)

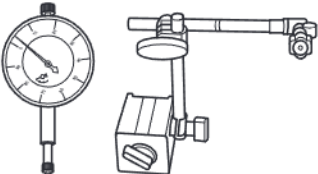
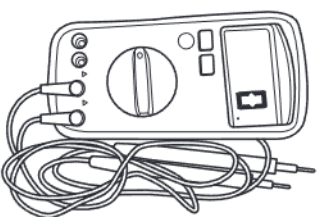
Description	Standard Thickness (mm)	Minimum Thickness (mm)	Maximum Runout (mm)
Rear Brake Disc	10	8	0.06
Rear Brake Lining	8.2	2	-

Tools

Special Tool

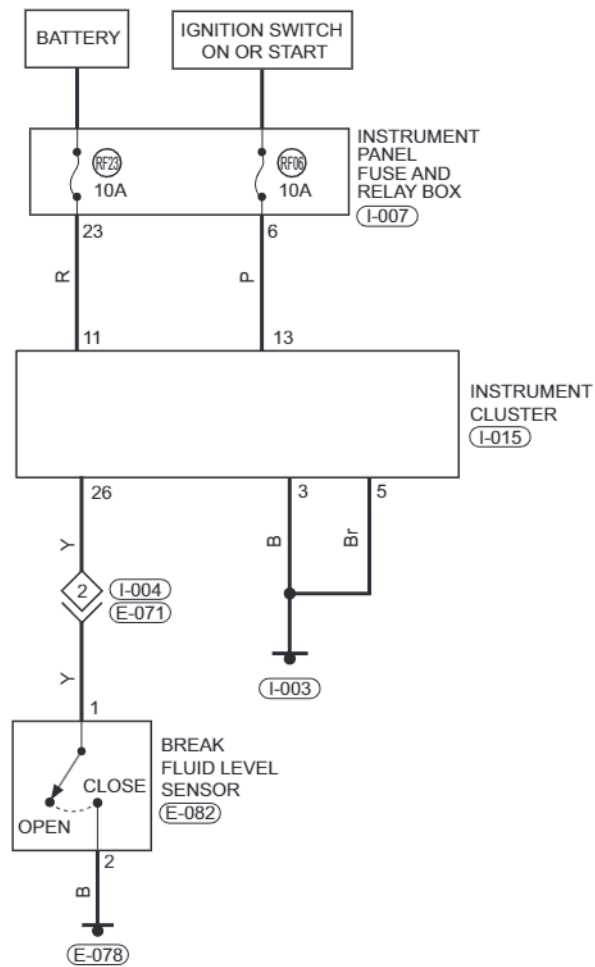
Brake Caliper Piston Pressing Tool	 RCH0000053
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General Tools

Dial Indicator and Magnetic Holder	 RCH0000023
Vernier Caliper	 RCH0000019
Digital Multimeter	 RCH0000002

Circuit Diagram

Brake System



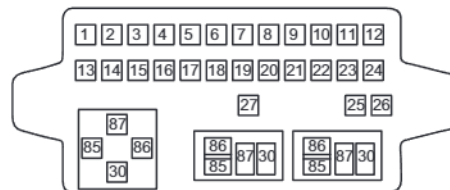
I-015
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I-004
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E-082
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I-007
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DIAGNOSIS & TESTING

Problem Symptoms Table

HINT:

Use the table below to help determine the cause of the problem symptoms. Check each suspected area in sequence. Repair or replace the faulty components, or adjust as necessary.

Symptom	Suspected Area	See page
Noise in brake	Front brake lining (cracked, deformed, dirty or burnished)	26-32
	Rear brake lining (cracked, deformed, dirty or burnished)	26-45
	Front disc brake locating bolt guide pin (worn)	26-30
	Rear disc brake locating bolt guide pin (worn)	26-42
	Front brake caliper assembly fixing bolt (loose)	26-28
	Rear brake caliper assembly fixing bolt (loose)	26-41
	Front brake disc (scored)	26-32
	Rear brake disc (scored)	26-45
	Excessive brake disc runout	26-41
	Brake shoe stopper spring (damaged)	27-17
	Brake shoe return tension spring (damaged or elasticity insufficient)	27-17
	Foreign matter on front brake disc	-
	Foreign matter on rear brake disc	-
Hard pedal but brake inefficient	Front brake lining (worn, cracked, deformed, oily or burnished)	26-32
	Rear brake lining (worn, cracked, deformed, oily or burnished)	26-45
	Front brake disc (unevenly worn)	26-32
	Rear brake disc (unevenly worn)	26-45
	Vacuum booster pushrod position (incorrect)	26-23
	Vacuum leaks in booster system	26-19
Hard pedal (firm-depress unable to lock-up wheels)	Vacuum booster (bounce)	26-19
Pedal overtravel (vehicle stops normally)	Air in brake system	26-12
Pedal pulsates/bounces during braking	Brake disc (unevenly worn)	26-32
		26-45



Symptom	Suspected Area	See page
Low or spongy pedal	Air in brake system	26-12
	Brake system (leaked)	-
	Front brake piston seal (worn or damaged)	26-30
	Rear brake piston seal (worn or damaged)	26-42
	Brake master cylinder assembly (malfunctioning)	26-16
	Vacuum booster pushrod position (incorrect)	26-23
Vehicle pulls during braking	Front brake piston (stuck or frozen)	26-30
	Rear brake piston (stuck or frozen)	26-42
	Front brake lining (dirty, cracked or deformed)	26-32
	Rear brake lining (dirty, cracked or deformed)	26-45
	Front brake disc (unevenly worn)	26-32
	Rear brake disc (unevenly worn)	26-45
Brake stuck	Brake pedal free play (minimum)	26-23
	Parking brake lever travel (in need of adjustment)	27-8
	Parking brake cable (stuck)	27-13
	Parking brake shoe clearance (in need of adjustment)	27-8
	Front brake lining (cracked or deformed)	26-32
	Rear brake lining (cracked or deformed)	26-45
	Front brake piston (stuck or frozen)	26-30
	Rear brake piston (stuck or frozen)	26-42
	Brake shoe return tension spring (loose or damaged)	27-17
	Vacuum booster pushrod position (incorrect)	26-23
	Vacuum leaks in booster system	26-19
	Brake master cylinder assembly (malfunctioning)	26-16

Inspection

CAUTION

- Use well-sealed brake fluid DOT4 or equivalent. DO NOT use oily solution, otherwise brake system seal may be damaged.
- Brake fluid may damage paint surface. If brake fluid spills on paint surface, wash it off immediately with water.
- DO NOT use gasoline, kerosene, alcohol, engine oil, transmission oil or any other fluid that contains mineral oil to clean the system components. These kinds of fluid will damage rubber cover and seal.
- During servicing, make sure to clean grease or other foreign matter on the outer surface of brake caliper assembly, brake lining, brake disc and wheel hub.
- When operating brake disc and brake caliper, be careful to prevent damaging brake disc and brake caliper or scratching or cutting brake shoe linings.

1. Check conditions of tires and wheels. Damaged or worn wheels and tires can cause a pull, shudder, vibration and a condition similar to sudden braking.
2. If noise occurs while braking, check suspension components. Bounce vehicle up and down several times and check suspension or steering components for any looseness, wear or damage.
3. Check brake fluid level and condition.
 - a. If brake fluid level is low, check ABS control unit assembly, brake wheel cylinder, brake caliper, brake line, brake master cylinder assembly and brake fluid reservoir, etc. for leakage.
 - b. If brake fluid is contaminated, drain an amount of fluid to check. Replace with new fluid as necessary.

HINT:

It is normal that brake fluid will become dark after being used for a period of time. Do not mistake this for contamination.

ON-VEHICLE SERVICE

Brake Bleeding

⚠ WARNING

- When bleeding brake system, wear safety glasses.
- Be careful when bleeding air, as brake fluid at high pressure may spray out of bleeder plug.

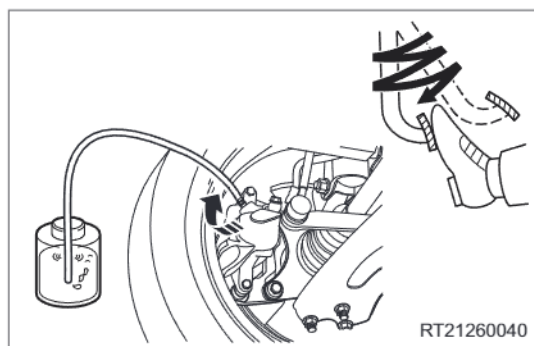
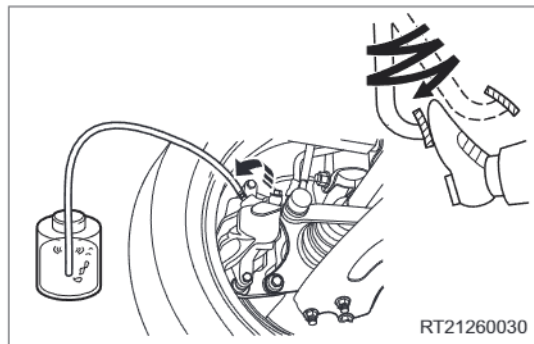
👁 CAUTION

- Before removing brake fluid reservoir, wipe it off to prevent dust and other foreign matter from dropping into the brake fluid reservoir.
- Use fresh, clear and well-sealed brake fluid of specified type or equivalent.
- DO NOT allow brake fluid to adhere to any paint surface, such as vehicle body. If brake fluid leaks onto any paint surface, immediately wash it off.
- During bleeding, do not depress brake pedal repeatedly at any time with bleeder plug opened. Otherwise, the amount of air in system will increase, and further bleeding is needed.
- DO NOT drain brake fluid in brake fluid reservoir while bleeding brake system.

HINT:

An assistant will be required to assist when bleeding brake system.

1. Fill the brake fluid reservoir with brake fluid to proper level.
2. Loosen the bleeder plug cap and connect a clear plastic hose to the bleeder plug. Submerge the end of hose into the clear container filled with new brake fluid.
3. Have an assistant depress the brake pedal 3 to 4 times repeatedly; depress and hold the brake pedal to a lower position. Then loosen the bleeder plug, and rotate it at least one turn.
4. Tighten the bleeder plug every time the brake pedal moves down quickly. Then release the brake pedal.

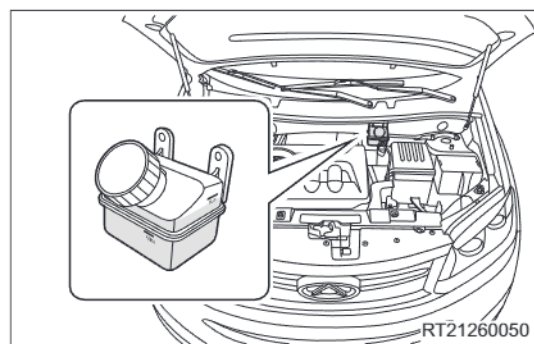


5. Repeat above steps, and bleed the brake lines of each wheel in the same manner in the order of rear left wheel, front right wheel, rear right wheel and front left wheel, until all air are bled from the brake lines.

Empty sign: a stream of fresh brake fluid flows into the clear container without bubbles.

HINT:

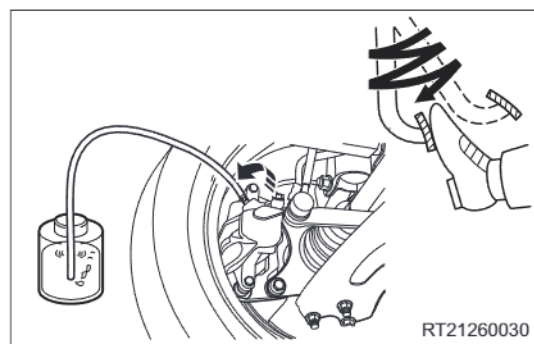
During bleeding the brake system, make sure the brake fluid level is always near the "MAX" mark. Check the brake fluid level at all times during bleeding. Add brake fluid as necessary.



6. Check and adjust the brake fluid level to the "MAX" mark.
7. Check brake pedal effect. If braking effect is improper or the pedal is spongy, air may still exist in the system. Perform bleeding procedures again for brake system as necessary.
8. Have the vehicle tested to confirm that brake operates properly and pedal feel is correct.

Brake Fluid Replacement

1. Drain the brake fluid.
 - a. Start the engine and run it at idle.
 - b. Remove the filler cap of brake fluid reservoir assembly. Remove the bleeder plug cap and connect a clear plastic hose to the bleeder plug, and submerge the end of hose into the clear container filled with new brake fluid.
 - c. Loosen the bleeder plug, and depress the brake pedal continuously until the brake fluid stops coming out.



2. Add brake fluid.
 - a. Tighten the bleeder plug after confirming that brake fluid is drained. Fill the brake fluid reservoir with new brake fluid to the proper level.
3. Perform bleeding procedures.
 - a. After replacing with new brake fluid, make sure to bleed the brake system for normal operation. [See page 26-12](#) for detail information about brake bleeding.

Brake Fluid Reservoir Assembly

On-vehicle Inspection

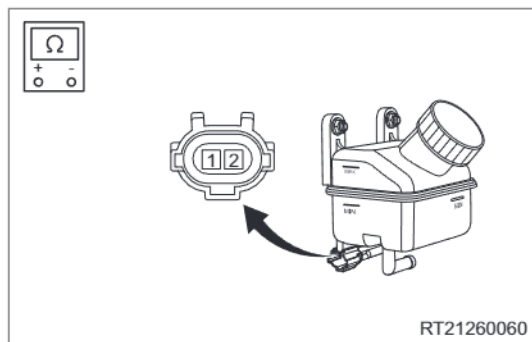
1. Check the brake fluid level warning switch.
 - a. Remove the brake fluid reservoir filler cap.
 - b. Disconnect the brake fluid level warning switch wire harness connector.
 - c. Using ohm band of digital multimeter, check for continuity between brake fluid level warning switch terminals according to conditions shown in the table below.

Standard Condition

Multimeter Connection	Condition	Specified Condition
Terminal 1 - Terminal 2	Float upward (switch ON)	No continuity
Terminal 1 - Terminal 2	Float downward (switch OFF)	Continuity

HINT:

- There is a float in the fluid reservoir. The position of float changes according to increasing or decreasing brake fluid level.
 - If result is not as specified, replace brake fluid reservoir assembly.
- d. Add brake fluid to the "MAX" mark.



Removal

1. Drain the brake fluid (See page 26-13).



ENVIRONMENTAL PROTECTION

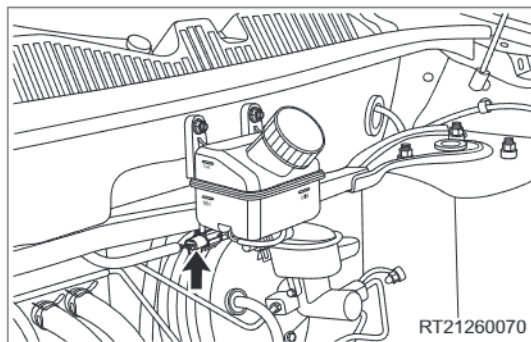
- Drained brake fluid should be well kept in a container. Never discard it at will.



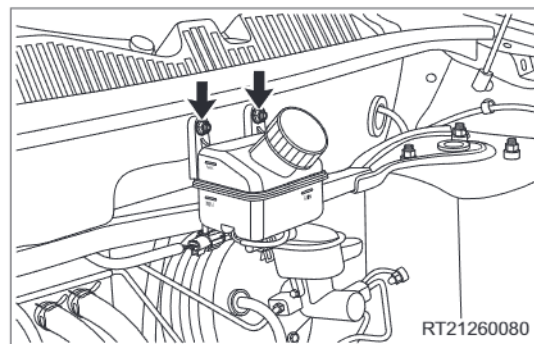
CAUTION

- Wash off brake fluid immediately if it comes in contact with any paint surface.

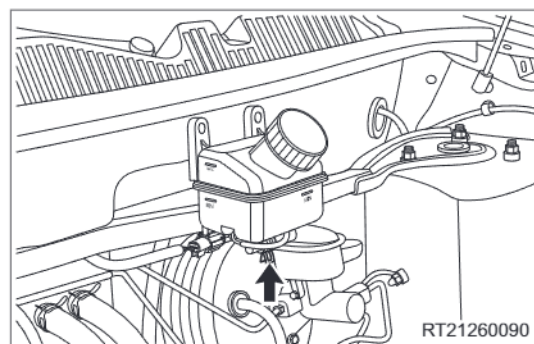
2. Remove the brake fluid reservoir assembly.
 - a. Disconnect the brake fluid level warning switch connector (arrow).



- b. Remove the coupling nuts (arrow) between brake fluid reservoir assembly and body.
(Tightening torque: 9 ± 1 N·m)



- c. Loosen the brake fluid tube fixing clamp (arrow) and disengage the brake fluid tube from brake fluid reservoir assembly.



- d. Remove the brake fluid reservoir assembly.

Installation

Installation is in the reverse order of removal.

HINT:

Perform bleeding procedures for brake system and add brake fluid to the proper level after completing installation.

Brake Master Cylinder Assembly

Removal

CAUTION

- Remove the vacuum remained in vacuum booster before removing brake master cylinder assembly to avoid damaging brake master cylinder assembly and prevent booster from sucking in any pollutant.
- When engine is not running, remove vacuum by depressing brake pedal repeatedly until the brake pedal can be depressed firmly.
- When removing brake line, sealing measures should be taken to prevent foreign matter from entering.

1. Drain the brake fluid ([See page 26-13](#)).

CAUTION

- Wash off brake fluid immediately if it comes in contact with any paint surface.

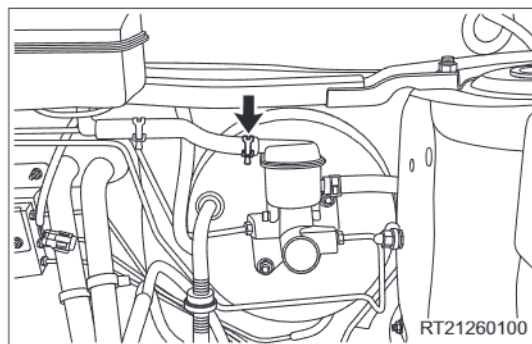
ENVIRONMENTAL PROTECTION

- Drained brake fluid should be well kept in a container. Never discard it at will.

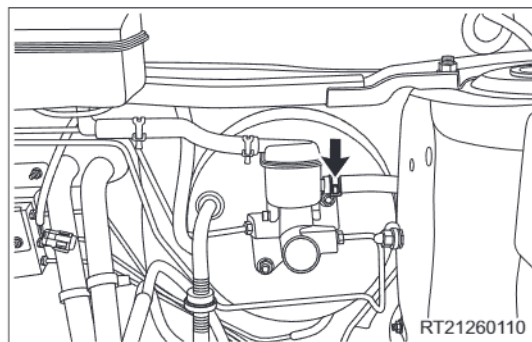
2. Remove the air filter assembly ([See page 10-17](#)).

3. Remove the brake master cylinder assembly.

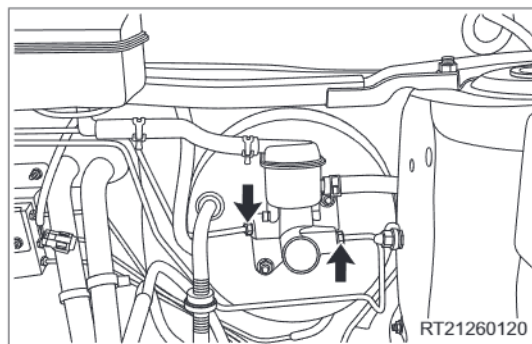
- a. Loosen the brake fluid tube fixing clamp (arrow) and disengage the brake fluid tube from brake fluid reservoir assembly.



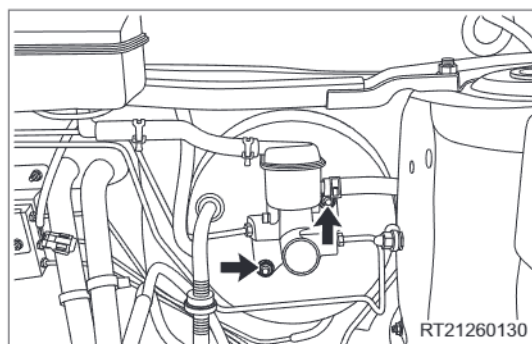
- b. Loosen the clutch hose fixing clamp (arrow) and disengage the clutch hose from brake fluid reservoir assembly (for only MT model).



- c. Loosen 2 coupling plugs (arrow) between brake master cylinder assembly and brake pipes.
(Tightening torque: $16 \pm 2 \text{ N}\cdot\text{m}$)

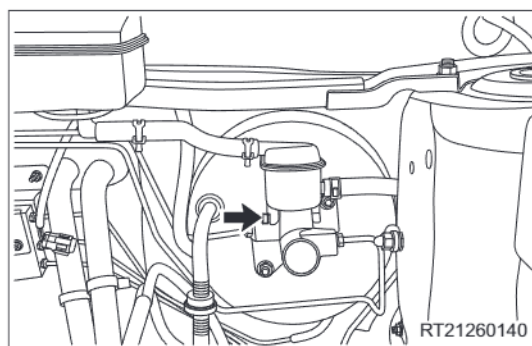


- d. Loosen 2 coupling nuts (arrow) between brake master cylinder assembly and vacuum booster.
(Tightening torque: $21 - 25 \text{ N}\cdot\text{m}$)

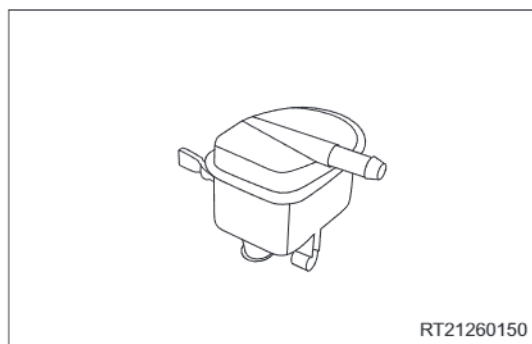


- e. Carefully and vertically slide the brake master cylinder assembly out of vacuum booster.

- f. Remove the coupling bolt (arrow) between brake fluid reservoir assembly and brake master cylinder assembly.
(Tightening torque: $3 - 5 \text{ N}\cdot\text{m}$)



- g. Disengage the connection between brake fluid reservoir assembly and brake master cylinder assembly, and remove the brake fluid reservoir assembly.



 CAUTION

- Brake master cylinder assembly and piston are designed to make piston fall out easily. To prevent this, make sure brake master cylinder is horizontal or end surface downward (piston surface facing upward) when handling the brake master cylinder assembly.
- Make sure that no foreign matter adheres to brake master cylinder assembly piston. If foreign matter adheres, clean it off with a piece of clean cloth. Then, apply grease to entire outer edge contact surface of master cylinder piston.
- Master cylinder should be handled carefully. Avoid any impact to the master cylinder, such as falling. The fallen master cylinder cannot be reused.
- DO NOT tap or pinch master cylinder piston, and avoid damaging master cylinder piston in any other ways.

Installation

Installation is in the reverse order of removal.

 CAUTION

- Make sure to tighten coupling plugs and nuts to the specified torque during installation.
- Perform bleeding procedures for brake system and add brake fluid to the proper level after completing installation.

Vacuum Booster with Brake Master Cylinder Assembly

On-vehicle Inspection

1. Check vacuum booster assembly.

a. Air tightness check.

- Start engine and stop it after 1 or 2 minutes. Slowly depress brake pedal several times.
- Make sure that booster is airtight. Check that distance every time the pedal depressed is gradually decreased compare to the previous operation.

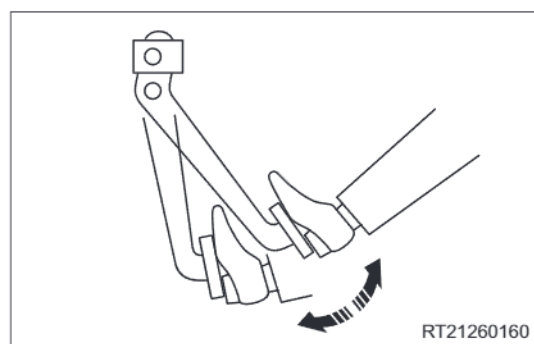
If pedal operation is not as specified, check the check valve. If check valve is normal, replace the vacuum booster assembly.

- Start engine. Depress and hold pedal, then stop engine.
- Make sure that booster is airtight. Depress and hold pedal for 30 seconds, and check that pedal reserve distance does not change.

If pedal operation is not as specified, check the check valve. If check valve is normal, replace the vacuum booster assembly.

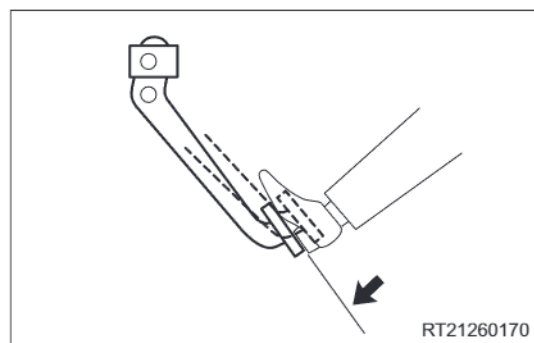
b. Operation check.

- Stop engine.
- Depress pedal several times and check that pedal reserve distance does not change.



- Depress and hold pedal, and then start engine. Check that pedal can only be depressed lightly.

If pedal operation is not as specified, check the check valve. If check valve is normal, replace the vacuum booster assembly.



Removal

1. Drain the brake fluid (See page 26-13).

CAUTION

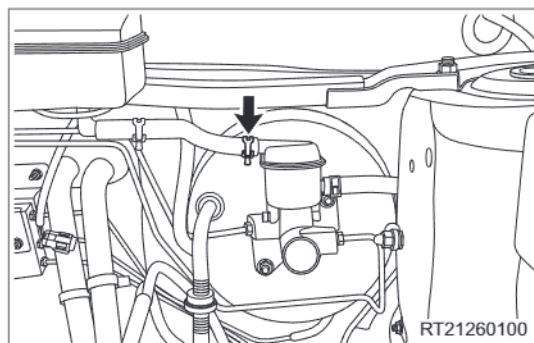
- Wash off brake fluid immediately if it comes in contact with any paint surface.

ENVIRONMENTAL PROTECTION

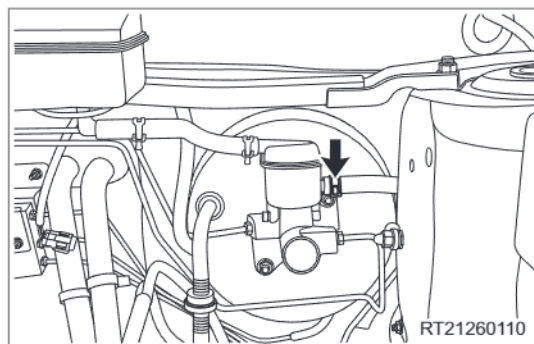
- Drained brake fluid should be well kept in a container. Never discard it at will.

2. Remove the air filter assembly (See page 10-17).
3. Remove the vacuum booster with brake master cylinder assembly.

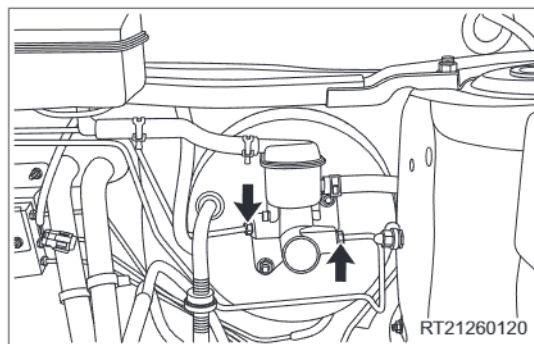
- a. Loosen the brake fluid tube fixing clamp (arrow) and disengage the brake fluid tube from brake fluid reservoir assembly.



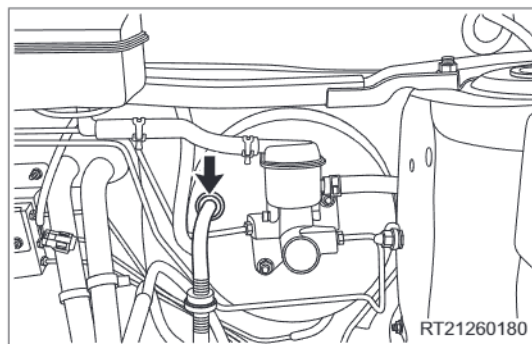
- b. Loosen the clutch hose fixing clamp (arrow) and disengage the clutch hose from brake fluid reservoir assembly (for only MT model).



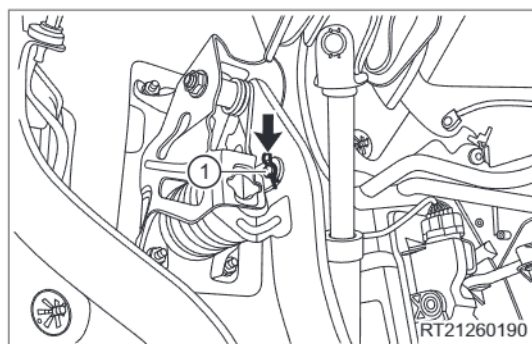
- c. Loosen 2 coupling plugs (arrow) between brake master cylinder assembly and brake pipes. (Tightening torque: 16 ± 2 N·m)



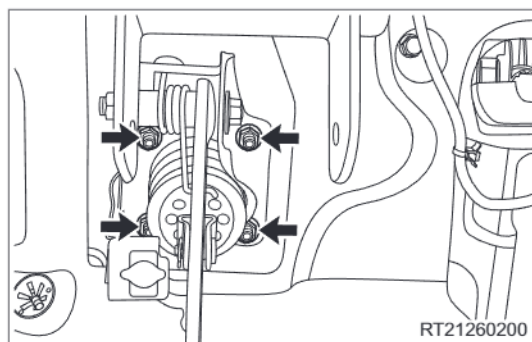
- d. Disengage the vacuum hose assembly with check valve (arrow) from vacuum booster assembly.



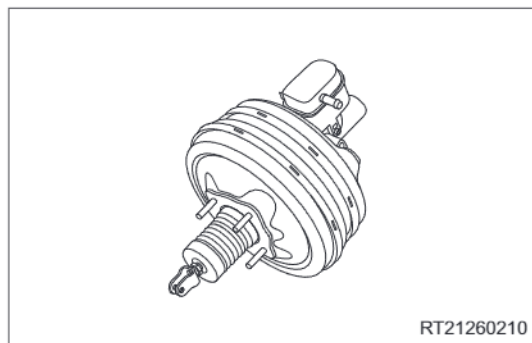
- e. Using needle-nose pliers, remove the locking pin (arrow) and pushrod pin (1) from vacuum booster pushrod, and detach the brake pedal assembly.



- f. Remove 4 coupling nuts (arrow) between vacuum booster assembly and brake pedal assembly. (Tightening torque: 25 ± 3 N·m)



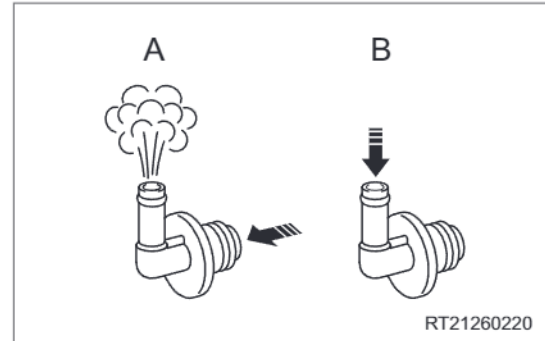
- g. Remove the vacuum booster with brake master cylinder assembly from engine compartment.



Inspection

1. Check the check valve.
 - a. Remove the check valve from vacuum hose assembly.
 - b. Check that there is airflow (A) from vacuum booster to engine, and no airflow (B) from engine to vacuum booster.

If result is not as specified, replace vacuum hose assembly.



Installation

Installation is in the reverse order of removal.

CAUTION

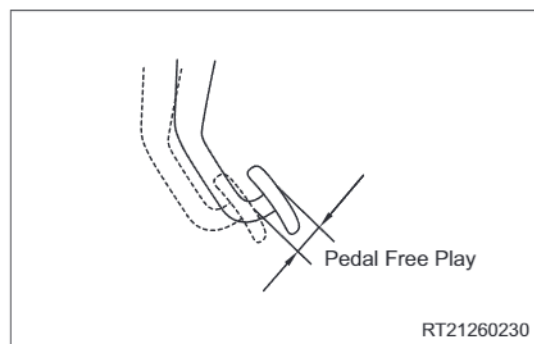
- Make sure to tighten fixing plugs and nuts to the specified torque during installation.
- Perform bleeding procedures for brake system and add brake fluid to proper level after completing installation.

Brake Pedal Assembly

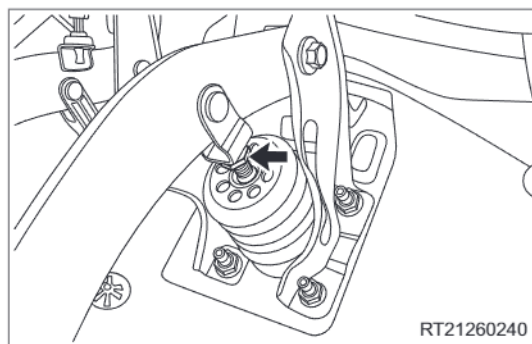
On-vehicle Inspection

1. Check brake pedal free play.
 - a. Stop engine. Depress brake pedal several times until no vacuum is left in vacuum booster, and then release brake pedal.
 - b. Depress brake pedal until resistance is felt.
 - c. As shown in the illustration, check the brake pedal free play by measuring distance between pedal position in above step and pedal position when it is released.

Standard brake pedal free play: 1 - 9 mm

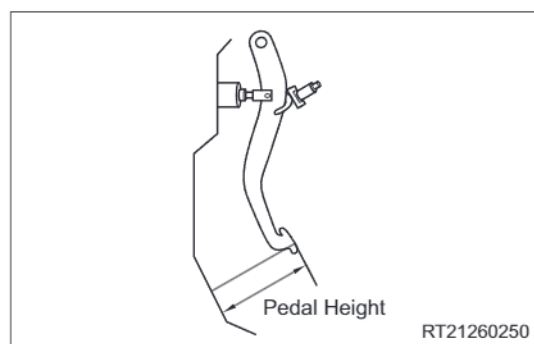


2. Adjust brake pedal free play.
 - a. As shown in the illustration, loosen the vacuum booster pushrod locking nut (arrow) and rotate the vacuum booster pushrod clockwise or counterclockwise to adjust the brake pedal free play to the specified value.



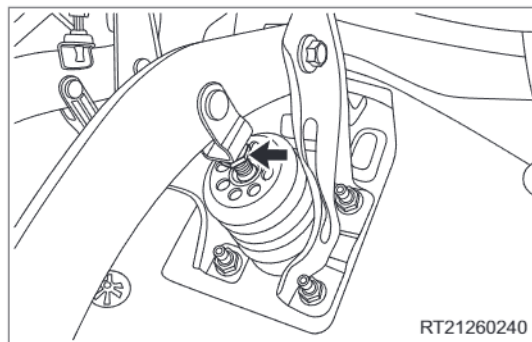
3. Check brake pedal height.
 - a. As shown in the illustration, turn over the carpet and measure distance between brake pedal center and dash panel, which is the brake pedal height.

Standard brake pedal height: 176 - 186 mm



4. Adjust brake pedal height.

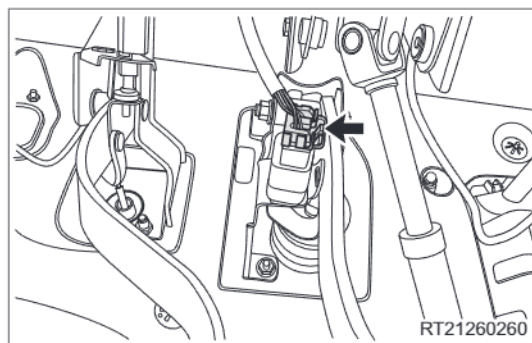
- a. As shown in the illustration, loosen the vacuum booster pushrod locking nut (arrow) and rotate the vacuum booster pushrod clockwise or counterclockwise to adjust brake height to the specified value.



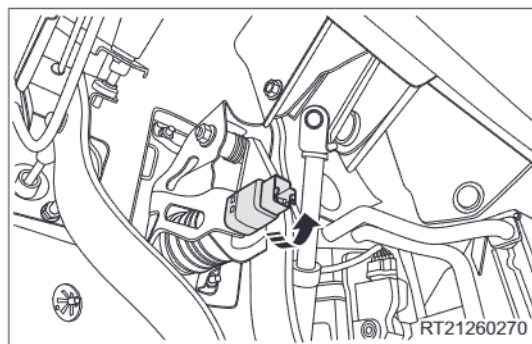
Removal

1. Remove the brake light switch assembly.

- a. Disconnect the brake light switch assembly wire harness connector (arrow).

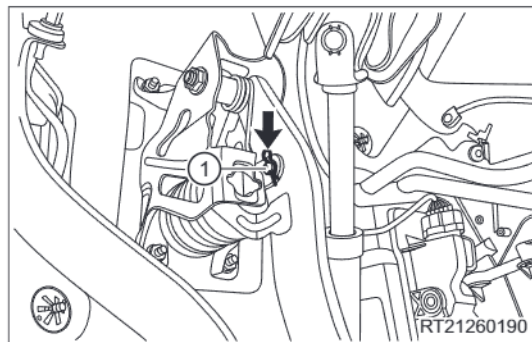


- b. Remove the brake light switch assembly by rotating it 90° clockwise or counterclockwise.

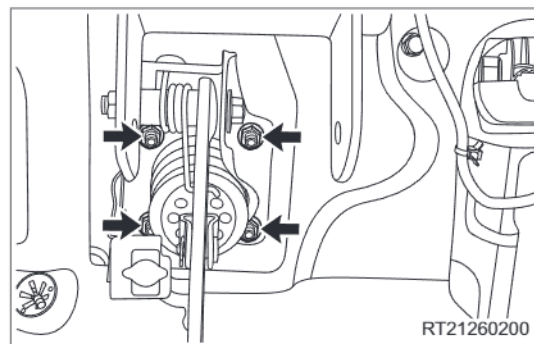


2. Remove the brake pedal assembly.

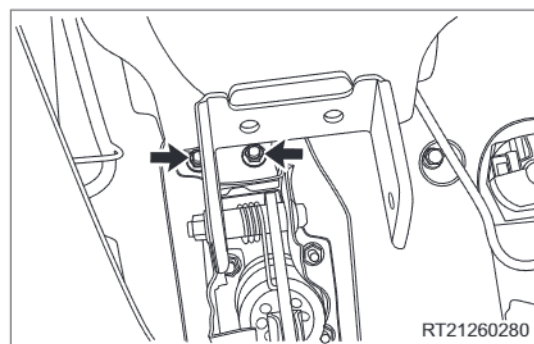
- a. Using needle-nose pliers, remove the locking pin (arrow) and pushrod pin (1) from vacuum booster pushrod, and detach the brake pedal assembly.



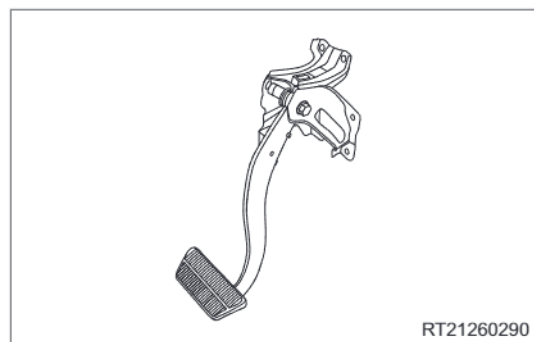
- b. Remove 4 coupling nuts (arrow) between vacuum booster assembly and brake pedal assembly.
(Tightening torque: 25 ± 3 N·m)



- c. Remove 2 coupling nuts (arrow) between brake pedal assembly and body.
(Tightening torque: 25 ± 3 N·m)



- d. Remove the brake pedal assembly from the inside of vehicle.



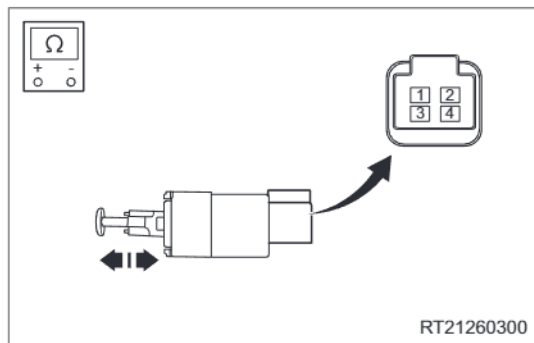
Inspection

1. Check brake light switch assembly.
 - a. Using ohm band of digital multimeter, check for continuity between brake light switch assembly terminals according to the table below.

Standard Condition

Multimeter Connection	Switch Condition	Specified Condition
Terminal 1 - Terminal 3	Brake pedal depressed (switch pin released)	Continuity
Terminal 2 - Terminal 4	Brake pedal depressed (switch pin released)	No continuity
Terminal 1 - Terminal 3	Brake pedal released (switch pin pushed)	No continuity
Terminal 2 - Terminal 4	Brake pedal released (switch pin pushed)	Continuity

If result is not as specified, replace brake light switch assembly.



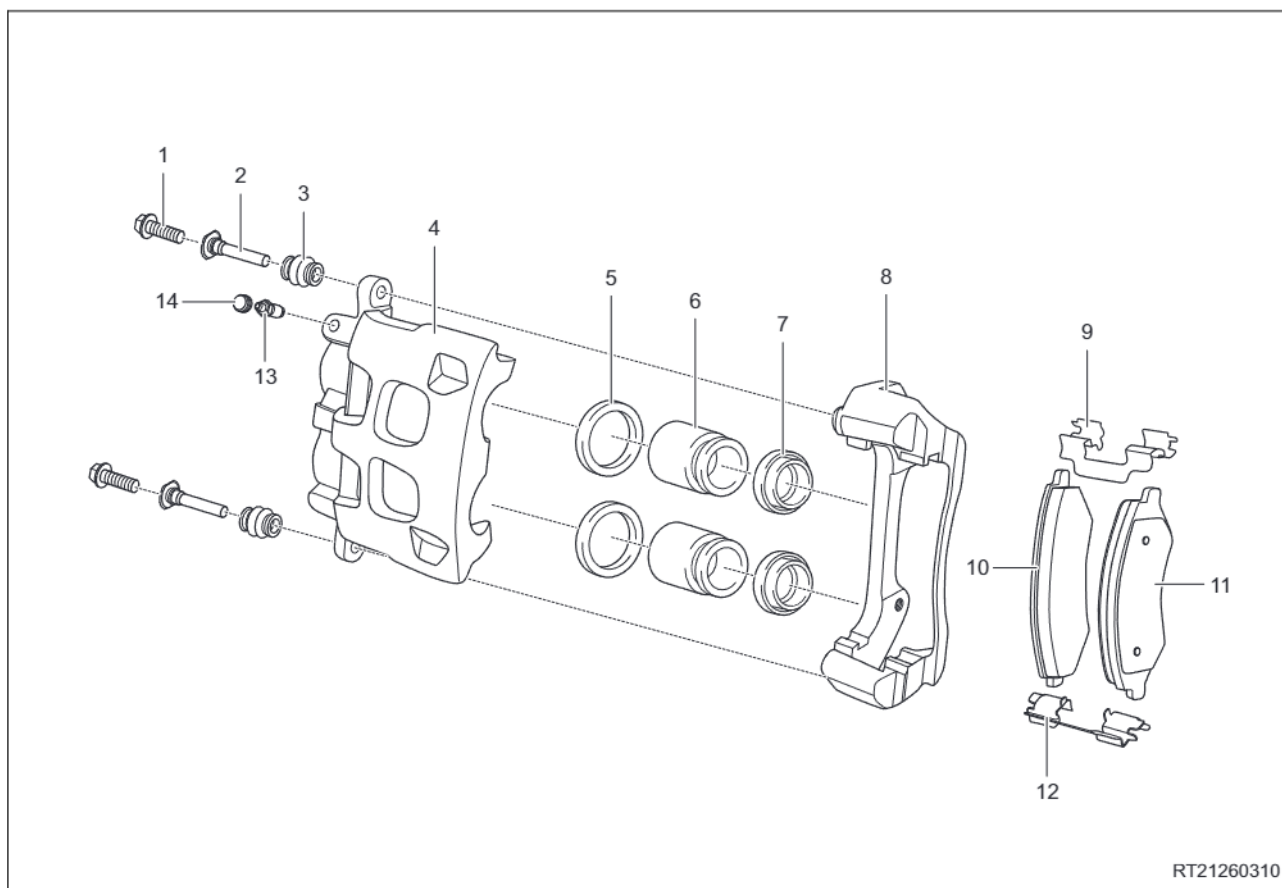
Installation

Installation is in the reverse order of removal.

CAUTION

- Make sure to tighten fixing nuts to the specified torque during installation.
- Check that brake light operates properly after completing installation.

Front Disc Brake Assembly

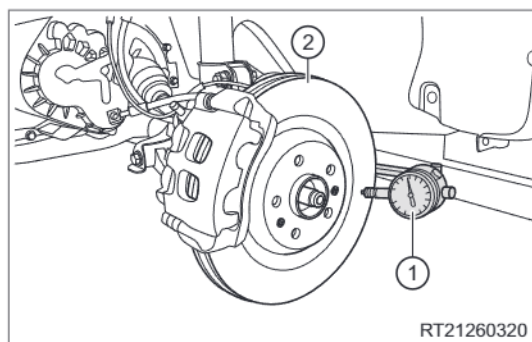


RT21260310

1 - Brake Caliper Locating Bolt	2 - Brake Caliper Locating Bolt Guide Pin
3 - Brake Caliper Guide Pin Rubber Dust Boot	4 - Front Disc Brake Cylinder
5 - Front Disc Brake Piston Seal Ring	6 - Front Disc Brake Piston
7 - Front Disc Brake Piston Dust Boot	8 - Front Disc Brake Caliper Fixing Bracket
9 - Upper Support Gasket	10 - Inner Brake Lining
11 - Outer Brake Lining	12 - Lower Support Gasket
13 - Bleeder Plug	14 - Bleeder Plug Cap

On-vehicle Inspection

1. Check brake disc runout.
 - a. Remove the front wheel (See page 24-9).
 - b. Secure the dial indicator (1) to the proper position. Position the dial indicator pointer approximately 10 mm from the outer edge of brake disc.
 - c. Slowly rotate the brake disc (2) and check the runout. Mark the lowest and highest points and record these measurements.



- d. Check the runout on the opposite side of brake disc in the same way. Mark the lowest and highest points and record these measurements.
- e. Compare the recorded runout value and limit value.
Maximum runout for front brake disc: 0.06 mm
- f. If runout exceeds the maximum value, replace the brake disc.

Removal

HINT:

- Use the same procedures for the right side and left side.
- Procedures listed below are for the left side.

1. Drain the brake fluid (See page 26-13).

CAUTION

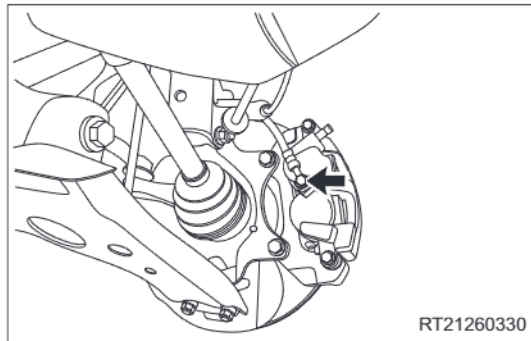
- Wash off brake fluid immediately if it comes in contact with any paint surface.



ENVIRONMENTAL PROTECTION

- Drained brake fluid should be well kept in a container. Never discard it at will.

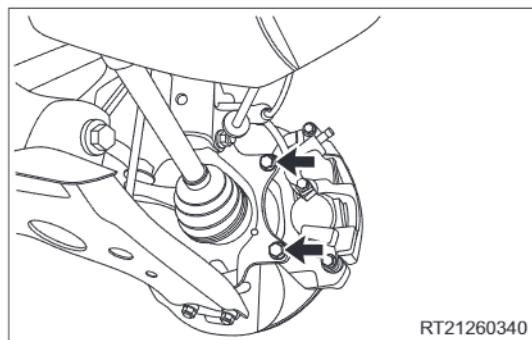
2. Remove the front left wheel (See page 24-9).
3. Remove the front left brake caliper assembly.
 - a. Remove the coupling bolt and washer (arrow) between front left brake caliper assembly and front left brake hose assembly.
(Tightening torque: 27 ± 2 N·m)



CAUTION

- DO NOT allow brake fluid to be sprayed on your clothes or skin when removing brake hose, as brake fluid is corrosive.

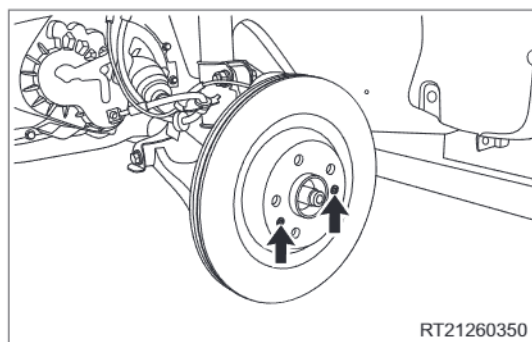
- b. Remove the coupling bolts (arrow) between front left brake caliper assembly and front left steering knuckle. (Tightening torque: 100 ± 10 N·m)



- c. Remove the front left brake caliper assembly.

4. Remove the front left brake disc.

- a. Remove 2 positioning screws (arrow) from front left brake disc, and remove the front left brake disc. (Tightening torque: 10 ± 1 N·m)



Disassembly

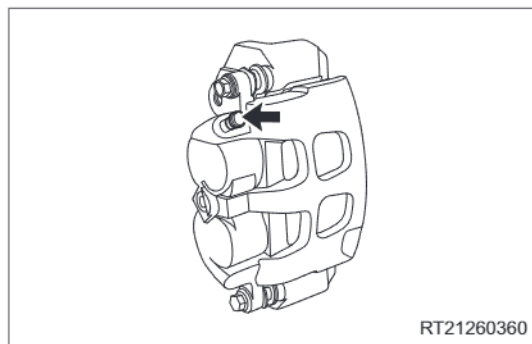
HINT:

- Use the same procedures for the right side and left side.
- Procedures listed below are for the left side.

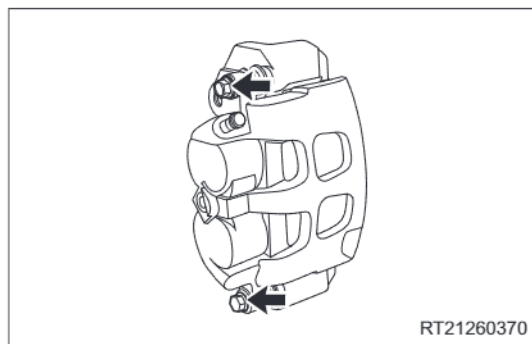
⚠ WARNING

- Never use high pressure when removing piston from the bore of brake caliper. Otherwise this may cause personal injuries.
- If it is needed to remove piston with compressed air. DO NOT face the piston to yourself or place your hands around the brake caliper and piston.

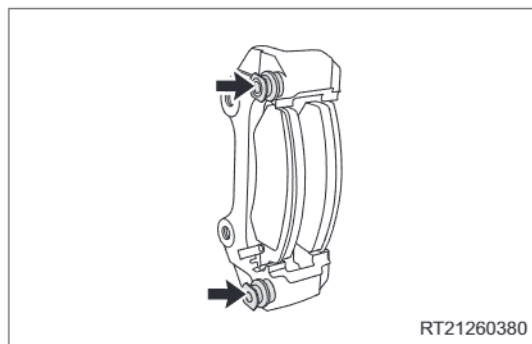
1. Remove the bleeder plug (w/ bleeder plug cap).
 - a. Remove the bleeder plug (w/ bleeder plug cap) (arrow) from brake caliper assembly.



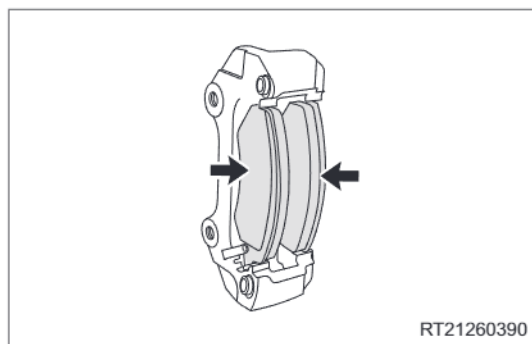
2. Remove the brake cylinder assembly.
 - a. Remove 2 locating bolts (arrow) between brake caliper fixing bracket and brake cylinder assembly.



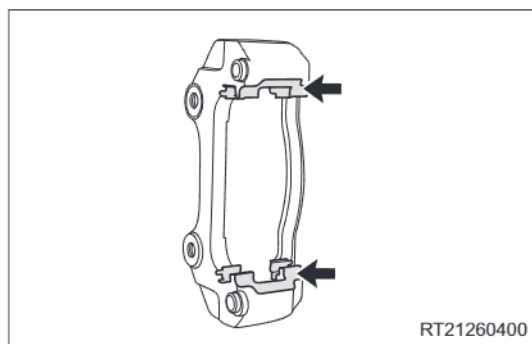
- b. Detach the brake cylinder assembly and brake caliper fixing bracket.
3. Remove the front brake caliper locating bolt guide pin (w/ dust boot).
 - a. Remove 2 brake caliper locating bolt guide pins (w/ dust boot) (arrow) from brake caliper fixing bracket.



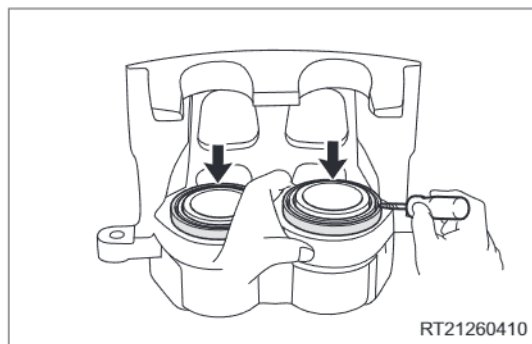
4. Remove the front brake lining.
 - a. Remove the inner brake lining and outer brake lining (arrow) from brake caliper fixing bracket.



5. Remove the brake lining support gasket.
 - a. Remove 2 brake lining support gaskets (arrow) from brake caliper fixing bracket.

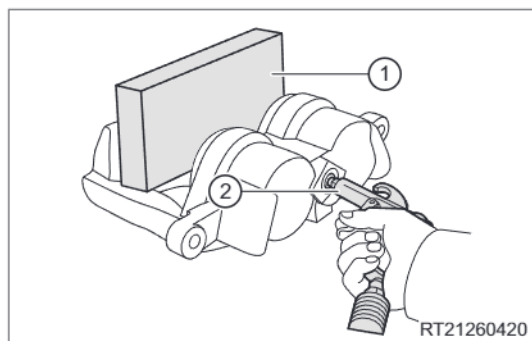


6. Remove the brake cylinder dust boot.
 - a. Using a flat tip screwdriver wrapped with protective tape, pry out the dust boots (arrow) on both sides carefully.

**CAUTION**

- Be careful not to damage brake piston and brake cylinder.

7. Remove the front disc brake piston.
 - a. Place a wooden board (1) between front disc brake piston and front disc brake cylinder.
 - b. Use compressed air (2) to carefully press out the piston from front disc brake cylinder through the attachment hole.

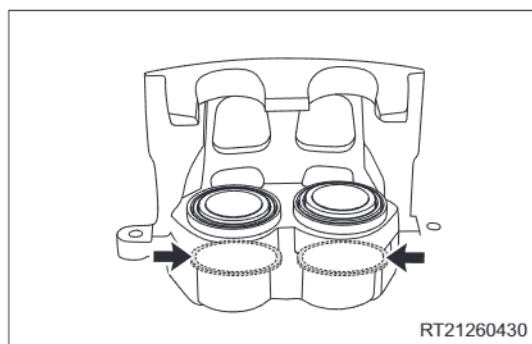


CAUTION

- Be careful not to splash brake fluid.
- DO NOT hold piston by hands to prevent injury.
- DO NOT remove or install brake piston casually, and always perform these operations by professional.

- c. Clean the piston bore with alcohol or proper solution. Then wipe it with a piece of lint.
8. Remove the front disc brake piston seal ring.

- a. Using a screwdriver wrapped with protective tape, carefully pry out the seal rings (arrow) on both sides of front disc brake piston from brake cylinder rear ring groove.

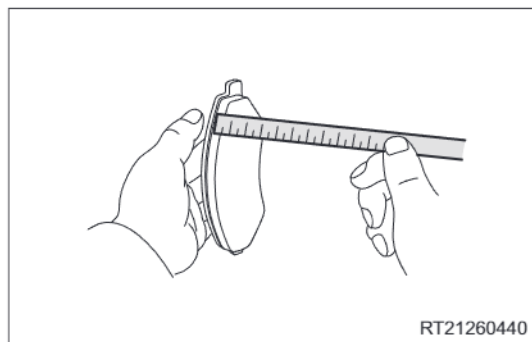


Inspection

1. Check brake cylinder and piston.
 - a. Check piston and bore for scratches or corrosion. If there are scratches or corrosion, remove them with fine sand cloth.
 - b. Remove dirt on piston with a soft brass wire brush and coarse cloth. Do not clean the piston with polishing cloth or sand cloth, as this may damage its surface. If surface of piston is damaged, replace it. If piston is stuck or bore is worn or corroded, replace entire brake caliper assembly. Use polishing cloth to remove small corrosion points inside the bore.
2. Check brake caliper fixing bracket and brake caliper guide pin set.
 - a. Clean the contact surface of brake caliper fixing bracket and brake lining support gasket with brake cleaner. Check for deformation, cracks, rust and foreign matter which is difficult to remove.
 - b. Check brake caliper guide pin rubber dust boot for deformation, cracks, worn and foreign matter which is difficult to remove.
 - c. Install brake caliper guide pin and brake caliper guide pin rubber dust boot to brake caliper fixing bracket. The brake caliper guide pin set should move smoothly without being stuck when pushing it with hand; otherwise replace it.
 - d. After installing the brake lining, check if it is easy to fall out (due to insufficient elasticity of support gasket). Replace as necessary.

3. Check brake lining.

- a. Visually check brake lining for flatness, and also check for excessive wear. If condition of lining cannot be confirmed accurately only by visual inspection, a physical check will be used as necessary.
- b. Measure the minimum brake lining thickness. When the minimum thickness of brake lining is 2 mm or less, replace the brake lining.



RT21260440

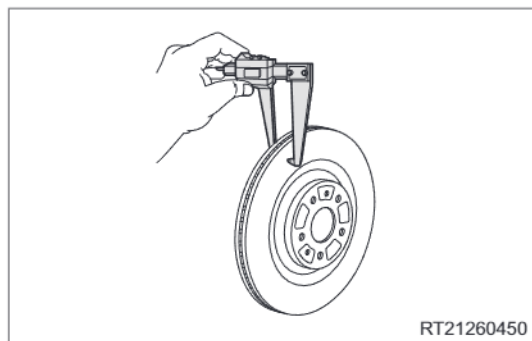
- c. When replacing excessively worn brake linings (inner and outer), it is also necessary to replace linings on the opposite side of vehicle as well as unchecked linings to maintain proper braking performance. If it is unnecessary to replace brake linings, be sure to reinstall brake linings to the original positions.

4. Check brake disc.

- a. Minor scratch or wear on brake disc surface is acceptable. If severe scratch or deformation exists, the brake disc must be replaced.
- b. Excessive wear of brake disc may cause poor contact between brake lining and surface of brake disc. If protrusion on the disc is not removed before installing new brake lining, abnormal wear of brake disc will be caused.
- c. It is normal that the surface of brake disc is worn when replacing brake lining. If cracks or burned spots exist, the brake disc must be replaced.

5. Check brake disc thickness.

- a. Using a vernier caliper, measure the brake disc thickness at the center of brake lining contact surface as shown in the illustration.
Standard thickness: 25 mm
Minimum thickness: 23 mm



RT21260450

- b. If it is less than the minimum thickness due to wear of brake disc, replace brake disc.

CAUTION

- DO NOT machine brake disc, because it may make the brake disc thickness less than the minimum thickness.

Assembly

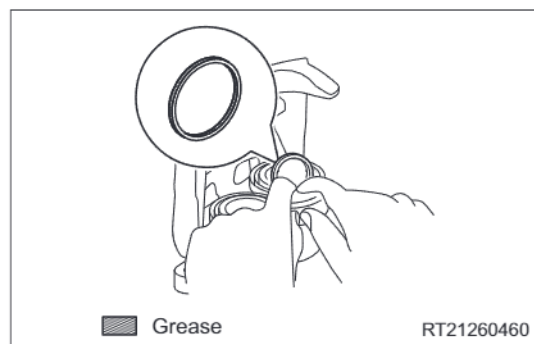
HINT:

- Use the same procedures for the right side and left side.
- Procedures listed below are for the left side.

CAUTION

- When assembling brake caliper assembly, always keep your hands clean.
- When assembling brake caliper assembly, always use clean new brake fluid.
- Never use old seal ring for front disc brake piston.

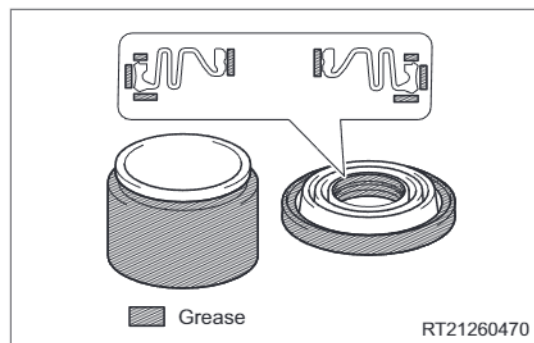
1. Install the front disc brake piston seal ring.
 - a. Apply a light coat of grease to entire inner and outer circumferences of new front disc brake piston seal ring.
 - b. Install the front disc brake piston seal ring onto the brake cylinder.



CAUTION

- Securely install front disc brake piston seal ring into the rear ring groove of brake cylinder.

2. Install the front disc brake piston.
 - a. Apply a light coat of grease to the inner and outer circumferences, and entire periphery of outer flange top/bottom surfaces of new brake cylinder dust boot as shown in the illustration.
 - b. Apply a light coat of grease to the entire outer circumference (part contacting with the brake cylinder dust boot and front disc brake cylinder) of front disc brake piston.

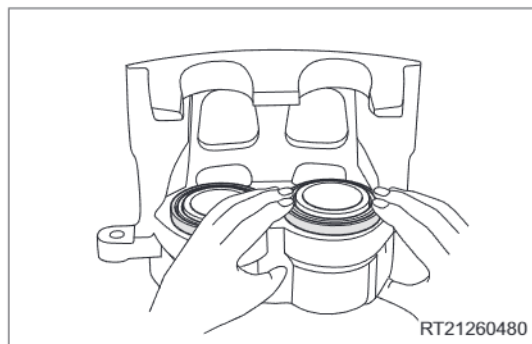


- c. Install the brake cylinder dust boot onto the front disc brake piston.
3. Install the brake cylinder dust boot.
 - a. Install the front disc brake piston to the front disc brake cylinder.

CAUTION

- DO NOT install piston forcibly to brake cylinder.

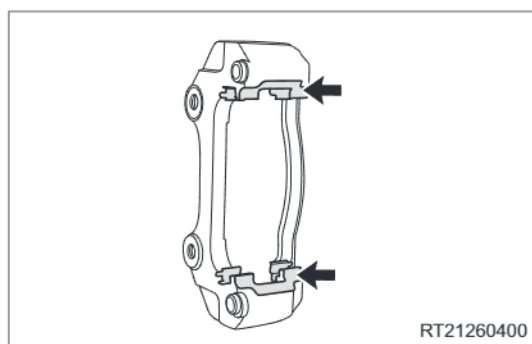
- b. Install the brake cylinder dust boot to the brake cylinder.



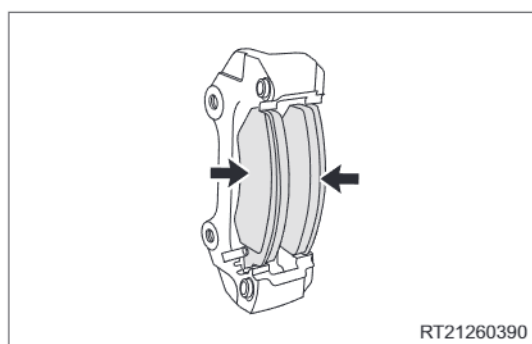
CAUTION

- Securely install brake cylinder dust boots into front ring grooves (both sides) of disc brake cylinder.
- DO NOT damage brake cylinder dust boot.

4. Install the brake lining support gasket.
- a. Securely install the upper and lower support gaskets (arrow) onto the brake caliper fixing bracket.



5. Install the front brake lining.
- a. Securely install the inner brake lining and outer brake lining (arrow) onto the brake caliper fixing bracket. Make sure they are clamped in place.

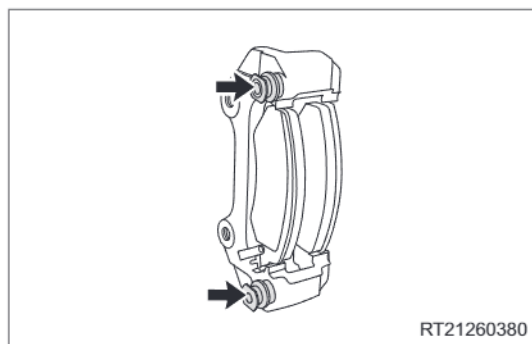


CAUTION

- Make sure the contact surface of lining and brake disc is free of oil and grease.

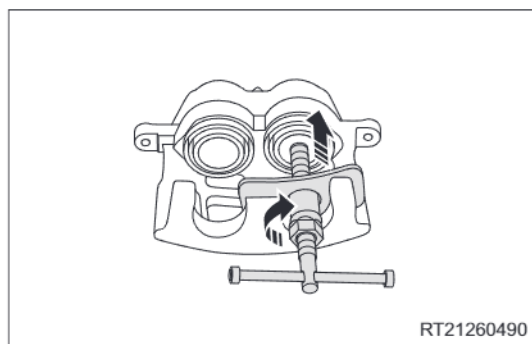
6. Install the front brake caliper locating bolt guide pin (w/ dust boot).

- a. Apply a small amount of grease to the contact surface between locating bolt guide pins and guide pin rubber dust boots, and securely install the dust boots (arrow) to the brake caliper fixing bracket.

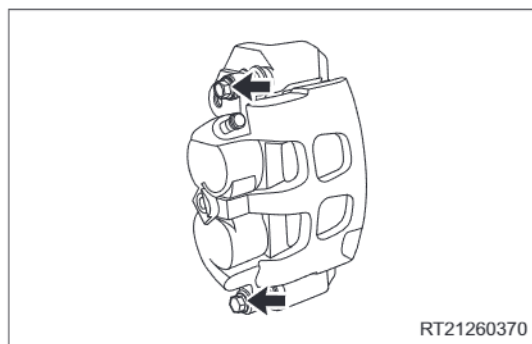


7. Install the brake cylinder assembly.

- a. Using brake cylinder piston pressing tool, slightly retract the brake cylinder piston (both sides).

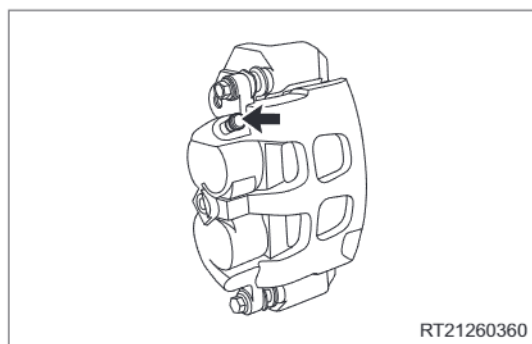


- b. Align the brake caliper locating bolts (arrow) with the guide pin hole and securely install the brake cylinder assembly.
(Tightening torque: 25 ± 3 N·m)



8. Install the bleeder plug (w/ bleeder plug cap).

- a. Securely install the bleeder plug (w/ bleeder plug cap) (arrow) to the front brake caliper assembly.
(Tightening torque: 9 - 11 N·m)



Installation

Installation is in the reverse order of removal.

CAUTION

- Make sure to tighten fixing bolts and nuts to the specified torque during installation.
- Before installing brake linings, completely retract brake caliper piston back into the bore of brake caliper.
- Depress brake pedal several times to secure the brake linings to brake disc in order to ensure safety after installing the brake linings and before moving vehicle.
- Replace brake linings in pairs. DO NOT replace it alone.
- DO NOT install inner brake lining and outer brake lining reversely.
- Be sure to check brake system for leakage after installation. Repair or replace malfunctioning parts as necessary.
- Be sure to perform bleeding procedures for brake system after installation.
- Be sure to add brake fluid to the proper level after installation.

Front Brake Hose Assembly

Removal

CAUTION

- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being scratched during removal and installation.

HINT:

- Use the same procedures for the right side and left side.
 - Procedures listed below are for the left side.
1. Remove the front left wheel (See page 24-9).
 2. Drain the brake fluid (See page 26-13).

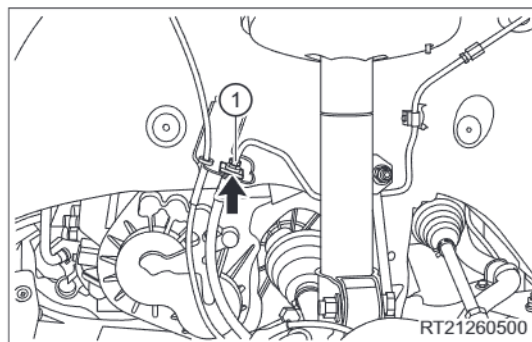
CAUTION

- Wash off brake fluid immediately if it comes in contact with any paint surface.

ENVIRONMENTAL PROTECTION

- Drained brake fluid should be well kept in a container. Never discard it at will.

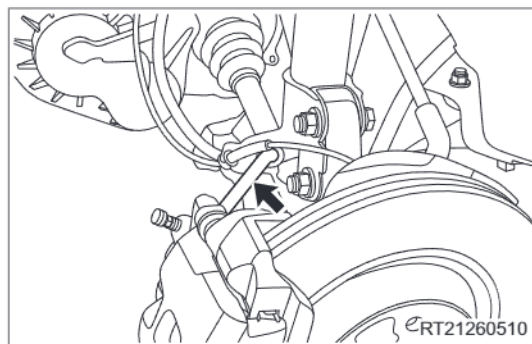
3. Remove the front left brake hose assembly.
 - a. Disengage the fixing clamp (arrow) and loosen the coupling plug (1) between front left brake hose assembly and front left brake pipe.
(Tightening torque: 16 ± 2 N·m)



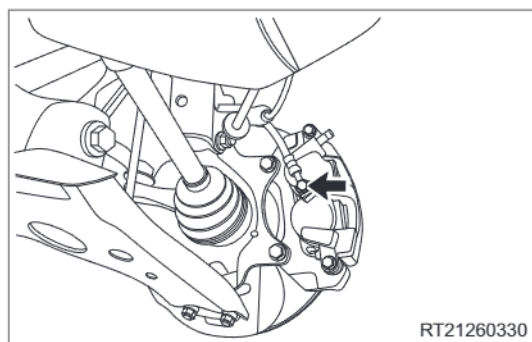
CAUTION

- DO NOT bend or damage brake tube.
- DO NOT allow any foreign matter such as dirt and dust to enter brake tube from joint parts.
- After removing brake line, perform sealing treatment to prevent foreign matter from entering.

- b. Remove the front left brake hose assembly (arrow) from front left shock absorber assembly.



- c. Remove the coupling bolt and washer (arrow) between front left brake caliper assembly and front left brake hose assembly.
(Tightening torque: 27 ± 2 N·m)



CAUTION

- DO NOT allow brake fluid to be sprayed on your clothes or skin when removing brake hose, as the brake fluid is corrosive.

- d. Remove the front left brake hose assembly.

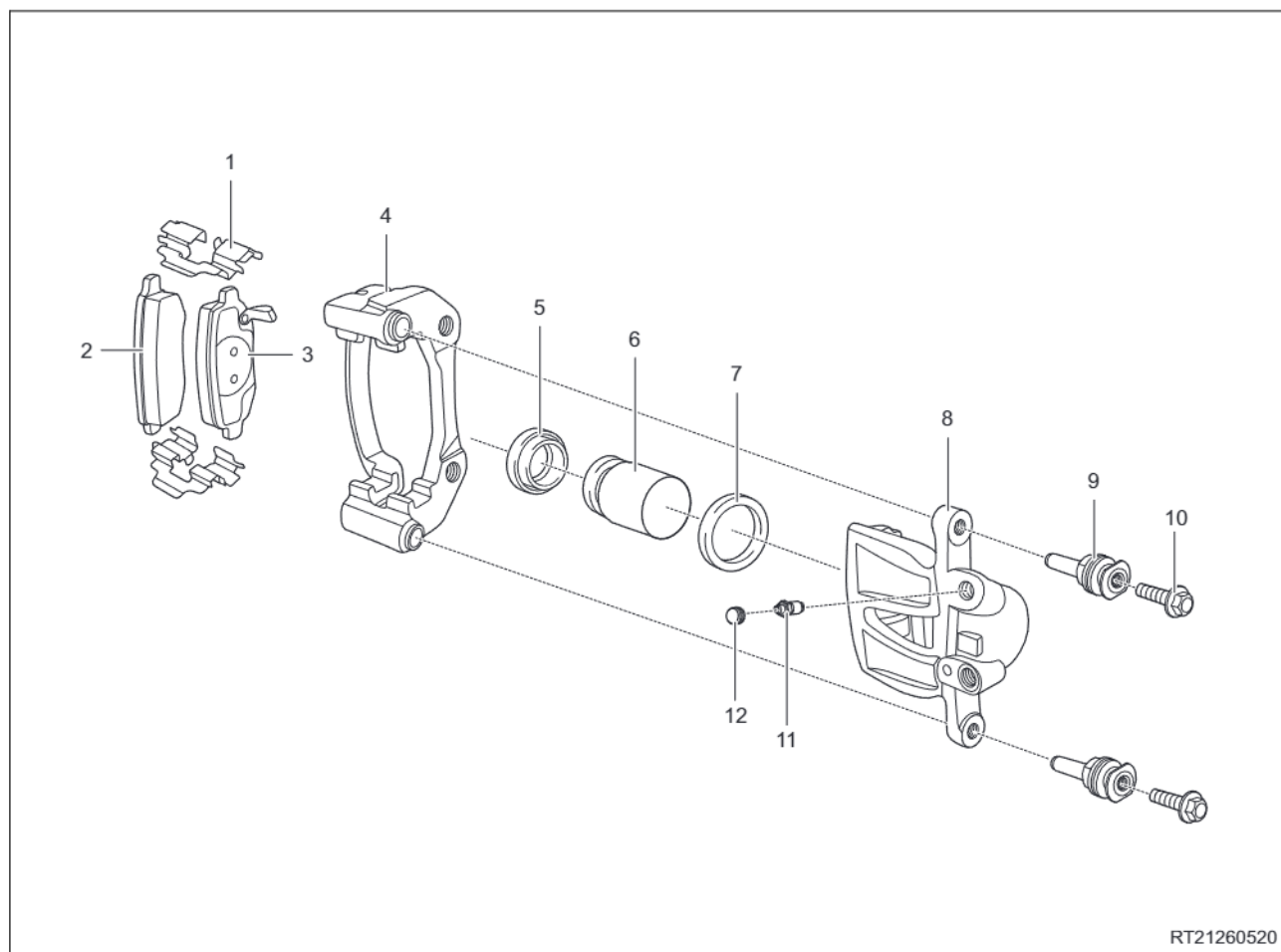
Installation

Installation is in the reverse order of removal.

CAUTION

- Make sure to tighten coupling bolts and plug to the specified torque during installation.
- Be sure to check brake system for leakage after installation. Repair or replace malfunctioning parts as necessary.
- Be sure to perform bleeding procedures for brake system after installation.
- Be sure to add brake fluid to the proper level after installation.

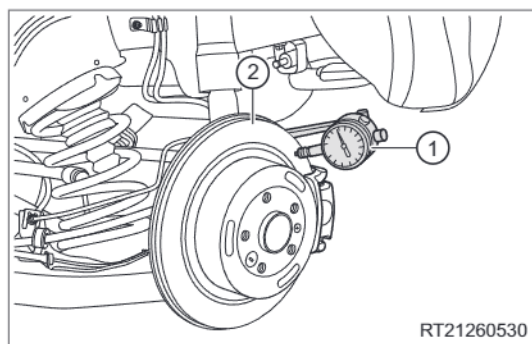
Rear Disc Brake Assembly



1 - Support Gasket	2 - Outer Brake Lining
3 - Inner Brake Lining	4 - Rear Disc Brake Caliper Fixing Bracket
5 - Rear Disc Brake Piston Dust Boot	6 - Rear Disc Brake Piston
7 - Rear Disc Brake Piston Seal Ring	8 - Rear Brake Cylinder
9 - Brake Caliper Locating Bolt Guide Pin (w/ Dust Boot)	10 - Brake Caliper Locating Bolt
11 - Bleeder Plug	12 - Bleeder Plug Cap

On-vehicle Inspection

1. Check brake disc runout.
 - a. Remove the rear wheel (See page 24-9).
 - b. Secure the dial indicator (1) to the proper position. Position the dial indicator pointer approximately 10 mm from the outer edge of rear brake disc.
 - c. Slowly rotate the brake disc (2) and check the runout. Mark the lowest and highest points and record these measurements.



- d. Check the runout on the opposite side of brake disc in the same way. Mark the lowest and highest points and record these measurements.
- e. Compare the recorded runout value and limit value.
Maximum runout for front brake disc: 0.06 mm
- f. If the runout exceeds the maximum value, replace the brake disc.

Removal

HINT:

- Use the same procedures for the right side and left side.
- Procedures listed below are for the left side.

1. Drain the brake fluid (See page 26-13).

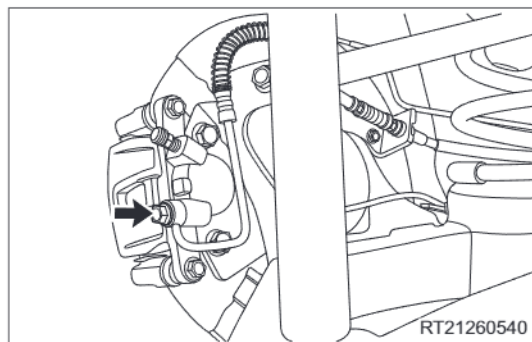
CAUTION

- Wash off brake fluid immediately if it comes in contact with any paint surface.

ENVIRONMENTAL PROTECTION

- Drained brake fluid should be well kept in a container. Never discard it at will.

2. Remove the rear left wheel (See page 24-9).
3. Remove the rear left brake caliper assembly.
 - a. Remove the coupling bolt and washer (arrow) between rear left brake caliper assembly and rear left brake hose assembly.
(Tightening torque: 20 ± 2 N·m)

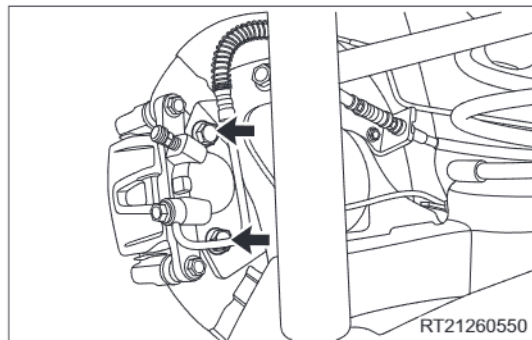


CAUTION

- DO NOT allow brake fluid to be sprayed on your clothes or skin when removing brake hose, as the brake fluid is corrosive.

- b. Remove the coupling bolts (arrow) between rear left brake caliper assembly and rear left brake bottom board assembly.

(Tightening torque: 100 ± 10 N·m)

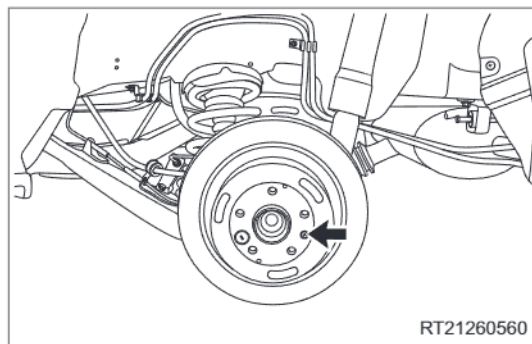


- c. Remove the rear left brake caliper assembly.

4. Remove the rear left brake disc.

- a. Remove the positioning screw (arrow) from rear left brake disc, and remove the rear left brake disc.

(Tightening torque: 10 ± 1 N·m)



Disassembly

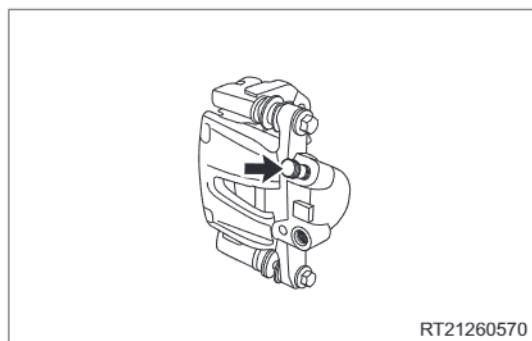
HINT:

- Use the same procedures for the right side and left side.
- Procedures listed below are for the left side.

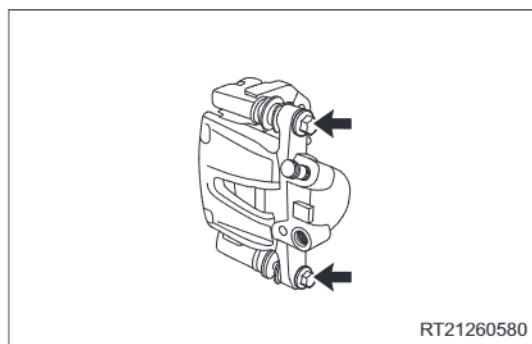
WARNING

- Never use high pressure when removing piston from the bore of brake caliper. Otherwise this may cause personal injuries.
- If it is needed to remove piston with compressed air. DO NOT allow the piston to face yourself or place your hands around the brake caliper and piston.

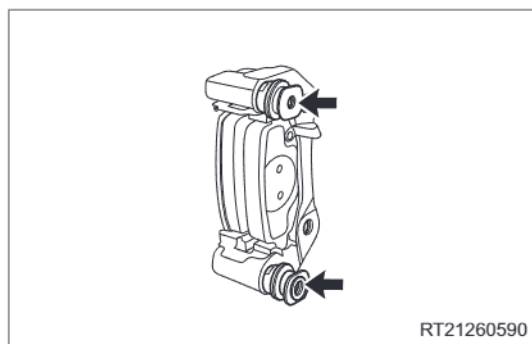
1. Remove the bleeder plug (w/ bleeder plug cap).
 - a. Remove the bleeder plug (w/ bleeder plug cap) (arrow) from brake caliper assembly.



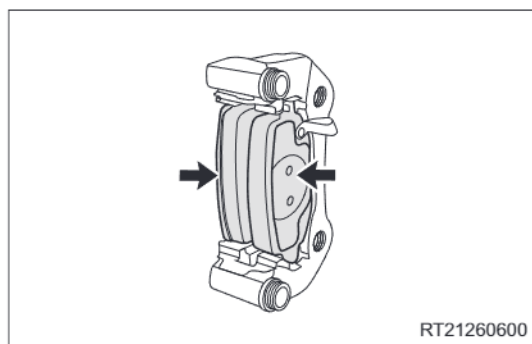
2. Remove the brake cylinder assembly.
 - a. Remove 2 locating bolts (arrow) between brake caliper fixing bracket and brake cylinder assembly.



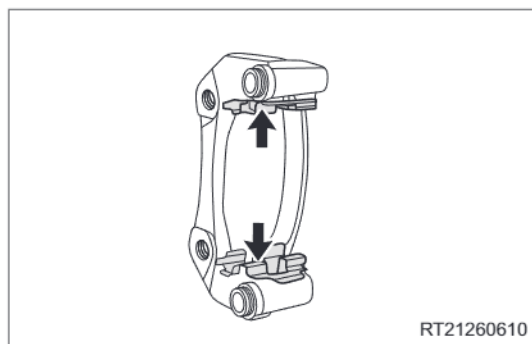
- b. Detach the brake cylinder assembly and brake caliper fixing bracket.
3. Remove the rear brake caliper locating bolt guide pin (w/ dust boot).
 - a. Remove 2 brake caliper locating bolt guide pins (w/ dust boot) (arrow) from brake caliper fixing bracket.



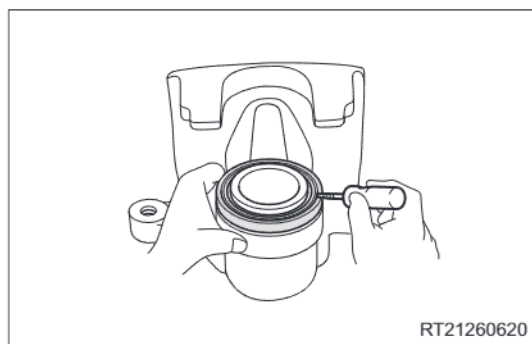
4. Remove the rear brake lining.
 - a. Remove the inner brake lining and outer brake lining (arrow) from brake caliper fixing bracket.



5. Remove the brake lining support gasket.
 - a. Remove 2 brake lining support gaskets (arrow) from brake caliper fixing bracket.



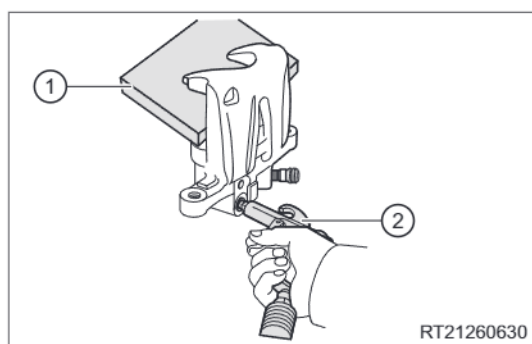
6. Remove the brake cylinder dust boot.
 - a. Using a flat tip screwdriver wrapped with protective tape, pry out the dust boot carefully.



CAUTION

- Be careful not to damage brake piston and brake cylinder.

7. Remove the rear disc brake piston.
 - a. Place a wooden board (1) between rear disc brake piston and rear disc brake cylinder.
 - b. Use compressed air (2) to carefully press out the piston from rear disc brake cylinder through the attachment hole.

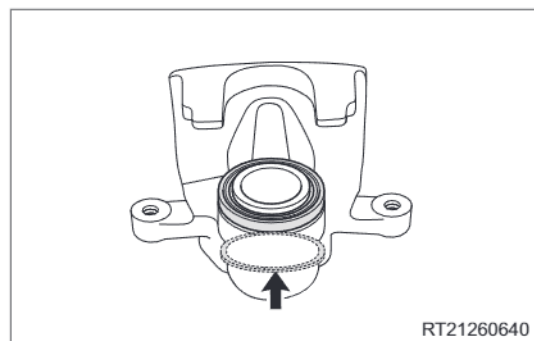


CAUTION

- Be careful not to splash brake fluid.
- DO NOT hold piston by hands to prevent injury.
- DO NOT remove or install brake piston casually, and always perform these operations by professional.

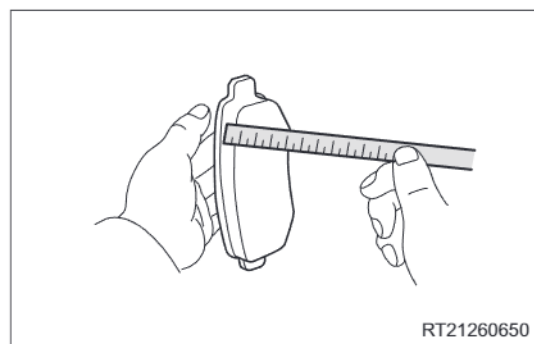
- c. Clean the piston bore with alcohol or proper solution. Then wipe it with a piece of lint.

8. Remove the rear disc brake piston seal ring.
 - a. Using a screwdriver wrapped with protective tape, carefully pry out the rear disc brake piston seal ring (arrow) from brake cylinder rear ring groove.



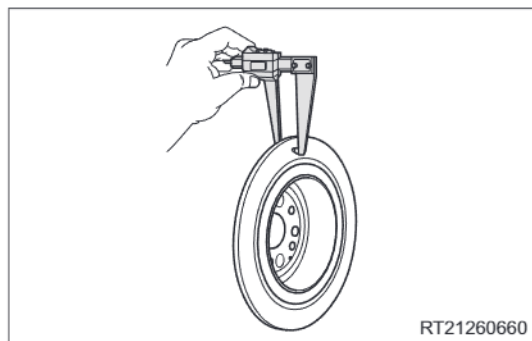
Inspection

1. Check brake cylinder and the piston.
 - a. Check piston and bore for scratches or corrosion. If there are scratches or corrosion, remove them with fine sand cloth.
 - b. Remove dirt on piston with a soft brass wire brush and coarse cloth. Do not clean the piston with polishing cloth or sand cloth, as this may damage its surface. If surface of piston is damaged, replace it. If piston is stuck or bore is worn or corroded, replace entire brake caliper assembly. Using polishing cloth to remove small corrosion points inside the bore.
2. Check brake caliper fixing bracket and brake caliper guide pin set.
 - a. Clean the contact surface of brake caliper fixing bracket and brake lining support gasket with brake cleaner. Check for deformation, cracks, rust and foreign matter which is difficult to remove.
 - b. Check brake caliper guide pin rubber dust boot for deformation, cracks, worn and foreign matter which is difficult to remove.
 - c. Install brake caliper guide pin and brake caliper guide pin rubber dust boot to brake caliper fixing bracket. The brake caliper guide pin set should move smoothly without being stuck when pushing it with hand; otherwise replace it.
 - d. After installing the brake lining, check if it is easy to fall out (due to insufficient elasticity of support gasket). Replace as necessary.
3. Check brake lining.
 - a. Visually check brake lining for flatness, and also check for excessive wear. If condition of lining cannot be confirmed accurately only by visual inspection, a physical check will be used as necessary.
 - b. Measure the minimum brake lining thickness. When the minimum thickness of brake lining is 2 mm or less, replace the brake lining.



- c. When replacing excessively worn brake linings (inner and outer), it is also necessary to replace linings on the opposite side of vehicle as well as unchecked linings to maintain proper braking performance. If it is unnecessary to replace brake linings, be sure to reinstall brake linings to the original positions.
4. Check brake disc.
 - a. Minor scratch or wear on brake disc surface is acceptable. If severe scratch or deformation exists, the brake disc must be replaced.

- b. Excessive wear of brake disc may cause poor contact between brake lining and surface of brake disc. If protrusion on the disc is not removed before installing new brake lining, abnormal wear of brake disc will be caused.
 - c. It is normal that the surface of brake disc is worn when replacing brake lining. If cracks or burned spots exist, the brake disc must be replaced.
5. Check brake disc thickness.
- a. Using a vernier caliper, measure the brake disc thickness at the center of brake lining contact surface as shown in the illustration.
Standard thickness: 10 mm
Minimum thickness: 8 mm



- b. If it is less than the minimum thickness due to wear of brake disc, replace brake disc.

CAUTION

- DO NOT machine brake disc, because it may make the brake disc thickness less than the minimum thickness.

Assembly

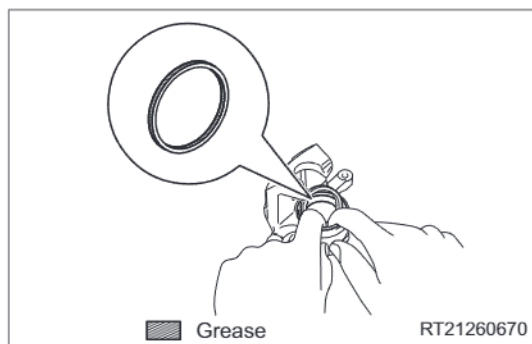
HINT:

- Use the same procedures for the right side and left side.
- Procedures listed below are for the left side.

CAUTION

- When assembling brake caliper assembly, always keep your hands clean.
- When assembling brake caliper assembly, always use clean new brake fluid.
- Never use old seal ring for front disc brake piston.

1. Install the rear disc brake piston seal ring.
 - a. Apply a light coat of grease to entire inner and outer circumferences of new rear disc brake piston seal ring.
 - b. Install the rear disc brake piston seal ring onto the brake cylinder.

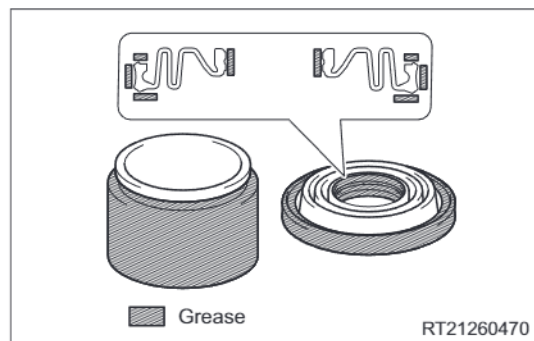


CAUTION

- Securely install rear disc brake piston seal ring into the rear ring groove of brake cylinder.

2. Install the rear disc brake piston.

- Apply a light coat of grease to the inner and outer circumferences, and entire periphery of outer flange top/bottom surfaces of new brake cylinder dust boot as shown in the illustration.
- Apply a light coat of grease to the entire outer circumference (part contacting with the brake cylinder dust boot and rear disc brake cylinder) of the rear disc brake piston.



- Install the brake cylinder dust boot onto the rear disc brake piston.

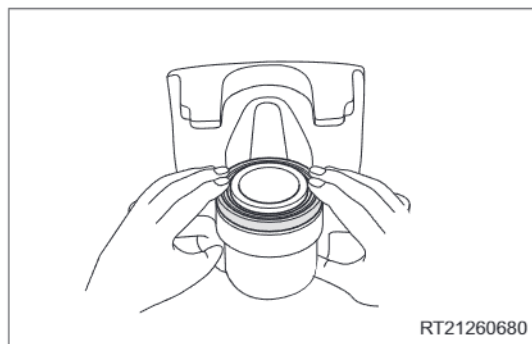
3. Install the brake cylinder dust boot.

- Install the rear disc brake piston to the rear disc brake cylinder.

CAUTION

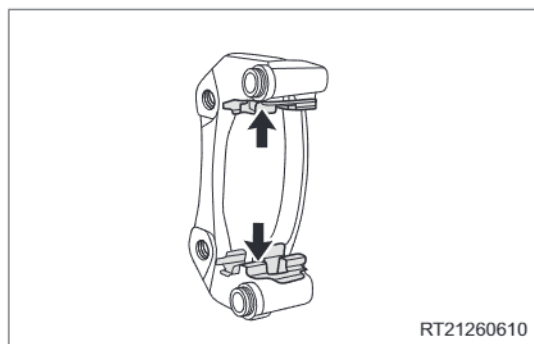
- DO NOT install piston forcibly to brake cylinder.

- Install the brake cylinder dust boot to the brake cylinder.

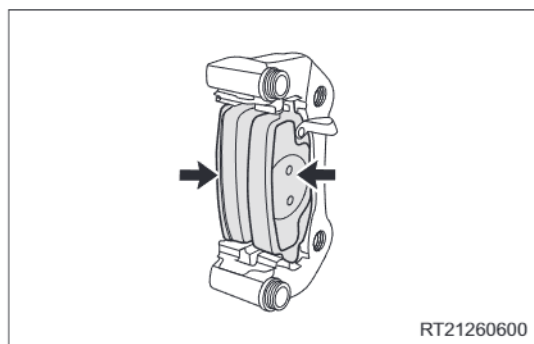
**CAUTION**

- Securely install brake cylinder dust boot into front ring groove of disc brake cylinder.
- DO NOT damage brake cylinder dust boot.

4. Install the brake lining support gasket.
 - a. Securely install the upper and lower support gaskets onto the brake caliper fixing bracket.



5. Install the rear brake lining.
 - a. Securely install the inner brake lining and outer brake lining (arrow) onto the brake caliper fixing bracket. Make sure they are clamped in place.

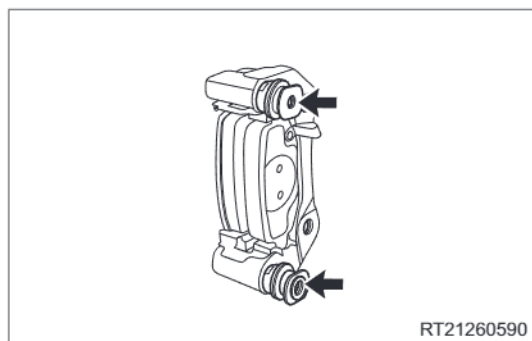


CAUTION

- Make sure the contact surface of lining and brake disc is free of oil and grease.

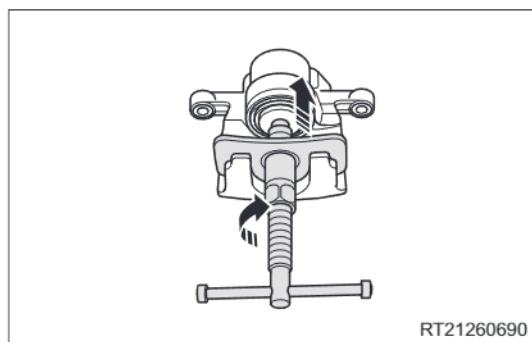
6. Install the rear brake caliper locating bolt guide pin (w/ dust boot).

- a. Apply a small amount of grease to the contact surface between locating bolt guide pins and guide pin rubber dust boots, and securely install the dust boots to the brake caliper fixing bracket.

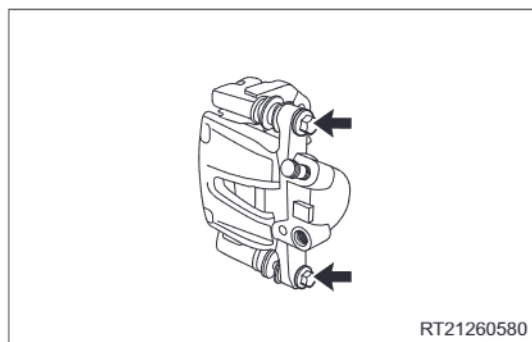


7. Install the brake cylinder assembly.

- a. Using brake cylinder piston pressing tool, slightly retract the brake cylinder piston (both sides).

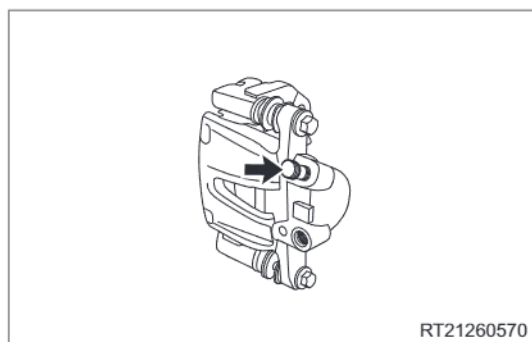


- b. Align the brake caliper locating bolts (arrow) with the guide pin hole and securely install the brake cylinder assembly.
(Tightening torque: $25 \pm 3 \text{ N}\cdot\text{m}$)



8. Install the bleeder plug (w/ bleeder plug cap).

- a. Securely install the bleeder plug (w/ bleeder plug cap) (arrow) to the rear brake caliper assembly.
(Tightening torque: $9 - 11 \text{ N}\cdot\text{m}$)



Installation

Installation is in the reverse order of removal.

CAUTION

- Make sure to tighten fixing bolts and nuts to the specified torque during installation.
- Before installing brake linings, completely retract brake caliper piston back into the bore of brake caliper.
- Depress brake pedal several times to secure the brake linings to brake disc in order to ensure safety after installing the brake linings and before moving vehicle.
- Replace brake linings in pairs. DO NOT replace it alone.
- DO NOT install inner brake lining and outer brake lining reversely.
- Be sure to check brake system for leakage after installation. Repair or replace malfunctioning parts as necessary.
- Be sure to perform bleeding procedures for brake system after installation.
- Be sure to add brake fluid to the proper level after installation.

Rear Brake Hose Assembly

Removal

CAUTION

- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being scratched during removal and installation.

HINT:

- Use the same procedures for the right side and left side.
- Procedures listed below are for the left side.

1. Drain the brake fluid ([See page 26-13](#)).

CAUTION

- Wash off brake fluid immediately if it comes in contact with any paint surface.

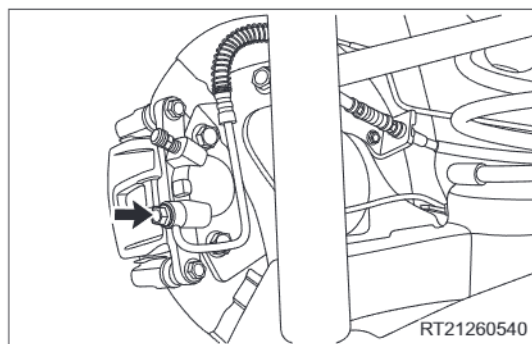
ENVIRONMENTAL PROTECTION

- Drained brake fluid should be well kept in a container. Never discard it at will.

2. Remove the rear left brake hose assembly.

- a. Remove the coupling bolt and washer (arrow) between rear left brake caliper assembly and rear left brake hose assembly.

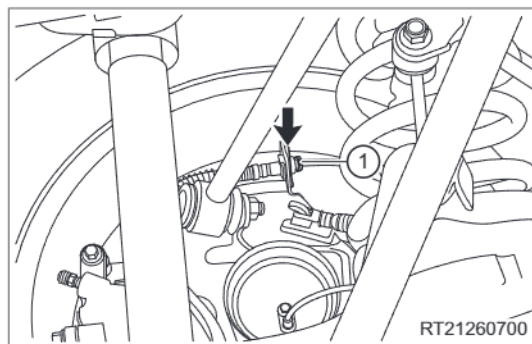
(Tightening torque: 20 ± 2 N·m)



CAUTION

- DO NOT allow brake fluid to be sprayed on your clothes or skin when removing brake hose, as the brake fluid is corrosive.

- b. Disengage the fixing clamp (arrow) and loosen the coupling plug (1) between rear brake hose assembly and brake pipe.
(Tightening torque: 16 ± 2 N·m)



CAUTION

- DO NOT bend or damage brake tube.
- DO NOT allow any foreign matter such as dirt and dust to enter brake tube from joint parts.
- After removing brake line, perform sealing treatment to prevent foreign matter from entering.

- c. Remove the rear brake hose assembly.

Installation

Installation is in the reverse order of removal.

CAUTION

- Make sure to tighten bolt and plug in place.
- Be sure to check brake system for leakage after installation. Repair or replace malfunctioning parts as necessary.
- Be sure to perform bleeding procedures for brake system after installation.
- Be sure to add brake fluid to the proper level after installation.

