PROCEDURE

Caution:

- **Do not let brake fluid come into contact with the painted surface of the vehicle body. Wash away with water immediately and wipe off if it is spilled by accident.**
- **Avoid mixing brake fluid of different brands or different grades even from the same brand to prevent fluid performance from degrading.**
- **Do not reuse drained brake fluid. When refilling brake fluid, always refill new brake fluid.**
- **Do not allow dirt or dust to get into the reservoir tank.**
- **For convenience and safety, perform the work with 2 people.**
- **During the operation, keep the reservoir tank filled with brake fluid at MIN level or higher to prevent entry of air.**

For air bleed procedure of each part, refer to the following.

- Master cylinder: Ref. to BRAKE>Air Bleeding>PROCEDURE > MASTER CYLINDER.
- Brake line: Ref. to BRAKE>Air Bleeding>PROCEDURE > BRAKE LINE.
- Hydraulic control unit: Ref. to BRAKE>Air Bleeding>PROCEDURE > HYDRAULIC CONTROL UNIT.
- Caliper: Ref. to BRAKE>Air Bleeding>PROCEDURE > CALIPER.

1. MASTER CYLINDER

Note:

- **When the master cylinder assembly is replaced or the reservoir tank is empty, bleed the brake master cylinder and the clutch master cylinder (MT model). For air bleed procedure of the clutch fluid, refer to "CLUTCH SYSTEM" section. Ref. to CLUTCH SYSTEM>Clutch Fluid Air Bleeding>PROCEDURE.**
- **If bleeding of the master cylinder assembly is not necessary, omit the following procedures, and perform bleeding of the brake line. Ref. to BRAKE>Air Bleeding>PROCEDURE > BRAKE LINE.**

1. Install the brake pipe to the master cylinder assembly.

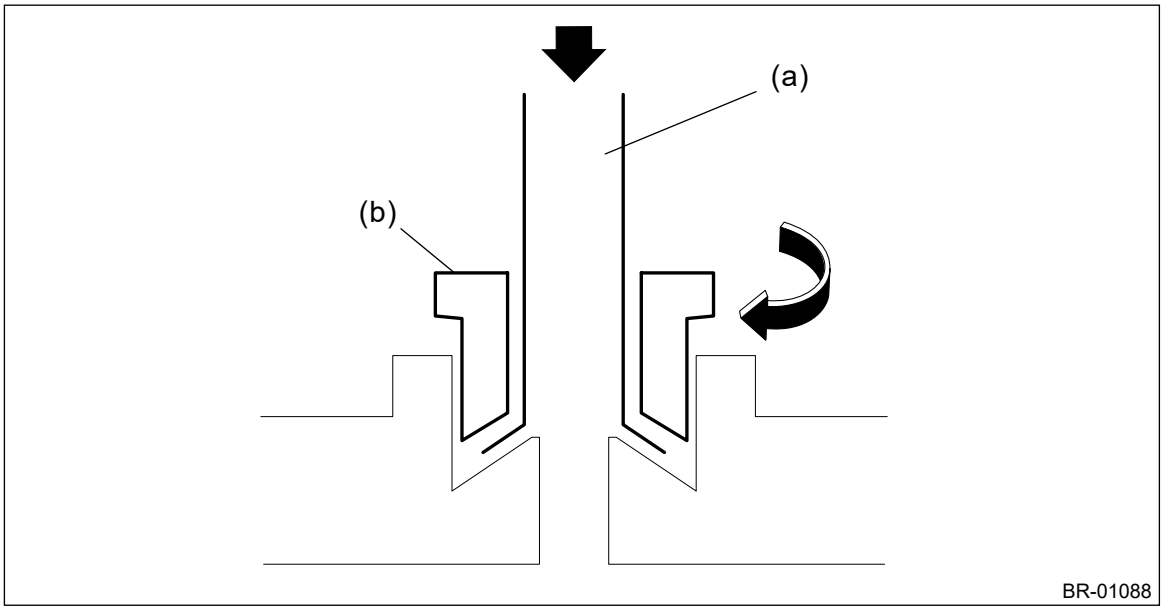
(1) Screw and tighten the flare nut (b) so that the end of the nut contacts the back side of the brake pipe flare, while pressing the brake pipe (a) toward the master cylinder assembly side.

Caution:

Be careful not to make scratches or other damage to the inside surface of the brake pipe flare.

Tightening torque:

Brake pipe flare nut: 19 N·m (1.9 kgf-m, 14 ft-lb)



2. Fill the reservoir tank of the master cylinder assembly with brake fluid.
   Note:
   - **Replenish brake fluid to the MAX level.**
   - **During the operation, keep the reservoir tank filled with brake fluid at MIN level or higher to prevent entry of air.**
3. Attach a transparent vinyl tube to the bleeder - screw of the right front caliper body assembly that is the closest from the VDC control module & hydraulic control unit, and the other end of the vinyl tube to a collection container.
4. Loosen the bleeder - screw, depress the brake pedal slowly and hold it.
5. Tighten the bleeder - screw, and release the brake pedal quickly.
6. Repeat steps 4) and 5) until there are no more air bubbles in the brake fluid in the vinyl tube.
   Note:
   Air bubbles are removed after repeating the procedures six to seven times.
7. Attach a transparent vinyl tube to the bleeder - screw of the left front caliper body assembly, and the other end of the vinyl tube to a brake fluid collection container.
8. Repeat steps 4) and 5) until there are no more air bubbles in the brake fluid in the vinyl tube.
   Note:
   - **Air bubbles are removed after repeating the procedures seven to eight times.**
   - **With the procedures so far, bleed is completed for the air that entered in the master cylinder, front brake piping hose passages and front caliper.**
     Next, perform the following procedures to bleed air that entered in the rear brake piping hose passages and rear caliper from the hydraulic unit.
9. Attach a transparent vinyl tube to the bleeder - screw of the left rear caliper body assembly, and the other end of the vinyl tube to a brake fluid collection container.
10. Loosen the bleeder - screw, and repeat the full stroke depressing operation of the brake pedal slowly, until the brake fluid in the transparent vinyl tube has no more air bubbles, then tighten the bleeder - screw.
    Note:

By repeating the procedures 15 times or more, air that entered in the rear brake pipe passages from the VDC control module & hydraulic control unit reaches the bleeder - screw of the left rear caliper body assembly and is discharged.

11. Attach a transparent vinyl tube to the bleeder - screw of the right rear caliper body assembly, and the other end of the vinyl tube to a brake fluid collection container.
12. Perform step 10).

    Note:

    - **By repeating the procedures 10 times or more, air that entered in the rear brake pipe passages from the VDC control module & hydraulic control unit reaches the bleeder - screw of the right rear caliper body assembly and is discharged.**
    - **With the procedures so far, bleed is completed for the air that entered in the rear brake piping hose passages and rear caliper from the hydraulic unit.**
      Lastly, perform the following procedures to bleed air that may remain in areas where the brake fluid flow stands.
13. Attach a transparent vinyl tube to the bleeder - screw of the right front caliper body assembly, and the other end of the vinyl tube to a brake fluid collection container.
14. After repeating firmly depressing of the brake pedal quickly five or six times, depress and hold the pedal.
15. Loosen the bleeder - screw to drain brake fluid. When the brake pedal reaches the full stroke position, tighten the bleeder - screw quickly, and release the brake pedal.
16. Repeat steps 14) and 15) until there are no more air bubbles in the transparent vinyl tube.

    Note:

    Repeat the procedures approximately four to five times.
17. Repeat steps 14) to 16) above for each brake caliper.

    Note:

    Bleed air in the order starting from the front RH → front LH → rear LH → rear RH.
18. Tighten the bleeder - screw to the specified torque.

    Tightening torque:

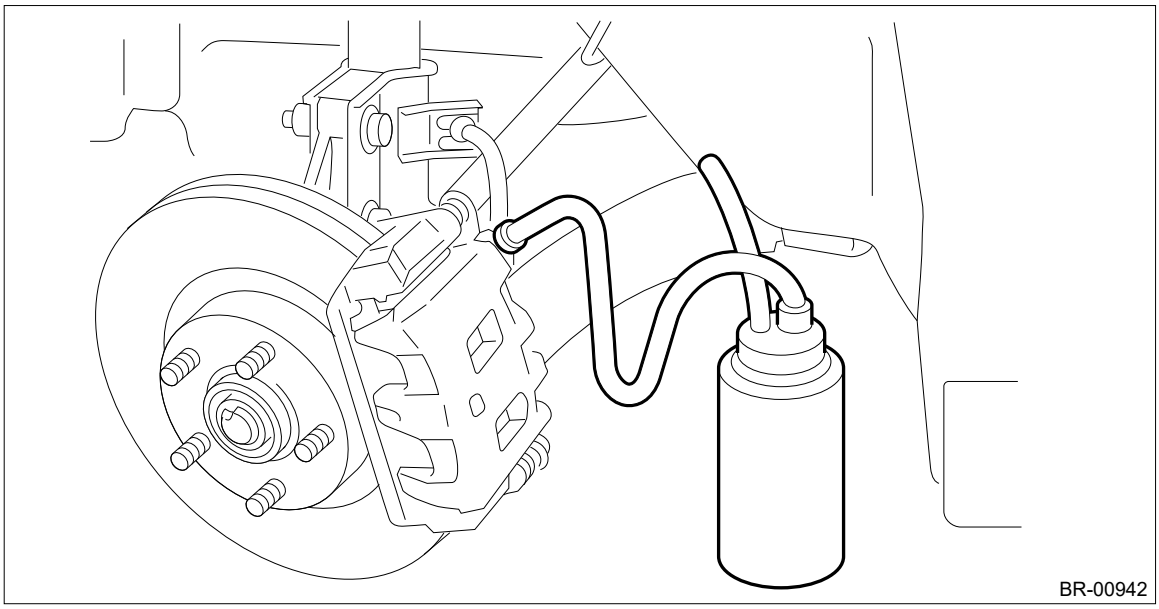
    Bleeder - screw: 8 N·m (0.82 kgf-m, 5.9 ft-lb)
19. Install the cap - bleeder to each bleeder - screw.

2. BRAKE LINE

1. When the master cylinder assembly is replaced or the reservoir tank is empty, bleed the master cylinder assembly before bleeding the brake line. Ref. to BRAKE>Air Bleeding>PROCEDURE > MASTER CYLINDER.
2. Fill the reservoir tank of the master cylinder assembly with brake fluid.

   Note:

   While bleeding air, keep the reservoir tank filled with brake fluid to prevent entry of air.
3. Attach one end of a transparent vinyl tube to the bleeder - screw, and the other end to a brake fluid collection container.



4. Loosen the bleeder - screw, and then repeat the full stroke depressing operation of the brake pedal, until brake fluid in the transparent vinyl tube has no more air bubbles.

   Note:

   Air bubbles are removed after repeating the depressing operation 15 times or more for the front caliper, and 20 times or more for the rear caliper.

5. Perform the steps 2) to 4) above on each brake caliper.

   Note:

   Perform in the order starting from the front RH → front LH → rear LH → rear RH.

6. Tighten the loosened bleeder - screw, repeat firmly depressing of the brake pedal 5 to 6 times, and then depress and hold the brake pedal.
7. Loosen the bleeder - screw to drain the brake fluid. When the brake pedal reaches the full stroke position, immediately tighten the bleeder - screw and return the brake pedal.
8. Repeat steps 6) and 7) until there are no more air bubbles in the transparent vinyl tube.
9. Perform the steps 6) to 8) above on each brake caliper.

   Note:

   Perform in the order starting from the front RH → front LH → rear LH → rear RH.

10. Operate the hydraulic control unit in the sequence control mode for both ABS and VDC systems.

    Caution:

    - **If there is a possibility that air enters the pressure control section in the hydraulic control unit, perform steps 11) to 16).**
    - **For normal air bleeding operation, do not operate the sequence control for the hydraulic control unit. (Operating the sequence control may let air in the normal air bleeding passages move to the pressure control section.)**

    Note:

    - **Normal air bleeding operation does not help bleed air that enters the pressure control section in the hydraulic control unit.**
    - **If there is a possibility that air enters the pressure control section in the hydraulic control unit (if VDC or ABS operates with air contained in the**

normal air bleeding passage), perform the sequence control mode for both of the ABS and VDC systems.

11. Perform the ABS sequence control mode. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>ABS Sequence Control.

    Caution:

    Be sure to perform the ABS sequence control mode first.

12. Perform the air bleeding operation of steps 3) and 4) for the bleeder - screw on each caliper.

    Note:

    - **Perform in the order starting from the front RH → front LH → rear LH → rear RH.**
    - **As a reference, the number of the full stroke depressing operation is six times.**

13. Perform the VDC sequence control mode. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Sequence Control.
14. Perform the air bleeding operation of steps 3) and 4) for the bleeder - screw on each caliper.
15. Repeat from steps 11) to 14) for three cycles.
16. In case air still remains at step 15), repeat steps 11) to 14) again until all air is removed.
17. Fill the reservoir tank with brake fluid up to the "MAX" level.
18. Tighten the bleeder - screw to the specified torque.

    Tightening torque:

    Bleeder - screw: 8 N·m (0.82 kgf-m, 5.9 ft-lb)

19. Install the cap - bleeder to each bleeder - screw.
20. Check that there are no brake fluid leaks at the flare nut portion or in the entire brake system.
21. Perform a road test and ensure that the brakes operate normally.

3. HYDRAULIC CONTROL UNIT

Bleed air from the brake line. Ref. to BRAKE>Air Bleeding>PROCEDURE > BRAKE LINE.

Note:

If there is a possibility that air enters the pressure control section in the hydraulic control unit, perform the sequence control mode for both of the ABS and VDC systems. (Refer to steps 10) to 16) for brake lining.)

4. CALIPER

Bleed air from the brake line. Ref. to BRAKE>Air Bleeding>PROCEDURE > BRAKE LINE.

INSPECTION

1. OPERATION CHECK WHEN NOT USING MEASURING DEVICES

Caution:

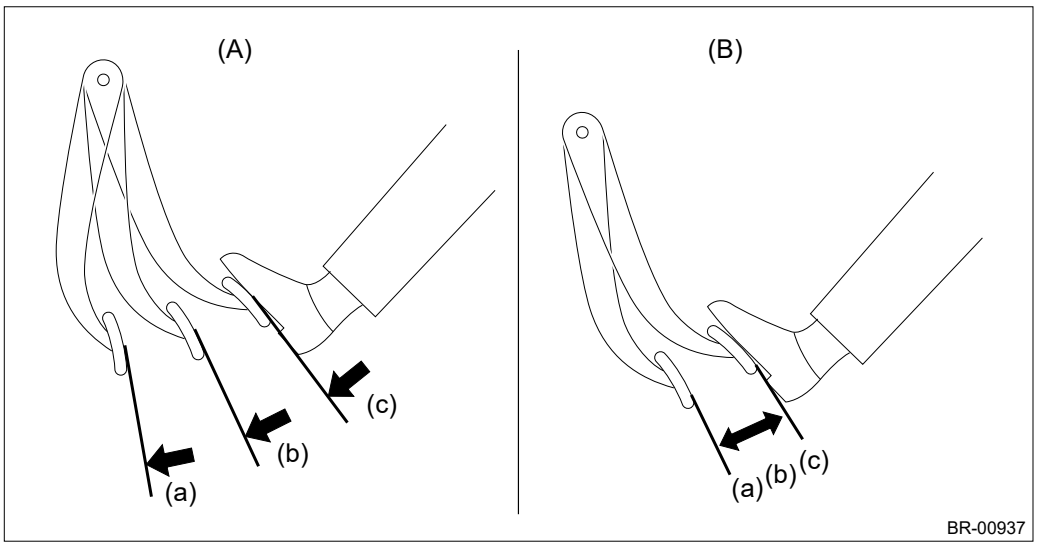
When checking operation, be sure to apply the parking brake securely.

When an operation check is performed with no measuring devices, a faulty part cannot be identified correctly. But it is possible to identify the outline of the defect by performing the check according to the following procedures.

- **Air tightness check**
  1. Start the engine, and idle it for 1 to 2 minutes, then turn it OFF.
  2. Depress the brake pedal several times applying the normal pedal force.

     Note:

     The pedal stroke should be the longest at the 1st depression, and it should become shorter at each successive depression.
  3. If no change occurs in the pedal height when pressed, the vacuum booster assembly is faulty.



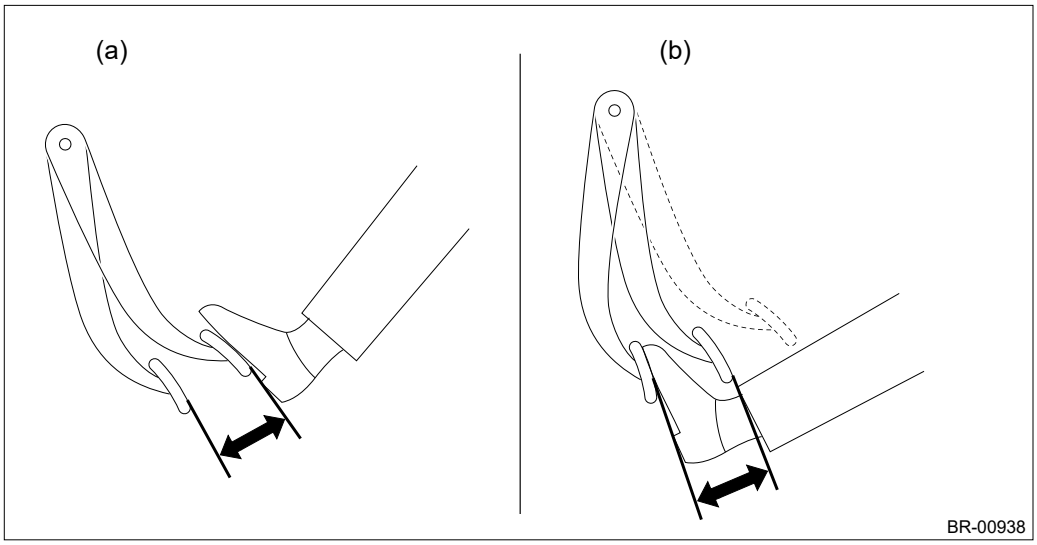
(A) [Normal] (B) Not OK

(a) [1st] (b) [2nd] (c) [3rd]

Note:

- **In case of defective operation, inspect the condition of the check valve, the vacuum hose, the seal sub assembly and the seal engagement surface of the vacuum booster assembly.**
- **If parts are damaged, or the sealing surface of the vacuum booster assembly has a defect such as flaking paint, damage or rust, it may cause negative pressure leakage. Therefore, replace the parts and perform the test again.**
- **If no improvement is observed, check precisely with gauges.**

- **Check operation**
  1. While the engine is OFF, depress the brake pedal several times applying the same pedal force, to check for a change in pedal height.



(a) When engine is stopped (b) When engine is started

2. With the brake pedal depressed, start the engine.
3. As the engine starts, the brake pedal should move slowly toward the floor. If the pedal height does not change, the vacuum booster assembly is faulty.

Note:

If a faulty part is detected after inspection, check precisely with measuring devices.

- **Loaded air tightness check**

Depress the brake pedal while the engine is running, and turn the engine to OFF while the pedal is depressed.

Keep the pedal depressed for 30 seconds. If the pedal height does not change, the function of vacuum booster assembly is normal. If the pedal height increases, it is faulty.

Note:

If a faulty part is detected after inspection, check precisely with measuring devices.

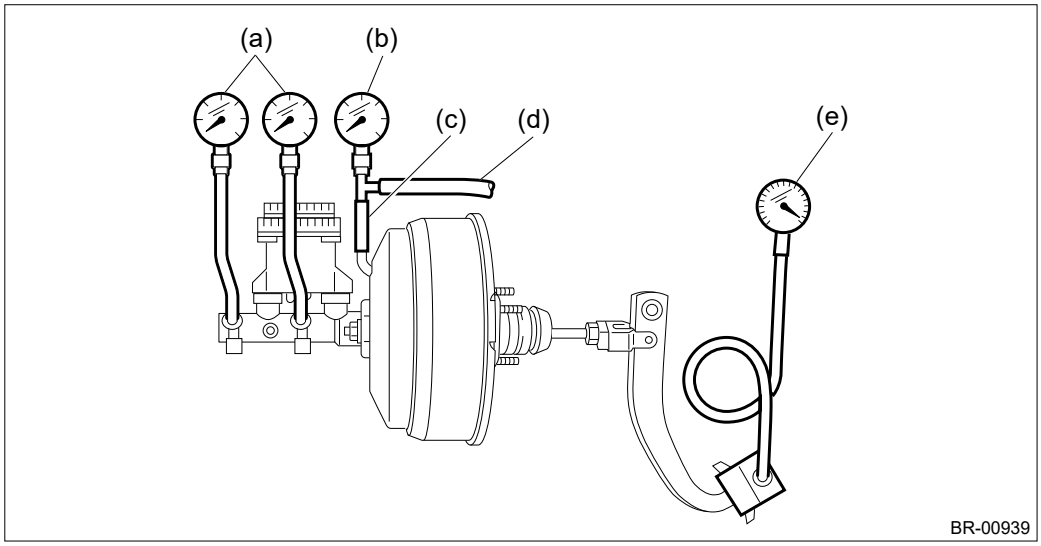
2. OPERATION CHECK WHEN USING MEASURING DEVICES

Caution:

When checking operation, be sure to apply the parking brake securely.

- **Check with measuring devices**

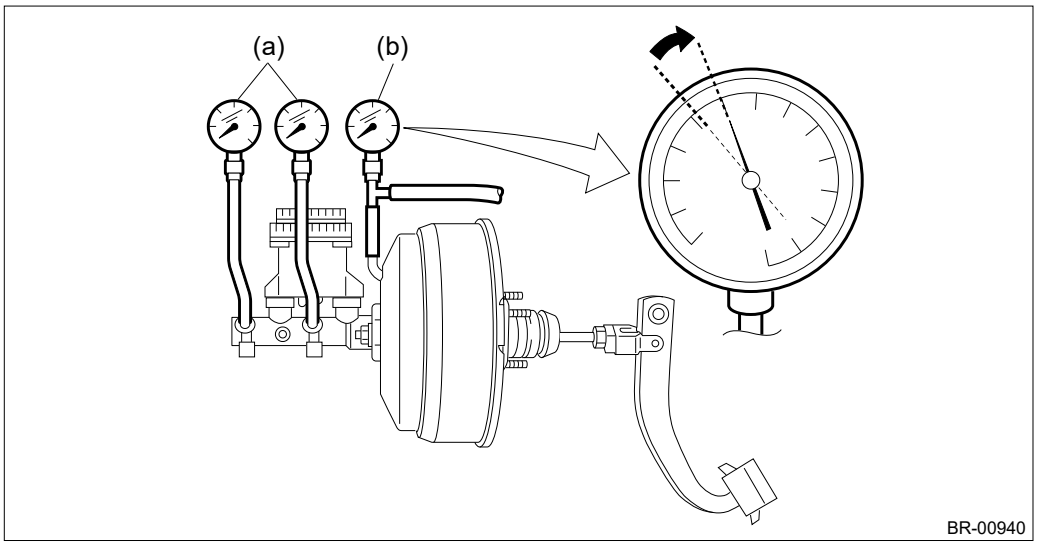
Connect a measuring device as shown in the figure. After bleeding air from the pressure gauge, perform each check.



(a) Pressure gauge
(b) Vacuum gauge
(c) Adapter hose
(d) Vacuum hose
(e) Pedal force gauge

- **Air tightness check**

1. Start the engine and keep it running at idle until vacuum pressure indicates 66.7 kPa (500 mmHg, 19.69 inHg) while the brake pedal is not depressed.



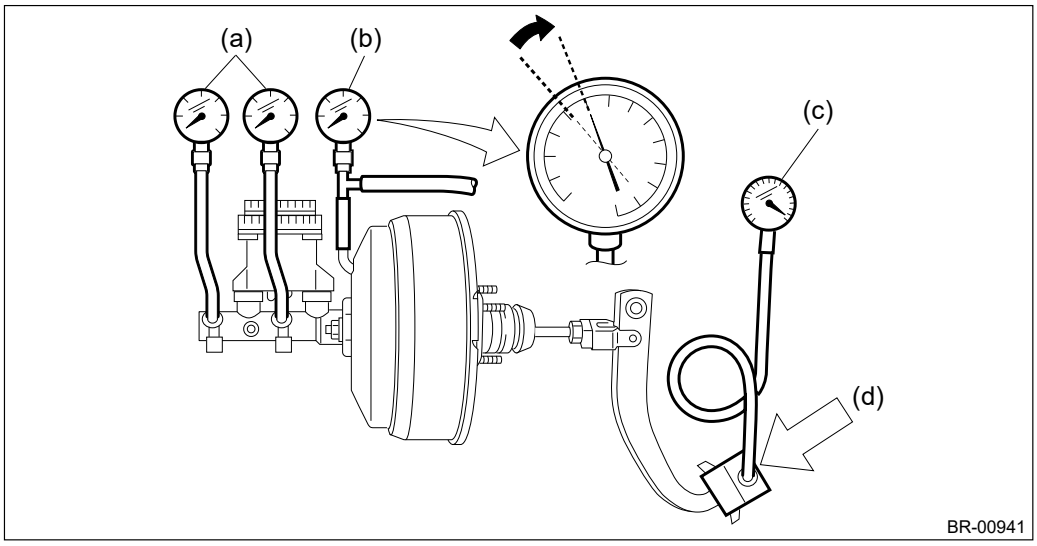
(a) Pressure gauge
(b) Vacuum gauge

2. Stop the engine and check the vacuum pressure.
   If the value matches the following standard, the vacuum booster assembly function is normal.
   Vacuum pressure: standard
   The range of vacuum pressure drop within 15 seconds after stopping the engine is 3.3 kPa (25 mmHg, 0.98 inHg) or less.
   If a faulty part is detected after inspection, it may results from one of the following causes.
   - Check valve malfunction
   - Leak from vacuum hose
   - Leak from shell joint section or stud bolt welded section
   - Damaged diaphragm
   - Leak from valve body seal and bearing section

- Leak from plate and seal assembly section
- Leak from poppet valve assembly section

● Loaded air tightness check

1. Start the engine and depress the brake pedal with a pedal force of 196 N (20 kgf, 44 lbf).
2. Keep the engine running at idle and the pedal depressed until vacuum pressure of the vacuum gauge indicates 66.7 kPa (500 mmHg, 19.69 inHg).



(a) Pressure gauge
(b) Vacuum gauge
(c) Pedal force gauge
(d) Depressed

3. Stop the engine and check the vacuum gauge.
   If the value matches the following standard, the vacuum booster function is normal.
   Vacuum pressure: standard
   The range of vacuum pressure drop within 15 seconds after stopping the engine is 3.3 kPa (25 mmHg, 0.98 inHg) or less.
   If a faulty part is detected after inspection, refer to "AIR TIGHTNESS CHECK".
   Ref. to BRAKE>Brake Booster>INSPECTION.
4. If the vacuum booster assembly is faulty, replace it with a new part.

● Lack of boost action check

1. Turn the engine OFF, and set the value of the vacuum gauge to "0".
2. Check the fluid pressure when the brake pedal is depressed. The pressure must be greater than the specification listed.

Brake pedal force: N (kgf, lbf)	147 (15, 33)	294 (30, 66)
Fluid pressure: kPa (kgf/cm^2, psi)	533 (5, 77)	1,551 (16, 225)

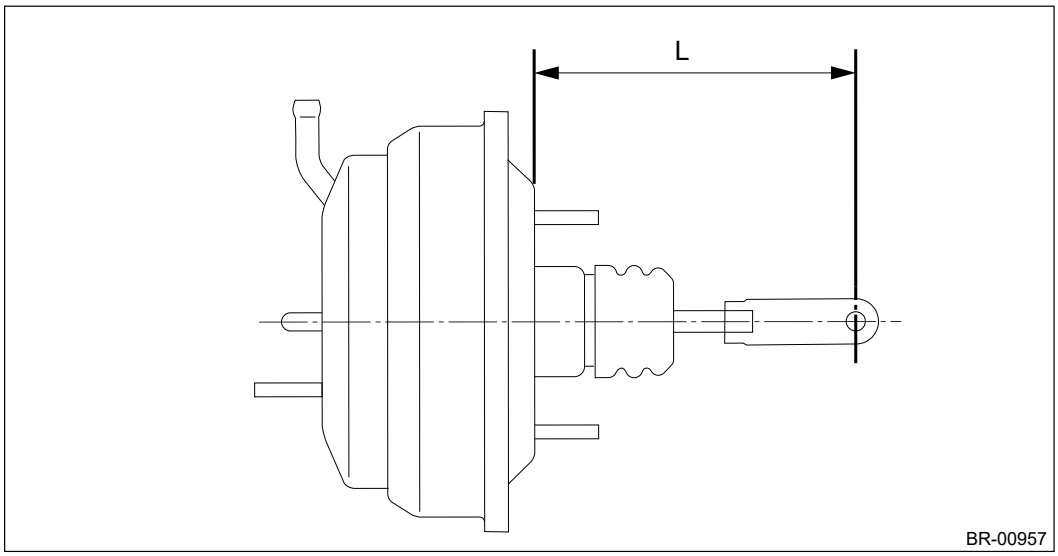
● Boosting action check

1. Set the vacuum gauge reading to 66.7 kPa (500 mmHg, 19.69 inHg) with the engine running.
2. Check the fluid pressure when the brake pedal is depressed. The pressure must be greater than the specification listed.

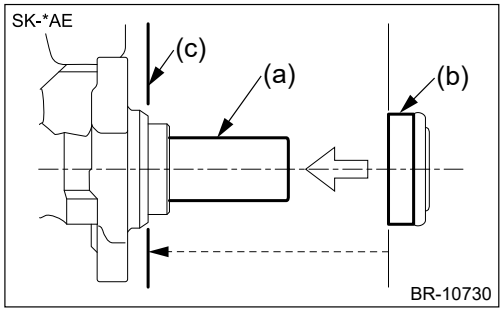
Brake pedal force: N (kgf, lbf)	147 (15, 33)	294 (30, 66)
Fluid pressure: kPa (kgf/cm^2, psi)	6,177 (63, 896)	11,273 (115, 1,635)

INSTALLATION

1. Check and adjust the operating rod of the vacuum booster assembly.
   (1) Measure the length between the vacuum booster assembly mounting surface and clevis pin hole.
   (2) If it is not within the specification, loosen the lock nut, rotate the vacuum booster assembly operating rod to adjust the rod length.
   Specification L:
   136.3 mm (5.37 in)



2. Install the vacuum booster assembly.
   Caution:
   - **Replace the clevis pin with a new part, and apply a thin coat of grease to the clevis pin.**
     Preparation items:
     Grease: NIGTIGHT LYW No. 2 grease or equivalent
   - **When installing the master cylinder assembly, replace the seal sub assembly with a new part, and install it to the vacuum booster assembly.**



(a) Primary piston
(b) Seal sub ASSY
(c) Install the seal sub ASSY to this surface.

   (1) Apply grease to the entire inner diameter of the vacuum booster assembly.
   Preparation items:
   Grease: An item contained in the seal kit (fluorine grease) or equivalent
   (2) Apply grease to the entire outer diameter of the seal sub assembly.
   Preparation items:

Grease: An item contained in the seal kit (fluorine grease) or equivalent

(3) Apply grease to the entire inner diameter of the seal sub assembly.

Preparation items:

Grease: An item contained in the seal kit (silicone grease) or equivalent

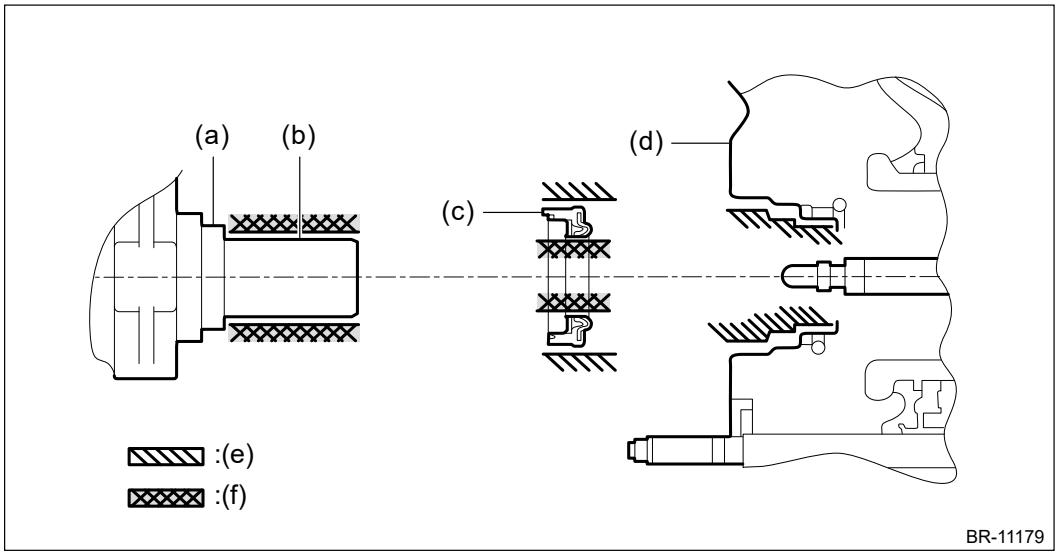
(4) Apply grease to the entire circumference on the piston rod of the master cylinder assembly.

Preparation items:

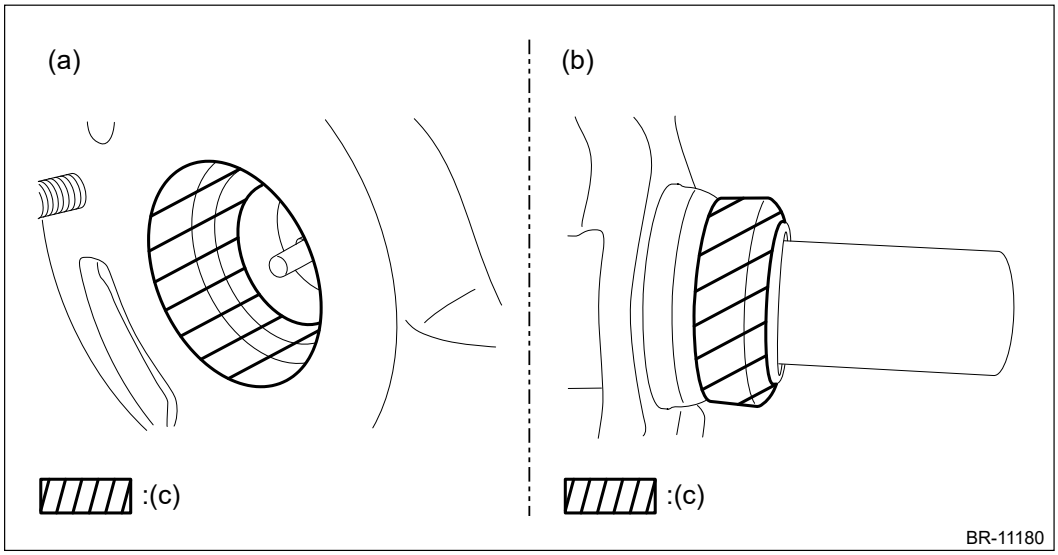
Grease: An item contained in the seal kit (silicone grease) or equivalent

Caution:

- **Apply fluorine grease to the entire circumference. Areas where application was missed may cause rust.**
- **Be careful not to mix up application locations of each grease.**



(a) Master cylinder ASSY
(b) Piston rod portion
(c) Seal sub ASSY
(d) Vacuum booster ASSY
(e) Fluorine grease application location
(f) Silicone grease application location



(a) Vacuum booster ASSY inner diameter (entire
(b) Seal sub ASSY outer diameter (entire circumference)
(c) Grease application location

circumference)

(5) Install the vacuum booster assembly.

Tightening torque:

18 N·m (1.8 kgf-m, 13.3 ft-lb)

3. Install each part in the reverse order of removal.

Tightening torque:

Master cylinder assembly: 13 N·m (1.33 kgf-m, 9.6 ft-lb)
Operating lock nut: 22 N·m (2.24 kgf-m, 16.2 ft-lb)
Knee airbag module: 7.5 N·m (0.76 kgf-m, 5.5 ft-lb)

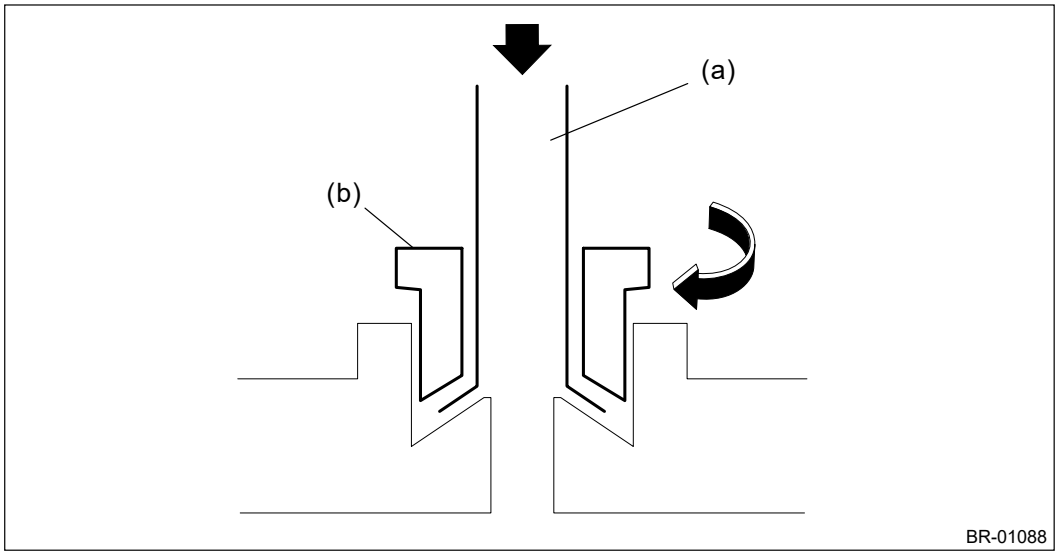
4. Turn and tighten the flare nut (b) by hand while pressing the brake pipe (a) toward the master cylinder assembly side.

Caution:

Be careful not to make scratches or other damage to the inside surface of the brake pipe flare.

Tightening torque:

Brake pipe flare nut: 19 N·m (1.94 kgf-m, 14 ft-lb)



5. Install the air conditioner pipe. Ref. to HVAC SYSTEM (HEATER, VENTILATOR AND A/C)>General Description>COMPONENT > AIR CONDITIONING UNIT.

6. Install the intercooler. (Turbo model) Ref. to INTAKE (INDUCTION) (H4DOTC)>Intercooler>INSTALLATION.

7. Connect the battery ground terminal. Ref. to NOTE>NOTE > BATTERY.

8. Bleed air from the brake system. Ref. to BRAKE>Air Bleeding>PROCEDURE.

9. Perform a road test to make sure the brakes do not drag.

REMOVAL

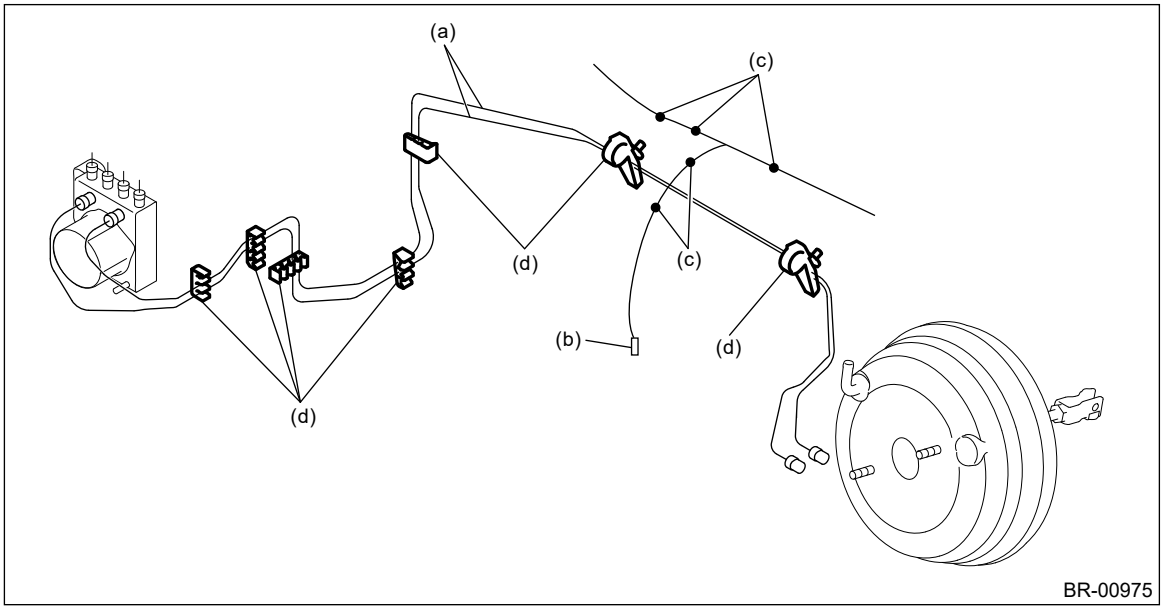
Caution:

- **Do not allow brake fluid to come in contact with the painted surface of the vehicle body. If it does, wash off with water and wipe away completely.**
- **If the master cylinder assembly is removed, inspect the seal engagement surface of the seal sub assembly and the vacuum booster assembly.**
- **If the sealing surface of the vacuum booster assembly has a defect such as flaking paint, damage or rust, it may cause negative pressure leakage. Therefore, replace the vacuum booster assembly with a new part.**

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to NOTE>NOTE > BATTERY.

   Note:

   For model with battery sensor, disconnect the ground terminal from battery sensor.
2. Drain brake fluid from the reservoir tank completely.
3. Remove the intercooler. (Turbo model) Ref. to INTAKE (INDUCTION) (H4DOTC)>Intercooler>REMOVAL.
4. Disconnect the air conditioner pipe. Ref. to HVAC SYSTEM (HEATER, VENTILATOR AND A/C)>Hose and Pipe>REMOVAL.
5. Remove the power steering control module. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Power Steering Control Module>REMOVAL.
6. Remove the master cylinder assembly. Ref. to BRAKE>Master Cylinder>REMOVAL.
7. Remove the brake pipe assembly (a).
   (1) Disconnect the starter connector (b) and harness clip (c).
   (2) Remove the brake pipe assembly (a) from the pipe clip (d).



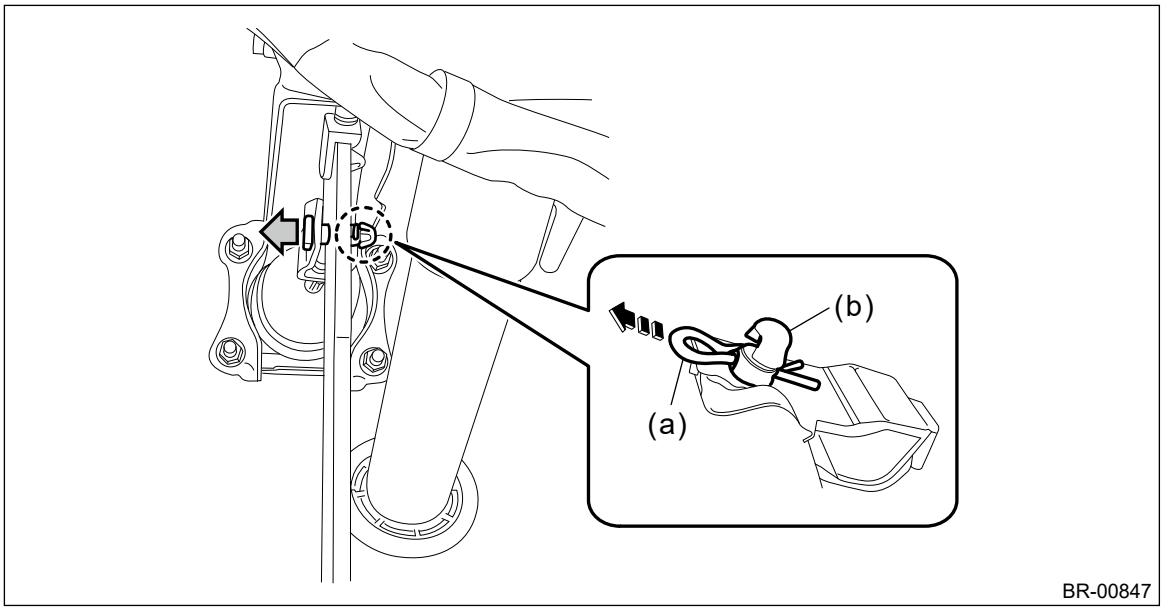
8. Remove the cover assembly - instrument panel LWR driver. Ref. to EXTERIOR/INTERIOR

TRIM>Instrument Panel Lower Cover>REMOVAL.

9. Remove the knee airbag module. (Model with knee airbag) Ref. to AIRBAG SYSTEM>Knee Airbag Module>REMOVAL.
10. Remove the universal joint assembly - steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint>REMOVAL.
11. Remove the column assembly - steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Column>REMOVAL.
12. Remove the snap pin (a) and clevis pin (b), and remove the operating rod from the brake pedal.

Caution:

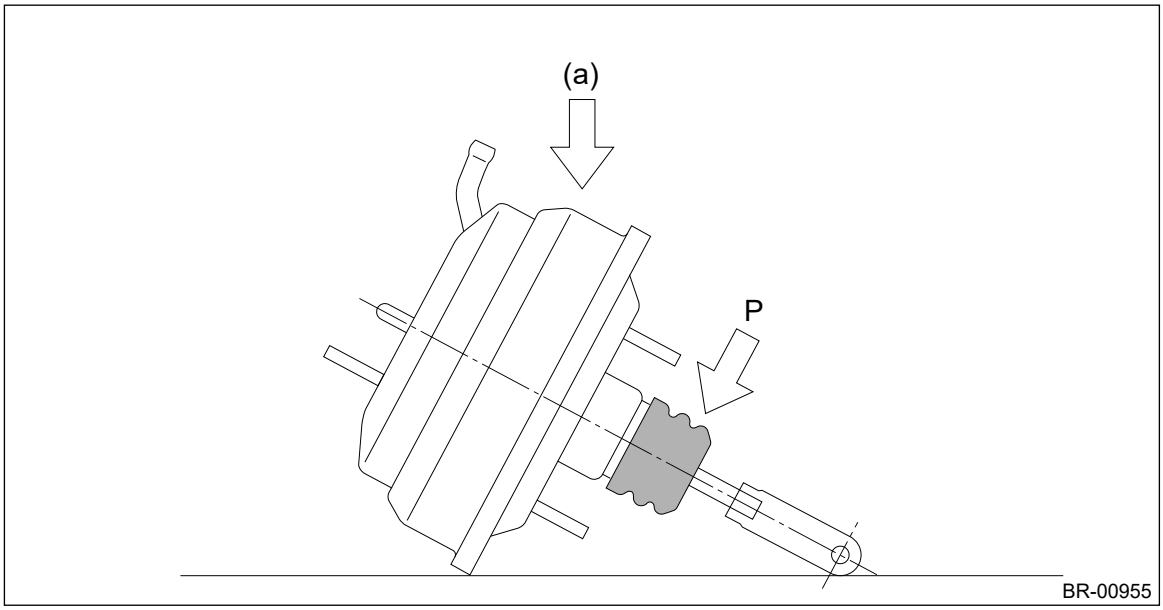
- **Be careful not to apply excessive force to the operating rod when handling the operating rod. The angle may change by ±3°, and it may result in damage to power piston cylinder.**
- **Do not change the push rod length.**



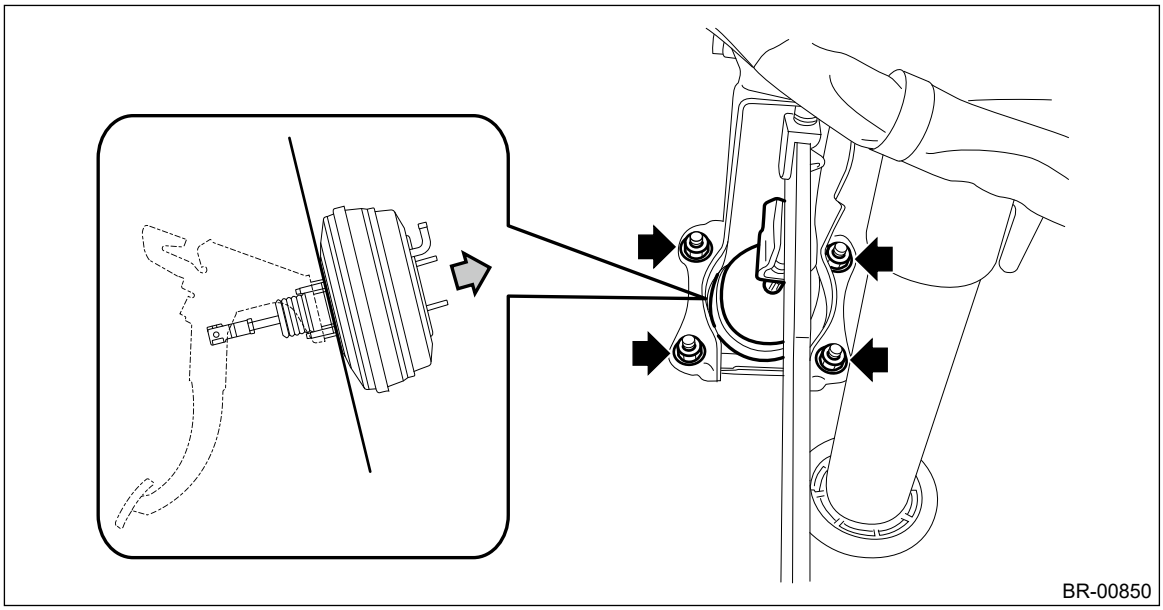
13. Remove the vacuum booster assembly.

Caution:

- **Do not disassemble the vacuum booster assembly.**
- **Make sure that the booster shell and vacuum pipe are not subject to strong impacts.**
- **Be careful not to drop the vacuum booster assembly. If the vacuum booster assembly is dropped accidentally, replace it.**
- **Be careful when placing the vacuum booster assembly on floor.**
- **If external force (a) is applied from above when the vacuum booster assembly is placed in this position, the resin portion as indicated by "P" may become damaged.**



(1) Remove the nuts, and then remove the vacuum booster assembly.



INSPECTION

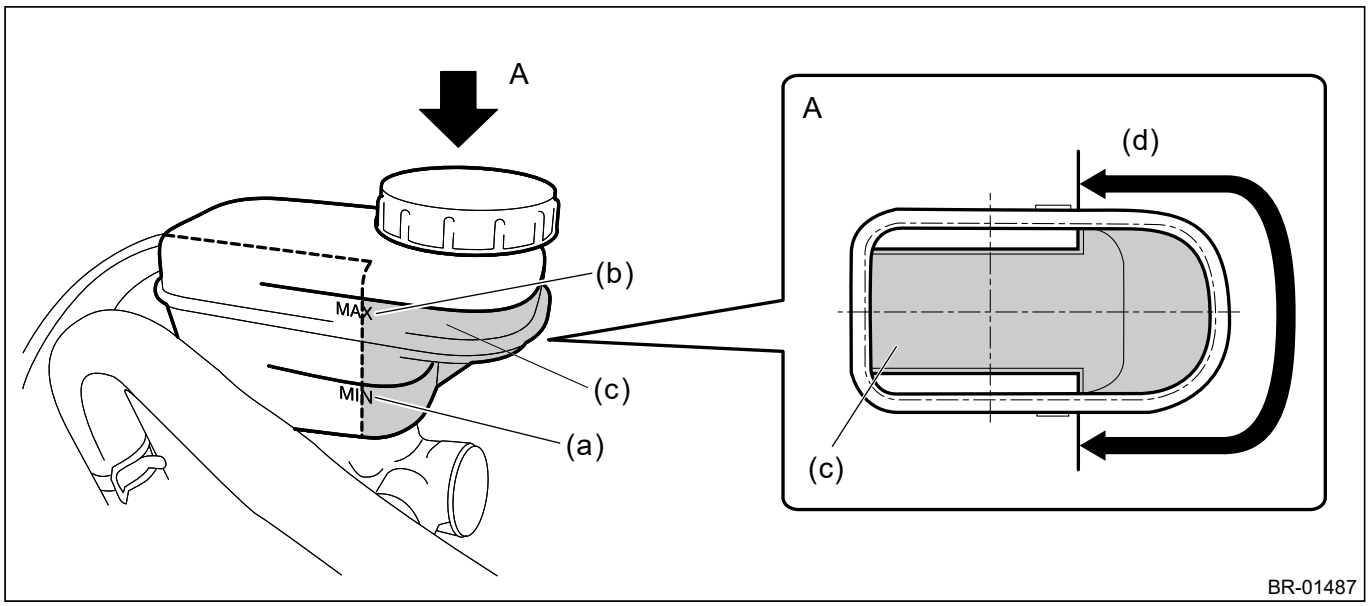
Caution:

- **Do not let brake fluid come into contact with the painted surface of the vehicle body. Wash away with water immediately and wipe off if it is spilled by accident.**
- **Do not reuse drained brake fluid. When refilling brake fluid, always refill new brake fluid.**
- **Avoid mixing brake fluid of different brands or different grades even from the same brand to prevent fluid performance from degrading.**
- **Do not allow dirt or dust to get into the reservoir tank.**

1. Check the fluid for discoloration.
2. Check that the amount of brake fluid is between the lines of "MIN" and "MAX" from the front view or from the forward right and left within 90°.

Caution:

Always check the level using the specified direction because there is a partition in the reservoir tank.



(A) View from upper face

(a) MIN. level

(b) MAX. level

(c) Brake fluid

(d) Brake fluid level check range

3. If the brake fluid level is close to "MIN", check the brake pipe or brake hose for any leak first. Then, check that the brake fluid level is reduced due to brake pad wear.
4. If the fluid is extremely discolored or the fluid level is less than the specified value after inspection, replenish or replace with the new fluid.

REPLACEMENT

Caution:

- **Do not let brake fluid come into contact with the painted surface of the vehicle body. Wash away with water immediately and wipe off if it is spilled by accident.**
- **Do not reuse drained brake fluid. When refilling brake fluid, always refill new brake fluid.**
- **Avoid mixing brake fluid of different brands or different grades even from the same brand to prevent fluid performance from degrading.**
- **Do not allow dirt or dust to get into the reservoir tank.**

Note:

- **During the operation, keep the reservoir tank filled with brake fluid to prevent entry of air.**
- **Operate the brake pedal slowly and depress it fully.**
- **For convenience and safety, perform the work with 2 people.**
- **The required amount of brake fluid is approximately 500 mL (16.9 US fl oz, 17.6 Imp fl oz) for the entire brake system.**

1. Lift up the vehicle.
2. Remove both the front and rear wheels.
3. Drain brake fluid from the reservoir tank.
4. Replenish the reservoir tank with the recommended brake fluid, and perform the same procedure as for bleeding the brake line on each brake caliper.

   Recommended brake fluid:

   FMVSS No. 116, DOT3 or DOT4

   Note:

   Repeat the full stroke depressing operation of the brake pedal 20 times slowly on each brake caliper, until new brake fluid comes out from transparent vinyl tube.

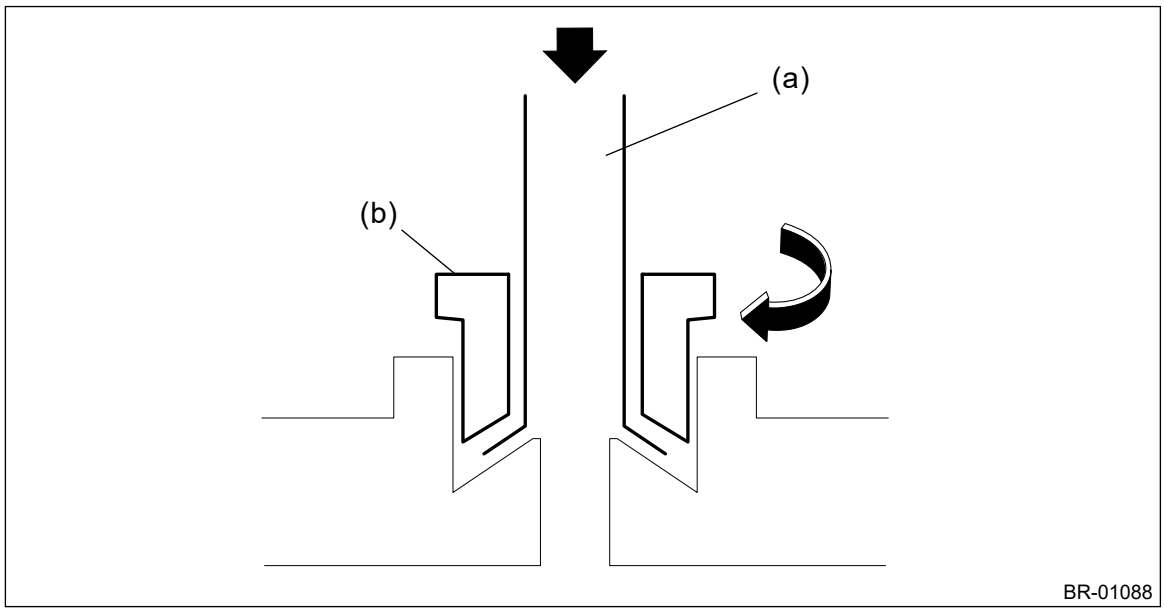
INSPECTION

Check the hose for crack, interference with other parts, damage, and fluid leakage on connecting sections. If any faulty is found, repair or replace the relevant part.

INSTALLATION

1. FRONT BRAKE HOSE

1. Secure the brake hose to strut mount.
   Tightening torque:
   Brake hose: 33 N·m (3.36 kgf-m, 24.3 ft-lb)
2. Connect the brake hose to the front caliper body assembly using a new gasket.
   Tightening torque:
   Union bolt: 26 N·m (2.65 kgf-m, 19.2 ft-lb)
3. Position the disc in straight position and route the brake hose through the hole in the bracket on the wheel apron side.
   Caution:
   Do not twist the brake hose.
4. Temporarily tighten the flare nut which connects brake pipe and hose.
5. Secure the brake hose to wheel apron bracket with clamp.
6. Turn and tighten the flare nut (b) by hand while pressing the brake pipe (a) toward the master cylinder assembly side.
   Caution:
   Be careful not to make scratches or other damage to the inside surface of the brake pipe flare.
   Tightening torque:
   Brake pipe flare nut: 19 N·m (1.94 kgf-m, 14 ft-lb)

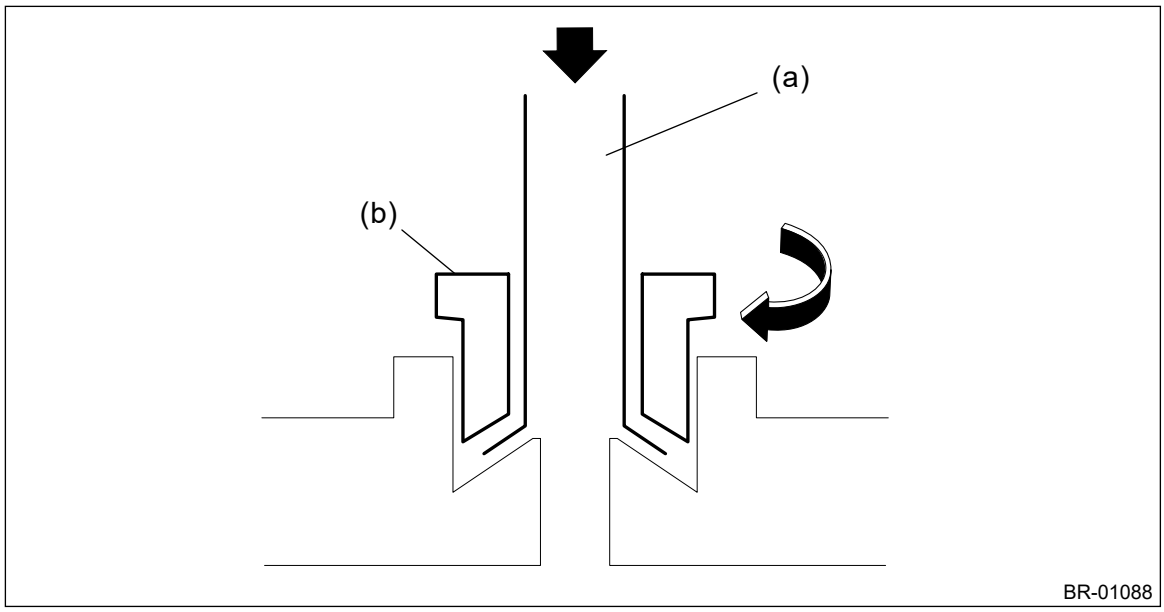


7. Bleed air from the brake system. Ref. to BRAKE>Air Bleeding>PROCEDURE.

2. REAR BRAKE HOSE

1. Route the brake hose through the hole of bracket, and lightly tighten the flare nut to connect brake pipe.

2. Insert the clamp to secure brake hose.
   Tightening torque:
   Brake hose bracket: 33 N·m (3.36 kgf-m, 24.3 ft-lb)
3. Install the brake hose to rear caliper body using a new gasket.
   Tightening torque:
   Union bolt: 26 N·m (2.65 kgf-m, 19.2 ft-lb)
4. Turn and tighten the flare nut (b) by hand while pressing the brake pipe (a) toward the master cylinder assembly side.
   Caution:
   Be careful not to make scratches or other damage to the inside surface of the brake pipe flare.
   Tightening torque:
   Brake pipe flare nut: 19 N·m (1.94 kgf-m, 14 ft-lb)

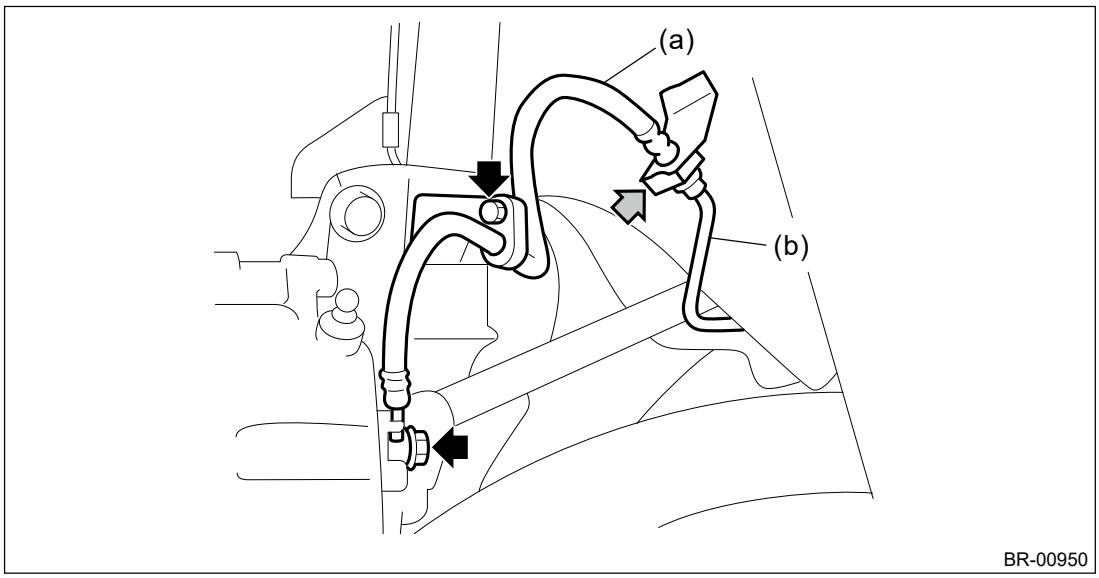


5. Bleed air from the brake system. Ref. to BRAKE>Air Bleeding>PROCEDURE.

REMOVAL

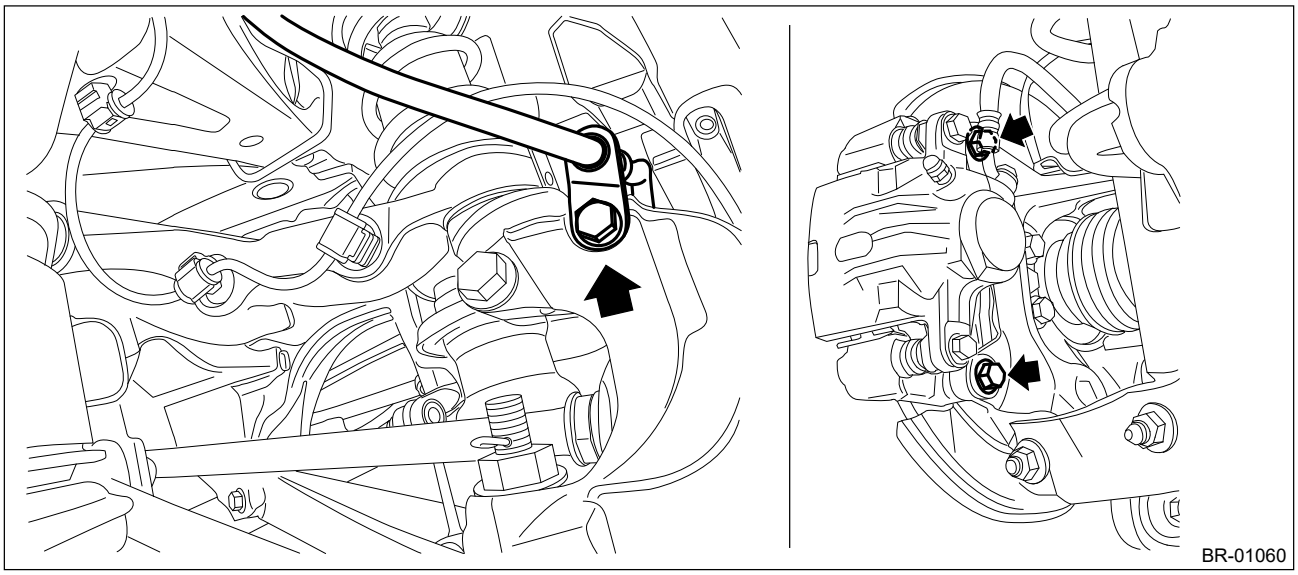
1. FRONT BRAKE HOSE

1. Separate the brake pipe (b) from brake hose (a) using a flare nut wrench.
2. Remove the clamp, strut mounting bolt and union bolt, and remove the front brake hose.

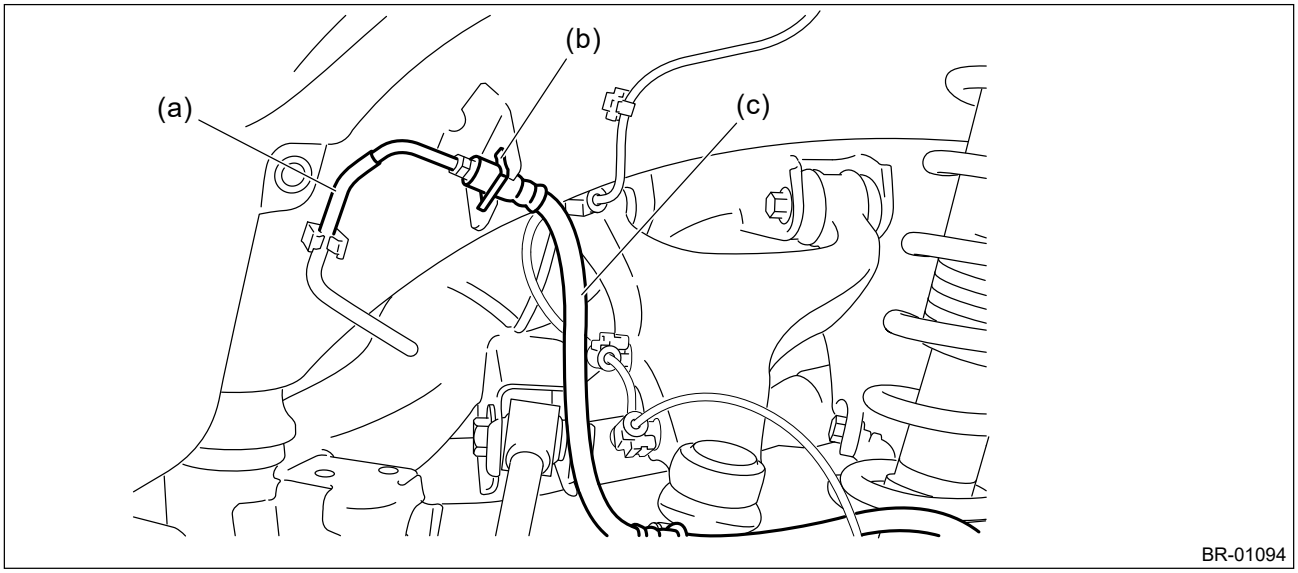


2. REAR BRAKE HOSE

1. Remove the brake hose bracket bolt and union bolt.



2. Press and separate the brake pipe (a) using a flare nut wrench.
3. Remove the brake hose clamp (b), and remove the rear brake hose (c).


(a)
(b)
(c)
BR-01094

INSPECTION

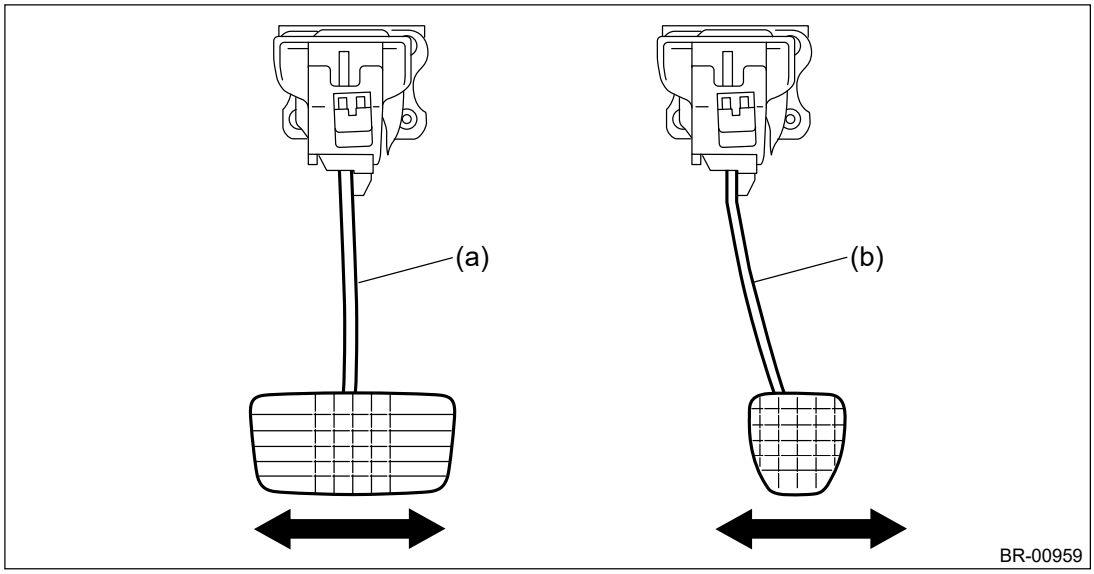
1. Move the pad - brake pedal in a horizontal direction with a force of approx. 10 N (1 kgf, 2 lbf), and check that the pedal deflection is in the range of specifications.

   Caution:

   If excessive deflection is noted, replace with a new bushing.

   Deflection of brake pedal:

   Limit: 5.0 mm (0.197 in) or less



(a) Brake pedal (except for MT model)

(b) Brake pedal (MT model)

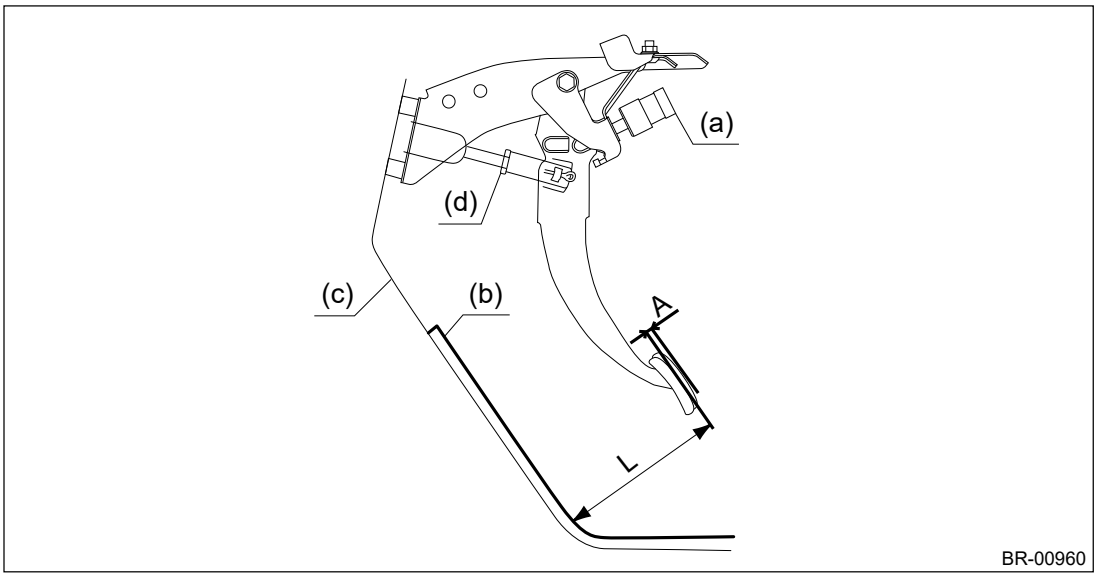
2. Check the position of the pedal pad.

   Pedal height L:

   140 — 150 mm (5.51 — 5.91 in)

   Brake pedal free play A:

   0.5 — 2.7 mm (0.02 — 0.11 in) [When pulling the brake pedal upward with a force of less than 10 N (1 kgf, 2 lbf)]



(a) Switch - stop light
(b) Mat
(c) Toe board
(d) Brake booster operating rod

3. If it is not within the specification, loosen the lock nuts of vacuum booster operating rod, and rotate the rod to adjust the pedal height L within the specification.
4. Tighten the lock nut.

Tightening torque:

Operating lock nut: 22 N·m (2.24 kgf-m, 16.2 ft-lb)

Note:

Check the brake pedal height. When adjusting, also adjust the switch - stop light.

INSTALLATION

Caution:

Before handling the airbag system components, always refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

1. Install each part in the reverse order of removal.

   Caution:

   - **Apply grease to the snap pin to prevent the operating rod from wear.**
   - **Replace the clevis pin with new parts, and apply thin coat of NIGTIGHT LYW No. 2 grease to the clevis pin.**

   Tightening torque:

   Brake pedal: 18 N•m (1.84 kgf-m, 13.3 ft-lb)

   Knee airbag module: 7.5 N•m (0.76 kgf-m, 5.5 ft-lb)
2. Connect the battery ground terminal. Ref. to NOTE>NOTE > BATTERY.
3. Check that the brake light operate properly.
4. Check the brake pedal after installation. Ref. to BRAKE>Brake Pedal>INSPECTION.

REMOVAL

1. CVT MODEL

Caution:

Before handling the airbag system components, always refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

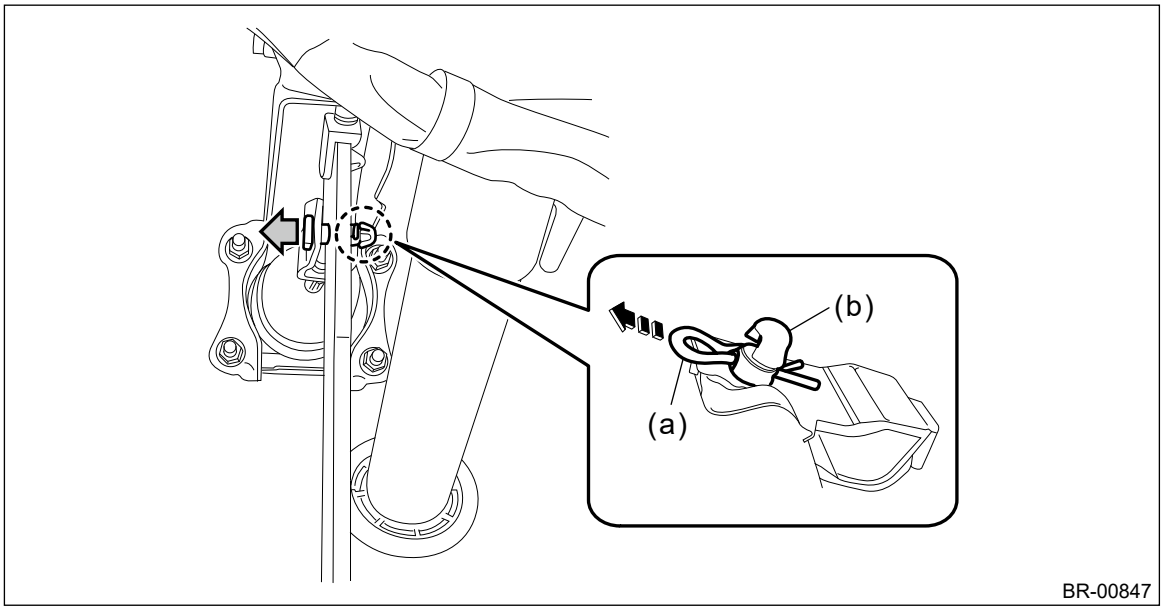
1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to NOTE>NOTE > BATTERY.

   Note:

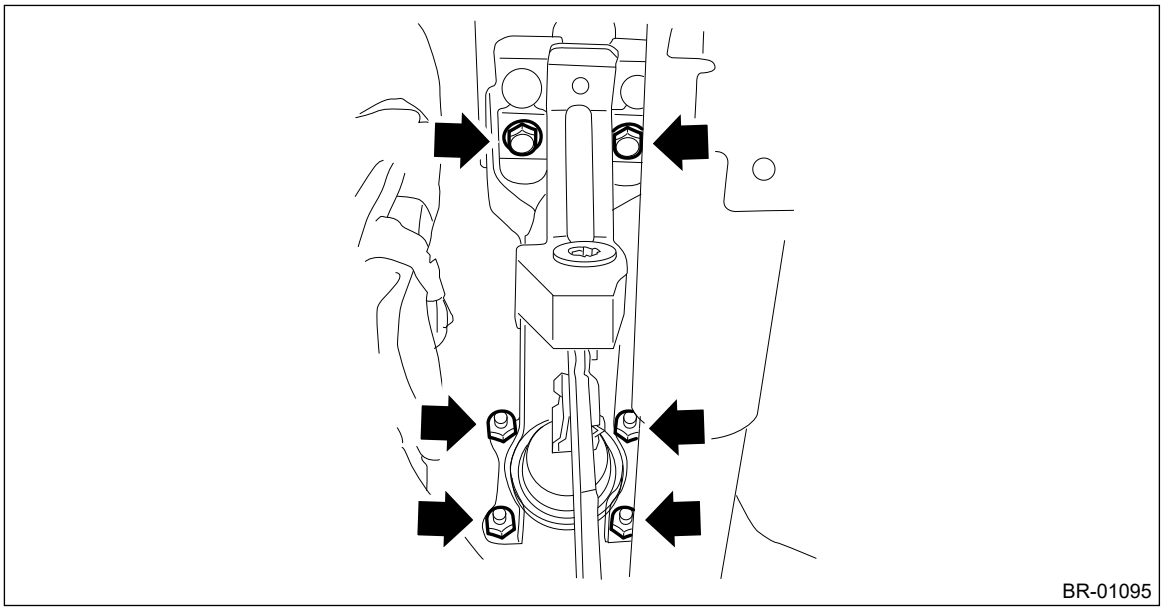
   For model with battery sensor, disconnect the ground terminal from battery sensor.
2. Remove the cover assembly - instrument panel LWR driver. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.
3. Remove the knee airbag module. (Model with knee airbag) Ref. to AIRBAG SYSTEM>Knee Airbag Module>REMOVAL.
4. Remove the universal joint assembly - steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint>REMOVAL.
5. Remove the column assembly - steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Column>REMOVAL.
6. Remove the brake pedal assembly.
   (1) Disconnect the stop light switch connector.
   (2) Remove the snap pin (a) and clevis pin (b), and remove the operating rod from the brake pedal.

   Caution:

   - **Be careful not to apply excessive force to the operating rod when handling the operating rod.**
     The angle may change by ±3°, and it may result in damage to power piston cylinder.
   - **Do not change the push rod length.**



(3) Remove the bolt and nut, and then detach the brake pedal assembly.



2. MT MODEL

Note:

Brake pedal is integrated with the clutch pedal.

For removal procedures of the brake pedal, refer to Clutch section. Ref. to CLUTCH SYSTEM>Clutch Pedal>REMOVAL.

INSPECTION

Check the pipe for crack and damage, and also check the connection for fluid leakage. If any faulty is found, repair or replace the relevant part.

Note:

Use a mirror when inspecting back sides and other locations which are hard to see.

INSTALLATION

Caution:

- **Yellow connectors and harnesses with yellow tapes around them are the connectors and harnesses for the airbag system. Using a tester above such circuits may cause malfunction of airbag system. Follow the cautions of "AIRBAG SYSTEM" in this case. Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
  - **Yellow connectors and harnesses with yellow tapes around them are the connectors and harnesses for the airbag system. When using a tester on these circuits, follow the cautions of "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
  - **Be careful not to damage the airbag system wiring harness when servicing the electrical parts around the steering column.**
- **Be careful not to damage the airbag system wiring harness when servicing the center brake pipe.**
- **When installing the brake pipe, do not bend.**
- **After installing the brake pipe and hose, perform air bleed.**
- **After installing the brake hoses, make sure that they do not contact the tires or suspension assembly, etc.**

Note:

The airbag system wiring harness is routed near the center brake pipe.

Tightening torque:

Front brake pipes & hoses: Ref. to BRAKE>General Description>COMPONENT > FRONT BRAKE PIPES AND HOSES.

Center & rear brake pipes and hoses: Ref. to BRAKE>General Description>COMPONENT > CENTER AND REAR BRAKE PIPES AND HOSES.

REMOVAL

Caution:

- **Be careful of the following items. Failure to do so may cause the airbag system malfunction.**
  - **Yellow connectors and harnesses with yellow tapes around them are the connectors and harnesses for the airbag system. When using a tester on these circuits, follow the cautions of "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
  - **Be careful not to damage the airbag system wiring harness when servicing the electrical parts around the steering column.**
- **Be careful not to damage the airbag system wiring harness when servicing the center brake pipe.**
- **When removing the brake pipe, do not bend.**

Note:

The airbag system wiring harness is routed near the center brake pipe.

INSPECTION

1. BRAKE VACUUM PUMP

Refer to "Read Diagnostic Trouble Code (DTC)" of "BRAKE VACUUM CONTROL". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Read Diagnostic Trouble Code (DTC)>OPERATION.

2. VACUUM HOSE

Check to see that air only flows in one direction, when air is blown into or sucked from the hose.

INSTALLATION

1. BRAKE VACUUM PUMP

Install in the reverse order of removal.

Tightening torque:

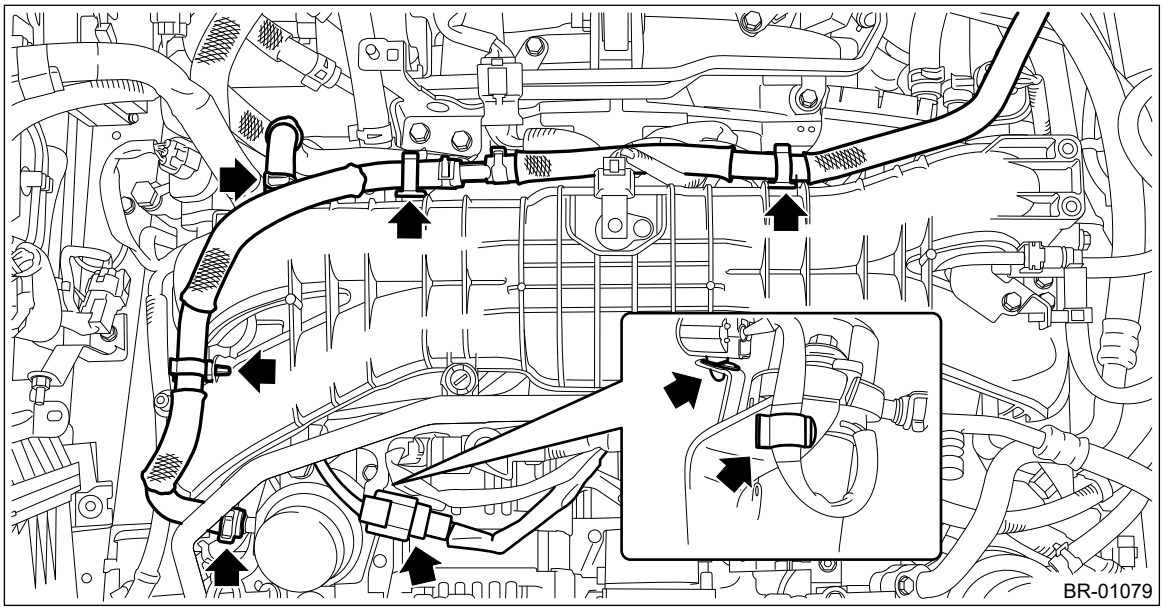
Bracket - generator: 19 N·m (1.9 kgf-m, 14.0 ft-lb)

Vacuum pump assembly: 6.4 N·m (0.65 kgf-m, 4.7 ft-lb)

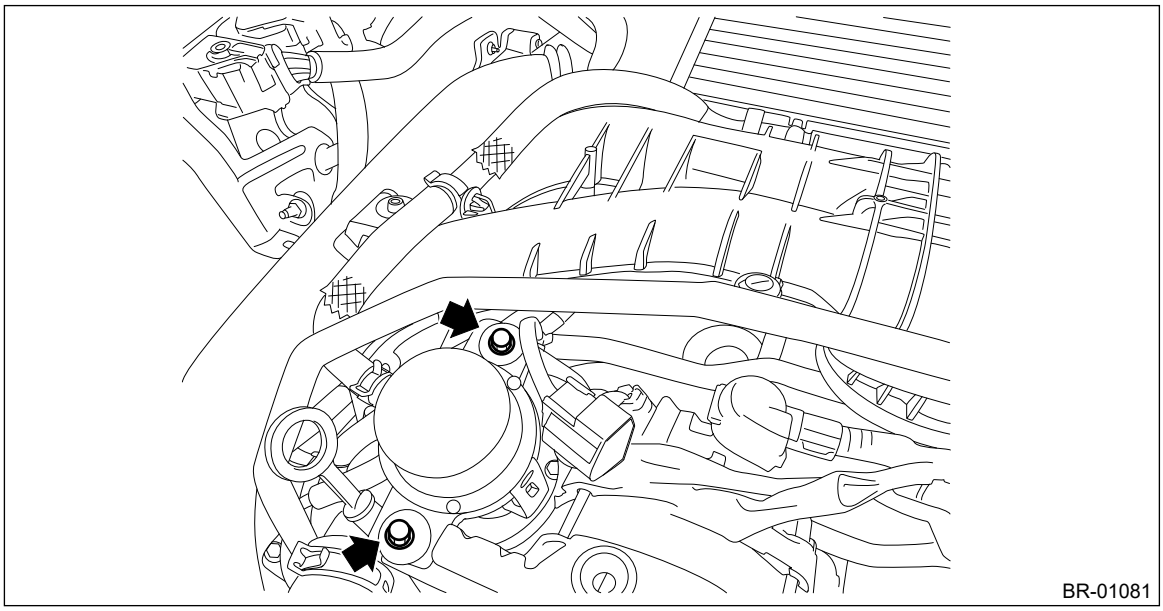
REMOVAL

1. BRAKE VACUUM PUMP

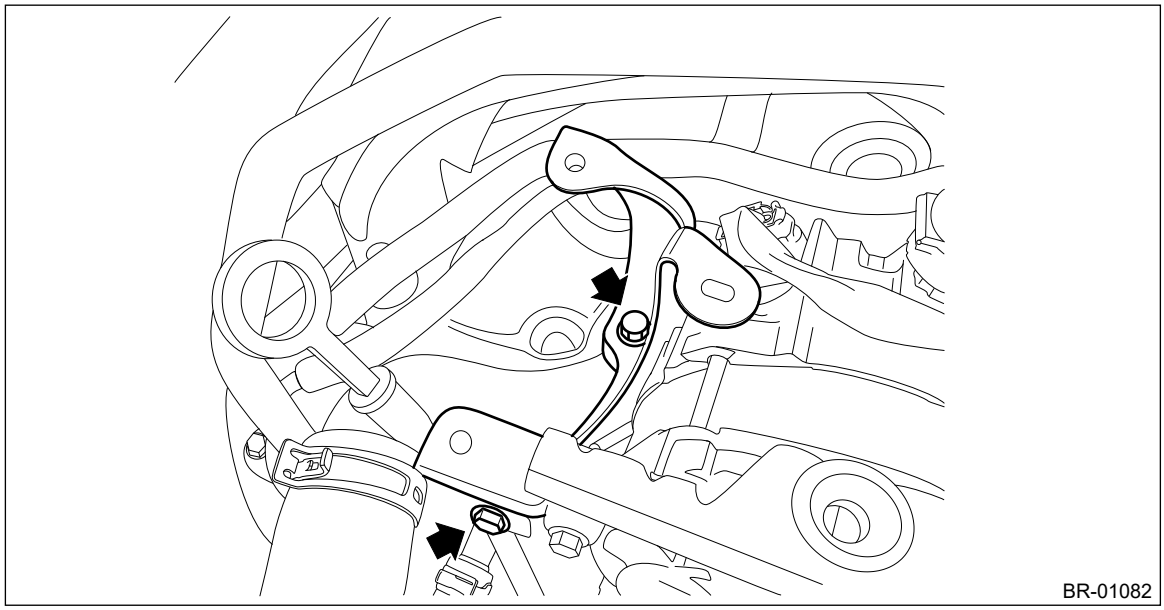
1. Disconnect the ground cable from battery.
2. Remove the vacuum pump assembly.
   (1) Disconnect the connectors of the vacuum pump assembly.
   (2) Remove the vacuum hose COMPL.



   (3) Remove the bolts, then remove the vacuum pump assembly.



3. Remove the bolts, and then remove the bracket - generator.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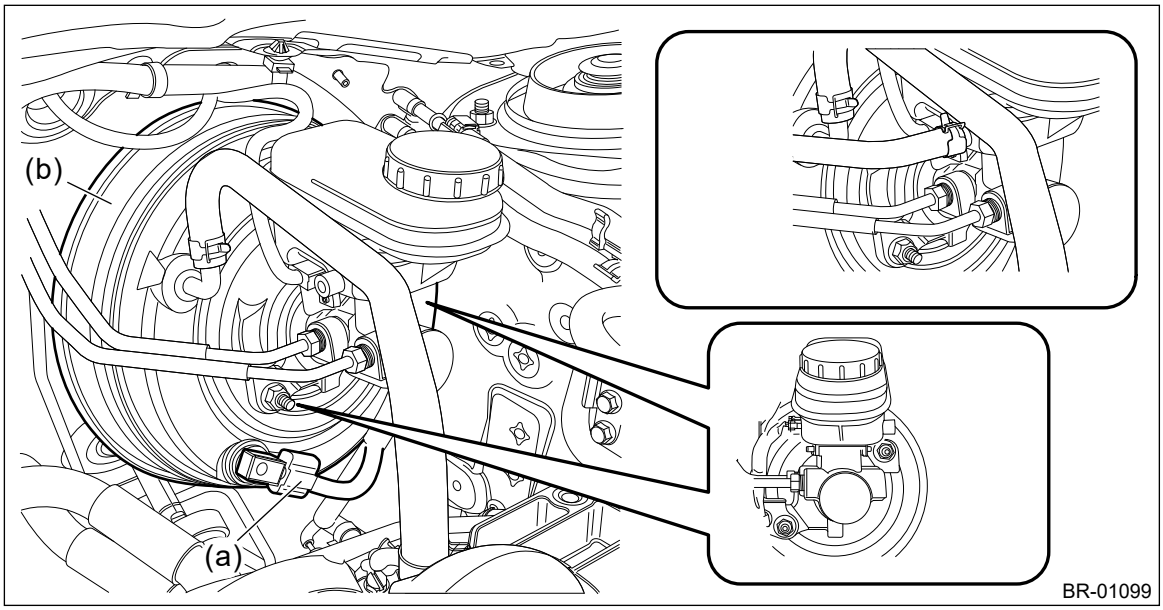
NOTE

Caution:

- **Do not remove the vacuum sensor (a). If removed, replace the vacuum booster assembly (b) with a new part.**
- **Do not rotate the vacuum sensor (a) when disconnecting the connector of vacuum sensor (a). Otherwise the grommet on the mounting location of the vacuum sensor (a) may be damaged.**

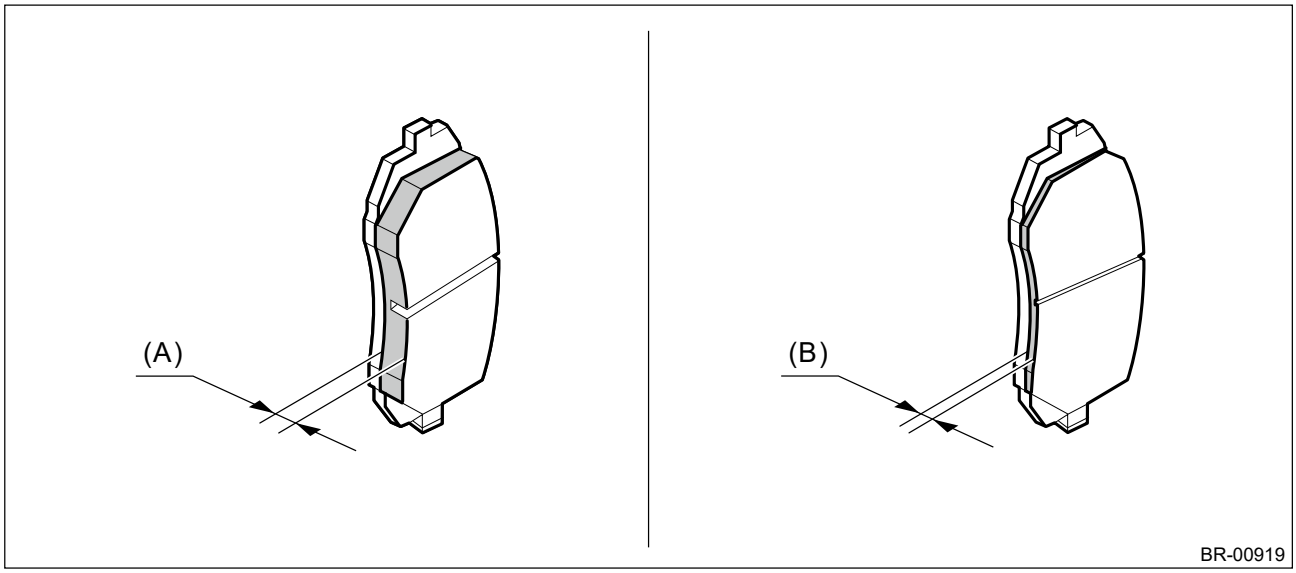


INSPECTION

1. Check the pad thickness (A).

Note:

- **Always replace the pads of both wheels and both sides as a set.**
- **Replace pad clips if they are twisted or worn.**
- **Replace the pad if there is oil or grease on it.**



	Standard (A)	Wear limit (B)
Pad thickness	11 mm (0.43 in)	1.5 mm (0.059 in)

Note:

- **Always replace the pads of both wheels and both sides as a set.**
- **Replace pad clips if they are twisted or worn.**
- **Wear indicators are installed on the inner and outer disc brake pads.**
  If the pad is worn to the limit, the end of wear indicator contacts disc rotor, and a squeaking sound is heard as the wheel rotates. If the sound is heard, replace the pad.
- **Replace the pad if there is oil or grease on it.**

2. If the wear limit is exceeded in the inspection, replace the brake pad.

INSTALLATION

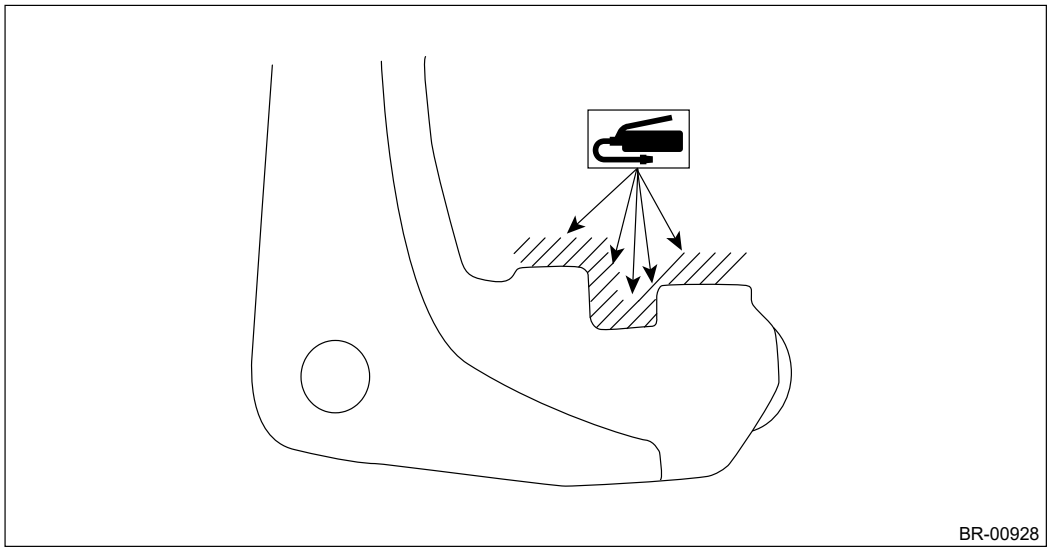
Note:

Before installation, remove the pad clip and remove mud, foreign matter and rust from the caliper body assembly and the support - front disc brake.

1. Apply a thin coat of grease to the support - front disc brake.

   Grease:

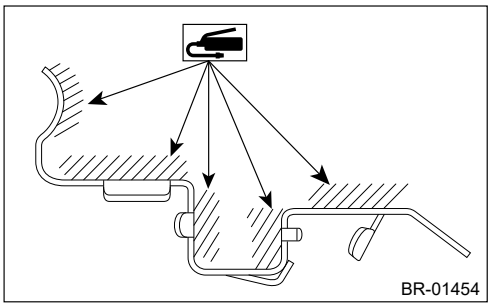
   An item contained in the pad kit, Molykote M7439 or equivalent



2. Check the brake pad. Ref. to BRAKE>Front Brake Pad>INSPECTION.
3. Apply a thin coat of grease to the pad clip.

   Grease:

   An item contained in the pad kit, Molykote M7439 or equivalent



4. Install the pad clip.
5. Press back the piston with a disc brake piston tool as needed.

   Caution:

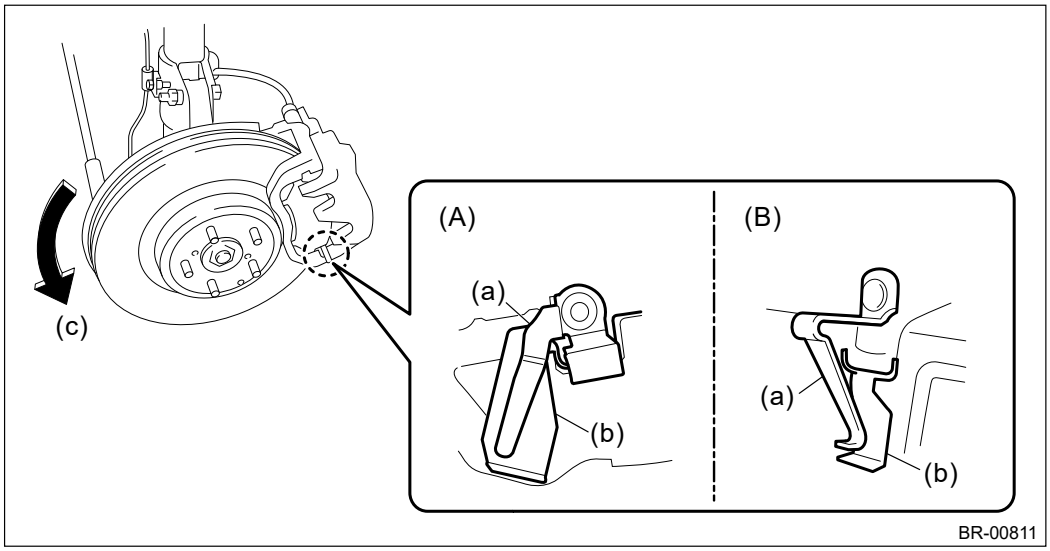
   When pressing back the piston, the clearance between pad and disc rotor becomes large, which makes the brake pedal effort softer.

   After the installation of front wheel, be sure to perform the adjustment of the clearance and the pedal effort by depressing the brake pedal several times.
6. Install the brake pad to the support - front disc brake.

   Caution:

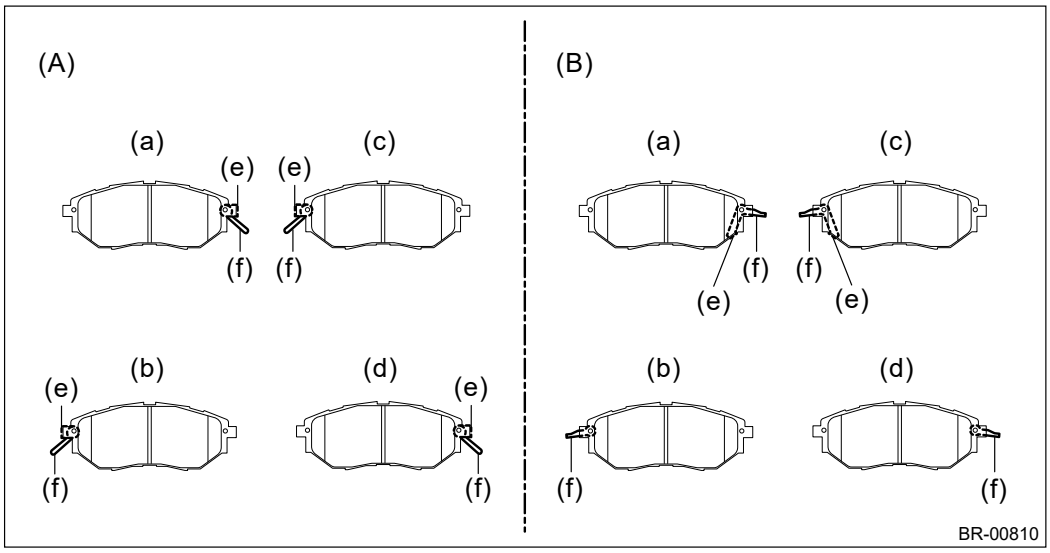
   - **Be sure to install so that the pad return spring faces the input side of the direction of brake rotor rotation, as shown in the figure.**

- **Correctly install the pad return spring to the supporting surface of the pad clip as shown in the figure.**
- **If the pad return spring is deformed or damaged, replace the brake pad with a new part.**



(A) 16-inch
(B) 17-inch
(a) Pad return spring
(b) Supporting surface of pad clip
(c) Direction of brake rotor rotation

Note:
Install the brake pad indicator in proper direction.



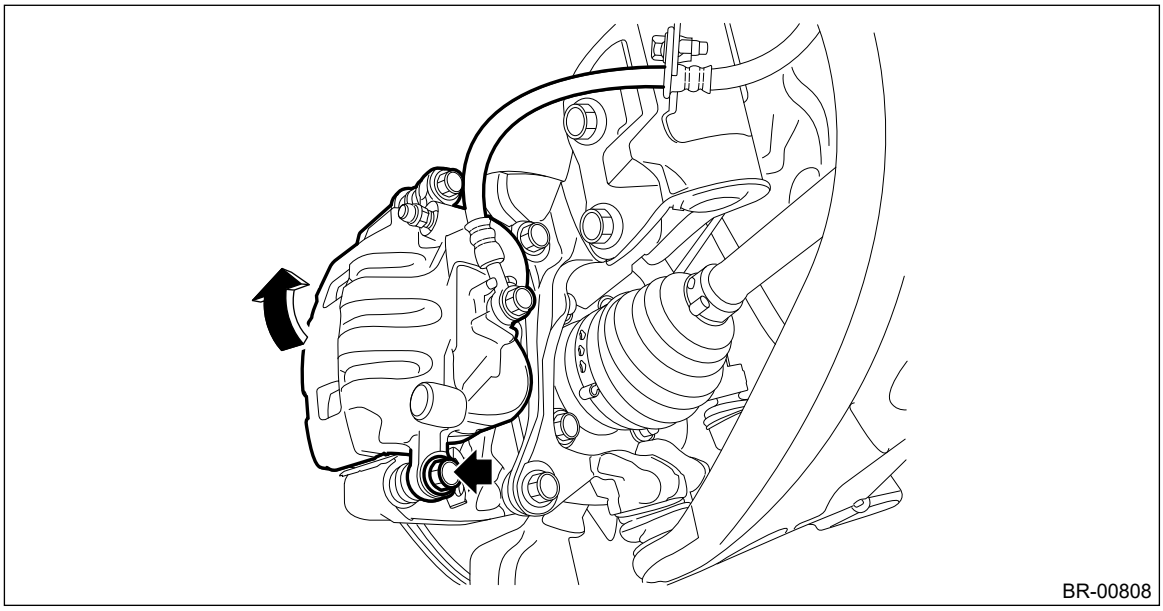
(A) 16-inch
(B) 17-inch
(a) LH — IN
(b) LH — OUT
(c) RH — IN
(d) RH — OUT
(e) Pad indicator
(f) Pad return spring

7. Install the caliper body assembly to the support - front disc brake.
Tightening torque:
Caliper bolt: 27 N·m (2.75 kgf-m, 19.9 ft-lb)

8. Install the front wheels.
Tightening torque:
120 N·m (12.24 kgf-m, 88.5 ft-lb)

REMOVAL

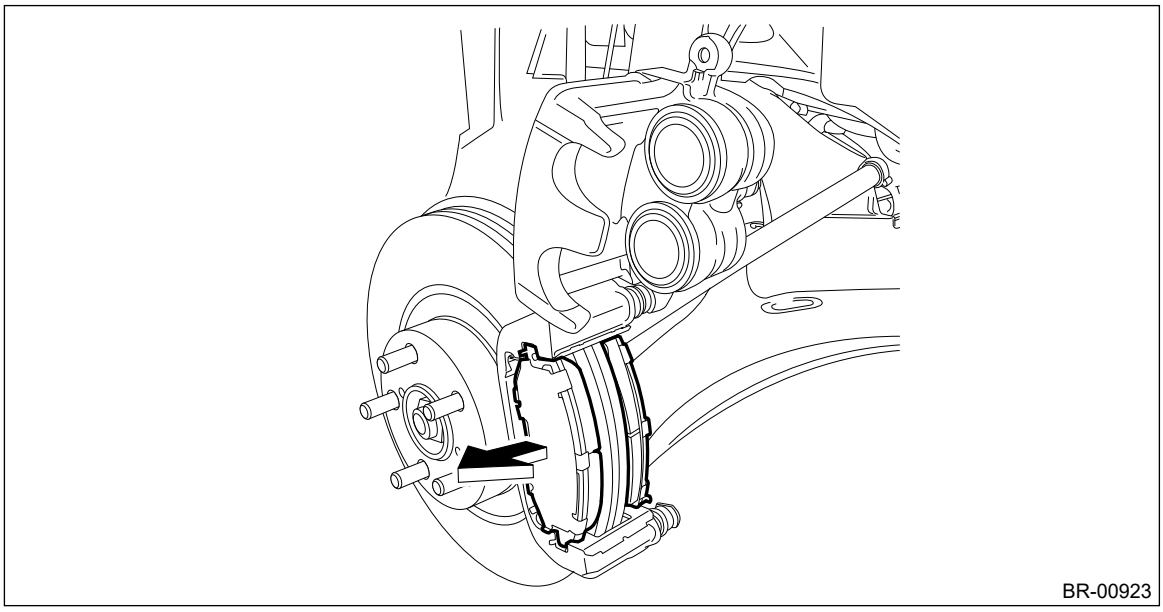
1. Lift up the vehicle, and then remove the front wheels.
2. Remove the front brake pad.
   (1) Remove the caliper bolt on the lower side.
   (2) Raise the caliper body assembly and support it.



Note:

Do not disconnect the brake hose from the caliper body assembly.

(3) Remove the brake pad from support - front disc brake.

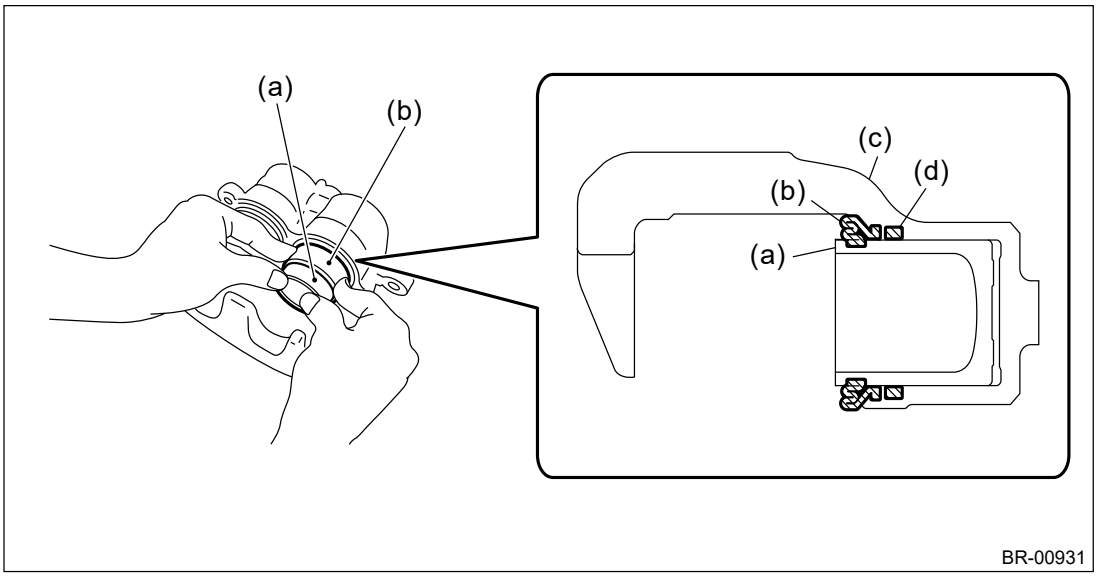


ASSEMBLY

1. Before assembly, check each part. Ref. to BRAKE>Front Disc Brake Assembly>INSPECTION.
2. Clean the inside of the caliper body cylinder using brake fluid.
3. Apply a coat of brake fluid to piston seal and install the piston seal to the caliper body cylinder groove.
4. Apply a coat of brake fluid to the inner surface of caliper body cylinder and the entire outer surface of the piston - disc brake.
5. Apply grease contained in the piston seal kit to the piston boot, and install it to the groove at the end of the cylinder.
6. Insert the piston - disc brake into the caliper body cylinder.
7. Position the piston boot in the grooves on the piston - disc brake and the caliper body cylinder.

   Caution:

   Do not force the piston - disc brake into the caliper body cylinder.

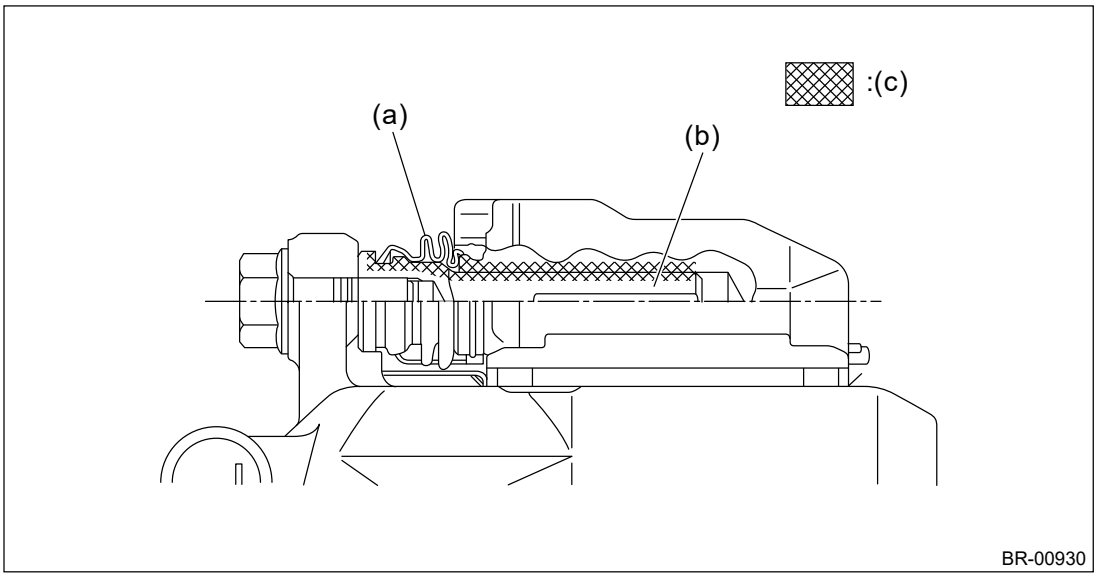


(a) Piston - disc brake
(b) Piston boot
(c) Caliper body assembly
(d) Piston seal

8. Apply grease contained in the piston seal kit to the lock pin - front brake, the outer surface of guide pin - front brake, the inner surface of support cylinder, and the grooves of pin boot.
9. Install the pin boot to the lock pin - front brake and guide pin - front brake, and insert them into the support cylinder.

   Caution:

   Insert the lock pin - front brake and guide pin - front brake into specified position, and make sure that they slide and seat properly.



(a) Pin boot

(b) Lock pin - front brake or guide pin - front brake

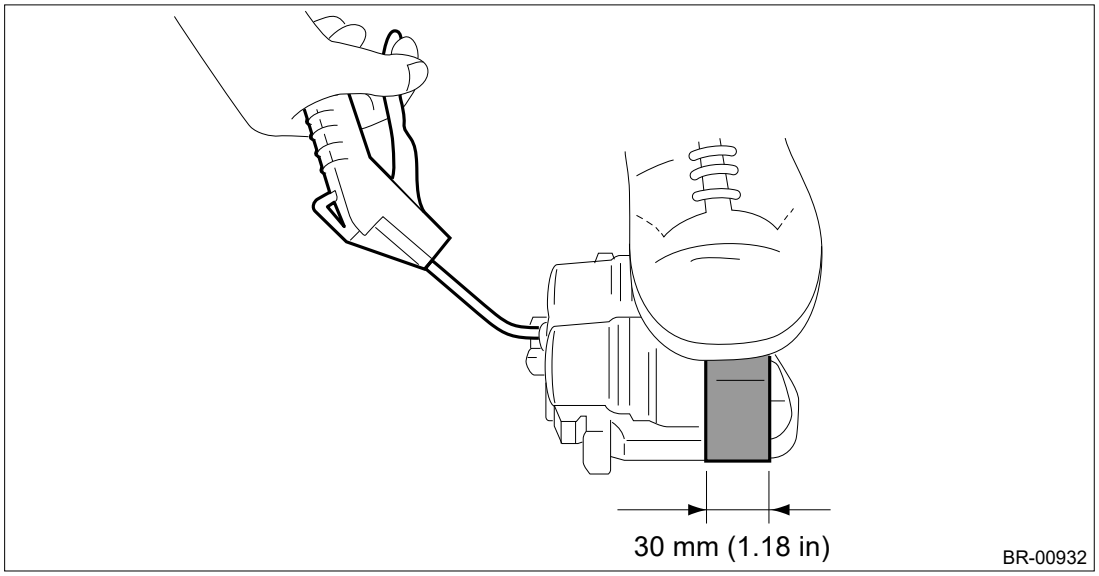
(c) Grease applied area

DISASSEMBLY

Caution:

Be careful not to allow foreign matter to enter the brake hose connector.

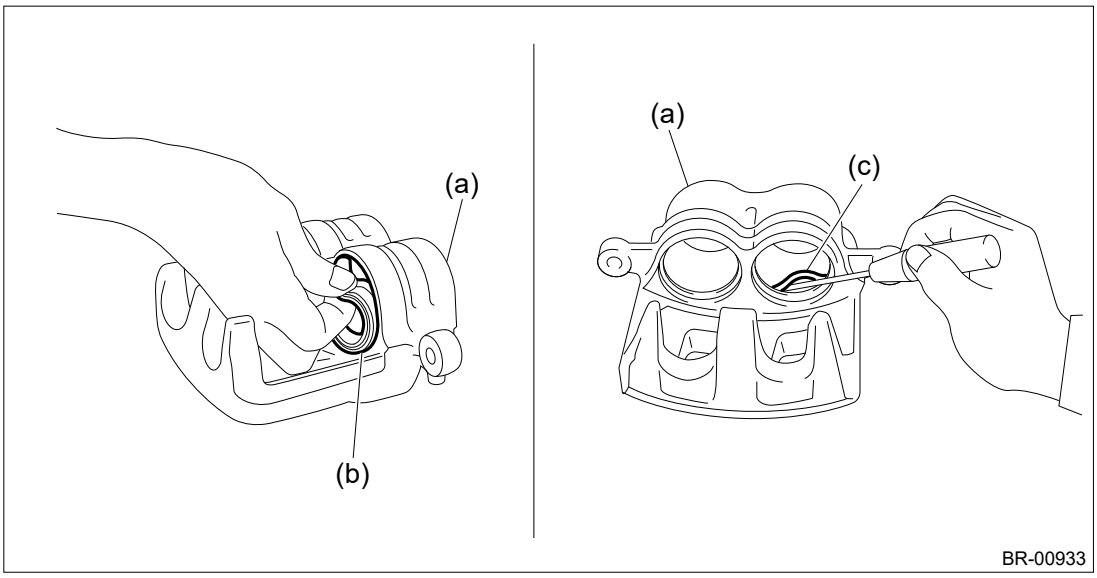
1. Remove mud and foreign matter from the caliper body.
2. Remove the piston - disc brake.
   (1) Place a wooden block in the caliper body as shown in the figure to prevent the piston - disc brake from jumping out and being damaged.
   (2) Using an air gun, gradually apply compressed air via the brake hose installation hole to push out the piston - disc brake.



3. Remove the piston boot (b) and piston seal (c) from the caliper body cylinder (a).

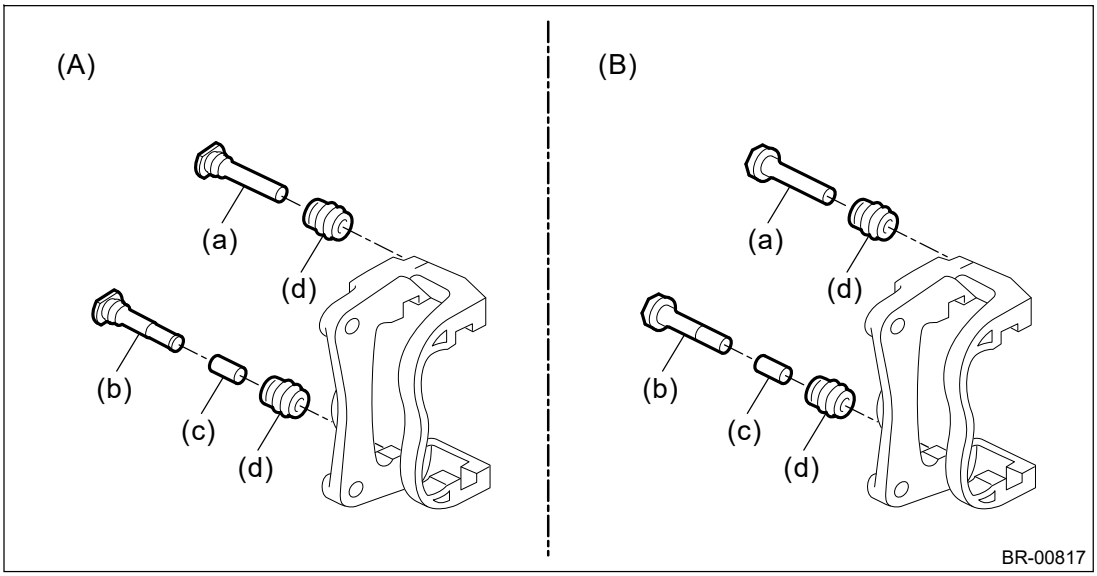
   Caution:

   Do not damage the cylinder and piston seal groove.



4. Remove the guide pin - front brake, lock pin - front brake, lock pin - sleeve, and pin boot from the

support - front disc brake.



(A) 16-inch
(B) 17-inch
(a) Guide pin (black)
(c) Bushing
(d) Pin boot
(b) Lock pin (silver)

INSPECTION

1. Check the caliper body cylinder and piston for uneven wear, damage or rust.
2. Check the rubber parts for damage or deterioration.
3. If faulty is found in the inspection, replace the relevant part.

INSTALLATION

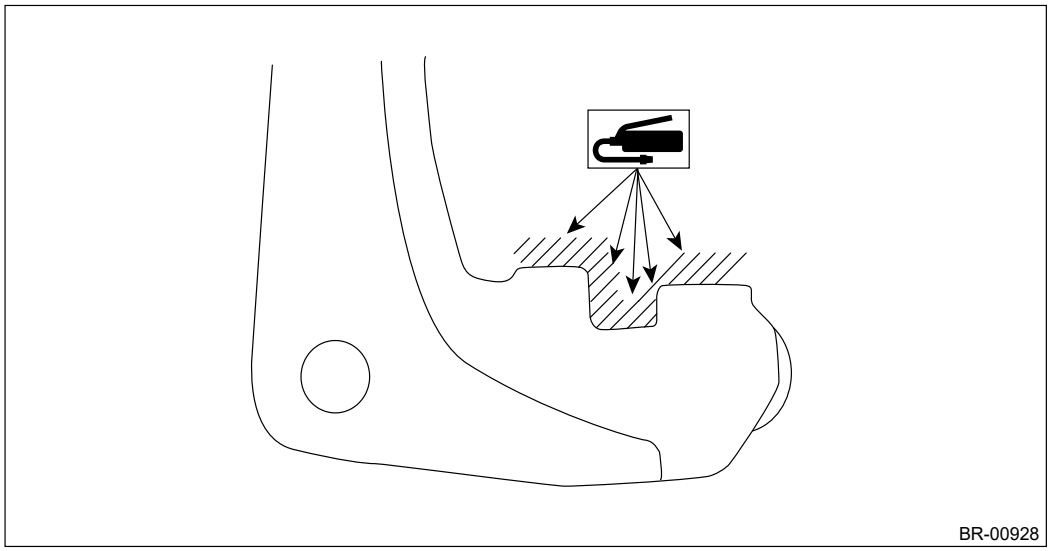
Note:

Before installation, remove the pad clip and remove mud, foreign matter and rust from the caliper body assembly and the support - front disc brake.

1. Check each part. Ref. to BRAKE>Front Disc Brake Assembly>INSPECTION.
2. Apply a thin coat of grease to the support - front disc brake.

   Grease:

   An item contained in the pad kit, Molykote M7439 or equivalent



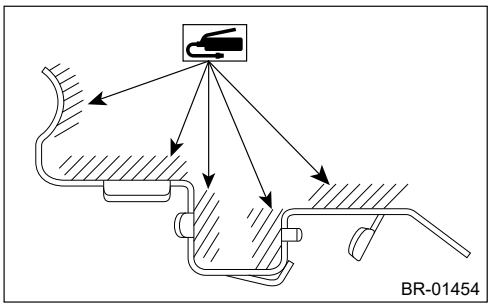
3. Install the support - front disc brake to the housing assembly - front axle.

   Tightening torque:

   Mounting bolt: 80 N·m (8.16 kgf-m, 59 ft-lb)
4. Apply a thin coat of grease to the pad clip.

   Grease:

   An item contained in the pad kit, Molykote M7439 or equivalent



5. Install the pad clip.
6. Press back the piston with a disc brake piston tool as needed.

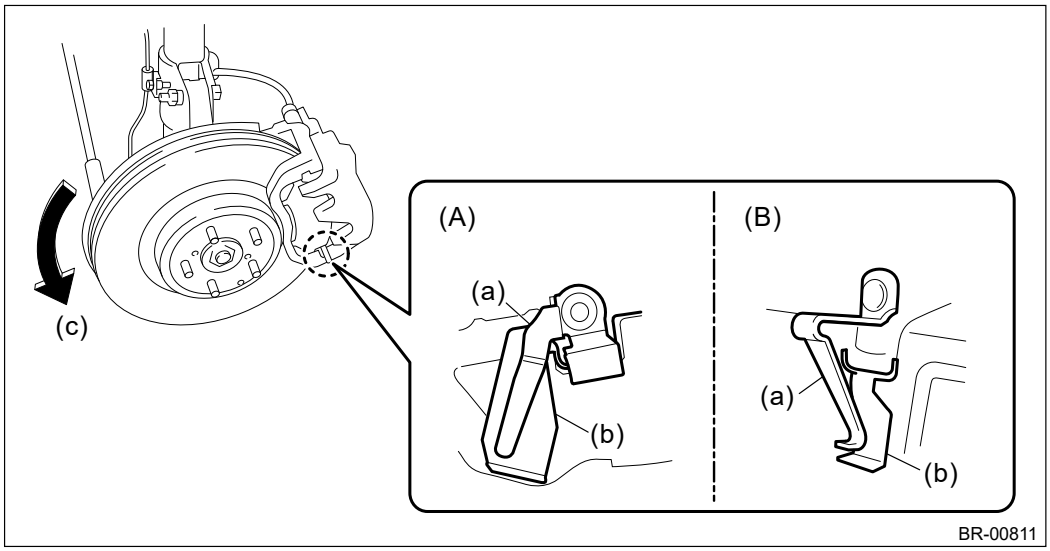
   Caution:

   When pressing back the piston, the clearance between pad and disc rotor becomes large, which makes the brake pedal effort softer.

   After the installation of front wheel, be sure to perform the adjustment of the clearance and the pedal effort by depressing the brake pedal several times.
7. Install the brake pad to the support - front disc brake.

Caution:

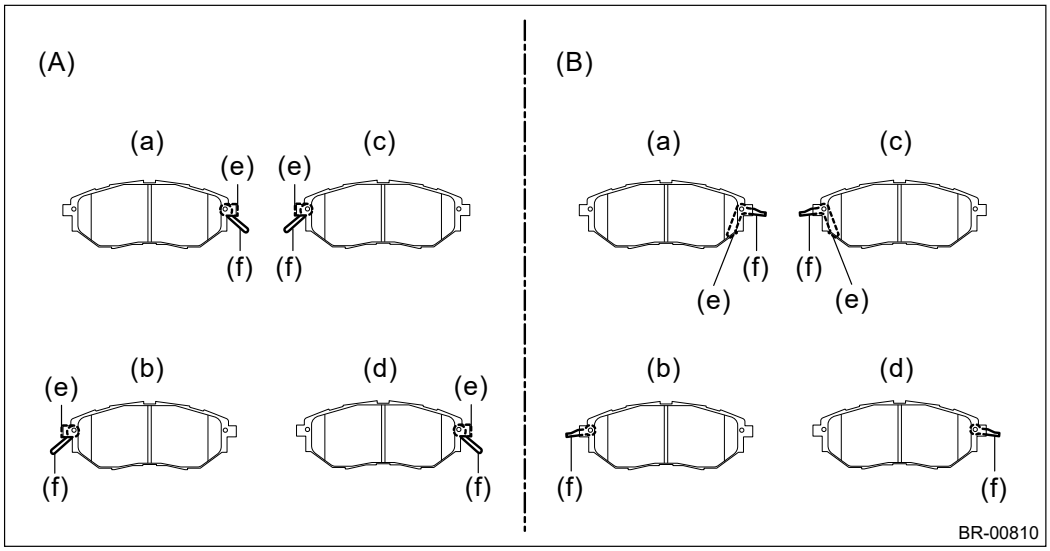
- **Be sure to install so that the pad return spring faces the input side of the direction of brake rotor rotation, as shown in the figure.**
- **Correctly install the pad return spring to the supporting surface of the pad clip as shown in the figure.**
- **If the pad return spring is deformed or damaged, replace the brake pad with a new part.**



(A) 16-inch
(B) 17-inch
(a) Pad return spring
(b) Supporting surface of pad clip
(c) Direction of brake rotor rotation

Note:

Install the brake pad indicator in proper direction.



(A) 16-inch
(B) 17-inch
(a) LH — IN
(b) LH — OUT
(c) RH — IN
(d) RH — OUT
(e) Pad indicator
(f) Pad return spring

8. Install the caliper body assembly to the support - front disc brake.

Tightening torque:

Caliper bolt: 27 N·m (2.75 kgf-m, 19.9 ft-lb)

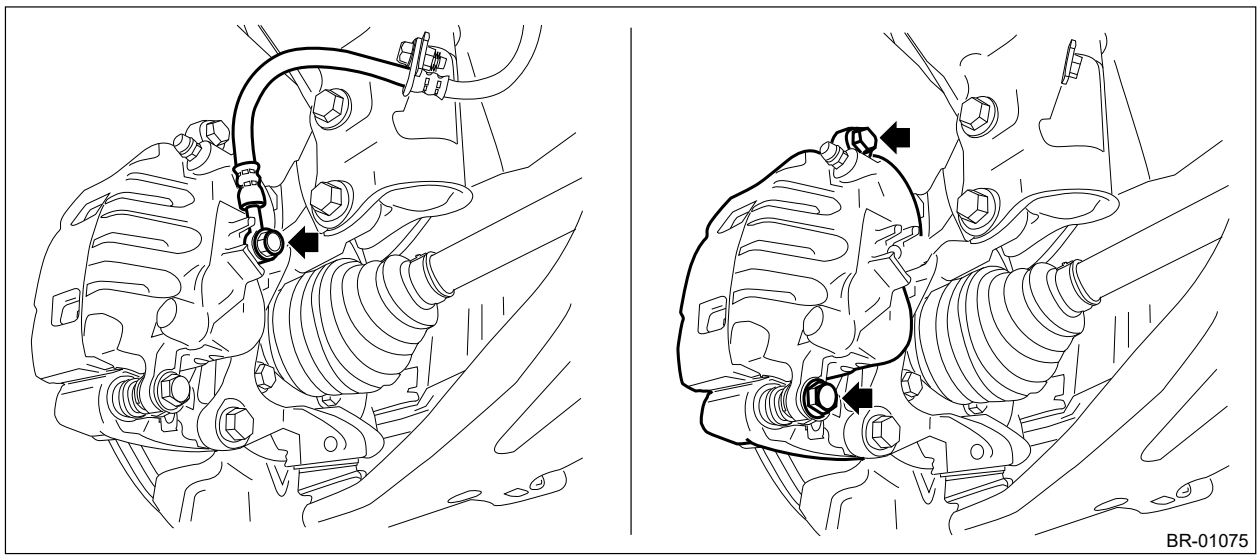
9. Connect the brake hose using a new brake hose gasket.
   Tightening torque:
   Union bolt: 26 N·m (2.65 kgf-m, 19.2 ft-lb)
10. Bleed air from the brake system. Ref. to BRAKE>Air Bleeding>PROCEDURE > BRAKE LINE.
11. Install the front wheels.
    Tightening torque:
    120 N·m (12.24 kgf-m, 88.5 ft-lb)

REMOVAL

Caution:

Do not allow brake fluid to come in contact with the painted surface of the vehicle body. If it does, wash off with water and wipe away completely.

1. Lift up the vehicle, and then remove the front wheels.
2. Remove the caliper body assembly.
   (1) Remove the union bolt and caliper bolt, and remove the caliper body assembly from the support - front disc brake.

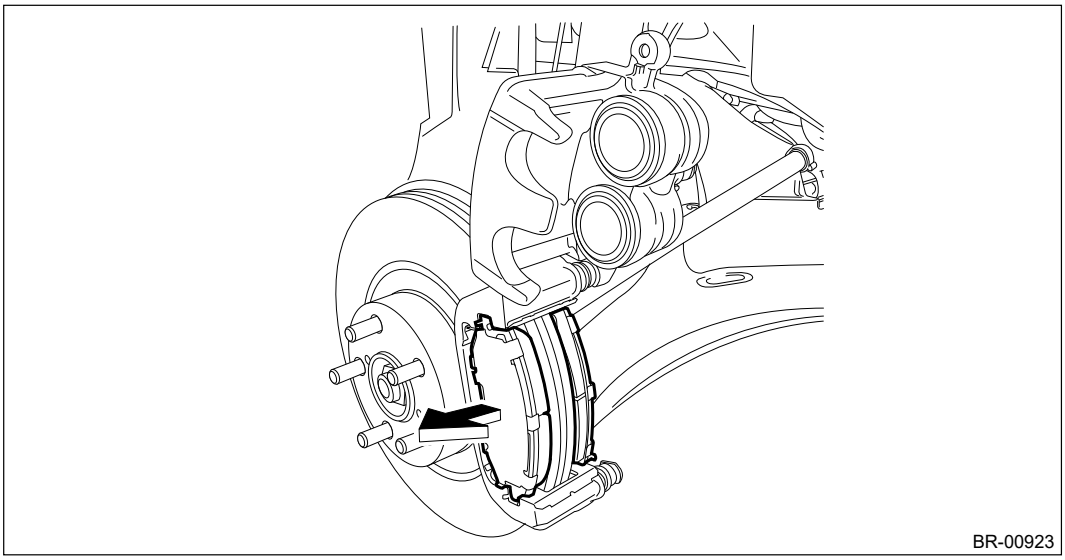


3. Remove the support - front disc brake.

Note:

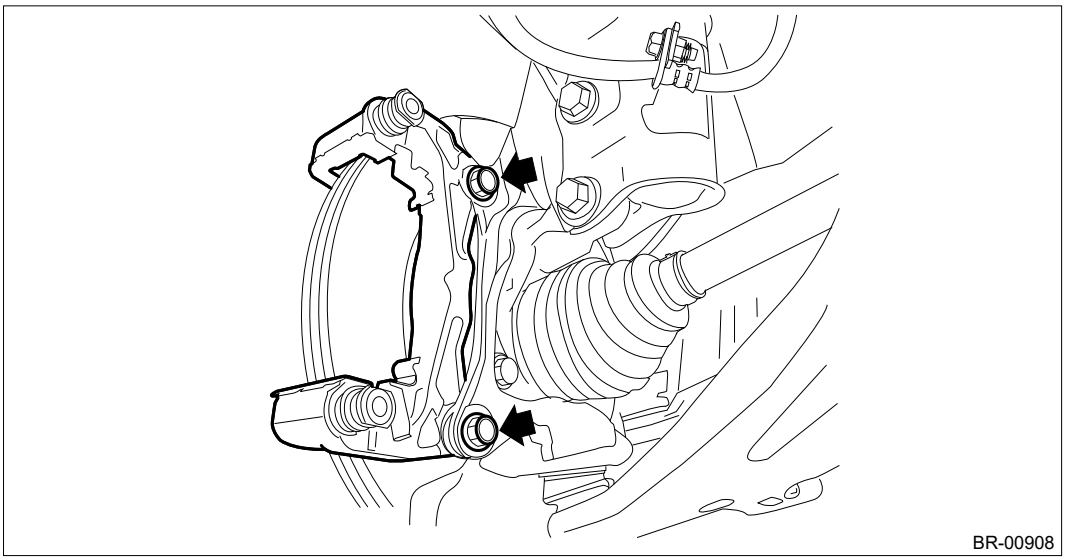
Remove the support - front disc brake only when replacing the disc rotor or the support - front disc brake. It is not necessary to remove it when servicing the caliper body assembly.

(1) Remove the brake pad from support - front disc brake.



(2) Remove the mounting bolts, and then remove the support - front disc brake from the housing

assembly - front axle.



INSPECTION

1. DISC ROTOR RUNOUT CHECK

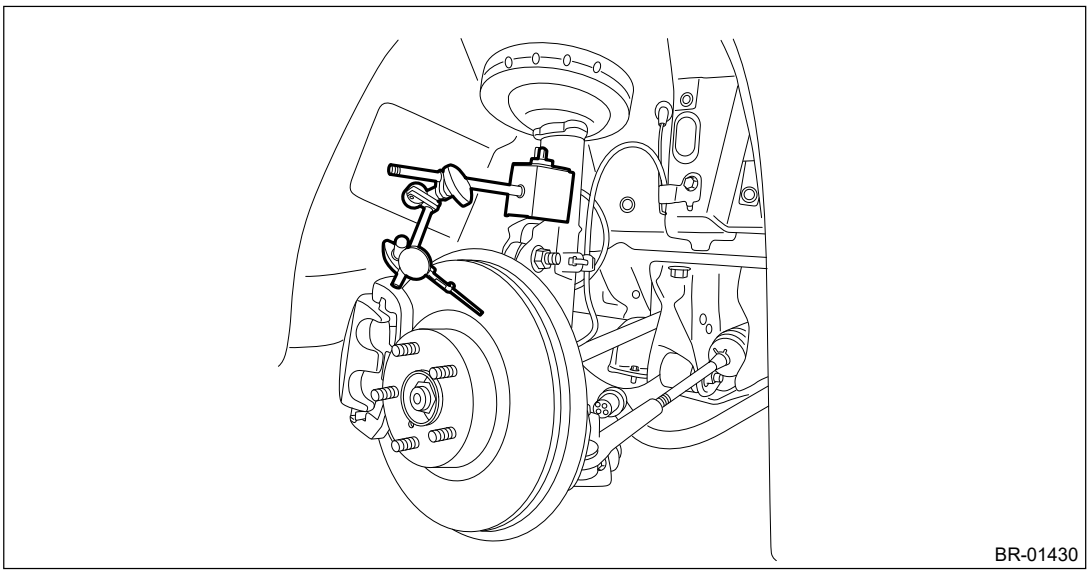
1. Check the hub unit COMPL - front axle for free play and runout before the inspection of disc rotor runout limit. Ref. to DRIVE SHAFT SYSTEM>Front Hub Unit Bearing>INSPECTION.
2. Tighten the wheel nuts to secure disc rotor.
3. Set a dial gauge 10 mm (0.39 in) inward from the disc rotor outer circumference, and check the outer disc rotor runout while rotating the disc rotor.

   Disc rotor runout limit: 0.05 mm (0.002 in)

   Note:

   <Example of magnet stand and dial gauge installation>

   The location where the magnet stand is installed varies to stabilize the magnet stand.



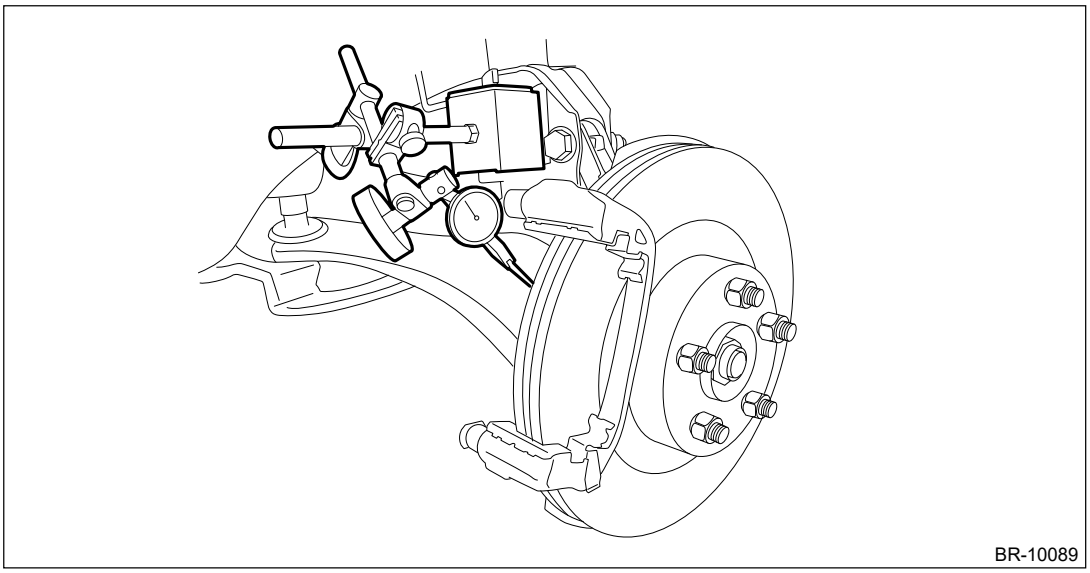
4. Set a dial gauge 10 mm (0.39 in) inward from the disc rotor outer circumference, and check the inner disc rotor runout while rotating the disc rotor.

   Disc rotor runout limit: 0.05 mm (0.002 in)

   Note:

   <Example of magnet stand and dial gauge installation>

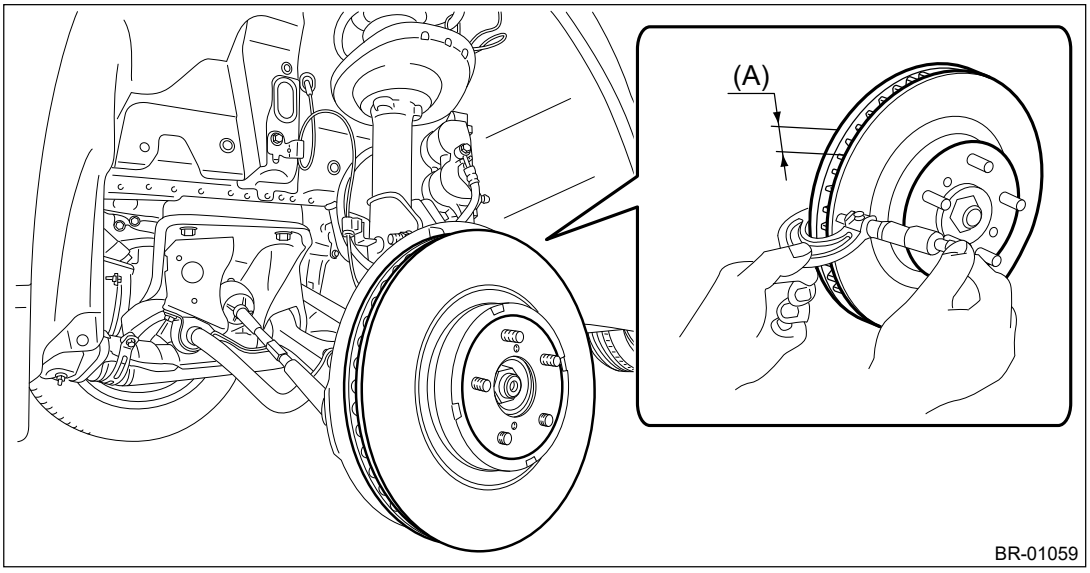
   The location where the magnet stand is installed varies to stabilize the magnet stand.



5. If the disc rotor runout exceeds service limit, grind the disc rotor.
6. Check the disc rotor thickness after grinding. Ref. to BRAKE>Front Disc Rotor>INSPECTION > DISC ROTOR THICKNESS CHECK.

2. DISC ROTOR THICKNESS CHECK

1. Set a micrometer 10 mm (0.39 in) inward from the disc rotor outer perimeter, and then measure the disc rotor thickness (A).



	Size	Standard	Wear limit	Disc rotor outer diameter
Disc rotor thickness (A)	16-inch	24 mm (0.94 in)	22 mm (0.87 in)	260 mm (10.24 in)
	17-inch	30 mm (1.18 in)	28 mm (1.1 in)	316 mm (12.44 in)

2. If the wear limit is exceeded in the inspection, replace the disc rotor.

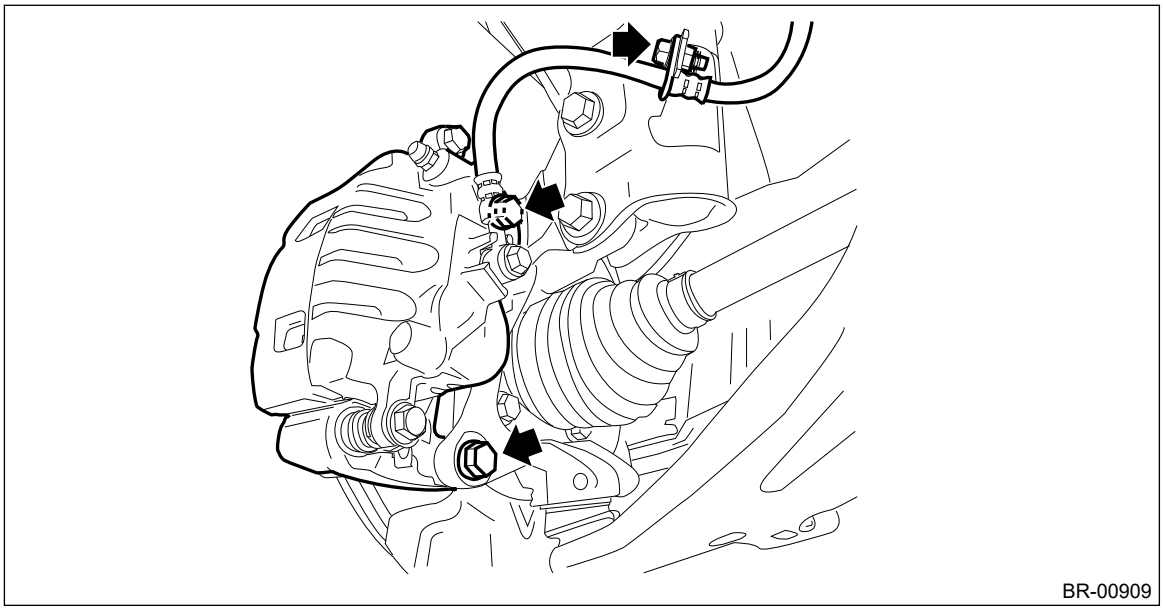
INSTALLATION

Note:
Before installation, remove mud and foreign matter from the caliper body assembly.

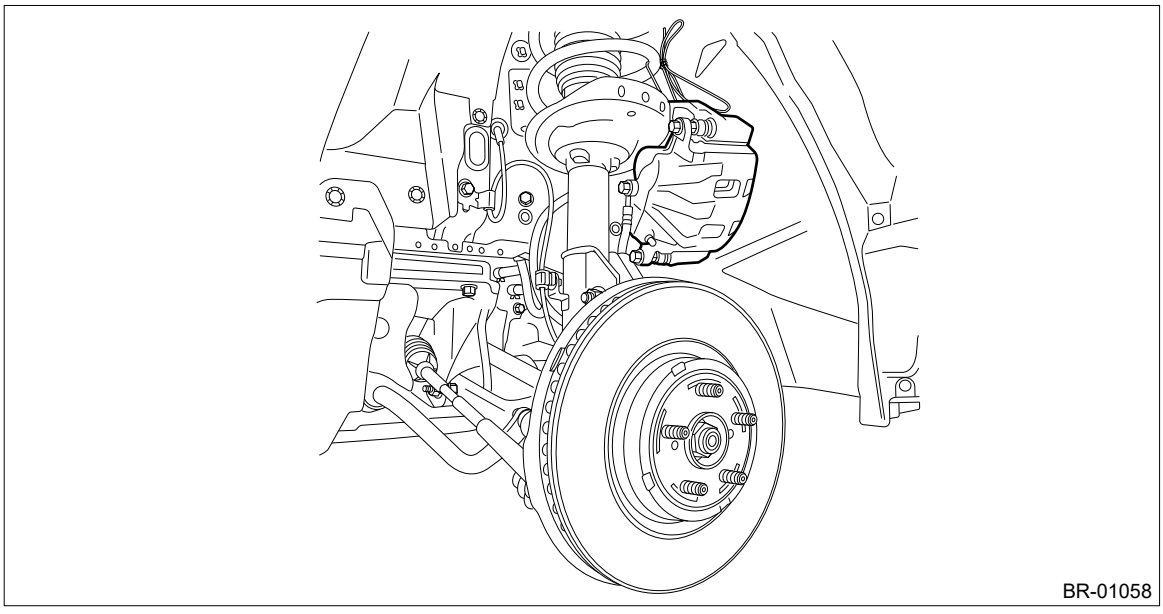
1. Before installation, check the front disc rotor. Ref. to BRAKE>Front Disc Rotor>INSPECTION.
2. Install each part in the reverse order of removal.
   Tightening torque:
   Brake hose bracket: 33 N•m (3.36 kgf-m, 24.3 ft-lb)
   Mounting bolt: 80 N•m (8.16 kgf-m, 59 ft-lb)
   Front wheel: 120 N•m (12.24 kgf-m, 88.5 ft-lb)

REMOVAL

1. Lift up the vehicle, and then remove the front wheels.
2. Remove the caliper body assembly from the housing assembly - front axle.
   (1) Remove the bolt from the brake hose bracket.
   (2) Remove the mounting bolt, and remove the caliper body assembly.



   (3) Prepare wiring harnesses etc. to be discarded, and suspend the caliper body assembly from the strut assembly.

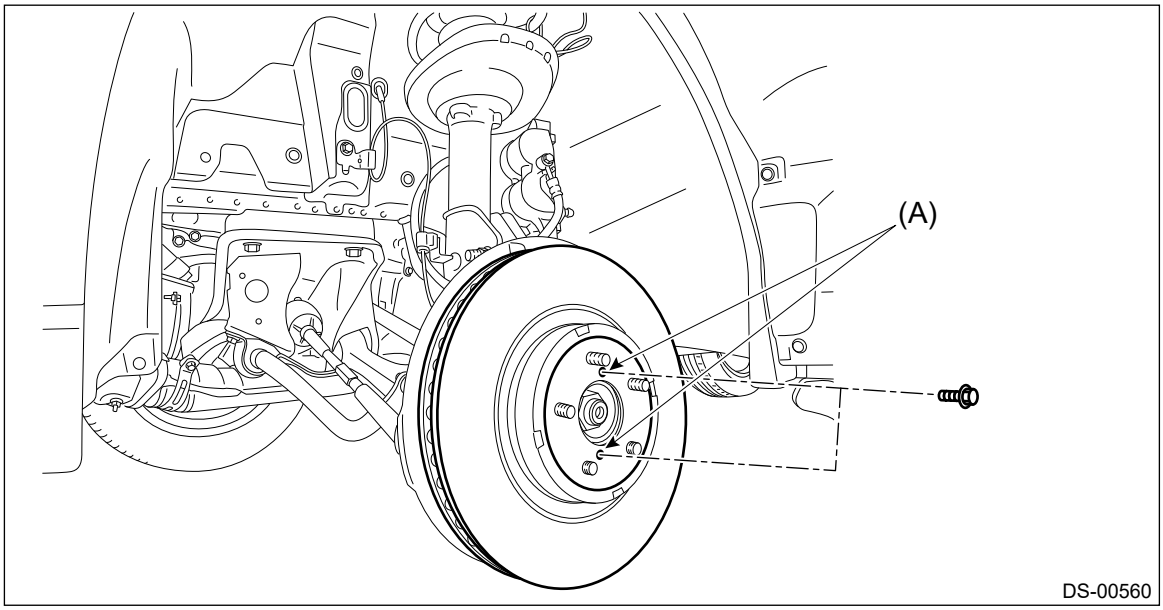


3. Remove the front disc rotor.

Note:

When the disc rotor is difficult to be removed from the hub unit COMPL - front axle, screw in 8 mm (0.31 in) bolt to the threaded part of the disc rotor (A), and

remove the disc rotor.

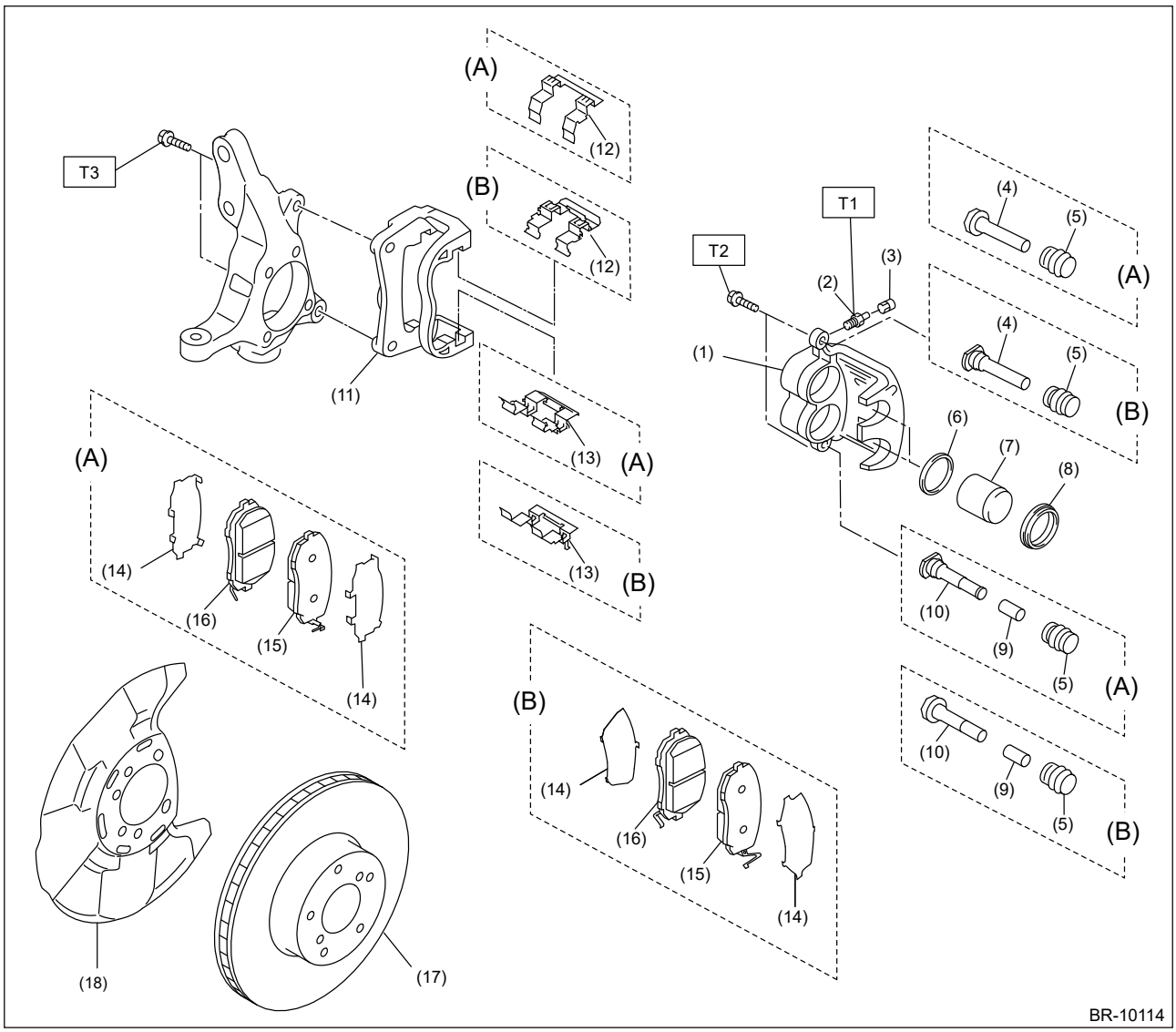


CAUTION

- Wear appropriate work clothing, including a helmet, protective goggles and protective shoes when performing any work.
- Before removal, installation or disassembly, be sure to clarify the failure. Avoid unnecessary removal, installation, disassembly and replacement.
- Use SUBARU genuine grease etc. or equivalent. Do not mix grease etc. of different grades or manufacturers.
- Before securing a part on a vise, place cushioning material such as wood blocks, aluminum plate, or cloth between the part and the vise.
- Be sure to tighten fasteners including bolts and nuts to the specified torque.
- Place shop jacks or rigid racks at the specified points.

COMPONENT

1. FRONT DISC BRAKE



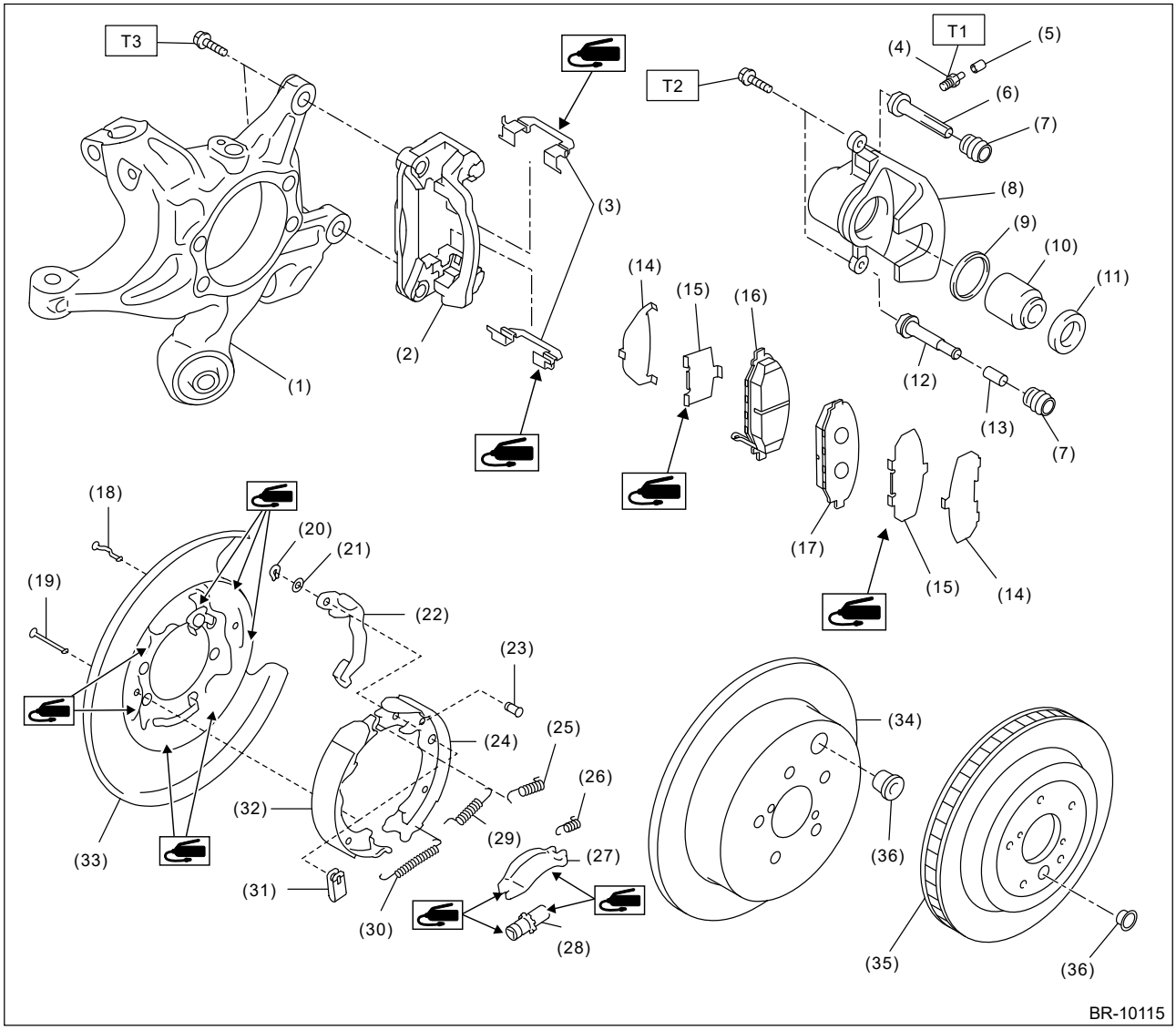
(A) 16-inch type
(B) 17-inch type

(1) Caliper body
(2) Bleeder - screw
(3) Cap - bleeder
(4) Guide pin - front brake (black)
(5) Pin boot
(6) Piston seal
(7) Piston - disc brake
(8) Piston boot
(9) Lock pin - sleeve
(10) Lock pin - front brake (silver)
(11) Support - front disc brake
(12) Pad clip - upper
(13) Pad clip - lower
(14) Shim - disc brake front
(15) Pad - disc brake front outer
(16) Pad - disc brake front inner
(17) Disc rotor
(18) Back plate - front brake

Tightening torque: N·m (kgf-m, ft-lb)

T1: 8 (0.82, 5.9)
T2: 27 (2.75, 19.9)
T3: 80 (8.16, 59)

2. REAR DISC BRAKE

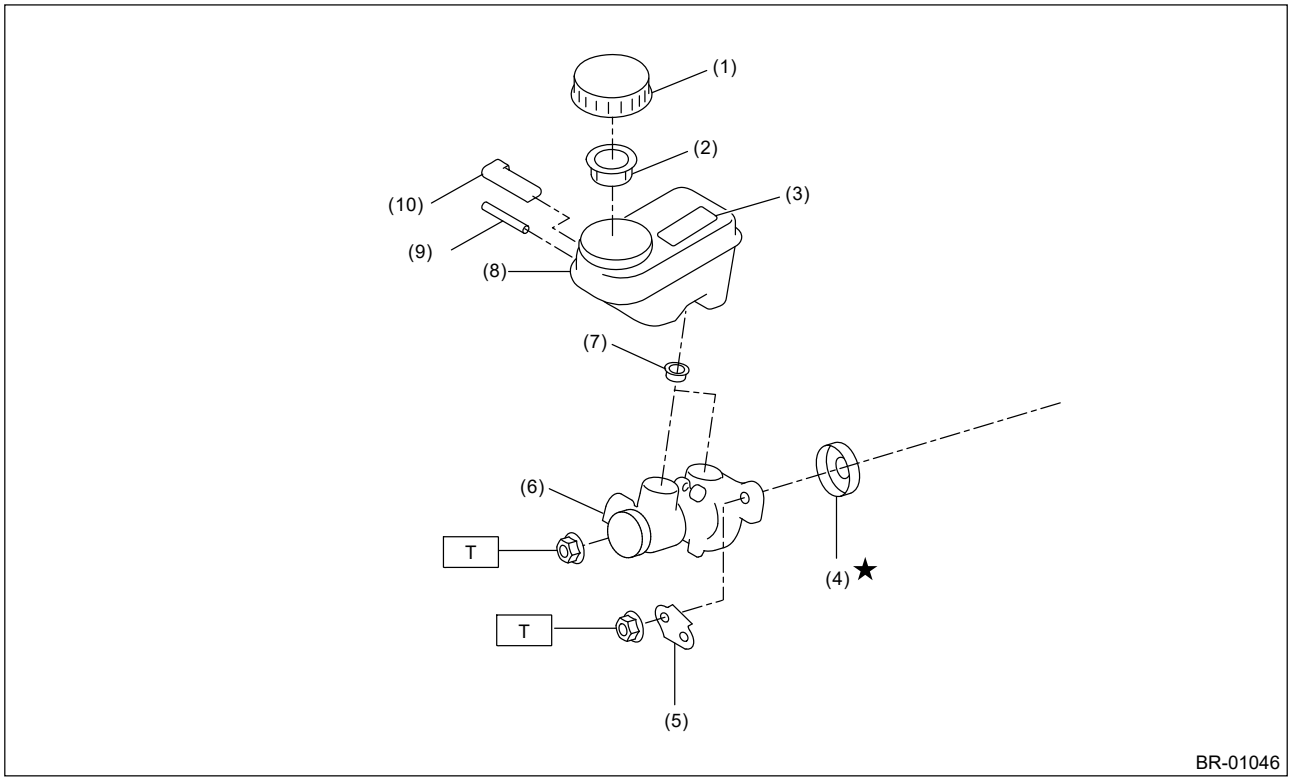


(1) Housing ASSY - rear axle
(2) Support - rear disc brake
(3) Pad clip - rear brake
(4) Bleeder - screw
(5) Cap - bleeder
(6) Guide pin - rear brake (black)
(7) Pin boot
(8) Caliper body
(9) Piston seal
(10) Piston - disc brake
(11) Piston boot
(12) Lock pin - rear brake (silver)
(13) Lock pin - sleeve
(14) Shim - disc brake rear outer
(15) Shim - disc brake rear inner
(16) Pad - disc brake rear inner
(17) Pad - disc brake rear outer
(18) Pin - secondary shoe hold-down
(19) Pin - primary shoe hold-down
(20) Retainer - rear brake
(21) Spring washer - rear brake
(22) Parking lever - rear
(23) Pin - parking lever
(24) Parking brake shoe (secondary)
(25) Spring - secondary shoe return
(26) Spring - strut
(27) Strut - brake
(28) Adjuster ASSY - rear brake
(29) Spring - primary shoe return
(30) Spring - adjuster
(31) Cup - shoe hold-down
(32) Parking brake shoe (primary)
(33) Back plate - rear brake
(34) Disc rotor (solid type)
(35) Disc rotor (ventilated type)
(36) Adjusting hole cover

Tightening torque: N·m (kgf-m, ft-lb)

T1: 8 (0.82, 5.9)
T2: 27 (2.75, 19.9)
T3: 66 (6.73, 48.7)

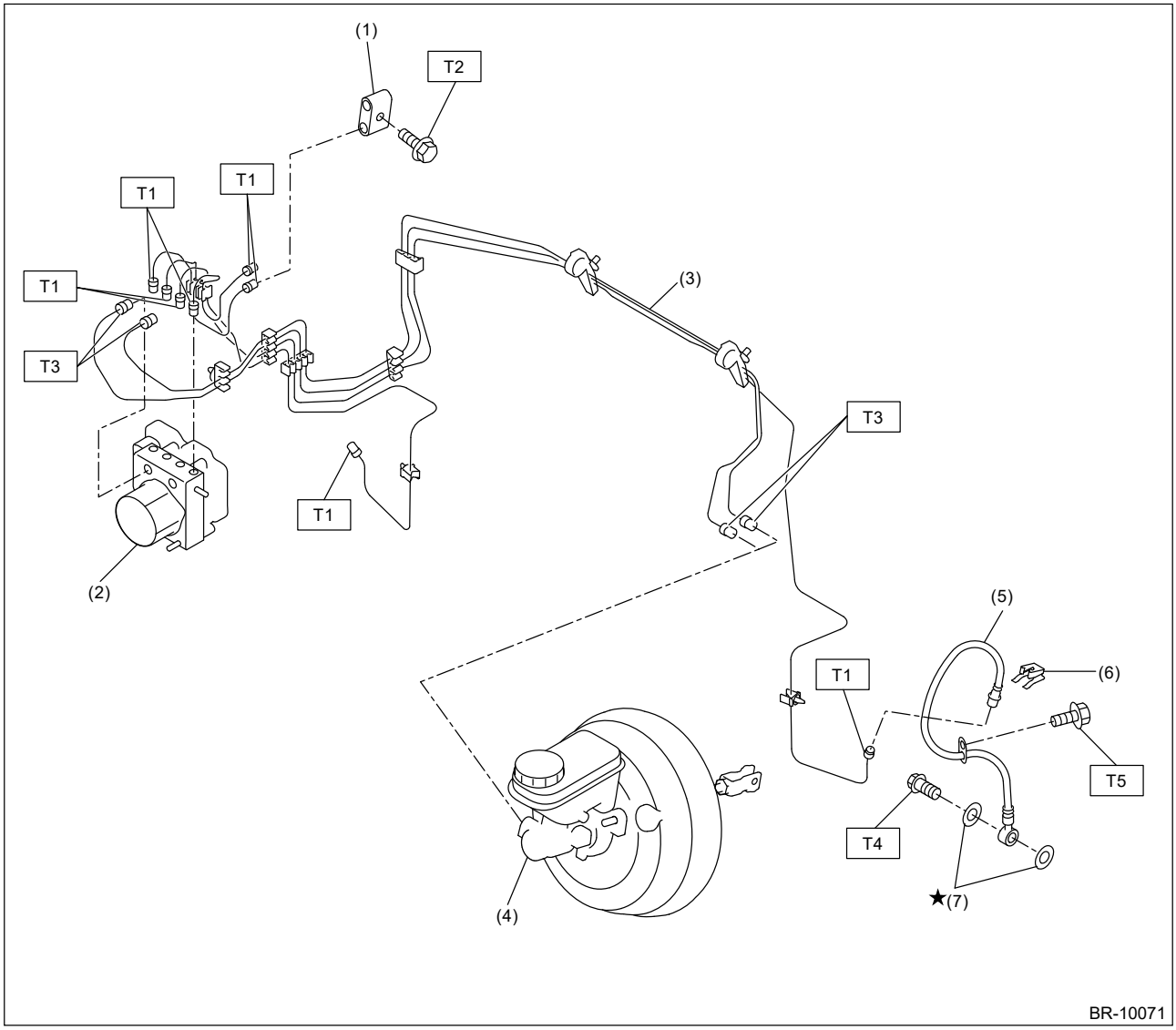
3. MASTER CYLINDER



(1)	Cap - reservoir tank	(6)	Cylinder body ASSY	***Tightening torque: N·m (kgf-m, ft-lb)***	
(2)	Filter - master cylinder	(7)	Seal	***T: 13 (1.33, 9.6)***	
(3)	Caution label (model with caution label)	(8)	Reservoir tank		
(4)	Seal sub ASSY	(9)	Pin		
(5)	Bracket - master cylinder	(10)	Level - indicator		

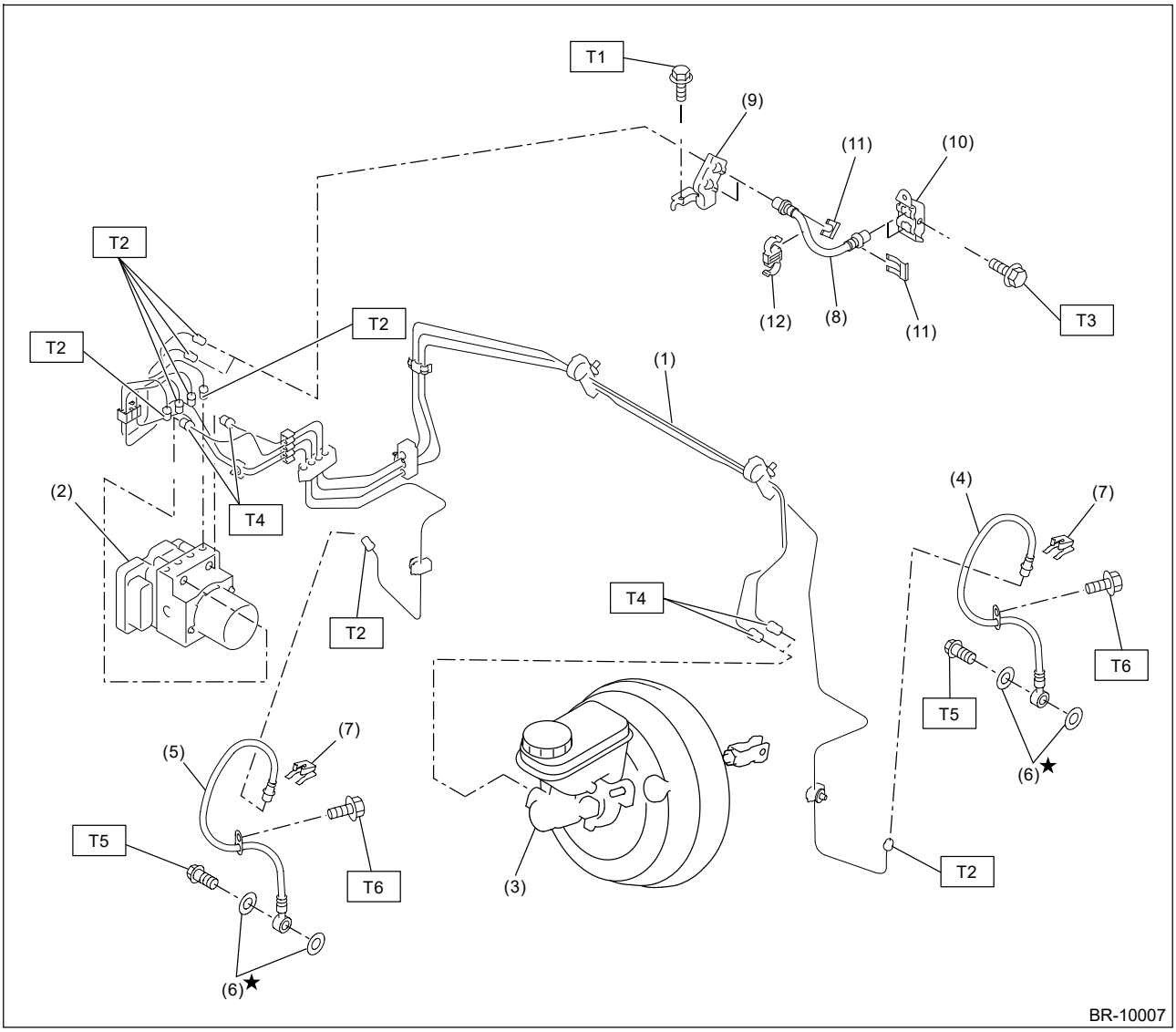
4. FRONT BRAKE PIPES AND HOSES

- Models without EyeSight



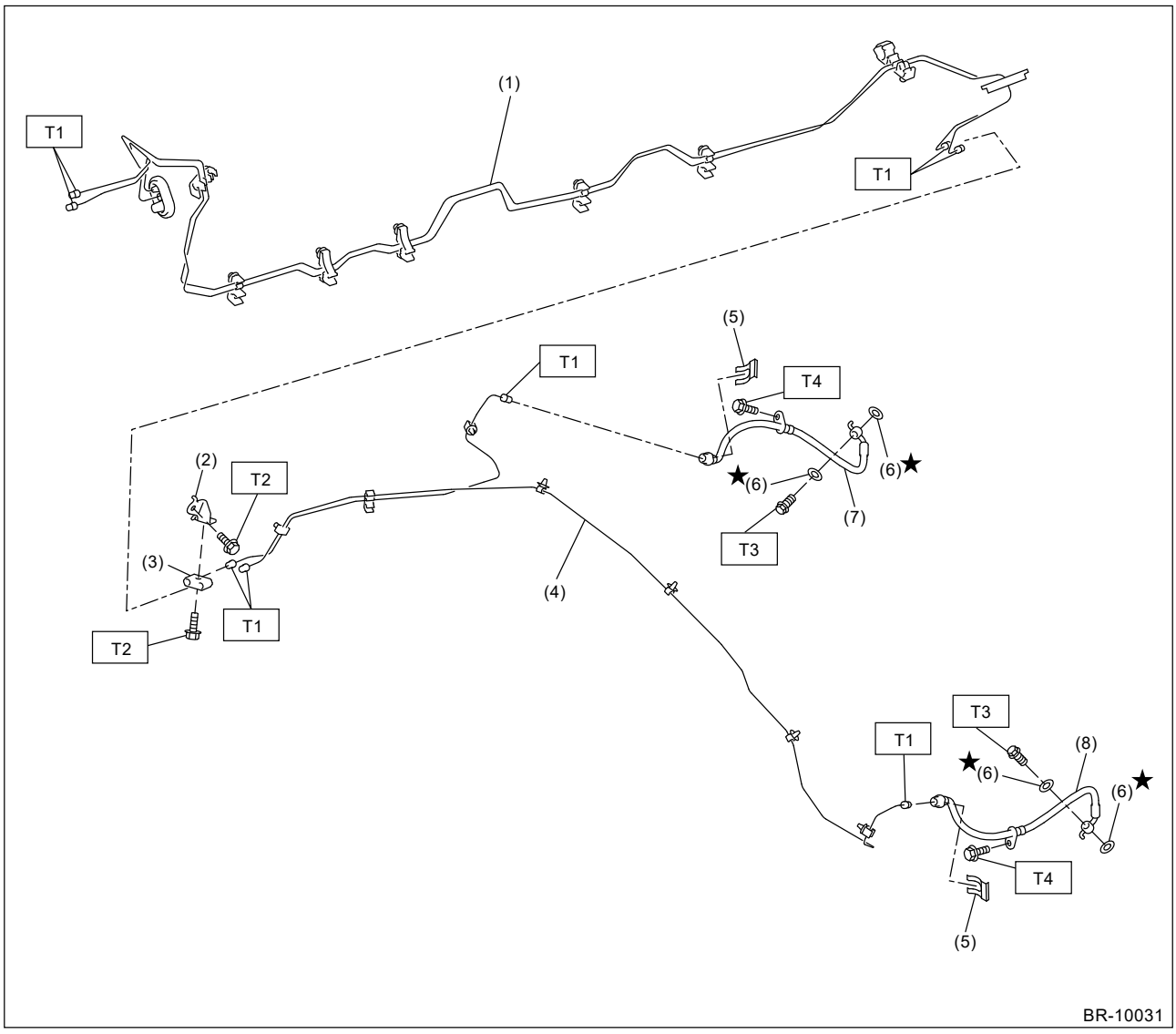
(1) Connector - two-way	(5) Front brake hose RH/LH	***Tightening torque: N·m (kgf-m, ft-lb)***
(2) VDC control module and hydraulic control unit (VDCCM&H/U)	(6) Clamp	***T1: 15 (1.53, 11.1)***
(3) Front brake pipe ASSY	(7) Gasket	***T2: 18 (1.84, 13.3)***
(4) Master cylinder ASSY		***T3: 19 (1.94, 14)***
		T4: 26 (2.65, 19.2)
		T5: 33 (3.36, 24.3)

- Models with EyeSight



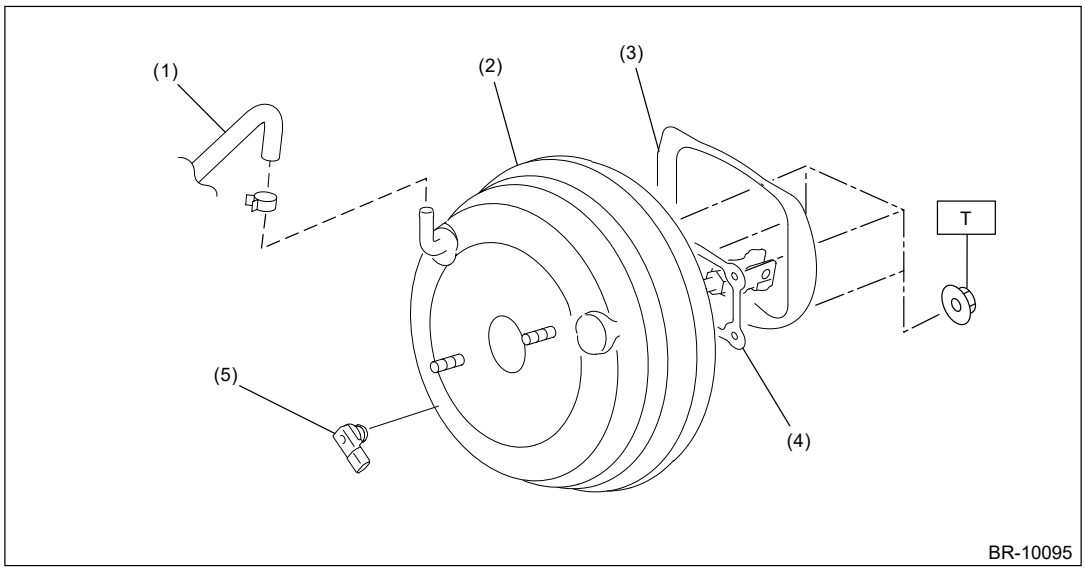
(1)	Front brake pipe ASSY	(7)	Clamp	***Tightening torque: N·m (kgf-m, ft-lb)***
(2)	VDC control module and hydraulic control unit (VDCCM&H/U)	(8)	Brake hose ASSY	***T1: 7.5 (0.76, 5.5)***
(3)	Master cylinder ASSY	(9)	Bracket	***T2: 15 (1.53, 11.1)***
(4)	Front brake hose RH	(10)	Bracket	***T3: 18 (1.84, 13.3)***
(5)	Front brake hose LH	(11)	Clip	***T4: 19 (1.94, 14)***
(6)	Gasket	(12)	Clamp	***T5: 26 (2.65, 19.2)***
				T6: 33 (3.36, 24.3)

5. CENTER AND REAR BRAKE PIPES AND HOSES



(1)	Center brake pipe ASSY	(5)	Clamp	***Tightening torque: N·m (kgf-m, ft-lb)***
(2)	Bracket	(6)	Gasket	***T1: 15 (1.53, 11.1)***
(3)	Connector	(7)	Rear brake hose RH	***T2: 18 (1.84, 13.3)***
(4)	Rear brake pipe ASSY	(8)	Rear brake hose LH	***T3: 26 (2.65, 19.2)***
				T4: 33 (3.36, 24.3)

6. BRAKE BOOSTER



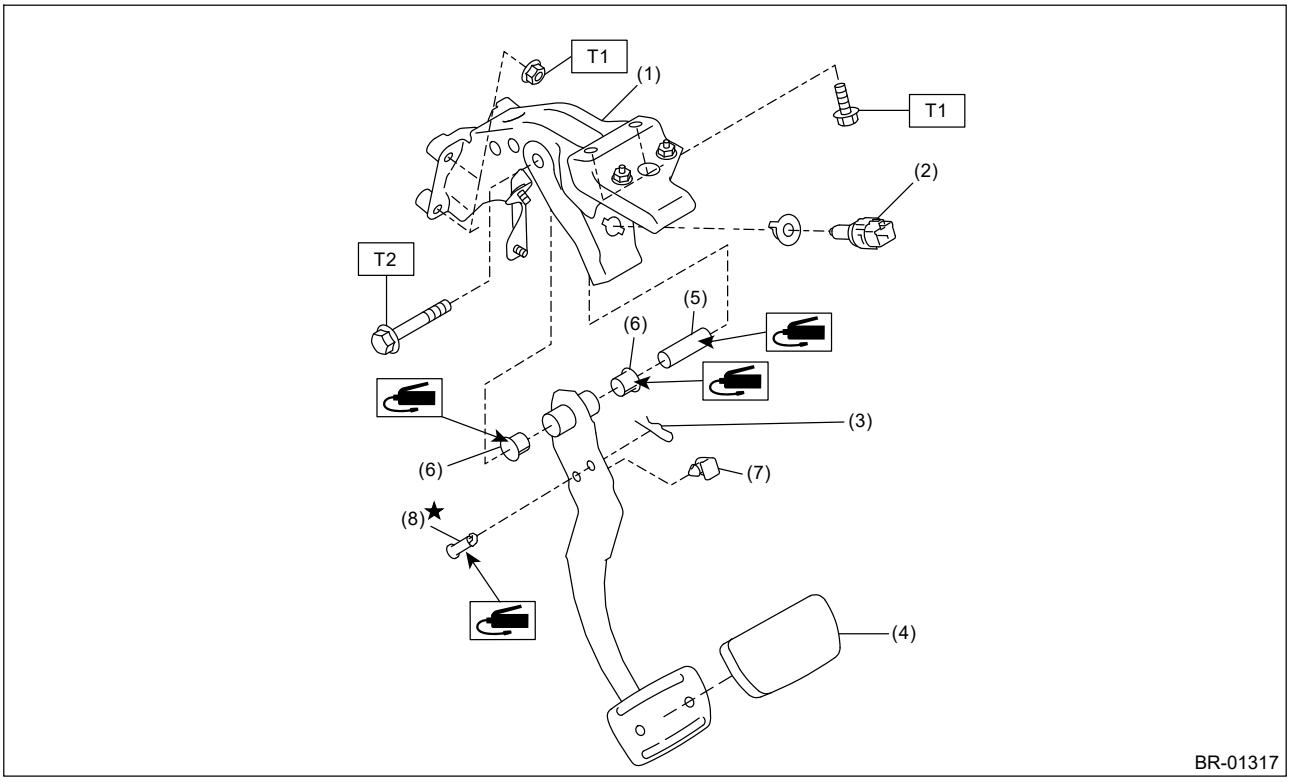
(1) Vacuum hose
(2) Vacuum booster ASSY
(3) Damping seat (model with EyeSight)
(4) Gasket
(5) Vacuum sensor

Tightening torque: N·m (kgf-m, ft-lb)

T: 18 (1.84, 13.3)

7. BRAKE PEDAL

- CVT model



(1) Brake pedal ASSY
(2) Switch - stop light
(5) Spacer - pedal
(6) Bushing - pedal

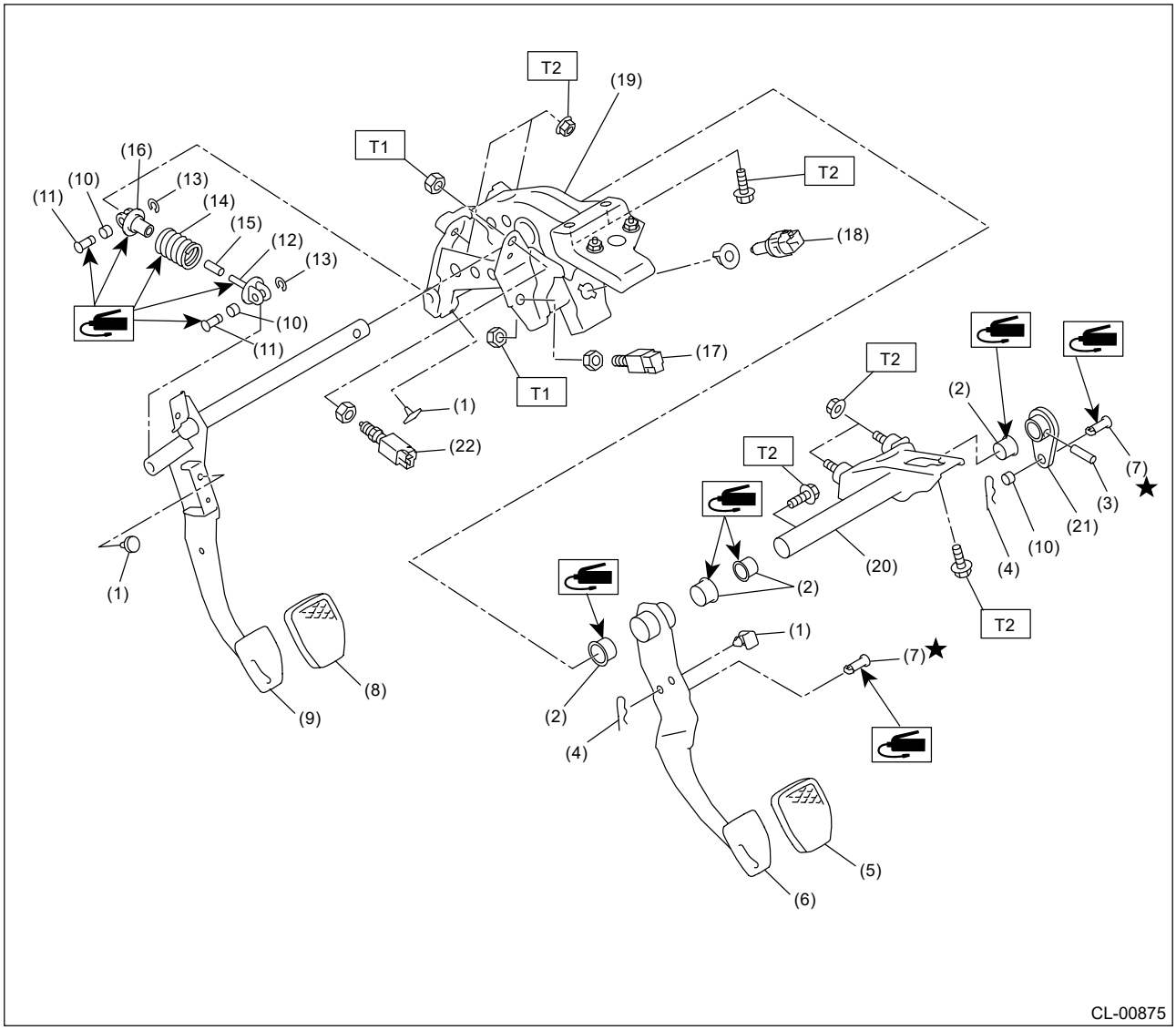
Tightening torque: N·m (kgf-m, ft-lb)

T1: 18 (1.84, 13.3)

(3) Snap pin
(4) Pad - brake pedal (normal type)
(7) Stopper - pedal
(8) Clevis pin

T2: 30 (3.06, 22.1)

- MT model

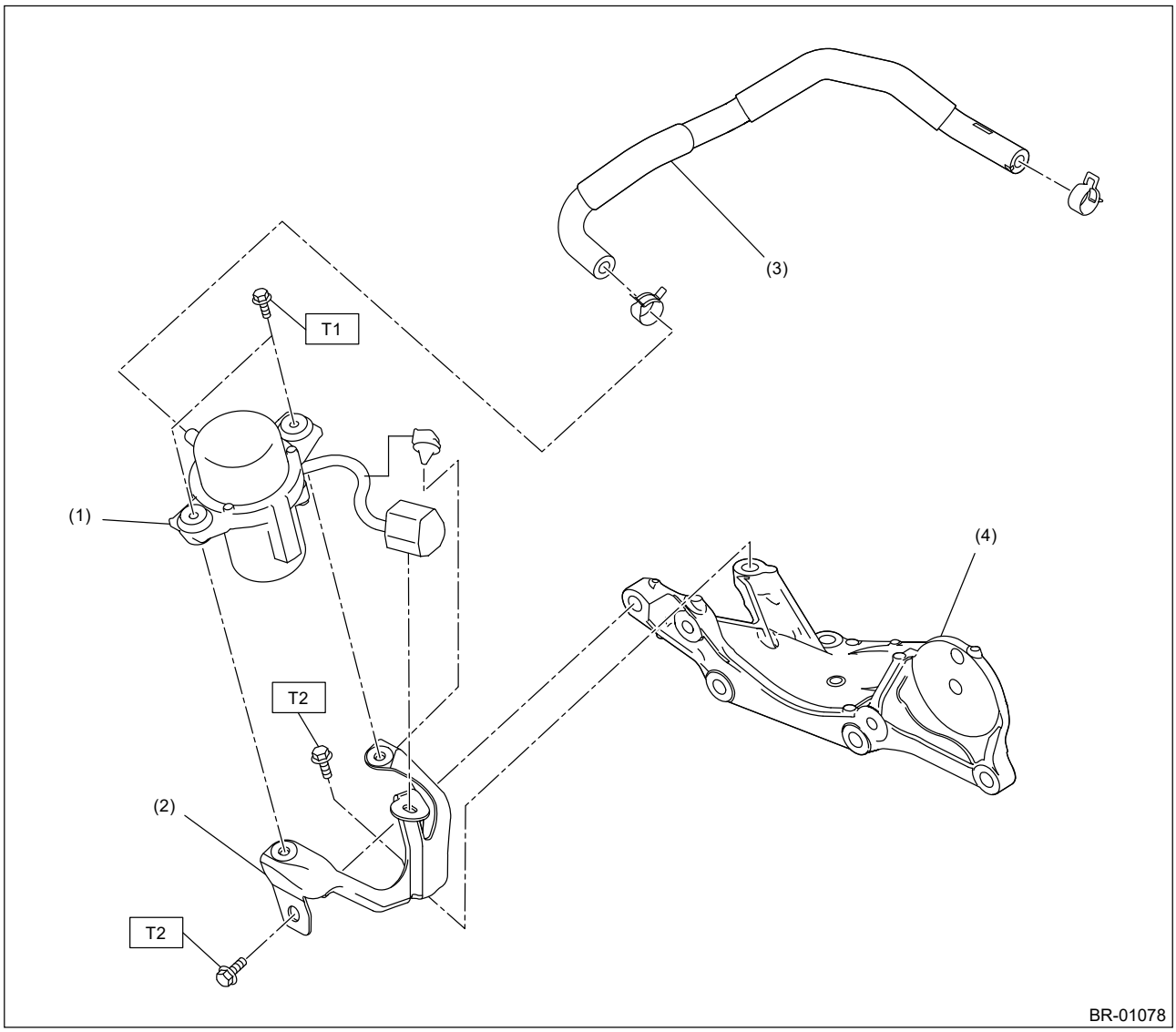


(1) Stopper
(2) Bushing
(3) Spring pin
(4) Snap pin
(5) Pad - brake pedal
(6) Brake pedal
(7) Clevis pin
(8) Clutch pedal pad
(9) Clutch pedal
(10) Bushing C
(11) Clutch clevis pin
(12) Assist rod A
(13) Clip
(14) Assist spring
(15) Assist bushing
(16) Assist rod B
(17) Clutch switch
(18) Switch - stop light
(19) Pedal bracket
(20) Clutch master cylinder bracket
(21) Lever
(22) Clutch start switch

Tightening torque: N·m (kgf-m, ft-lb)

T1: 8 (0.82, 5.9)
T2: 18 (1.84, 13.3)

8. BRAKE VACUUM PUMP



(1) Vacuum pump ASSY

(2) Bracket COMPL - vacuum pump

(3) Vacuum hose COMPL

(4) Bracket - generator

Tightening torque: N·m (kgf-m, ft-lb)

T1: 6.4 (0.65, 4.7)

T2: 19 (1.9, 14)

SPECIFICATION

Front disc brake	Size		16-inch type	17-inch type
	Type		Disc (floating type, ventilated)	
	Effective disc diameter	mm (in)	244 (9.61)	261 (10.28)
	Disc thickness × Diameter	mm (in)	24 × 294 (0.94 × 11.57)	30 × 316 (1.18 × 12.44)
	Effective cylinder diameter	mm (in)	42.8 (1.685) × 2	
	Pad dimensions (Length × Width × Thickness)	mm (in)	117.8 × 50.5 × 11.0 (4.638 × 1.988 × 0.433)	130.0 × 53.5 × 11 (5.118 × 2.106 × 0.433)
	Clearance adjustment		Automatic adjustment	
Rear disc brake	Size		15-inch type	16-inch type
	Type		Disc (floating type, solid)	Disc (floating type, ventilated)
	Effective disc diameter	mm (in)	238 (9.37)	243 (9.57)
	Disc thickness × Diameter	mm (in)	10 × 274 (0.39 × 10.79)	18 × 278 (0.71 × 10.94)
	Effective cylinder diameter	mm (in)	38.1 (1.5)	40.4 (1.591)
	Pad dimensions (Length × Width × Thickness)	mm (in)	92 × 33 × 9 (3.622 × 1.299 × 0.354)	95.5 × 34.8 × 11 (3.759 × 1.370 × 0.433)
	Clearance adjustment		Automatic adjustment	
Master cylinder	Type		Tandem	
	Effective diameter	mm (in)	23.8 (15/16)	
	Reservoir type		Sealed type	
	Brake fluid reservoir capacity	cm^3 (cu in)	240 (12.51)	
Brake booster	Type		Vacuum suspended	
	Effective diameter	mm (in)	208 + 229 (8.19 + 9)	
Brake line			Dual circuit system	
Brake fluid			FMVSS No. 116, DOT3 or DOT4	
			Caution: • **Do not let brake fluid come into contact with the painted surface of the vehicle body. Wash away**	

	with water immediately and wipe off if it is spilled by accident. • **Avoid mixing brake fluid of different brands or different grades even from the same brand to prevent fluid performance from degrading.** • **When refilling brake fluid, do not allow dirt or dust to get into the reservoir tank.** • **Always use new SUBARU genuine brake fluid when replacing or refilling the fluid. Do not reuse drained brake fluid.**

Note:
Refer to "PARKING BRAKE" for parking brake specifications. **Ref. to PARKING BRAKE>General Description>SPECIFICATION.**

Item			Standard	Limit
Front brake	Pad thickness mm (in)	All models	11 (0.43)	1.5 (0.059)
	Disc thickness mm (in)	16-inch	24 (0.94)	22 (0.87)
		17-inch	30 (1.18)	28 (1.1)
	Disc runout mm (in)	All models	—	0.05 (0.002)
Rear brake (disc type)	Pad thickness mm (in)	Solid disc	9 (0.354)	1.5 (0.059)
	Pad thickness mm (in)	Ventilated disc	11 (0.43)	1.5 (0.059)
	Disc thickness mm (in)	Solid disc	10 (0.39)	8.5 (0.335)
	Disc thickness mm (in)	Ventilated disc	18 (0.71)	16 (0.63)
	Disc runout mm (in)		—	0.05 (0.002)
Parking brake	Inside diameter mm (in)		170 (6.69)	171 (6.73)
	Lining thickness mm (in)		3.5 (0.14)	1.5 (0.059)

		Brake pedal force N (kgf, lbf)	Fluid pressure kPa (kgf/cm^2, psi)
Brake booster	Brake fluid pressure with engine stopped	147 (15, 33)	533 (5, 77)
		294 (30, 66)	1,551 (16, 225)
	Brake fluid pressure with engine running and vacuum pressure at 66.7 kPa (500 mmHg, 19.69 inHg)	147 (15, 33)	6,177 (63, 896)
		294 (30, 66)	11,273 (115, 1,635)

Brake pedal	Free play	mm (in)	0.5 — 2.7 (0.020 — 0.11)

			[When pulling the brake pedal upward with a force of less than 10 N (1 kgf, 2 lbf)]

INSPECTION

	Trouble and possible cause	Corrective action
1. Insufficient braking	(1) Fluid leakage from the hydraulic mechanism	Repair or replace. (cup, piston seal, piston boot, master cylinder piston kit, pipe or hose)
	(2) Entry of air into the hydraulic mechanism	Bleed air.
	(3) Wear, deteriorated surface material, water or fluid on lining	Replace, grind or clean.
	(4) Improper operation of master cylinder assembly, disc caliper, vacuum booster assembly or check valve	Repair or replace.
2. Unstable or uneven braking	(1) Fluid on lining or rotor	Correct the cause of fluid leakage, and clean or replace.
	(2) Rotor defective	Repair or replace the rotor.
	(3) Improper lining contact, deteriorated surface, deteriorated or worn lining material	Repair by grinding, or replace.
	(4) Deformed back plate	Repair or replace.
	(5) Overinflation of tires	Adjust the air pressure.
	(6) Defective wheel alignment	Adjust alignment.
	(7) Loose back plate or support installation bolt	Tighten to the specified torque.
	(8) Defective hub unit COMPL	Replace.
	(9) Defective hydraulic system	Replace the cylinder, brake pipe or hose.
	(10) Unstable performance of the parking brake	Check, adjust or replace the rear brake and cable system.
3. Excessive pedal stroke	(1) Entry of air into the hydraulic mechanism	Bleed air.
	(2) Excessive play in the master cylinder push rod	Adjust.
	(3) Fluid leakage from the hydraulic mechanism	Repair or replace. (cup, piston seal, piston boot, master cylinder piston kit, pipe or hose)
	(4) Improper lining contact or worn lining	Repair or replace.
4. Brake dragging or improper brake return	(1) Insufficient pedal play	Adjust play.
	(2) Improper master cylinder return	Clean or replace the cylinder.
	(3) Clogged hydraulic system	Replace.
	(4) Improper return or adjustment of parking brake	Repair or adjust.
	(5) Weakened spring tension or breakage of shoe return spring	Replace the spring.

	(6) Improper disc caliper operation	Repair or replace.
	(7) Faulty wheel bearing	Replace.
5. Brake noise (1) (creaking sound)	(1) Hardened or deteriorated brake pad	Replace the pad.
	(2) Worn brake pad	Replace the pad.
	(3) Loose back plate or support installation bolt	Tighten to the specified torque.
	(4) Loose hub unit COMPL	Tighten to the specified torque.
	(5) Dirty rotor	Clean the rotor, or clean and replace brake assembly.
6. Brake noise (2) (hissing sound)	(1) Worn brake pad	Replace the pad.
	(2) Improperly installed pad	Correct or replace the pad.
	(3) Loose or bent rotor	Retighten or replace.
7. Brake noise (3) (click sound)	Excessively worn pad or support	Replace the pad or the support.

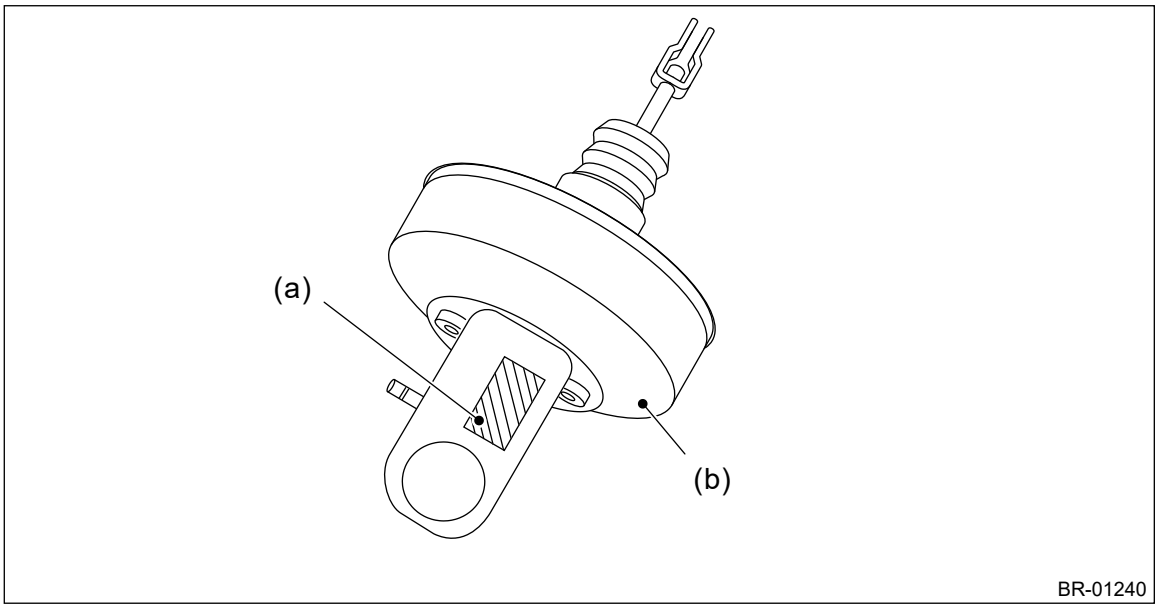
ASSEMBLY

Caution:

When replacing the reservoir tank, adhere the label to the position shown in the figure. (C0 model)

Fluid caution label:

C0 model: Part No. 25080GA010



(a) Fluid caution label (b) Brake booster

1. Install the seal to the cylinder body assembly.
2. Install the reservoir tank.

Caution:

Be careful not to tighten a vise excessively.

(1) Place the master cylinder assembly between aluminum plates and fix it on a vise.

(2) Drive the pin using a punch and a hammer to install the reservoir tank.

DISASSEMBLY

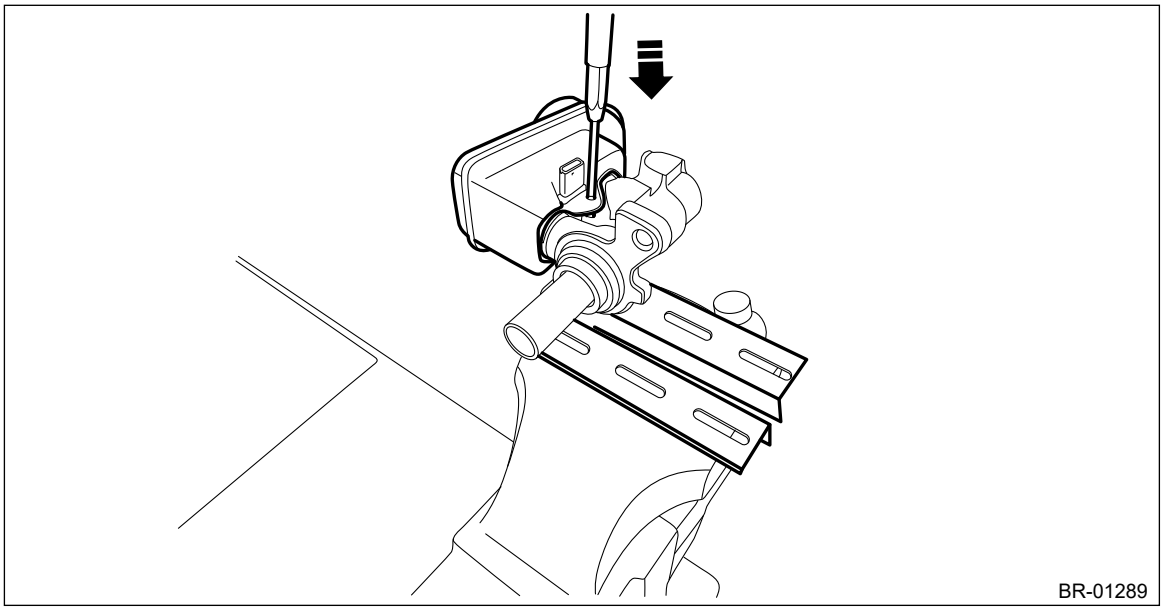
1. Remove the reservoir tank.

   Caution:

   Be careful not to tighten a vise excessively.

   (1) Place the master cylinder assembly between aluminum plates and fix it on a vise.

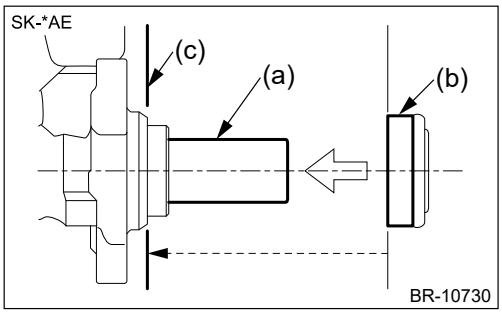
   (2) Drive out the pin using a punch and a hammer to remove the reservoir tank.



2. Remove the seal from the cylinder body assembly.

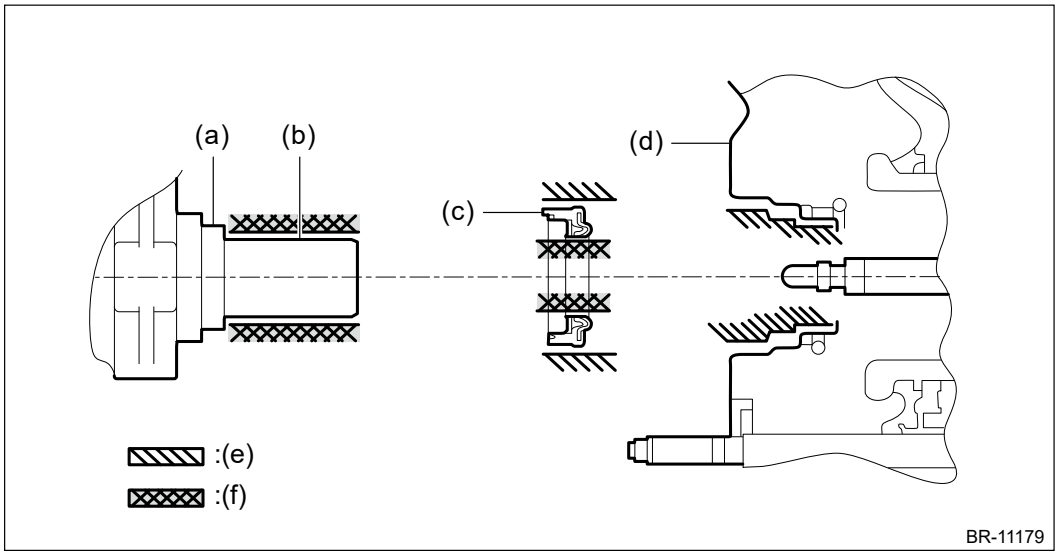
INSTALLATION

1. Install the master cylinder assembly.
   (1) Replace the seal sub assembly for the master cylinder assembly with a new part.
   Caution:
   Be careful not to install the seal sub assembly in the wrong location.

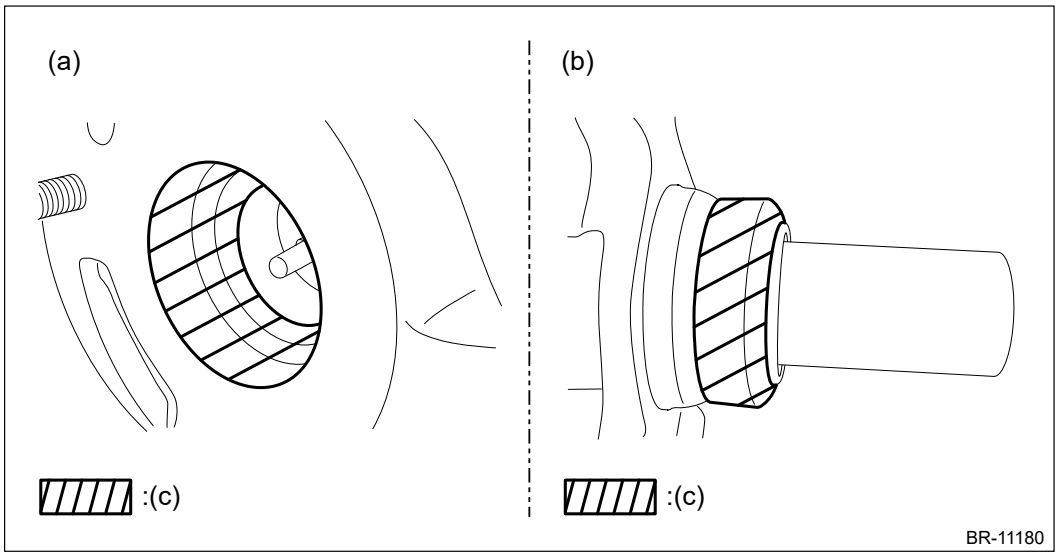


   (a) Primary piston
   (b) Seal sub ASSY
   (c) Install the seal sub ASSY to this surface.

   (2) Apply grease to the entire inner diameter of the vacuum booster assembly.
   Preparation items:
   Grease: Fluorine grease or equivalent
   (3) Apply grease to the entire outer diameter of the seal sub assembly.
   Preparation items:
   Grease: Fluorine grease or equivalent
   (4) Apply grease to the entire inner diameter of the seal sub assembly.
   Preparation items:
   Grease: Silicone grease or equivalent
   (5) Apply grease to the entire circumference on the piston rod of the master cylinder assembly.
   Preparation items:
   Grease: Silicone grease or equivalent
   Caution:
   - **Apply fluorine grease to the entire circumference. Areas where application was missed may cause rust.**
   - **Be careful not to mix up application locations of each grease.**



(a) Master cylinder ASSY
(b) Piston rod portion
(c) Seal sub ASSY
(d) Vacuum booster ASSY
(e) Fluorine grease application location
(f) Silicone grease application location



(a) Vacuum booster ASSY inner diameter (entire circumference)
(b) Seal sub ASSY outer diameter (entire circumference)
(c) Grease application location

(6) Install the master cylinder assembly.

Tightening torque:

13 N·m (1.3 kgf-m, 9.6 ft-lb)

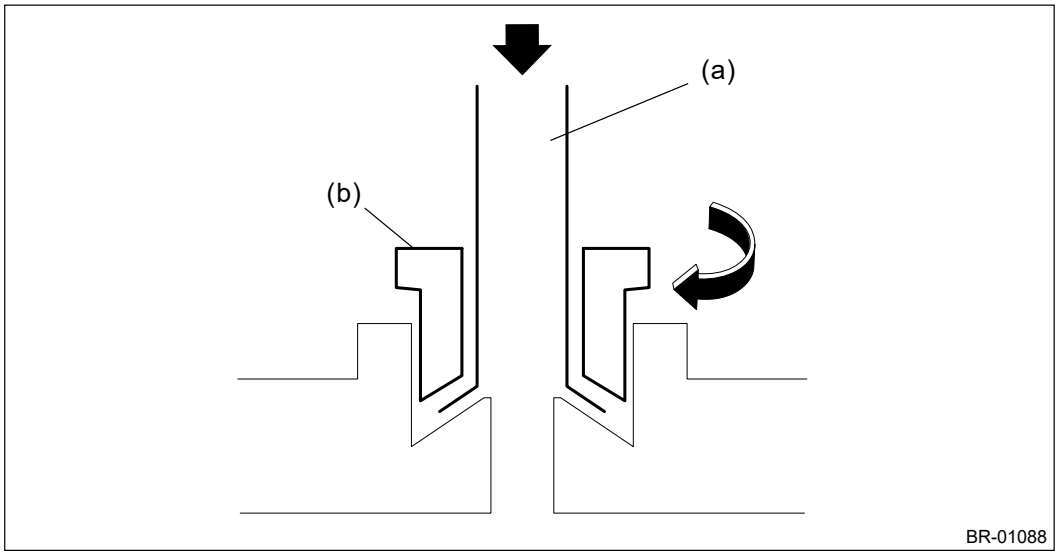
2. Turn and tighten the flare nut (b) by hand while pressing the brake pipe (a) toward the master cylinder assembly side.

Caution:

Be careful not to make scratches or other damage to the inside surface of the brake pipe flare.

Tightening torque:

Brake pipe flare nut: 19 N•m (1.94 kgf-m, 14.0 ft-lb)



3. Connect the battery ground terminal. Ref. to NOTE>NOTE > BATTERY.
4. Bleed air from the brake system and clutch system (MT model). Ref. to BRAKE>Air Bleeding>PROCEDURE.

REMOVAL

Caution:

- **Do not allow brake fluid to come in contact with the painted surface of the vehicle body. If it does, wash off with water and wipe away completely.**
- **After removing the master cylinder assembly, inspect the seal engagement surface of the seal sub assembly and the vacuum booster assembly.**
- **If the sealing surface of the vacuum booster assembly has a defect such as flaking paint, damage or rust, it may cause negative pressure leakage. Therefore, replace the vacuum booster assembly with a new part.**

1. Disconnect the ground cable from battery. Ref. to NOTE>NOTE > BATTERY.

   Note:

   For model with battery sensor, disconnect the ground terminal from battery sensor.
2. Drain brake fluid from the reservoir tank completely.
3. Remove the master cylinder assembly.

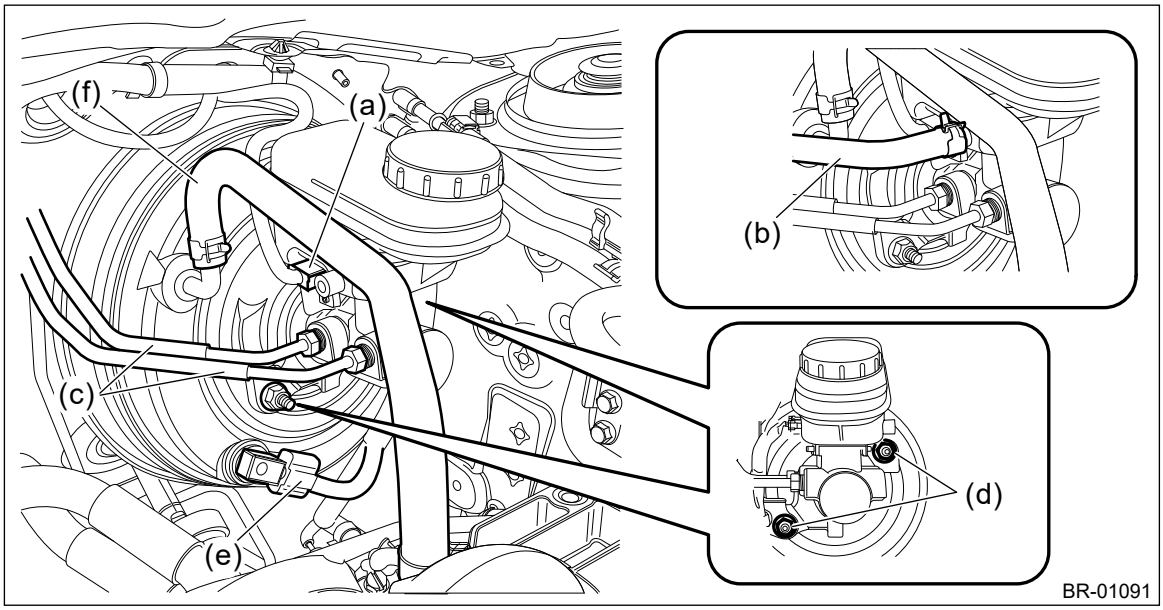
   Caution:

   - **Do not remove the vacuum sensor (e). If removed, replace the vacuum booster assembly with a new part. (Turbo model)**
   - **Do not allows the vacuum sensor (e) to turn. Otherwise the gasket on the mounting location of the vacuum sensor may be damaged. (Turbo model)**

   (1) Disconnect the fluid level sensor connector (a).
   (2) Disconnect the clutch hose (b). (MT model)
   (3) Turn the flare nuts while pressing the brake pipes toward the master cylinder assembly side and disconnect the brake pipes (c).
   (4) Remove the nut (d), and slowly remove the master cylinder assembly from the vacuum booster assembly.

   Caution:

   Before removing the master cylinder assembly, depress the brake pedal several times to make sure that the negative pressure in the vacuum booster assembly is completely removed.

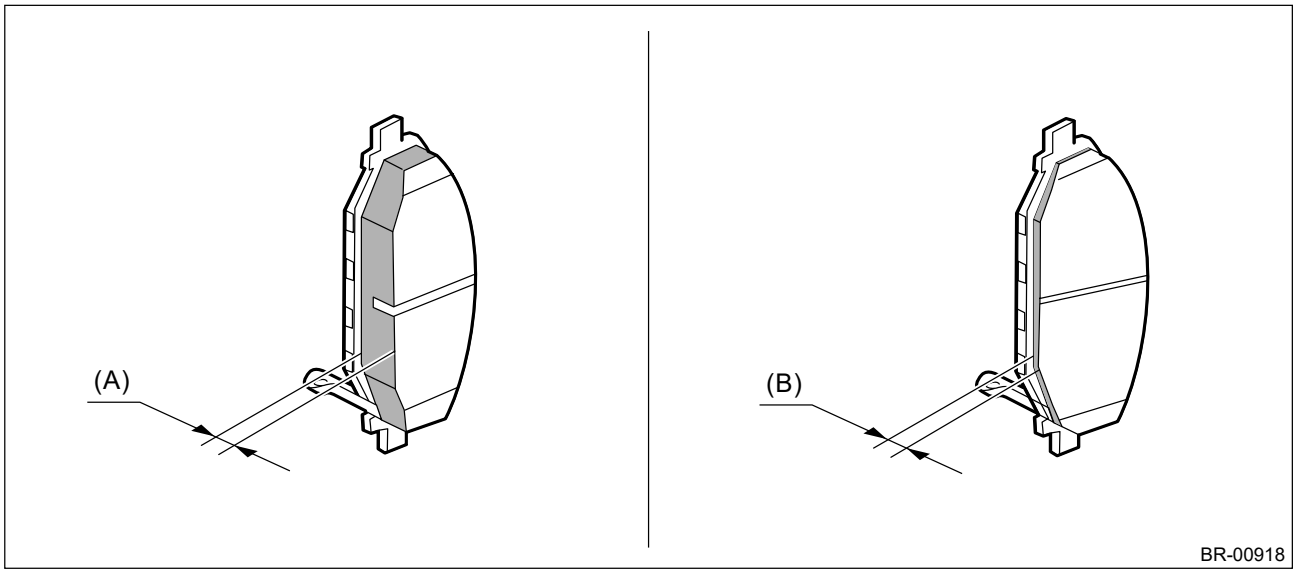

(f)
(a)
(b)
(c)
(d)
(e)
BR-01091

INSPECTION

1. Check the pad thickness.

   Note:

   - **Always replace the pads of both wheels and both sides as a set.**
   - **Replace pad clips if they are twisted or worn.**
   - **Replace the pad if there is oil or grease on it.**
   - **A wear indicator is installed on the pad - disc brake rear inner. If the pad is worn to the limit, the end of wear indicator contacts disc rotor, and a squeaking sound is heard as the wheel rotates. If the sound is heard, replace the pad.**



	Disc rotor type	Standard (A)	Wear limit (B)
Pad thickness	Solid disc	9 mm (0.35 in)	1.5 mm (0.059 in)
	Ventilated disc	11 mm (0.43 in)	

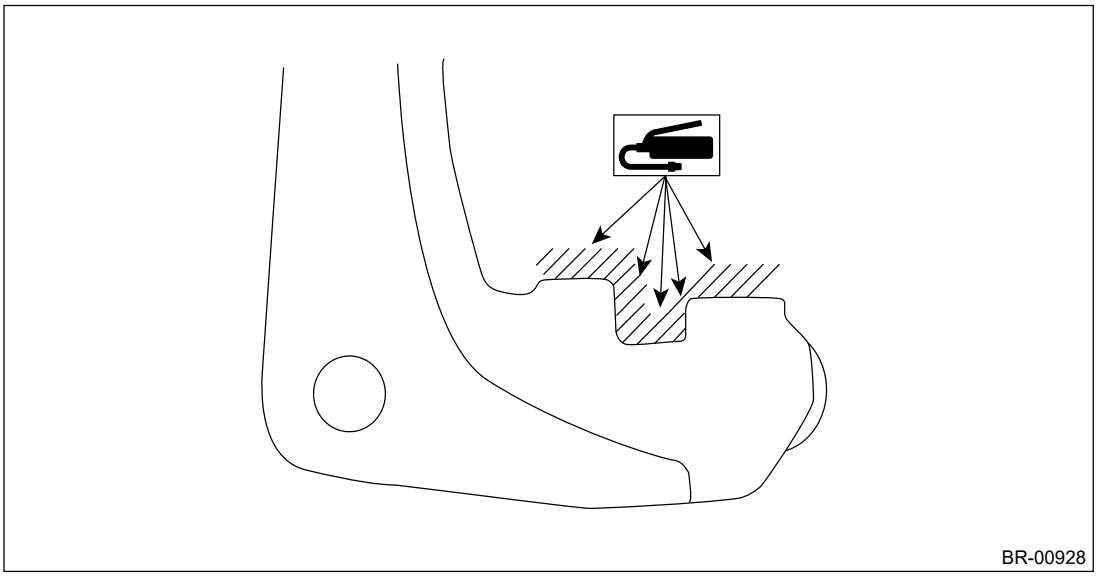
2. If the wear limit is exceeded in the inspection, replace the brake pad.

INSTALLATION

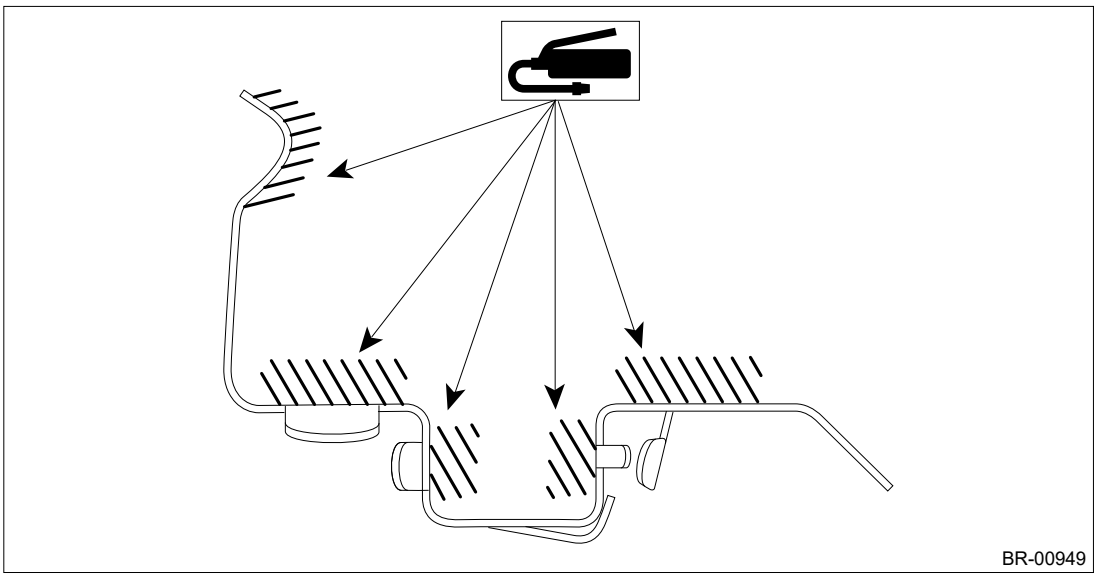
Note:

Before installation, remove the pad clip and remove mud, foreign matter and rust from the caliper body assembly and the support - rear disc brake.

1. Apply a thin coat of grease to the support - rear disc brake.
   Grease:
   An item contained in the pad kit, Molykote M7439 or equivalent



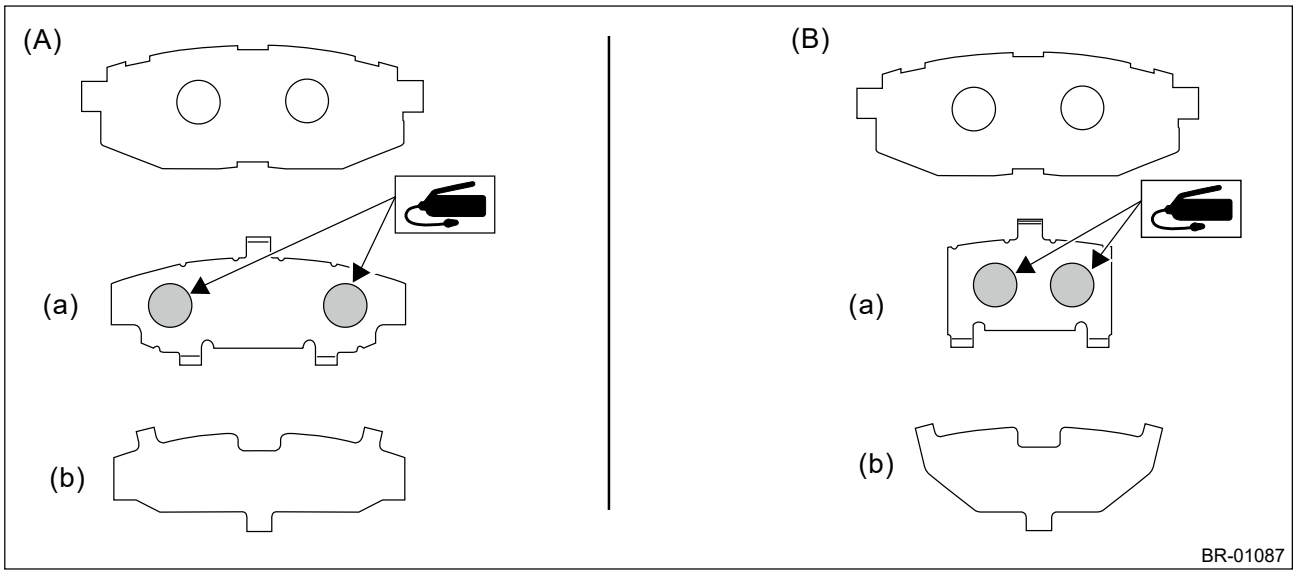
2. Before installation, check the brake pad. Ref. to BRAKE>Rear Brake Pad>INSPECTION.
3. Apply a thin coat of grease to the pad clip.
   Grease:
   An item contained in the pad kit, Molykote M7439 or equivalent



4. Apply a thin coat of grease to the shim - disc brake rear inner (a) and the shim - disc brake rear outer (b).

Grease:

Grease contained in the pad kit or WAKO grease V160



(A) Pad - disc brake rear outer (B) Pad - disc brake rear inner

5. Install the pad clip.
6. Press back the piston with a disc brake piston tool as needed.

Caution:

When pressing back the piston, the clearance between pad and disc rotor becomes large, which makes the brake pedal effort softer.

After the installation of rear wheel, be sure to perform the adjustment of the clearance and the pedal effort by depressing the brake pedal several times.

7. Install the brake pad to the support - rear disc brake.
8. Install the caliper body assembly to the support - rear disc brake.

Tightening torque:

Caliper bolt: 27 N·m (2.75 kgf-m, 19.9 ft-lb)

9. Install the brake hose bracket.

Tightening torque:

Brake hose bracket: 33 N·m (3.36 kgf-m, 24.3 ft-lb)

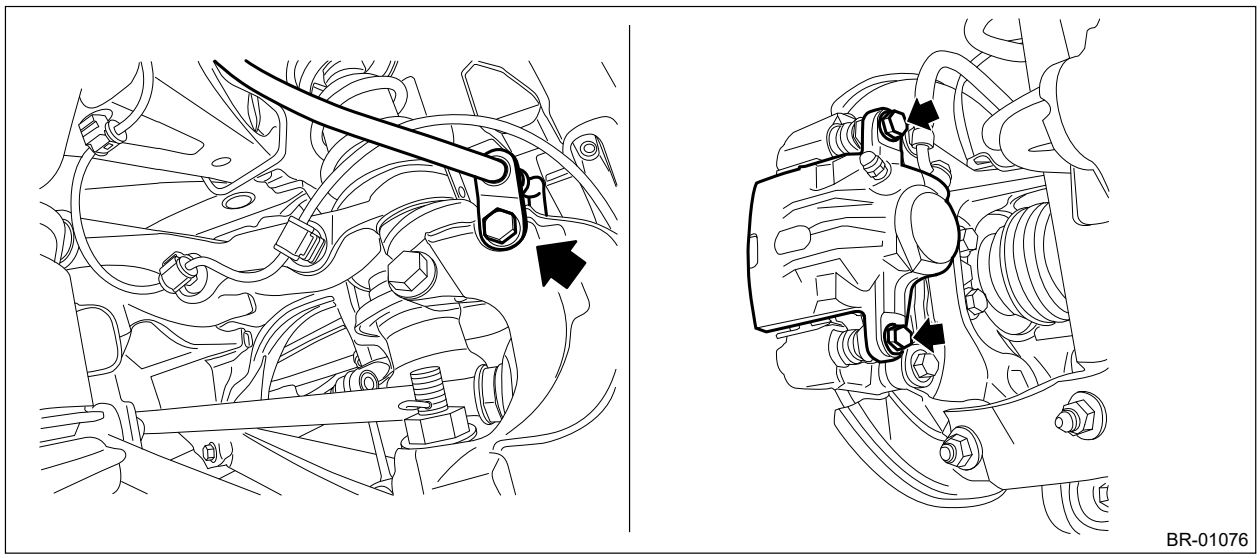
10. Install the rear wheels.

Tightening torque:

120 N·m (12.24 kgf-m, 88.5 ft-lb)

REMOVAL

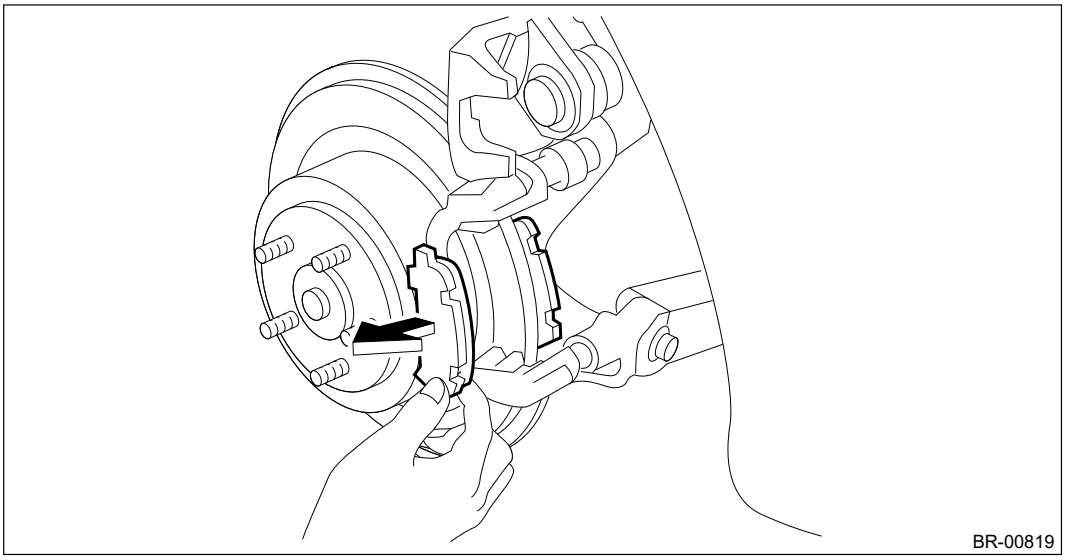
1. Lift up the vehicle, and then remove the rear wheels.
2. Remove the rear brake pad.
   (1) Remove the bolts and remove the brake hose bracket.
   (2) Remove the caliper bolt, and raise and hold the caliper body assembly.



Note:

Do not disconnect the brake hose from the caliper body assembly.

   (3) Remove the brake pad from support - rear disc brake.

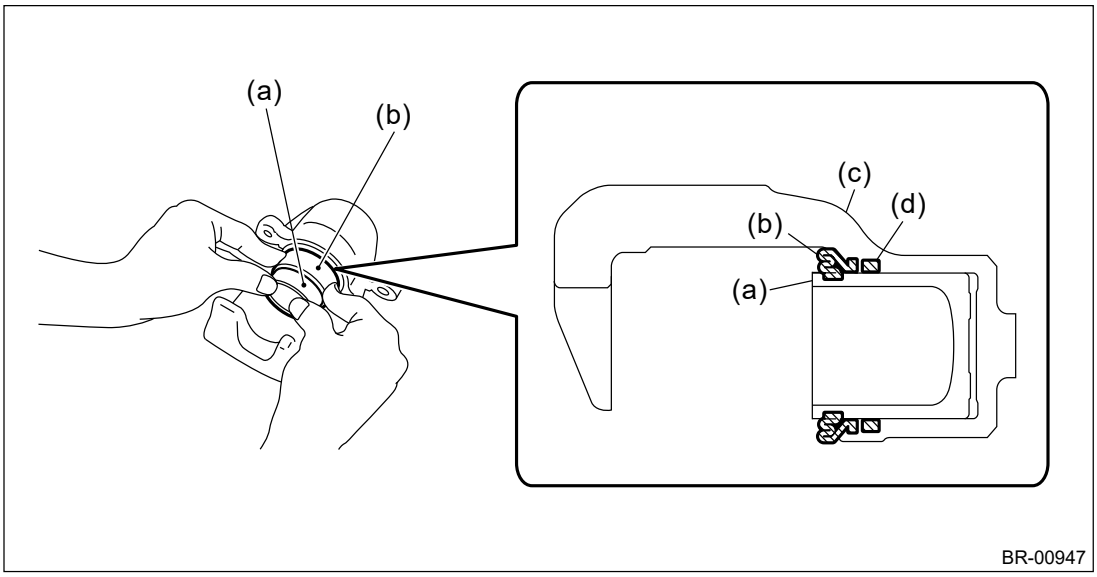


ASSEMBLY

1. Before installation, check each part. Ref. to BRAKE>Rear Disc Brake Assembly>INSPECTION.
2. Clean the inside of the caliper body cylinder using brake fluid.
3. Apply a coat of brake fluid to piston seal and install the piston seal to the caliper body cylinder groove.
4. Apply a coat of brake fluid to the inner surface of caliper body cylinder and the entire outer surface of the piston - disc brake.
5. Apply grease contained in the piston seal kit to the piston boot, and install it to the groove at the end of the cylinder.
6. Insert the piston - disc brake into the caliper body cylinder.

   Caution:

   Do not force the piston - disc brake into the caliper body cylinder.
7. Position the piston boot in the grooves on the piston - disc brake and the caliper body cylinder.

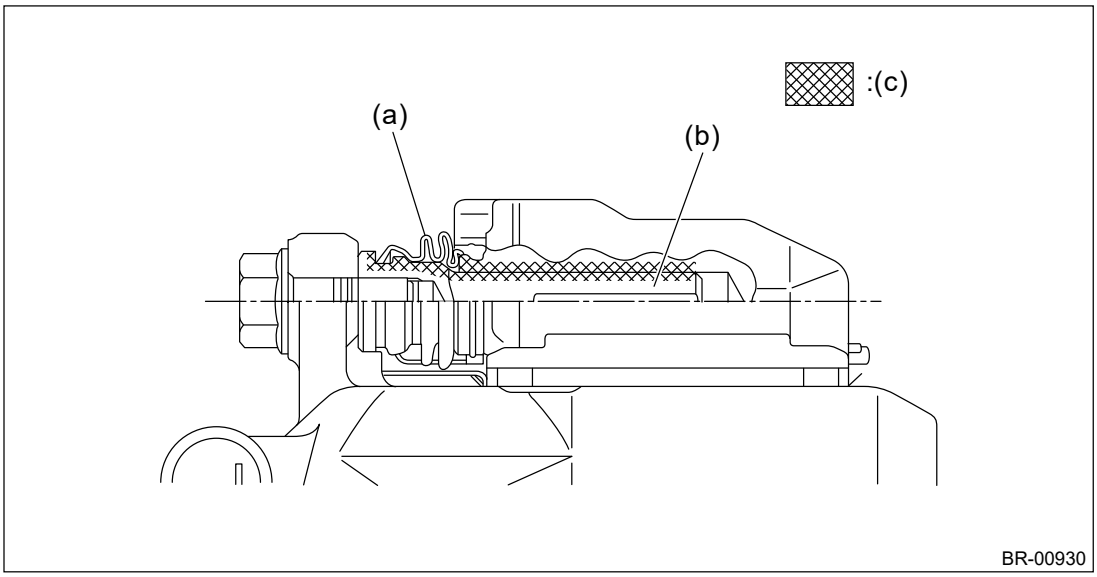


(a) Piston - disc brake
(b) Piston boot
(c) Caliper body
(d) Piston seal

8. Apply grease contained in the piston seal kit to the lock pin - rear brake, the outer surface of guide pin - rear brake, the inner surface of support cylinder, and the grooves of pin boot.
9. Install the pin boot to the lock pin - rear brake and guide pin - rear brake, and insert them into the support cylinder.

   Caution:

   Insert the lock pin - rear brake and guide pin - rear brake into specified position, and make sure that they slide and seat properly.



(a) Pin boot

(b) Lock pin - rear brake or guide pin - rear brake

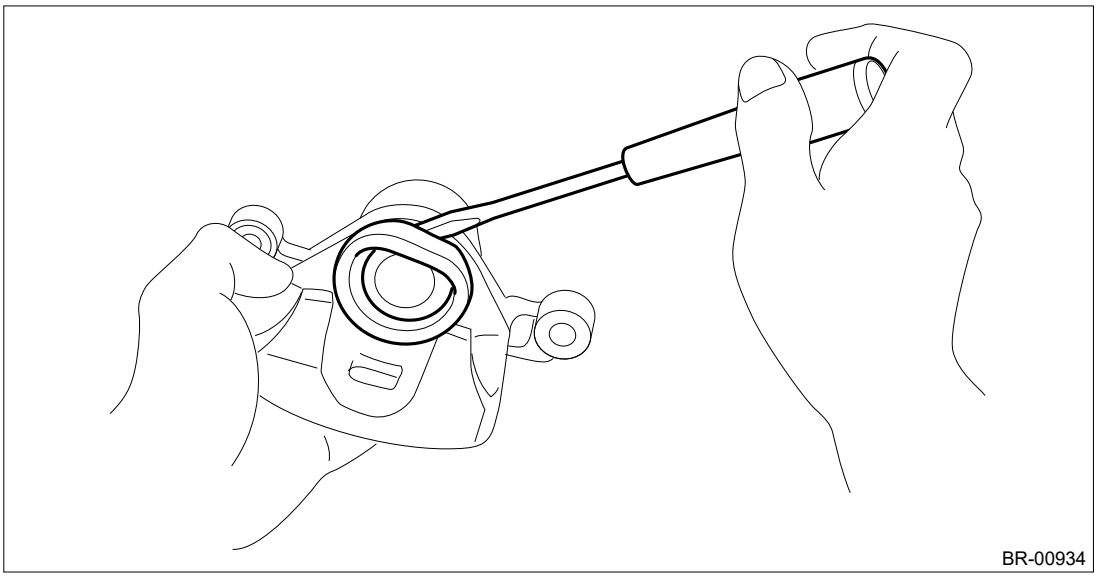
(c) Grease applied area

DISASSEMBLY

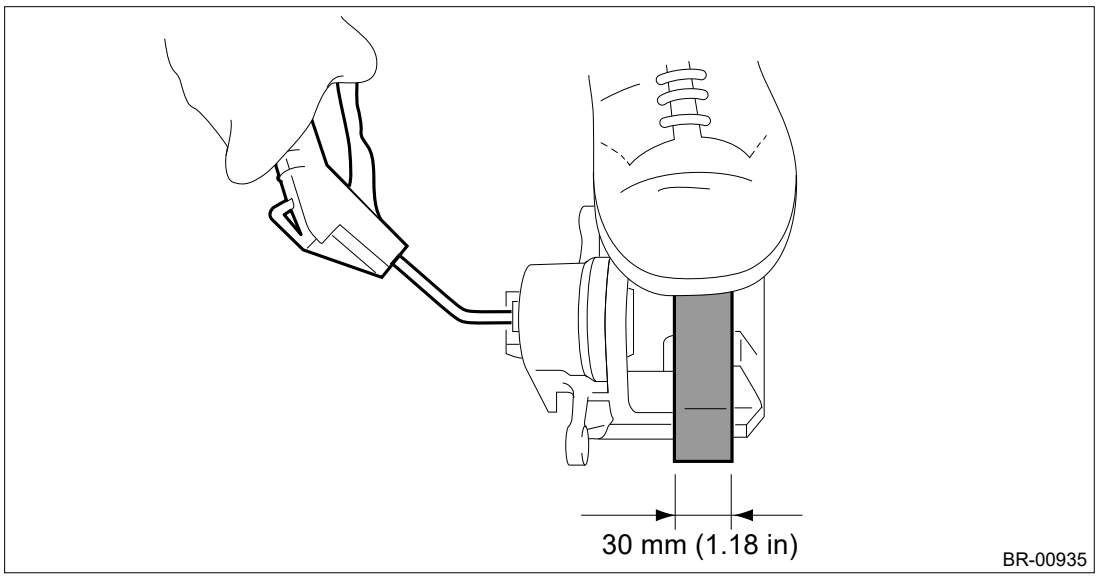
Caution:

Be careful not to allow foreign matter to enter the brake hose connector.

1. Remove mud and foreign matter from the caliper body assembly.
2. Remove the piston boot from caliper body cylinder.



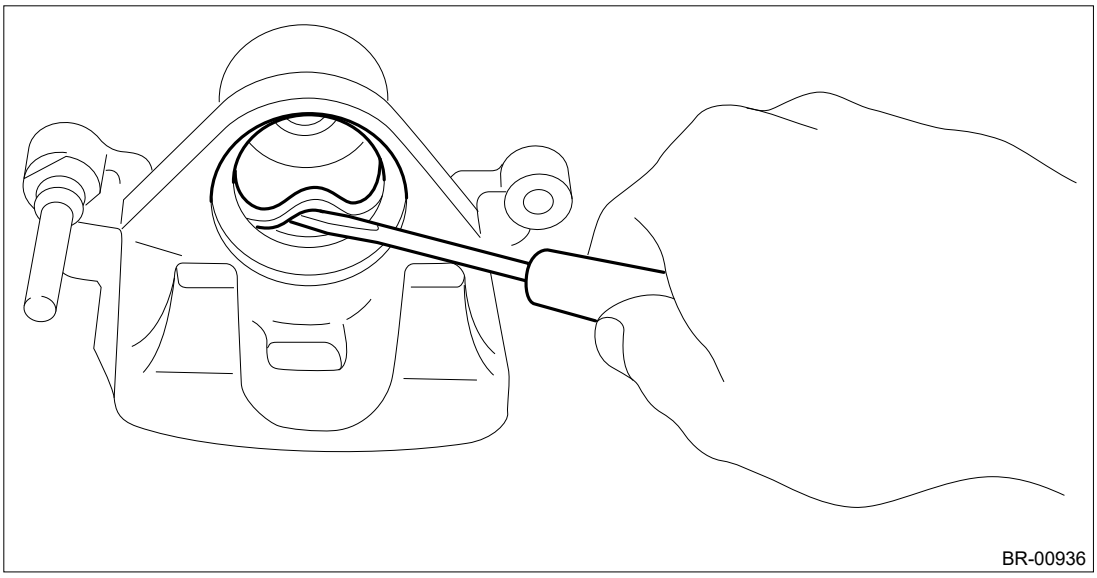
3. Remove the piston - disc brake.
   (1) Place a wooden block in the caliper body assembly as shown in the figure to prevent the piston - disc brake from jumping out and being damaged.
   (2) Using an air gun, gradually apply compressed air via the brake hose installation hole to push out the piston - disc brake.



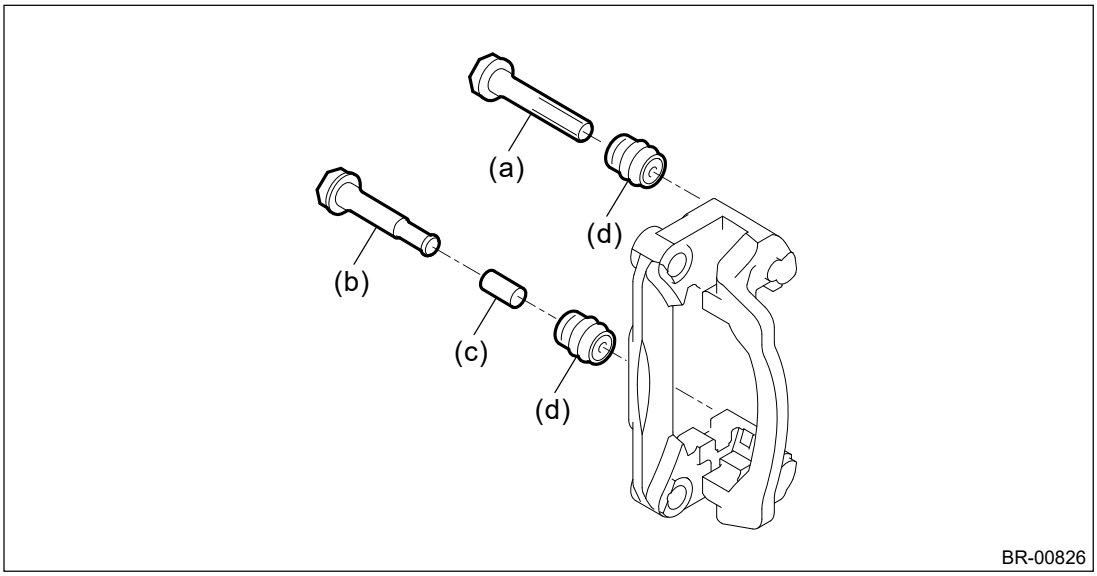
4. Remove the piston seal from caliper body cylinder.

Caution:

Do not damage the cylinder and piston seal groove.



5. Remove the guide pin - rear brake, lock pin - rear brake, lock pin - sleeve, and pin boot from the support - rear disc brake.



(a) Guide pin - rear brake (black)
(b) Lock pin - rear brake (silver)
(c) Lock pin - sleeve
(d) Pin boot

INSPECTION

1. Check the caliper body cylinder and piston - disc brake for uneven wear, damage or rust.
2. Check the rubber parts for damage or deterioration.
3. If faulty is found in the inspection, replace the relevant part.

INSTALLATION

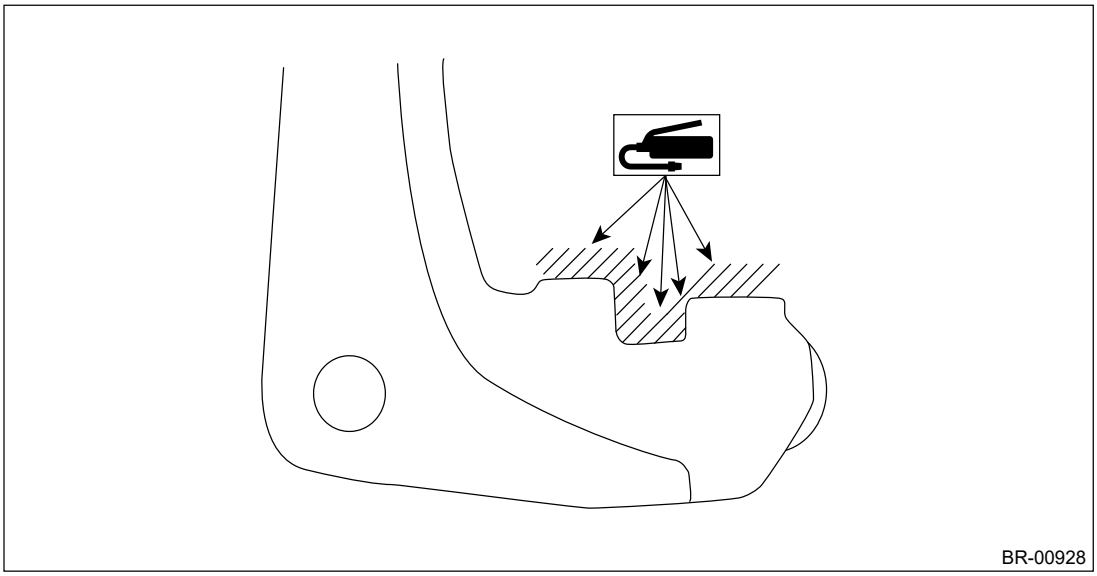
Note:

Before installation, remove the pad clip and remove mud, foreign matter and rust from the caliper body assembly and the support - rear disc brake.

1. Before installation, check each part. Ref. to BRAKE>Rear Disc Brake Assembly>INSPECTION.
2. Apply a thin coat of grease to the support - rear disc brake.

   Grease:

   An item contained in the pad kit, Molykote M7439 or equivalent



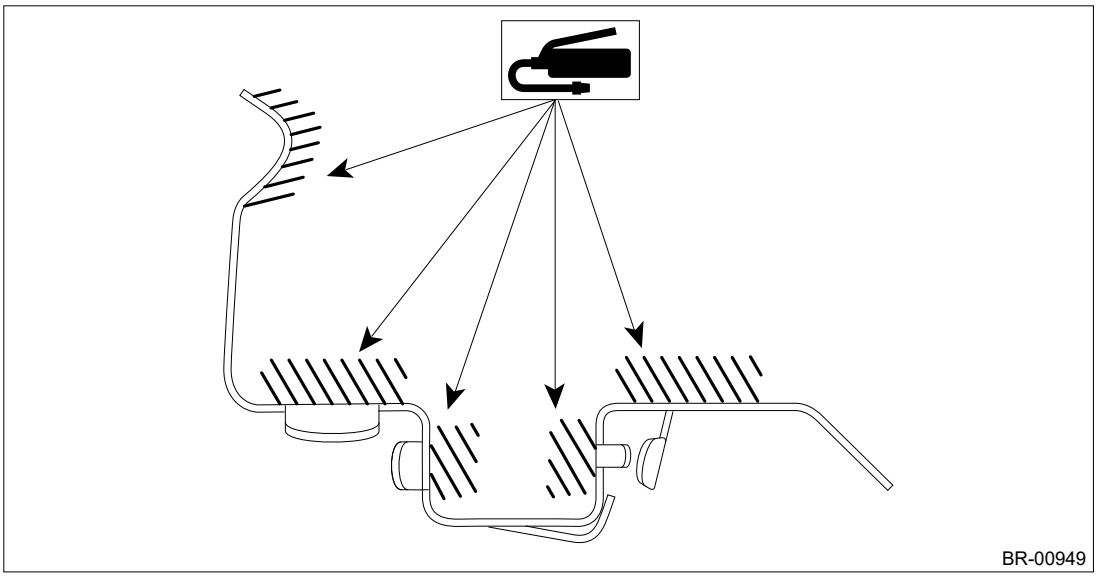
3. Install the support - rear disc brake to the housing assembly - rear axle.

   Tightening torque:

   Mounting bolt: 66 N·m (6.73 kgf-m, 48.7 ft-lb)
4. Apply a thin coat of grease to the pad clip.

   Grease:

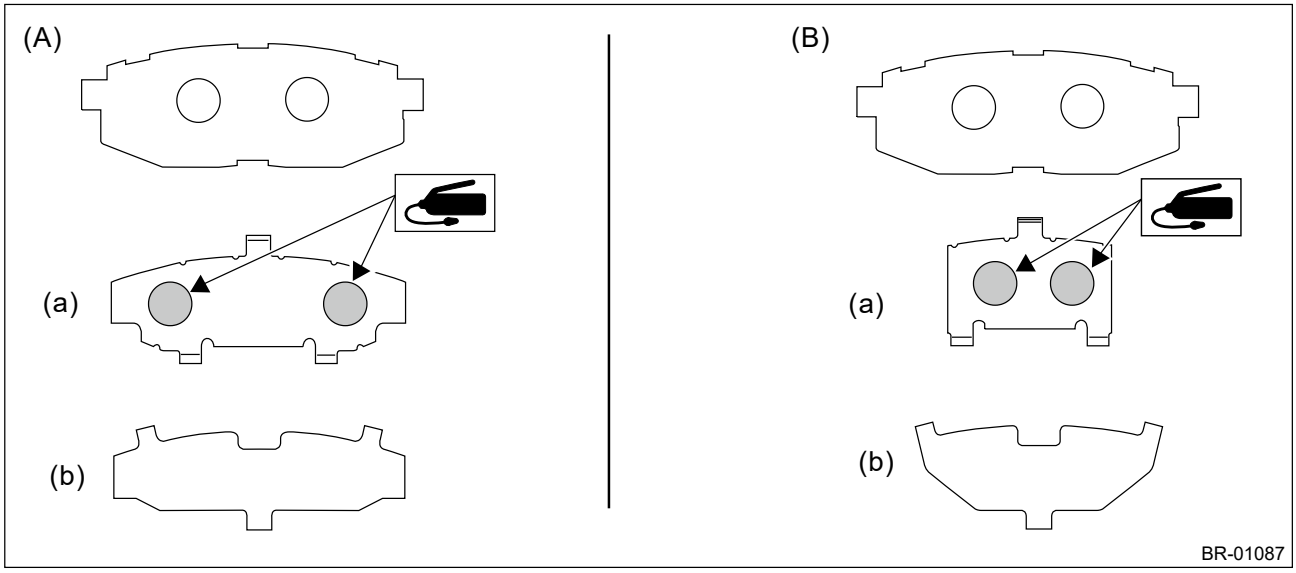
   An item contained in the pad kit, Molykote M7439 or equivalent



5. Apply a thin coat of grease to the shim - disc brake rear inner (a) and the shim - disc brake rear outer (b).

Grease:

Grease contained in the pad kit or WAKO grease V160



(A) Pad - disc brake rear outer (B) Pad - disc brake rear inner

6. Install the pad clip.
7. Press back the piston with a disc brake piston tool as needed.

Caution:

When pressing back the piston, the clearance between pad and disc rotor becomes large, which makes the brake pedal effort softer.

After the installation of rear wheel, be sure to perform the adjustment of the clearance and the pedal effort by depressing the brake pedal several times.

8. Install the brake pad to the support - rear disc brake.
9. Install the caliper body assembly to the support - rear disc brake.

Tightening torque:

Caliper bolt: 27 N·m (2.75 kgf-m, 19.9 ft-lb)

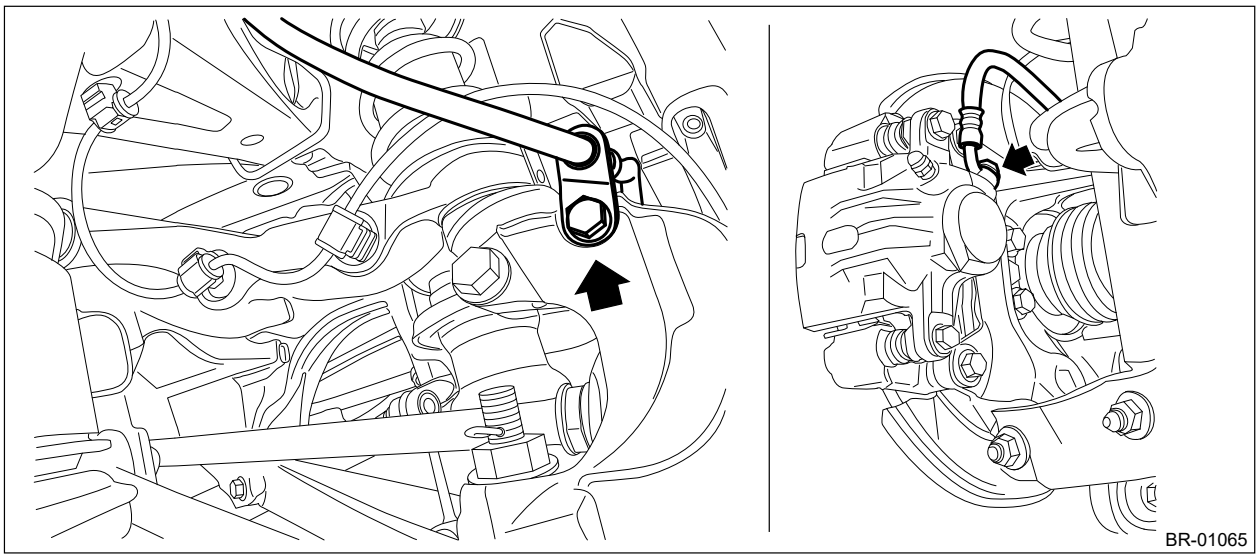
10. Install the brake hose bracket.
    Tightening torque:
    Brake hose bracket: 33 N·m (3.36 kgf-m, 14.3 ft-lb)
11. Connect the brake hose using a new brake hose gasket.
    Tightening torque:
    Union bolt: 26 N·m (2.65 kgf-m, 19.2 ft-lb)
12. Bleed air from the brake system. Ref. to BRAKE>Air Bleeding>PROCEDURE > BRAKE LINE.
13. Install the rear wheels.
    Tightening torque:
    120 N·m (12.24 kgf-m, 88.5 ft-lb)

REMOVAL

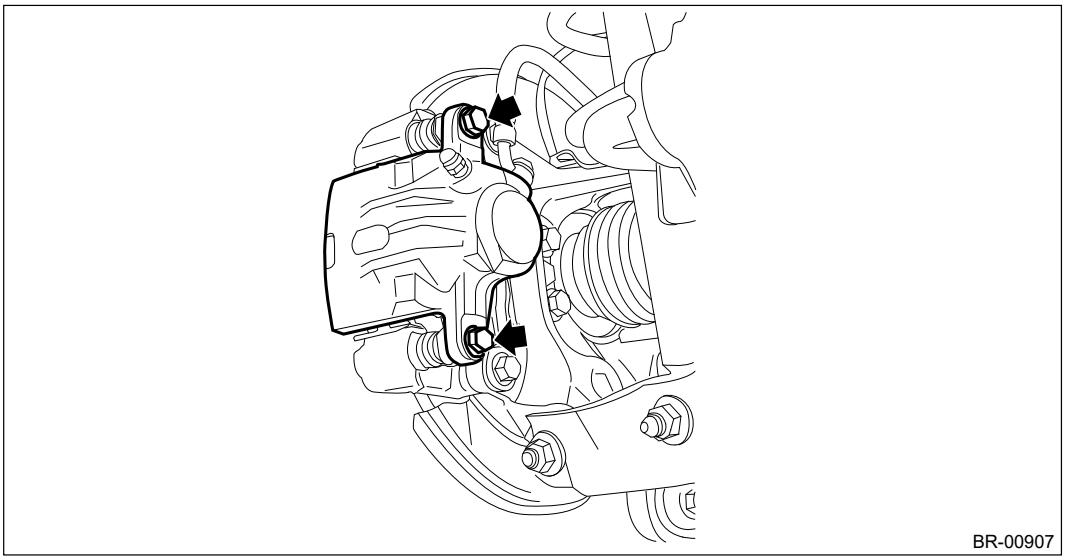
Caution:

Do not allow brake fluid to come in contact with the painted surface of the vehicle body. If it does, wash off with water and wipe away completely.

1. Lift up the vehicle, and then remove the rear wheels.
2. Remove the caliper body assembly from the support - rear disc brake.
   (1) Remove the brake hose bracket and union bolt.



   (2) Remove the caliper bolt, and remove the caliper body assembly.



3. Remove the support - rear disc brake.

Note:

Remove the support - rear disc brake only when replacing the disc rotor or the support - rear disc brake. It is not necessary to remove it when servicing the caliper body assembly.

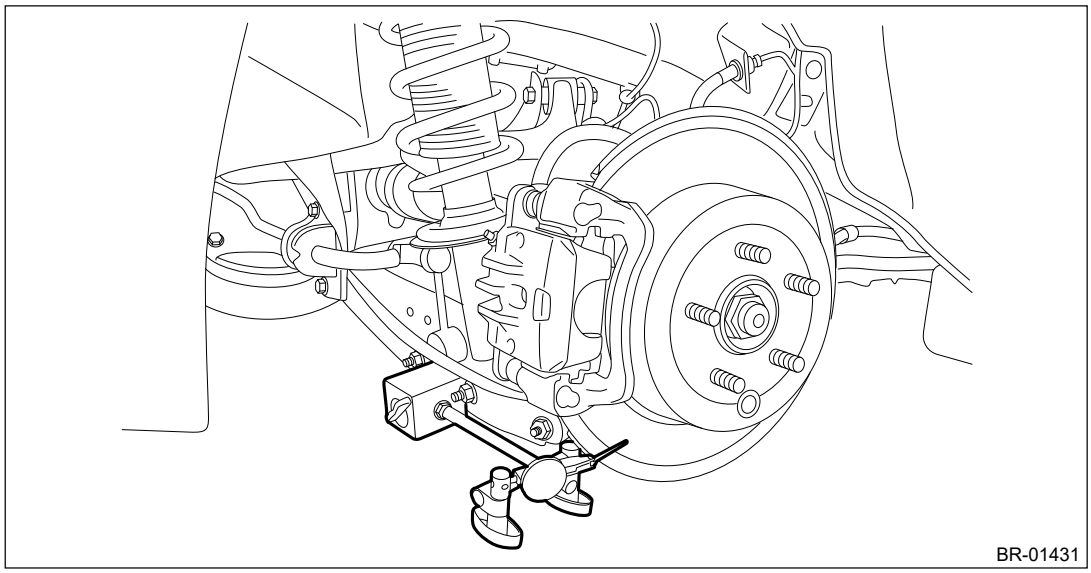
   (1) Remove the brake pad from support - rear disc brake.
   (2) Remove the mounting bolts, and then remove the support - rear disc brake from the housing

assembly - rear axle.

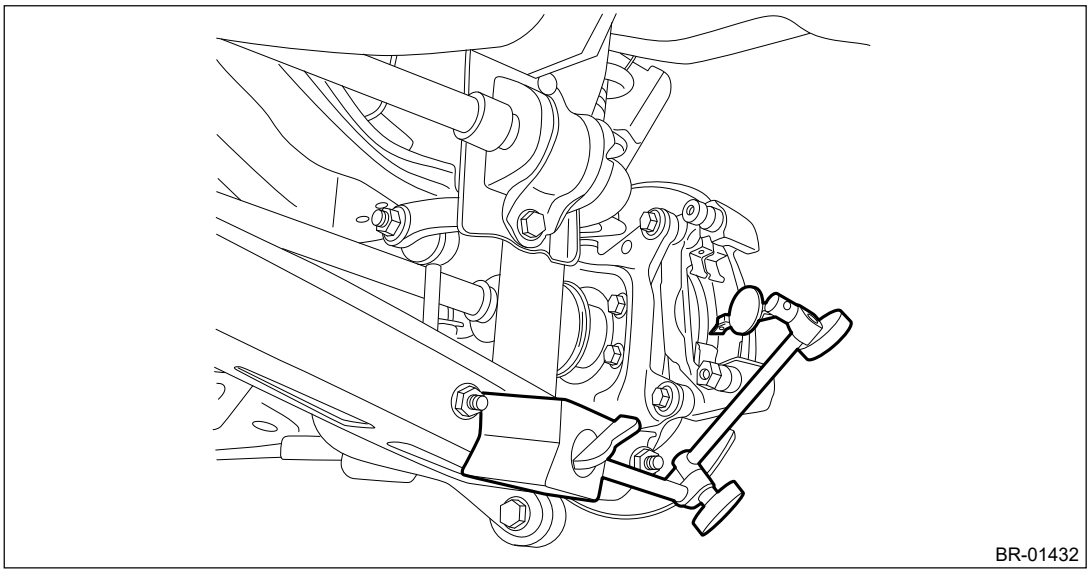
INSPECTION

1. DISC ROTOR RUNOUT CHECK

1. Check the hub unit COMPL - rear axle for free play and runout before the inspection of disc rotor runout limit. Ref. to DRIVE SHAFT SYSTEM>Rear Hub Unit Bearing>INSPECTION.
2. Check the disc rotor runout.
   (1) Remove the caliper body assembly. Ref. to BRAKE>Rear Disc Brake Assembly>REMOVAL.
   (2) Secure the disc rotor by tightening the five wheel nuts.
   (3) Set a dial gauge 10 mm (0.39 in) inward from the disc rotor outer circumference, and check the outer disc rotor runout while rotating the disc rotor.
   Disc rotor runout limit: 0.05 mm (0.002 in)
   Note:
   <Example of magnet stand and dial gauge installation>
   The location where the magnet stand is installed varies to stabilize the magnet stand.



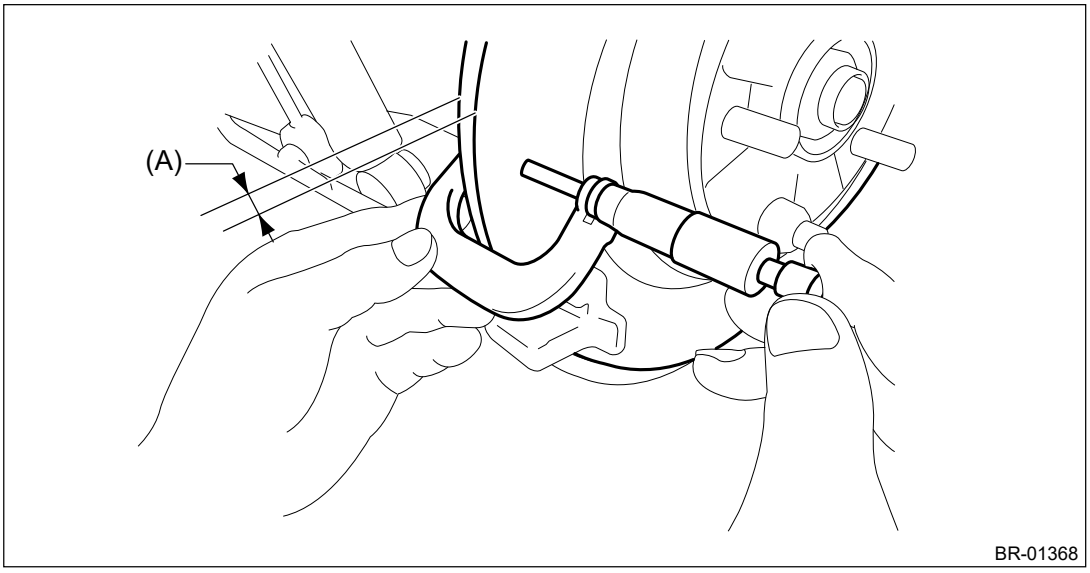
   (4) Set a dial gauge 10 mm (0.39 in) inward from the disc rotor outer circumference, and check the inner disc rotor runout while rotating the disc rotor.
   Disc rotor runout limit: 0.05 mm (0.002 in)
   Note:
   <Example of magnet stand and dial gauge installation>
   The location where the magnet stand is installed varies to stabilize the magnet stand.



3. If the disc rotor runout exceeds service limit, grind the disc rotor.
4. Check the disc rotor thickness after grinding. Ref. to BRAKE>Rear Disc Rotor>INSPECTION > DISC ROTOR THICKNESS CHECK.

2. DISC ROTOR THICKNESS CHECK

1. Set a micrometer 10 mm (0.39 in) inward from the disc rotor outer perimeter, and then measure the disc rotor thickness (A).



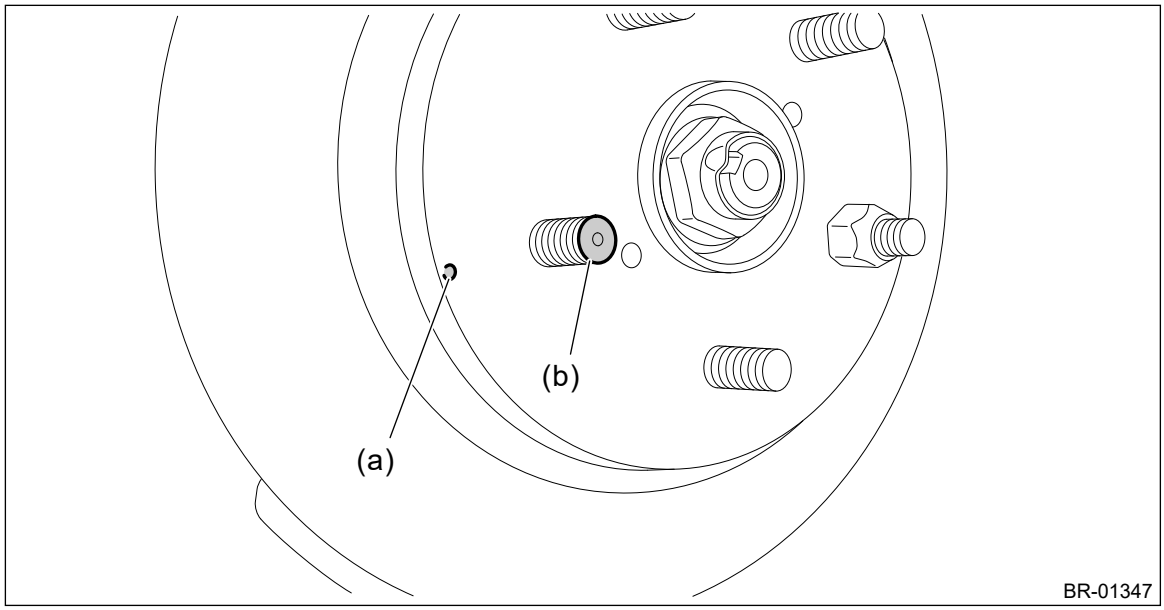
	Disc rotor type	Standard	Wear limit	Disc rotor outer diameter
Disc rotor thickness (A)	Solid disc	10 mm (0.39 in)	8.5 mm (0.33 in)	274 mm (10.79 in)
	Ventilated disc	18 mm (0.71 in)	16 mm (0.63 in)	278 mm (10.94 in)

2. If the wear limit is exceeded in the inspection, replace the disc rotor.

INSTALLATION

Note:
Before installation, remove mud and foreign matter from the caliper body assembly.

1. Before installation, check the rear disc rotor. Ref. to BRAKE>Rear Disc Rotor>INSPECTION.
2. Install each part in the reverse order of removal.
   Note:
   When installing the rear disc rotor, match the alignment mark (a) of the rear disc rotor and the alignment mark (b) of the bolt - hub.

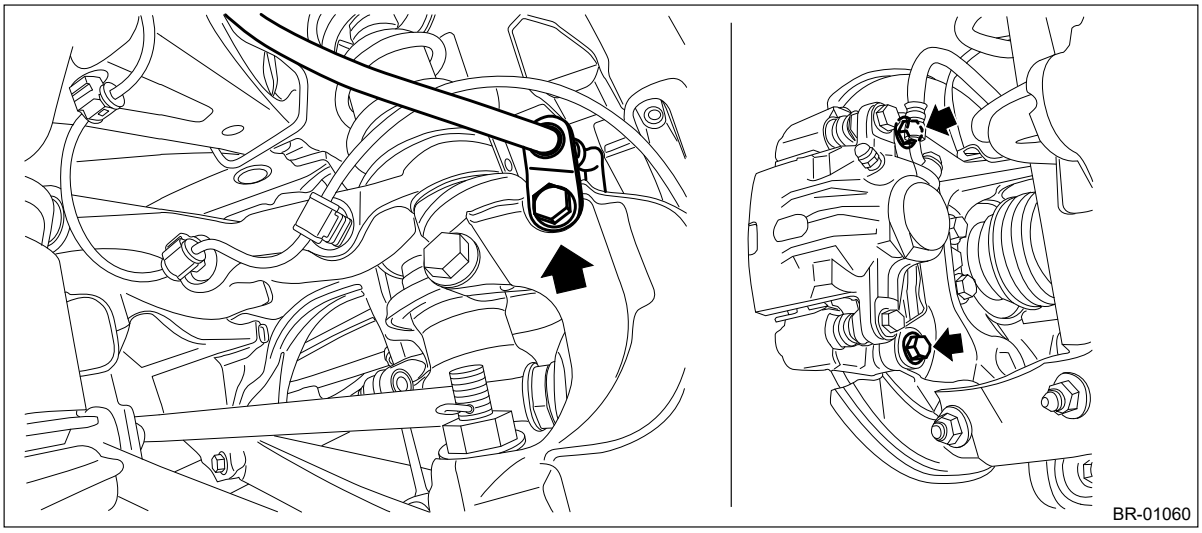


3. Adjust the parking brake. Ref. to PARKING BRAKE>Parking Brake Assembly (Rear Disc Brake)>ADJUSTMENT.

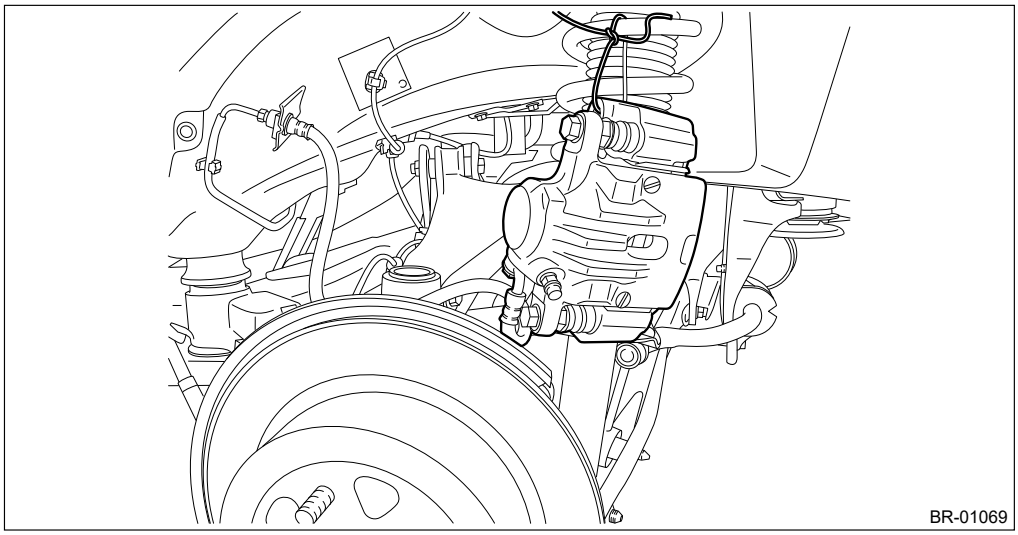
Tightening torque:
Brake hose bracket: 33 N·m (3.36 kgf-m, 24.3 ft-lb)
Mounting bolt: 66 N·m (6.73 kgf-m, 48.7 ft-lb)
Rear wheel: 120 N·m (12.24 kgf-m, 88.5 ft-lb)

REMOVAL

1. Lift up the vehicle, and then remove the rear wheels.
2. Release the lever assembly - hand brake.
3. Remove the caliper body assembly from the housing assembly - rear axle.
   (1) Remove the bolt from the brake hose bracket.
   (2) Remove the mounting bolt, and remove the caliper body assembly.



   (3) Prepare wiring harnesses etc. to be discarded, and suspend the caliper body assembly from the shock absorber with the harnesses.

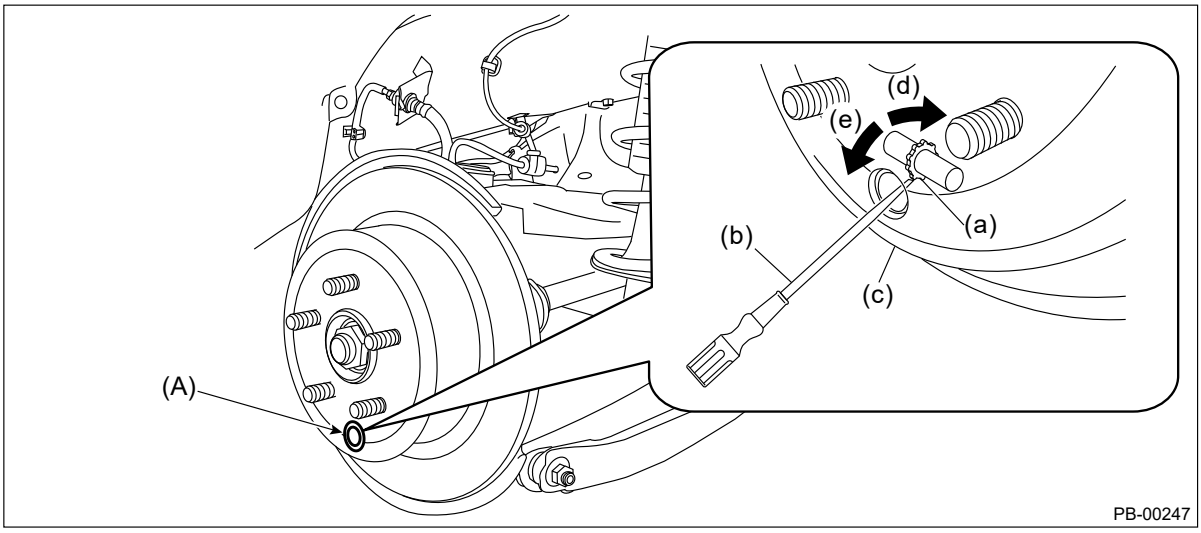


4. Remove the rear disc rotor.

Note:

If it is difficult to remove the disc rotor, perform the following two methods in order.

1. Remove the adjusting hole cover (A), insert the flat tip screwdriver, and rotate the adjuster assembly - rear brake until the brake shoe moves far enough to remove the disc rotor.



(a) Adjuster ASSY - rear brake

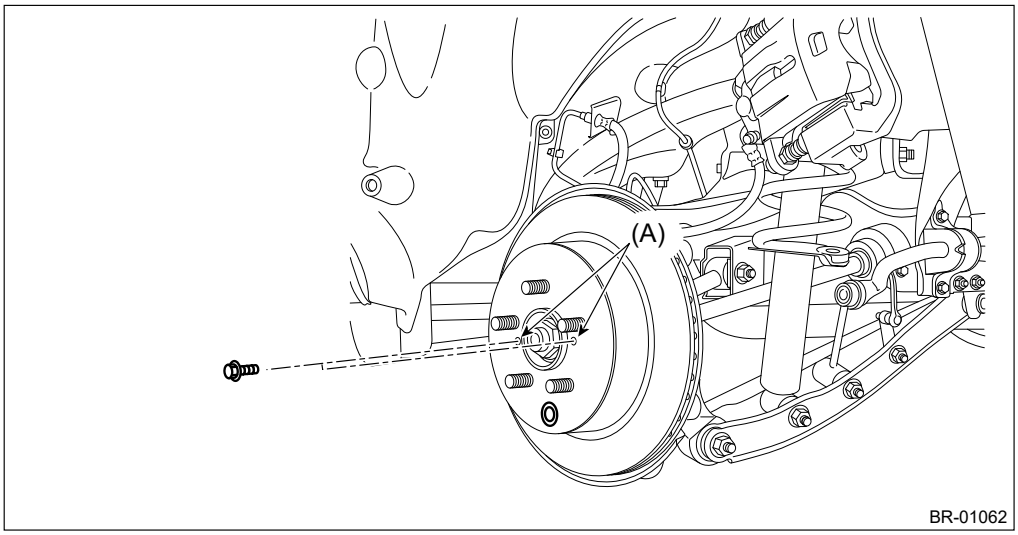
(b) Flat tip screwdriver

(c) Disc rotor

(d) Extend the adjuster ASSY - rear brake

(e) Shorten the adjuster ASSY - rear brake

2. If the disc rotor is not removed after performing above step, screw in an 8 mm (0.31 in) bolt to the threaded part (A) of the disc rotor, and remove the disc rotor.

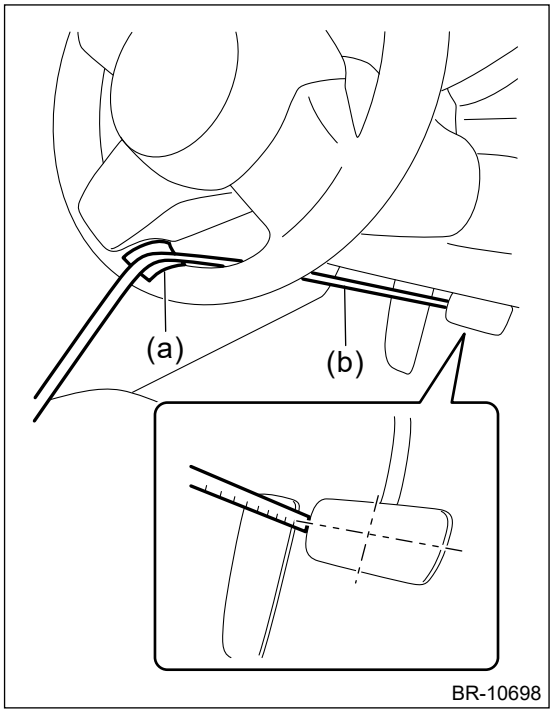


ADJUSTMENT

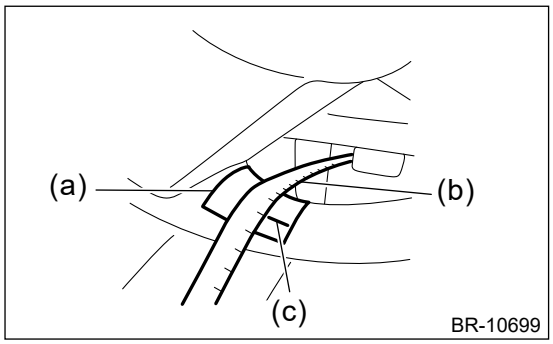
1. Measure the brake pedal stroke which turns on the stop light switch.
   (1) Release the steering wheel lock, tilt the steering column to the lowest end and fully retract the column by the telescopic system.
   (2) Affix the masking tape (a) to protect the steering wheel from damage, pass the measure (b) through the steering wheel and fix it to the vertical center position of the brake pedal.

Caution:

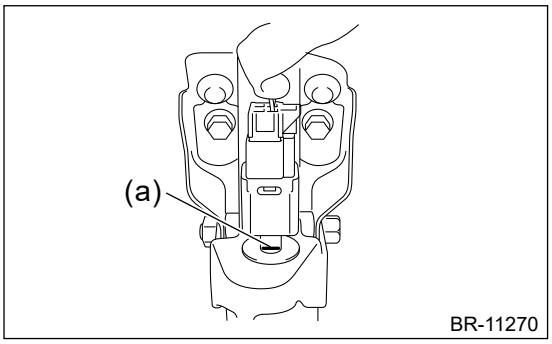
If the measure (b) interferes with the knee airbag module, remove the knee airbag module. **Ref. to AIRBAG SYSTEM>Knee Airbag Module>REMOVAL.**



   (3) Set the measure (b) so that it becomes straight from the brake pedal, and add a marking (c) on the masking tape (a).



   (4) Operate the brake pedal, and read the position where the stop light illuminates (the amount of the pedal stroke) using the marking added in the previous step.
2. Add a making (a) to the threaded portion of the stop light switch.



3. Remove the stop light switch. Ref. to BRAKE>Stop Light Switch>REMOVAL.
4. Adjust the stop light switch so that the position where the stop light illuminates (pedal stroke volume) comes within the standard.

Specification:

4 mm (0.16 in) or more, 6 mm (0.24 in) or less

Caution:

- **If the stop light illuminating position is less than 3 mm (0.12 in), it may lead to an incorrect stop light illumination by vibrations etc. even when the brake pedal is not operated while driving.**
- **Perform the operation while supporting the brake pedal by pulling it upward.**

Note:

- **To adjust the installation position of the stop light switch, shift the threads. By shifting the thread by one pitch, the stop light illumination timing changes 4 mm (0.16 in) — 5 mm (0.2 in). When further precise adjustment is necessary, perform adjustment by the operating rod.**
- **The stop light illumination timing becomes later by pushing in the stop light switch toward the vehicle front, and becomes earlier by pushing in toward the vehicle rear.**

(1) Align the groove of clip with the cutout portion of stop light switch push rod.
(2) Pull up the brake pedal toward you, let the push rod of the stop light switch stroke, and push in the stop light switch until it reaches the stopper.

Caution:

When pushing the stop light switch against the stopper, do not apply excessive force.

(3) Turn the stop light switch clockwise by 45° to secure.

Caution:

The turning torque of stop light switch should be 3 N·m (0.3 kgf-m, 2.2 ft-lb) or less. If it is hard to turn the stop light switch, reduce the switch pushing force and turn it again.

5. When precise adjustment is necessary, perform adjustment by the operating rod.
(1) Loosen the lock nut of the operating rod, and rotate the rod so that the stop light illumination position (pedal stroke volume) comes within the standard value.
(2) Tighten the lock nut.

Tightening torque:

22 N·m (2.24 kgf-m, 16.2 ft-lb)

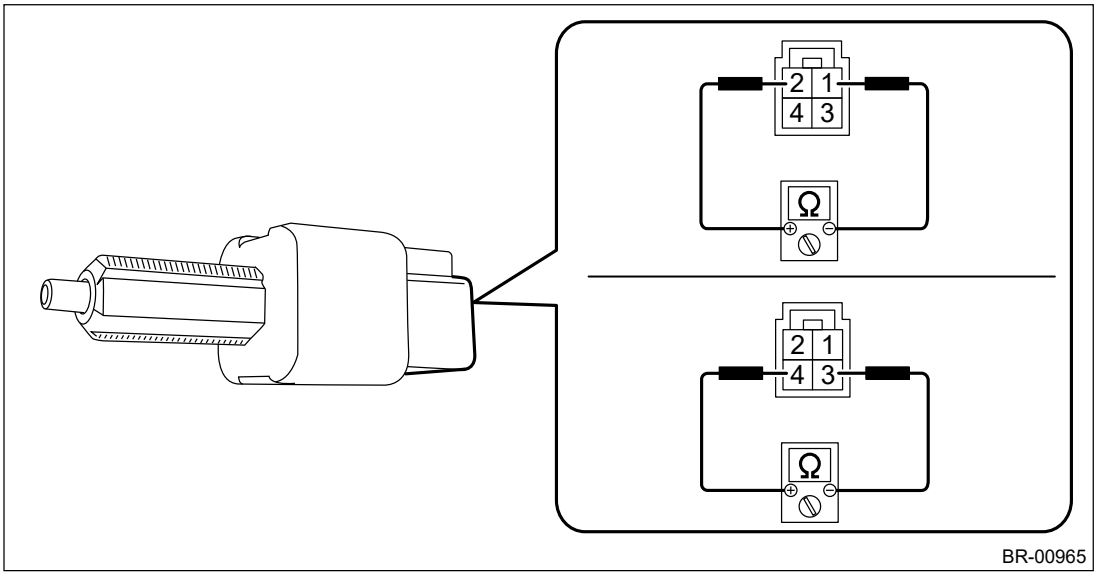
6. After adjustment, make sure that the stop light illuminates normally.

INSPECTION

1. Disconnect the stop light switch connector.
2. Measure the resistance between stop light switch terminals.

   Preparation tool:

   Circuit tester



Terminal No.	Inspection conditions	Standard
1 — 2	When brake pedal is depressed	Less than 1 Ω
	When brake pedal is released	1 MΩ or more
3 — 4	When brake pedal is depressed	1 MΩ or more
	When brake pedal is released	Less than 1 Ω

3. Replace the stop light switch if the inspection result is not within the standard value.

INSTALLATION

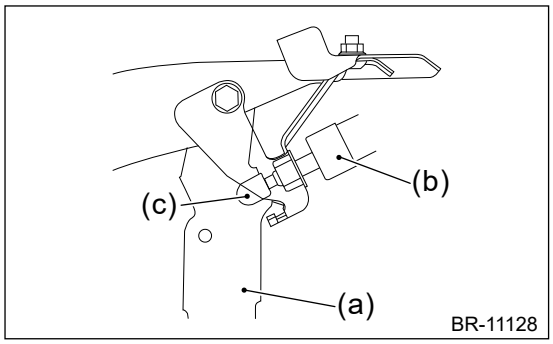
1. Install the stop light switch.

   Caution:

   - **Turn the stop light switch clockwise when installing so that it can return backward by approximately 1 mm (0.04 in) and clearance is automatically adjusted.**
   - **If it is hard to turn the switch, reduce the switch pushing force and turn it again.**

   (1) Align the groove of clip with the cutout portion of stop light switch push rod.

   (2) While pulling up the brake pedal (a) toward you, let the push rod of the stop light switch (b) stroke, and insert it until it reaches the stopper (c).



   (3) Install the stop light switch by turning it clockwise.

   (4) Connect the connector.

2. Adjust the stop light switch position. Ref. to BRAKE>Stop Light Switch>ADJUSTMENT.
3. Install each part in the reverse order of removal.
4. Connect the battery ground terminal. Ref. to NOTE>NOTE > BATTERY.

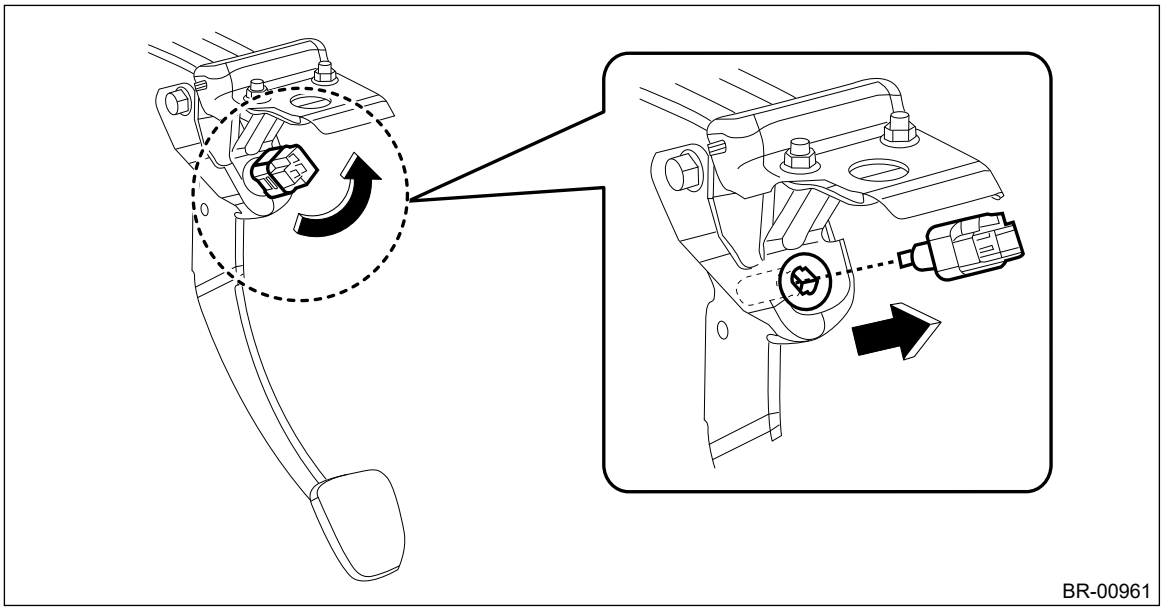
REMOVAL

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to NOTE>NOTE > BATTERY.

   Note:

   For model with battery sensor, disconnect the ground terminal from battery sensor.

2. Remove the cover assembly - instrument panel LWR driver. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.
3. Remove the knee airbag module. Ref. to AIRBAG SYSTEM>Knee Airbag Module>REMOVAL.
4. Remove the stop light switch.
   (1) Disconnect the stop light switch connector.
   (2) Remove the stop light switch by turning it counterclockwise.

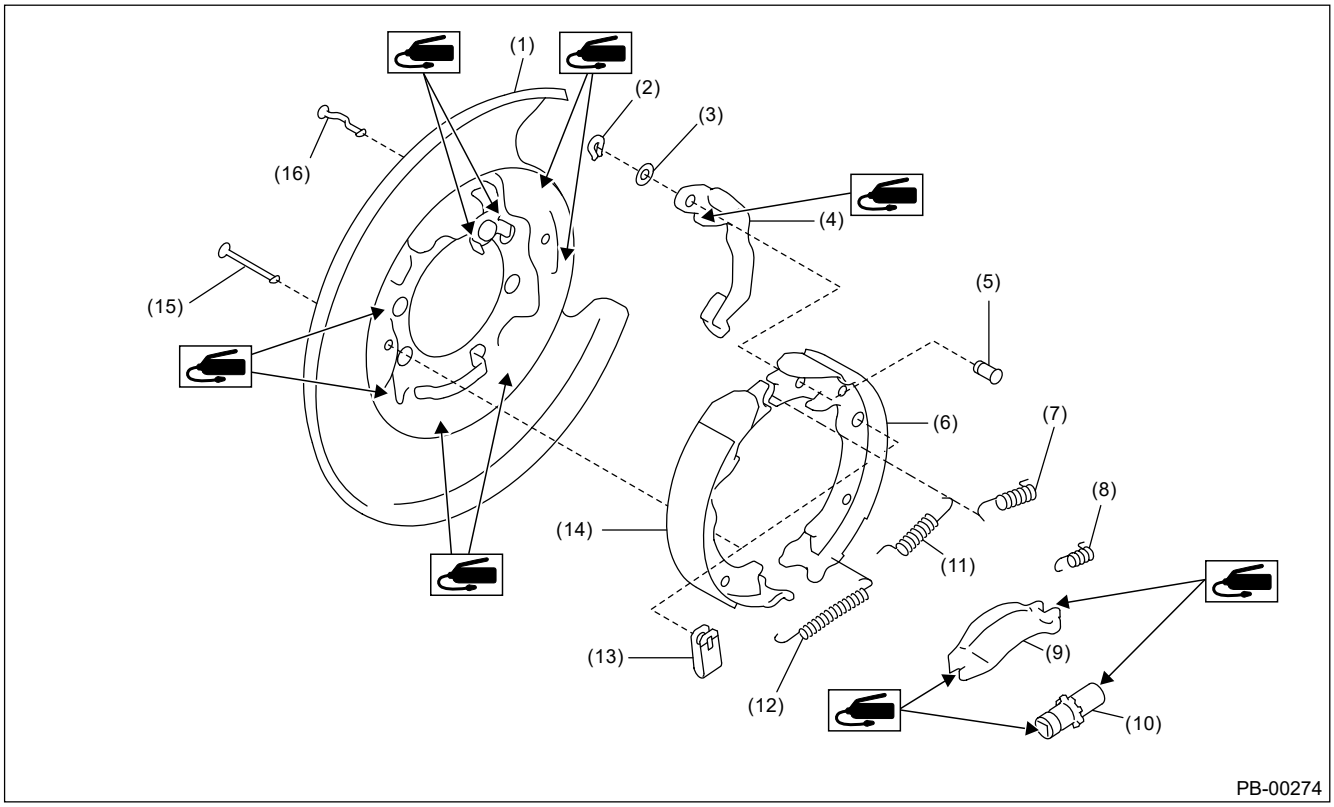


CAUTION

- Wear appropriate work clothing, including a helmet, protective goggles and protective shoes when performing any work.
- Before removal, installation or disassembly, be sure to clarify the failure. Avoid unnecessary removal, installation, disassembly and replacement.
- Vehicle components are extremely hot after driving. Be wary of receiving burns from heated parts.
- Use SUBARU genuine grease etc. or equivalent. Do not mix grease etc. of different grades or manufacturers.
- Be sure to tighten fasteners including bolts and nuts to the specified torque.
- Place shop jacks or rigid racks at the specified points.
- Make sure grease does not come into contact with the parking shoes.

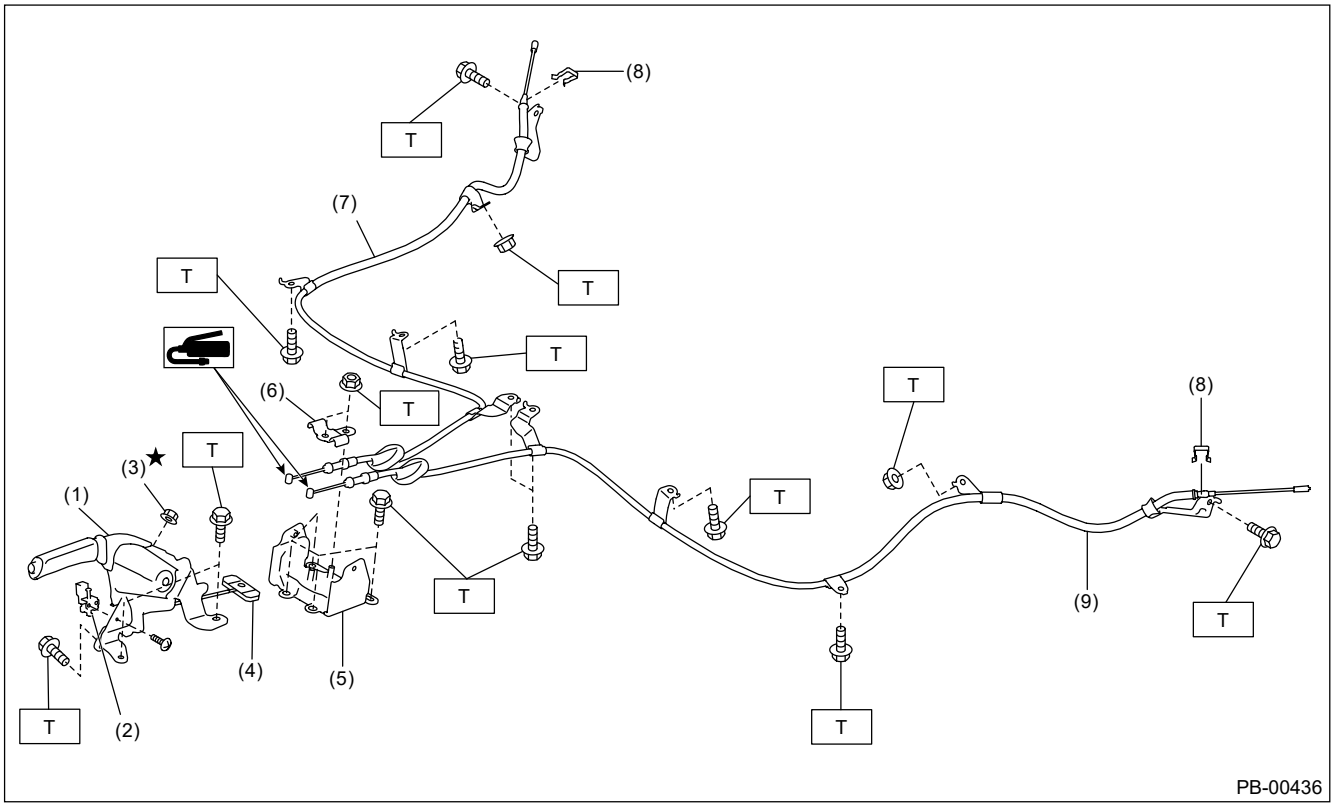
COMPONENT

1. PARKING BRAKE (REAR DISC BRAKE)



(1) Back plate - rear brake
(2) Retainer - rear brake
(3) Spring washer - rear brake
(4) Parking lever - rear
(5) Pin - parking lever
(6) Parking brake shoe (secondary)
(7) Spring - secondary shoe return
(8) Spring - strut
(9) Strut - brake
(10) Adjuster ASSY - rear brake
(11) Spring - primary shoe return
(12) Spring - adjuster
(13) Cup - shoe hold-down
(14) Parking brake shoe (primary)
(15) Pin - primary shoe hold-down
(16) Pin - secondary shoe hold-down

2. PARKING BRAKE LEVER & CABLE



(1) Lever ASSY - hand brake
(2) Switch ASSY - hand brake
(3) Adjusting nut (self-locking nut)
(4) Equalizer
(5) Bracket
(6) Clamp A - hand brake cable
(7) Cable ASSY - parking brake RH
(8) Clamp B - hand brake cable
(9) Cable ASSY - parking brake LH

Tightening torque: N·m (kgf-m, ft-lb)

T: 18 (1.84, 13.3)

PREPARATION TOOL

1. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.

SPECIFICATION

[Model]		Rear disc brake
Type		Mechanical, drum in disc rear brakes
Effective drum diameter	mm (in)	170 (6.69)
Lining dimensions (Length × Width × Thickness)	mm (in)	147.7×30.0×3.5 (5.81×1.181×0.14)
Clearance adjustment		Manual adjustment
Lever stroke	Notches/N (kgf, lbf)	7 — 8/200 (20.4, 45)

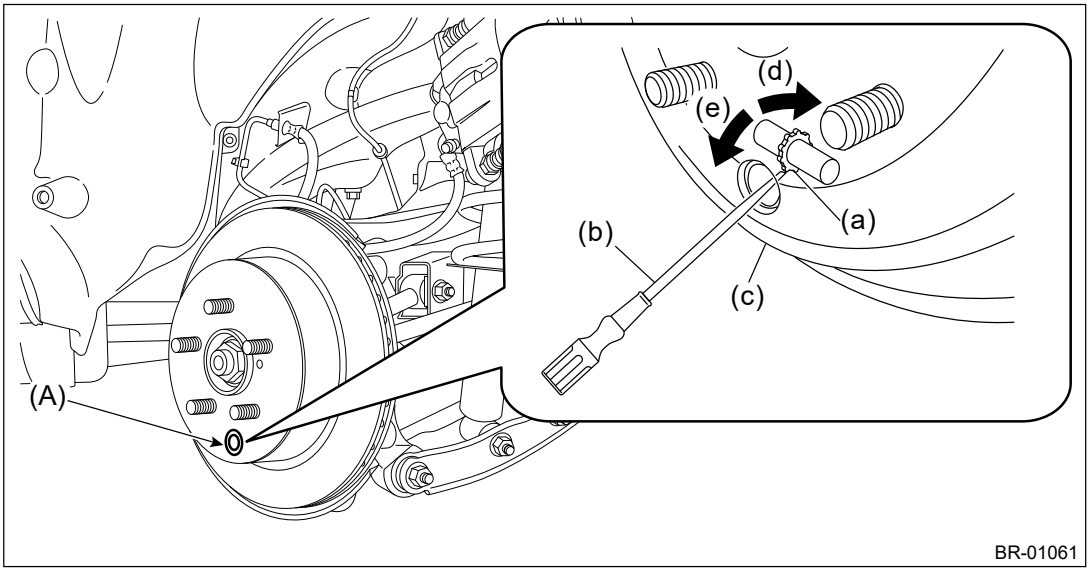
INSPECTION

Symptoms	Possible cause	Corrective action
Brake drag	Lever assembly - hand brake is maladjusted.	Adjust.
	Parking brake cable does not move.	Repair or replace.
	Parking brake shoe clearance is maladjusted.	Adjust.
	Spring - shoe return is faulty.	Replace.
Noise from brake	Spring - shoe return is faulty.	Replace.
	Cup - shoe hold-down is faulty.	Replace.

ADJUSTMENT

1. SHOE CLEARANCE

1. Return the lever assembly - hand brake completely.
2. Loosen the adjusting nut, and make the cable free.
3. Remove the adjusting hole cover (A) from the rear disc rotor.
4. Insert a flat tip screwdriver (b) into the brake adjustment hole (A), and rotate the adjuster assembly - rear brake (a) until the disc rotor cannot be turned by hand.

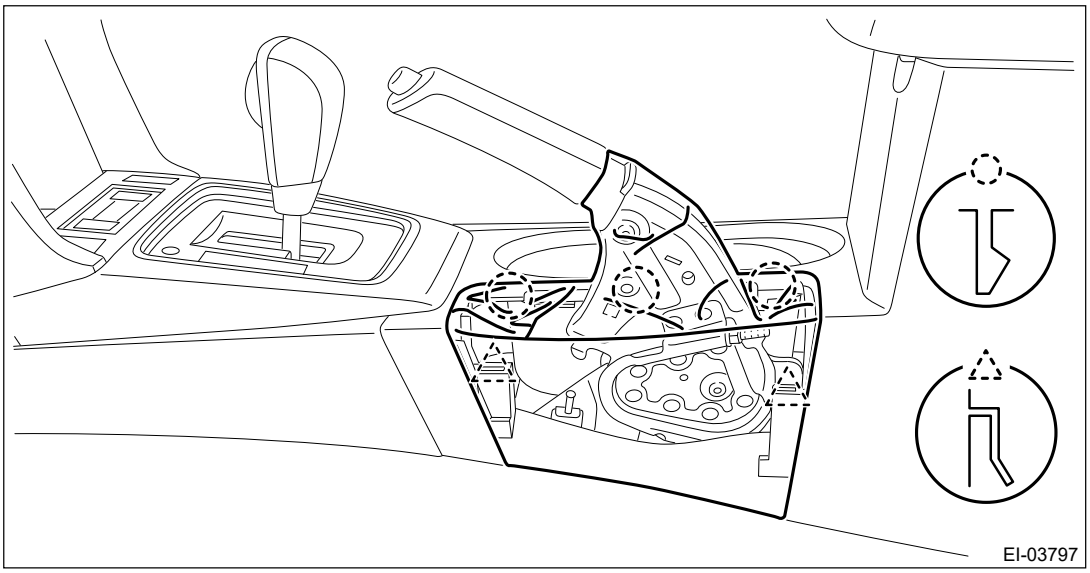


(a) Adjuster ASSY - rear brake
(b) Flat tip screwdriver
(c) Disc rotor
(d) Extend the adjuster ASSY - rear brake
(e) Shorten the adjuster ASSY - rear brake

5. Loosen the adjuster assembly - rear brake by 10 notches in the direction of the arrow (e).
   Caution:
   - **Check there is no brake drag.**
   - **Make sure that the adjuster assembly - rear brake is loosened by 10 notches. If it is not loosened sufficiently, dragging may occur.**
6. Install the adjusting hole cover to the disc rotor.
7. Adjust the parking lever stroke. Ref. to PARKING BRAKE>Parking Brake Assembly (Rear Disc Brake)>ADJUSTMENT > LEVER STROKE.

2. LEVER STROKE

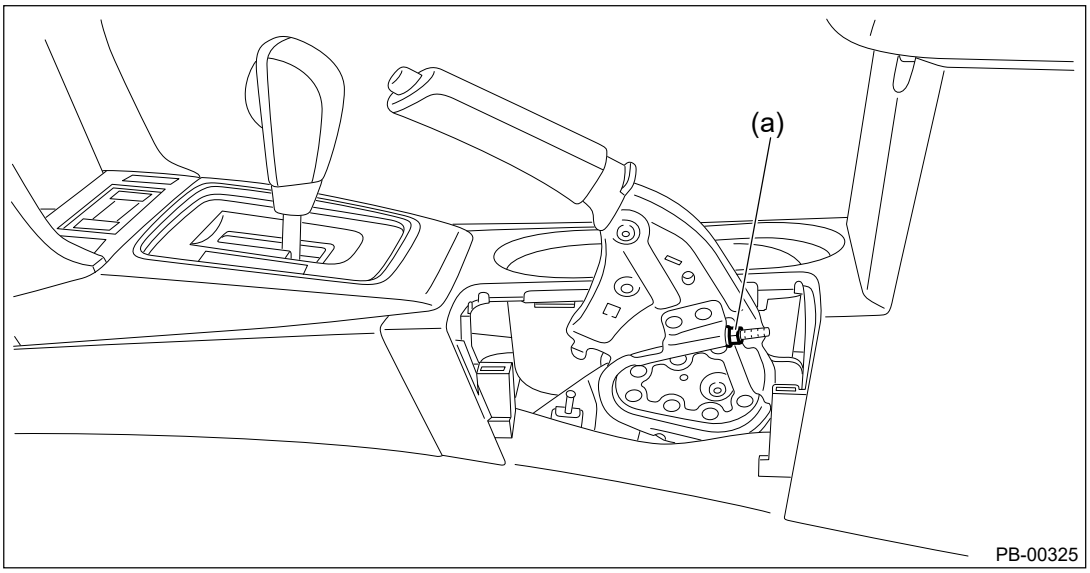
1. Adjust the shoe clearance before adjusting lever stroke. Ref. to PARKING BRAKE>Parking Brake Assembly (Rear Disc Brake)>ADJUSTMENT > SHOE CLEARANCE.
2. Release the claws, and then remove the boot - parking brake.



3. Pull the lever assembly - hand brake hard 3 to 5 times.
4. Turn the adjusting nut (a) until the lever stroke is at the specified value.

Lever stroke:

7 to 8 notches when pulled with a force of 200 N (20.4 kgf, 45 lbf)



5. Check there is no parking brake drag.
6. Check that the brake warning light illuminates when the lever assembly - hand brake is operated.

Note:

The light must illuminate when the first notch is reached after pulling the lever.

7. Install the boot - parking brake.

INSPECTION

1. Measure the inner diameter of the rear disc rotor. If scoring or worn is found on the disc, replace the rear disc rotor.
   Disc rotor inner diameter:
   Specification: 170 mm (6.69 in)
   Service limit: 171 mm (6.73 in)
2. Measure the lining thickness. If it exceeds the limit, replace the brake shoe.
   Lining thickness:
   Specification: 3.5 mm (0.14 in)
   Service limit: 1.5 mm (0.059 in)
   Note:
   Replace the right and left parking brake shoe as a set.

INSTALLATION

Caution:

Be sure the lining surface is free from brake fluid and grease.

1. Apply brake grease to the following locations.

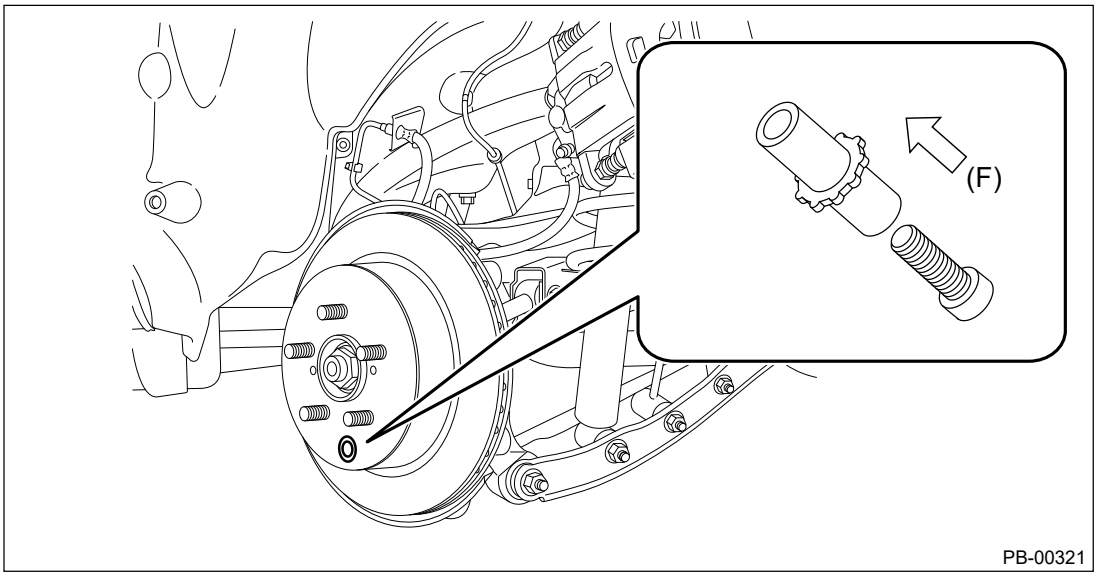
   Brake grease:

   Molykote 44MA (Part No. 26648FJ000) or equivalent

   - Six contact surfaces of the parking brake shoe rim and back plate - rear brake
   - Contact surface of the parking brake shoe and the anchor pin
   - Contact surface of the parking lever assembly - rear and the strut - brake
   - Contact surface of the parking brake shoe and the adjuster assembly - rear brake
   - Contact surface of the parking brake shoe and the strut - brake
   - Contact surface of the parking lever - rear and the parking brake shoe
2. Install the spring washer - rear brake and the lever to the secondary side parking brake shoe pin, and lock the retainer - rear brake securely.
3. Install the cable assembly - parking brake to the lever.
4. Attach the adjuster assembly - rear brake and the spring - adjuster to the parking brake shoe.

   Note:

   Install the adjuster assembly - rear brake with the screw section facing to the direction shown in the figure below.



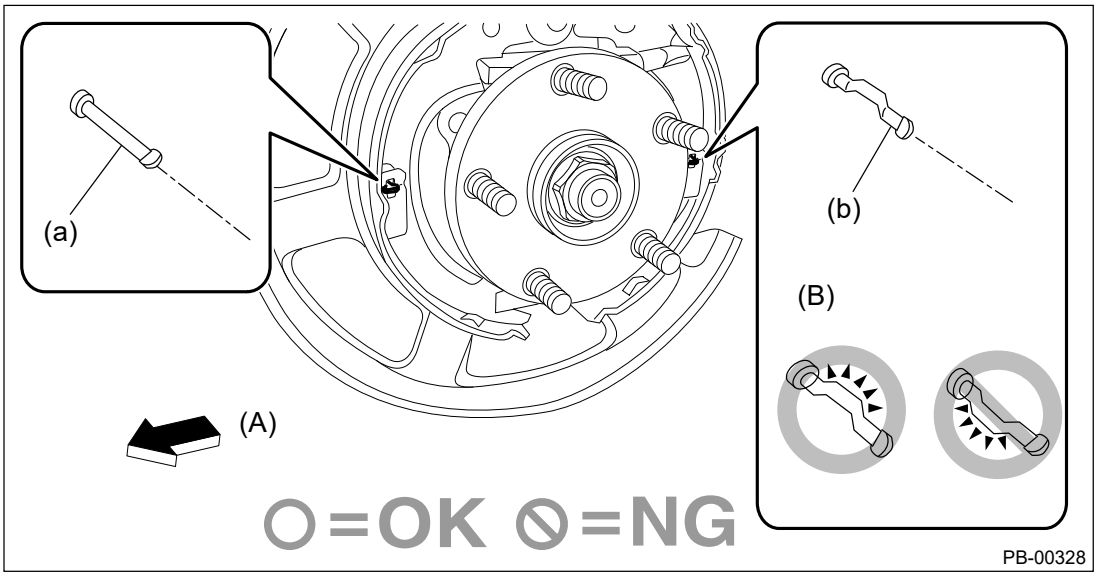
(F) Left wheel: front side of vehicle, right wheel: rear side of vehicle

5. Check that the cable assembly - parking brake does not fall from the cable guide.
6. Install the parking brake shoes to the back plate - rear brake with the pins - shoe hold-down and the cups - shoe hold-down.

   Note:

   - **Do not reversely install the pin - primary shoe hold-down (a) and the pin - secondary shoe hold-down (b).**

- **When installing the pin - secondary shoe hold-down (b), face the convex portion to the rear of the vehicle not to contact with the parking lever - rear.**



(A) Front side of vehicle

(B) Orientation of pin - shoe hold-down relative to the front of the vehicle

7. Install the strut - brake and the spring - strut to the parking brake shoes.

Note:

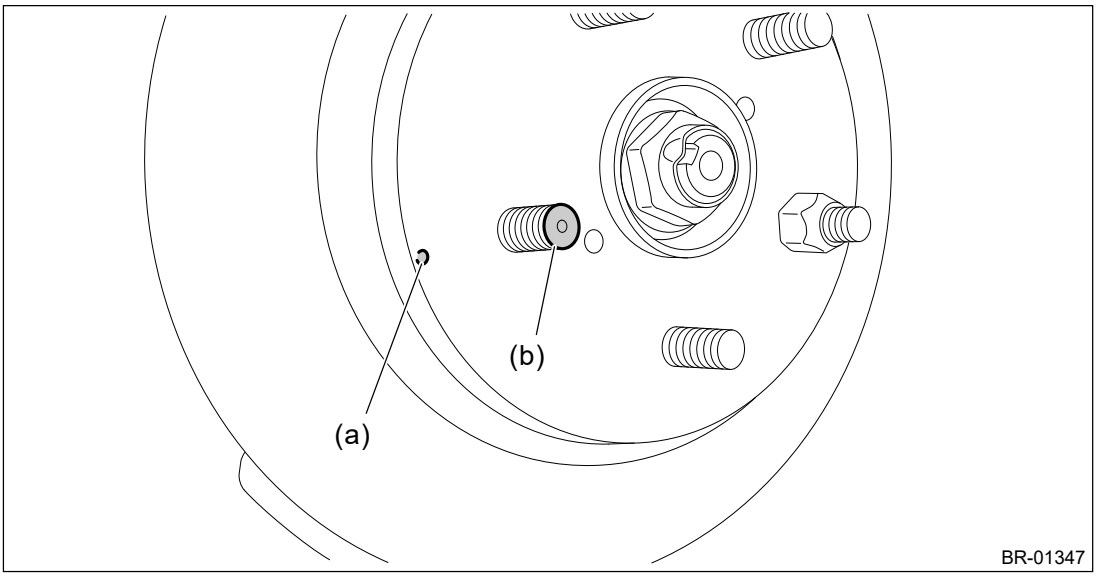
Install the spring - strut so that it comes towards the front side of the vehicle.

8. Install the return springs on the primary side first, and then the secondary side.

9. Install the brake disc rotor and the brake caliper assembly.

Note:

When installing the rear disc rotor, match the alignment mark (a) of the rear disc rotor and the alignment mark (b) of the bolt - hub.



10. Install the brake hose bracket.

Tightening torque:

Refer to "COMPONENT" of "General Description". Ref. to BRAKE>General Description>COMPONENT.

11. Adjust the parking brake. Ref. to PARKING BRAKE>Parking Brake Assembly (Rear Disc Brake)>ADJUSTMENT.

12. Install the rear wheels.

Tightening torque:

120 N·m (12.24 kgf-m, 88.5 ft-lb)

13. If new parking brake shoes are replaced, drive the vehicle to break-in the parking brake lining.

(1) Drive the vehicle at approximately 35 km/h (22 MPH) or more.

(2) While pressing the button of lever assembly - hand brake, pull the lever assembly - hand brake with a force of 150 N (15.3 kgf, 33.7 lbf).

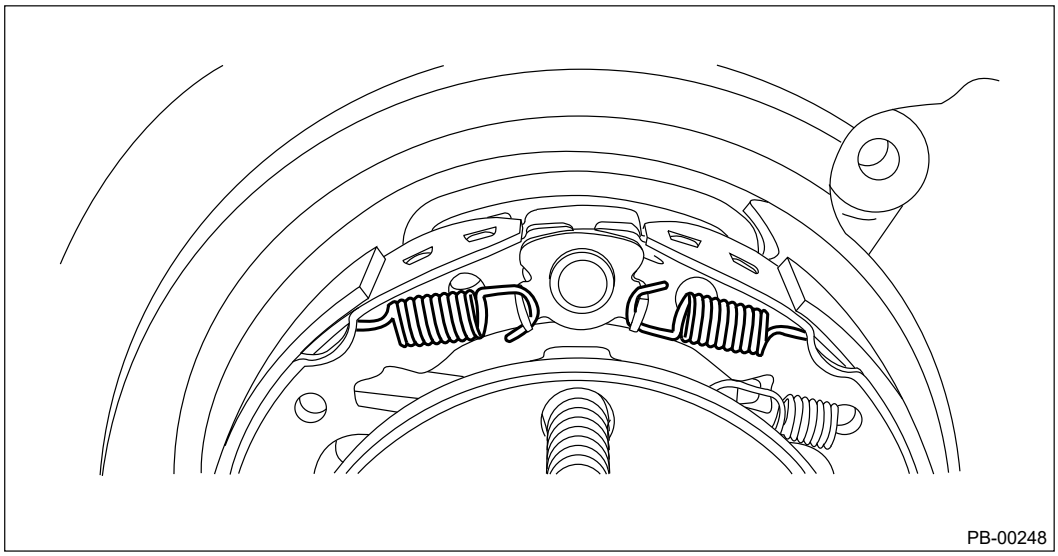
(3) Drive the vehicle for about 200 m (0.12 mile) in this condition.

(4) Wait 5 to 10 minutes for the parking brake to cool down. Repeat steps (1) through (3) again.

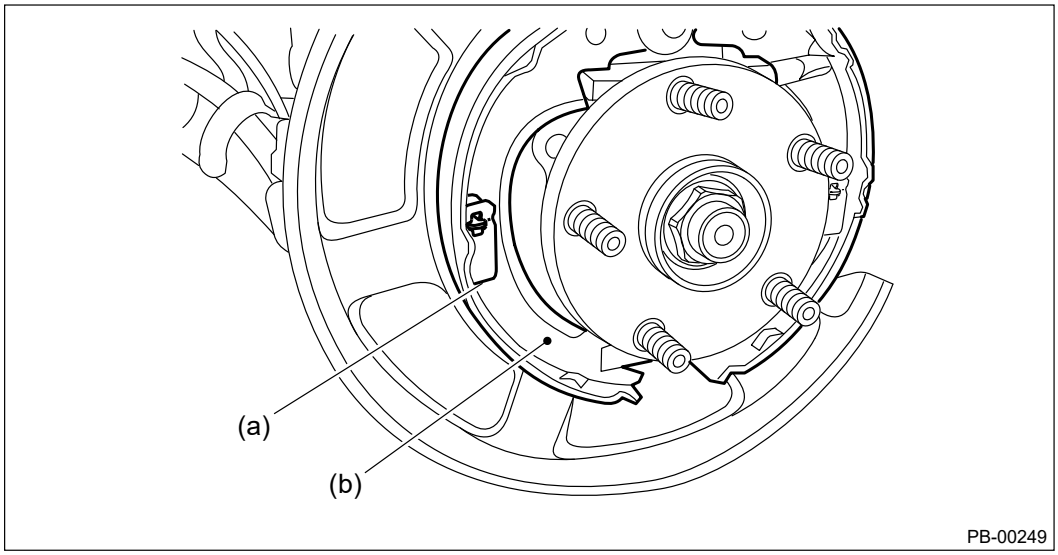
(5) After breaking-in, re-adjust the parking brakes.

REMOVAL

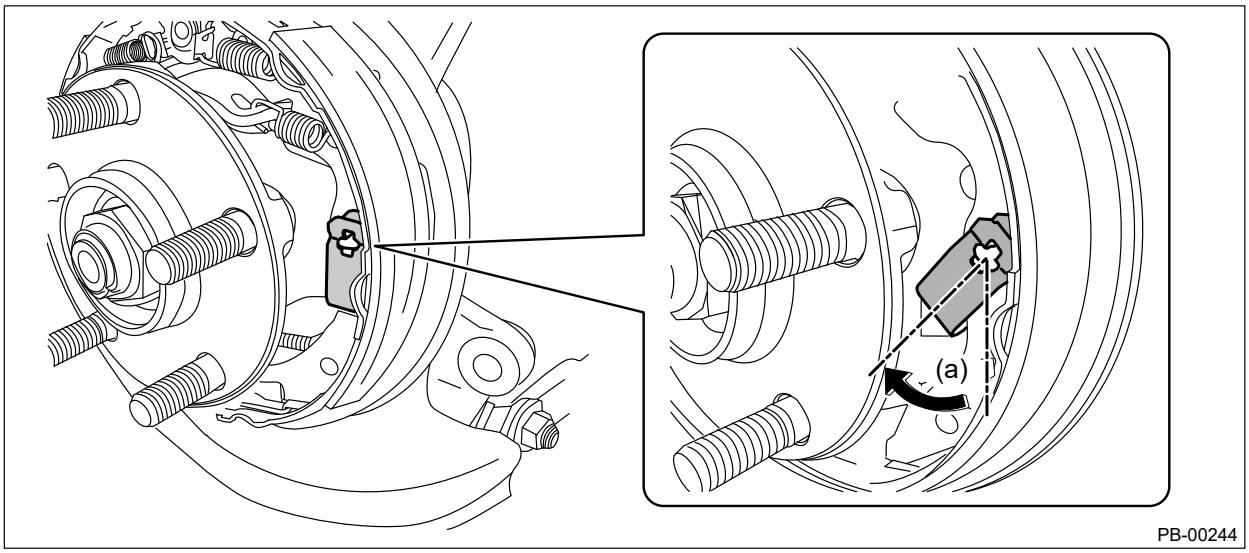
1. Release the parking brake.
2. Lift up the vehicle, and then remove the rear wheels.
3. Remove the brake hose bracket.
4. Remove the rear disc rotor. Ref. to BRAKE>Rear Disc Rotor>REMOVAL.
5. Remove the spring - primary shoe return and the spring - secondary shoe return.



6. Remove the parking brake shoe on the primary side.
   (1) Remove the cup - shoe hold-down (a) and the spring - adjuster, and remove the parking brake shoe (b).

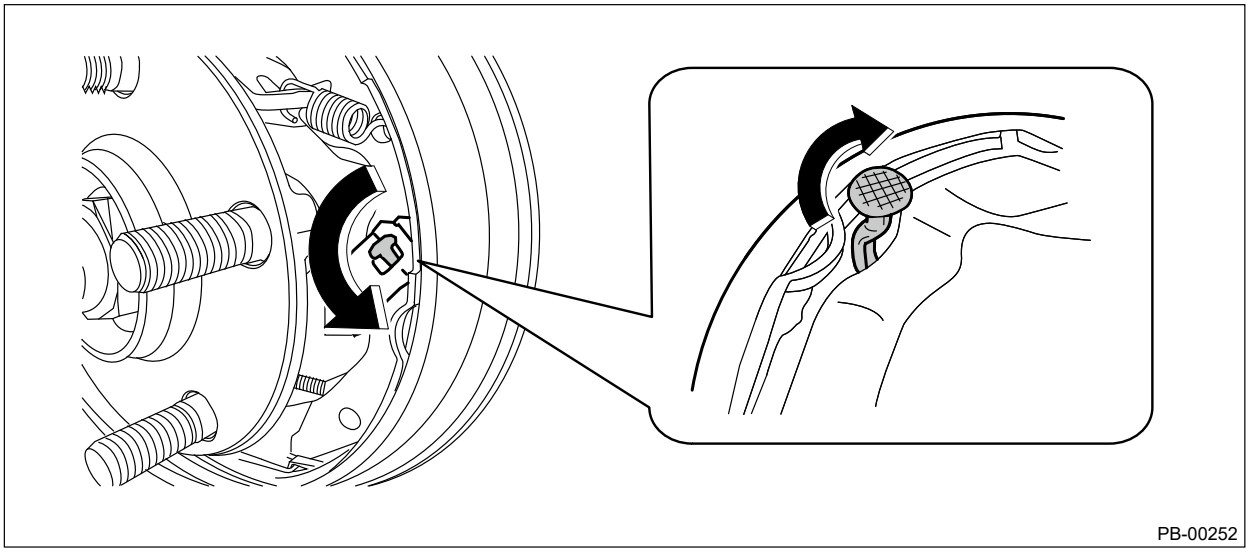


   (2) Remove the strut - brake and the spring - strut.
   (3) Remove the adjuster assembly - rear brake.
7. Remove the parking brake shoe on the secondary side.
   (1) Rotate the cup - shoe hold-down in the direction of the front side of the vehicle.

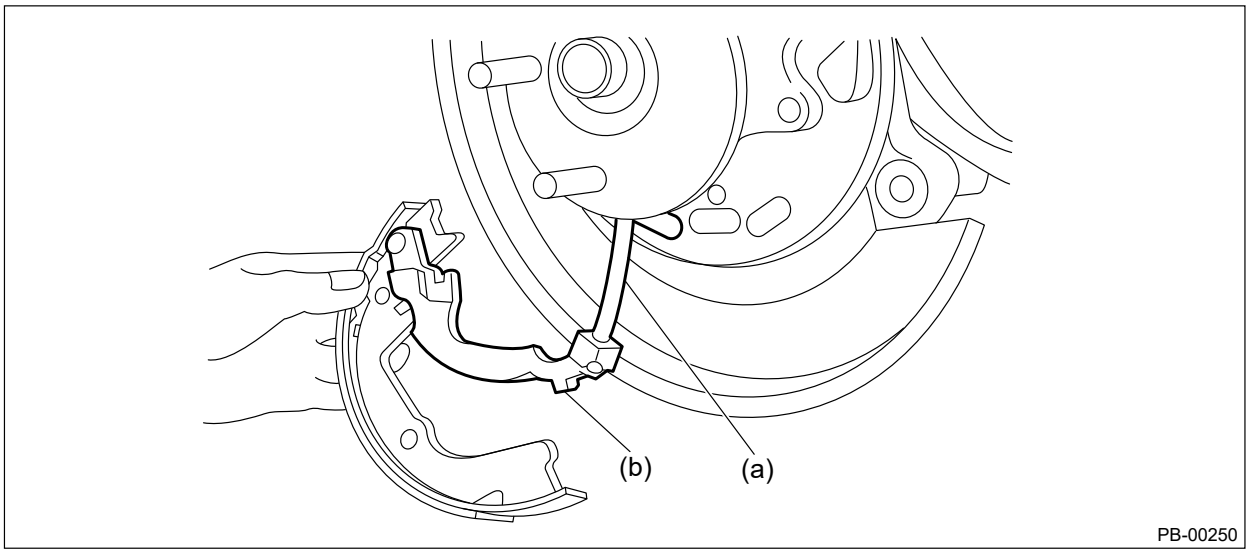


(a) Approx. 45°

(2) Press and shorten the cup - shoe hold-down.
(3) Rotate the pin - secondary shoe hold-down in the opposite direction, and pull out the pin - shoe hold-down.



8. Remove the cable assembly - hand brake cable (a) from the parking lever - rear (b).



9. Remove the retainer - rear brake from the secondary side parking brake shoe. Remove the parking lever - rear from the brake shoe.

INSPECTION

Check the removed cable and replace if damaged, rusty or malfunctioning.

1. Check the cable for smooth operation.
2. Check the inner cable for damage and rust.
3. Check the outer cable for damage, bends and cracks.

INSTALLATION

1. Install each part in the reverse order of removal.

   Caution:

   Do not reuse the nut (self locking nut). Always replace with a new part.

   Tightening torque:

   Fuel tank protector: Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Tank Protector>REMOVAL.

   Cable clamp: 18 N•m (1.84 kgf-m, 13.3 ft-lb)

   Rear wheel: 120 N•m (12.24 kgf-m, 88.5 ft-lb)

   Note:

   - **Apply grease to the cable guide inside the tunnel, and pass the cable through.**
   - **After installing the backrest assembly, make sure that each seat belt operates normally.**
   - **Make sure that they are properly secured on each hook on the vehicle side.**

2. Connect the battery ground terminal. Ref. to NOTE>NOTE > BATTERY.
3. Be sure to adjust the lever stroke. Ref. to PARKING BRAKE>Parking Brake Lever>ADJUSTMENT.

REMOVAL

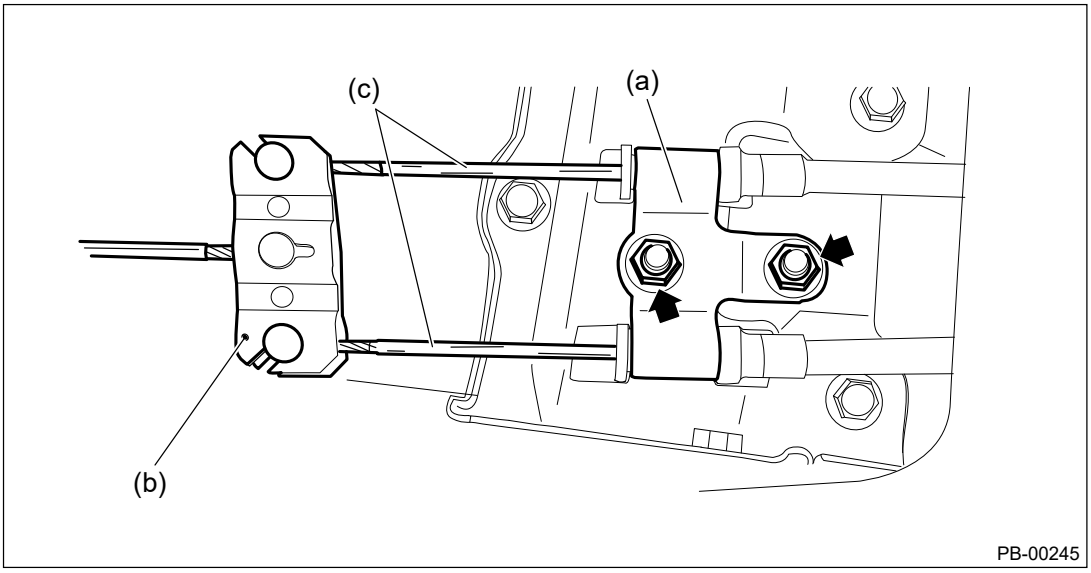
Caution:

- **Refer to "CAUTION" of "General Description" before handling the airbag system components. Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **The airbag system is fitted with a backup power supply. After disconnecting the battery ground cable, the airbag may operate if you do not wait for 60 seconds before starting the service of airbag system.**

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to NOTE>NOTE > BATTERY.

   Note:

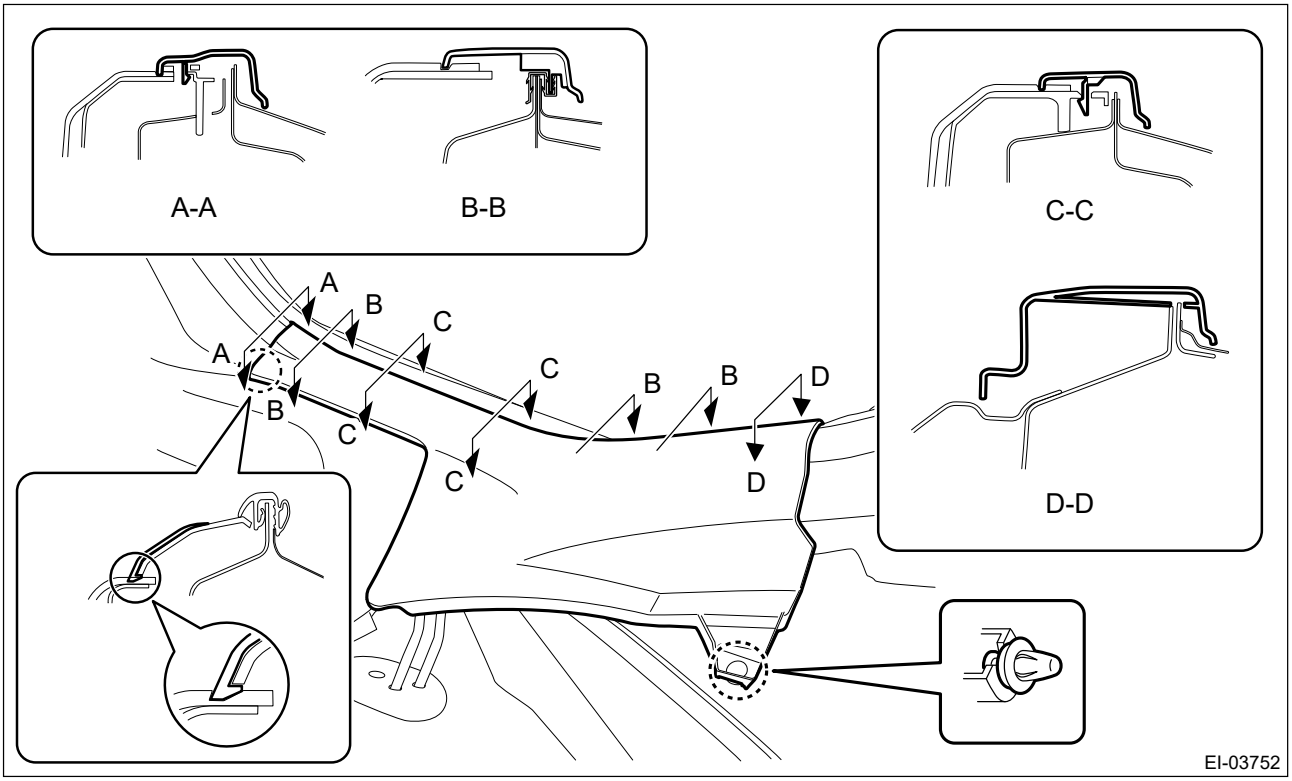
   For model with battery sensor, disconnect the ground terminal from battery sensor.
2. Remove the lever assembly - hand brake. Ref. to PARKING BRAKE>Parking Brake Lever>REMOVAL.
3. Remove the nut and remove the clamp A - hand brake cable (a).
4. Remove the inner cable end (c) from the equalizer (b).



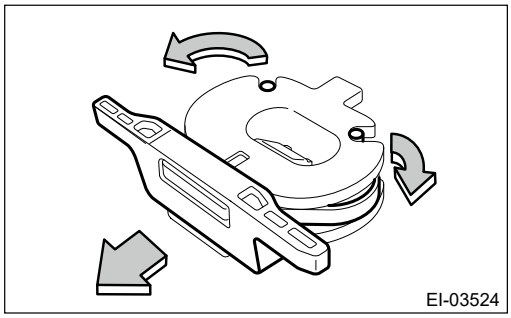
5. Remove the rear seat cushion assembly. Ref. to SEATS>Rear Seat>REMOVAL.
6. Release the clips and claws, and remove the side sill covers - rear INN on the left and right sides.

   Caution:

   Do not pull with excessive force. Doing so may damage the claws of the side sill cover - rear INN.



7. Remove the clips and knobs of the hook - seat cushion rear.



8. Turn over the floor carpet and remove the grommet of the cable assembly - parking brake from the rear floor.

9. Lift up the vehicle, and then remove the rear wheels.

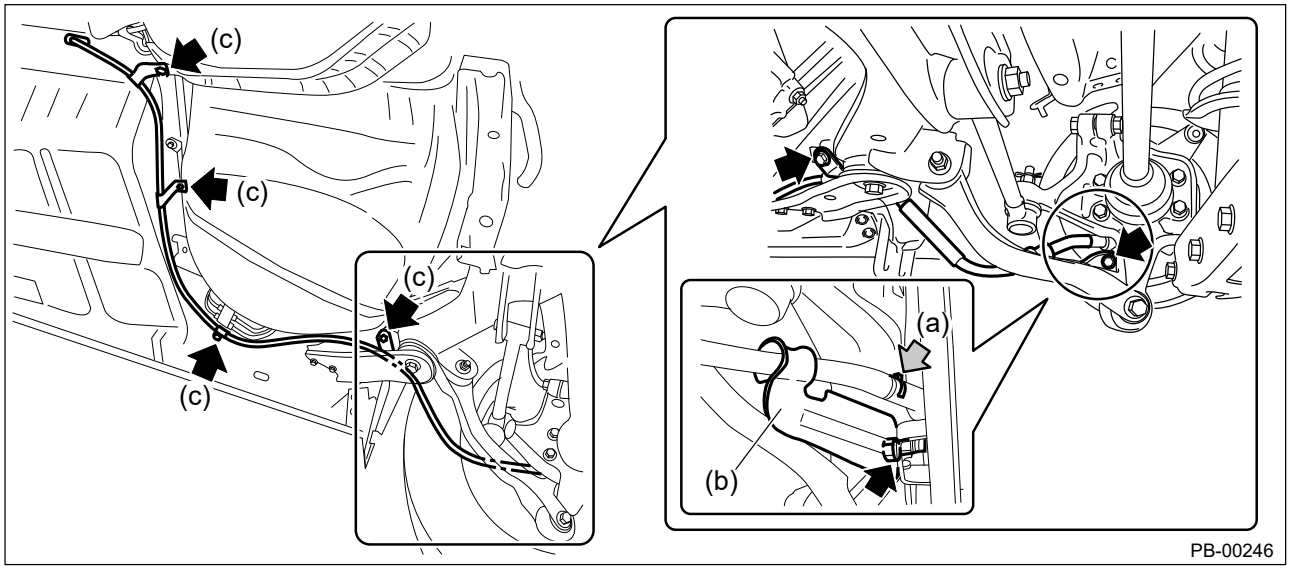
10. Remove the fuel tank protector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Tank Protector>REMOVAL.

11. Remove the cable assembly - parking brake from the lever section of parking brake shoe. Ref. to PARKING BRAKE>Parking Brake Assembly (Rear Disc Brake)>REMOVAL.

12. Remove the exhaust pipe and muffler.

- Center exhaust pipe
  Turbo model: Ref. to EXHAUST(H4DOTC)>Center Exhaust Pipe>REMOVAL.
  Non-turbo model: Ref. to EXHAUST(H4DO)>Center Exhaust Pipe>REMOVAL.
- Rear exhaust pipe
  Turbo model: Ref. to EXHAUST(H4DOTC)>Rear Exhaust Pipe>REMOVAL.
  Non-turbo model: Ref. to EXHAUST(H4DO)>Rear Exhaust Pipe>REMOVAL.
- Muffler
  Turbo model: Ref. to EXHAUST(H4DOTC)>Muffler>REMOVAL.
  Non-turbo model: Ref. to EXHAUST(H4DO)>Muffler>REMOVAL.

13. Remove the propeller shaft assembly. Ref. to DRIVE SHAFT SYSTEM>Propeller Shaft>REMOVAL.
14. Remove the cable assembly - parking brake from the lever section of parking brake shoe. Ref. to PARKING BRAKE>Parking Brake Assembly (Rear Disc Brake)>REMOVAL.
15. Remove the clamp B - hand brake cable (a) from the rear brake.
16. Remove the cable clamp (b) from the back plate - rear brake.
17. Remove the cable clamp (c) from the rear floor, and remove the cable assembly - parking brake.



ADJUSTMENT

Adjust the parking lever stroke. Ref. to PARKING BRAKE>Parking Brake Assembly (Rear Disc Brake)>ADJUSTMENT > LEVER STROKE.

INSPECTION

1. LEVER ASSEMBLY

1. Operate the lever assembly - hand brake 3 to 4 times and fully return the lever assembly - hand brake.
2. While slowly pulling up the lever assembly - hand brake, count the notches.

   Lever stroke:

   7 to 8 notches when pulled with a force of 200 N (20.4 kgf, 45 lbf)

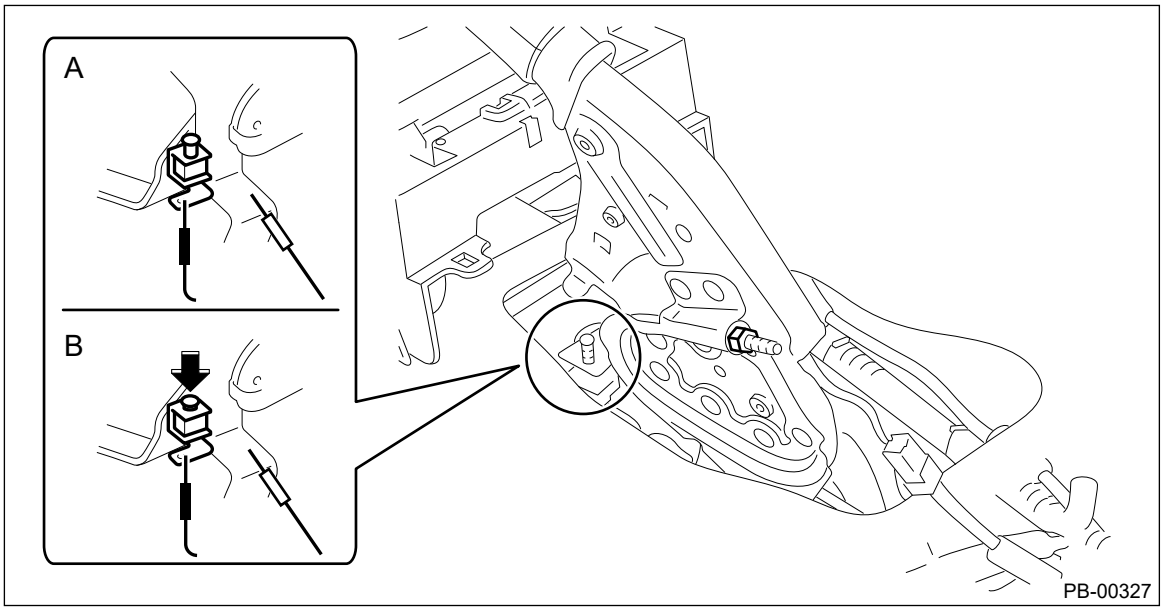
   If it is not within the specified value, adjust the parking brake. Ref. to PARKING BRAKE>Parking Brake Assembly (Rear Disc Brake)>ADJUSTMENT.

2. SWITCH ASSEMBLY

1. Measure the resistance between the switch assembly - hand brake and chassis ground.

   Preparation tool:

   Circuit tester



	Switch position	Standard
A	When shaft is free (ON)	Less than 1 Ω
B	When shaft is pressed in (OFF)	10 kΩ or more

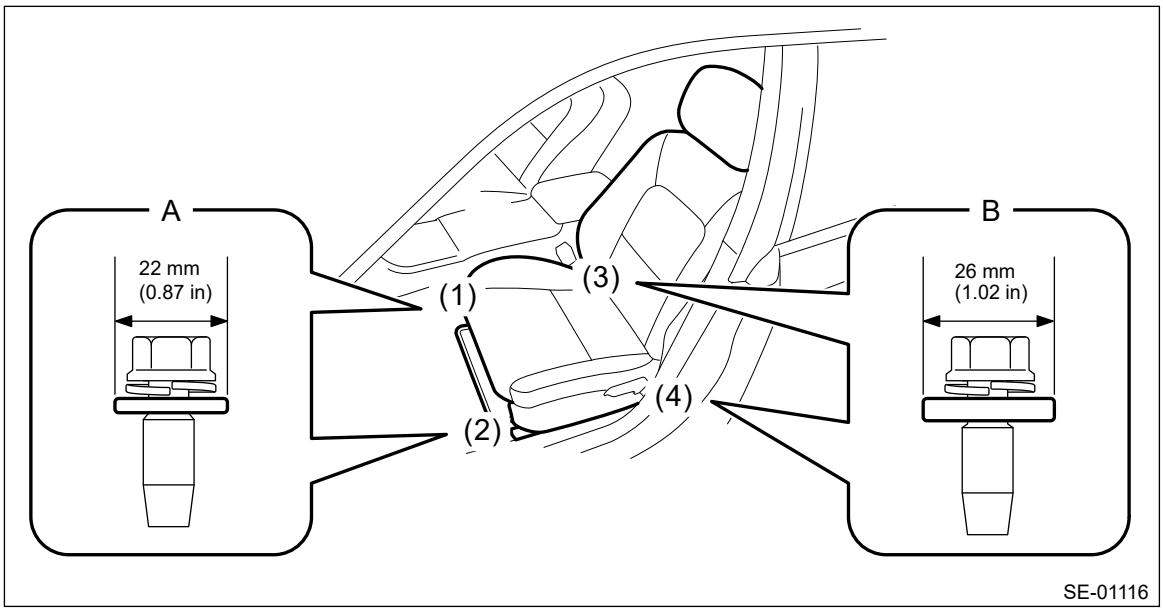
If it is not within the specified value, replace the switch assembly - hand brake.

INSTALLATION

1. Install each part in the reverse order of removal.

Caution:

- **The front seat mounting bolts differ between the front mounting points and the rear mounting points. When installing the front seat, make sure that you are using correct bolts at correct positions.**
- **Tighten the slide rail assembly installing bolts in the order as shown in the figure, in several steps by gradually increasing the torque until they reach the specified torque.**



- **Front (bolt A): Washer diameter 22 mm (0.87 in)**
- **Rear (bolt B): Washer diameter 26 mm (1.02 in)**

Tightening torque:

Front seat assembly: 53 N•m (5.4 kgf-m, 39.1 ft-lb)
Console box assembly: 6.5 N•m (0.66 kgf-m, 4.8 ft-lb)
Lever assembly - hand brake: 18 N•m (1.84 kgf-m, 13.3 ft-lb)

2. Install a new adjusting nut (self-locking nut).
3. Connect the battery ground terminal. Ref. to NOTE>NOTE > BATTERY.

Note:

After connecting the battery sensor terminal, place the select lever in the "P" position.

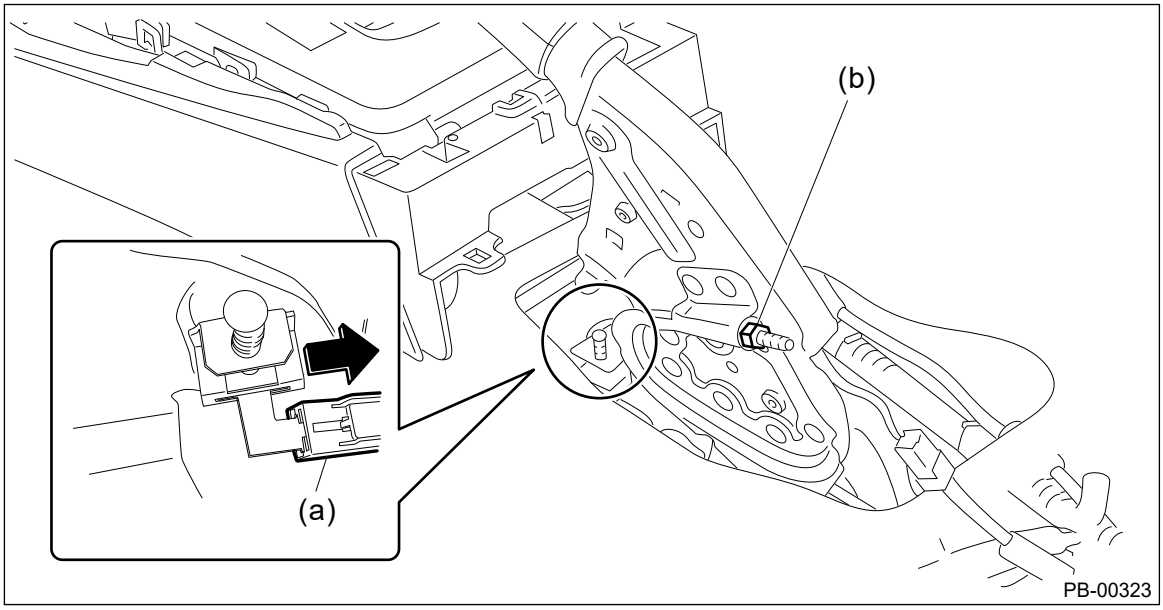
4. Be sure to adjust the lever stroke. Ref. to PARKING BRAKE>Parking Brake Lever>ADJUSTMENT.

REMOVAL

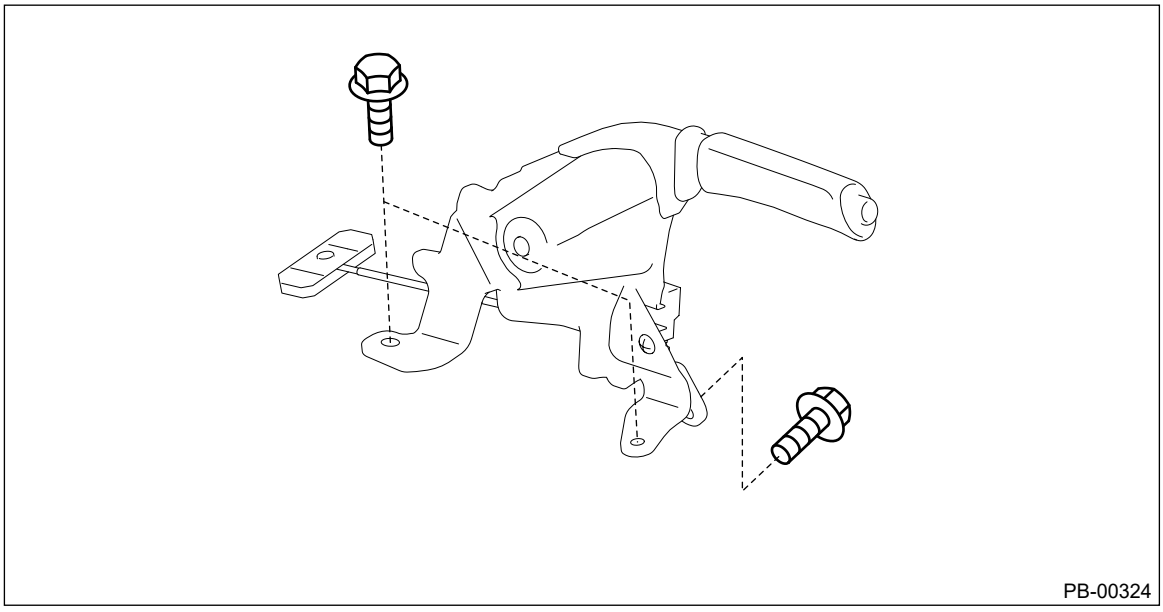
1. Set the wheel stoppers to tires.
2. Move the passenger's seat towards the front.
3. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to NOTE>NOTE > BATTERY.

   Note:
   - **For model with battery sensor, disconnect the ground terminal from battery sensor.**
   - **On CVT models, shift the select lever into "N" before disconnecting the battery ground cable.**
4. Remove the driver's seat. Ref. to SEATS>Front Seat>REMOVAL.
5. Remove the console box assembly. Ref. to EXTERIOR/INTERIOR TRIM>Console Box>REMOVAL.
6. Remove the lever assembly - hand brake.
   (1) Disconnect the connector (a) of the switch assembly - hand brake.
   (2) Remove the adjusting nut (b).

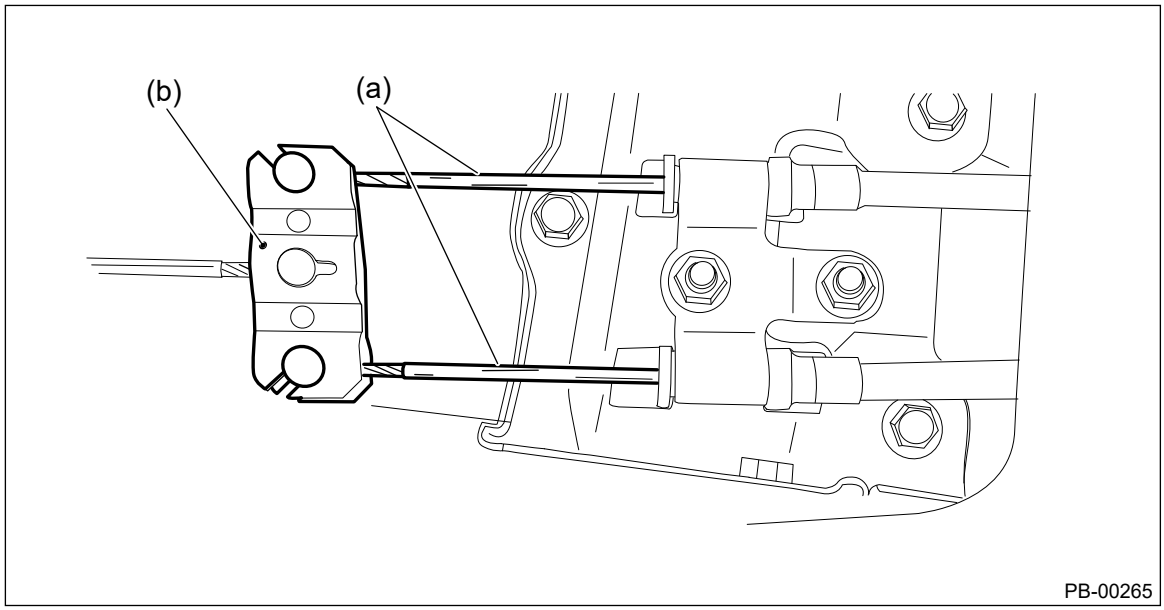
   Caution:
   A self-locking nut is used for the adjusting nut of parking cable. Therefore, replace the self-locking nut with a new one when disassembling.



   (3) Remove the bolt, and then remove the lever assembly - hand brake.



7. Remove the inner cable end (a) from the equalizer (b).



OPERATION

1. While the ABS sequence control is being performed, the operation of the hydraulic unit can be checked using the brake tester or pressure gauge after the hydraulic unit solenoid valve operation.
2. ABS sequence control can be started by the Subaru Select Monitor.

1. ABS SEQUENCE CONTROL WITH SUBARU SELECT MONITOR

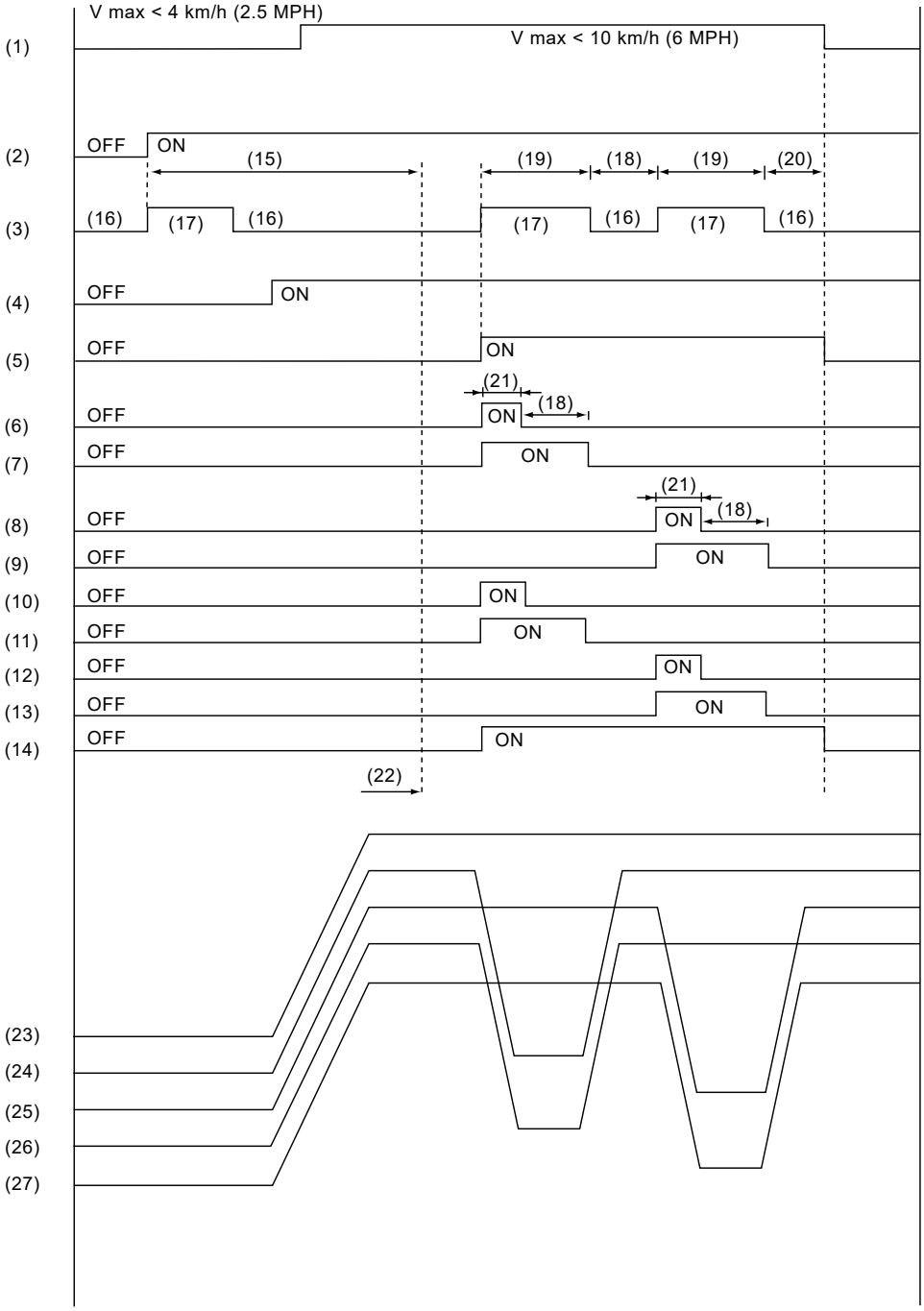
Caution:
For models with EyeSight, performing the sequence control may cause the EyeSight warning light to illuminate. If the sequence control is performed, refer to "Basic Diagnostic Procedure" of "EyeSight (DIAGNOSTICS)" and check DTCs and then clear memory. **Ref. to EyeSight (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Note:
In the event of any trouble, the ABS sequence control will not operate.

1. Connect the Subaru Select Monitor.
   Note:
   For detailed operation procedures, refer to "Application help".
   (1) Turn the ignition switch to ON.
   (2) On [Start] display, select [Diagnosis].
   (3) On [Vehicle selection] display, input the target vehicle information and select [OK].
   (4) On [Main Menu] display, select Each System.
   (5) On [Select System] display, select [Brake Control], and then select [Enter].
   (6) On [Select Function] display, select [Work Support].
   (7) On the work support item list, select [ABS Sequence Control Mode].
2. Follow the procedures displayed in the Subaru Select Monitor to execute the following.
   (1) When using a brake tester, depress the brake pedal with a force of 100 N (10.2 kgf, 22.5 lbf).
   (2) When using a pressure gauge, press the brake pedal so that the pressure gauge indicates 3,500 kPa (36 kgf/cm^2, 511 psi).
3. The brake system being operated is displayed on the Subaru Select Monitor.

2. CONDITIONS FOR ABS SEQUENCE CONTROL

Note:
The control operation starts at point A.



VDC00988

(1) All wheel speed
(2) Ignition key
(3) ABS Warning Lamp
(4) Switch - stop light
(5) Valve relay
(6) FL decompression valve
(7) FL compression valve
(8) FR decompression valve
(11) RR compression valve
(12) RL decompression valve
(13) RL compression valve
(14) Pump motor
(15) A few seconds
(16) Extinction
(17) Light On
(18) 1.0 second
(20) 0.6 seconds
(21) 0.4 seconds
(22) Point A
(23) Master cylinder pressure
(24) FL wheel cylinder pressure
(25) FR wheel cylinder pressure
(26) RR wheel cylinder pressure
(27) RL wheel cylinder pressure

(9) FR compression valve

(10) RR decompression valve

(19) 1.4 seconds

SPECIFICATION

1. CONDITIONS FOR COMPLETION OF ABS SEQUENCE CONTROL

When the following conditions develop, the ABS sequence control stops and ABS operation is returned to the normal control mode.

- When the speed of at least one wheel reaches 10 km/h (6 MPH).
- When the brake pedal is released during ABS sequence control and the switch - stop light becomes OFF.
- After completion of ABS sequence control.
- When a malfunction is detected.

VEHICLE DYNAMICS CONTROL (VDC) > Brake Lamp Relay

INSPECTION

Refer to "INSPECTION" of "Relay and Fuse". Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Relay and Fuse>INSPECTION.

INSTALLATION

Install each part in the reverse order of removal.

OPERATION

1. BRAKE LAMP LIGHTING OPERATION MODE BY SUBARU SELECT MONITOR

Caution:

For models with EyeSight, performing brake light relay compulsory operation may cause the EyeSight warning light to illuminate. If the brake light relay compulsory operation is performed, refer to "Basic Diagnostic Procedure" of "EyeSight (DIAGNOSTICS)" and check DTCs and then clear memory. **Ref. to EyeSight (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Note:

In the event of any trouble, brake lamp lighting operation mode will not function.

1. Connect the Subaru Select Monitor.

   Note:

   - **In the event of any trouble, brake lamp lighting operation mode will not function.**
   - **For detailed operation procedures, refer to "Application help".**

   (1) On [Start] display, select [Diagnosis].
   (2) On [Vehicle selection] display, input the target vehicle information and select [OK].
   (3) On [Main Menu] display, select [Each System].
   (4) On [Each System] display, select [Brake Control System], and then select [Next].
   (5) On [Select Function] display, select [Work Support].
   (6) On the work support item list, select [Brake Lamp Lighting Operation].
2. Operate according to the procedures displayed in the Subaru Select Monitor.

REMOVAL

Remove the brake light relay from the main fuse box.

Note:

Refer to "LOCATION" of "Relay and Fuse". Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Relay and Fuse>LOCATION.

SPECIFICATION

1. CONDITIONS TO COMPLETE BRAKE LAMP LIGHTING OPERATION MODE

When the following conditions develop, the brake lamp lighting operation mode stops and the normal control mode is restored.

- When the speed of at least one wheel reaches 10 km/h (6 MPH).
- When brake lamp lighting operation mode ends.
- When a malfunction is detected.

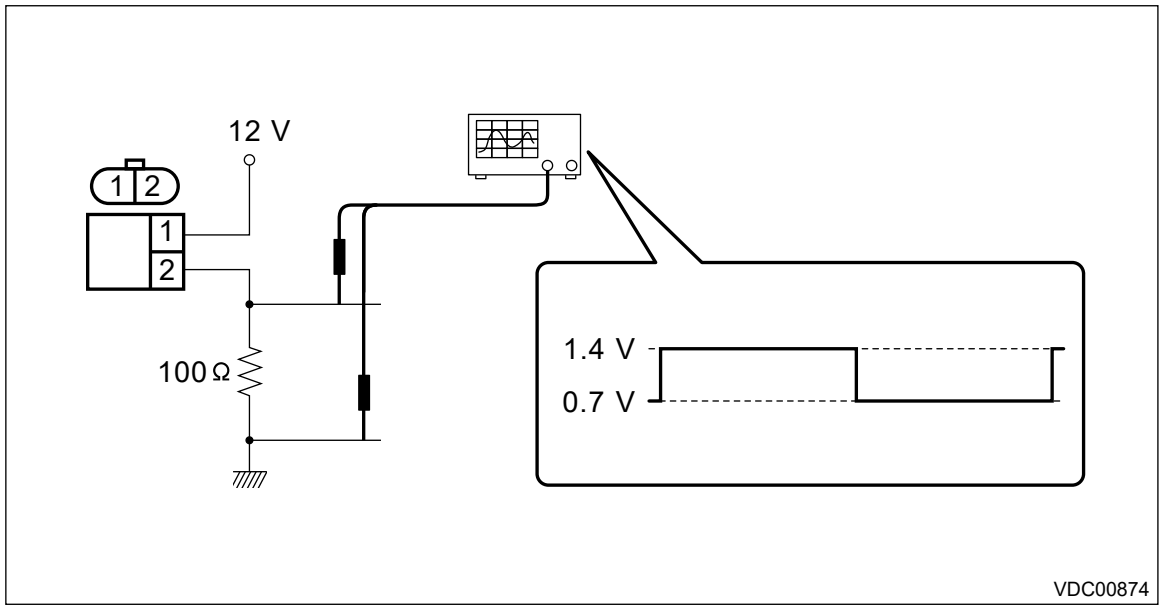
INSPECTION

1. CHECK WITH SUBARU SELECT MONITOR

1. Connect the Subaru Select Monitor to data link connector.
   Note:
   For detailed operation procedures, refer to "Application help".
   (1) On [Start] display, select [Diagnosis].
   (2) On [Vehicle selection] display, input the target vehicle information and select [OK].
   (3) On [Main Menu] display, select [Each System].
   (4) On [Select System] display, select [Brake Control], and then select [Next].
   (5) On [Select Function] display, select [Data Monitor].
   (6) From the data monitor item list, select [FR Wheel Speed] and [FL Wheel Speed].
2. Check if the speed indicated on the display changes in the same manner as the speedometer reading during acceleration/deceleration when the steering wheel is in the straight-ahead position.
3. If the speed indicated on the display does not change in the inspection, check the ABS wheel speed sensor. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Front ABS Wheel Speed Sensor>INSPECTION > CHECK ABS WHEEL SPEED SENSOR UNIT.

2. CHECK ABS WHEEL SPEED SENSOR UNIT

1. Visually check the tip of the ABS wheel speed sensor for foreign particles or damage. If necessary, clean the tip or replace the ABS wheel speed sensor.
2. Disconnect the ABS wheel speed sensor connector.
3. Check the ABS wheel speed sensor cable for discontinuity. If defective, replace the ABS wheel speed sensor.
4. Connect a 12 V power supply to No. 1 terminal of ABS wheel speed sensor connector, and attach a resistor to the No. 2 terminal. Rotate the wheel at about 2.75 km/h (2 MPH), and measure the voltage using an oscilloscope.
   Standard value of output voltage:
   0.7 — 1.4 V



5. Replace the ABS wheel speed sensor if the inspection result is not within the standard value.

INSTALLATION

Caution:

- **Be careful not to damage the sensor.**
- **Do not apply excessive force to the sensor harness.**

1. Install each part in the reverse order of removal.

   Note:

   - **Check the identification (mark) on the harness to make sure there is no warpage. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>General Description>SPECIFICATION.**
   - **Check if the harness is not pulled and does not come in contact with the suspension or body while operating the steering.**

   Tightening torque:

   Front ABS wheel speed sensor: 7.5 N•m (0.76 kgf-m, 5.5 ft-lb)
   Front ABS wheel speed sensor bracket: 33 N•m (3.36 kgf-m, 24.3 ft-lb)
   Front wheel: 120 N•m (12.24 kgf-m, 88.5 ft-lb)

2. Connect the battery ground terminal. Ref. to NOTE>NOTE > BATTERY.

REMOVAL

1. Disconnect the ground cable from battery. Ref. to NOTE>NOTE > BATTERY.

   Note:

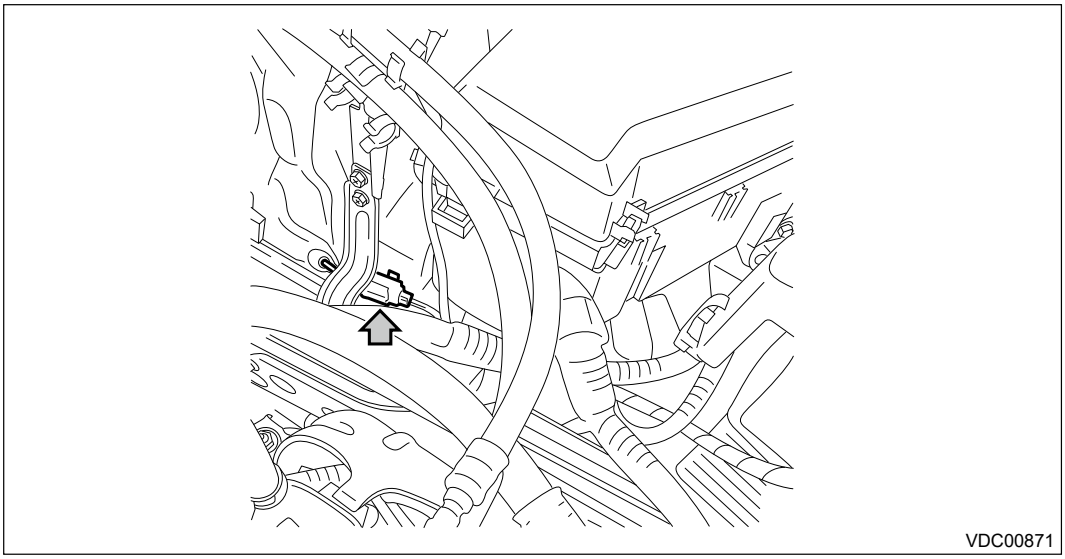
   For model with battery sensor, disconnect the ground terminal from battery sensor.

2. Lift up the vehicle, and then remove the front wheels.
3. Remove the front ABS wheel speed sensor.

   Caution:

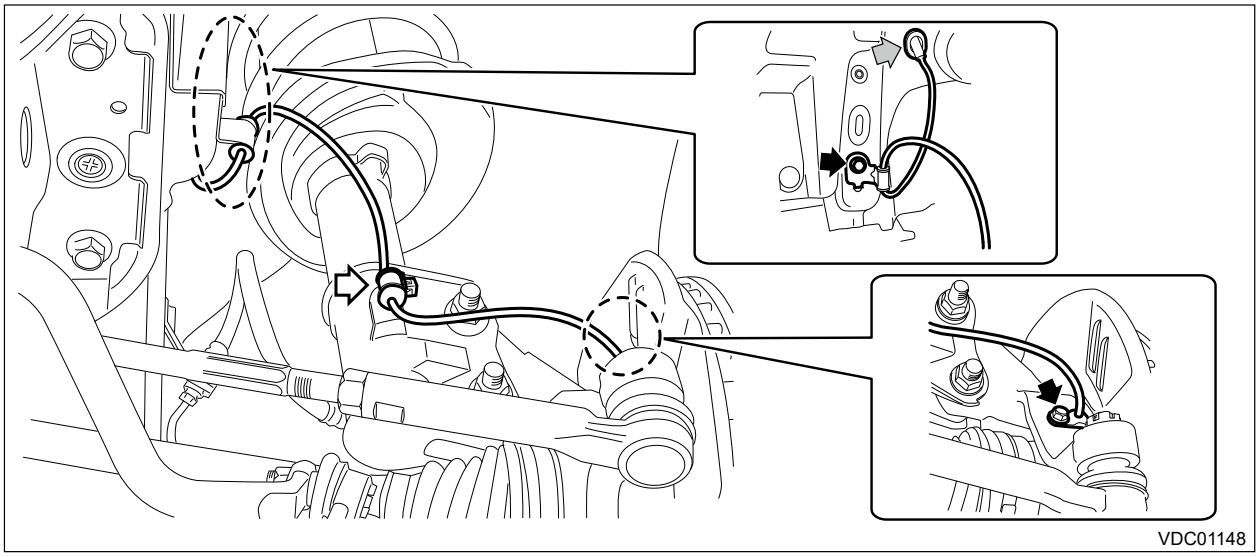
   - **Be careful not to damage the sensor.**
   - **Do not apply excessive force to the sensor harness.**
   - **Leave the sensor harness clamp on the vehicle side.**

   (1) Disconnect the connector of the front ABS wheel speed sensor in the engine compartment.



   (2) Remove each harness clip and grommet.

   (3) Remove the bolts, and remove the front ABS wheel speed sensor from the housing assembly - front axle.



INSPECTION

Visually check the magnetic encoder for any damage. If necessary, replace with a new hub unit COMPL - front axle.

Note:

Because the magnetic encoder is integrated with hub unit COMPL, replace the hub unit COMPL with a new part if there is any defect found on the magnetic encoder.

INSTALLATION

Refer to “Front Hub Unit Bearing” for installation, because the front magnetic encoder is integrated with the hub unit COMPL - front axle. Ref. to DRIVE SHAFT SYSTEM>Front Hub Unit Bearing>INSTALLATION.

REMOVAL

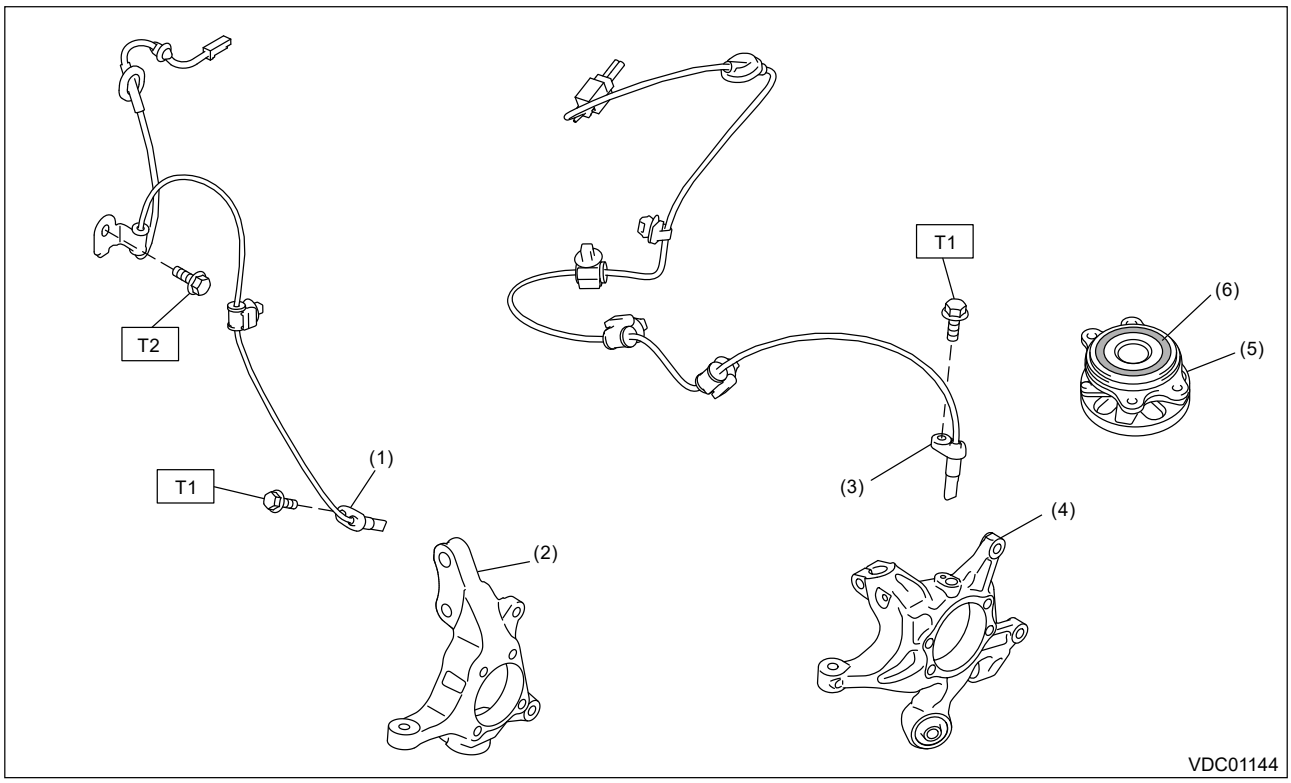
Refer to “Front Hub Unit Bearing” for removal, because the front magnetic encoder is integrated with the hub unit COMPL - front axle. Ref. to DRIVE SHAFT SYSTEM>Front Hub Unit Bearing>REMOVAL.

CAUTION

- Wear appropriate work clothing, including a helmet, protective goggles and protective shoes when performing any work.
- Remove contamination including dirt and corrosion before removal, installation or disassembly.
- Keep the disassembled parts in order and protect them from dust and dirt.
- Before disconnecting connectors of sensors or units, be sure to disconnect the ground cable from battery.
- Before removal, installation or disassembly, be sure to clarify the failure. Avoid unnecessary removal, installation, disassembly and replacement.
- Vehicle components are extremely hot after driving. Be wary of receiving burns from heated parts.
- Be sure to tighten fasteners including bolts and nuts to the specified torque.
- Place shop jacks or rigid racks at the specified points.
- When removing, installing or replacing the VDCCM&H/U, VDCCM&H/U bracket, steering wheel or steering angle sensor, perform “VDC sensor midpoint setting mode” of the VDC. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT.

COMPONENT

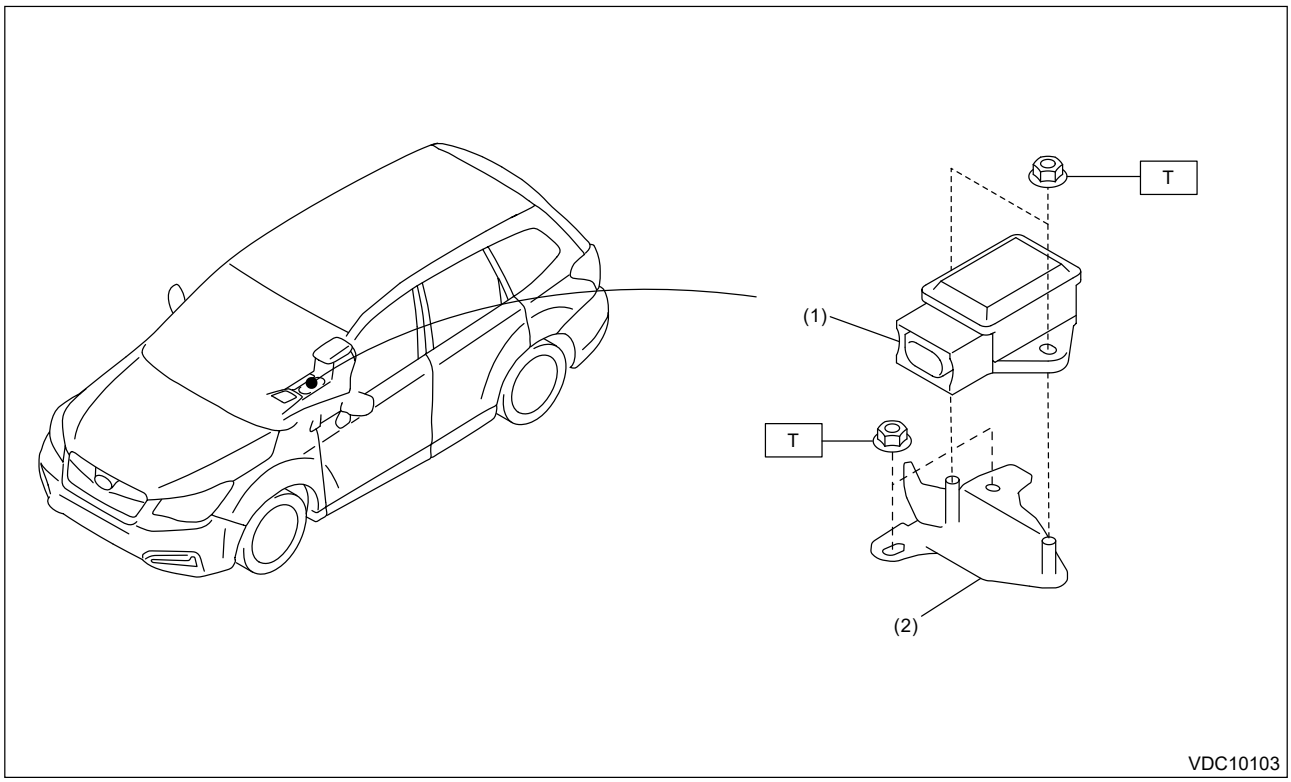
1. ABS WHEEL SPEED SENSOR



(1)	Front ABS wheel speed sensor	(4)	Housing ASSY - rear axle	***Tightening torque: N·m (kgf-m, ft-lb)***
(2)	Housing ASSY - front axle	(5)	Hub unit COMPL	***T1: 7.5 (0.76, 5.5)***
(3)	Rear ABS wheel speed sensor	(6)	Magnetic encoder	***T2: 33 (3.36, 24.3)***

2. YAW RATE & G SENSOR

Only for models with EyeSight

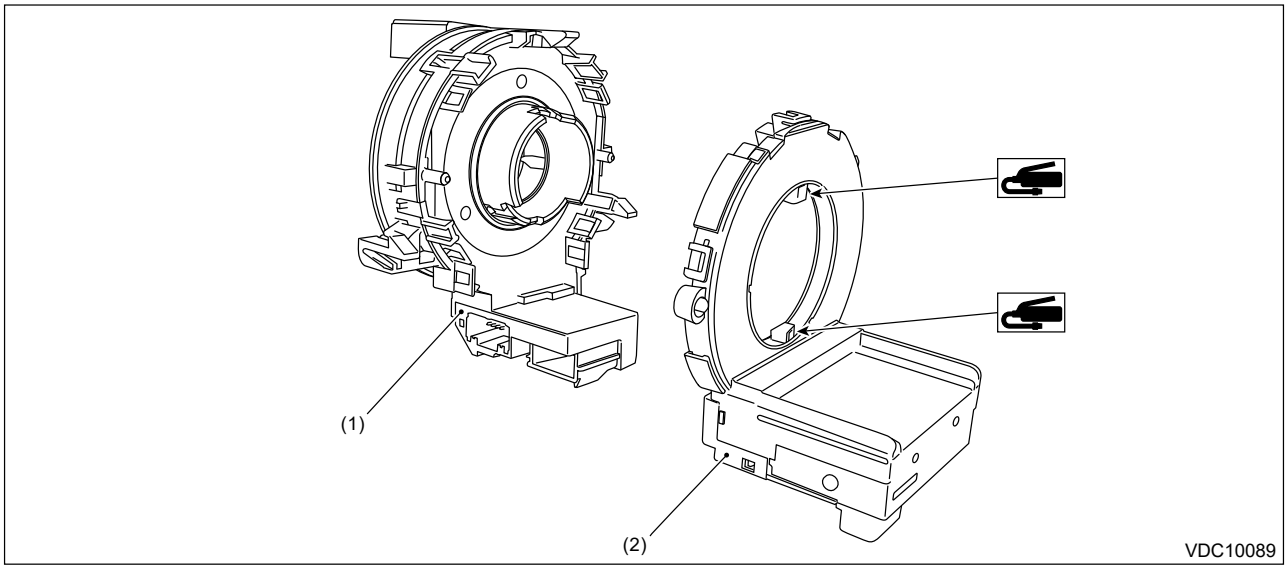


(1) Yaw rate & G sensor (2) Bracket

Tightening torque: N·m (kgf-m, ft-lb)

T: 7.5 (0.76, 5.5)

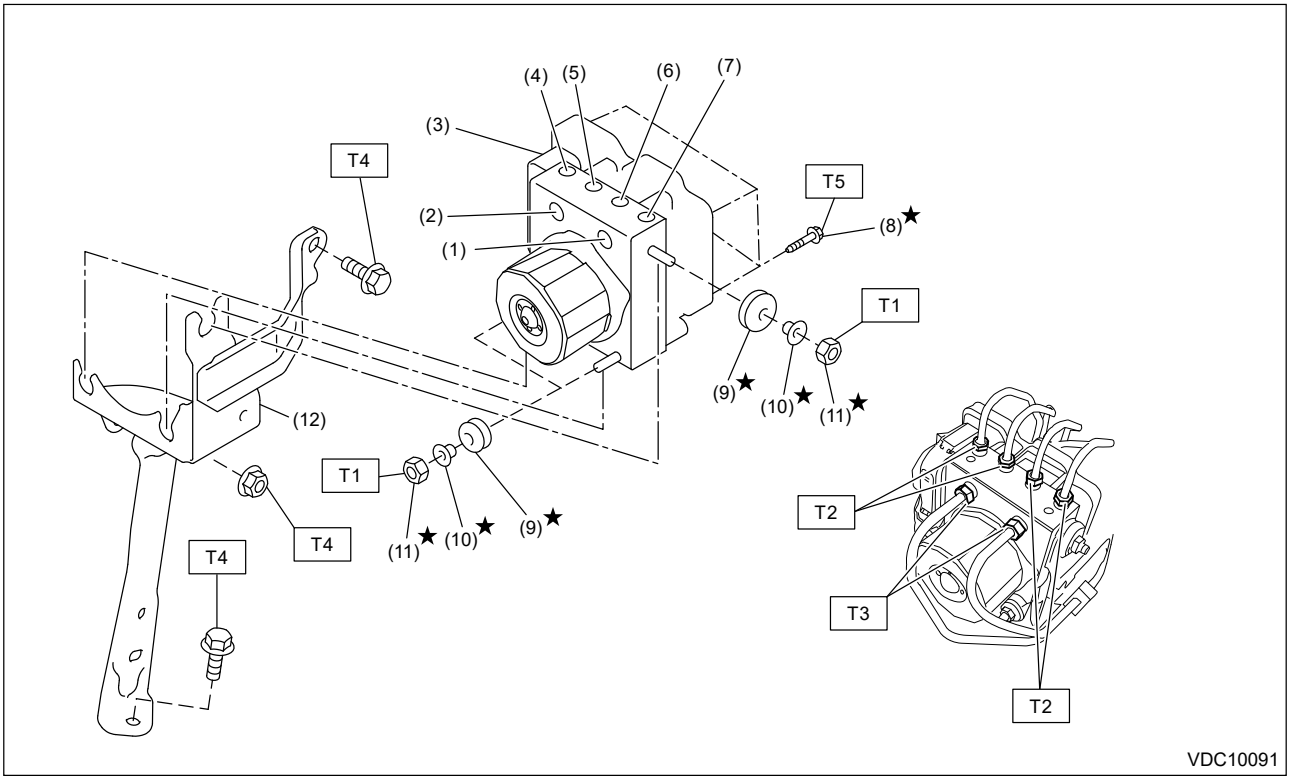
3. STEERING ANGLE SENSOR



(1) Steering roll connector (2) Steering angle sensor

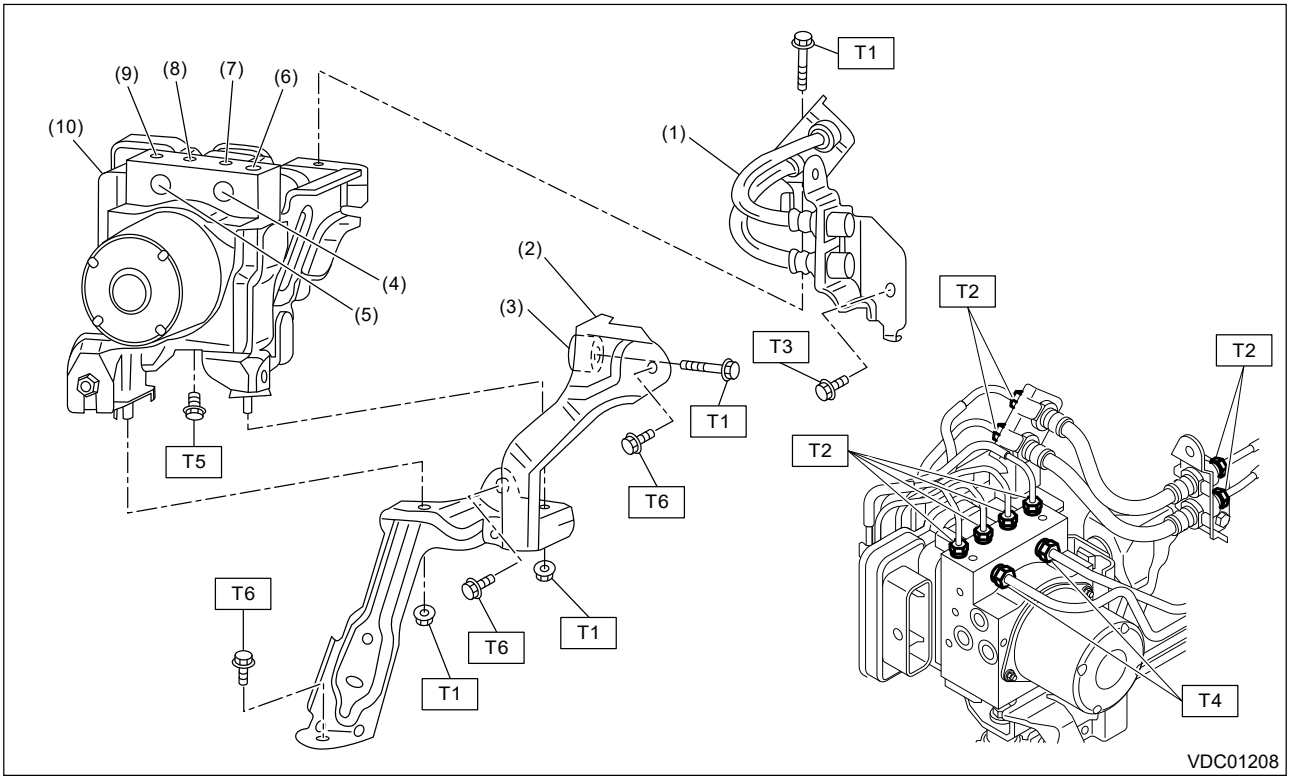
4. VDC CONTROL MODULE AND HYDRAULIC CONTROL UNIT (VDCCM&H/U)

- Models without EyeSight



(1)	Primary inlet	(7)	Rear LH outlet	***Tightening torque: N·m (kgf-m, ft-lb)***
(2)	Secondary inlet	(8)	Bolt	***T1: 7.5 (0.76, 5.5)***
(3)	VDC control module and hydraulic control unit (VDCCM&H/U)	(9)	Damper - hydraulic unit	***T2: 15 (1.53, 11.1)***
(4)	Rear RH outlet	(10)	Spacer	***T3: 19 (1.94, 14)***
(5)	Front LH outlet	(11)	Nut	***T4: 33 (3.36, 24.3)***
(6)	Front RH outlet	(12)	Bracket - hydraulic unit	***T5: Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>REPLACEMENT.***

- Models with EyeSight



(1) Hose ASSY	(8) Front LH outlet	***Tightening torque: N·m (kgf-m, ft-lb)***
(2) Bracket - hydraulic unit	(9) Rear RH outlet	***T1: 7.5 (0.76, 5.5)***
(3) Damper - hydraulic unit	(10) VDC control module and hydraulic control unit (VDCCM&H/U)	***T2: 15 (1.53, 11.1)***
(4) Primary inlet		***T3: 18 (1.84, 13.3)***
(5) Secondary inlet		***T4: 19 (1.94, 14)***
(6) Rear LH outlet		***T5: 27 (2.75, 19.9)***
(7) Front RH outlet		***T6: 33 (3.36, 24.3)***

PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.
PRESSURE GAUGE	Used for measuring oil pressure.
Oscilloscope	Used for measuring the sensor.
Steering wheel puller	Used for removing the steering wheel.
TORX® E5	Used for replacing the VDC control module & hydraulic control unit (VDCCM&H/U).

SPECIFICATION

Item				Specification or identification
ABS wheel speed sensor	ABS wheel speed sensor gap (for reference)	Front		0.77—1.43 mm (0.030—0.056 in)
		Rear		0.44—1.76 mm (0.017—0.069 in)
	Identifications of harness (symbol)	Front	RH	Z1
			LH	Z2
		Rear	RH	Z5
			LH	Z6
VDCCM&H/U identification	Models without EyeSight			BS
	Models with EyeSight			BT or BX

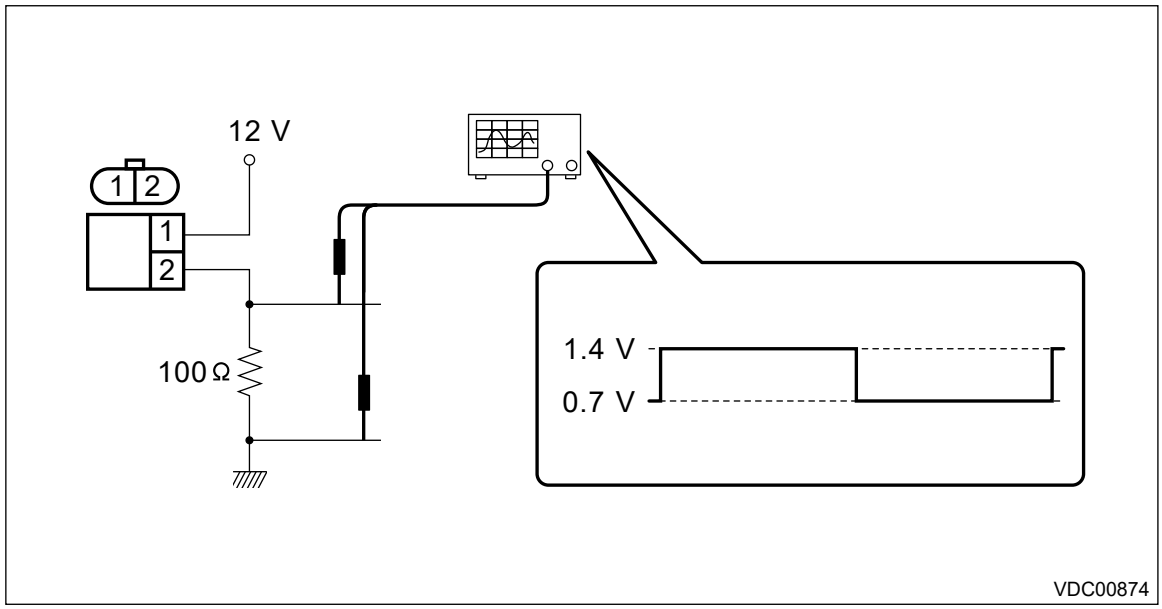
INSPECTION

1. CHECK WITH SUBARU SELECT MONITOR

1. Connect the Subaru Select Monitor to data link connector.
   Note:
   For detailed operation procedures, refer to "Application help".
   (1) On [Start] display, select Diagnosis.
   (2) On Vehicle selection display, input the target vehicle information and select [OK].
   (3) On Main Menu display, select [Each System].
   (4) On [Select System] display, select [Brake Control System], and then select [Next].
   (5) On [Select Function] display, select [Data Monitor].
   (6) From the data monitor item list, select [RR Wheel Speed] and [RL Wheel Speed].
2. Check if the speed indicated on the display changes in the same manner as the speedometer reading during acceleration/deceleration when the steering wheel is in the straight-ahead position.
3. If the speed indicated on the display does not change in the inspection, check the ABS wheel speed sensor. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Front ABS Wheel Speed Sensor>INSPECTION > CHECK ABS WHEEL SPEED SENSOR UNIT.

2. CHECK ABS WHEEL SPEED SENSOR UNIT

1. Visually check the tip of the ABS wheel speed sensor for foreign particles or damage. If necessary, clean the tip or replace the ABS wheel speed sensor.
2. Disconnect the ABS wheel speed sensor connector.
3. Check the ABS wheel speed sensor cable for discontinuity. If defective, replace the ABS wheel speed sensor.
4. Connect a 12 V power supply to No. 1 terminal of ABS wheel speed sensor connector, and attach a resistor to the No. 2 terminal. Rotate the wheel at about 2.75 km/h (2 MPH), and measure the voltage using an oscilloscope.
   Standard value of output voltage:
   0.7 — 1.4 V



5. Replace the ABS wheel speed sensor if the inspection result is not within the standard value.

INSTALLATION

Caution:

- **Be careful not to damage the sensor.**
- **Do not apply excessive force to the sensor harness.**

1. Install each part in the reverse order of removal.

   Note:

   Check the identification (mark) on the harness to make sure there is no warpage. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>General Description>SPECIFICATION.

   Tightening torque:

   Rear ABS wheel speed sensor: 7.5 N•m (0.76 kgf-m, 5.5 ft-lb)

   Rear wheel: 120 N•m (12.24 kgf-m, 88.5 ft-lb)

2. Connect the battery ground terminal. Ref. to NOTE>NOTE > BATTERY.

REMOVAL

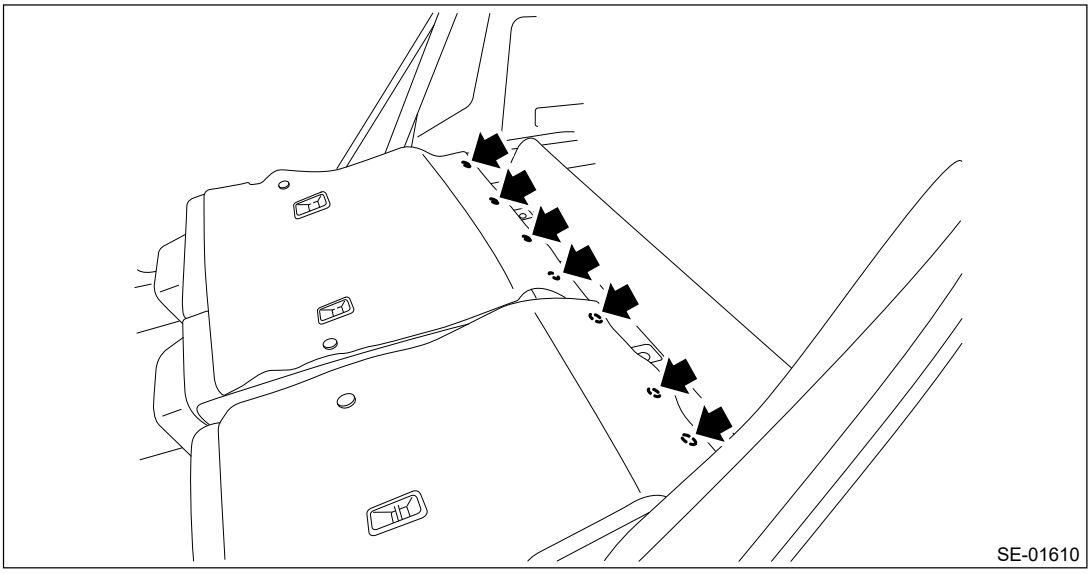
Caution:

- **Be careful not to damage the sensor.**
- **Do not apply excessive force to the sensor harness.**
- **Leave the sensor harness clamp on the vehicle side.**

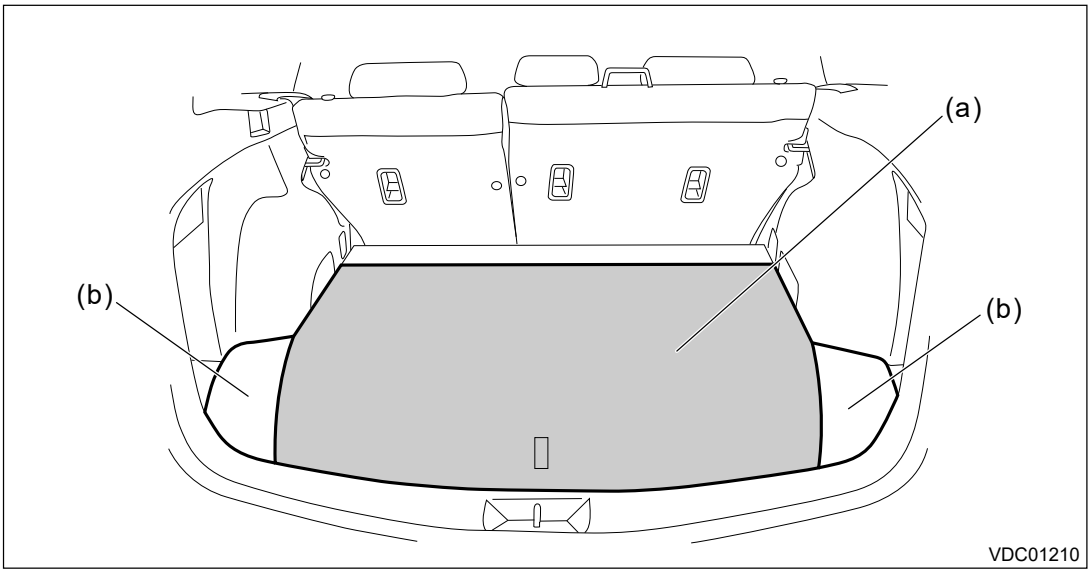
1. Disconnect the ground cable from battery. Ref. to NOTE>NOTE > BATTERY.

   Note:

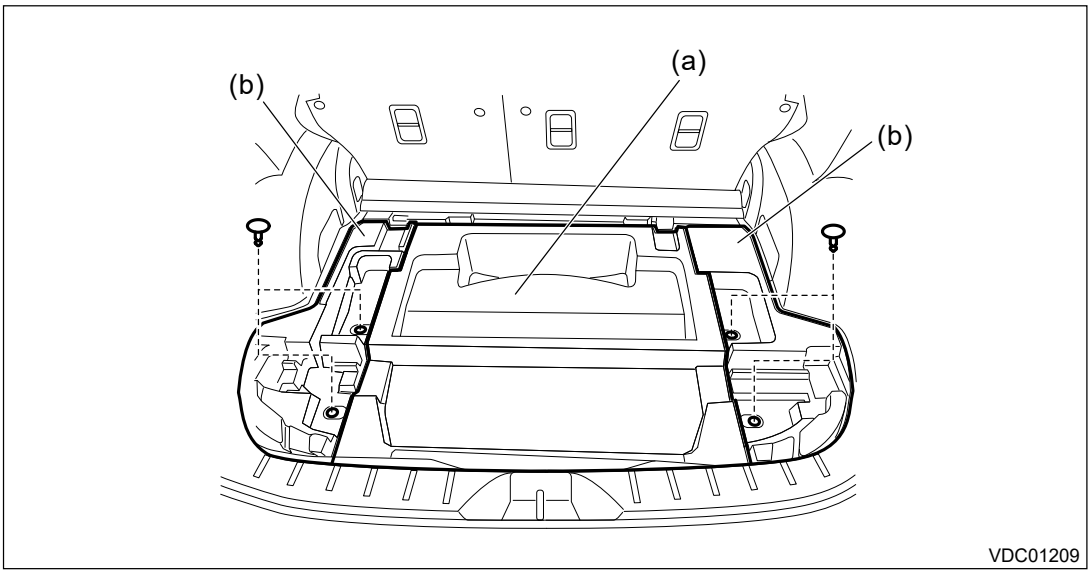
   For model with battery sensor, disconnect the ground terminal from battery sensor.
2. Lift up the vehicle, and then remove the rear wheels.
3. Tilt the backrest assembly of the rear seat forward.
4. Remove the clips located at the bottom of the cover COMPL - rear backrest LH and RH of the rear seat back.



5. Remove the mat - rear floor CTR (a) and the mats - rear floor (b) of right and left sides.



6. Remove the clips and remove the cover - trunk (a) and right and left spacers - rear front side (b).

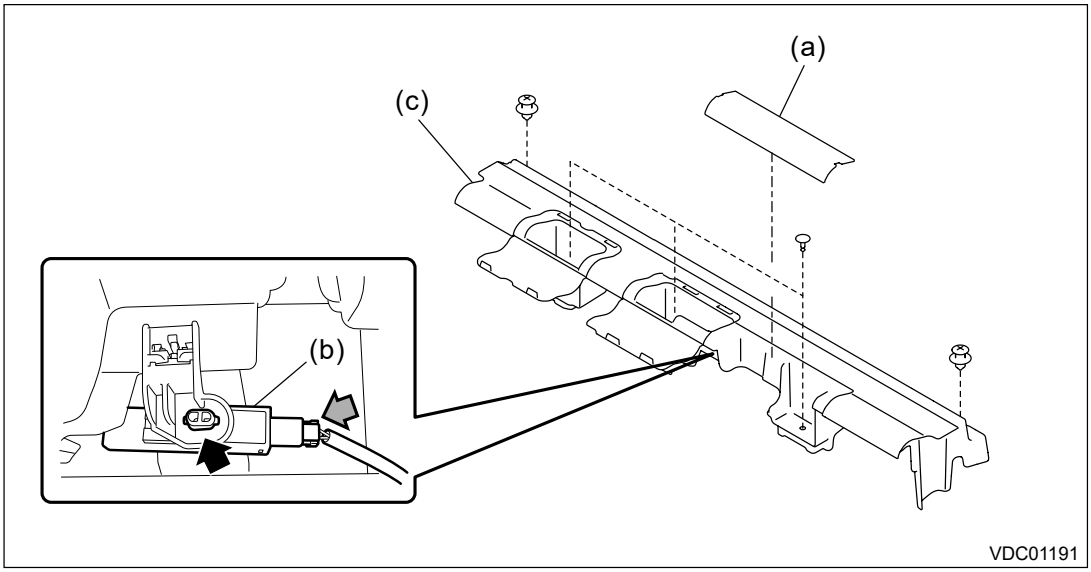


7. Remove the spacer - rear floor front.

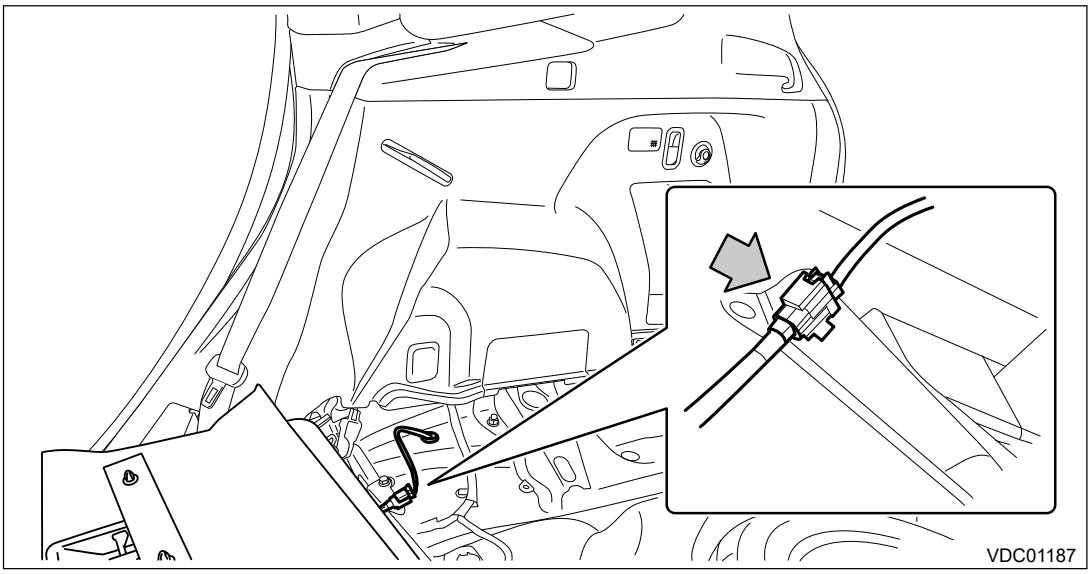
(1) Remove the spacer - rear floor front center (a).

(2) Disconnect the connector and remove the rear antenna assembly - interior (b).

(3) Remove the clips and spacer - rear floor front (c).

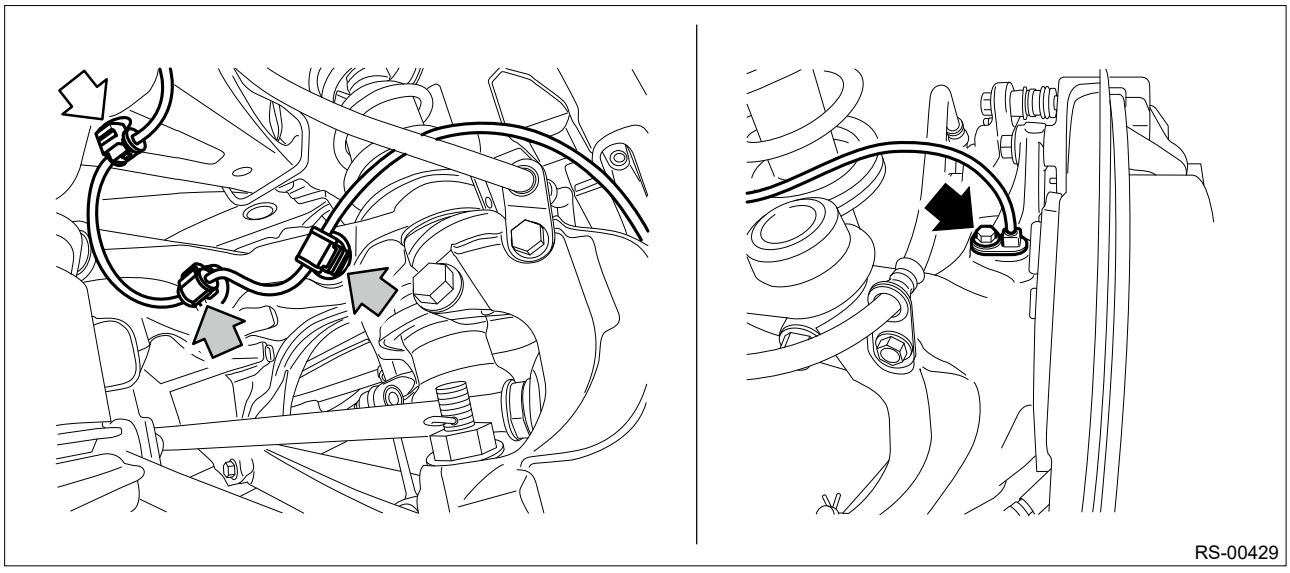


8. Disconnect the connector of the rear ABS wheel speed sensor.



9. Remove the grommet from the rear wheel housing, and pull out the connector of the rear ABS wheel speed sensor.

10. Remove the harness clip and bolt, and remove the rear ABS wheel speed sensor.



INSPECTION

Visually check the magnetic encoder parts for any damage. If necessary, replace with a new hub unit COMPL - rear axle.

Note:

Because the magnetic encoder is integrated with hub unit COMPL, replace the hub unit COMPL with a new part if there is any defect found on the magnetic encoder.

INSTALLATION

Refer to “Rear Hub Unit Bearing” for installation, because the rear magnetic encoder is integrated with the hub unit COMPL - rear axle. Ref. to DRIVE SHAFT SYSTEM>Rear Hub Unit Bearing>INSTALLATION.

REMOVAL

Refer to “Rear Hub Unit Bearing” for removal, because the rear magnetic encoder is integrated with the hub unit COMPL - rear axle. Ref. to DRIVE SHAFT SYSTEM>Rear Hub Unit Bearing>REMOVAL.

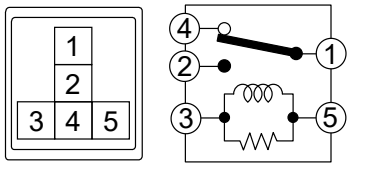
INSPECTION

1. CHECK FUSE

1. Remove the fuse and inspect visually.
2. If the fuse is blown out, replace the fuse.

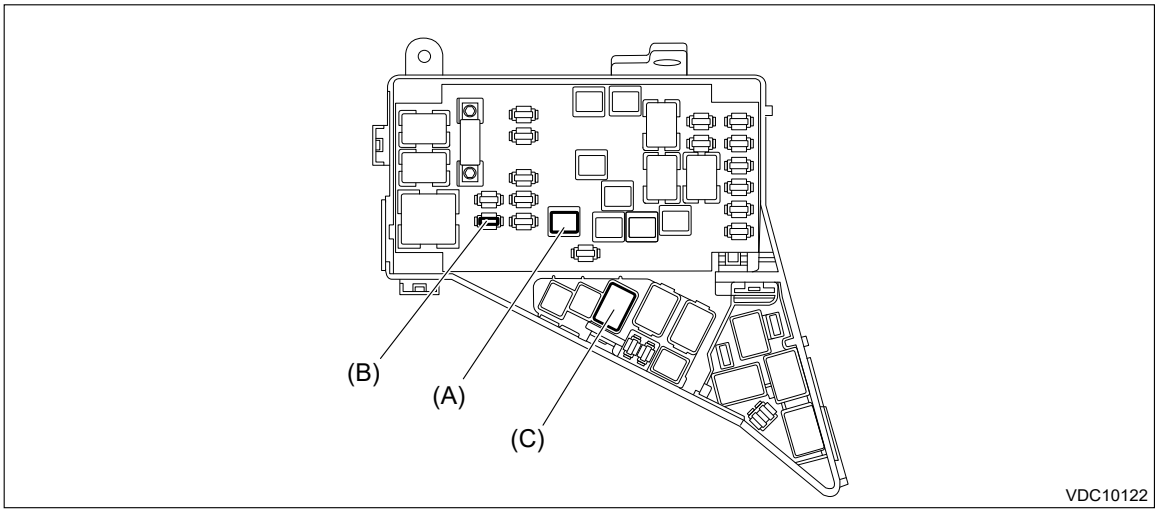
2. CHECK RELAY

1. Check the resistance between relay terminals.

Terminal No.	Inspection conditions	Standard	Circuit
1 — 2	Always	1 MΩ or more	 SL-01085
1 — 4	Always	Less than 1 Ω	
1 — 2	Apply battery voltage between terminals 3 and 5.	Less than 1 Ω	

2. Replace the relay if the inspection result is not within the standard value.

LOCATION



Main fuse box	Fuse 50A (VDC CM&H/U)	(A)
	Fuse 30A (VDC CM&H/U)	(B)
	Brake light relay	(C)

Note:

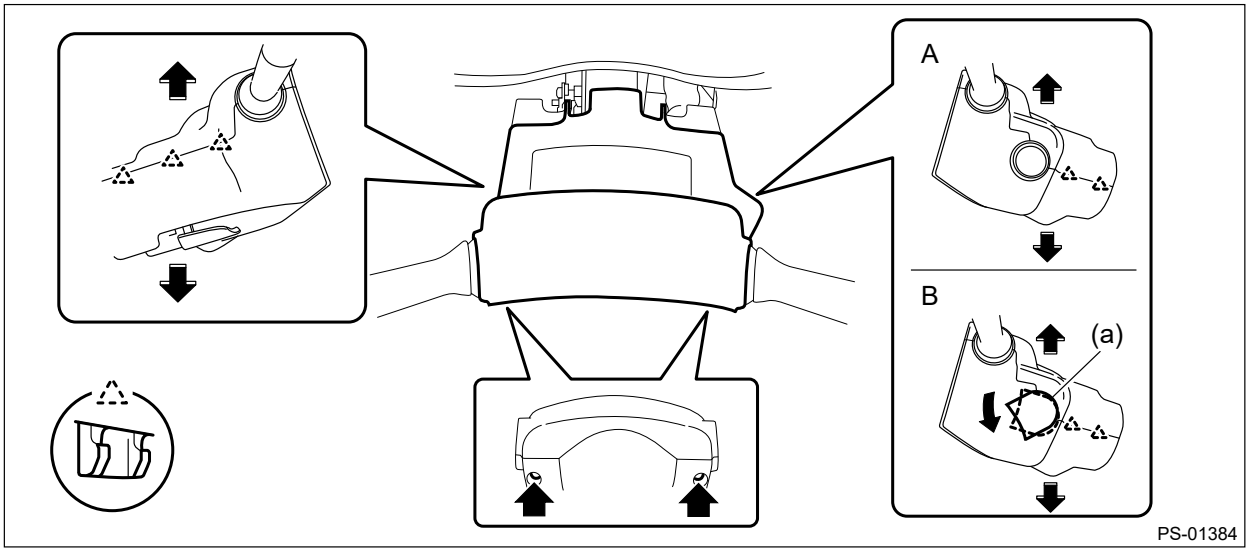
For other related fuses, refer to the wiring diagram. Ref. to WIRING SYSTEM>Power Supply Circuit.

REPLACEMENT

Caution:

- **If the steering wheel and steering angle sensor are removed, perform "VSC(VDC) Centering Mode" of the VDC. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT.**
- **Before handling the airbag system components, always refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **Always use the steering wheel puller for removal to avoid deforming the steering wheel.**
- **If the steering wheel has been removed, make sure that the steering roll connector is not turned from the original position.**

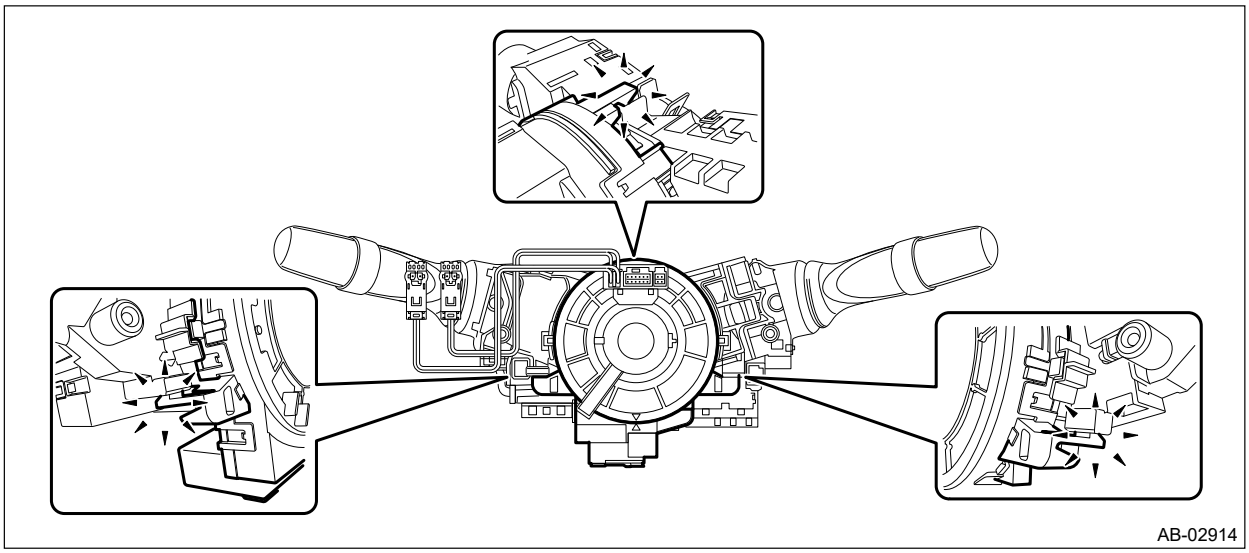
1. Set the tire to the straight-ahead position.
2. Turn the ignition switch to OFF.
3. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to NOTE>NOTE > BATTERY.
4. Remove the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module>REMOVAL.
5. Remove the steering wheel. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel>REMOVAL.
6. Remove the cover assembly - column.
   (1) Remove the cap - key cylinder (a). (Model with keyless access with push button start)
   (2) Release the screws and claws.
   (3) Remove the cover assembly - column UPR and the cover assembly - column LWR.



A Model without keyless access with push button start

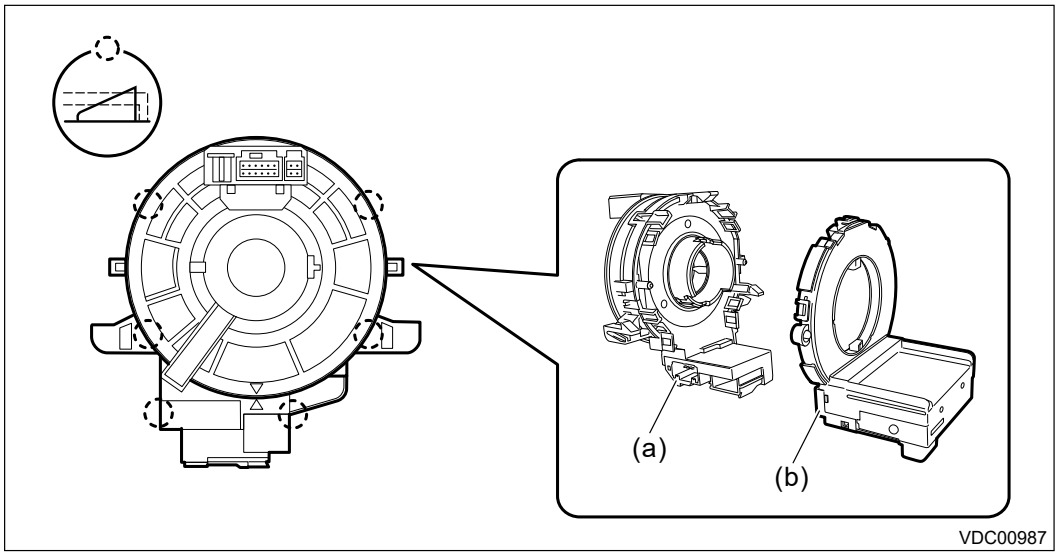
B Model with keyless access with push button start

7. Remove the steering roll connector.
   Caution:
   Make sure that the steering roll connector is not turned from the original position.
   (1) Disconnect the connector under the steering roll connector.
   (2) Release the claws and remove the steering roll connector.



8. Remove the steering angle sensor.

(1) Release the claws and remove the steering angle sensor (b) from the steering roll connector (a).

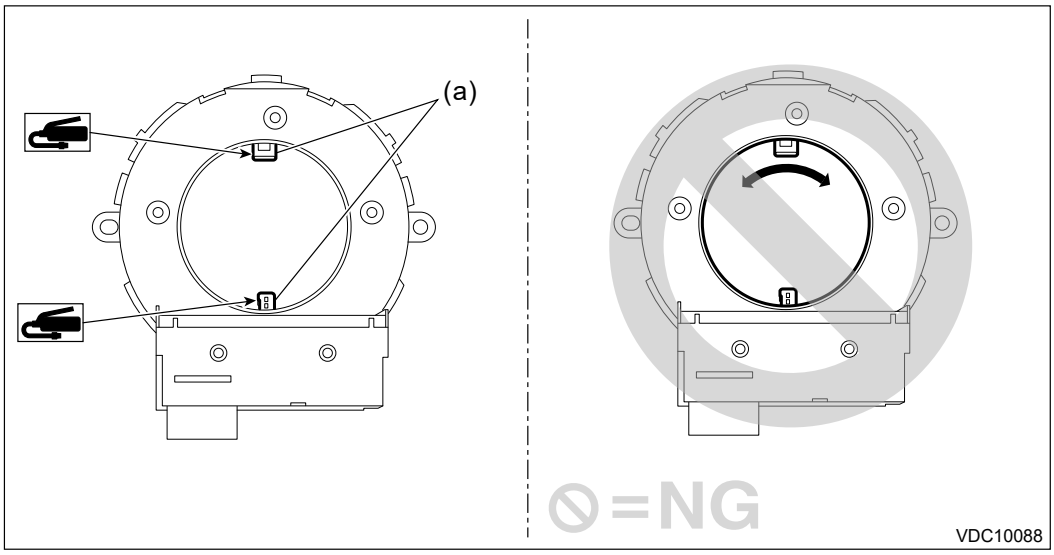


9. Install the steering angle sensor.

(1) Apply grease to the protrusion (a) of the new steering angle sensor.

Caution:

Do not rotate the steering angle sensor protrusion.



(2) Align the center of steering roll connector. Ref. to AIRBAG SYSTEM>Roll Connector>INSTALLATION.

(3) Align the position of the protrusion and install the steering angle sensor to the steering roll connector.

10. Install each part in the reverse order of removal.

Tightening torque:

Steering wheel: 39 N·m (3.98 kgf-m, 28.8 ft-lb)

Clearance:

Between cover assembly - column and steering wheel: 4 — 6 mm (0.16 — 0.24 in)

11. Connect the battery ground terminal. Ref. to NOTE>NOTE > BATTERY.

12. After installation, perform the neutral position setting of the steering angle sensor. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE.

ADJUSTMENT

1. VDC SENSOR MIDPOINT SETTING MODE

After installing, replacing or adjusting the following parts, perform the VDC sensor midpoint setting mode.

- Steering angle sensor
- Steering wheel
- Suspension parts
- Wheel alignment
- VDCCM&H/U
- VDCCM&H/U bracket

1. Park the vehicle on a level surface, and set the steering wheel to the neutral position.
2. Perform the VDC sensor 0 point setting mode.
   (1) Connect the Subaru Select Monitor.
   Note:
   For detailed operation procedures, refer to "Application help".
   (2) Turn the ignition switch to ON.
   (3) On [Start] display, select [Diagnosis].
   (4) On Vehicle selection display, input the target vehicle information and select [OK].
   (5) On Main Menu display, select [Each System].
   (6) On [Select System] display, select [Brake Control], and then select [Next].
   (7) On [Select Function] display, select [Data Monitor].
   (8) From the data monitor item list, select [Steering Angle Sensor], [Longitudinal G Sensor] and [Abnormal Lateral G Sensor output].
   (9) Check that the steering angle sensor output value is between −10 and 10 deg.
   Note:
   If the output value is different from the standard value, check the steering wheel.
   (10) Check that output values for the longitudinal G sensor and lateral G sensor are −2 — 2 m/s2.
   Note:
   If the output value is not at the standard value, check the installing condition of the VDCCM&H/U and VDCCM&H/U bracket.
   (11) On [Select Function] display, select Work Support.
   (12) From the work support item list, select [VSC(VDC) Centering Mode], and perform the setting according to the procedure displayed on the Subaru Select Monitor screen.
3. Drive the vehicle for 10 minutes, and check that there is no system malfunction or the warning light illumination while driving.
4. Make sure that the DTC is not stored.

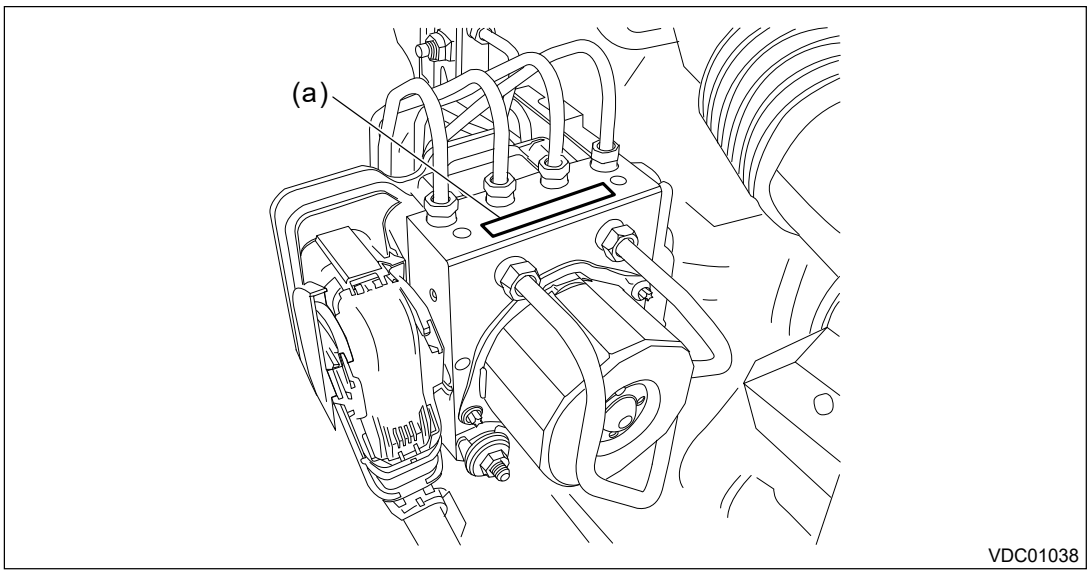
INSPECTION

1. Check the identification (a) of the VDC control module & hydraulic control unit (VDCCM&H/U).

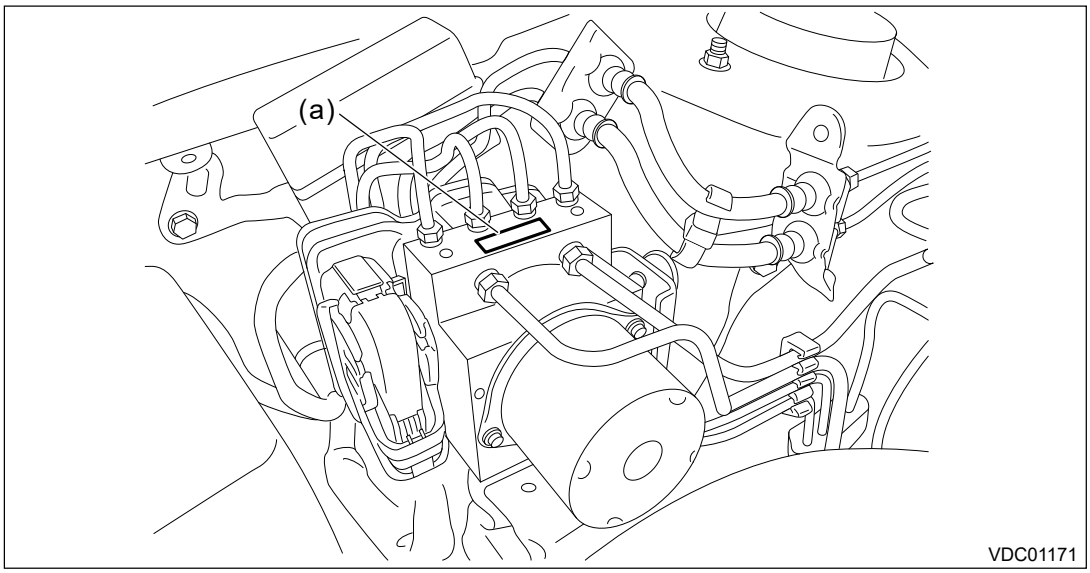
   Note:

   For the identification, refer to "SPECIFICATION" in "General Description". Ref. to VEHICLE DYNAMICS CONTROL (VDC)>General Description>SPECIFICATION.

   - Models without EyeSight



   - Models with EyeSight



2. Check the condition of connection and settlement of connector, and correct or replace if defective.

1. CHECKING THE HYDRAULIC UNIT ABS OPERATION BY PRESSURE GAUGE

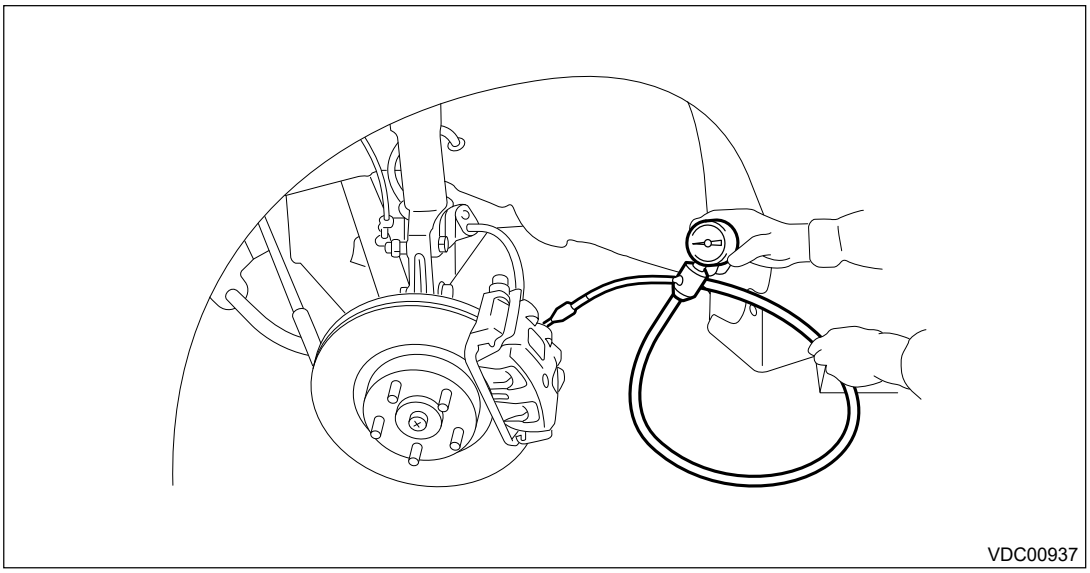
1. Lift up the vehicle, and then remove the wheel.
2. Remove the bleeder - screws from the FL and FR caliper bodies.
3. Connect two pressure gauges to FL and FR caliper bodies.

Caution:

- **Use a pressure gauge used exclusively for brake fluid measurement.**
- **Do not use the pressure gauge used for the measurement of transmission oil. Doing so will cause the piston seal to expand and deform.**

Note:

Wrap sealing tape around the pressure gauge.



4. Bleed air from the pressure gauges and the FL and FR caliper bodies.
5. Perform ABS sequence control. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>ABS Sequence Control.

   Note:

   When the hydraulic unit begins to work, first the FL side performs decompression, hold and compression, and then the FR side performs decompression, hold and compression.
6. Read values indicated on the pressure gauge and check if the fluctuation of the values between decompression and compression meets the standard values. Depress the brake pedal and check that the kick-back is normal, and tightness is normal.

Inspection conditions	Front wheel	Rear wheel
Initial value	3,500 kPa (36 kgf/cm^2, 511 psi)	3,500 kPa (36 kgf/cm^2, 511 psi)
When depressurized	500 kPa (5 kgf/cm^2, 73 psi) or less	500 kPa (5 kgf/cm^2, 73 psi) or less
When pressurized	3,500 kPa (36 kgf/cm^2, 511 psi) or more	3,500 kPa (36 kgf/cm^2, 511 psi) or more

7. Disconnect the pressure gauges from FL and FR caliper bodies.
8. Install the bleeder - screws of the FL and FR caliper bodies.
9. Remove the bleeder - screws from the RL and RR caliper bodies.
10. Connect two pressure gauges to RL and RR caliper bodies.

11. Bleed air from RL and RR caliper bodies, and pressure gauge.
12. Perform ABS sequence control. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>ABS Sequence Control.

    Note:

    When the hydraulic unit begins to work, first the RR side performs decompression, hold and compression, and then the RL side performs decompression, hold and compression.
13. Read values indicated on the pressure gauge and check if the fluctuation of the values between decompression and compression meets specification. Depress the brake pedal and check that the kick-back is normal, and tightness is normal.
14. Disconnect the pressure gauge from the RL and RR caliper bodies.
15. Install the bleeder - screws of the RL and RR caliper bodies.
16. Bleed air from the brake system. Ref. to BRAKE>Air Bleeding.

2. CHECKING THE HYDRAULIC UNIT ABS OPERATION WITH THE BRAKE TESTER

1. Set wheels other than the one to measure on free rollers.
2. Prepare for the ABS sequence control operation. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>ABS Sequence Control.
3. Set the front wheels or rear wheels on the brake tester and set the gear to neutral.
4. Operate the brake tester.
5. Perform ABS sequence control. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>ABS Sequence Control.
6. When the hydraulic unit begins to work, check the following work sequence.
   (1) The FL wheel performs decompression, hold and compression in sequence, and subsequently the FR wheel repeats the cycle.
   (2) The RR wheel performs decompression, hold and compression in sequence, and subsequently the RL wheel repeats the cycle.
7. Read values indicated on the brake tester and check if the fluctuation of the values between decompression and compression meets specification.

Inspection conditions	Front wheel	Rear wheel
Initial value	1,000 N (102 kgf, 225 lb)	1,000 N (102 kgf, 225 lb)
When depressurized	500 N (51 kgf, 112 lb) or less	500 N (51 kgf, 112 lb) or less
When pressurized	1,000 N (102 kgf, 225 lb) or more	1,000 N (102 kgf, 225 lb) or more

8. After the inspection, depress the brake pedal and check that it is not abnormally hard, and tightness is normal.

3. CHECKING THE HYDRAULIC UNIT VDC OPERATION USING A PRESSURE GAUGE

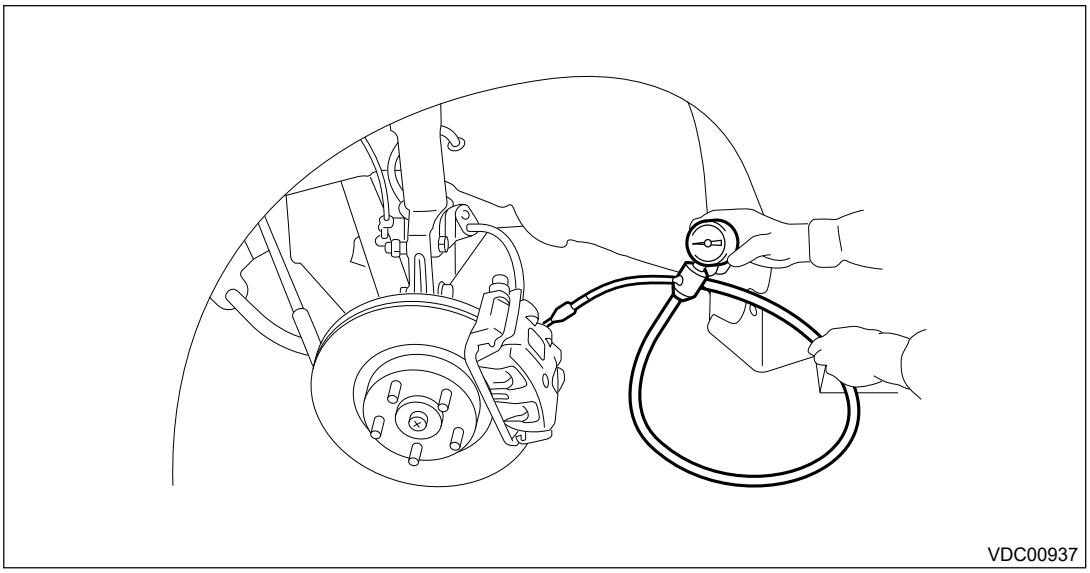
1. Lift up the vehicle, and then remove the wheel.
2. Remove the bleeder - screws from the FL and FR caliper bodies.
3. Connect two pressure gauges to FL and FR caliper bodies.

Caution:

- **Use a pressure gauge used exclusively for brake fluid measurement.**
- **Do not use a pressure gauge used for the measuring transmission oil pressure, as the piston seal may expand and deform.**

Note:

Wrap sealing tape around the pressure gauge.



4. Bleed air from the pressure gauge.
5. Perform VDC sequence control. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Sequence Control.

   Note:

   When the hydraulic unit begins to work, first the FL side performs compression, hold, and decompression, and then the FR side performs compression, hold, and decompression.
6. Read values indicated on the pressure gauge and check if the fluctuation of the values between decompression and compression meets specification. Depress the brake pedal and check that it is not abnormally hard, and tightness is normal.

Inspection conditions	Front wheel	Rear wheel
When pressurized	3,000 kPa (31 kgf/cm^2, 441 psi) or more	3,000 kPa (31 kgf/cm^2, 441 psi) or more
When depressurized	500 kPa (5 kgf/cm^2, 73 psi) or less	500 kPa (5 kgf/cm^2, 73 psi) or less

7. Disconnect the pressure gauges from FL and FR caliper bodies.
8. Install the bleeder - screws of the FL and FR caliper bodies.
9. Remove the bleeder - screws from the RL and RR caliper bodies.
10. Connect two pressure gauges to RL and RR caliper bodies.
11. Bleed air from RL and RR caliper bodies, and pressure gauge.
12. Perform VDC sequence control. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Sequence Control.

Note:

When the hydraulic unit begins to work, first the RR side performs compression, hold, and decompression, and then the RL side performs compression, hold, and decompression.

13. Read the values indicated on the pressure gauges and check if it is within specification. Depress the brake pedal and check that it is not abnormally hard, and tightness is normal.
14. Disconnect the pressure gauge from the RL and RR caliper bodies.
15. Install the bleeder - screws of the RL and RR caliper bodies.
16. Bleed air from the brake system. Ref. to BRAKE>Air Bleeding.

4. CHECK HYDRAULIC UNIT VDC OPERATION WITH BRAKE TESTER

1. Set wheels other than the one to measure on free rollers.
2. Prepare to operate the VDC sequence control. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Sequence Control.
3. Set the front wheels or rear wheels on the brake tester and set the gear to neutral.
4. Operate the brake tester.
5. Perform VDC sequence control. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Sequence Control.
6. When the hydraulic unit begins to work, check the following work sequence.
   (1) The FL wheel performs compression, hold and decompression in sequence, and subsequently the FR wheel repeats the cycle.
   (2) The RR wheel performs compression, hold and decompression in sequence, and subsequently the RL wheel repeats the cycle.
7. Read values indicated on the brake tester and check if the fluctuation of the values between decompression and compression meets specification.

Inspection conditions	Front wheel	Rear wheel
When pressurized	2,000 N (204 kgf, 450 lbf) or more	2,000 N (204 kgf, 450 lbf) or more
When depressurized	500 N (51 kgf, 112 lbf) or less	500 N (51 kgf, 112 lbf) or less

8. After the inspection, depress the brake pedal and check that it is not abnormally hard, and tightness is normal.

INSTALLATION

Caution:

- **When installing the VDCCM&H/U to the bracket - hydraulic unit, make sure that there is no oil adhered to the bolts and the threads of VDCCM&H/U. If the oil is adhered, degrease it carefully before tightening.**
- **Connect the VDCCM&H/U connector securely.**
- **When installing the VDCCM&H/U, replace the damper - hydraulic unit, spacer and nut with new parts. (Models without EyeSight)**

1. Install each part in the reverse order of removal.
   Tightening torque:
   Refer to "COMPONENT" of "General Description". Ref. to VEHICLE DYNAMICS CONTROL (VDC)>General Description>COMPONENT > VDC CONTROL MODULE AND HYDRAULIC CONTROL UNIT (VDCCM&H/U).
2. Connect the battery ground terminal. Ref. to NOTE>NOTE > BATTERY.
3. Bleed air from the brake system. Ref. to BRAKE>Air Bleeding.
4. Perform parameter confirmation, selection, and registration.
   Note:
   - **When the VDCCM&H/U is replaced with a new part, be sure to perform the selection ● registration operation.**
   - **Be sure to use the Subaru Select Monitor for the selection and registration of parameter.**
   - **When the registration has not been performed, the DTC code "Parameter selection error" is detected together with the ABS/EBD/VDC warning light illumination.**
   (1) Check that the applied model and grade of the relevant vehicle are included. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Subaru Select Monitor>OPERATION > PARAMETER CHECK.
   (2) If the applied model and grade of the target vehicle are not included, perform parameter selection and registration. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Subaru Select Monitor>OPERATION > PARAMETER SELECTION.
5. Perform VDC sensor midpoint setting mode. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT.

REMOVAL

1. MODELS WITHOUT EyeSight

1. Disconnect the ground cable from battery. Ref. to NOTE>NOTE > BATTERY.

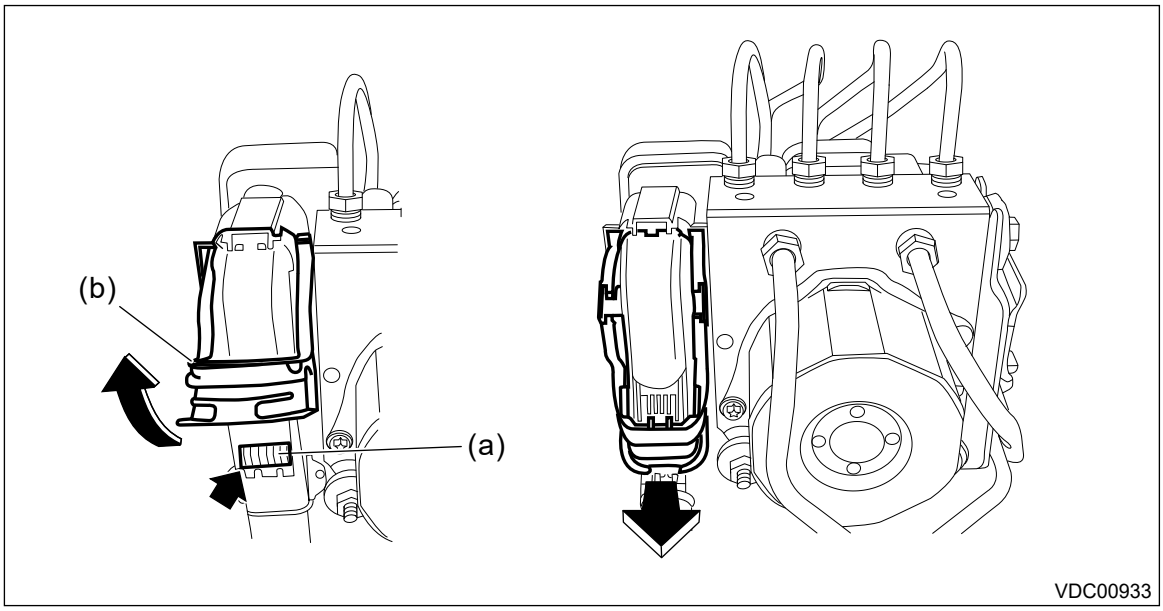
   Note:

   For model with battery sensor, disconnect the ground terminal from battery sensor.

2. Remove the engine control module (ECM). (Turbo model) Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM)>REMOVAL.
3. Remove the intake duct. (Turbo model) Ref. to INTAKE (INDUCTION)(H4DOTC)>Intake Duct>REMOVAL.
4. Remove the air intake boot. (Non-turbo model) Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>REMOVAL.
5. Remove the VDC control module & hydraulic control unit (VDCCM&H/U).
   (1) Remove any dirt from around the VDCCM&H/U.
   (2) Pull up the lock lever (b) while pressing the lock button (a) and disconnect the VDCCM&H/U connector.

   Caution:

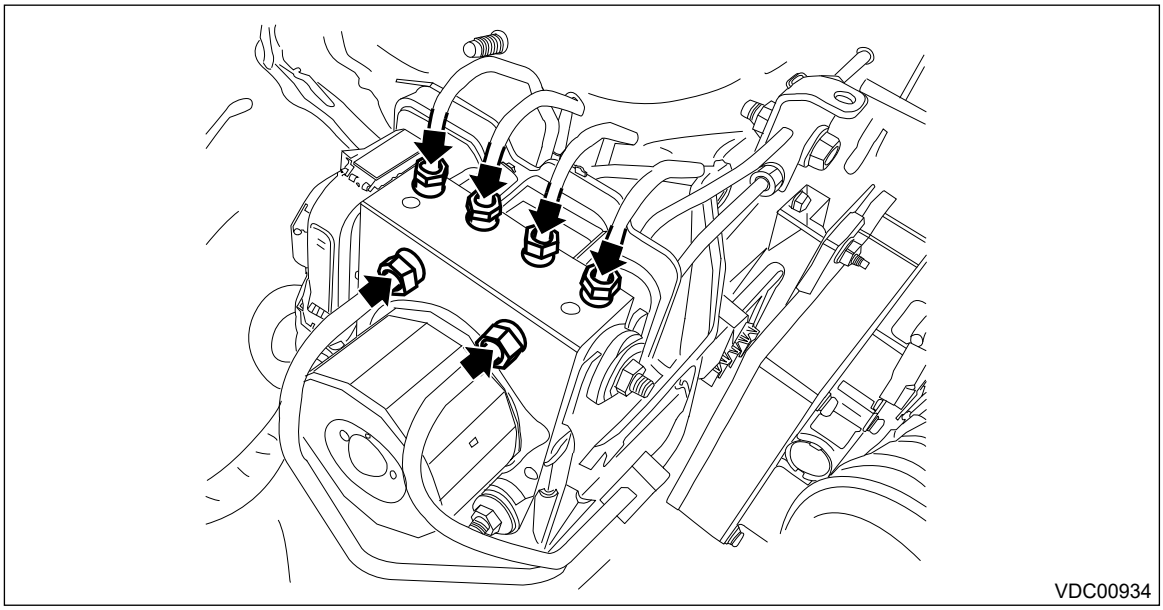
   Do not pull on the harness when disconnecting the connector.



   (3) Using a flare nut wrench, disconnect each brake pipe from VDCCM&H/U.

   Caution:

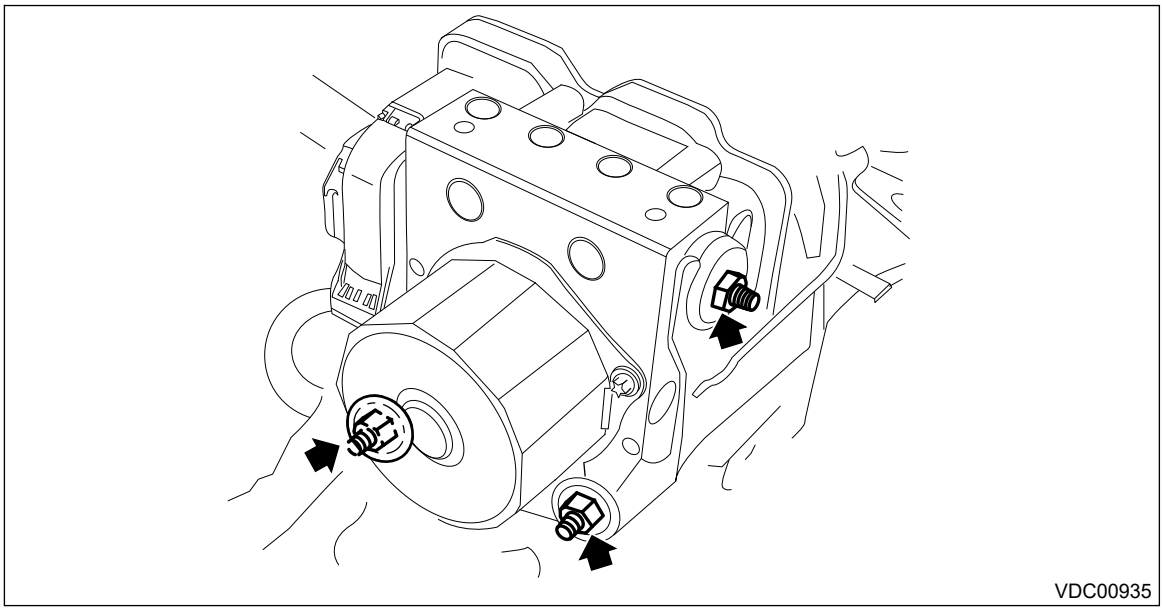
   - **Wrap the brake pipe with a vinyl bag so as not to spill the brake fluid on the painted surface of the vehicle body.**
   - **If brake fluid is spilled on the painted surface of the vehicle body, wash it off immediately with water and wipe clean.**



(4) Remove the nuts and remove the VDCCM&H/U from the bracket - hydraulic unit.

Caution:

- **Do not drop or bump the VDCCM&H/U.**
- **Do not turn the VDCCM&H/U upside down or place it sideways for storage.**
- **Be careful not to let foreign matter enter the VDCCM&H/U.**
- **Be careful that no water and fluid enter the connectors.**



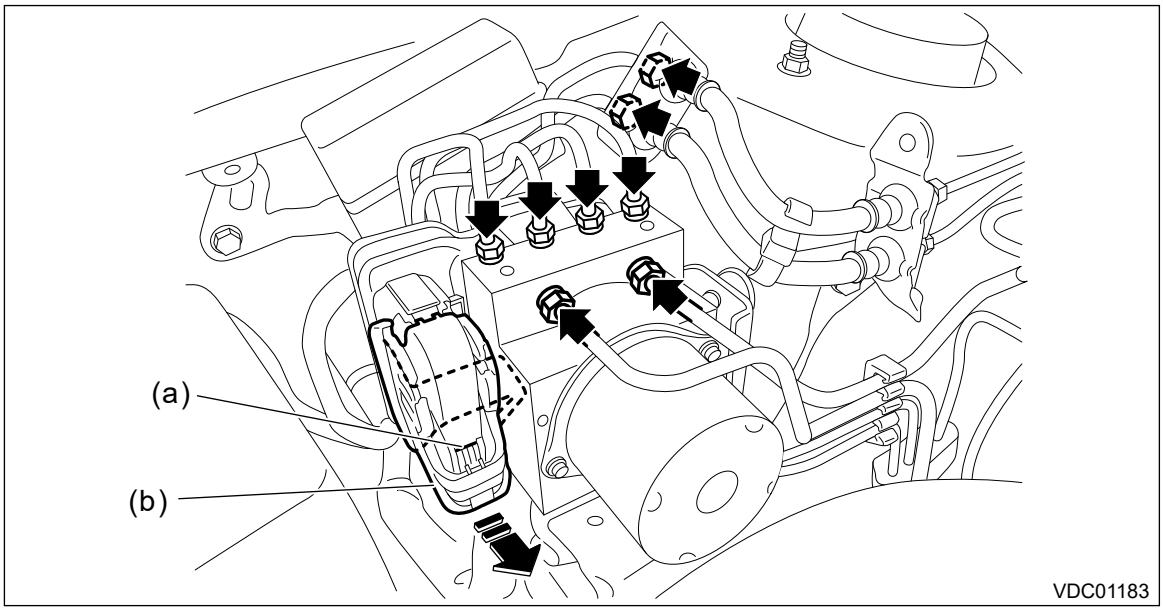
2. MODELS WITH EyeSight

Caution:

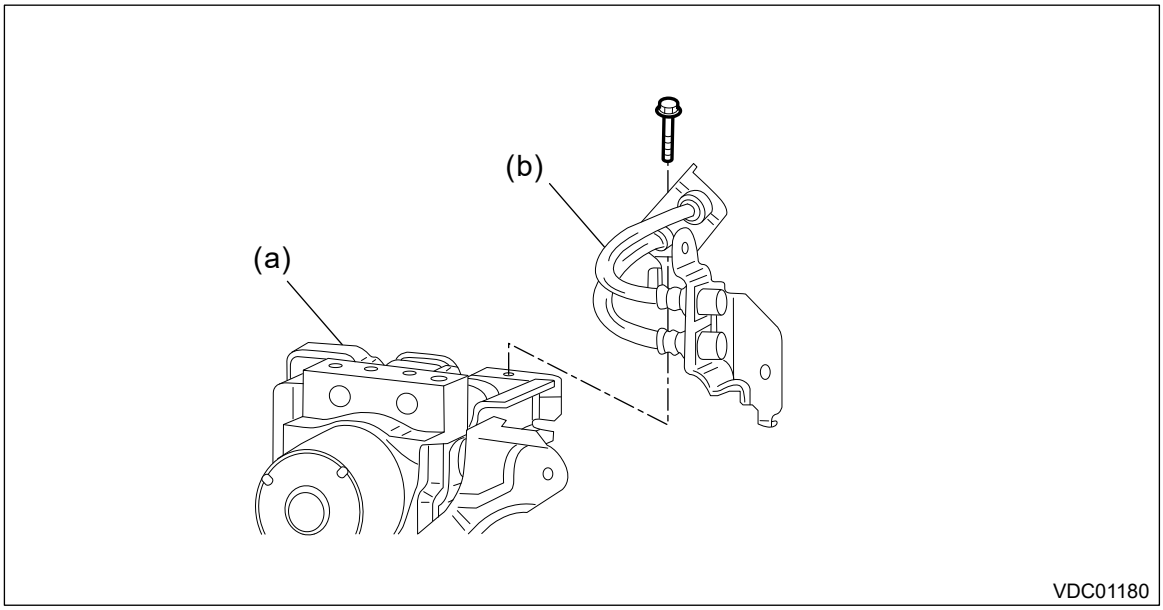
- **Avoid unnecessary removal of parts in order to prevent fluid leakage.**
- **When the VDCCM&H/U components are removed, be sure to perform the installation according to the installation procedures.** **Ref. to VEHICLE**

DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>INSTALLATION.

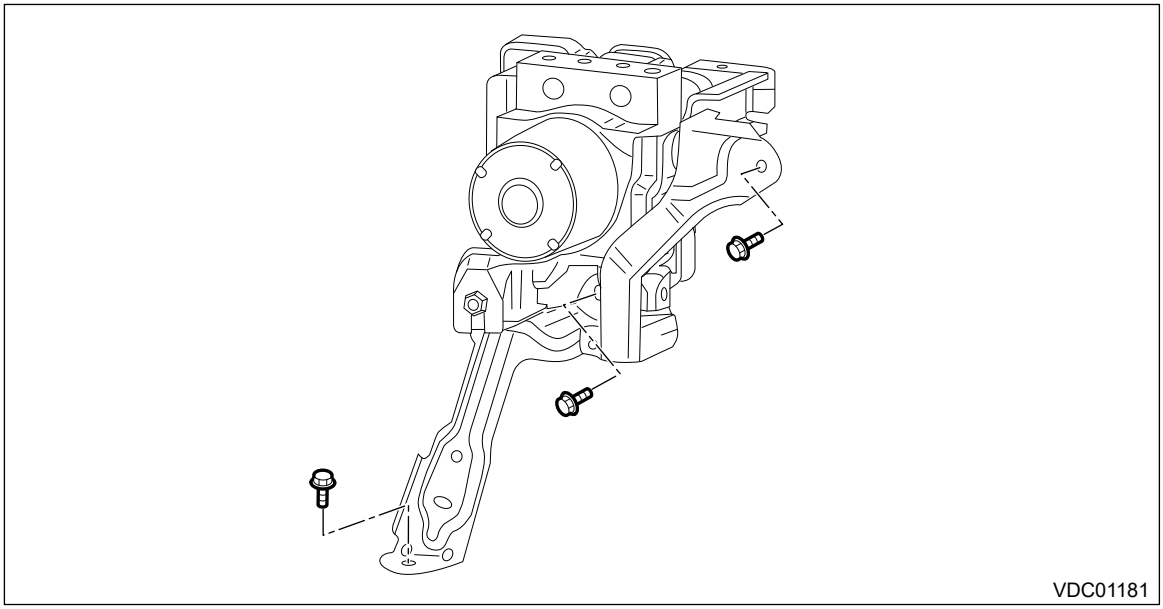
1. Disconnect the ground cable from battery. Ref. to NOTE>NOTE > BATTERY.
   Note:
   For model with battery sensor, disconnect the ground terminal from battery sensor.
2. Remove the engine control module (ECM). (Turbo model) Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM)>REMOVAL.
3. Remove the intake duct. (Turbo model) Ref. to INTAKE (INDUCTION)(H4DOTC)>Intake Duct>REMOVAL.
4. Remove the air intake boot. (Non-turbo model) Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>REMOVAL.
5. Remove the VDC control module & hydraulic control unit (VDCCM&H/U).
   (1) Remove any dirt from around the VDCCM&H/U.
   (2) Pull up the lock lever (b) while pressing the lock button (a) and disconnect the VDCCM&H/U connector.
   (3) Using a flare nut wrench, disconnect each brake pipe from VDCCM&H/U.
   Caution:
   - **Do not pull on the harness when disconnecting the connector.**
   - **Wrap the brake pipe with a vinyl bag so as not to spill the brake fluid on the painted surface of the vehicle body.**
   - **If brake fluid is spilled on the painted surface of the vehicle body, wash it off immediately with water and wipe clean.**



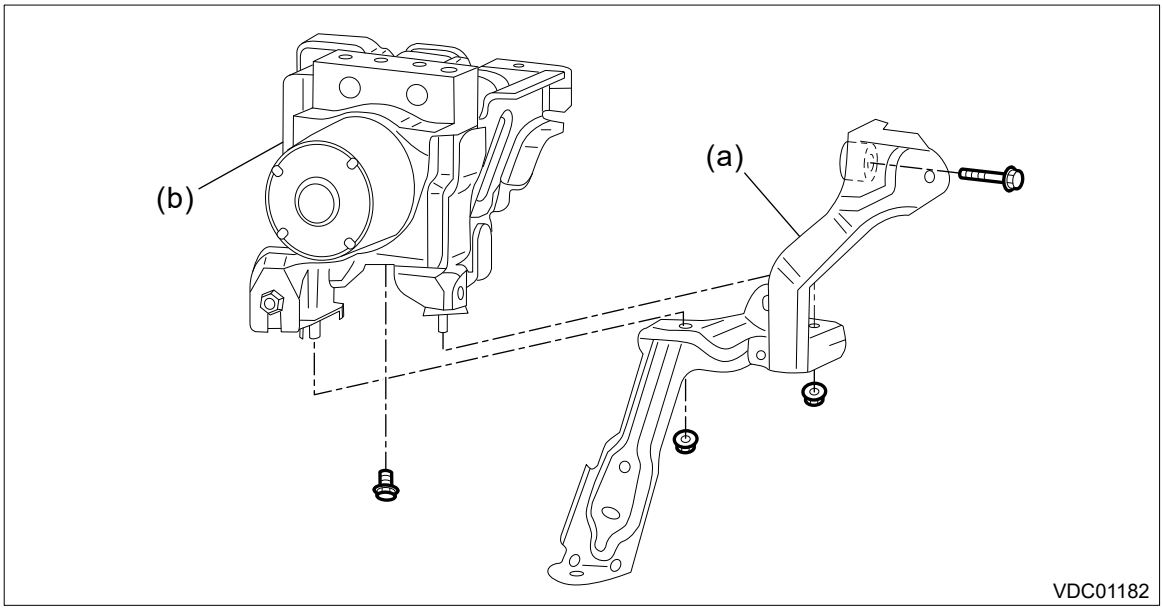
6. Remove the bracket - hydraulic unit and VDCCM&H/U.
   (1) Remove the bolts, and remove the hose assembly (b) from the bracket - hydraulic unit (a).



(2) Remove the bolts and remove the bracket - hydraulic unit and VDCCM&H/U from the vehicle.



(3) Remove the bolts and nuts and remove the VDCCM&H/U (b) from the bracket - hydraulic unit (a).



Caution:

- **Do not drop or bump the VDCCM&H/U.**
- **Do not turn the VDCCM&H/U upside down or place it sideways for storage.**
- **Be careful not to let foreign matter enter the VDCCM&H/U.**
- **Be careful that no water and fluid enter the connectors.**

REPLACEMENT

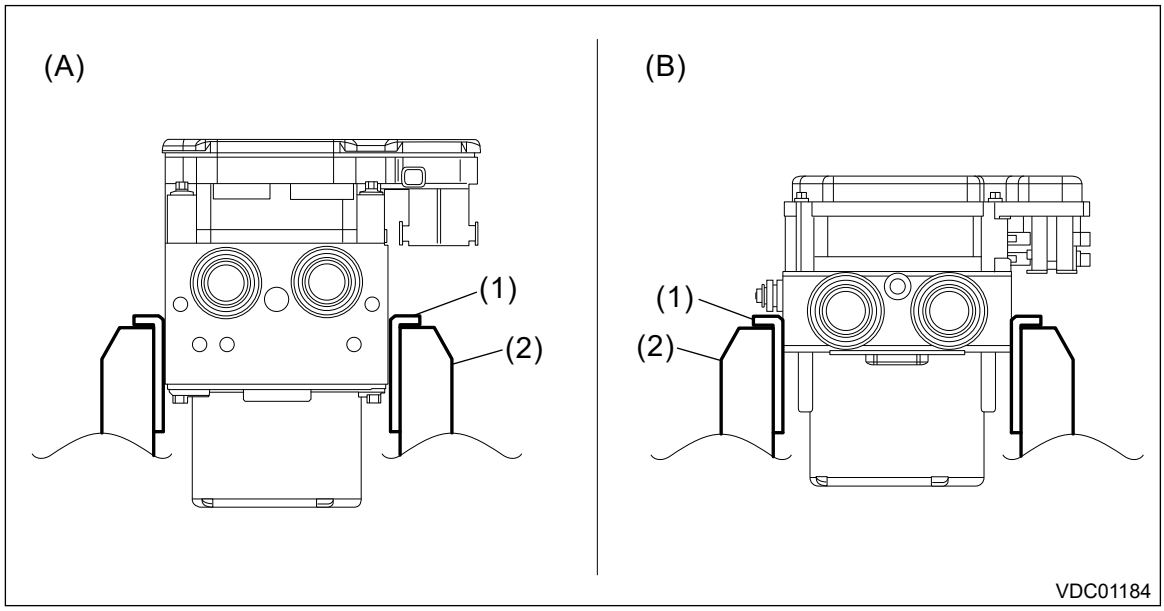
Caution:

- **Because the pressure sensor built into the H/U is easily damaged by static electricity, start the operation after performing static electricity measures.**
- **Be careful not to touch the sensors in the H/U to prevent damage.**
- **Because the seal of the VDCCM cannot be replaced, do not pull or peel it by lifting it up.**
- **Because the screw of the H/U will become slightly worn in every replacement procedure, 5 times is the maximum number of times for replacement. If a problem is found such as not being able to torque the screw to specifications even before 5 replacement operations are performed, replace the H/U body.**
- **When installing the VDCCM, always use new screws.**
- **When the sealing surface of the VDCCM or H/U is dirty or damaged and it cannot be cleaned or repaired, replace with a new part.**

1. Remove the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>REMOVAL.
2. To prevent entry of foreign objects and brake fluid leakage, plug the oil pressure port of the VDCCM&H/U using a screw plug, etc.
3. Set the pump motor section of the removed VDCCM&H/U face down on a vise.

   Note:

   Before securing a part on a vise, place cushioning material such as wood blocks, aluminum plate, or cloth between the part and the vise.

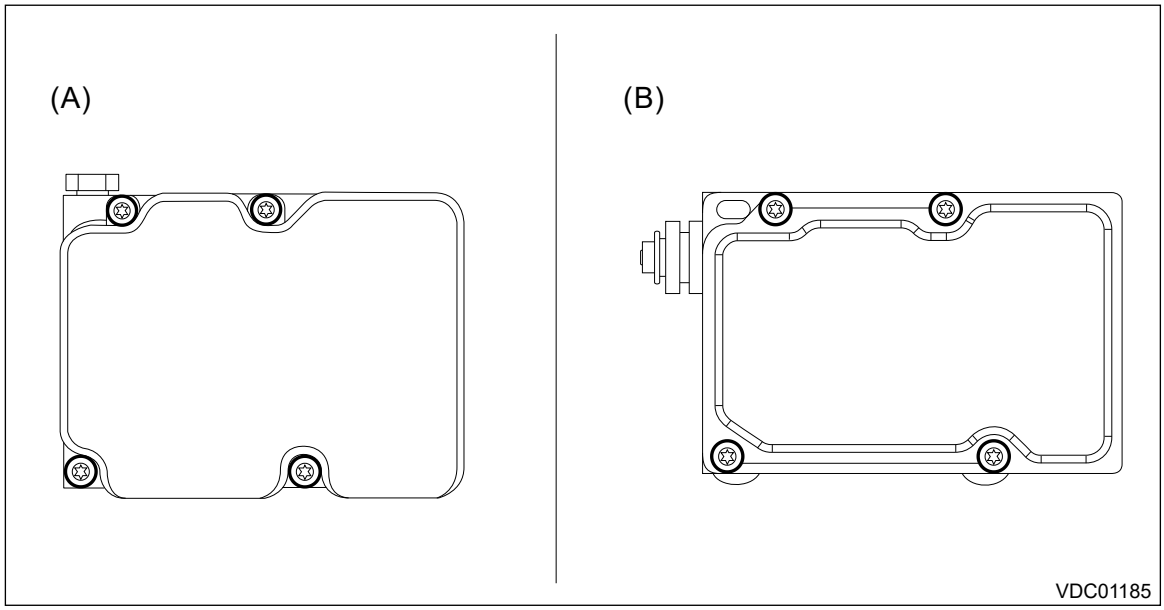


(A) Models with EyeSight
(B) Models without EyeSight
(1) Aluminum plate, etc.
(2) Vise

4. Using TORX® E5, remove the four screws from VDCCM.

Caution:

Do not re-use the screws.



(A) Models with EyeSight (B) Models without EyeSight

5. Slowly pull out the VDCCM upward from the H/U.

Note:

To prevent damaging of coil section, remove the VDCCM straight up from H/U without twisting.

6. Make sure there is no dirt or damage on the sealing surface of the H/U.

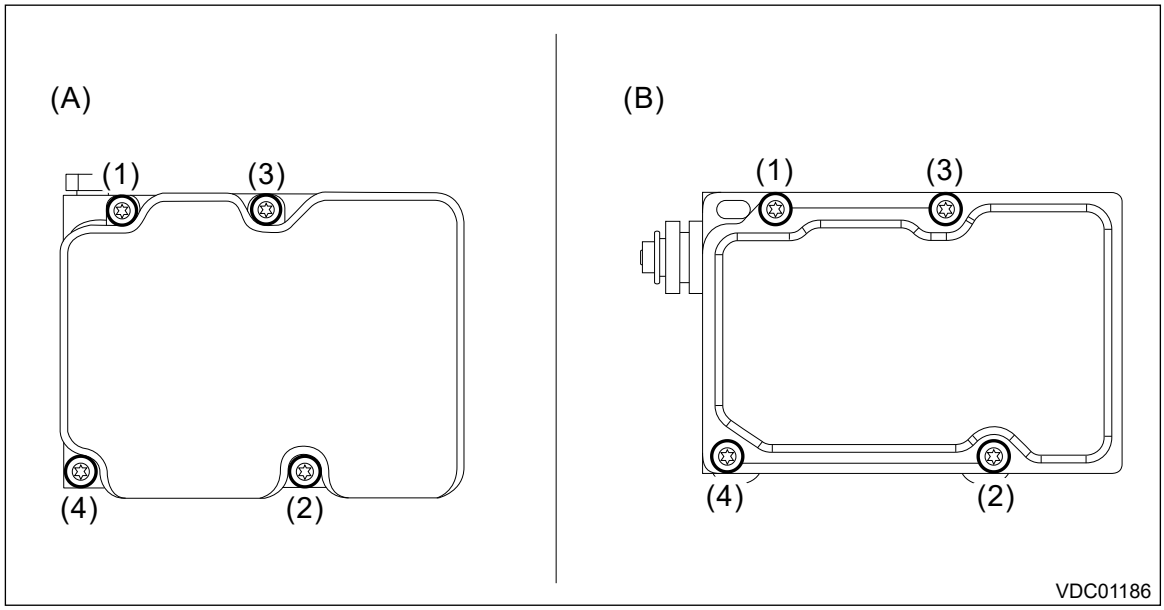
Caution:

- **Do not clean the VDCCM&H/U by applying compressed air.**
- **Even if damage is found on the H/U seal, do not attempt repair by filing or with a metal scraper. To remove the seal residue, always use a plastic scraper. Do not use chemical such as paint thinner, etc., to clean.**

7. Position the coil of the new VDCCM to align with the H/U valve.
8. To prevent deformation of the VDCCM housing cover, hold the corner of VDCCM and install it to the H/U without tilting.
9. Using TORX® E5, gradually tighten new screws in order of (1) through (4).

Caution:

Always use new screws.



(A) Models with EyeSight (B) Models without EyeSight

Tightening torque:
1.5 N•m (0.15 kgf-m, 1.1 ft-lb)

10. Check that there is no foreign matter in mating surface between the VDCCM&H/U.

11. Using TORX® E5 again, gradually tighten the screws in order of (1) through (4).
Tightening torque:
3 N•m (0.31 kgf-m, 2.2 ft-lb)

12. Check that there is no gap in the mating surface between VDCCM&H/U.

13. Install the VDCCM&H/U to the vehicle.
Caution:
When installing the VDCCM&H/U, replace the damper - hydraulic unit, spacer and nut with new parts. (Models without EyeSight)

14. Bleed air from the brake system. Ref. to BRAKE>Air Bleeding>PROCEDURE.

15. Perform the selection and registration operation of parameter.
Note:
- **After replacing the VDCCM, be sure to perform the selection • registration operation of parameter.**
- **For the selection and registration of parameter, the Subaru Select Monitor is required.**
- **When the registration has not been performed, the DTC code "Parameter selection error" is detected together with the ABS/EBD/VDC warning light illumination.**

(1) Check the parameter to confirm that the applied models and grades of the relevant vehicle are included. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Subaru Select Monitor>OPERATION > PARAMETER CHECK.

(2) If the applied model and grade of the target vehicle are not included on the «Confirm on parameter» display screen, perform parameter selection and registration again. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Subaru Select Monitor>OPERATION > PARAMETER SELECTION.

16. Execute Clear Memory after parameter selection and registration operations because the DTC for “Parameter selection error” is memorized.

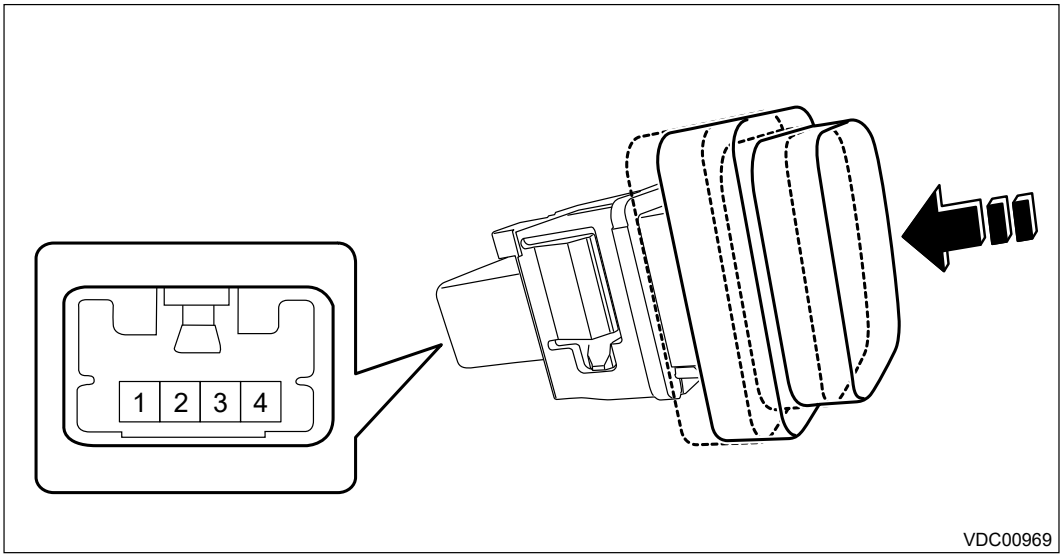
INSPECTION

1. Disconnect the VDC OFF switch connector.
2. Check the resistance between the VDC OFF switch terminals.

Preparation tool:

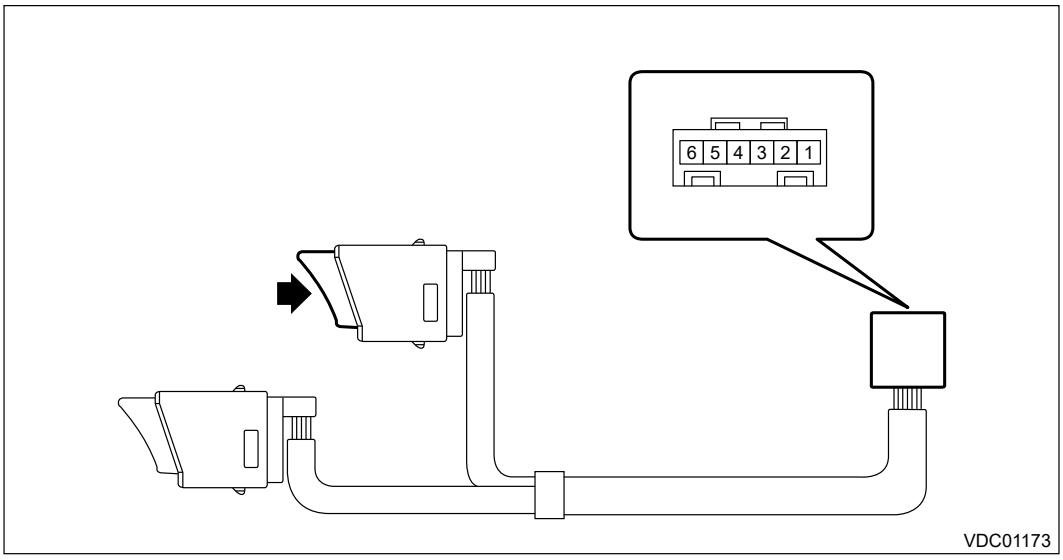
Circuit tester

- Model without power rear gate



Terminal No.	Inspection conditions	Standard
2 - 3	Switch OFF	1 MΩ or more
	Switch ON	Less than 1 Ω

- Model with power rear gate



Terminal No.	Inspection conditions	Standard
1 - 2	Switch OFF	1 MΩ or more
	Switch ON	Less than 1 Ω

3. Replace the VDC OFF switch if the inspection result is not within the standard value.

INSTALLATION

1. Install each part in the reverse order of removal.
2. Connect the battery ground terminal. Ref. to NOTE>NOTE > BATTERY.

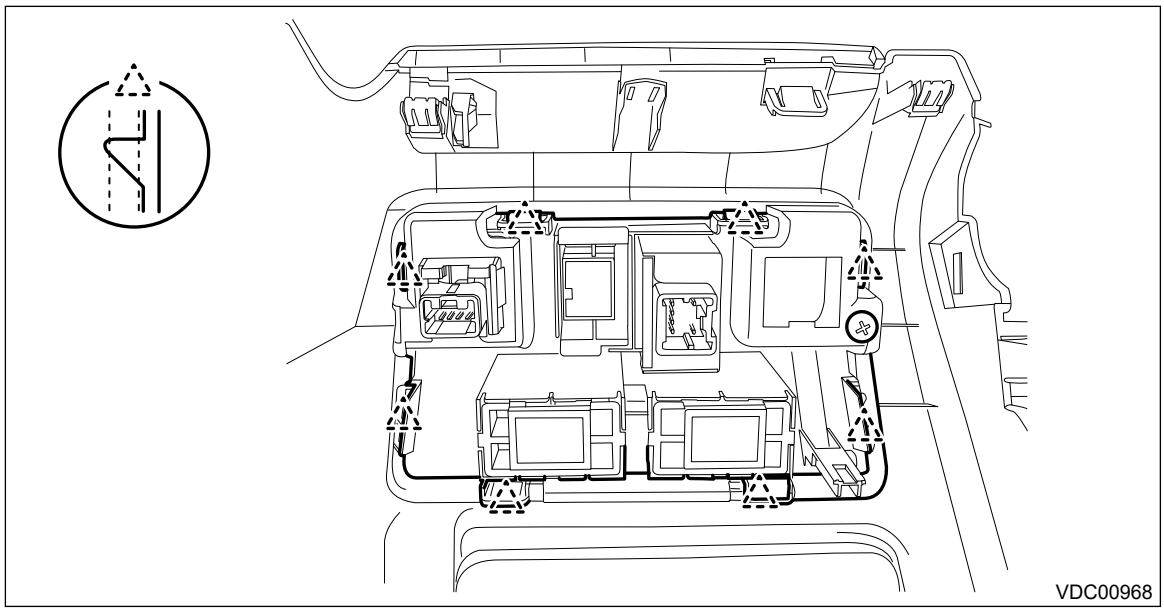
VEHICLE DYNAMICS CONTROL (VDC) > VDC OFF Switch

REMOVAL

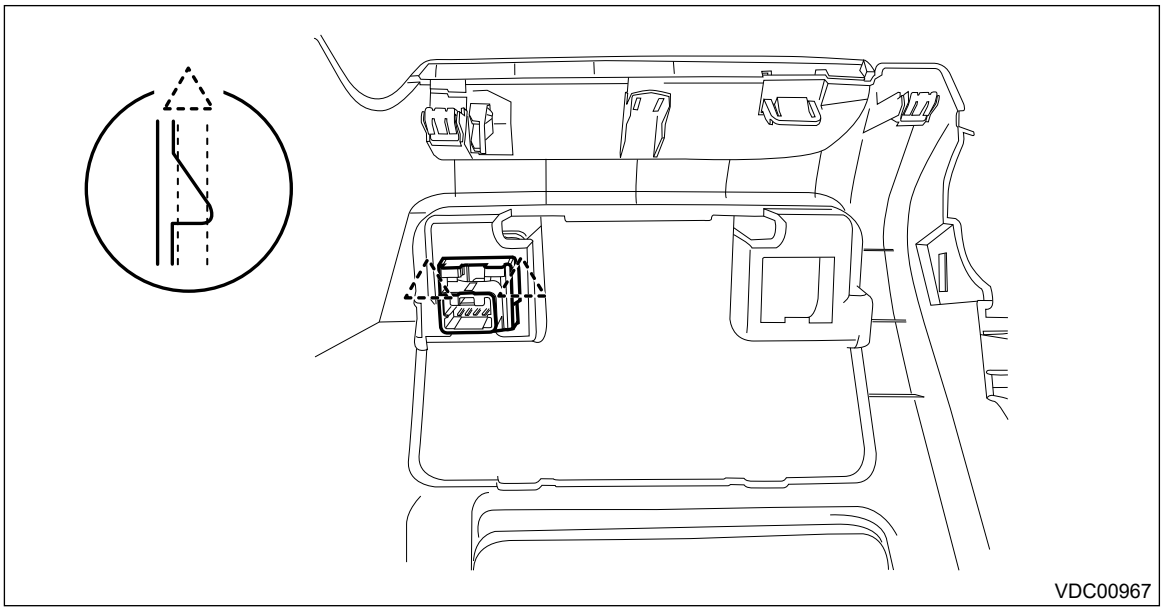
1. Disconnect the ground cable from battery. Ref. to NOTE>NOTE > BATTERY.

   Note:

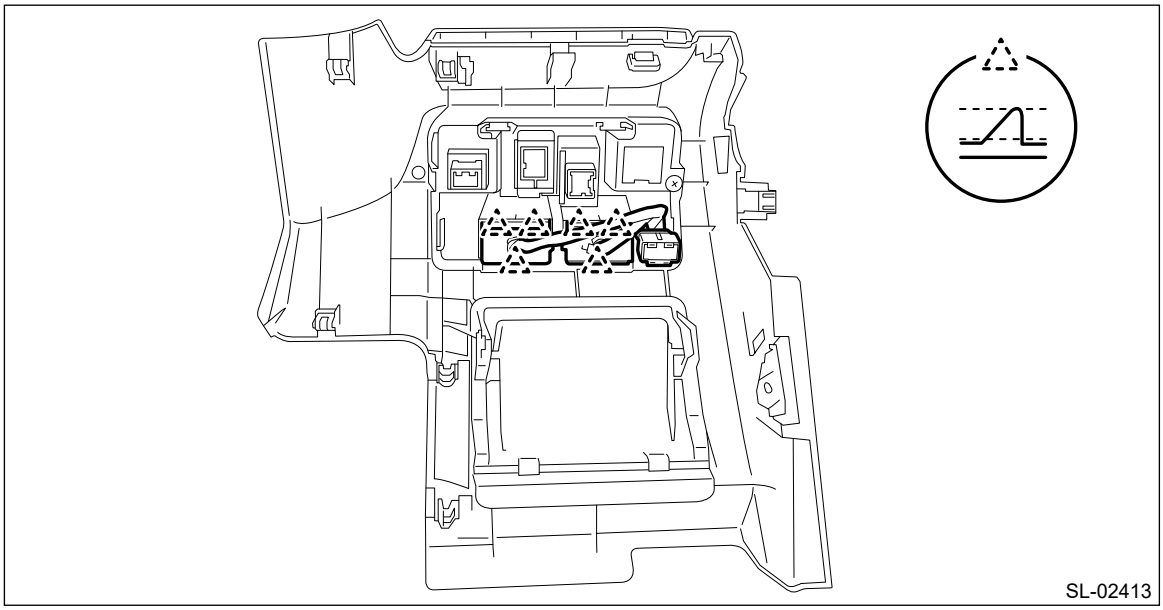
   For model with battery sensor, disconnect the ground terminal from battery sensor.
2. Remove the cover assembly - instrument panel LWR driver. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.
3. Remove the screws and release the claws, then detach the cover. (Model without power rear gate)



4. Release the claws and remove the VDC OFF switch.
   - Model without power rear gate



- Model with power rear gate



OPERATION

1. While the VDC sequence control is performed, the operation of the hydraulic unit can be checked using the brake tester or pressure gauge after the hydraulic unit solenoid valve is operated.
2. VDC sequence control can be started by Subaru Select Monitor.

1. VDC SEQUENCE CONTROL WITH SUBARU SELECT MONITOR

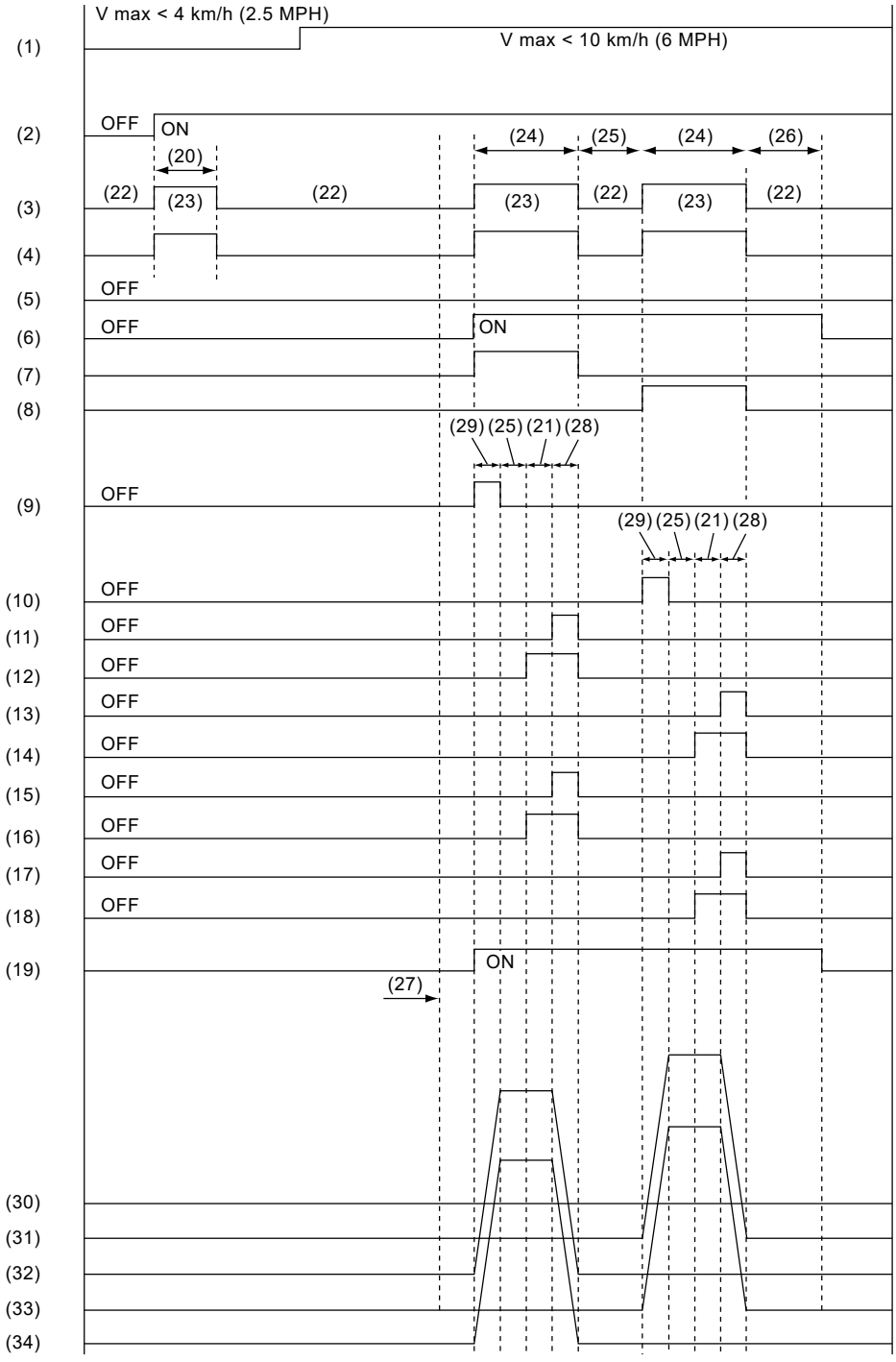
Caution:
For models with EyeSight, performing the sequence control may cause the EyeSight warning light to illuminate. If the sequence control is performed, refer to "Basic Diagnostic Procedure" of "EyeSight (DIAGNOSTICS)" and check DTCs and then clear memory. **Ref. to EyeSight (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Note:
In the event of any trouble, sequence control will not operate.

1. Connect the Subaru Select Monitor.
   Note:
   For detailed operation procedures, refer to "Application help".
   (1) Turn the ignition switch to ON.
   (2) On [Start] display, select [Diagnosis].
   (3) On [Vehicle selection] display, input the target vehicle information and select [OK].
   (4) On [Main Menu] display, select [Each System].
   (5) On [Select System] display, select [Brake Control System], and then select [Enter].
   (6) On [Select Function] display, select [Work Support].
   (7) On the work support item list, select [VDC Function Check Mode].
2. Operate according to the procedures displayed in the Subaru Select Monitor.
3. The brake system being operated is displayed on the Subaru Select Monitor.

2. CONDITIONS FOR VDC SEQUENCE CONTROL

Note:
The control operation starts at point A.



VDC10059

(1) All wheel speed
(2) Ignition key
(3) ABS Warning Lamp
(4) VDC Warning Lamp
(5) Switch - stop light
(6) Valve relay
(7) VDC switching valve 1 FL
(8) VDC switching valve 1 FR
(13) FR decompression valve
(14) FR compression valve
(15) RR decompression valve
(16) RR compression valve
(17) RL decompression valve
(18) RL compression valve
(19) Pump motor
(20) A few seconds
(25) 1 second
(26) 1.6 seconds
(27) Point A
(28) 0.4 seconds
(29) 0.8 seconds
(30) Master cylinder pressure
(31) FR wheel cylinder pressure
(32) FL wheel cylinder pressure

(9) VDC switching valve 2 FL
(10) VDC switching valve 2 FR
(11) FL decompression valve
(12) FL compression valve
(21) 1.2 seconds
(22) Extinction
(23) Light On
(24) 3.4 seconds
(33) RL wheel cylinder pressure
(34) RR wheel cylinder pressure

SPECIFICATION

1. CONDITIONS FOR COMPLETION OF VDC SEQUENCE CONTROL

When the following conditions develop, the VDC sequence control stops and VDC operation is returned to the normal control mode.

- When the speed of at least one wheel reaches 10 km/h (6 MPH).
- After completion of VDC sequence control.
- When a malfunction is detected.

ELECTRICAL SPECIFICATION

Refer to the Control Module I/O Signal of the "Vehicle Dynamics Control System (VDC) (DIAGNOSTICS)". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Control Module I/O Signal>ELECTRICAL SPECIFICATION.

VEHICLE DYNAMICS CONTROL (VDC) > Vehicle Dynamics Control System

INSPECTION

Refer to the “Vehicle Dynamics Control System (VDC) (DIAGNOSTICS)”. Ref. to BRAKE CONTROL (DIAGNOSTICS)>General Diagnostic Table>INSPECTION.

VEHICLE DYNAMICS CONTROL (VDC) > Vehicle Dynamics Control System

NOTE

For operation procedures of each component of the vehicle dynamics control system, refer to the respective section.

- VDC control module & hydraulic control unit (VDCCM&H/U): Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
- Yaw rate & G sensor: Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Yaw Rate and G Sensor.
- Steering angle sensor: Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Steering Angle Sensor.
- Front ABS wheel speed sensor: Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Front ABS Wheel Speed Sensor.
- Rear ABS wheel speed sensor: Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Rear ABS Wheel Speed Sensor.
- Front magnetic encoder: Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Front Magnetic Encoder.
- Rear magnetic encoder: Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Rear Magnetic Encoder.
- VDC OFF switch: Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC OFF Switch.

WIRING DIAGRAM

Refer to “Vehicle Dynamics Control System” in the wiring diagram. Ref. to WIRING SYSTEM>Vehicle Dynamics Control System>WIRING DIAGRAM.

INSPECTION

1. YAW RATE & LONGITUDINAL G AND LATERAL G SENSORS SIGNAL (MODELS WITHOUT EyeSight)

1. CHECK YAW RATE & G SENSOR.

1. Check the installation condition of the VDC control module & hydraulic control module (VDCCM&H/U).
2. Using Subaru Select Monitor, display [Data Monitor].
   Note:
   For detailed operation procedures, refer to "Application help".
3. Read the output of [Yaw Rate Sensor], [Longitudinal G Sensor] and [Lateral G Sensor].

When the vehicle is placed horizontally, are the displayed values −1.5 to 1.5 m/s^2 for longitudinal G and lateral G sensor, and −4 to 4 deg/s for yaw rate sensor?

Yes — Go to 2.

No — Replace the VDC control module & hydraulic control unit (VDCCM&H/U).

2. PERFORM DRIVING TEST.

Drive for approximately 10 minutes, and check that there is no system malfunction or the warning light illumination while driving.

Is there any abnormal movement or the warning light illumination while driving?

Yes — Perform the diagnosis according to DTCs for the VDC system. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC).

No — G sensor is normal.

2. YAW RATE & G SENSOR SIGNAL (MODELS WITH EyeSight)

1. CHECK YAW RATE & G SENSOR.

1. Check the yaw rate & lateral G sensor installation.
2. Select the [Data Monitor] using Subaru Select Monitor.
   Note:
   For detailed operation procedures, refer to "Application help".
3. Read the output of [Yaw Rate Sensor], [Longitudinal G Sensor] and [Lateral G Sensor].

Are the indicated values when the vehicle is placed horizontally, Lateral G sensor: −1.5 to 1.5 m/s^2, Yaw rate sensor: −4 to 4 deg/s?

Yes — Go to 2.

No — Repair the harness connector between yaw rate & G sensor and VDCCM&H/U. Or replace yaw rate & G sensor.

2. CHECK G SENSOR.

1. Remove the console box.
2. Remove the yaw rate & G sensor from vehicle without disconnecting the connector.
3. Read the display of Subaru Select Monitor.
   Note:
   When the yaw rate & G sensor is moved with its power supply on, DTC of yaw rate & G sensor may be recorded.

When the yaw rate & G sensor is inclined 90° to the right, is the indicated value 6.8 to 12.8 m/s^2?

Yes — Go to 3.

No — Repair the harness connector between yaw rate & G sensor and VDCCM&H/U. Or replace yaw rate & G sensor.

3. CHECK G SENSOR.

Read the display of Subaru Select Monitor.

Note:
When the yaw rate & G sensor is moved with its power supply on, DTC of yaw rate & G sensor may be recorded.

When the yaw rate & G sensor is inclined 90° to the left, is the indicated value −6.8 to −12.8 m/s^2?

Yes	Yaw rate & G sensors are normal.
No	Repair the harness connector between yaw rate & G sensor and VDCCM&H/U. Or replace yaw rate & G sensor.

INSTALLATION

Caution:

After completion of installation, set the following two positions.

- **Positioning to the center of steering angle sensor**
- **Positioning the yaw rate & G sensors to zero**

The above procedure is required for the VDCCM&H/U to identify the vehicle position afterward. For the setting procedures of the 2 steps above, refer to "Adjustment" in "VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)". **Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT.**

1. Install each part in the reverse order of removal.

   Tightening torque:

   Yaw rate & G sensor: 7.5 N•m (0.76 kgf-m, 5.5 ft-lb)

   Console box assembly: 6.5 N•m (0.66 kgf-m, 4.8 ft-lb)
2. Connect the battery ground terminal. Ref. to NOTE>NOTE > BATTERY.

NOTE

For models without EyeSight, yaw rate & longitudinal G and lateral G sensors are integrated with the VDC control module & hydraulic control unit (VDCCM&H/U).

REMOVAL

1. Disconnect the ground cable from battery. Ref. to NOTE>NOTE > BATTERY.

   Note:

   For model with battery sensor, disconnect the ground terminal from battery sensor.
2. Remove the console box. Ref. to EXTERIOR/INTERIOR TRIM>Console Box>REMOVAL.
3. Disconnect the connector from yaw rate & G sensor.
4. Remove the nut and remove the yaw rate & G sensor.

   Caution:

   Do not drop or hit the yaw rate & G sensor.