

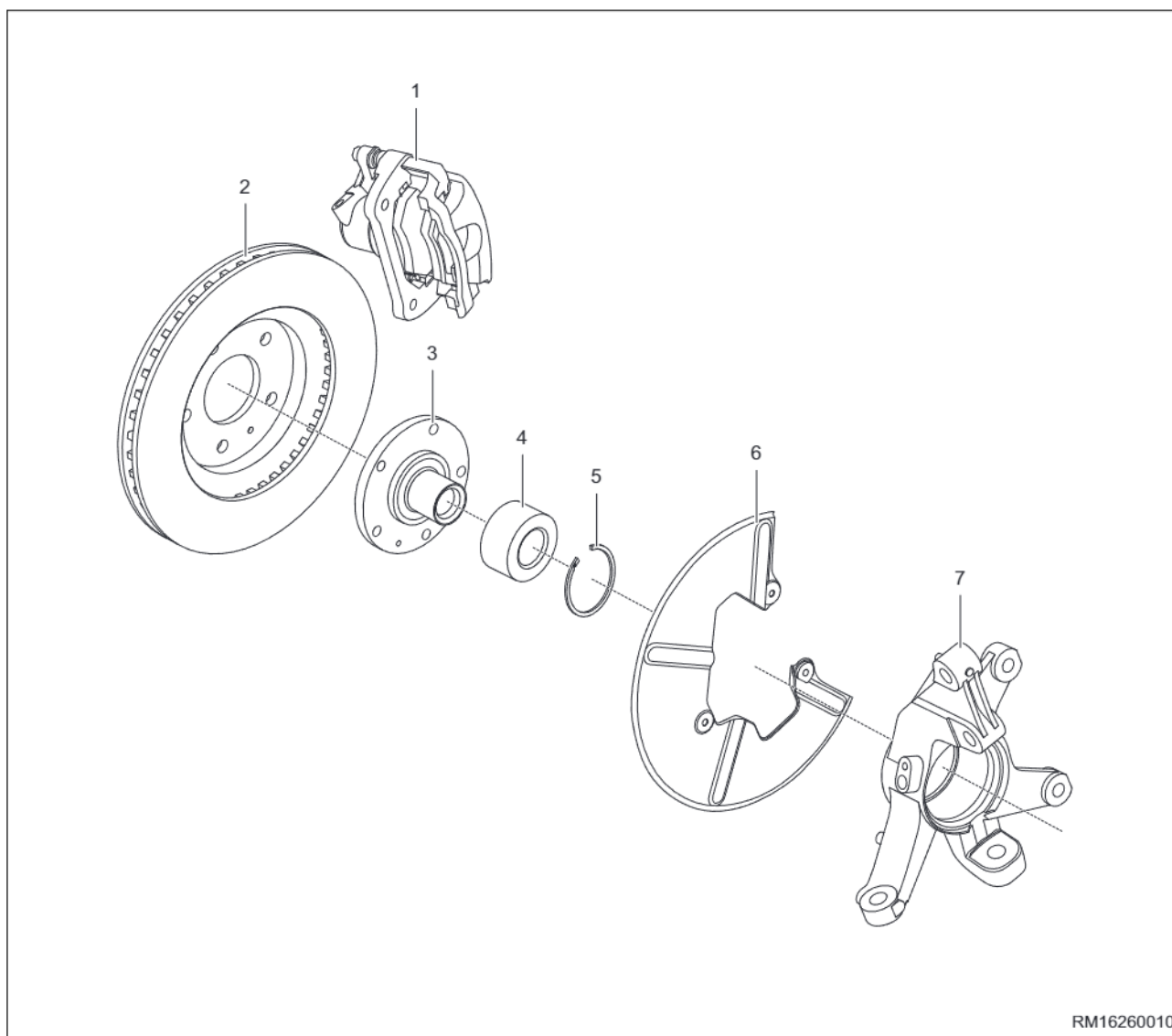
BRAKE

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GENERAL INFORMATION

Description

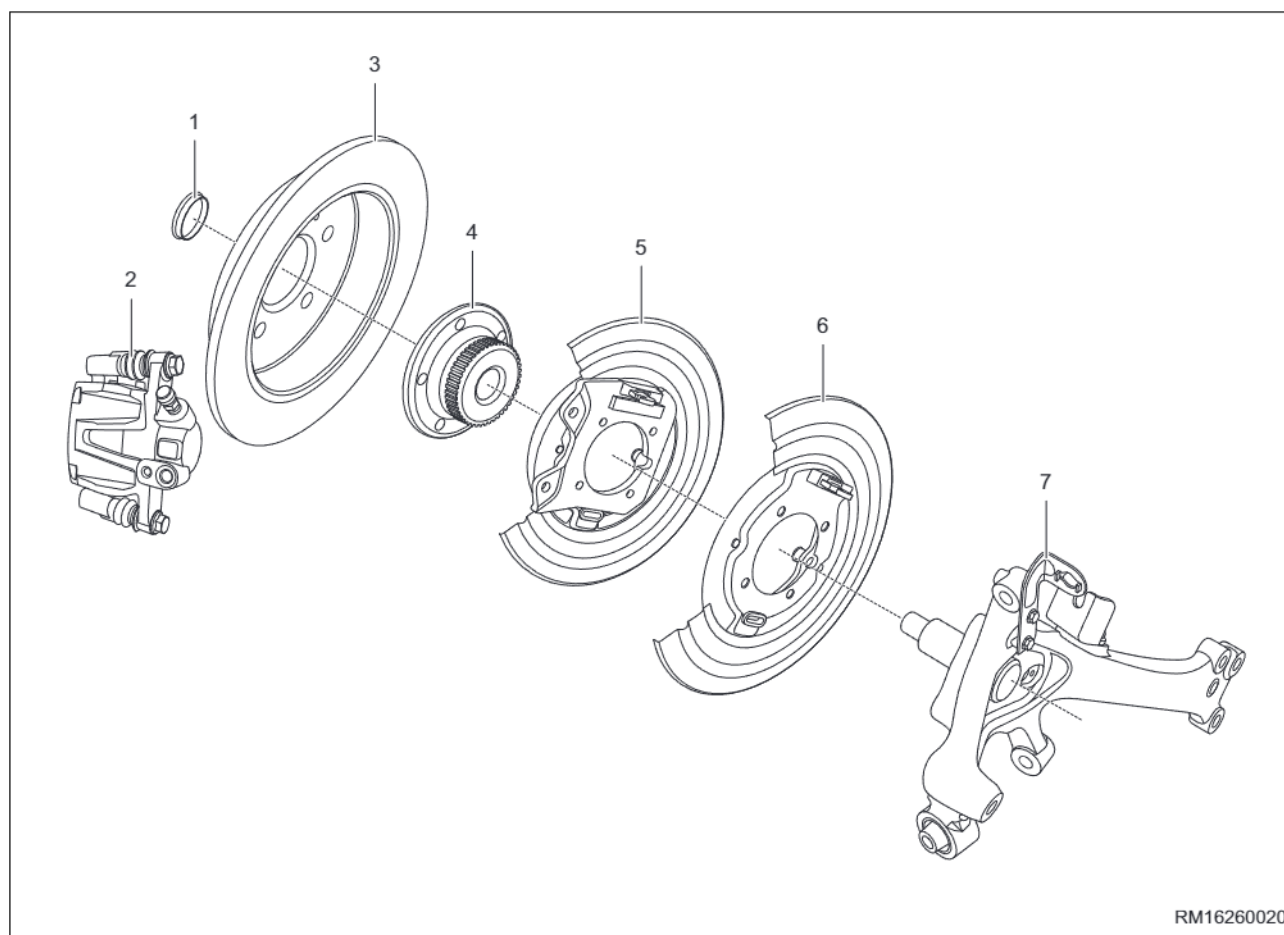
Front Disc Brake Assembly



RM16260010

1 - Front Brake Caliper Assembly	2 - Front Brake Disc
3 - Front Hub	4 - Front Hub Bearing
5 - Bearing Retainer	6 - Front Dust Guard
7 - Front Steering Knuckle	

Rear DIH (Drum-in-hat)



RM16260020

1 - Rear Bearing End Cover	2 - Rear Brake Caliper Assembly
3 - Rear Brake Disc	4 - Rear Hub Bearing Assembly
5 - Parking Brake Assembly	6 - Brake Caliper Mounting Board
7 - Rear Steering Knuckle Assembly	

Brake system uses the following configuration: a disc brake is used for each front wheel, and DIH (Drum-in-hat) (disc brake is used for service brake, and drum brake is used for parking brake), is used for each rear wheel.

Using lever principle, brake pedal pushes the 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 the brake tube, and then distributed to individual brake calipers. Brake calipers apply force to brake linings using hydraulic pressure. Brake linings will cause wheel speed to decrease or stop depending on the amount of brake pressure applied.

Specifications

Torque Specifications

Description	Torque (N·m)
Wheel Mounting Bolt	110 ± 10
Coupling Plug Between Brake Master Cylinder Assembly and Brake Pipe	16 ± 1
Coupling Nut Between Brake Master Cylinder Assembly and Vacuum Booster Assembly	13.7 - 21.6
Coupling Nut Between Vacuum Booster Assembly and Brake Pedal Assembly	23 ± 2
Coupling Nut Between Brake Pedal Assembly and Body	23 ± 2
Coupling Plug Between Front Brake Caliper Assembly and Front Brake Hose Assembly	16 ± 1
Coupling Bolt Between Front Brake Caliper Assembly and Front Steering Knuckle Assembly	100 ± 10
Front Brake Disc Locating Screw	8 ± 1
Front Brake Caliper Bleeder Plug	9 - 11
Guide Bolt Between Front Brake Caliper Fixing Bracket and Front Brake Cylinder Assembly	22 - 32
Coupling Plug Between Front Brake Hose Assembly and Front Brake Pipe	16 ± 1
Coupling Bolt Between Rear Brake Caliper Assembly and Rear Brake Hose Assembly	16 ± 1
Coupling Bolt Between Rear Brake Caliper Assembly and Brake Caliper Mounting Board Assembly	100 ± 10
Rear Brake Disc Locating Screw	10 ± 1
Rear Brake Caliper Bleeder Plug	9 - 11
Guide Bolt Between Rear Brake Caliper Fixing Bracket and Rear Brake Cylinder Assembly	23 ± 2
Coupling Plug Between Rear Brake Hose Assembly and Brake Pipe	16 ± 1

Front Disc Brake

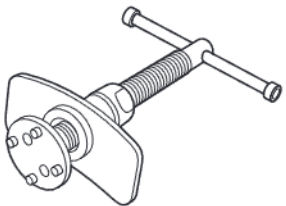
Description	Standard Thickness (mm)	Minimum Thickness (mm)	Maximum Runout (mm)
Front Brake Disc	25	23	0.02
Front Brake Lining	11.2	1.5	-

Rear DIH (Drum-in-hat)

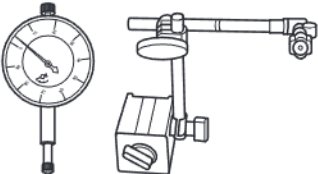
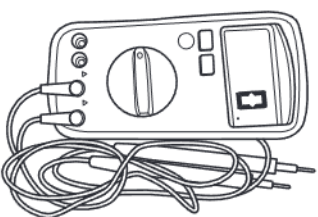
Description	Standard Thickness (mm)	Minimum Thickness (mm)	Maximum Runout (mm)
Rear Brake Disc	10	8	0.025
Rear Brake Lining	11.2	1.5	-

Tools

Special Tool

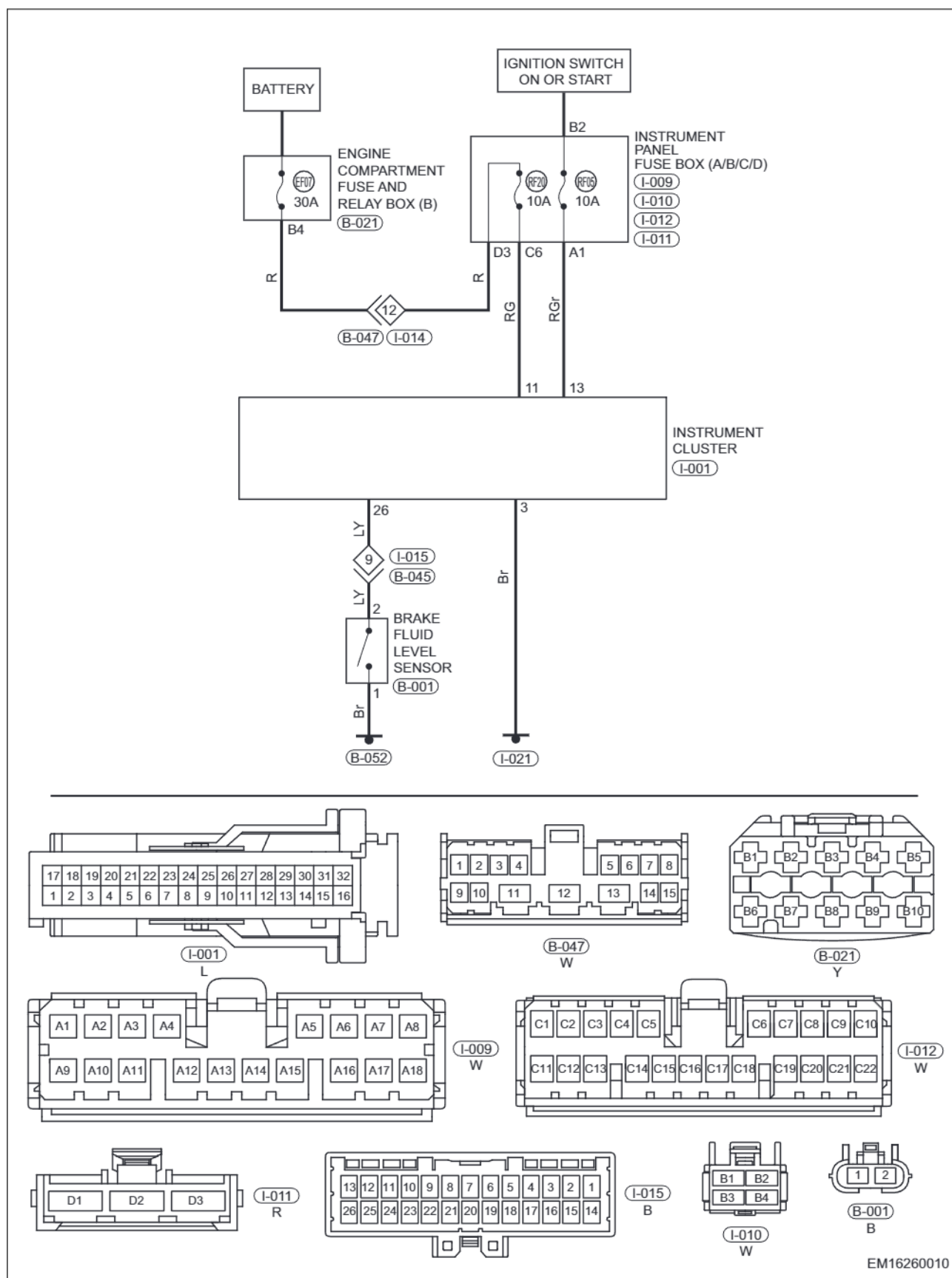
Brake Caliper Piston Pressing Tool	 RCH0000053
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General Tools

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

Circuit Diagram

Brake System



DIAGNOSIS & TESTING

Problem Symptoms Table

HINT:

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

Symptom	Suspected Area	See page
Noise in brake	Front brake lining (cracked, deformed, dirty or burnished)	26-27
	Rear brake lining (cracked, deformed, dirty or burnished)	26-41
	Front disc brake guide bolt guide pin (worn)	26-27
	Rear disc brake guide bolt guide pin (worn)	26-41
	Front brake caliper assembly coupling bolt (loose)	26-27
	Rear brake caliper assembly coupling bolt (loose)	26-41
	Front brake disc (scored)	26-26
	Rear brake disc (scored)	26-39
	Excessive brake disc runout	26-25
	Brake shoe stopper spring (damaged)	27-19
	Brake shoe return tension spring (damaged or insufficient elasticity)	27-19
	Foreign matter on front brake disc	-
	Foreign matter on rear brake disc	-
Hard pedal but braking inefficient	Front brake lining (worn, cracked, deformed, oily or burnished)	26-27
	Rear brake lining (worn, cracked, deformed, oily or burnished)	26-41
	Front brake disc (unevenly worn)	26-26
	Rear brake disc (unevenly worn)	26-39
	Vacuum booster pushrod position (incorrect)	26-18
	Vacuum leaks in booster system	26-20
Hard pedal (firm-depress unable to lock-up wheels)	Vacuum booster (bounce)	26-18
Pedal overtravel (vehicle stops normally)	Air in brake system	26-12
Pedal pulsates/bounces during braking	Brake disc (unevenly worn)	26-26

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)	26-27
	Rear brake piston seal (worn or damaged)	26-41
	Brake master cylinder assembly (malfunction)	26-16
	Vacuum booster pushrod position (incorrect)	26-18
Vehicle pulls during braking	Front brake piston (catching or frozen)	26-27
	Rear brake piston (catching or frozen)	26-41
	Front brake lining (dirty, cracked or deformed)	26-27
	Rear brake lining (dirty, cracked or deformed)	26-41
	Front brake disc (unevenly worn)	26-26
	Rear brake disc (unevenly worn)	26-39
Brake catching	Brake pedal free play (minimum)	26-21
	Parking brake control mechanism stroke (in need of adjustment)	27-8
	Parking brake cable (catching)	27-14
	Parking brake shoe clearance (in need of adjustment)	27-8
	Front brake lining (cracked or deformed)	26-27
	Rear brake lining (cracked or deformed)	26-41
	Front brake piston (catching or frozen)	26-27
	Rear brake piston (catching or frozen)	26-41
	Brake shoe return tension spring (loose or damaged)	27-19
	Vacuum booster pushrod position (incorrect)	26-18
	Vacuum leaks in booster system	26-20
	Brake master cylinder assembly (malfunction)	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 the rubber cover and seal.
- During servicing, be sure to clean the 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 not to damage brake disc and brake caliper and scratch or cut brake shoe linings.

1. Check the 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 the suspension components. Bounce the vehicle up and down several times and check suspension or steering components for any looseness, wear or damage.
3. Check the brake fluid level and condition.
 - a. If brake fluid level is low, check ABS/ESP 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 a certain amount of fluid for inspection. 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 from bleeder plug.

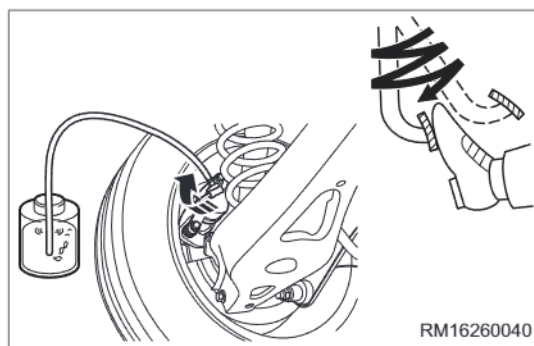
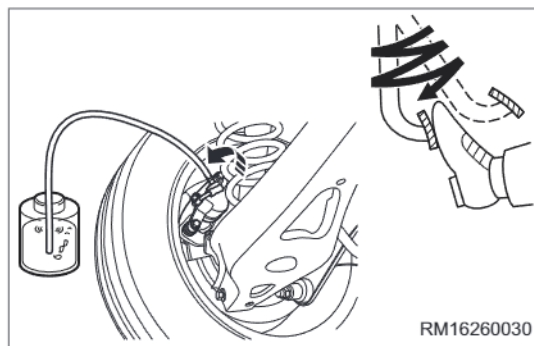
👁 CAUTION

- Before removing brake fluid reservoir, wipe off any dust and other foreign matters on brake fluid reservoir to prevent them from entering.
- Use fresh, clear and well-sealed brake fluid with specified type or equivalent.
- DO NOT allow the 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, air amount in the system will increase to make an extra bleeding.
- DO NOT drain the brake fluid in brake fluid reservoir while bleeding brake system.

HINT:

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

1. Fill brake fluid reservoir with brake fluid to a 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; and hold it at a lower position. Then loosen the bleeder plug at least one turn.
4. Tighten the bleeder plug and then release the brake pedal every time brake pedal goes down quickly.

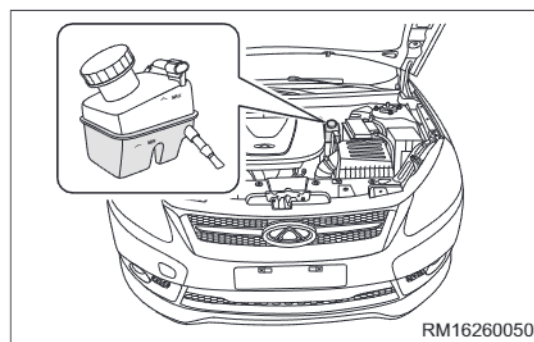


5. Repeat the above steps, and use the same procedures to bleed brake line of each wheel in order of rear left wheel, front right wheel, rear right wheel and front left wheel, until no air exists in brake line.

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

HINT:

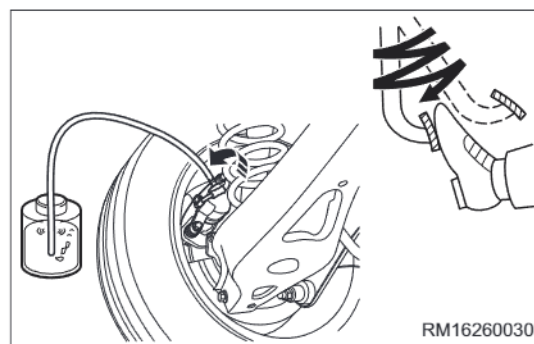
During bleeding brake system, make sure brake fluid level in brake fluid reservoir is always near "MAX" mark. Check the brake fluid level at all times during bleeding. Add brake fluid as necessary.



6. Check and adjust the brake fluid level to "MAX" mark.
7. Check the brake pedal effect. If braking effect is poor or pedal is spongy, air may still exist in system. Perform bleeding procedures for brake system again as necessary.
8. Test vehicle to confirm that brakes operate properly with good depressing feel.

Brake Fluid Replacement

1. Drain brake fluid.
 - a. Start the engine and run it at idle.
 - b. Screw off the filler cap of brake fluid reservoir assembly. Loosen the bleeder plug cap and connect a clear plastic hose to bleeder plug. Submerge the end of hose into clear container filled with new brake fluid.
 - c. Loosen the bleeder plug, and depress the brake pedal continuously until no brake fluid comes out.



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

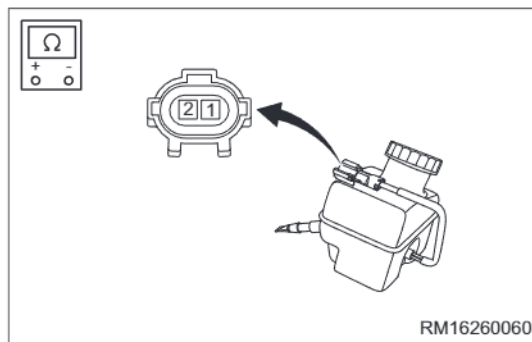
Brake Fluid Reservoir Assembly

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 the ohm band of digital multimeter, check for continuity between brake fluid level warning switch terminals according to the conditions shown in 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, which changes its position as brake fluid level rises or drops, in fluid reservoir.

If result is not as specified, replace brake fluid reservoir assembly.

- d. Add brake fluid to "MAX" mark.

Removal

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



ENVIRONMENTAL PROTECTION

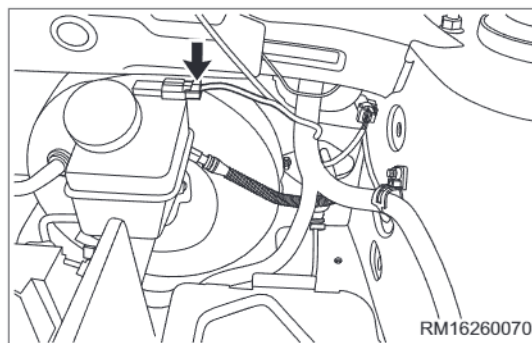
- Drained brake fluid should be well kept in a container. Never discard it at will.



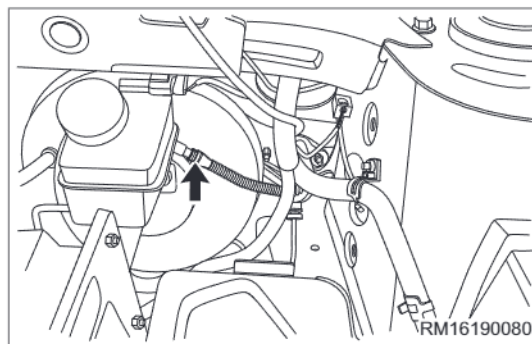
CAUTION

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

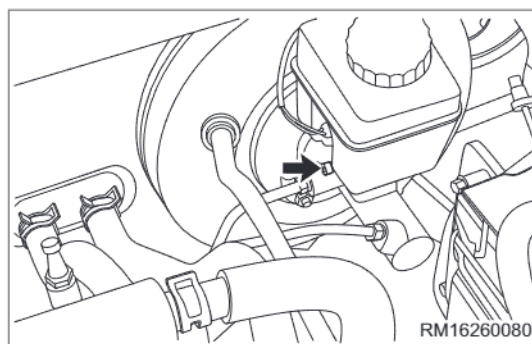
2. Remove the brake fluid reservoir assembly.
 - a. Disconnect the brake fluid level warning switch connector (arrow).



- b. Disconnect the clutch hose (arrow) from brake fluid reservoir assembly (for MT model).



- c. Remove the coupling bolt (arrow) between brake fluid reservoir assembly and brake master cylinder assembly.



- d. Remove the brake fluid reservoir assembly from brake master cylinder assembly.

Installation

Installation is in the reverse order of removal.

HINT:

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

Brake Master Cylinder Assembly

Removal

CAUTION

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

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

ENVIRONMENTAL PROTECTION

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

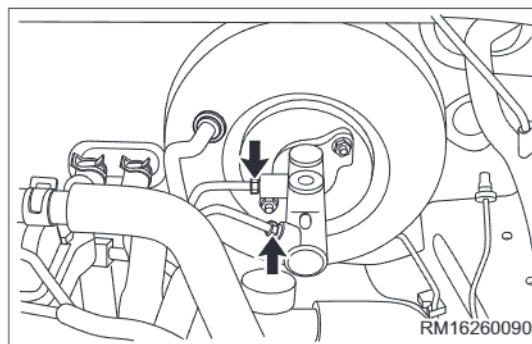
CAUTION

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

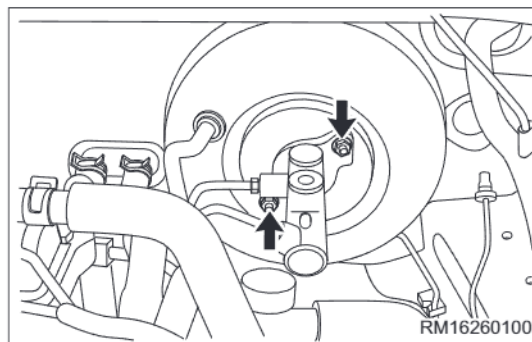
2. Remove the brake fluid reservoir assembly ([See page 26-14](#)).

3. Remove the brake master cylinder assembly.

- a. Loosen 2 coupling plugs (arrow) between brake master cylinder assembly and brake pipes.
(Tightening torque: $16 \pm 1 \text{ N}\cdot\text{m}$)



- b. Loosen 2 coupling nuts and washers (arrow) between brake master cylinder assembly and vacuum booster.
(Tightening torque: $13.7 - 21.6 \text{ N}\cdot\text{m}$)



- c. Slide the brake master cylinder assembly vertically out of vacuum booster carefully.

 CAUTION

- The design of brake master cylinder assembly and piston makes piston fall out easily. To prevent this, make sure that brake master cylinder is horizontal or end surface faces down (piston surface facing upward) when handling.
- 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 the master cylinder piston.
- Master cylinder should be handled carefully. Avoid any impact to master cylinder, such as dropping. It cannot be reused if dropped.
- DO NOT tap or pinch the master cylinder piston, and avoid damaging the master cylinder piston in any other ways.

Installation

Installation is in the reverse order of removal.

 CAUTION

- Be sure to tighten coupling plugs and nuts to specified torques during installation.
- Perform bleeding procedures for brake system and add brake fluid to a proper level after installation.

Vacuum Booster with Brake Master Cylinder Assembly

On-vehicle Inspection

1. Check the vacuum booster assembly.

a. Check air tightness.

- Start engine and stop it after 1 or 2 minutes. Slowly depress the brake pedal several times.
- Make sure that booster is airtight. Check that every pedal depression amount becomes less than the previous one.

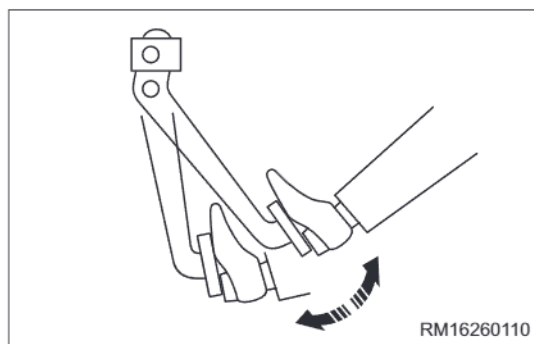
If pedal operation is not as specified, check the check valve. If check valve is normal, replace the vacuum booster assembly.

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

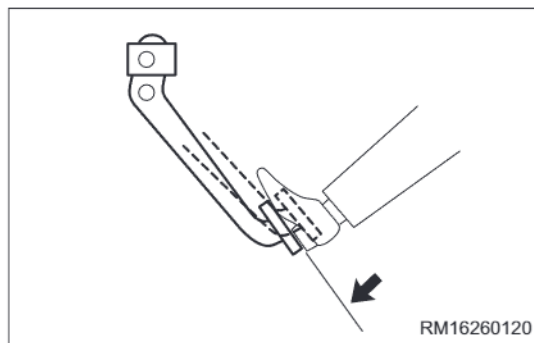
If pedal operation is not as specified, check the check valve. If check valve is normal, replace the vacuum booster assembly.

b. Check operation.

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



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



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

Removal

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

CAUTION

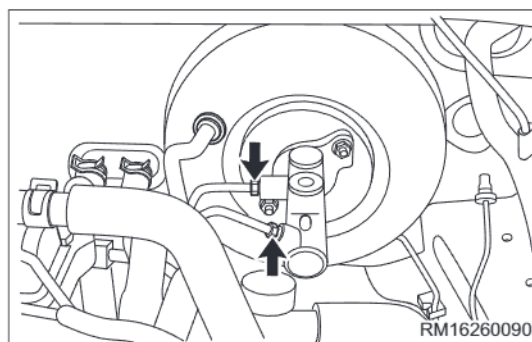
- Wash off brake fluid immediately if it comes in contact with any paint surface.

ENVIRONMENTAL PROTECTION

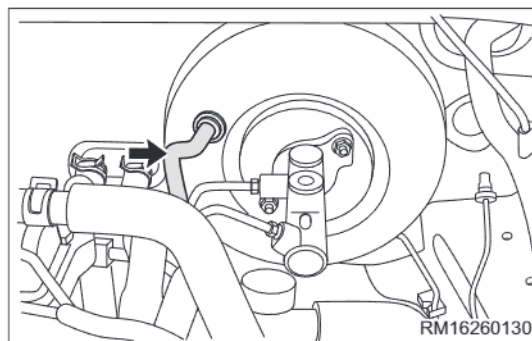
- Drained brake fluid should be well kept in a container. Never discard it at will.

2. Remove the battery (See page 16-7).
3. Remove the battery tray (See page 16-9).
4. Remove the brake fluid reservoir assembly (See page 26-14).
5. Remove the vacuum booster with brake master cylinder assembly.

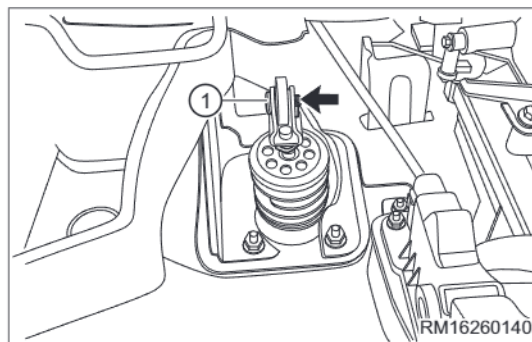
- a. Loosen 2 coupling plugs (arrow) between brake master cylinder assembly and brake pipes.
(Tightening torque: 16 ± 1 N·m)



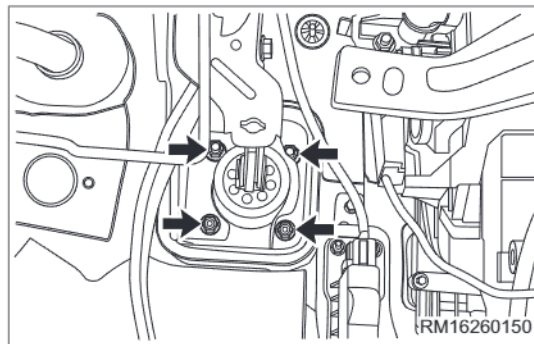
- b. Disengage the vacuum hose assembly with check valve (arrow) from vacuum booster assembly.



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



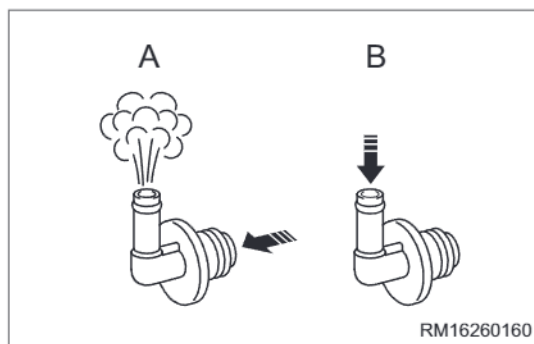
- d. Remove 4 coupling nuts (arrow) between vacuum booster assembly and brake pedal assembly.
(Tightening torque: 23 ± 2 N·m)



- e. 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

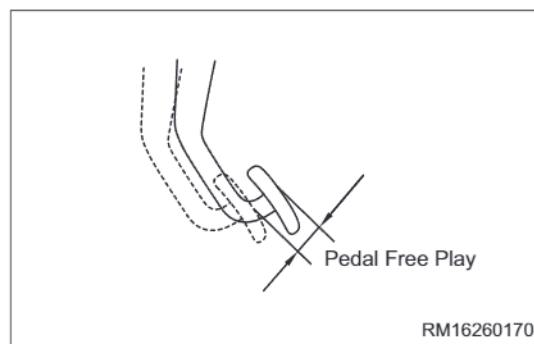
- Be sure to tighten coupling plugs and nuts to specified torques during installation.
- Perform bleeding procedures for brake system and add brake fluid to a proper level after installation.

Brake Pedal Assembly

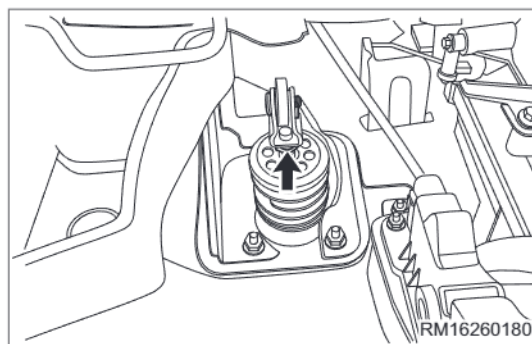
On-vehicle Inspection

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

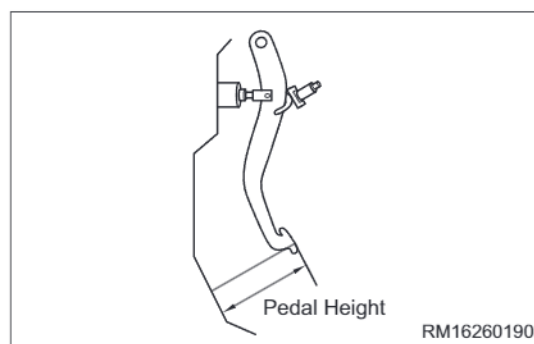
Standard brake pedal free play: 1 - 9 mm



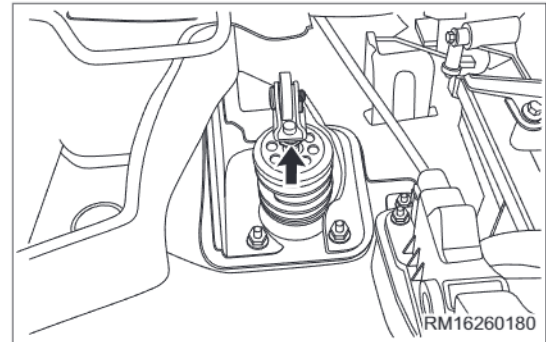
2. Adjust the brake pedal free play.
 - a. As shown in illustration, loosen the vacuum booster pushrod locking nut (arrow) and rotate the vacuum booster pushrod clockwise or counterclockwise to adjust brake pedal free play to specified value.



3. Check the brake pedal height.
 - a. As shown in illustration, turn over the carpet and measure the distance between brake pedal center and dash panel, which is brake pedal height.
- Standard brake pedal height: 292.7 ± 3 mm

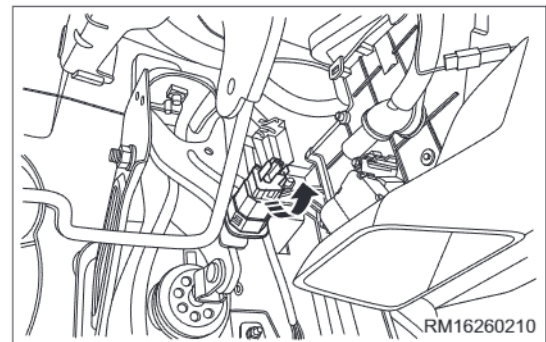
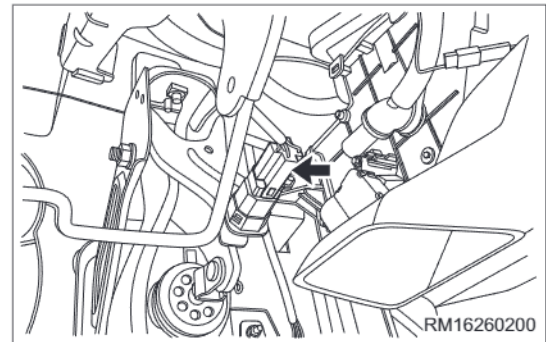


4. Adjust the brake pedal height.
 - a. As shown in illustration, loosen the vacuum booster pushrod locking nut (arrow) and rotate the vacuum booster pushrod clockwise or counterclockwise to adjust brake pedal height to specified value.

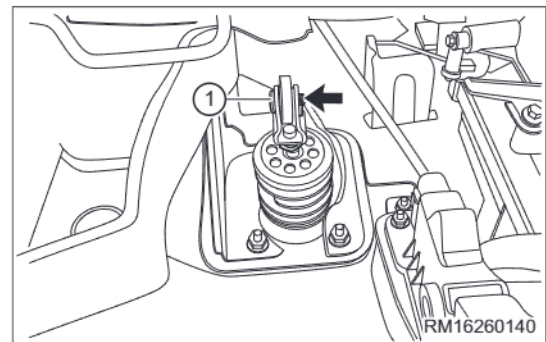


Removal

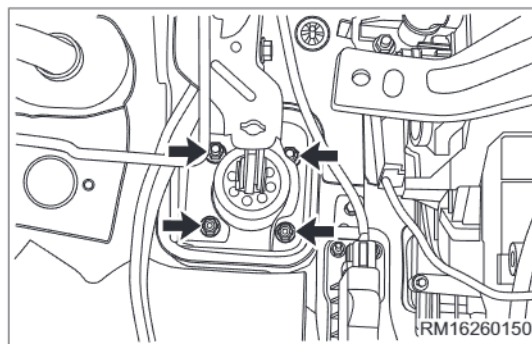
1. Remove the brake light switch assembly.
 - a. Disconnect the brake light switch assembly wire harness connector (arrow).
 - b. Remove the brake light switch assembly by rotating it 90° clockwise or counterclockwise.



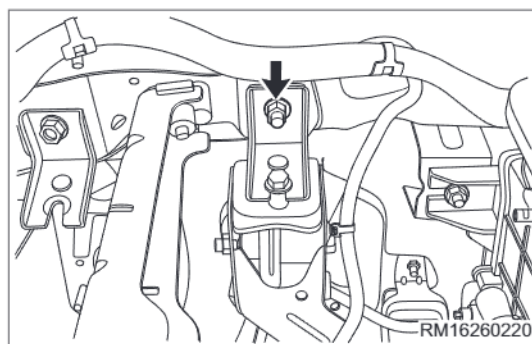
2. Remove the brake pedal assembly.
 - a. Using needle-nose pliers, remove the locking pin (arrow) and pushrod pin (1) from vacuum booster pushrod and detach the brake pedal assembly.



- b. Remove 4 coupling nuts (arrow) between vacuum booster assembly and brake pedal assembly.
(Tightening torque: $23 \pm 2 \text{ N}\cdot\text{m}$)



- c. Remove the coupling nut (arrow) between brake pedal assembly and body.
(Tightening torque: $23 \pm 2 \text{ N}\cdot\text{m}$)



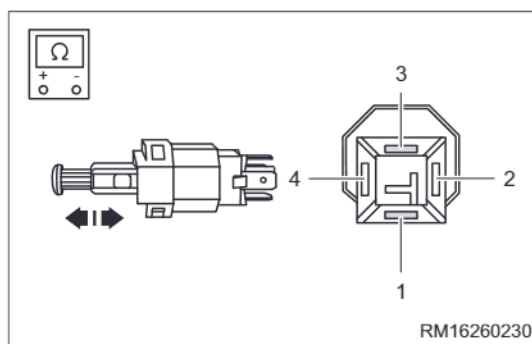
- d. Remove the brake pedal assembly from inside of vehicle.

Inspection

1. Check the 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.

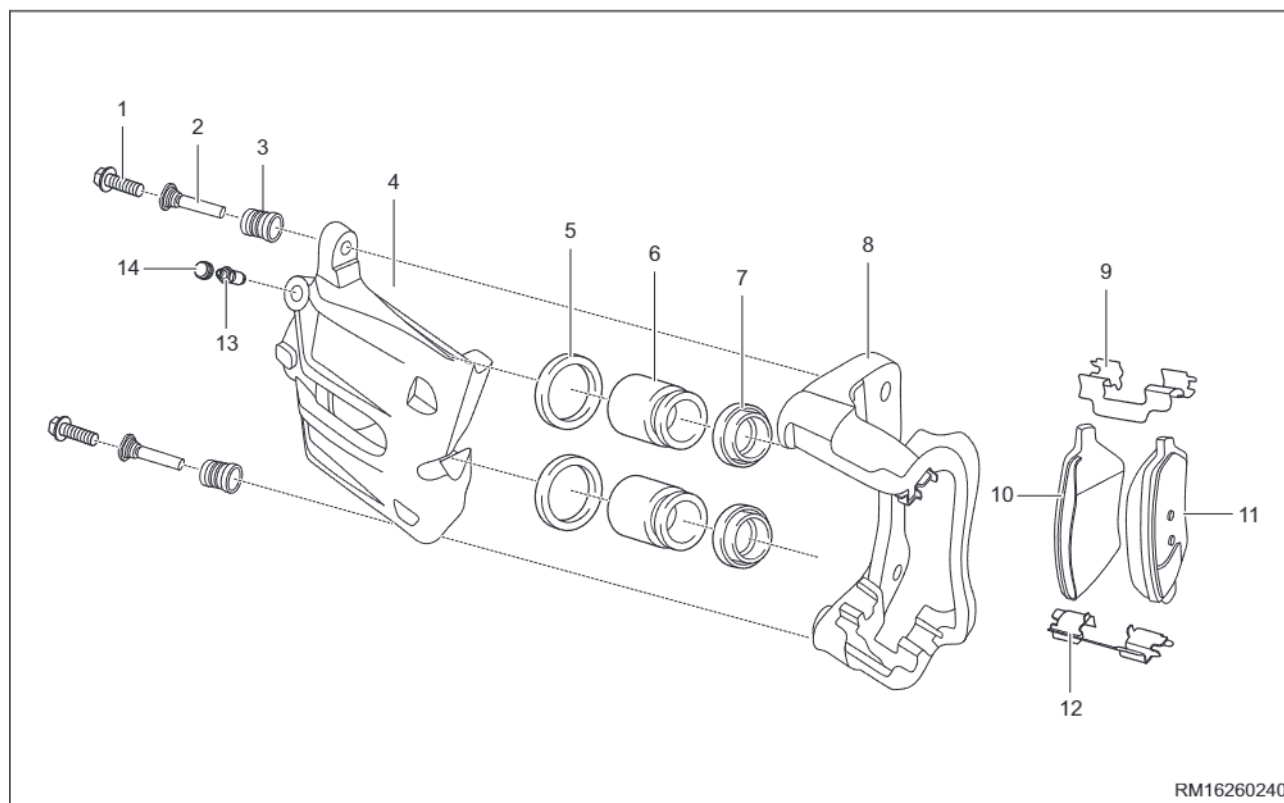
Installation

Installation is in the reverse order of removal.

CAUTION

- Be sure to tighten coupling nuts to specified torque during installation.
- Check that brake light operates properly after installation.

Front Disc Brake Assembly

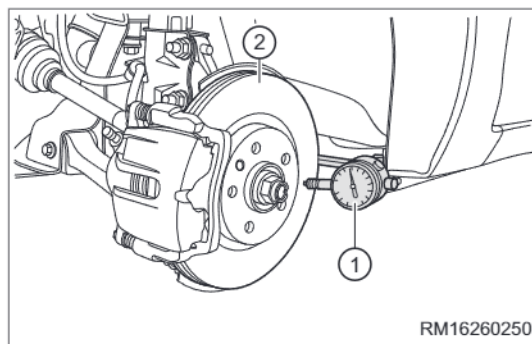


RM16260240

1 - Brake Caliper Guide Bolt	2 - Brake Caliper Guide 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 Shim	10 - Inner Brake Lining
11 - Outer Brake Lining	12 - Lower Support Shim
13 - Bleeder Plug	14 - Bleeder Plug Cap

On-vehicle Inspection

1. Check the brake disc runout.
 - a. Remove the front wheel (See page 24-9).
 - b. Secure a dial indicator (1) to a proper position. Position the dial indicator pointer approximately 10 mm from 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.



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- d. Check the runout on 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 with maximum value.
Maximum runout for front brake disc: 0.02 mm
- f. If runout exceeds the maximum value, replace brake disc.

Removal

HINT:

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

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

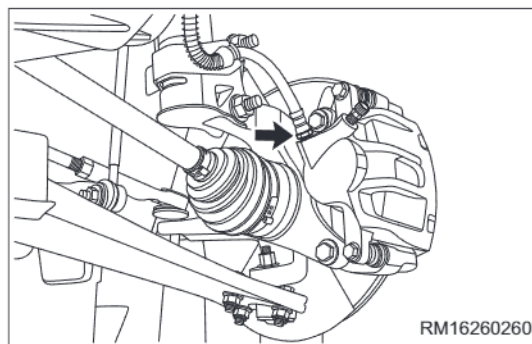
CAUTION

- 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.

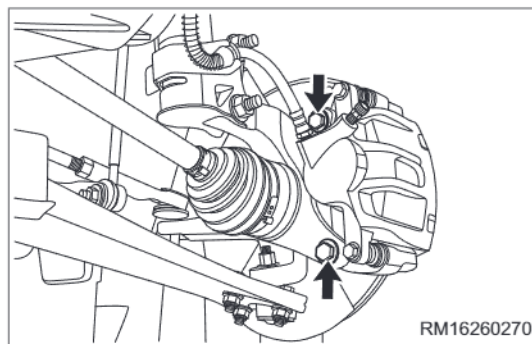
2. Remove the front left wheel (See page 24-9).
3. Remove the front left brake caliper assembly.
 - a. Remove the coupling plug (arrow) between front left brake caliper assembly and front left brake hose assembly.
(Tightening torque: 16 ± 1 N·m)



CAUTION

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

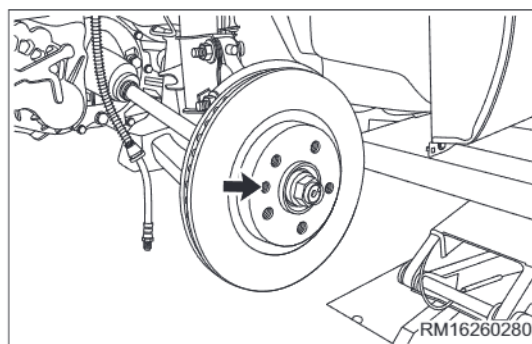
- b. Remove 2 coupling bolts (arrow) between front left brake caliper assembly and front left steering knuckle.
(Tightening torque: 100 ± 10 N·m)



- c. Remove the front left brake caliper assembly.

4. Remove the front left brake disc.

- a. Remove the locating screw (arrow) from front left brake disc and remove the front left brake disc.
(Tightening torque: 8 ± 1 N·m)



Disassembly

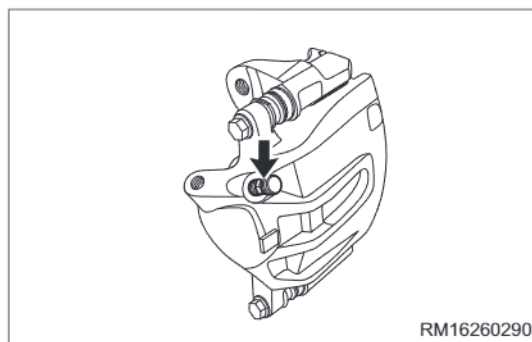
HINT:

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

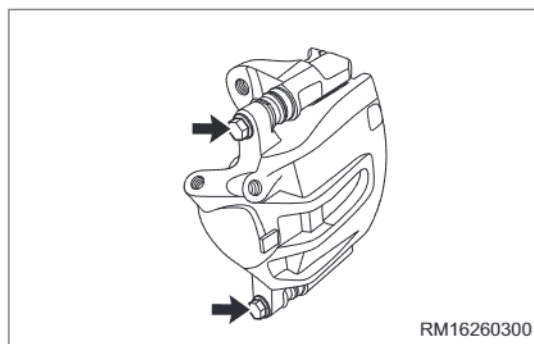
⚠ WARNING

- 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 the piston with compressed air, do not allow the piston to face yourself or place your hands around the brake caliper and piston.

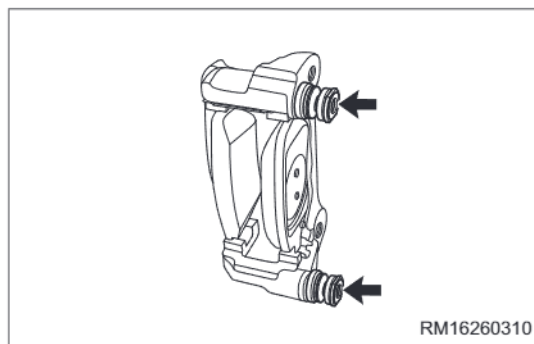
1. Remove the bleeder plug (w/ bleeder plug cap).
- a. Remove the bleeder plug (w/ bleeder plug cap) (arrow) from brake caliper assembly.



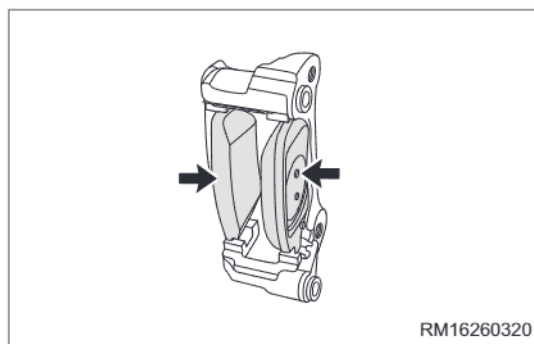
2. Remove the brake cylinder assembly.
 - a. Remove 2 guide bolts (arrow) between brake caliper fixing bracket and brake cylinder assembly.



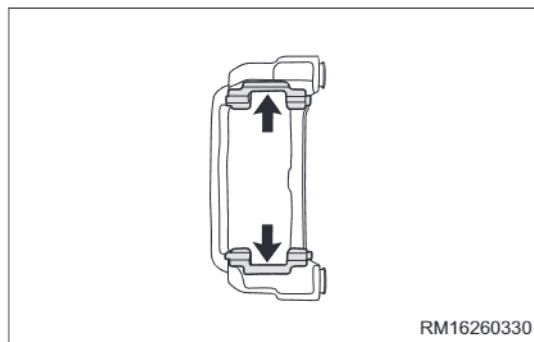
- b. Separate the brake cylinder assembly from brake caliper fixing bracket.
3. Remove the front brake caliper guide bolt guide pin (w/ dust boot).
 - a. Remove 2 brake caliper guide bolt guide pins (w/ dust boot) (arrow) from brake caliper fixing bracket.



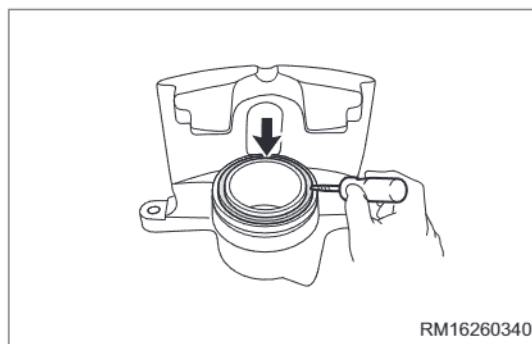
4. Remove the front brake lining.
 - a. Remove the inner brake lining and outer brake lining (arrow) from brake caliper fixing bracket.



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



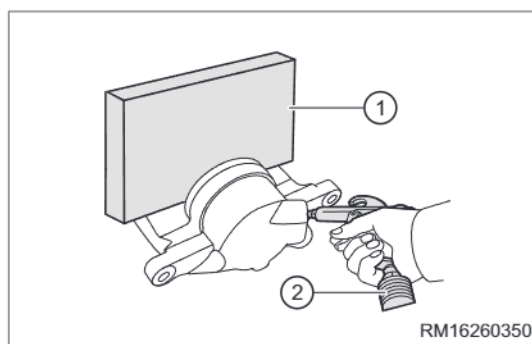
6. Remove the brake cylinder dust boot.
 - a. Using a flat tip screwdriver wrapped with protective tape, pry out the dust boot (arrow) carefully.



CAUTION

- Be careful not to damage the 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 attachment hole.

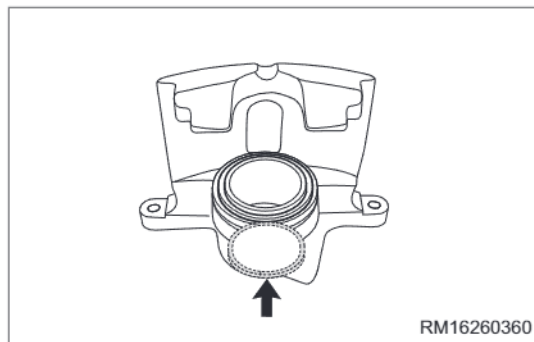


CAUTION

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

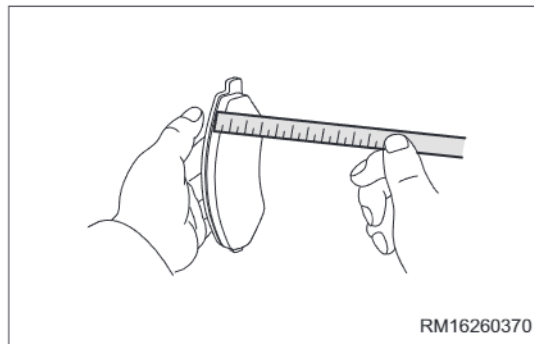
- c. Clean the piston bore with alcohol or proper solution. Then wipe it with a piece of lint.

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



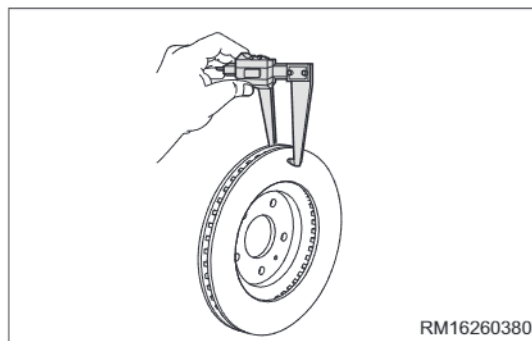
Inspection

1. Check the 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 the 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 the surface of piston is damaged, replace it. If the piston is stuck or bore is worn or corroded, replace the entire brake caliper assembly. Using the polishing cloth, remove the small corrosion points inside the bore.
2. Check the brake caliper fixing bracket and brake caliper guide pin set.
 - a. Clean the contact surfaces of brake caliper fixing bracket and brake lining support shims 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, wear and foreign matter which is difficult to remove.
 - c. Install the brake caliper guide pin and its rubber dust boot to brake caliper fixing bracket. Brake caliper guide pin set should move smoothly without sticking 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 shim). Replace as necessary.
3. Check the brake lining.
 - a. Visually check the brake lining for flatness, and also check for excessive wear. If the condition of lining cannot be confirmed accurately only by visual inspection, perform physical inspection as necessary.
 - b. Measure the minimum brake lining thickness. When the minimum thickness of brake lining is 1.5 mm or less, replace the brake linings.



- c. When replacing the excessively worn brake linings (inner and outer), it is also necessary to replace the linings on 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 original positions.
4. Check the 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 the protrusion on disc is not removed before installing the new brake lining, it will cause abnormal wear of brake disc.
 - 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 the brake disc thickness.
- a. Using a vernier caliper, measure the brake disc thickness at the center of brake lining contact surface as shown in illustration.
Standard thickness: 25 mm
Minimum thickness: 23 mm



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

CAUTION

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

Assembly

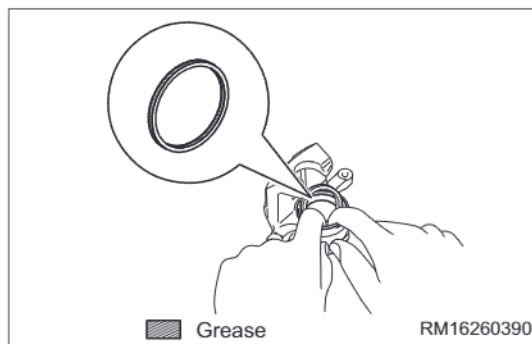
HINT:

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

CAUTION

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

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



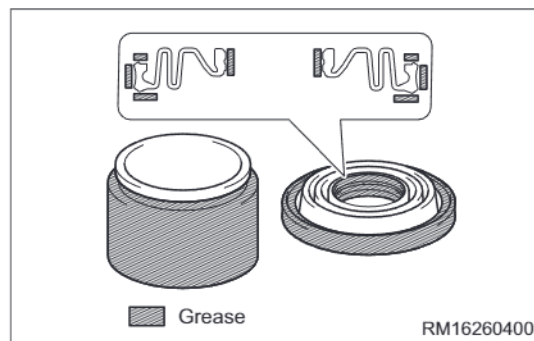
- b. Install the front disc brake piston seal ring onto the brake cylinder.

CAUTION

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

2. Install the front 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 illustration.
- Apply a light coat of grease to the entire outer circumference (part contacting with brake cylinder dust boot and front disc brake cylinder) of front disc brake piston.



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

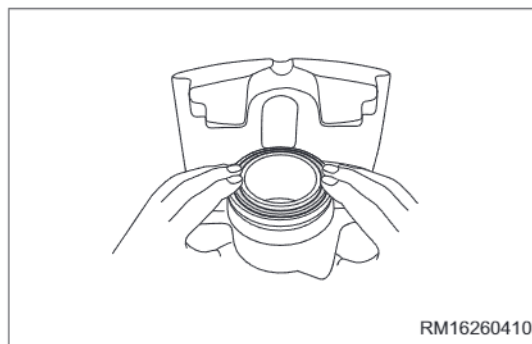
3. Install the brake cylinder dust boot.

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

CAUTION

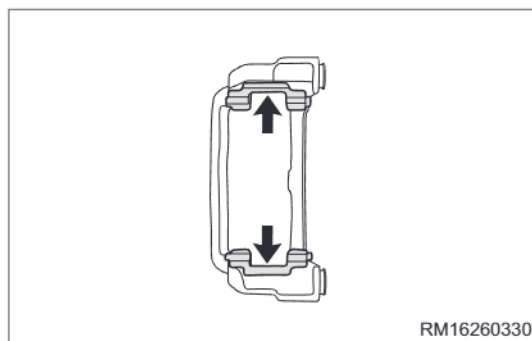
- DO NOT install the piston forcibly to brake cylinder.

- Install the brake cylinder dust boot to brake cylinder.

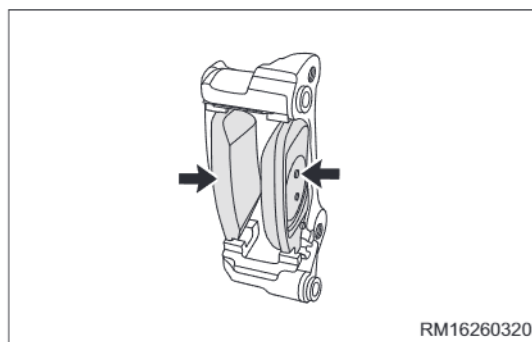
**CAUTION**

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

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



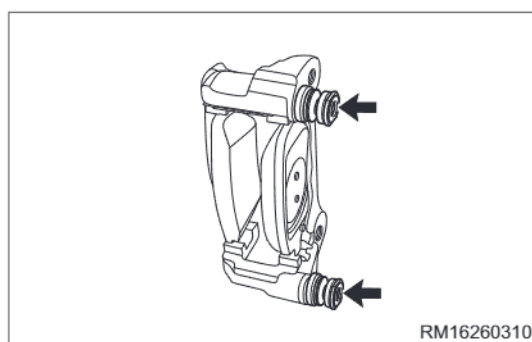
5. Install the front brake lining.
 - a. Securely install the inner brake lining and outer brake lining (arrow) onto the brake caliper fixing bracket. Make sure they are clamped in place.



CAUTION

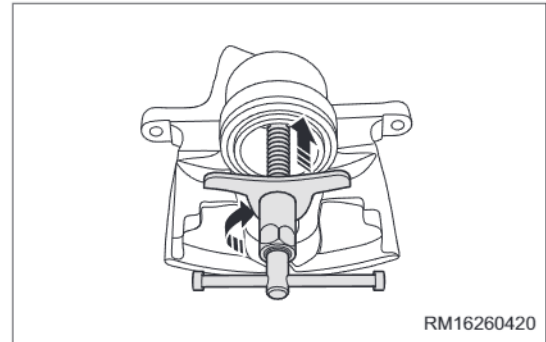
- Make sure the contact surface of lining and brake disc is free of oil and grease.

6. Install the front brake caliper guide bolt guide pin (w/ dust boot).
 - a. Apply a small amount of grease to the contact surface between guide bolt guide pin and guide pin rubber dust boot (arrow), and securely install them to brake caliper fixing bracket.

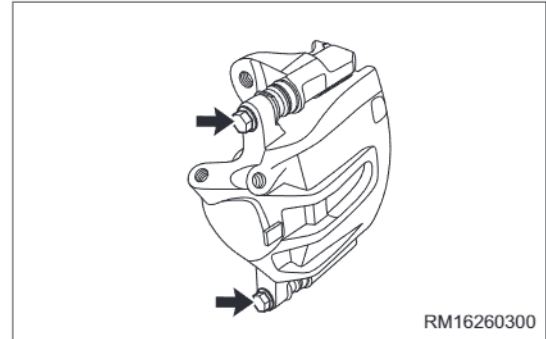


7. Install the brake cylinder assembly.

- a. Using brake cylinder piston pressing tool, slightly retract the brake cylinder piston.

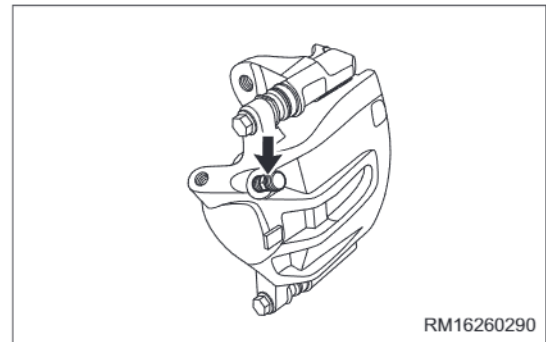


- b. Align brake caliper guide bolts (arrow) with guide pin holes and securely install the brake cylinder assembly.
(Tightening torque: 22 - 32 N·m)



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

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



Installation

Installation is in the reverse order of removal.

CAUTION

- Be sure to tighten bolts and nuts to specified torques during installation.
- Before installing brake linings, completely retract the brake caliper piston back into bore of brake caliper.
- Depress the brake pedal several times to secure the brake linings to brake disc in order to ensure safety after installing brake linings and before moving vehicle.
- Replace the brake linings in pairs. DO NOT replace one alone.
- DO NOT install the 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 a 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 same procedures for right and left sides .
 - Procedures listed below are for left side.
1. Remove the front left wheel (See page 24-9).
 2. Drain brake fluid (See page 26-13).

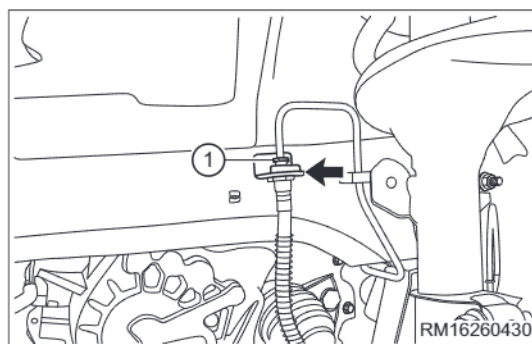
CAUTION

- 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.

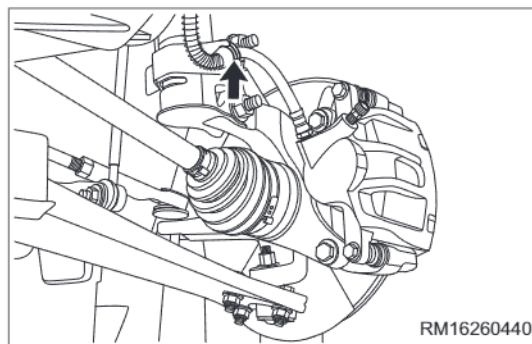
3. Remove the front left brake hose assembly.
 - a. Disengage the fixing clamp (arrow) and loosen the coupling plug (1) between front left brake hose assembly and front left brake pipe.
(Tightening torque: 16 ± 1 N·m)



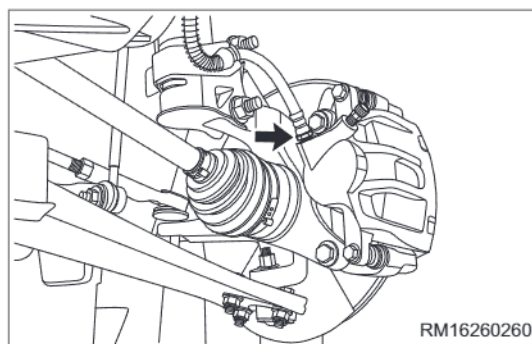
CAUTION

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

- b. Disengage the fixing part (arrow) of front left brake hose assembly from front left shock absorber assembly.



- c. Remove the coupling plug (arrow) between front left brake caliper assembly and front left brake hose assembly.
(Tightening torque: 16 ± 1 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.

- d. Remove the front left brake hose assembly.

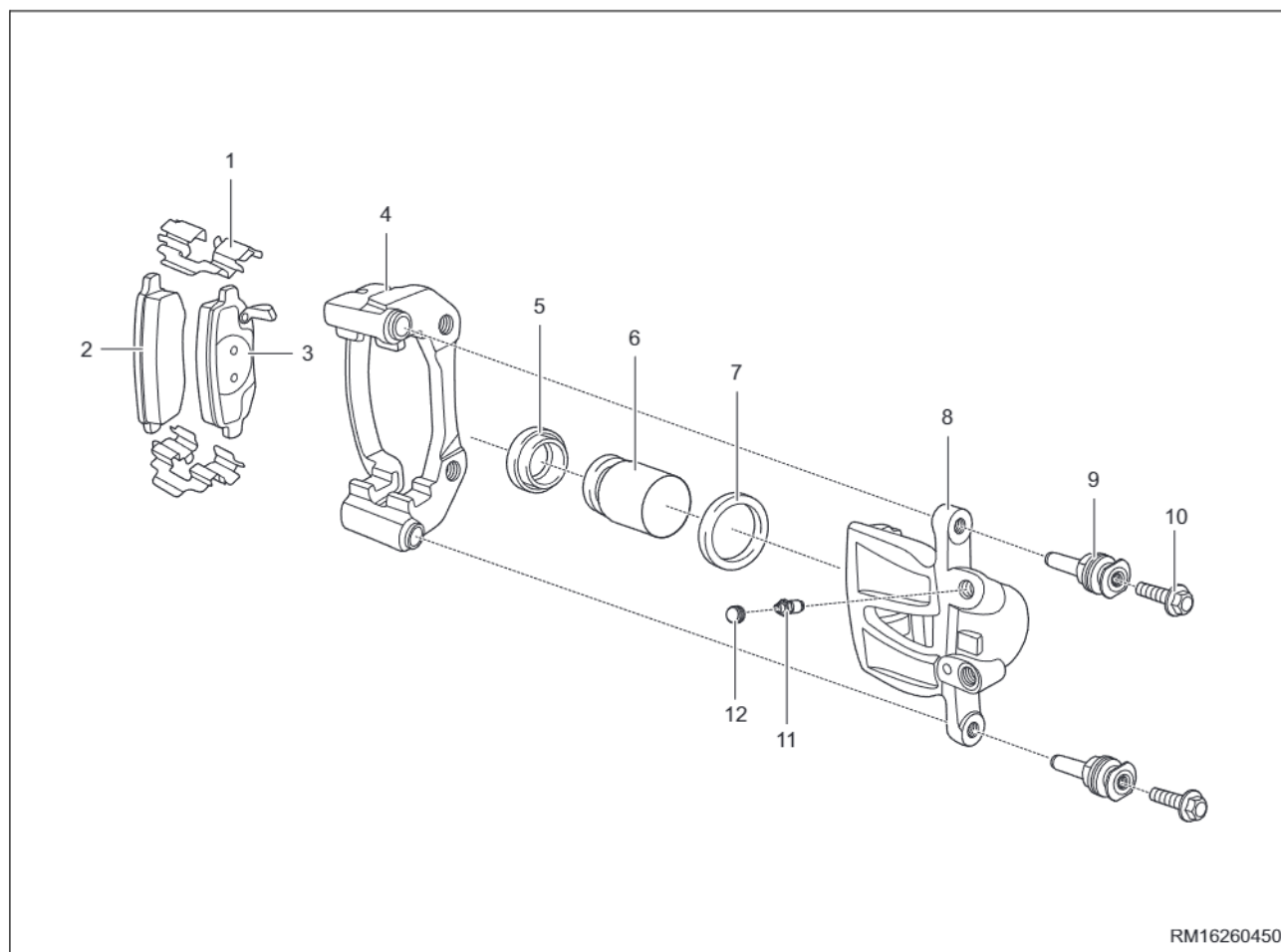
Installation

Installation is in the reverse order of removal.

CAUTION

- Be sure to tighten coupling plugs to 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 a proper level after installation.

Rear Disc Brake Assembly

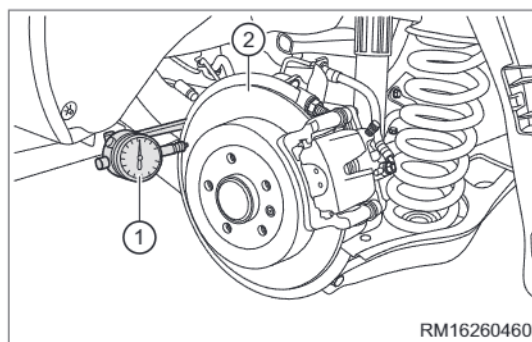


RM16260450

1 - Support Shim	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 Disc Brake Cylinder
9 - Brake Caliper Guide Bolt Guide Pin (w/ Dust Boot)	10 - Brake Caliper Guide Bolt
11 - Bleeder Plug	12 - Bleeder Plug Cap

On-vehicle Inspection

1. Check the brake disc runout.
 - a. Remove the rear wheel (See page 24-9).
 - b. Secure a dial indicator (1) to a 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 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 with maximum value.
Maximum runout for rear brake disc: 0.025 mm
- f. If runout exceeds the maximum value, replace brake disc.

Removal

HINT:

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

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

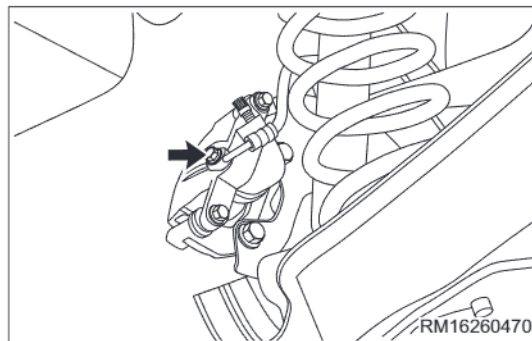
CAUTION

- 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.

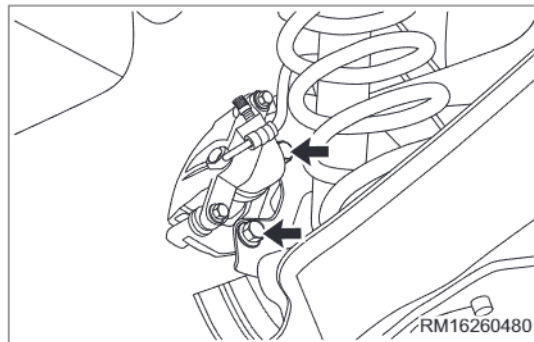
2. Remove the rear left wheel (See page 24-9).
3. Remove the rear left brake caliper assembly.
 - a. Remove the coupling bolt and washer (arrow) between rear left brake caliper assembly and rear left brake hose assembly.
(Tightening torque: 16 ± 1 N·m)



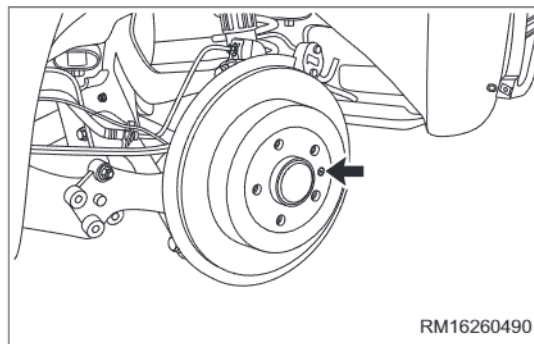
CAUTION

- 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 rear left brake caliper assembly and left brake caliper mounting 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 locating screw (arrow) from rear left brake disc and remove the rear left brake disc.
(Tightening torque: 10 ± 1 N·m)



Disassembly

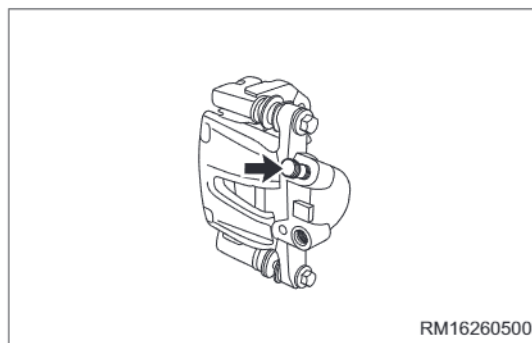
HINT:

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

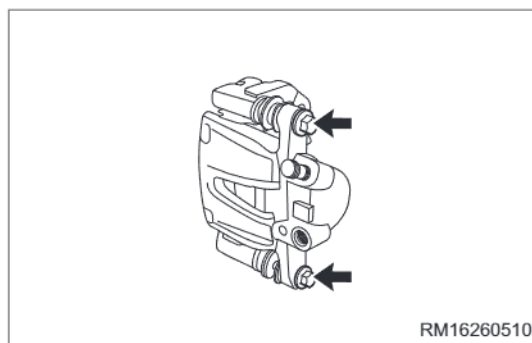
WARNING

- 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 the 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.

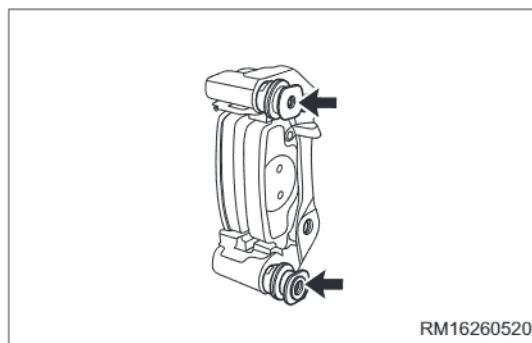


2. Remove the brake cylinder assembly.
 - a. Remove 2 guide bolts (arrow) between brake caliper fixing bracket and brake cylinder assembly.

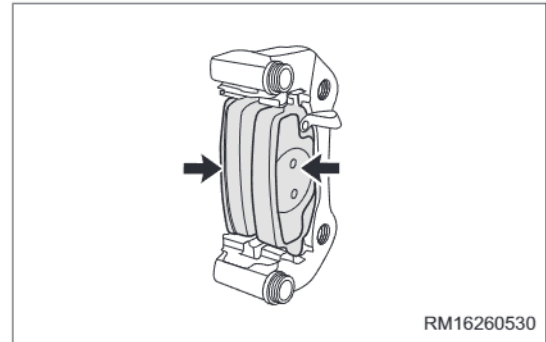


- b. Separate the brake cylinder assembly from brake caliper fixing bracket.
3. Remove the rear brake caliper guide bolt guide pin (w/ dust boot).

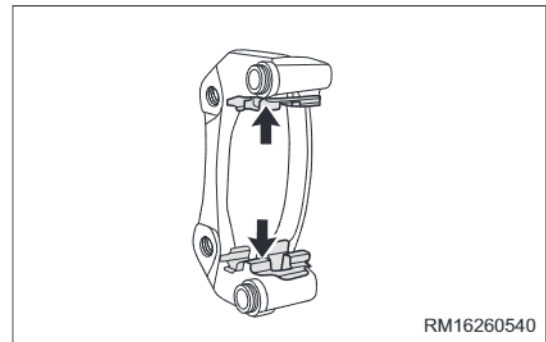
- a. Remove 2 brake caliper guide bolt guide pins (w/ dust boot) (arrow) from brake caliper fixing bracket.



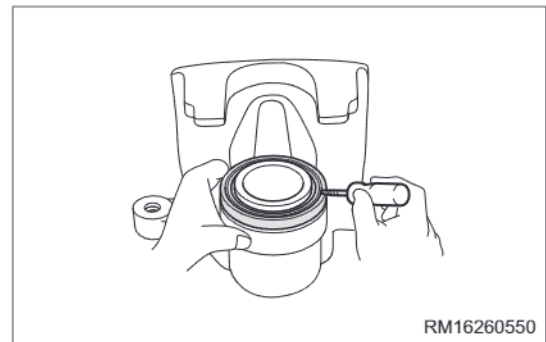
4. Remove the rear brake lining.
 - a. Remove the inner brake lining and outer brake lining (arrow) from brake caliper fixing bracket.



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

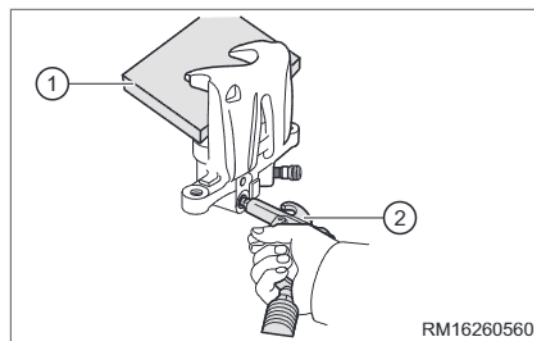


6. Remove the brake cylinder dust boot.
 - a. Using a flat tip screwdriver wrapped with protective tape, pry out the dust boot carefully.

**CAUTION**

- Be careful not to damage the 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 attachment hole.

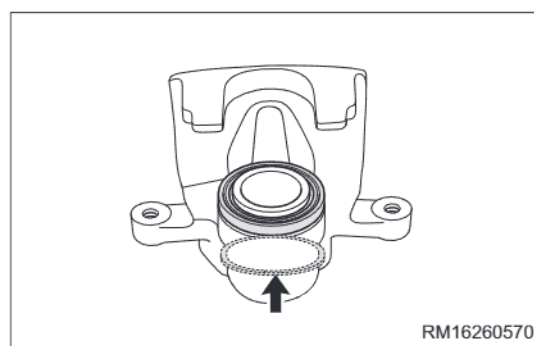


CAUTION

- Be careful not to splash brake fluid.
- DO NOT hold piston by hands to prevent injury.
- DO NOT remove or install the brake piston casually, and always perform these operations by the 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 flat tip screwdriver wrapped with protective tape, carefully pry out the rear disc brake piston seal ring (arrow) from rear ring groove of brake cylinder.

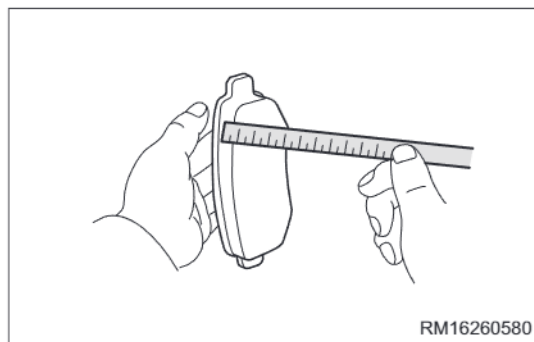


Inspection

1. Check the 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 the 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 the surface of piston is damaged, replace it. If the piston is stuck or bore is worn or corroded, replace the entire brake caliper assembly. Using the polishing cloth, remove the small corrosion points inside the bore.
2. Check the brake caliper fixing bracket and brake caliper guide pin set.
 - a. Clean the contact surfaces of brake caliper fixing bracket and brake lining support shims 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, wear and foreign matter which is difficult to remove.
 - c. Install the brake caliper guide pin and its rubber dust boot to brake caliper fixing bracket. Brake caliper guide pin set should move smoothly without sticking when pushing it with hand; otherwise replace it.
 - d. After installing brake lining, check if it is easy to fall out (due to weak elasticity of support shim). Replace it as necessary.

3. Check the brake lining.

- a. Visually check brake lining for flatness, and also check for excessive wear. If the condition of lining cannot be confirmed accurately only by visual inspection, perform physical inspection as necessary.
- b. Measure the minimum brake lining thickness. When the minimum thickness of brake lining is 1.5 mm or less, replace the brake linings.



- c. When replacing the excessively worn brake linings (inner and outer), it is also necessary to replace the linings on 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 original positions.

4. Check the brake disc.

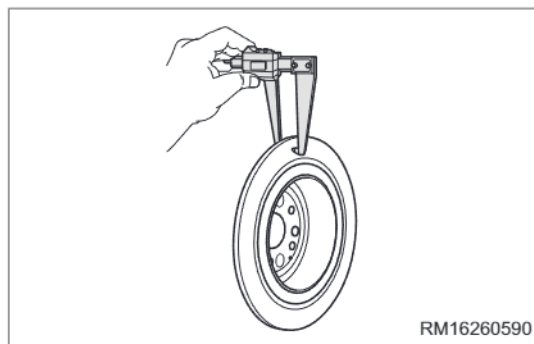
- a. Minor scratch or wear on brake disc surface is acceptable. If severe scratch or deformation exists, the brake disc must be replaced.
- b. Excessive wear of brake disc may cause poor contact between brake lining and surface of brake disc. If protrusion on the disc is not removed before installing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

5. Check the brake disc thickness.

- a. Using a vernier caliper, measure the brake disc thickness at center of brake lining contact surface as shown in 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 the brake disc, because it may make brake disc thickness less than the minimum.

Assembly

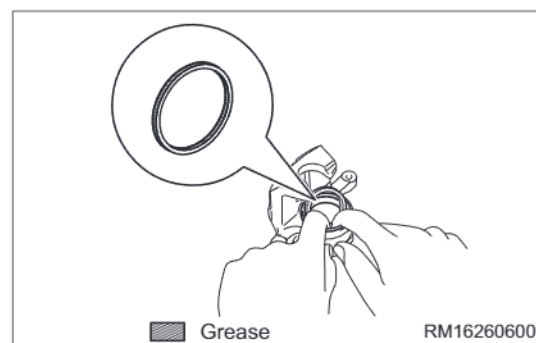
HINT:

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

CAUTION

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

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

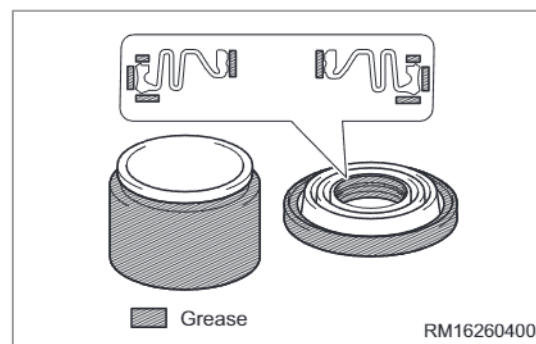


- b. Install the rear disc brake piston seal ring onto brake cylinder.

CAUTION

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

2. Install the rear 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 illustration.
 - b. 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 rear disc brake piston.



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

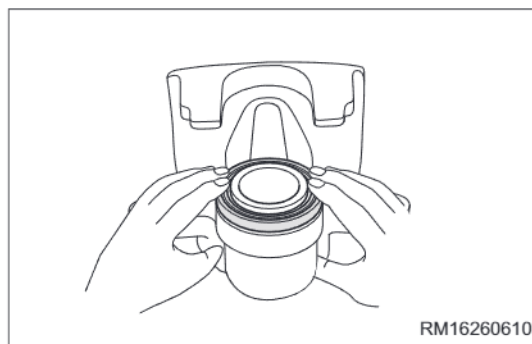
3. Install the brake cylinder dust boot.

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

CAUTION

- DO NOT install the piston forcibly to the brake cylinder.

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

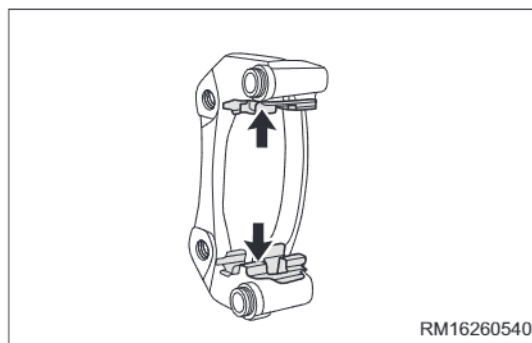


CAUTION

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

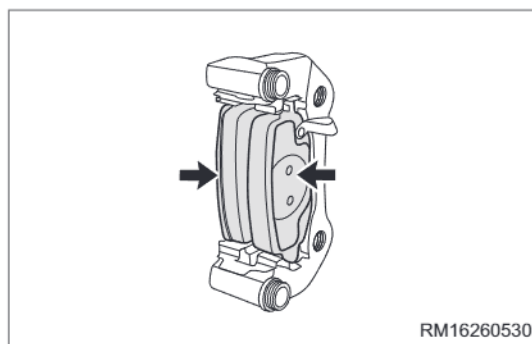
4. Install the brake lining support shim.

- a. Securely install the upper and lower support shims (arrow) onto 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.

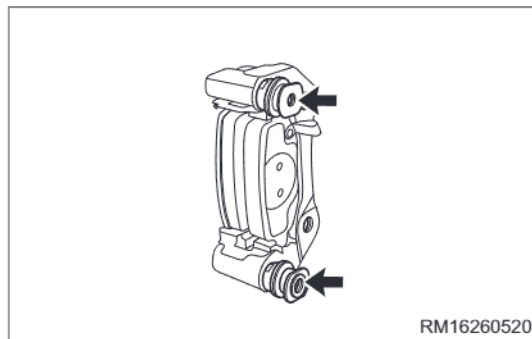


CAUTION

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

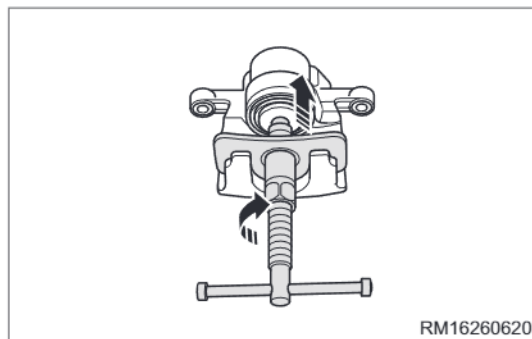
6. Install the rear brake caliper guide bolt guide pin (w/ dust boot).

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

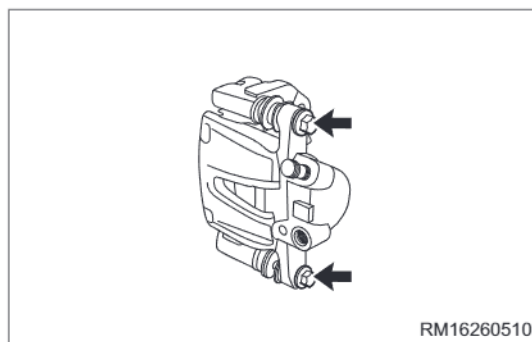


7. Install the brake cylinder assembly.

- Using brake cylinder piston pressing tool, slightly retract the brake cylinder piston.

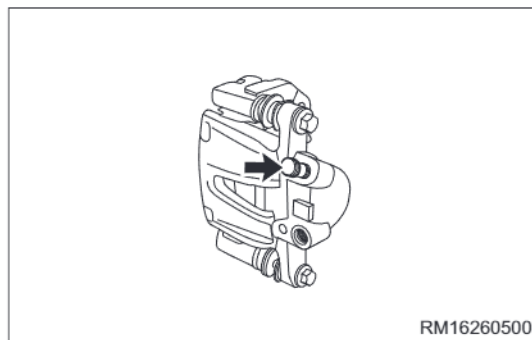


- Align brake caliper guide bolts (arrow) with guide pin holes and securely install the brake cylinder assembly. (Tightening torque: 23 ± 2 N·m)



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

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



Installation

Installation is in the reverse order of removal.

CAUTION

- Be sure to tighten bolts and nuts to specified torques during installation.
- Before installing brake linings, completely retract the brake caliper piston back into bore of brake caliper.
- Depress the brake pedal several times to secure brake linings to brake disc in order to ensure safety after installing brake linings and before moving vehicle.
- Replace the brake linings in pairs. DO NOT replace one alone.
- DO NOT install the 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 a 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 same procedures for right and left sides .
- Procedures listed below are for left side.

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

CAUTION

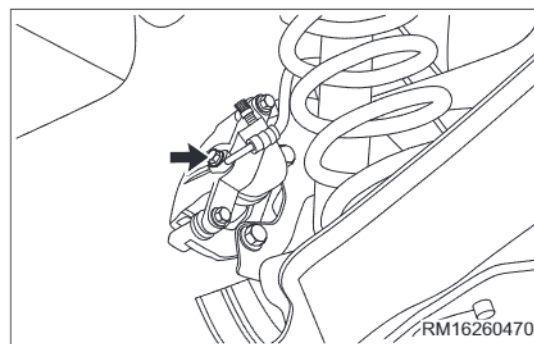
- Wash off brake fluid immediately if it comes in contact with any paint surface.

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.

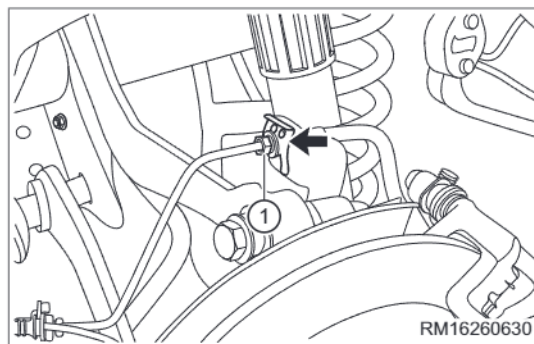
- Remove the coupling bolt and washer (arrow) between rear left brake caliper assembly and rear left brake hose assembly.
(Tightening torque: 16 ± 1 N·m)



CAUTION

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

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



CAUTION

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

- c. Remove the rear left brake hose assembly.

Installation

Installation is in the reverse order of removal.

CAUTION

- Be sure to tighten coupling 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 a proper level after installation.

