VEHICLE DYNAMICS CONTROL (VDC)

VDC

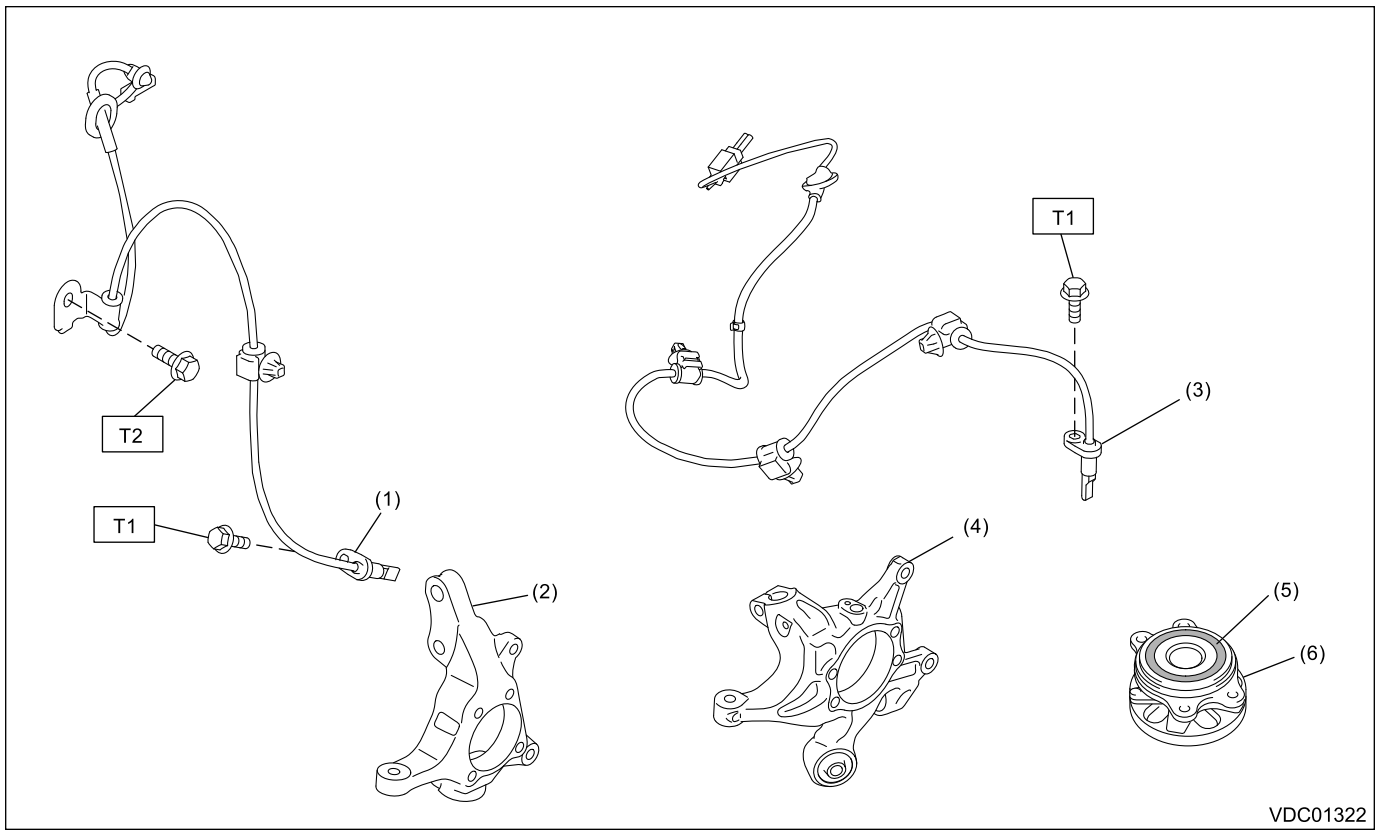
1. General Description
2. Relay and Fuse
3. Vehicle Dynamics Control System
4. VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)
5. ABS Sequence Control
6. VDC Sequence Control
7. Brake Lamp Relay
8. Yaw Rate and G Sensor
9. Steering Angle Sensor
10. Front ABS Wheel Speed Sensor
11. Rear ABS Wheel Speed Sensor
12. Front Magnetic Encoder
13. Rear Magnetic Encoder
14. VDC OFF Switch
15. Auto Vehicle Hold Switch

SPECIFICATION

Item				Specification or identification
ABS wheel speed sensor	ABS wheel speed sensor gap (for reference)	Front		0.63 — 1.57 mm (0.02 — 0.062 in)
		Rear	Model equipped with hand brake	0.47 — 1.73 mm (0.02 — 0.068 in)
			Model equipped with EPB	0.60 — 1.59 mm (0.02 — 0.063 in)
	Identifications of harness (symbol)	Front	RH	G1
			LH	G2
		Rear	RH	G3
			LH	G4
VDCCM&H/U identification	Model without EyeSight (model with spare tire)			PM
	Models with EyeSight			PF

COMPONENT

1. ABS WHEEL SPEED SENSOR

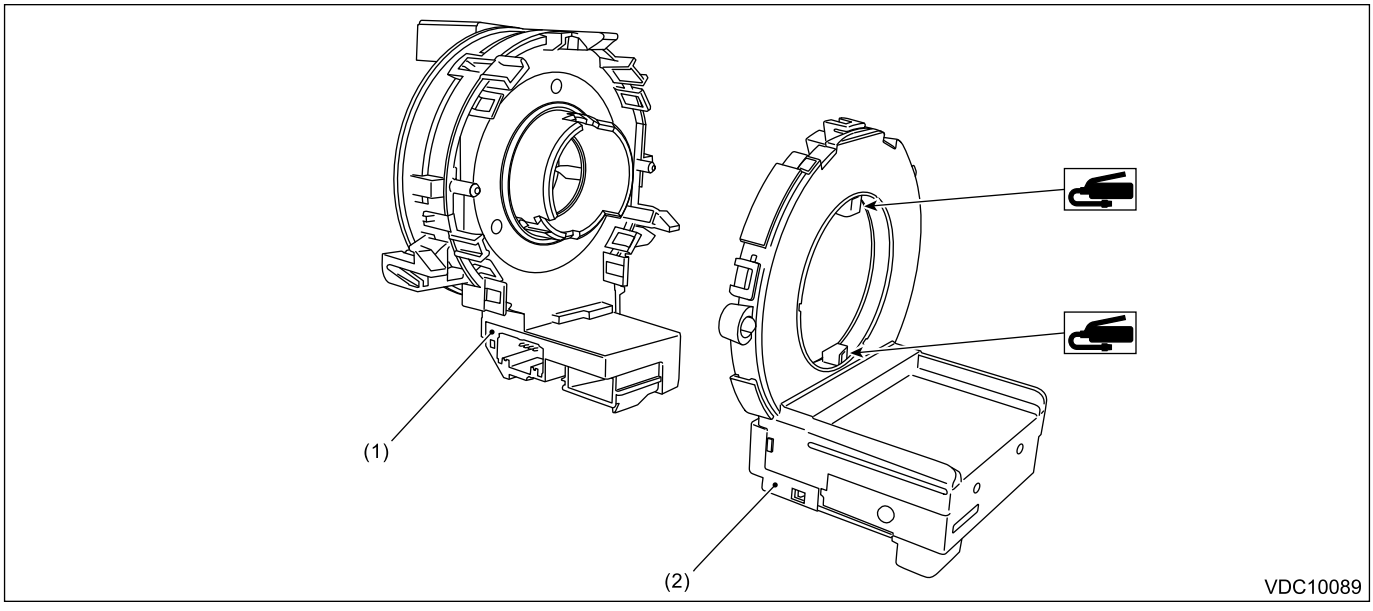


(1) Front ABS wheel speed sensor
(2) Housing ASSY - front axle
(3) Rear ABS wheel speed sensor
(4) Housing ASSY - rear axle
(5) Magnetic encoder
(6) Hub unit bearing

Tightening torque: N·m (kgf-m, ft-lb)

T1: 7.5 (0.8, 5.5)
T2: 33 (3.4, 24.3)

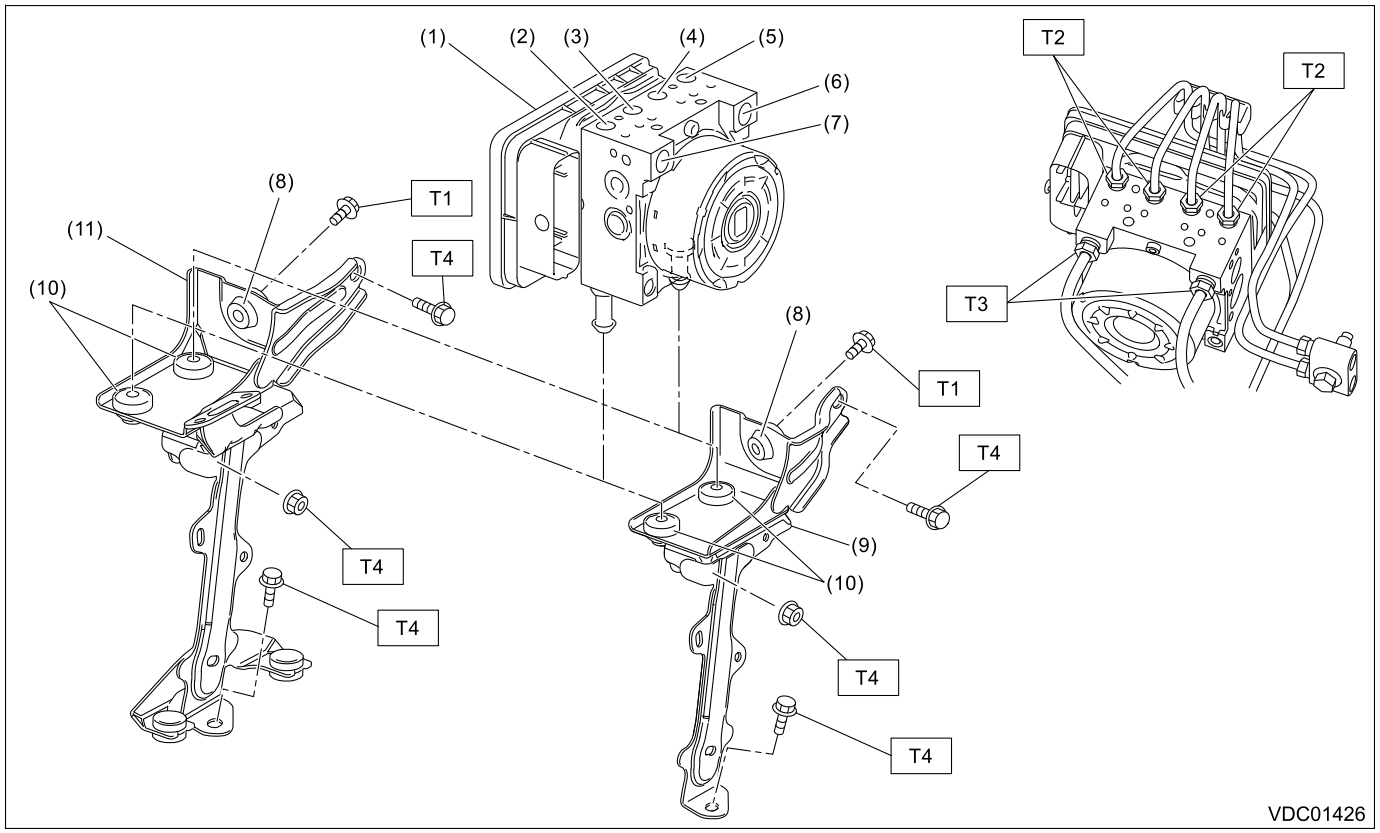
2. STEERING ANGLE SENSOR



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

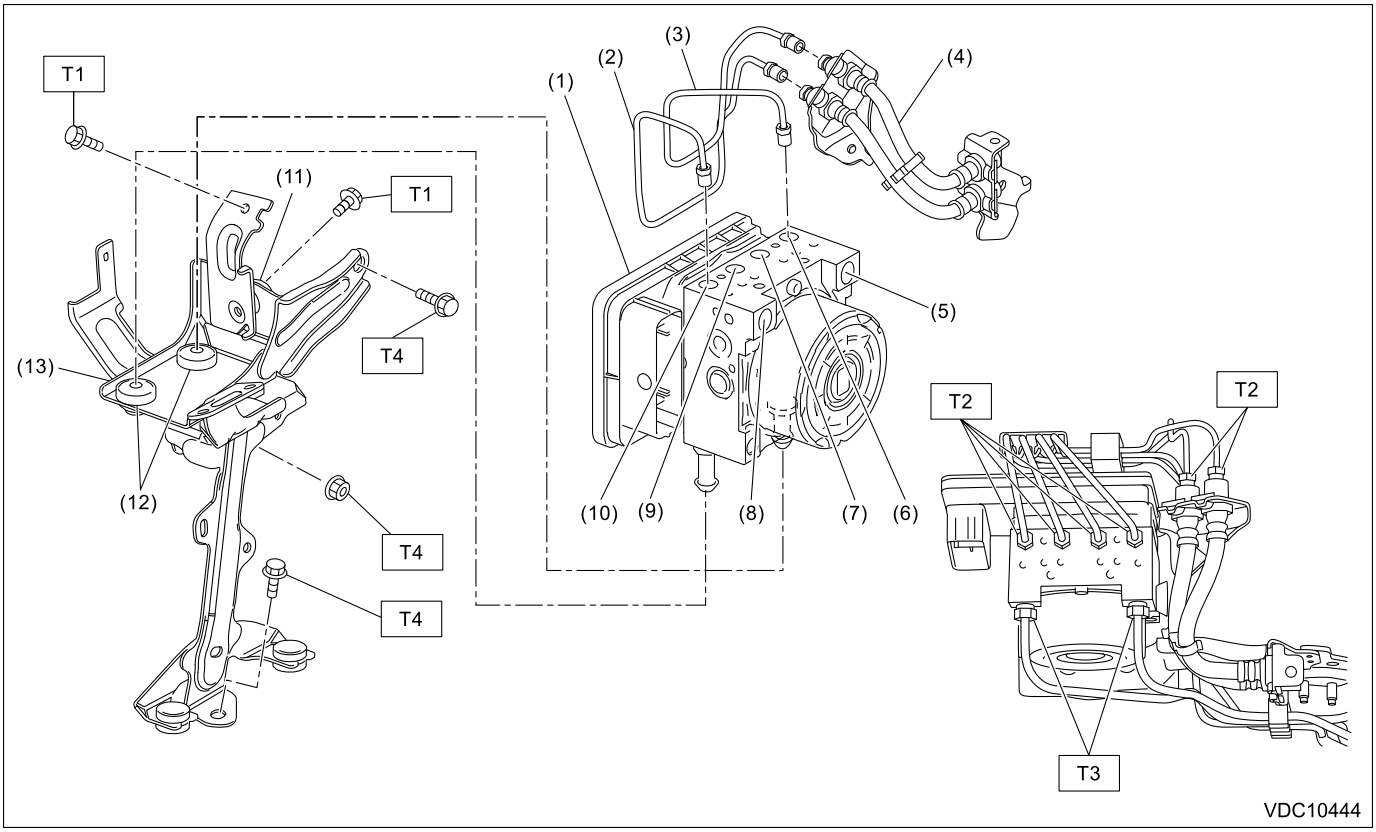
3. VDC CONTROL MODULE AND HYDRAULIC CONTROL UNIT (VDCCM&H/U)

- Models without EyeSight



(1)	VDC control module and hydraulic control unit (VDCCM&H/U)	(7)	Secondary inlet	***Tightening torque: N·m (kgf-m, ft-lb)***
(2)	Rear RH outlet	(8)	Damper - hydraulic unit	***T1: 7.5 (0.8, 5.5)***
(3)	Front LH outlet	(9)	Bracket - hydraulic unit (STI model)	***T2: 15 (1.5, 11.1)***
(4)	Front RH outlet	(10)	Spacer	***T3: 19 (1.9, 14)***
(5)	Rear LH outlet	(11)	Bracket - hydraulic unit (except for STI model)	***T4: 33 (3.4, 24.3)***
(6)	Primary inlet			

- Models with EyeSight



(1)	VDC control module and hydraulic control unit (VDCCM&H/U)	(8)	Secondary inlet	***Tightening torque: N·m (kgf-m, ft-lb)***	
(2)	Pipe A	(9)	Front LH outlet	***T1: 7.5 (0.8, 5.5)***	
(3)	Pipe B	(10)	Rear RH outlet	***T2: 15 (1.5, 11.1)***	
(4)	Hose ASSY	(11)	Spacer	***T3: 19 (1.9, 14)***	
(5)	Primary inlet	(12)	Damper - hydraulic unit	***T4: 33 (3.4, 24.3)***	
(6)	Rear LH outlet	(13)	Bracket - hydraulic unit		
(7)	Front RH outlet				

VEHICLE DYNAMICS CONTROL (VDC) > General Description

CAUTION

- When performing any work, always wear work clothes, a work cap and protective shoes. Additionally, wear a helmet, protective goggles, etc. if necessary.
- Remove contamination including dirt and corrosion before removal, installation, disassembly or assembly.
- Keep the disassembled parts in order and protect them from dust and dirt.
- When performing a repair, identify the cause of trouble and avoid unnecessary removal, disassembly and replacement.
- Some vehicle components are extremely hot immediately after driving. Be wary of receiving burns from heated parts.
- Be sure to tighten fasteners including bolts and nuts to the specified torque.
- Always use the jack-up point when the shop jacks or rigid racks are used to support the vehicle.

- When removing, installing or replacing the VDCCM&H/U, VDCCM&H/U bracket, steering wheel or steering angle sensor (steering roll connector), 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 > VDC SENSOR MIDPOINT SETTING MODE.

VEHICLE DYNAMICS CONTROL (VDC) > General Description

PREPARATION TOOL

1. SPECIAL TOOL

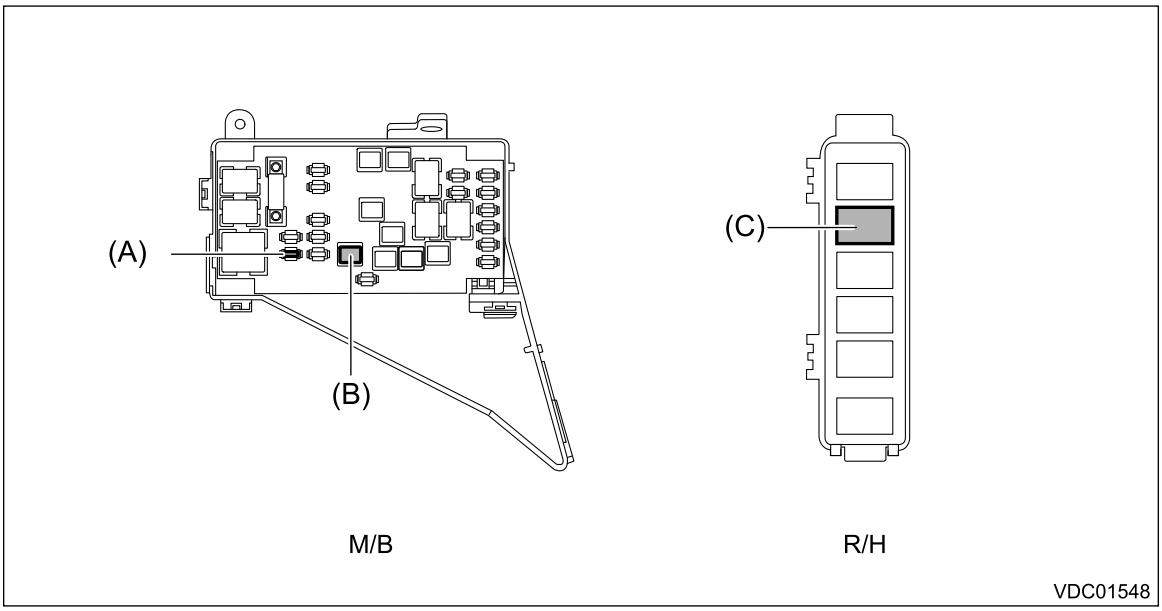
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note:** **For detailed operation procedures of Subaru Select Monitor 4, refer to “Application help”.**

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.

VEHICLE DYNAMICS CONTROL (VDC) > Relay and Fuse

LOCATION



Main fuse box	Fuse 30A (VDC CM&H/U)	(A)
	Fuse 40 A (VDC CM&H/U)	(B)
Relay holder	Brake light relay*	(C)
*: Model with EyeSight		

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

VEHICLE DYNAMICS CONTROL (VDC) > Relay and Fuse

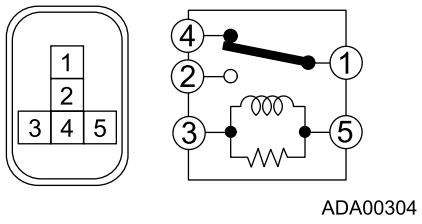
INSPECTION

1. CHECK FUSE

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

2. CHECK RELAY

1. Measure the resistance between relay terminals.

Terminal No.	Inspection conditions	Standard	Circuit
1 — 2	Always	1 MΩ or more	
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.

VEHICLE DYNAMICS CONTROL (VDC) > Vehicle Dynamics Control System

WIRING DIAGRAM

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

VEHICLE DYNAMICS CONTROL (VDC) > Vehicle Dynamics Control System

ELECTRICAL SPECIFICATION

Refer to the Control Module I/O Signal of the “Vehicle Dynamics Control System (VDC) (DIAGNOSTICS)”. Ref. to VEHICLE DYNAMICS CONTROL (VDC) (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 VEHICLE DYNAMICS CONTROL (VDC) (DIAGNOSTICS)>General Diagnostic Table>INSPECTION.

VEHICLE DYNAMICS CONTROL (VDC) > Vehicle Dynamics Control System

NOTE

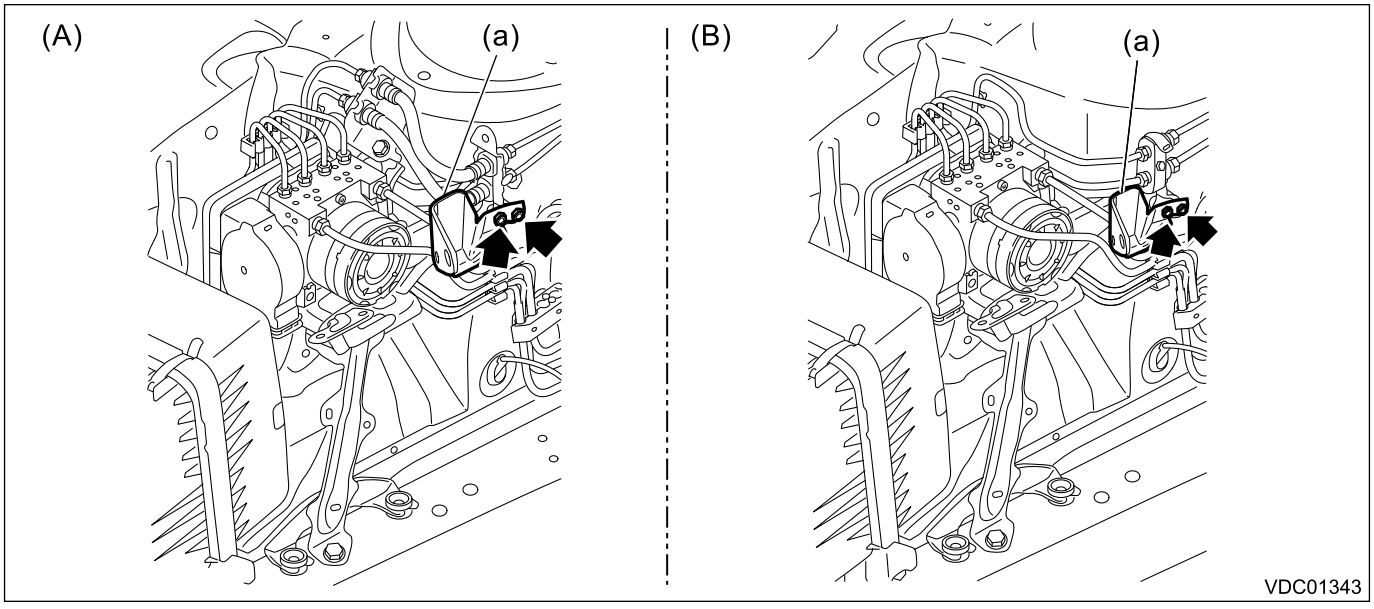
For operation procedures of each component of the vehicle dynamics control system, refer to the respective section.

- 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.
- Auto vehicle hold switch: Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Auto Vehicle Hold Switch.

REMOVAL

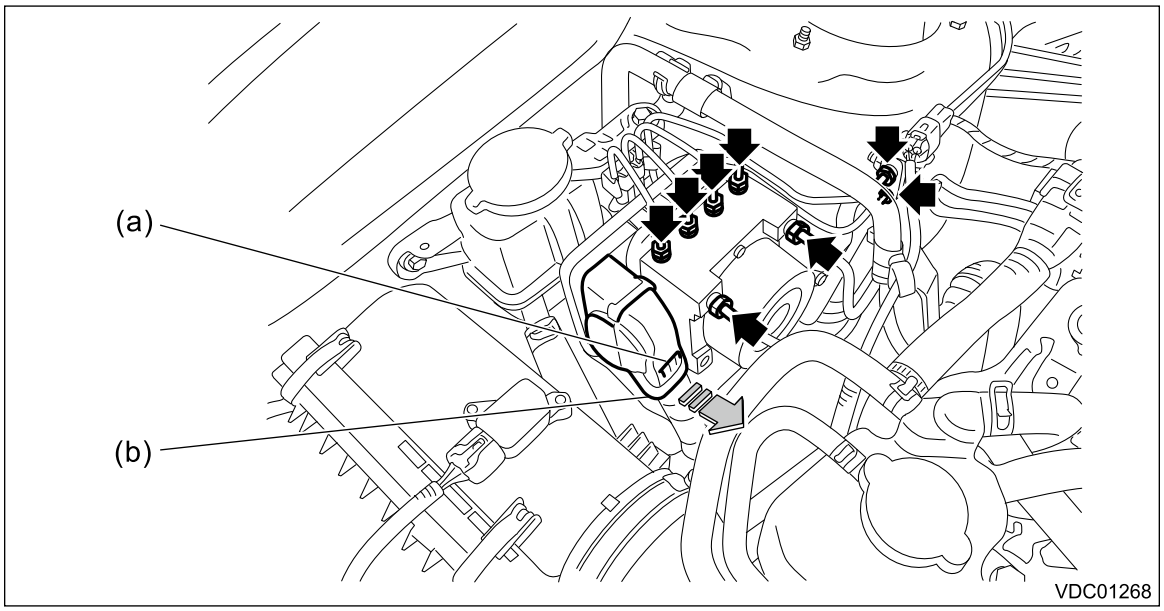
Caution:
- **Avoid unnecessary removal of parts in order to prevent fluid leakage.**
- **When the VDCCM&H/U components are removed, be sure to perform the installation according to the installation procedures. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>INSTALLATION.**

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). (Except for STI model) Ref. to FUEL INJECTION (FUEL SYSTEMS)(w/o STI)>Engine Control Module (ECM)>REMOVAL.
3. Remove the VDC control module & hydraulic control unit (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.**
   (1) Remove any dirt from around the VDCCM&H/U.
   (2) Remove the nuts, and remove the bracket (a) from the bracket - connector front. (Except for STI model)

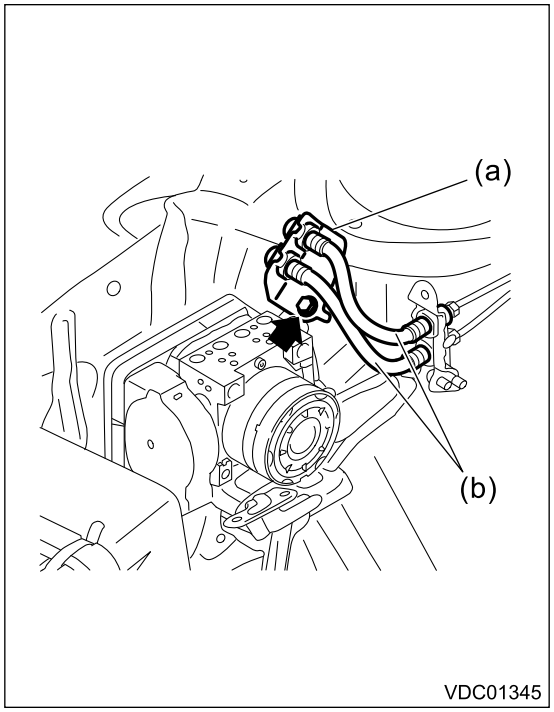


(A) Models with EyeSight (B) Models without EyeSight

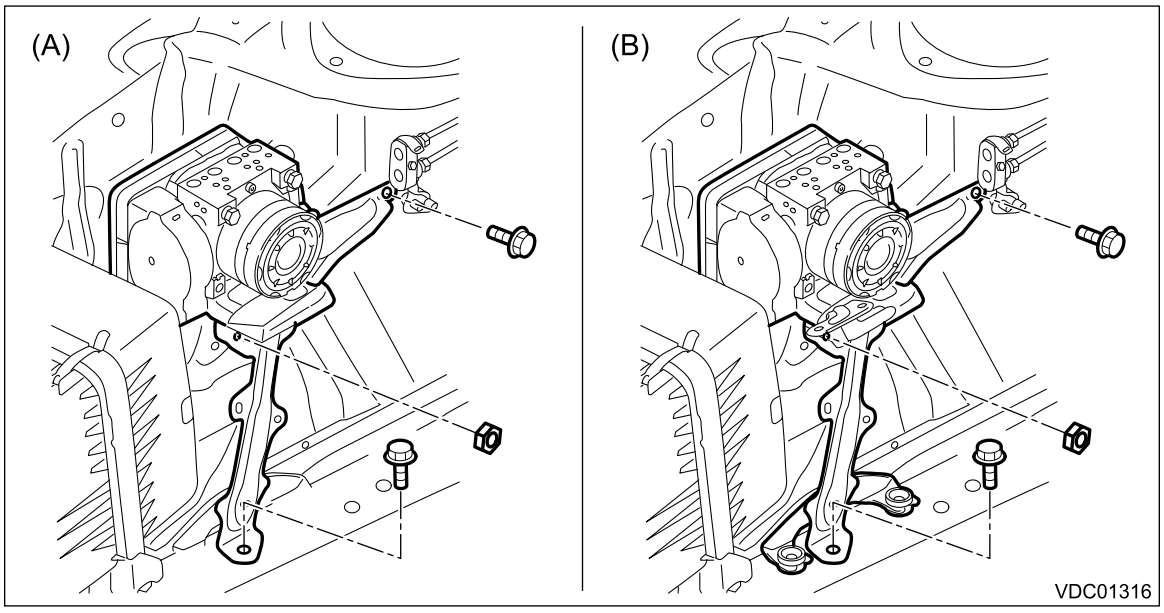
   (3) Pull up the lock lever (b) while pressing the lock button (a) and disconnect the VDCCM&H/U connector.
   (4) Separate each brake pipe using a flare nut wrench.



(5) Remove the bolts, and remove the bracket (a) and hose (b) from the bracket - hydraulic unit. (Models with EyeSight)

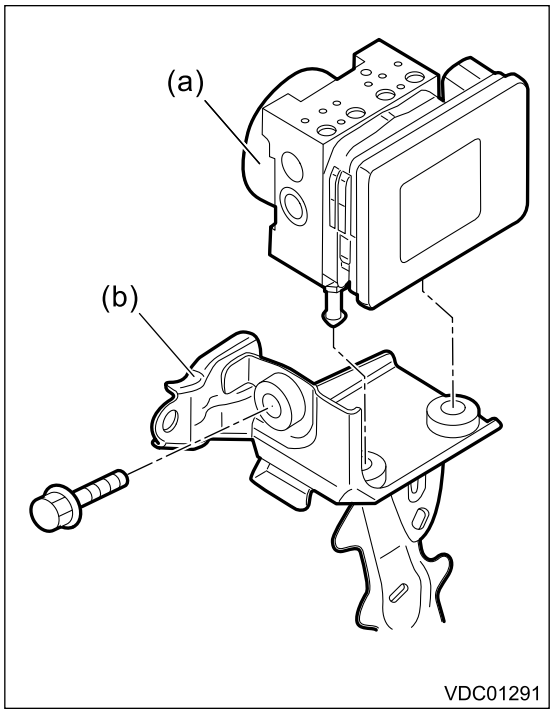


(6) Remove the bolts and nuts, and remove the bracket - hydraulic unit and the VDCCM&H/U.



(A) STI model (B) Except for STI model

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



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

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.**

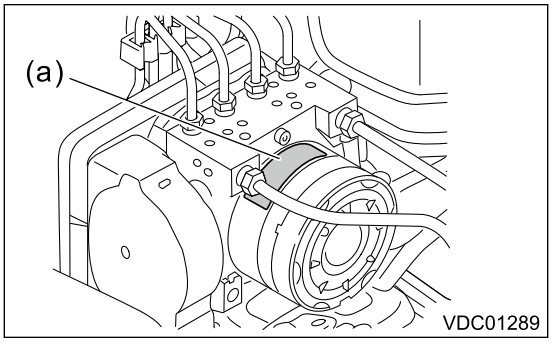
1. Install the bracket - hydraulic unit and the VDCCM&H/U.
   (1) Install the VDCCM&H/U to the bracket - hydraulic unit.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
   (2) Attach the bracket - hydraulic unit.
   Tightening torque:
   33 N·m (3.4 kgf-m, 23.8 ft-lb)
   (3) Attach the bracket to the bracket - connector front. (Except for STI model)
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
   (4) Connect the VDCCM&H/U connector.
   (5) Install each brake pipe using a flare nut wrench.
   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. Install the engine control module (ECM). (Except for STI model) Ref. to FUEL INJECTION (FUEL SYSTEMS)(w/o STI)>Engine Control Module (ECM)>INSTALLATION.
3. Connect the battery ground terminal. Ref. to NOTE>NOTE > BATTERY.
4. Bleed air from the brake system. Ref. to BRAKE>Air Bleeding>PROCEDURE.
5. 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.**
   - **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 VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>MAINTENANCE MODE > VDCCM PARAMETER CHECK.
   (2) If the applied model and grade of the target vehicle are not included, perform parameter selection and registration. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>MAINTENANCE MODE > VDCCM PARAMETER SELECTION.
6. Perform "VDC sensor midpoint setting mode". Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE.

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

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.

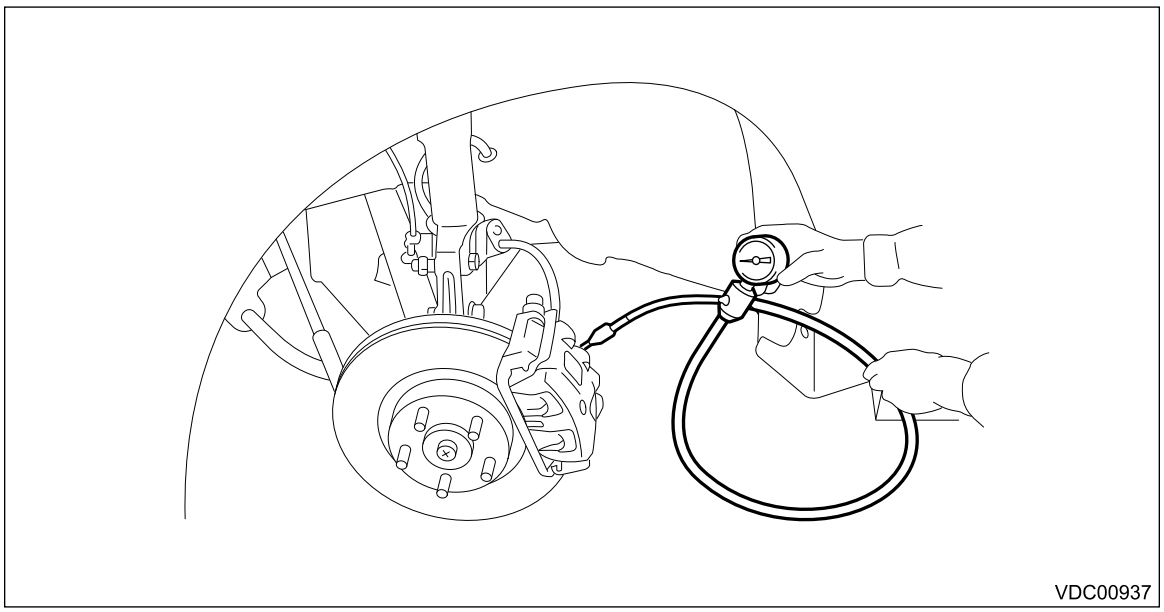


2. Check the condition of connection and settlement of connector, and correct or replace if defective.

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 front LH and front RH caliper bodies.
3. Connect two pressure gauges to front LH and front RH 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 front LH and front RH 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 front LH side performs decompression, hold and compression, and then the front RH side performs decompression, hold and compression.

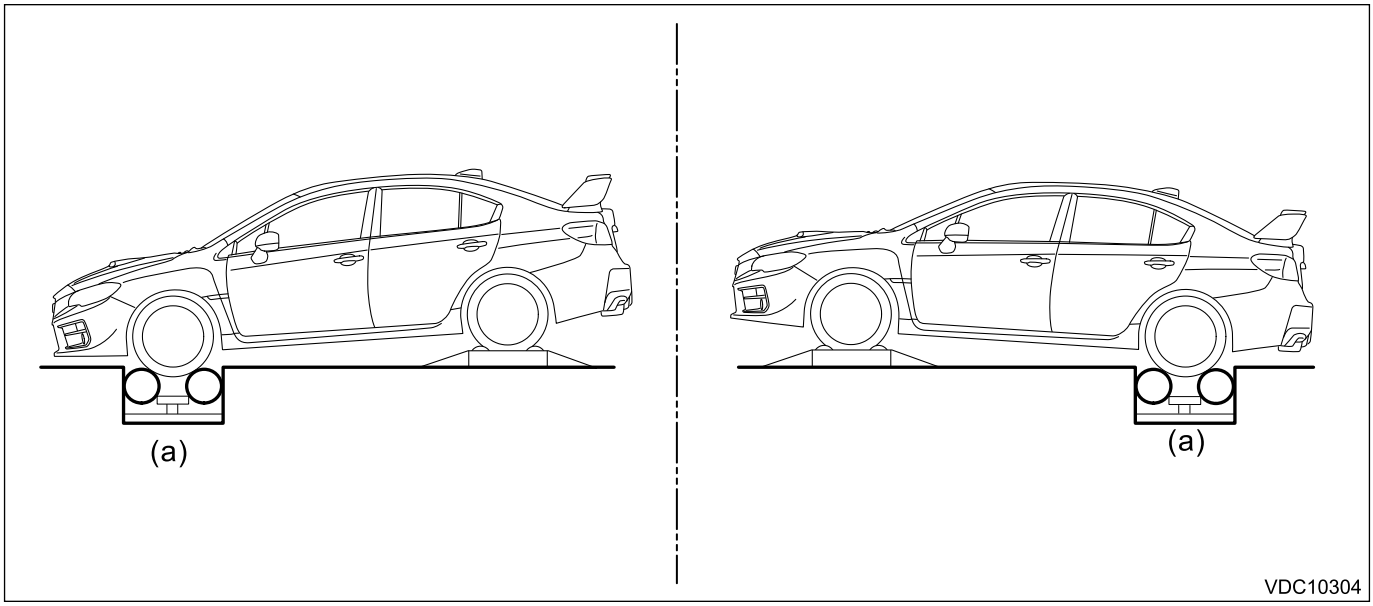
6. Read values indicated on the pressure gauge and check if the fluctuation of the values between decompression and compression meets the standard values. Depress the brake pedal and check that the kick-back is normal, and tightness is normal.

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. Remove the pressure gauge from the front LH and front RH caliper bodies.
8. Install the bleeder - screws of the front LH and front RH caliper bodies.
9. Remove the bleeder - screws from the rear LH and rear RH caliper bodies.
10. Connect two pressure gauges to rear LH and rear RH caliper bodies.
11. Bleed air from the pressure gauges and the rear LH and rear RH caliper bodies.
12. Perform ABS sequence control. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>ABS Sequence Control.
    Note:
    When the hydraulic unit begins to work, first the rear LH side performs decompression, hold and compression, and then the rear RH 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. Remove the pressure gauge from the rear LH and rear RH caliper bodies.
15. Install the bleeder - screws of the rear LH and rear RH 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 (a) and set the gear to neutral.



4. Operate the brake tester.
   Note:
   When any wheel speed reaches 10 km/h (6 MPH), the ABS sequence control stops and ABS operation is returned to the normal control mode.
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 front LH wheel performs decompression, hold and compression in sequence, and subsequently the front RH wheel repeats the same cycle.
   (2) The rear RH wheel performs decompression, hold and compression in sequence, and subsequently the rear LH wheel repeats the same 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.

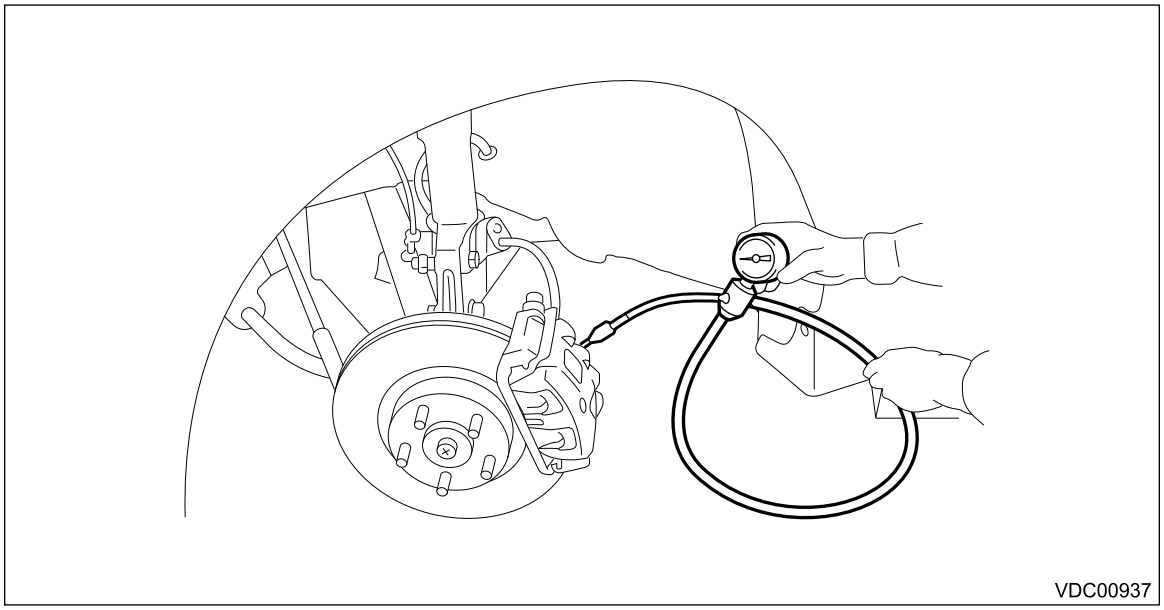
2. Remove the bleeder - screws from the front LH and front RH caliper bodies.
3. Connect two pressure gauges to front LH and front RH caliper bodies.

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 front LH side performs compression, hold and decompression, and then the front RH 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.

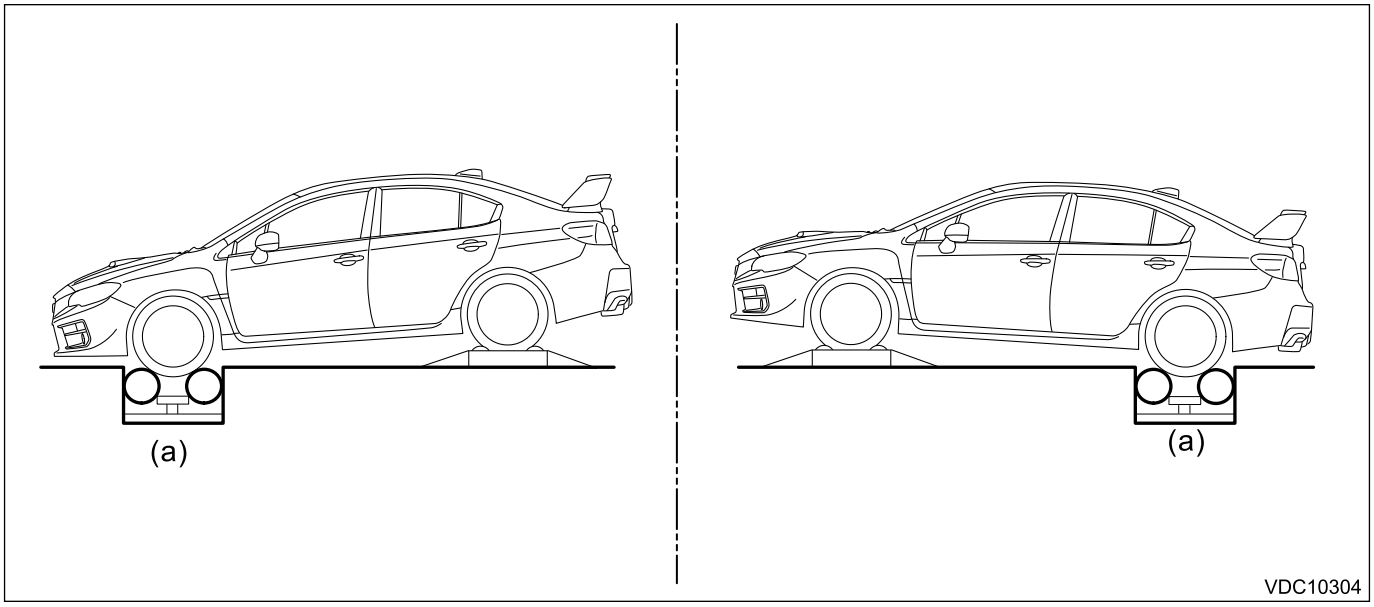
Inspection conditions	Front wheel	Rear wheel
When pressurized	3,000 kPa (31 kgf/cm^2, 441 psi) or more	3,000 kPa (31 kgf/cm^2, 441 psi) or more
When depressurized	500 kPa (5 kgf/cm^2, 73 psi) or less	500 kPa (5 kgf/cm^2, 73 psi) or less

7. Remove the pressure gauge from the front LH and front RH caliper bodies.
8. Install the bleeder - screws of the front LH and front RH caliper bodies.

9. Remove the bleeder - screws from the rear LH and rear RH caliper bodies.
10. Connect two pressure gauges to rear LH and rear RH caliper bodies.
11. Bleed air from the pressure gauges and the rear LH and rear RH caliper bodies.
12. Perform VDC sequence control. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Sequence Control.
    Note:
    When the hydraulic unit begins to work, first the rear RH side performs compression, hold and decompression, and then the rear LH 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. Remove the pressure gauge from the rear LH and rear RH caliper bodies.
15. Install the bleeder - screws of the rear LH and rear RH 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 (a) and set the gear to neutral.



4. Operate the brake tester.
    Note:
    When any wheel speed reaches 10 km/h (6 MPH), the VDC sequence control stops and VDC operation is returned to the normal control mode.
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 front LH wheel performs compression, hold and decompression in sequence, and subsequently the front RH wheel repeats the same cycle.

(2) The rear RH wheel performs compression, hold and decompression in sequence, and subsequently the rear LH wheel repeats the same 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.

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

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. Using Subaru Select Monitor, select «Steering Angle Sensor», «Longitudinal G Sensor» and «Lateral G sensor Output» from the data monitor item list. Ref. to VEHICLE DYNAMICS CONTROL (VDC) (DIAGNOSTICS)>Subaru Select Monitor>OPERATION > READ CURRENT DATA.
   (1) Check the value of the steering angle sensor output.
   Specification:
   - When it is within the range of −10 — 10 deg: Perform the VDC sensor 0 point setting mode.
   - When it is outside the range of −10 — 10 deg: Check the steering wheel neutral position.

   (2) Check the values of the longitudinal G sensor and the lateral G sensor outputs.
   Specification:
   - When it is within the range of −2 — 2 m/s^2: Perform the VDC sensor 0 point setting mode.
   - When it is outside the range of −2 — 2 m/s^2: Check the VDC CM&H/U bracket installation status.
3. Perform the VDC sensor midpoint setting mode. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE.

4. Drive the vehicle for 10 minutes, and check that there is no system malfunction or the warning light illumination while driving.
5. Make sure that the DTC is not stored.

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

MAINTENANCE MODE

1. BRAKE MAINTENANCE MODE

Note:
For brake maintenance mode, refer to "PARKING BRAKE" section. Ref. to PARKING BRAKE>Parking Brake System>OPERATION > BRAKE MAINTENANCE MODE.

2. VDCCM PARAMETER READING

1. Perform reading of parameter.
   (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 «Confirmed».
   (5) On «Main Menu» display, select «Each System».
   (6) On «Select System» display, select «Brake Control System» and select «Enter».
   (7) On «Select Function» display, select «Work Support».
   (8) On «Work Support» display, select «Reading of parameter: ECM to SSM».
2. Save and close the file.

3. VDCCM PARAMETER WRITING

1. Perform writing of parameter.
   (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 «Confirmed».
   (5) On «Main Menu» display, select «Each System».
   (6) On «Select System» display, select «Brake Control System» and select «Enter».
   (7) On «Select Function» display, select «Work Support».
   (8) On «Work Support» display, select «Writing of parameter: SSM to ECM».
2. Open the file saved in the «Reading of parameter: ECM to SSM» procedure.
3. When the confirmation screen indicating the vehicle information appears, check that the correct applied model and grade are displayed and click the «OK» button.

4. VDCCM PARAMETER SELECTION

Note:

- **When the VDCCM&H/U is replaced with a replacement part, be sure to perform the parameter selection/registration to the VDCCM&H/U using this function.**
- **To check the applied model, refer to the "Model number plate" attached to the vehicle. Ref. to IDENTIFICATION.**
- **If you entered a wrong applied model, you can re-write it.**
- **When the registration has not been performed, the DTC code "Parameter" is detected together with the ABS/EBD/VDC warning light illumination.**
- **This function can be used for the replacement part of VDCCM&H/U.**

1. Perform selection of parameter.
   (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 «Confirmed».
   (5) On «Main Menu» display, select «Each System».
   (6) On «Select System» display, select «Brake Control System» and select «Enter».
   (7) On «Select Function» display, select «Work Support».
   (8) On «Work Support» display, select «Selection of Parameter».
2. Check the applied model and option code indicated on the "Model number plate". Ref. to IDENTIFICATION.
3. Enter the applied model of 7-digit alphanumeric characters and press the «Enter» key.
4. When the option code input screen appears after entering the applied model, enter the option code consisting of 4-digit alphanumeric characters, and press the «Enter» key. When the option code is 3 digits, add "0" (zero) in front and enter the code as 4 digits.
5. When the confirmation screen indicating the vehicle information appears, check that the correct applied model and grade are displayed and click the «OK» button.
   Note:
   When the displayed applied model and grade are different from those of the vehicle, perform registration operations again after clicking the [OK] button.
6. Execute the Clear Memory Mode after parameter selection and registration operations because the DTC for "Parameter selection error" is memorized. Ref. to VEHICLE DYNAMICS CONTROL (VDC) (DIAGNOSTICS)>Clear Memory Mode.

5. VDCCM PARAMETER CHECK

Note:
The parameter data registered in the VDCCM is shown on the display.

1. Perform confirming on parameter.
   (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 «Confirmed».
(5) On «Main Menu» display, select «Each System».
(6) On «Select System» display, select «Brake Control System» and select «Enter».
(7) On «Select Function» display, select «Work Support».
(8) On «Work Support» display, select «Confirm on parameter».

2. Check that the applied model and grade of the relevant vehicle are included, and click the «OK» button.
3. If the applied model and grade of the target vehicle are not included, perform “parameter selection and registration”. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>MAINTENANCE MODE > VDCCM PARAMETER SELECTION.

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.

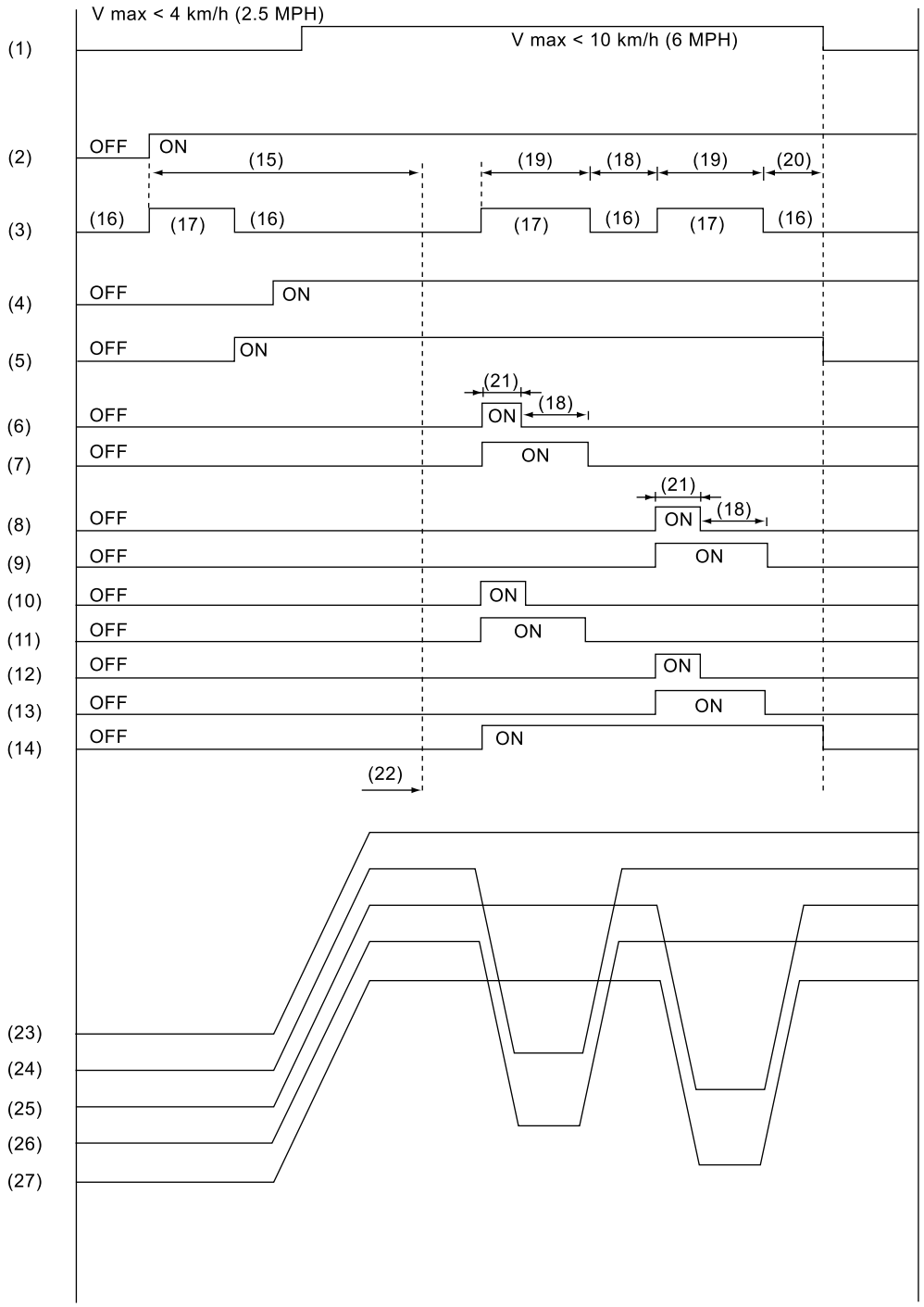
1. ABS SEQUENCE CONTROL WITH SUBARU SELECT MONITOR

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 «Confirmed».
   (4) On «Main Menu» display, select «Each System».
   (5) On «Select System» display, select «Brake Control System» and select «Enter».
   (6) On «Select Function» display, select «Work Support».
   (7) From 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.



VDC01320

(1) All wheel speed
(2) Ignition key
(3) ABS warning light
(4) Switch - stop light
(5) Valve relay
(11) Rear RH compression valve
(12) Rear LH decompression valve
(13) Rear LH compression valve
(14) Pump motor
(15) A few seconds
(20) 0.6 seconds
(21) 0.4 seconds
(22) Point A
(23) Master cylinder pressure
(24) Front LH wheel cylinder pressure

(6) Front LH decompression valve
(7) Front LH compression valve
(8) Front RH decompression valve
(9) Front RH compression valve
(10) Rear RH decompression valve
(16) Light OFF
(17) Light ON
(18) 1.0 seconds
(19) 1.4 seconds
(25) Front RH wheel cylinder pressure
(26) Rear RH wheel cylinder pressure
(27) Rear LH wheel cylinder pressure

VEHICLE DYNAMICS CONTROL (VDC) > ABS Sequence Control

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.

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.

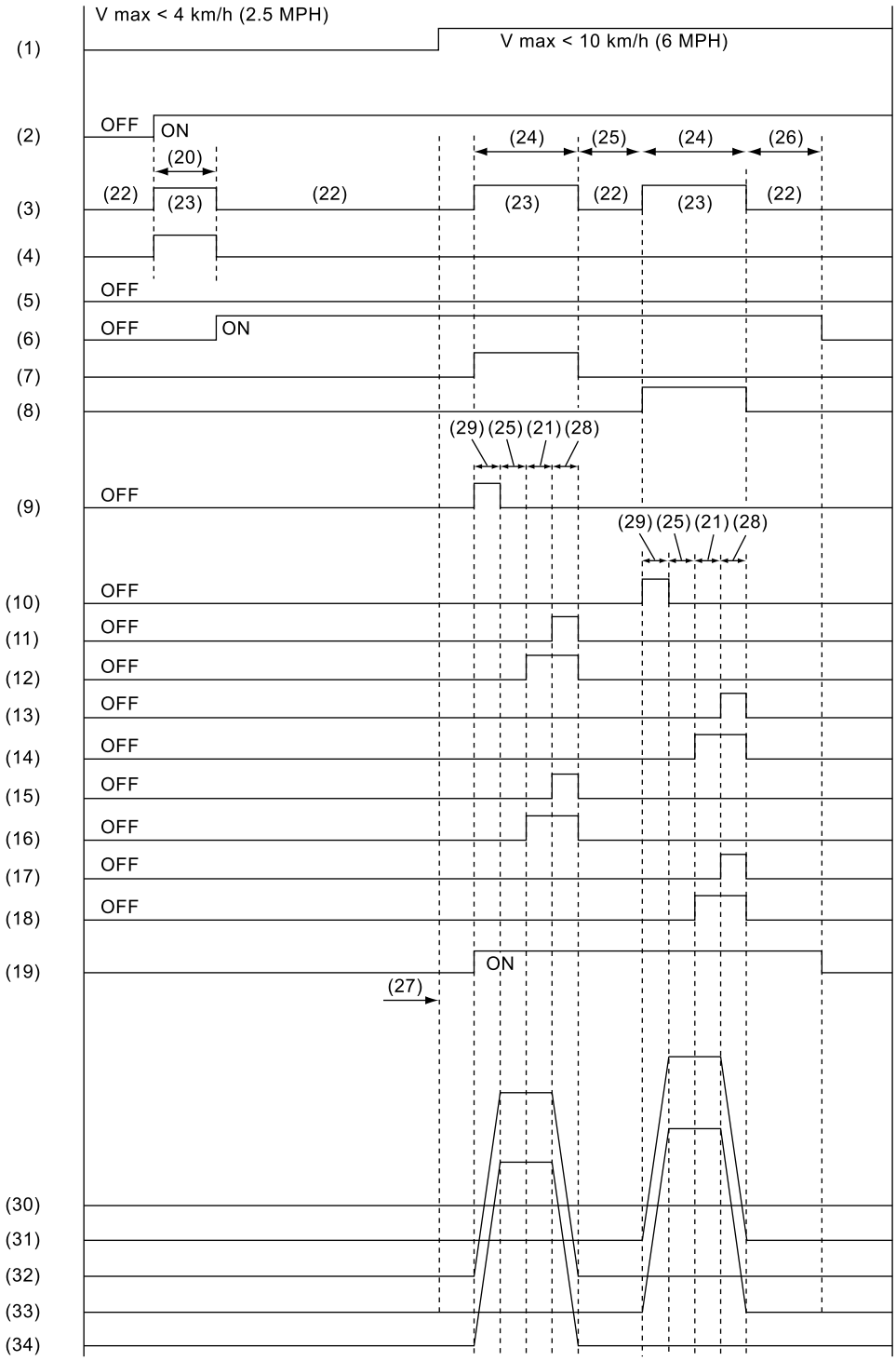
1. VDC SEQUENCE CONTROL WITH SUBARU SELECT MONITOR

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 «Confirmed».
   (4) On «Main Menu» display, select «Each System».
   (5) On «Select System» display, select «Brake Control System» and select «Enter».
   (6) On «Select Function» display, select «Work Support».
   (7) From 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.



VDC01434

(1) All wheel speed
(2) Ignition key
(3) ABS warning light
(4) VDC warning light
(5) Switch - stop light
(6) Valve relay
(13) Front RH decompression valve
(14) Front RH compression valve
(15) Rear RH decompression valve
(16) Rear RH compression valve
(17) Rear LH decompression valve
(18) Rear LH compression valve
(25) 1 second
(26) 1.6 seconds
(27) Point A
(28) 0.4 seconds
(29) 0.8 seconds
(30) Master cylinder pressure

(7) VDC switching valve 1 front LH
(8) VDC switching valve 1 front RH
(9) VDC switching valve 2 front LH
(10) VDC switching valve 2 front RH
(11) Front LH decompression valve
(12) Front LH compression valve
(19) Pump motor
(20) A few seconds
(21) 1.2 seconds
(22) Light OFF
(23) Light ON
(24) 3.4 seconds
(31) Front RH wheel cylinder pressure
(32) Front LH wheel cylinder pressure
(33) Rear LH wheel cylinder pressure
(34) Rear RH wheel cylinder pressure

VEHICLE DYNAMICS CONTROL (VDC) > VDC Sequence Control

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.

VEHICLE DYNAMICS CONTROL (VDC) > Brake Lamp Relay

NOTE

For brake light relay, refer to "Relay and Fuse". Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Relay and Fuse.

VEHICLE DYNAMICS CONTROL (VDC) > Brake Lamp Relay

OPERATION

1. BRAKE LIGHT 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.

1. Connect the Subaru Select Monitor.
   Note:
   - **In the event of any trouble, brake light 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 «Confirmed».
   (3) On «Main Menu» display, select «Each System».
   (4) On «Select System» display, select «Brake Control System» and select «Enter».
   (5) On «Select Function» display, select «Work Support».
   (6) From the work support item list, select «Brake Lamp Lighting Operation» mode.
2. Operate according to the procedures displayed in the Subaru Select Monitor.

VEHICLE DYNAMICS CONTROL (VDC) > Brake Lamp Relay

SPECIFICATION

1. CONDITIONS TO COMPLETE BRAKE LIGHT LIGHTING OPERATION MODE

When the following conditions develop, the brake light 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 light lighting operation mode ends.
- When a malfunction is detected.

NOTE

Yaw rate & longitudinal G and lateral G sensor are integrated with the VDC control module & hydraulic control unit (VDCCM&H/U).

INSPECTION

1. YAW RATE & LONGITUDINAL G AND LATERAL G SENSOR SIGNAL

1. CHECK YAW RATE & G SENSOR.

1. Check the installation condition of the VDC control module & hydraulic control module (VDCCM&H/U).
2. Using the Subaru Select Monitor, display «Data monitor».
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 — 1.5 m/s^2 for longitudinal G and lateral G sensor, and −4 — 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 VEHICLE DYNAMICS CONTROL (VDC) (DIAGNOSTICS)>List of Diagnostic Trouble Code (DTC).
No	G sensor is normal.

REMOVAL

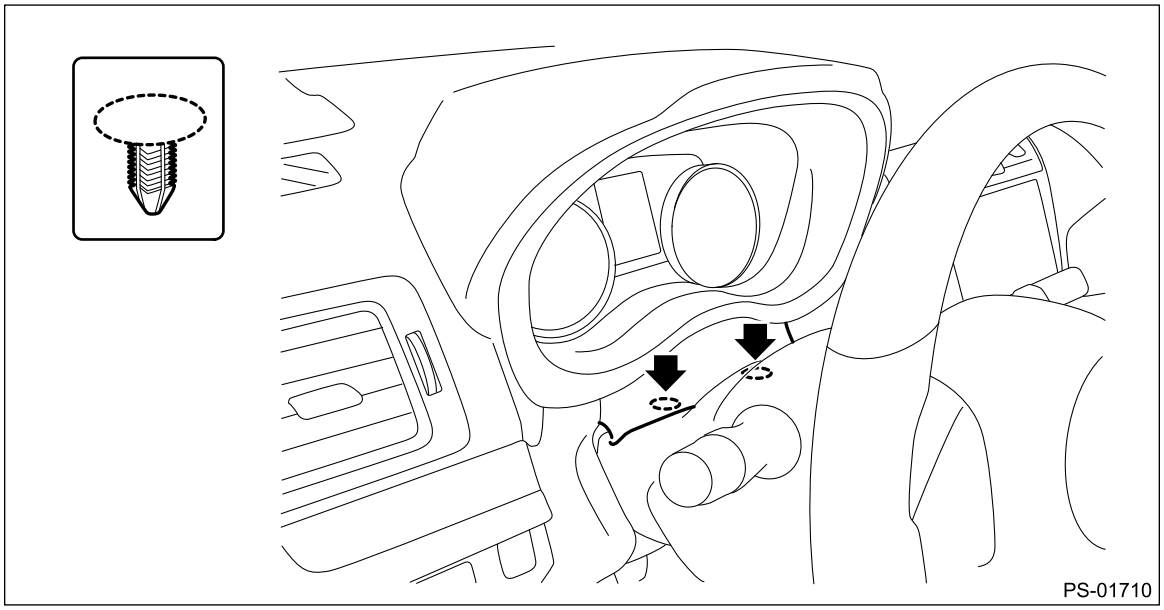
Caution:

- **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 > VDC SENSOR MIDPOINT SETTING MODE.**
- **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.**

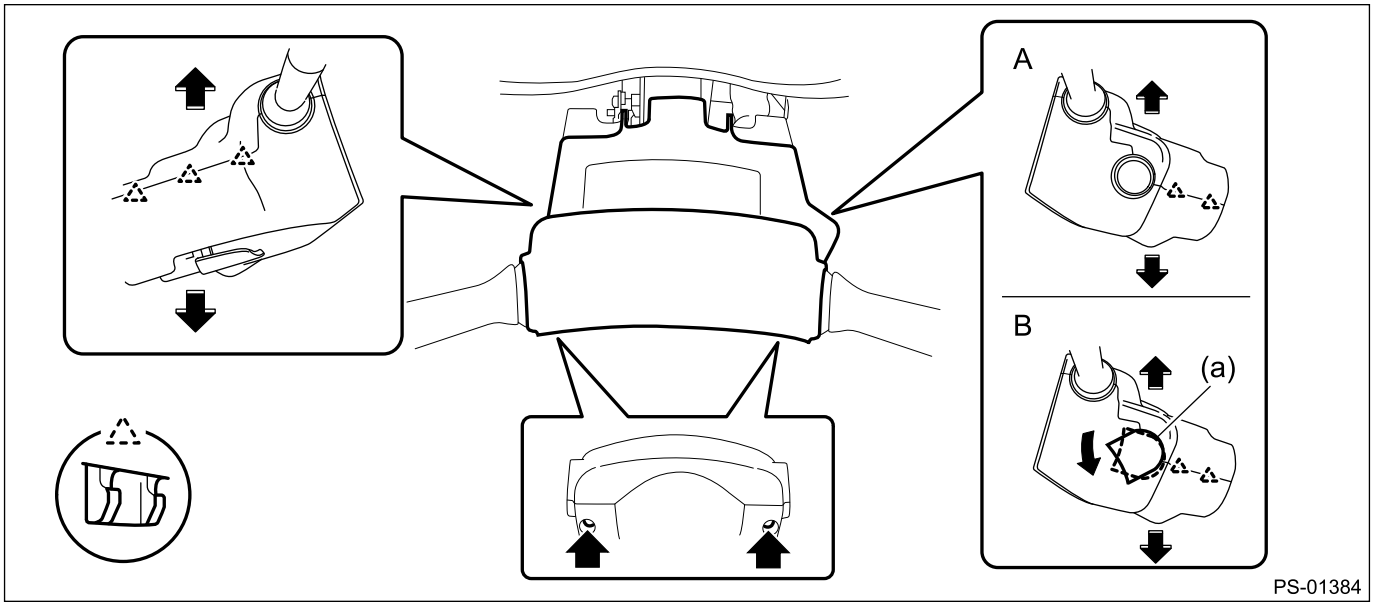
1. Position the front wheels straight ahead.
2. Disconnect the ground terminal from battery and wait for at least 60 seconds before starting work. Ref. to NOTE>NOTE > BATTERY.

   Note:

   For model with battery sensor, disconnect the ground terminal from battery sensor.
3. Remove the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module>REMOVAL.
4. Remove the steering wheel. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel>REMOVAL.
5. Remove the cover assembly - column.
   (1) Release the clips, and remove the cover assembly - steering UPR.



   (2) Remove the screws.
   (3) Remove the cap - key cylinder (a). (Model with keyless access with push button start)
   (4) Release the claw, and 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

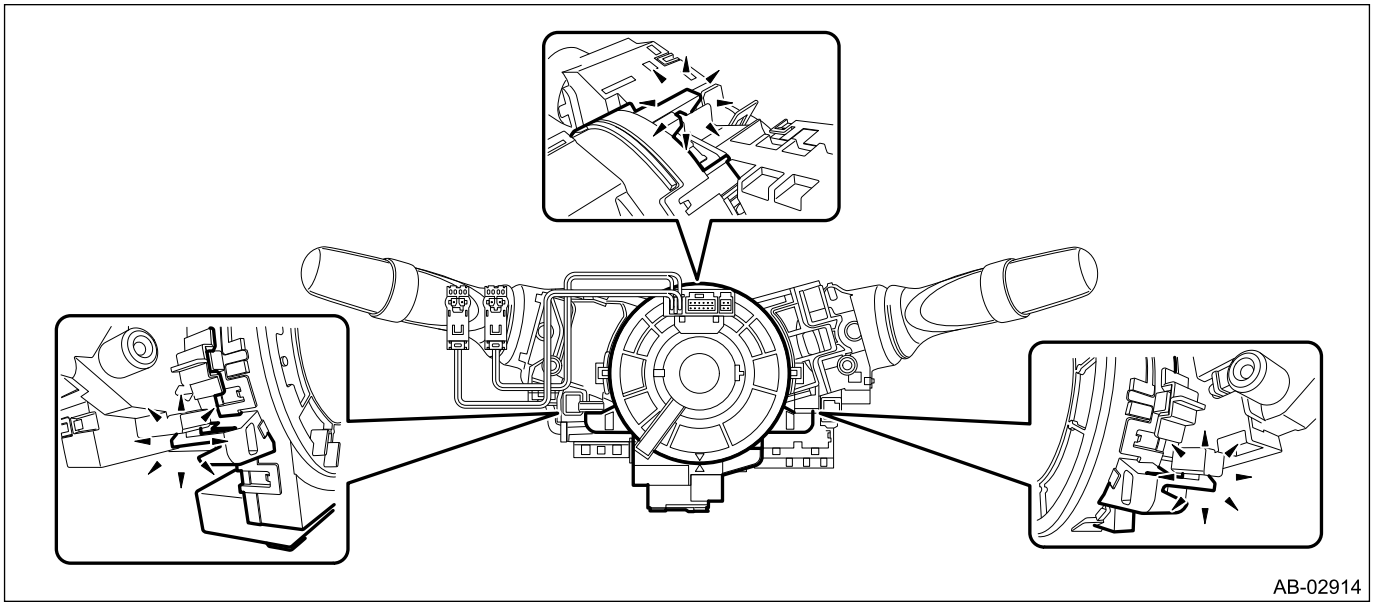
6. Remove the steering roll connector.

Caution:

Make sure that the steering roll connector is not turned from the original position.

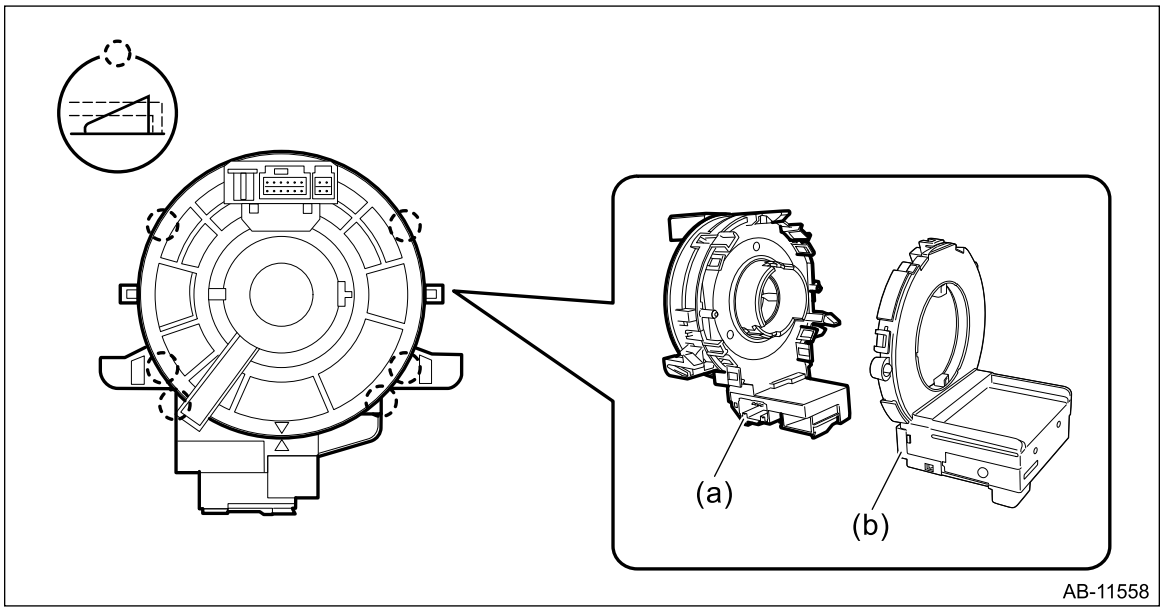
(1) Disconnect the connector under the steering roll connector.

(2) Release the claws and remove the steering roll connector.



7. Remove the steering angle sensor.

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



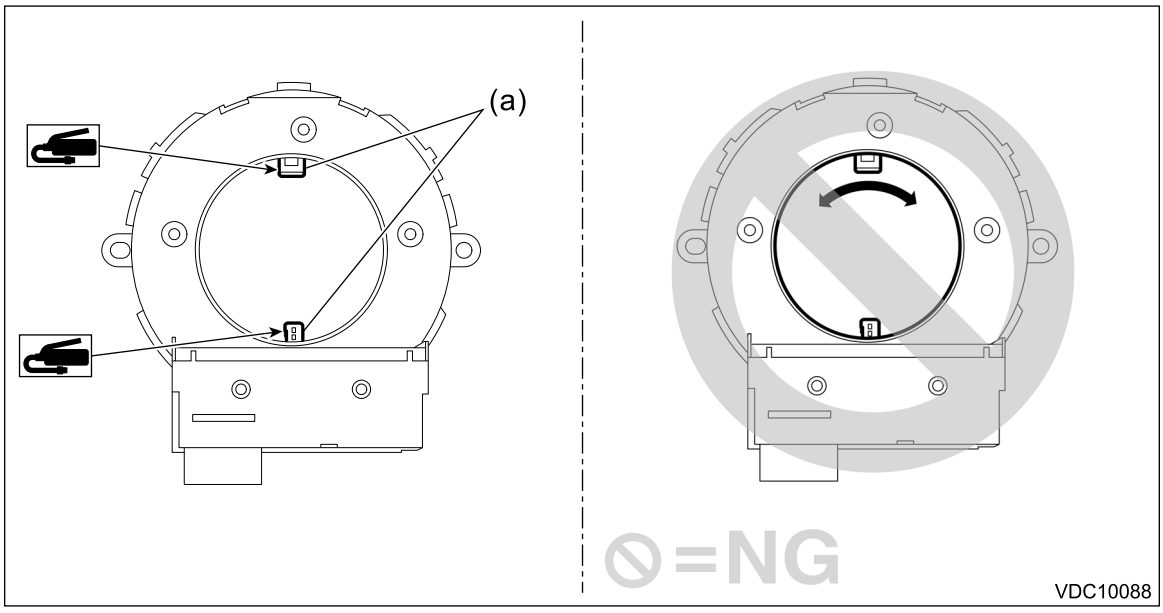
VEHICLE DYNAMICS CONTROL (VDC) > Steering Angle Sensor

INSTALLATION

Caution:

- **When removing, installing or replacing the VDCCM&H/U, VDCCM&H/U bracket, steering wheel or steering angle sensor (steering roll connector), 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 > VDC SENSOR MIDPOINT SETTING MODE.**
- **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 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.

2. Install the cover assembly - column.
3. Install the steering wheel.

Tightening torque:

Steering wheel: 39 N·m (4 kgf-m, 28.8 ft-lb)

Clearance:

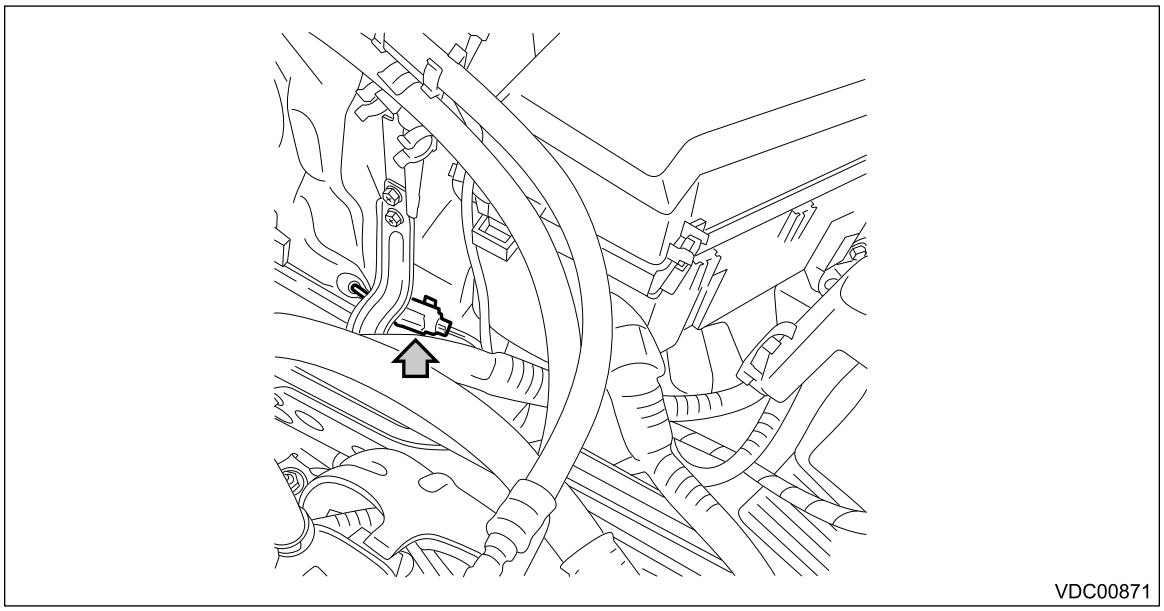
Between cover assembly - column and steering wheel: 4 — 6 mm (0.16 — 0.24 in)

4. Install the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module>INSTALLATION.
5. Connect the battery ground terminal. Ref. to NOTE>NOTE > BATTERY.
6. 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.

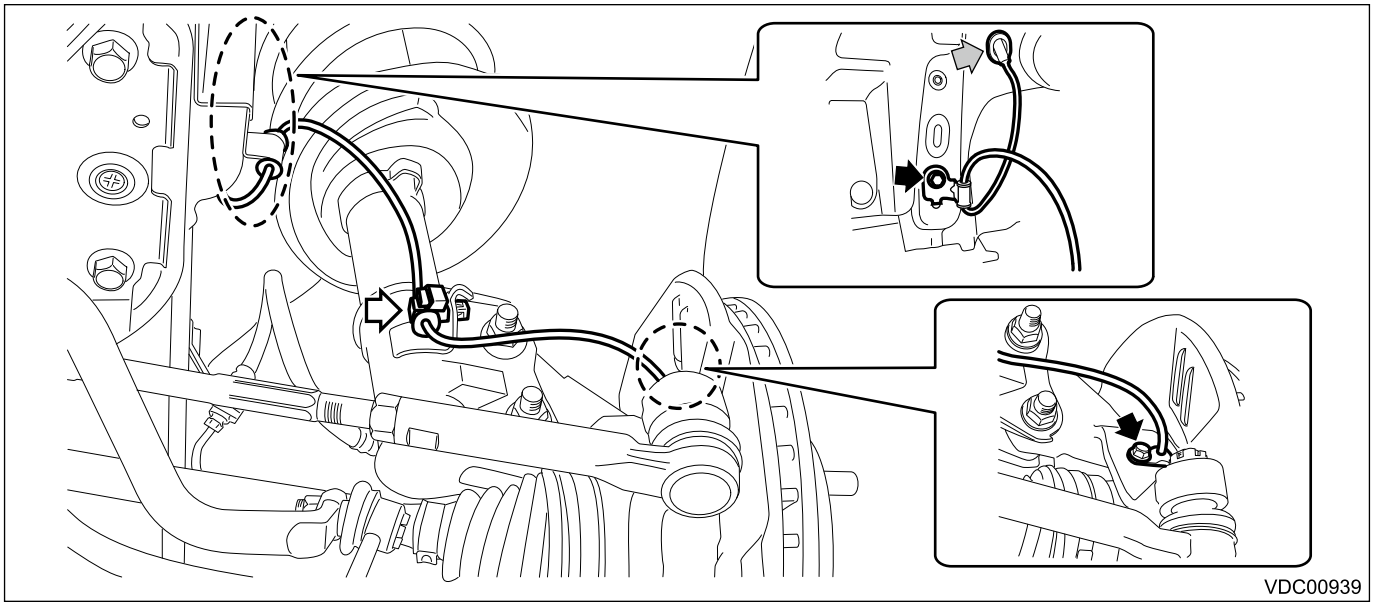
REMOVAL

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.



VEHICLE DYNAMICS CONTROL (VDC) > Front ABS Wheel Speed Sensor

INSTALLATION

Caution:

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

1. Install the front ABS wheel speed sensor.
   Tightening torque:
   Front ABS wheel speed sensor: 7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
   Front ABS wheel speed sensor bracket: 33 N·m (3.4 kgf-m, 24.3 ft-lb)
2. Install the front wheels.
   Tightening torque:
   Front wheel: 120 N·m (12.2 kgf-m, 88.5 ft-lb)
3. Lower the vehicle.
   Note:
   Check if the harness is not pulled and does not come in contact with the suspension or body while operating the steering.
4. Connect the battery ground terminal. Ref. to NOTE>NOTE > BATTERY.

VEHICLE DYNAMICS CONTROL (VDC) > Front ABS Wheel Speed Sensor

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 «Confirmed».

(3) On «Main Menu» display, select «Each System».
(4) On «Select System» display, select «Brake Control System» and select «Enter».
(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 inspection result shows that the value for either side alone does not change on the display screen, swap the ABS wheel speed sensors between LH and RH and then check again to see if the value changes or not.

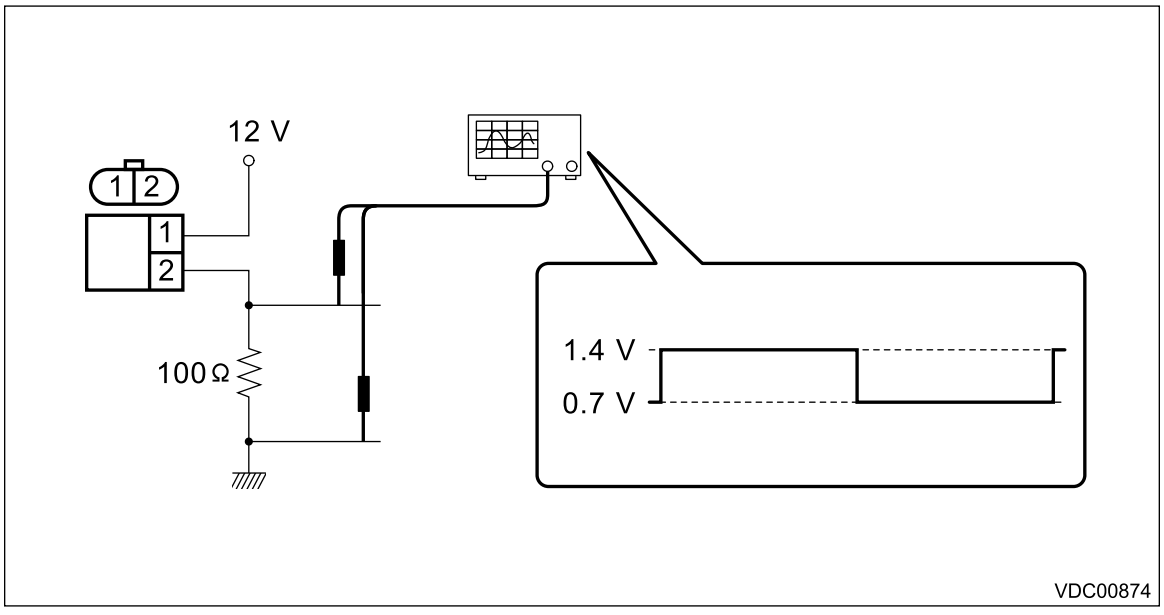
Note:
Using a tape or the like, mark the one on which the value did not change.

- If the inspection result shows that the value does not change on the sensor marked: Replace the relevant ABS wheel speed sensor.
- If the inspection result shows that the value does not change on the sensor not marked: Place the ABS wheel speed sensor that is not marked to the original position, and perform unit inspection on the ABS wheel speed sensor that is marked. 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, then attach resistance to the No. 2 terminal. Rotate the wheel at about 2.75 km/h (2 MPH), and measure the voltage using an oscilloscope.

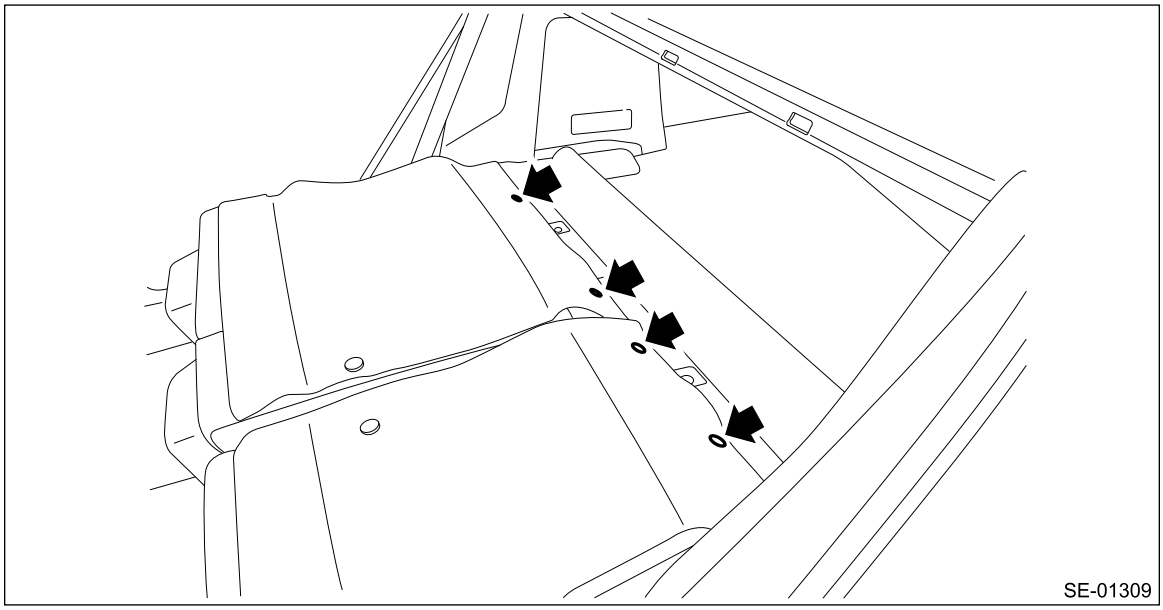
Standard value of output voltage:
0.7 — 1.4 V



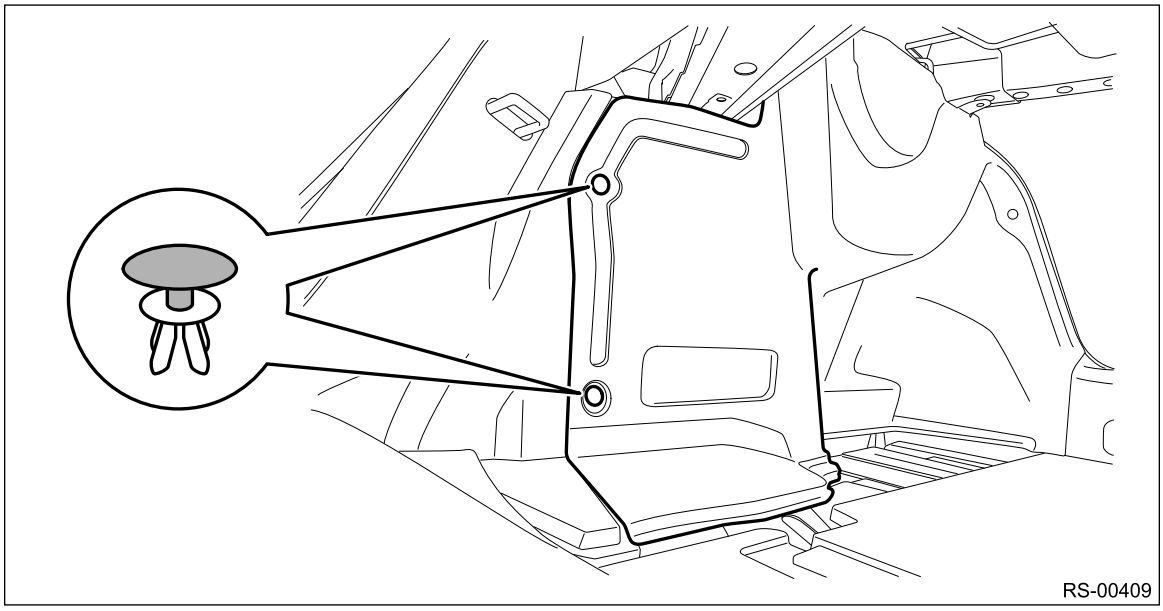
- If the inspection result shows that the output voltage is out of the standard value: Replace the magnetic encoder (hub unit bearing).
- If the inspection result shows that the output voltage is within standard value: Replace the VDCCM&H/U.

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. Lift up the vehicle, and then remove the rear wheels.
3. Take out the trunk mat.
4. Tilt the backrest assembly of the rear seat forward.
5. Remove the clips located at the bottom of the cover COMPL - rear backrest LH and RH of the rear seat back.



6. Remove the clips, and turn over the trim panel - trunk side.

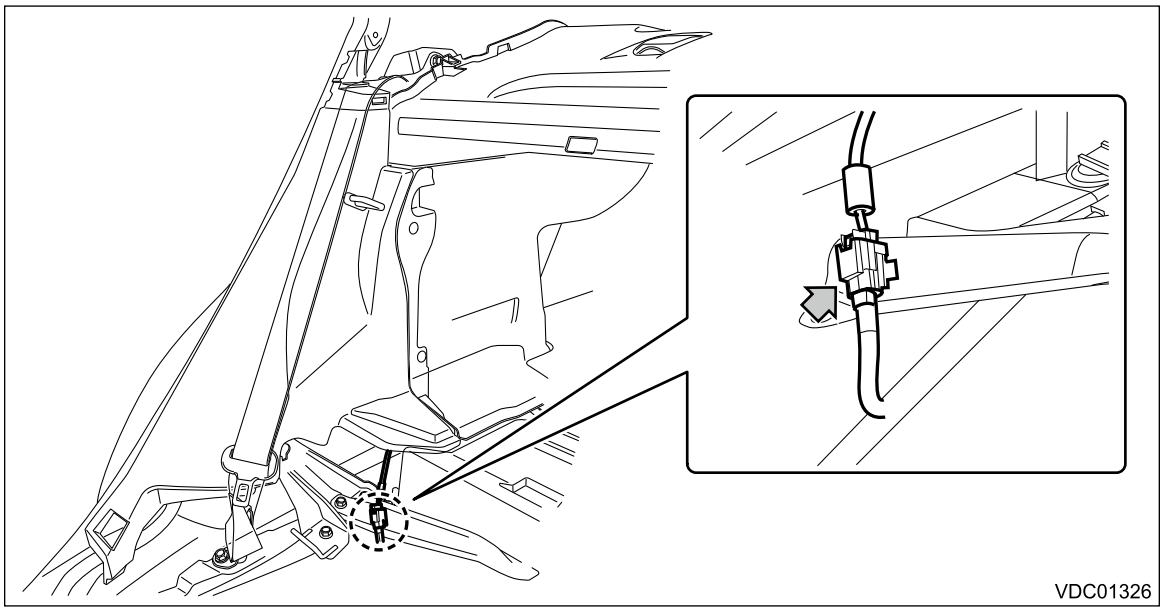


7. Remove the rear ABS wheel speed sensor.

Caution:

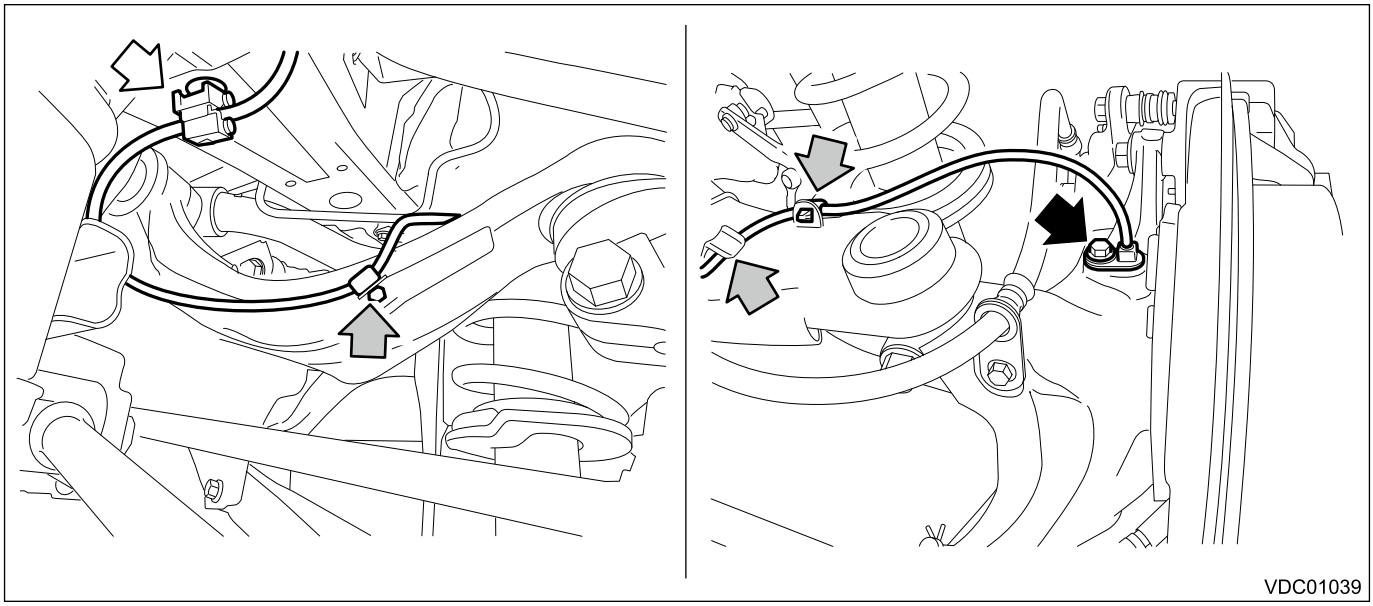
- **Be careful not to damage the sensor.**
- **Do not apply excessive force to the sensor harness.**
- **Leave the sensor harness clamp on the vehicle side.**

(1) Disconnect the connector of the rear ABS wheel speed sensor.



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

(3) Remove the clip and bolt on the harness clamp, and remove the rear ABS wheel speed sensor.



VEHICLE DYNAMICS CONTROL (VDC) > Rear ABS Wheel Speed Sensor

INSTALLATION

Caution:

- **Be careful not to damage the sensor.**
- **Do not apply excessive force to the sensor harness.**
- **Securely install the sensor harness to the rear upper arm assembly bracket.**

1. Install the rear ABS wheel speed sensor.
   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 (0.8 kgf-m, 5.5 ft-lb)
2. Install the rear wheels.
   Tightening torque:
   Rear wheel: 120 N·m (12.2 kgf-m, 88.5 ft-lb)
3. Lower the vehicle.
4. Connect the battery ground terminal. Ref. to NOTE>NOTE > BATTERY.

VEHICLE DYNAMICS CONTROL (VDC) > Rear ABS Wheel Speed Sensor

INSPECTION

1. CHECK WITH SUBARU SELECT MONITOR

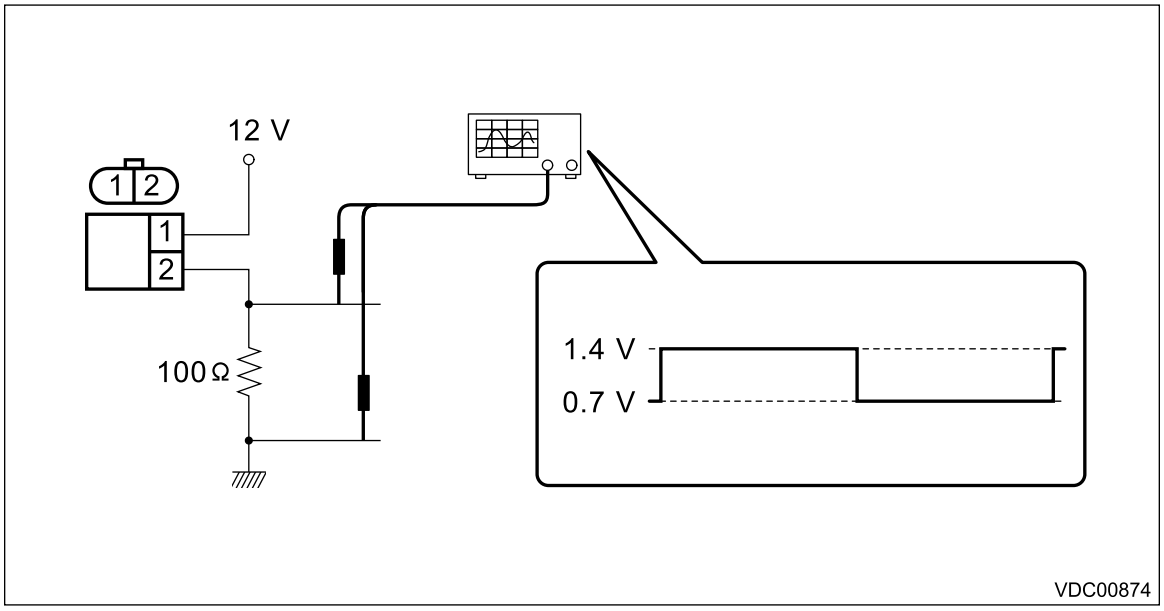
1. Connect the Subaru Select Monitor.
   Note:
   For detailed operation procedures, refer to "Application help".
   (1) On «Start» display, select «Diagnosis».
   (2) On «Vehicle selection» display, input the target vehicle information and select «Confirmed».
   (3) On «Main Menu» display, select «Each System».
   (4) On «Select System» display, select «Brake Control System» and select «Enter».
   (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 inspection result shows that the value for either side alone does not change on the display screen, swap the ABS wheel speed sensors between LH and RH and then check again to see if the value changes or not.
   Note:
   Using a tape or the like, mark the one on which the value did not change.
   - If the inspection result shows that the value does not change on the sensor marked: Replace the relevant ABS wheel speed sensor.
   - If the inspection result shows that the value does not change on the sensor not marked: Place the ABS wheel speed sensor that is not marked to the original position, and perform unit inspection on the ABS wheel speed sensor that is marked. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Rear 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, then attach resistance 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



- If the inspection result shows that the output voltage is out of the standard value: Replace the magnetic encoder (hub unit bearing).
- If the inspection result shows that the output voltage is within standard value: Replace the VDCCM&H/U.

VEHICLE DYNAMICS CONTROL (VDC) > Front Magnetic Encoder

REMOVAL

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

VEHICLE DYNAMICS CONTROL (VDC) > Front Magnetic Encoder

INSTALLATION

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

VEHICLE DYNAMICS CONTROL (VDC) > Front Magnetic Encoder

INSPECTION

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

Note:

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

VEHICLE DYNAMICS CONTROL (VDC) > Rear Magnetic Encoder

REMOVAL

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

VEHICLE DYNAMICS CONTROL (VDC) > Rear Magnetic Encoder

INSTALLATION

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

VEHICLE DYNAMICS CONTROL (VDC) > Rear Magnetic Encoder

INSPECTION

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

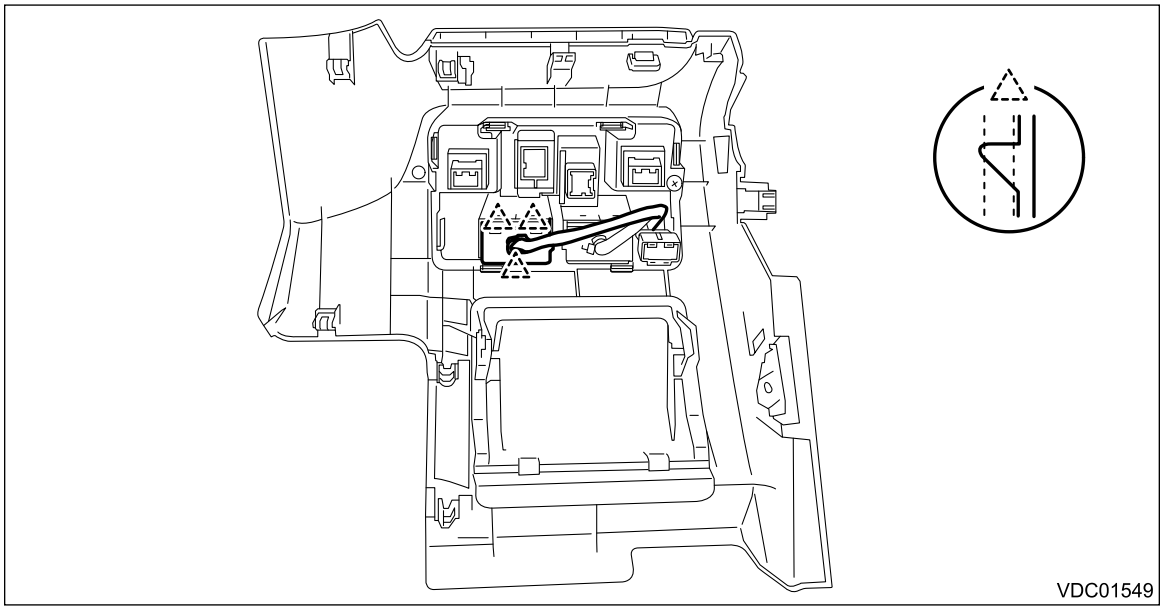
Note:

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

VEHICLE DYNAMICS CONTROL (VDC) > VDC OFF Switch

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 OUT. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.
3. Release the claws and remove the VDC OFF switch.



VEHICLE DYNAMICS CONTROL (VDC) > VDC OFF Switch

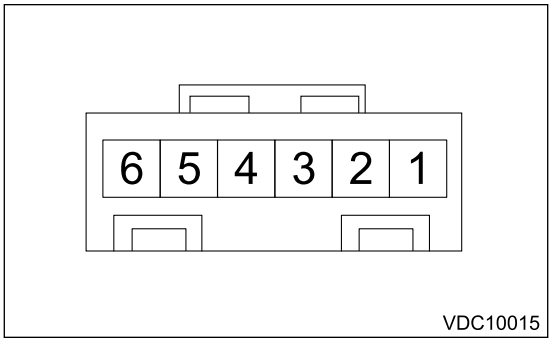
INSTALLATION

1. Install the VDC OFF switch.
2. Install the cover assembly - instrument panel LWR driver OUT.
3. Connect the battery ground terminal. Ref. to NOTE>NOTE > BATTERY.

VEHICLE DYNAMICS CONTROL (VDC) > VDC OFF Switch

INSPECTION

1. Remove the VDC OFF switch. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC OFF Switch>REMOVAL.
2. Measure the resistance between the VDC OFF switch terminals.
   Preparation tool:
   Circuit tester



Terminal No.	Inspection conditions	Standard
5 — 6	Switch OFF	1 MΩ or more
	Switch ON	Less than 1 Ω

Terminal No.	Inspection conditions	Specification
4 (+) — 3 (−)	Apply battery voltage.	Light ON

Note:

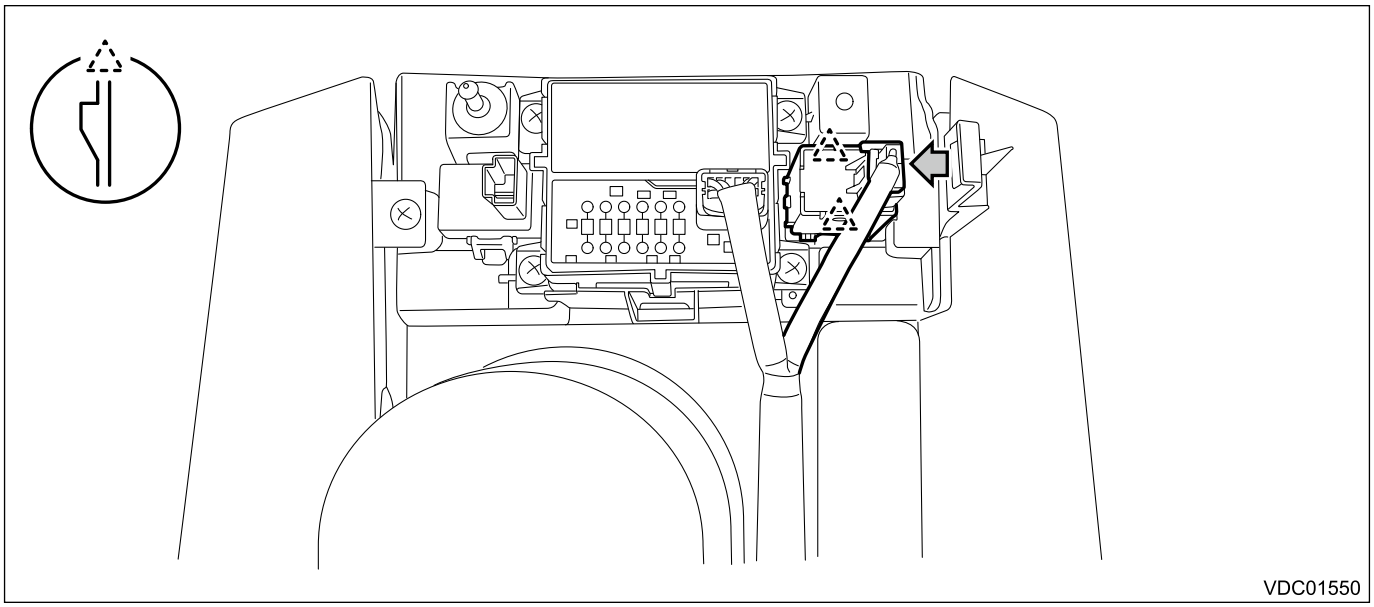
Replace the VDC OFF switch if the inspection result is not within the standard value.

3. Install the VDC OFF switch. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC OFF Switch>REMOVAL.

VEHICLE DYNAMICS CONTROL (VDC) > Auto Vehicle Hold Switch

REMOVAL

1. Disconnect the ground terminal from battery sensor. Ref. to NOTE>NOTE > BATTERY.
2. Remove the console box assembly. Ref. to EXTERIOR/INTERIOR TRIM>Console Box>REMOVAL > MODEL WITH PARKING BRAKE LEVER.
3. Remove the parking brake switch. Ref. to PARKING BRAKE>Parking Brake Switch>REMOVAL.
4. Disconnect the connector, and remove the auto vehicle hold switch.



VEHICLE DYNAMICS CONTROL (VDC) > Auto Vehicle Hold Switch

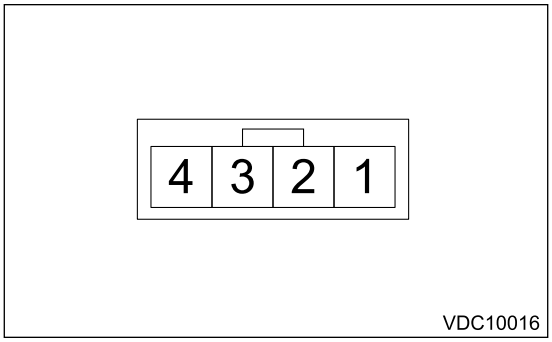
INSTALLATION

1. Install the auto vehicle hold switch.
2. Install the parking brake switch. Ref. to PARKING BRAKE>Parking Brake Switch>INSTALLATION.
3. Install the console box assembly. Ref. to EXTERIOR/INTERIOR TRIM>Console Box>INSTALLATION > MODEL WITH PARKING BRAKE LEVER.
4. Connect the ground terminal to battery sensor. Ref. to NOTE>NOTE > BATTERY.

VEHICLE DYNAMICS CONTROL (VDC) > Auto Vehicle Hold Switch

INSPECTION

1. Measure the resistance between connector terminals.
   Preparation tool:
   Circuit tester



(1) Measure the resistance between auto vehicle hold switch terminals.

Terminal No.	Inspection conditions	Standard
1 — 4	Switch OFF	1 MΩ or more
	Switch ON	Less than 1 Ω

(2) Apply battery voltage between the connector terminals to check lighting condition of illumination inside the switch.

Terminal No.	Inspection conditions	Specification
2 (+) — 3 (−)	Apply battery voltage.	Light ON

2. Replace the auto vehicle hold switch if the inspection result is not within the standard value.

BRAKE

BR

1. General Description
2. Front Brake Pad
3. Front Disc Rotor
4. Front Disc Brake Assembly
5. Rear Brake Pad
6. Rear Disc Rotor
7. Rear Disc Brake Assembly
8. Master Cylinder
9. Brake Booster
10. Brake Fluid
11. Air Bleeding
12. Brake Hose
13. Brake Pipe
14. Brake Pedal
15. Stop Light Switch
16. Brake Vacuum Pump
17. Brake Vacuum Sensor
18. General Diagnostic Table

SPECIFICATION

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

1. FRONT DISC BRAKE

- Except for STI model

Item			Specification	
Size			17-inch	
Type			Floating 2-POT piston type Ventilated disc	Opposed 4-POT piston type Ventilated disc (Brembo)
Effective cylinder diameter		mm (in)	42.8 × 2 (1.685 × 2)	40.0 × 2, 46 × 2 (1.575 × 2, 1.811 × 2)
Pad dimension (Length × Width × Thickness)		mm (in)	130 × 53.5 × 11 (5.118 × 2.106 × 0.433)	129.6 × 60.0 × 8.8 (5.102 × 2.362 × 0.35)
Pad thickness	mm (in)	Standard	11 (0.43)	8.8 (0.35)
		Limit	1.5 (0.059)	1.2 (0.047)
Effective disc diameter		mm (in)	261 (10.28)	268 (10.55)
Rotor dimension (O.D. × Thickness)		mm (in)	316 × 30 (12.44 × 1.18)	326 × 30 (12.83 × 1.18)
Disc thickness	mm (in)	Standard	30 (1.18)	
		Limit	28 (1.1)	
Disc runout	mm (in)	Standard	—	
		Limit	0.05 (0.002)	0.075 (0.003)
Clearance adjustment			Automatic adjustment	

- STI model

Item			Specification
Size			18-inch
Type			Opposed 6-POT piston type Ventilated disc (Brembo)
Effective cylinder diameter		mm (in)	30 × 2,34 × 2, 38 × 2 (1.181 × 2, 1.339 × 2, 1.496 × 2)
Pad size (Length × Width × Thickness)		mm (in)	160.7 × 57.2 × 9.5 (6.327 × 2.252 × 0.37)
Pad thickness	mm (in)	Standard	9.5 (0.37)

Item		Specification
	Limit	2.8 (0.11)
Effective disc diameter mm (in)		280 (11.02)
Rotor size (O.D. × Thickness) mm (in)		340 × 30 (13.39 × 1.18)
Disc thickness mm (in)	Standard	30 (1.18)
	Limit	28 (1.1)
Disc runout mm (in)	Standard	—
	Limit	0.075 (0.003)
Clearance adjustment		Automatic adjustment

2. REAR DISC BRAKE

- Except for STI model

Item		Specification	
Size		15-inch	17-inch
Type		Floating 1-POT piston type Solid disc	Opposed 2-POT piston type Ventilated disc (Brembo)
Effective cylinder diameter mm (in)		38.1 (1.5)	40 × 2 (1.575 × 2)
Pad dimension (Length × Width × Thickness) mm (in)		92 × 33 × 9 (3.622 × 1.299 × 0.354)	74.8 × 45 × 9 (2.945 × 1.772 × 0.354)
Pad thickness mm (in)	Standard	9 (0.354)	
	Limit	1.5 (0.059)	1.55 (0.061)
Effective disc diameter mm (in)		250 (9.84)	268 (10.55)
Rotor dimension (O.D. × Thickness) mm (in)		286 × 10 (12.44 × 0.79)	316 × 20 (12.44 × 0.79)
Disc thickness mm (in)	Standard	10 (0.39)	20 (0.79)
	Limit	8.5 (0.335)	18 (0.71)
Disc runout mm (in)	Standard	—	
	Limit	0.05 (0.002)	0.07 (0.0028)
Clearance adjustment		Automatic adjustment	

Item	Specification
Size	17-inch
Type	Floating 1-POT piston type (Caliper with electric parking) Ventilated disc
Effective cylinder diameter mm (in)	40 (1.57)
Pad dimension (Length × Width × Thickness) mm (in)	86.8 × 43.5 × 9 (3.42 × 1.71 × 0.354)

Item		Specification
Pad thickness mm (in)	Standard	9 (0.354)
	Limit	1.5 (0.059)
Effective disc diameter mm (in)		255 (10.04)
Rotor dimension (O.D. × Thickness) mm (in)		300 × 17 (11.81 × 0.67)
Disc thickness mm (in)	Standard	17 (0.67)
	Limit	15 (0.59)
Disc runout mm (in)	Standard	—
	Limit	0.05 (0.002)
Clearance adjustment		Automatic adjustment

- STI model

Item		Specification
Size		18-inch
Type		Opposed 2-POT piston type Ventilated disc (Brembo)
Effective cylinder diameter mm (in)		40 × 2 (1.575 × 2)
Pad size (Length × Width × Thickness) mm (in)		99.6 × 52.4 × 10 (3.921 × 2.063 × 0.394)
Pad thickness mm (in)	Standard	10 (0.394)
	Limit	2.8 (0.11)
Effective disc diameter mm (in)		276 (10.87)
Rotor size (O.D. × Thickness) mm (in)		326 × 20 (12.83 × 0.79)
Disc thickness mm (in)	Standard	20 (0.79)
	Limit	18 (0.71)
Disc runout mm (in)	Standard	—
	Limit	0.07 (0.0028)
Clearance adjustment		Automatic adjustment

3. MASTER CYLINDER

Item	Specification
Type	Tandem
Effective diameter mm (in)	25.4 (1)
Reservoir type	Sealed type
Brake fluid reservoir capacity cm^3 (cu in)	240 (14.64)

4. BRAKE BOOSTER

Item	Specification	
Type	Vacuum suspended	
Effective diameter mm (in)	208 + 229 (8.19 + 9.02)	
Brake fluid pressure	Brake pedal force N (kgf, lbf)	Fluid pressure kPa (kgf/cm^2, psi)
When engine is stopped	147 (15, 33)	451 (4.6, 65)
	294 (30, 66)	1,344 (13.7, 195)
When engine is running and vacuum pressure is at 66.7 kPa (500 mmHg, 19.69 inHg)	147 (15, 33)	4,766 (48.6, 691)
	294 (30, 66)	9,885 (100.8, 1,434)

5. BRAKE LINE, BRAKE PEDAL AND BRAKE FLUID

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.**

Item		Specification
Brake line		Dual circuit system
Brake pedal	Type	Suspended type
	Free play mm (in)	0.5 — 2.7 (0.02 — 0.11) [When pulling the brake pedal upward with a force of less than 10 N (1 kgf, 2 lbf)]
Brake fluid		FMVSS No. 116, DOT3, or DOT4

BRAKE > General Description

COMPONENT

1. FRONT DISC BRAKE

- Floating 2-POT piston type

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

∗1: 17 mm (width across flats)
∗2: 19 mm (width across flats)

Tightening torque: N·m (kgf-m, ft-lb)

T1: 8 (0.8, 5.9)
T2: 27 (2.8, 20.3)
T3: 80 (8.2, 59)
T4: 135 (13.8, 99.6)

- Opposed 4-POT piston type

(1) Caliper body
(2) Bleeder - screw
(3) Cap - bleeder
(4) Guide plate
(5) Cross spring
(6) Shim - disc brake front outer
(7) Shim - disc brake front inner
(8) Pad - disc brake front inner
(9) Pad - disc brake front outer
(10) Disc rotor (ventilated type)
(11) Clip - slide pin
(12) Pin - disc brake
(13) Piston seal
(14) Piston - disc brake
(15) Piston boot
(16) Mounting bolt

Tightening torque: N·m (kgf-m, ft-lb)

T1: 20 (2, 14.8)
T2: 120 (12.2, 88.5)

- Opposed 6-POT piston type

(1) Caliper body
(2) Bleeder - screw
(3) Cap - bleeder
(4) Cross spring
(5) Pad - disc brake front inner
(6) Pad - disc brake front outer
(7) Disc rotor (ventilated type)
(8) Pin - disc brake
(9) Pad clip nut
(10) Piston seal
(11) Piston - disc brake
(12) Piston boot
(13) Pad clip bolt
(14) Mounting bolt

Tightening torque: N·m (kgf-m, ft-lb)

T1: 18.5 (1.9, 13.6)
T2: 30 (3.1, 22.1)
T3: 120 (12.2, 88.5)

2. REAR DISC BRAKE (DRUM IN DISC TYPE)

- Floating 1-POT piston type

(1) Support - rear disc brake
(2) Pad clip - rear brake
(3) Bleeder - screw
(4) Cap - bleeder
(5) Guide pin - rear brake (black)
(6) Pin boot
(7) Caliper body
(8) Piston seal
(9) Piston - disc brake
(10) Piston boot
(16) Pad - disc brake rear outer
(17) Shim - disc brake rear outer and inner
(18) Pin - shoe hold-down
(19) Back plate - rear brake
(20) Retainer - rear brake
(21) Spring washer - rear brake
(22) Parking lever - rear
(23) Parking brake shoe (secondary)
(24) Pin - parking lever
(25) Spring - secondary shoe return
(31) Spring - shoe clamp
(32) Parking brake shoe (primary)
(33) Adjusting hole cover
(34) Disc rotor (solid type)
(35) Mounting bolt
(36) Caliper bolt

∗1: 14 mm (width across flats)
∗2: 17 mm (width across flats)

(11) Lock pin - rear brake (silver)
(12) Lock pin - bushing
(13) Shim - disc brake rear outer
(14) Shim - disc brake rear inner
(15) Pad - disc brake rear inner
(26) Spring - strut
(27) Adjuster ASSY - rear brake
(28) Strut - brake
(29) Spring - primary shoe return
(30) Spring - adjuster

Tightening torque: N·m (kgf-m, ft-lb)

T1: 8 (0.8, 5.9)
T2: 27 (2.8, 19.9)
T3: 66 (6.7, 48.7)
T4: 110 (11.2, 81.1)

- Opposed 2-POT piston type, except for WRX STI model

(1) Caliper body
(2) Bleeder - screw
(3) Cap - bleeder
(4) Guide plate
(5) Cross spring
(6) Shim - disc brake rear outer and inner
(13) Piston boot
(14) Pin - shoe hold-down
(15) Back plate - rear brake
(16) Retainer - rear brake
(17) Spring washer - rear brake
(18) Parking lever - rear
(25) Spring - primary shoe return
(26) Spring - adjuster
(27) Spring - shoe clamp
(28) Parking brake shoe (primary)
(29) Adjusting hole cover
(30) Disc rotor (ventilated type)

(7) Pad - disc brake rear inner
(8) Pad - disc brake rear outer
(9) Clip - slide pin
(10) Pin - disc brake
(11) Piston seal
(12) Piston - disc brake
(19) Parking brake shoe (secondary)
(20) Pin - parking lever
(21) Spring - secondary shoe return
(22) Spring - strut
(23) Adjuster ASSY - rear brake
(24) Spring - strut
(31) Mounting bolt

Tightening torque: N·m (kgf-m, ft-lb)

T1: 18.5 (1.9, 13.6)

T2: 73 (7.4, 53.8)

- Opposed 2-POT piston type, for WRX STI model

(1) Caliper body
(2) Bleeder - screw
(3) Cap - bleeder
(4) Pin - disc brake
(13) Retainer - rear brake
(14) Spring washer - rear brake
(15) Parking lever - rear
(16) Parking brake shoe (secondary)
(25) Parking brake shoe (primary)
(26) Adjusting hole cover
(27) Disc rotor (ventilated type)
(28) Mounting bolt

(5) Cross spring
(6) Pad - disc brake rear inner
(7) Pad - disc brake rear outer
(8) Piston seal
(9) Piston - disc brake
(10) Piston boot
(11) Pin - shoe hold-down
(12) Back plate - rear brake
(17) Pin - parking lever
(18) Spring - secondary shoe return
(19) Spring - strut
(20) Adjuster ASSY - rear brake
(21) Spring - strut
(22) Spring - primary shoe return
(23) Spring - adjuster
(24) Spring - shoe clamp

Tightening torque: N·m (kgf-m, ft-lb)

T1: 18.5 (1.9, 13.6)
T2: 73 (7.4, 53.8)

3. REAR DISC BRAKE (ELECTRONIC PARKING BRAKE TYPE)

(1) Support - rear disc brake
(2) Guide pin - rear brake
(3) Parking brake actuator ASSY
(4) O-ring
(5) Cap
(6) Bleeder - screw
(7) Cap - bleeder
(8) Pin boot
(9) Piston boot
(10) Caliper body
(11) Pad - disc brake rear inner
(12) Pad - disc brake rear outer
(13) Pat clip
(14) Disc rotor (ventilated type)
(15) Mounting bolt

∗: The component cannot be reused when the emergency release of parking brake was performed or when the actuator has a malfunction.

∗1: 14 mm (width across flats)
∗2: 17 mm (width across flats)

Tightening torque: N·m (kgf-m, ft-lb)

T1: 8 (0.8, 5.9)
T2: 17 (1.7, 12.5)
T3: 25 (2.5, 18.4)
T4: 66 (6.7, 48.7)
T5: 110 (11.2, 81.1)

4. MASTER CYLINDER

(1) Cap - reservoir tank
(2) Filter - master cylinder
(3) Caution label (model with caution label)
(4) Seal sub ASSY
(5) Bracket - master cylinder
(6) Nut
(7) Cylinder body ASSY
(8) Seal
(9) Reservoir tank
(10) Pin
(11) Level - indicator

Tightening torque: N·m (kgf-m, ft-lb)

T: 13 (1.3, 9.6)

5. FRONT BRAKE PIPES AND HOSES

- Models without EyeSight

(1)	Connector - two-way	(5)	Gasket	***Tightening torque: N·m (kgf-m, ft-lb)***
(2)	VDC control module and hydraulic control unit (VDCCM&H/U)	(6)	Clamp	***T1: 15 (1.5, 11.1)***
(3)	Front brake pipe ASSY	(7)	Front brake hose LH	***T2: 18 (1.8, 13.3)***
(4)	Master cylinder ASSY	(8)	Front brake hose RH	***T3: 19 (1.9, 14)***
				T4: 26 (2.7, 19.2)
				T5: 33 (3.4, 24.3)

∗: For brembo type only

- Models with EyeSight

(1) VDC control module and hydraulic control module
(2) Front brake pipe ASSY
(3) Master cylinder ASSY
(4) Gasket
(5) Clamp
(6) Front brake hose ASSY RH/LH
(7) Clamp
(8) Brake hose ASSY
(9) Bracket

Tightening torque: N·m (kgf-m, ft-lb)
T1: 7.5 (0.8, 5.5)
T2: 15 (1.5, 11.1)
T3: 18 (1.8, 13.3)
T4: 19 (1.9, 14)
T5: 26 (2.7, 19.2)
T6: 33 (3.4, 24.3)

6. CENTER AND REAR BRAKE PIPES AND HOSES

- Models without EyeSight

(1) Center brake pipe ASSY
(2) Bracket
(3) Connector
(4) Rear brake pipe ASSY
∗: For brembo type only
(5) Clamp
(6) Gasket
(7) Rear brake hose RH
(8) Rear brake hose LH

Tightening torque: N·m (kgf-m, ft-lb)

T1: 15 (1.5, 11.1)
T2: 18 (1.8, 13.3)
T3: 26 (2.7, 19.2)
T4: 33 (3.4, 24.3)

- Models with EyeSight

(1) Center brake pipe ASSY
(2) Bracket
(3) Connector
(4) Rear brake pipe ASSY
(5) Clamp
(6) Gasket
(7) Rear brake hose RH
(8) Rear brake hose LH

Tightening torque: N·m (kgf-m, ft-lb)

T1: 15 (1.5, 11.1)
T2: 18 (1.8, 13.3)
T3: 26 (2.7, 19.2)
T4: 33 (3.4, 24.3)

7. 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 (1.8, 13.3)

8. BRAKE PEDAL

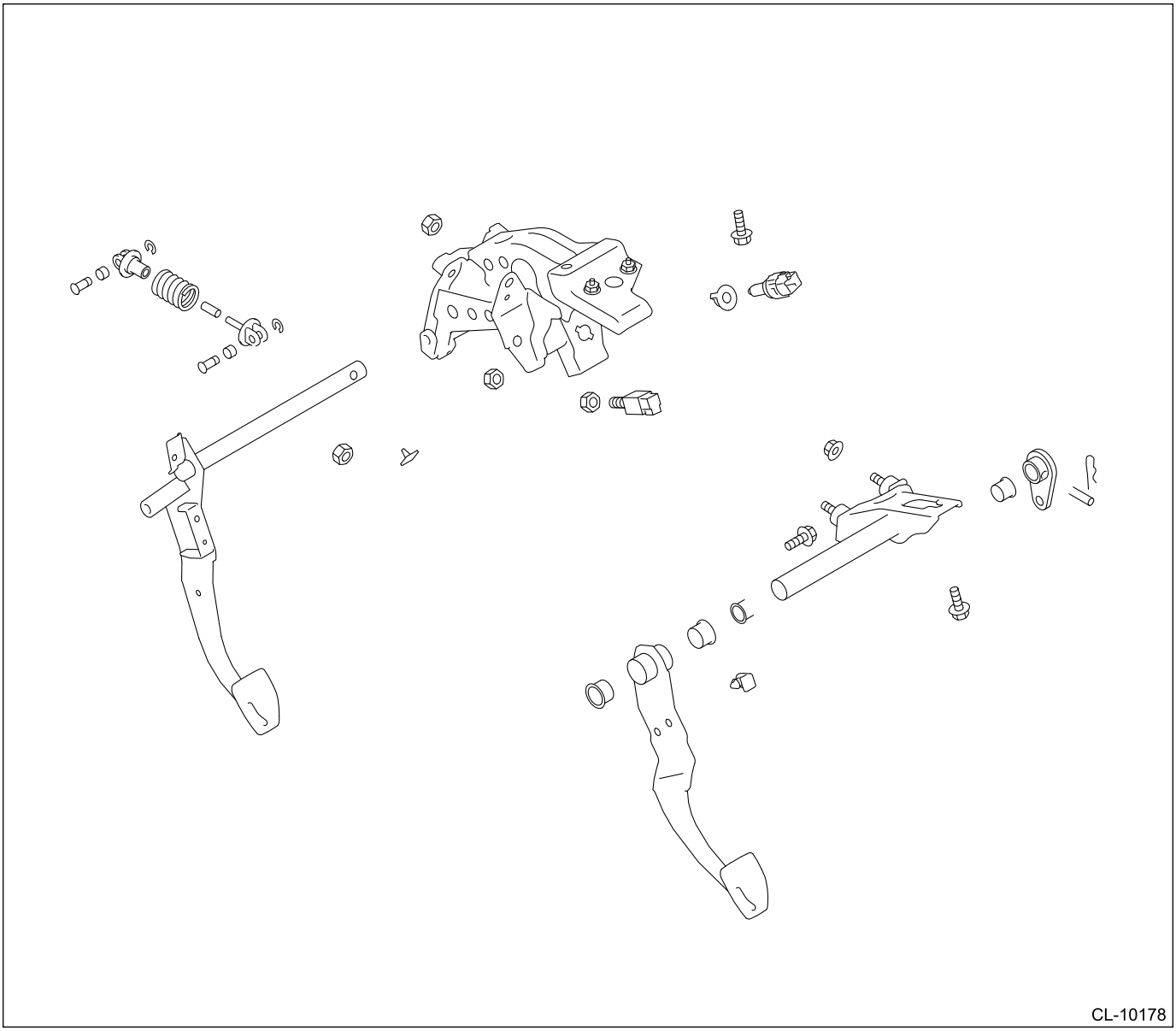
- AT model

(1) Brake pedal ASSY
(2) Clip
(3) Stop light switch
(4) Snap pin
(5) Pad - brake pedal (sport type)
(6) Stopper - pedal
(7) Clevis pin
(8) Bushing - pedal
(9) Spacer - pedal

Tightening torque: N·m (kgf-m, ft-lb)

T1: 18 (1.8, 13.3)
T2: 30 (3.1, 22.1)

- MT model



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

Tightening torque: N·m (kgf-m, ft-lb)

T1: 8 (0.8, 5.9)
T2: 18 (1.8, 13.3)

9. BRAKE VACUUM PUMP

(1)	Vacuum pump ASSY	(3)	Vacuum hose COMPL	***Tightening torque: N·m (kgf-m, ft-lb)***	
(2)	Bracket COMPL - vacuum pump	(4)	Bracket - generator	***T1: 6.4 (0.7, 4.7)***	
				T2: 19 (1.9, 14)	

BRAKE > General Description

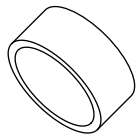
CAUTION

- When performing any work, always wear work clothes, a work cap and protective shoes. Additionally, wear a helmet, protective goggles, etc. if necessary.
- When performing a repair, identify the cause of trouble and avoid unnecessary removal, disassembly and replacement.

- Some vehicle components are extremely hot immediately after driving. Be wary of receiving burns from heated parts.
- Use SUBARU genuine grease, the recommended 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.
- Always use the jack-up point when the shop jacks or rigid racks are used to support the vehicle.
- Apply grease onto sliding or revolving surfaces before installation.
- Be sure that the surface of brake disc, brake pad or brake shoe is free from grease or oil.
- Remove contamination including dirt and corrosion before removal, installation, disassembly or assembly.
- Do not secure a part in a vise directly. Place cushioning materials such as wood blocks, aluminum plates, or waste cloth between the part and the vise.

PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
	—	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".**
 ST99099AL000	99099AL000	PISTON BOOT INSTALLER	Used for installing the piston boot.

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 the operation and airtightness of the brake booster.

TOOL NAME	REMARKS
Vacuum gauge	Used for measuring the operation and airtightness of the brake booster.
Dial gauge	Used for measuring brake disc rotor run-out.
Magnet stand	Used for measuring brake disc rotor run-out.
Cap	Used for brake hose installing portion of brake disc caliper.
Disc brake piston tool	Used for pushing back the electronic parking brake piston. • KTC disc parking tool rotor • OTC brake caliper tool adapter or equivalent

REMOVAL

1. FLOATING 2-POT PISTON TYPE

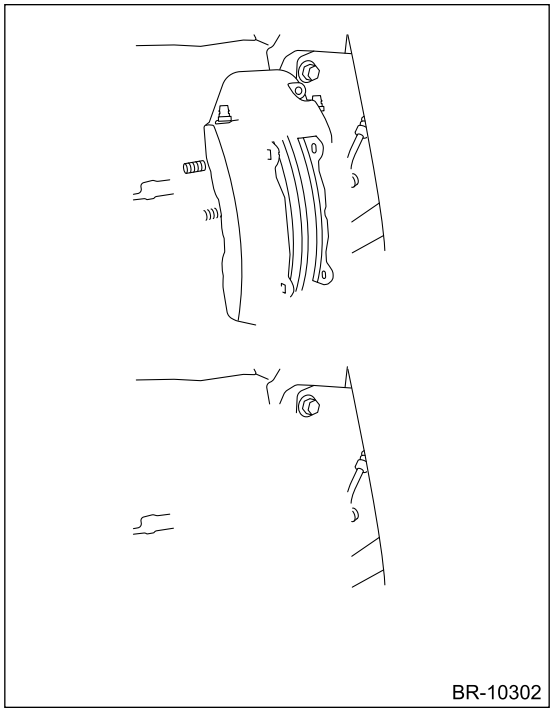
1. Lift up the vehicle, and then remove the front wheels.
2. Remove the pad - disc brake front.
   (1) Remove the caliper bolt on the lower side.
   (2) Raise the caliper body assembly and remove the pad - disc brake front.
   Note:
   Do not disconnect the brake hose from the caliper body assembly.

2. OPPOSED 4-POT PISTON TYPE

1. Lift up the vehicle, and then remove the front wheels.
2. Remove the pad - disc brake front.
   (1) Remove the clip - slide pin (a), and remove the pin - disc brake (b) and cross spring (c).
   (2) While pushing back the piston with a wrench, remove the pad - disc brake front.

3. OPPOSED 6-POT PISTON TYPE

1. Lift up the vehicle, and then remove the front wheels.
2. Remove the pad - disc brake front.
   (1) Remove the pin - disc brake (a), cross spring (b) and pad clip bolt (c).
   (2) Remove the pad - disc brake front.



BRAKE > Front Brake Pad

INSTALLATION

1. FLOATING 2-POT PISTON TYPE

Note:
Remove the pad clip before installation, 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.
   Preparation items:
   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.
   Preparation items:
   Grease: An item contained in the pad kit, Molykote M7439 or equivalent

4. Install the pad clip.
5. Press back the piston using disc brake piston tool as needed.
   Caution:
   When the pushing-back procedure of the piston is performed, the clearance between the pad and the disc rotor increases, 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 disc 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 pad - disc brake front with a new part.**

(a) Pad return spring (b) Supporting surface of pad clip (c) Disc rotor rotation direction

Note:
Install the pad wear indicator in proper direction.

(a) LH — IN
(b) LH — OUT
(c) RH — IN
(d) RH — OUT
(e) Pad wear indicator
(f) Pad return spring

7. Install the caliper body assembly.
   Tightening torque:
   27 N·m (2.8 kgf-m, 19.9 ft-lb)
8. Install the front wheels.
   Tightening torque:
   120 N·m (12.2 kgf-m, 88.5 ft-lb)

2. OPPOSED 4-POT PISTON TYPE

Note:
Before installation, remove mud and foreign matter from the disc brake assembly.

1. Apply a thin coat of grease to the side of the pad - disc brake front, both sides of the shim - disc brake front inner and the shim mounting surface of the pad - disc brake front.
   Preparation items:
   Grease (pad side (A)): An item contained in the pad kit, Molykote M7439 or equivalent
   Grease (shim and pad (B)): An item contained in the pad kit or Dow Corning Molykote AS880N

2. Install the pad - disc brake front.
   Note:
   Install so that the arrow (a) faces upward.

3. Install the cross spring.
4. Install the pin - disc brake.

5. Install the clip - slide pin.
6. Install the front wheels.
   Tightening torque:
   120 N·m (12.2 kgf-m, 88.5 ft-lb)

3. OPPOSED 6-POT PISTON TYPE

Note:
Before installation, remove mud and foreign matter from the disc brake assembly.

1. Apply a thin coat of grease to the side surface of the pad - disc brake front.
   Preparation items:
   Grease: An item contained in the pad kit, Molykote M7439 or equivalent

2. Install the pad - disc brake front.
   Note:
   Install the parts with the pad wear indicator facing downward.

   (a) Pad - disc brake front outer
   (b) Pad - disc brake front inner
   (c) Pad wear indicator

3. Install the pad clip bolt.
   Tightening torque:
   30 N·m (3.1 kgf-m, 22.1 ft-lb)
4. Install the cross spring.
5. Install the pin - disc brake.
6. Install the front wheels.
   Tightening torque:
   120 N·m (12.2 kgf-m, 88.5 ft-lb)

INSPECTION

1. Check the thickness of the pad - disc brake front.

   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.**
   - **Pad wear indicators are installed on the pad - disc brake front inner (floating 2-POT piston type) or on the pad - disc brake front outer (opposed 4-POT & 6-POT piston type), and a squeaking sound is heard when the pad is worn to the limit.**

- Floating 2-POT piston type

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

- Opposed 4-POT piston type

	Standard (a)	Wear limit (b)
Pad thickness	8.8 mm (0.35 in)	1.2 mm (0.047 in)

- Opposed 6-POT piston type

	Standard (c)	Wear limit (d)
Pad thickness	9.5 mm (0.37 in)	2.8 mm (0.11 in)

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

REMOVAL

1. Lift up the vehicle, and then remove the front wheels.
2. Remove the disc brake assembly.
   (1) Remove the brake hose bracket.
   (2) Remove the mounting bolt, and remove the disc brake assembly.
   (3) Prepare wiring harnesses etc. to be discarded, and suspend the disc brake assembly from the strut assembly.
   Caution:
   Since the 17-inch & 18-inch (Brembo) caliper bodies are easily scratched and the paint may be stripped, protect them from being contacted with other parts or tools.
   - Floating 2-POT piston type

   - Opposed 4-POT piston type

- Opposed 6-POT piston type

3. Remove the disc rotor.
   Note:
   When the disc rotor is difficult to be removed, screw in 8 mm (0.31 in) bolt to the threaded part of the disc rotor (A), and remove the disc rotor.

INSTALLATION

Note:
Before installation, remove mud and foreign matter from the disc brake assembly.

1. Check the front disc rotor. Ref. to BRAKE>Front Disc Rotor>INSPECTION.
2. Install the disc rotor.
3. Install the disc brake assembly and the brake hose bracket.
   Caution:
   Be sure to temporarily tighten the bolts (both locations) until the bolts seat (until the bolt washers contact the housing). Use new bolts if faulty such as peeling is found at the dacrotizing treatment (especially the threads) of the mounting bolts. (Opposed 4-POT piston type)
   Tightening torque:
   Mounting bolt (floating 2-POT piston type): Refer to "COMPONENT" of "General Description" for the tightening torque. Ref. to BRAKE>General Description>COMPONENT > FRONT DISC BRAKE.
   Mounting bolt (opposed 4-POT & 6-POT piston type): 120 N·m (12.2 kgf-m, 88.5 ft-lb)
   Brake hose bracket: 33 N·m (3.4 kgf-m, 24.3 ft-lb)
4. Install the front wheels.
   Tightening torque:
   120 N·m (12.2 kgf-m, 88.5 ft-lb)

BRAKE > Front Disc Rotor

INSPECTION

1. DISC ROTOR RUNOUT CHECK

1. Check the front hub unit bearing for free play and runout before the inspection of disc rotor runout limit. Ref. to DRIVE SHAFT SYSTEM>Front Hub Unit Bearing>INSPECTION.
2. Check the disc rotor runout.
   (1) Remove the caliper body assembly. Ref. to BRAKE>Front Disc Rotor>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
   Floating 2-POT piston type: 0.05 mm (0.002 in)
   Opposed 4-POT & 6-POT piston type: 0.075 mm (0.003 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

Floating 2-POT piston type: 0.05 mm (0.002 in)

Opposed 4-POT & 6-POT piston type: 0.075 mm (0.003 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 inspection result shows that the disc rotor runout exceeds service limit, perform the following procedure.

- Floating 2-POT piston type & opposed 4-POT piston type: Grind the disc rotor. Check the disc rotor thickness after grinding. Ref. to BRAKE>Front Disc Rotor>INSPECTION > DISC ROTOR THICKNESS CHECK.
- Opposed 6-POT piston type: Replace the disc rotor. Ref. to BRAKE>Front Disc Rotor>REMOVAL.

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)	17-inch (floating 2-POT piston type)	30 mm (1.18 in)	28 mm (1.1 in)	316 mm (12.44 in)
	17-inch (opposed 4-POT piston type)	30 mm (1.18 in)	28 mm (1.1 in)	326 mm (12.83 in)
	18-inch	30 mm (1.18 in)	28 mm (1.1 in)	340 mm (13.39 in)

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

3. CHECK DISC ROTOR FOR CRACK AND DAMAGE (OPPOSED 6-POT PISTON TYPE)

1. Check the sliding surface of the disc rotor for cracks (a), damage and wear. If defective, replace the disc rotor.

Caution:
If there is a 5 mm (0.2 in) crack around the holes of disc rotor, always replace the disc rotor with a new one.

REMOVAL

1. FLOATING 2-POT PISTON TYPE

1. Lift up the vehicle, and then remove the front wheels.
2. Remove the union bolt and the caliper bolt, and remove the caliper body assembly.
   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.**
   - **Prepare a container to catch grease or oil, etc. If any grease or oil spills, wipe it off and clean immediately to prevent from penetrating into floor or flowing outside.**

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

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

2. OPPOSED 4-POT PISTON TYPE

1. Lift up the vehicle, and then remove the front wheels.
2. Remove the pad - disc brake front. Ref. to BRAKE>Front Brake Pad>REMOVAL > OPPOSED 4-POT PISTON TYPE.
3. Remove the union bolt and the mounting bolt, and remove the disc brake assembly.

Caution:

- **Since the 17-inch (Brembo) caliper body is easily scratched and the paint may be stripped, protect it from being contacted with other parts or tools.**
- **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.**
- **Prepare a container to catch grease or oil, etc. If any grease or oil spills, wipe it off and clean immediately to prevent from penetrating into floor or flowing outside.**

3. OPPOSED 6-POT PISTON TYPE

1. Lift up the vehicle, and then remove the front wheels.
2. Remove the pad - disc brake front. Ref. to BRAKE>Front Brake Pad>REMOVAL > OPPOSED 6-POT PISTON TYPE.
3. Remove the union bolt and the mounting bolt, and remove the disc brake assembly.
   Caution:
   - **Since the 18-inch (Brembo) caliper body is easily scratched and the paint may be stripped, protect it from being contacted with other parts or tools.**
   - **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.**
   - **Prepare a container to catch grease or oil, etc. If any grease or oil spills, wipe it off and clean immediately to prevent from penetrating into floor or flowing outside.**

BRAKE > Front Disc Brake Assembly

INSTALLATION

1. FLOATING 2-POT PISTON TYPE

Note:
Remove the pad clip before installation, 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.
   Preparation items:
   Grease: An item contained in the pad kit, Molykote M7439 or equivalent

3. Install the support - front disc brake.
   Tightening torque:
   Mounting bolt: Refer to "COMPONENT" of "General Description" for the tightening torque. Ref. to BRAKE>General Description>COMPONENT > FRONT DISC BRAKE.
4. Apply a thin coat of grease to the pad clip.
   Preparation items:
   Grease: An item contained in the pad kit, Molykote M7439 or equivalent

5. Install the pad clip.
6. Press back the piston using disc brake piston tool as needed.
   Caution:
   When the pushing-back procedure of the piston is performed, the clearance between the pad and the disc rotor increases, 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.

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) Pad return spring

(b) Supporting surface of pad clip

(c) Direction of brake rotor rotation

Note:
Install the pad wear indicator in proper direction.

(a) LH — IN

(b) LH — OUT

(c) RH — IN

(d) RH — OUT

(e) Pad wear indicator

(f) Pad return spring

8. Install the caliper body assembly.
   Tightening torque:
   27 N·m (2.8 kgf-m, 19.9 ft-lb)
9. Connect the brake hose using a new brake hose gasket.
   Tightening torque:
   26 N·m (2.7 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 (12.2 kgf-m, 88.5 ft-lb)

2. OPPOSED 4-POT PISTON TYPE

Note:
Before installation, remove mud and foreign matter from the disc brake assembly.

1. Check each part. Ref. to BRAKE>Front Disc Brake Assembly>INSPECTION.
2. Install the disc brake assembly.
   Caution:
   Be sure to temporarily tighten the bolts (both locations) until the bolts seat (until the bolt washers contact the housing). Use new bolts if faulty such as peeling is found at the dacrotizing treatment (especially the threads) of the mounting bolts.
   Tightening torque:
   120 N·m (12.2 kgf-m, 88.5 ft-lb)
3. Connect the brake hose. Ref. to BRAKE>Brake Hose>INSTALLATION > FRONT BRAKE HOSE.
4. Apply a thin coat of grease to the side of the pad - disc brake front, both sides of the shim - disc brake front inner and the shim mounting surface of the pad - disc brake front.
   Preparation items:
   Grease (pad side (A)): An item contained in the pad kit, Molykote M7439 or equivalent
   Grease (shim and pad (B)): An item contained in the pad kit or Dow Corning Molykote AS880N

5. Install the pad - disc brake front.

Note:
Install so that the arrow (a) faces upward.

6. Install the cross spring.
7. Install the pin - disc brake.
8. Install the clip - slide pin.
9. Bleed air from the brake system. Ref. to BRAKE>Air Bleeding>PROCEDURE > BRAKE LINE.
10. Install the front wheels.
    Tightening torque:
    120 N·m (12.2 kgf-m, 88.5 ft-lb)

3. OPPOSED 6-POT PISTON TYPE

Note:
Before installation, remove mud and foreign matter from the disc brake assembly.

1. Check each part. Ref. to BRAKE>Front Disc Brake Assembly>INSPECTION.
2. Install the disc brake assembly.
   Tightening torque:
   120 N·m (12.2 kgf-m, 88.5 ft-lb)
3. Connect the brake hose. Ref. to BRAKE>Brake Hose>INSTALLATION > FRONT BRAKE HOSE.
4. Apply a thin coat of grease to the side surface of the pad - disc brake front.
   Preparation items:
   Grease: An item contained in the pad kit, Molykote M7439 or equivalent

5. Install the pad - disc brake front.
   Note:
   Install the parts with the pad wear indicator facing downward.

(a) Pad - disc brake front outer

(b) Pad - disc brake front inner

(c) Pad wear indicator

6. Install the pad clip bolt.
   Tightening torque:
   30 N·m (3.1 kgf-m, 22.1 ft-lb)
7. Install the cross spring.
8. Install the pin - disc brake.
9. Bleed air from the brake system. Ref. to BRAKE>Air Bleeding>PROCEDURE > BRAKE LINE.
10. Install the front wheels.
    Tightening torque:
    120 N·m (12.2 kgf-m, 88.5 ft-lb)

BRAKE > Front Disc Brake Assembly

DISASSEMBLY

Caution:

- **Be careful not to allow foreign matter to enter the brake hose connector.**
- **Since the 17-inch & 18-inch (Brembo) caliper bodies are easily scratched and the paint may be stripped, protect them from being contacted with other parts or tools.**

1. Remove mud and foreign matter from the caliper body assembly.
2. Remove the piston boot.
   Note:
   Remove the 4 piston boots for the opposed 4-POT piston type, and remove the 6 piston boots for the opposed 6-POT piston type.

(A) Floating 2-POT piston type (B) Opposed 4-POT piston type (C) Opposed 6-POT piston type

3. 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.

Note:

Instead of removing the pistons one by one, remove all pistons at once after adjusting the amount of protrusion evenly using a wooden block.

(A) Floating 2-POT piston type (B) Opposed 4-POT piston type (C) Opposed 6-POT piston type

4. Remove the piston seal (a).

Caution:

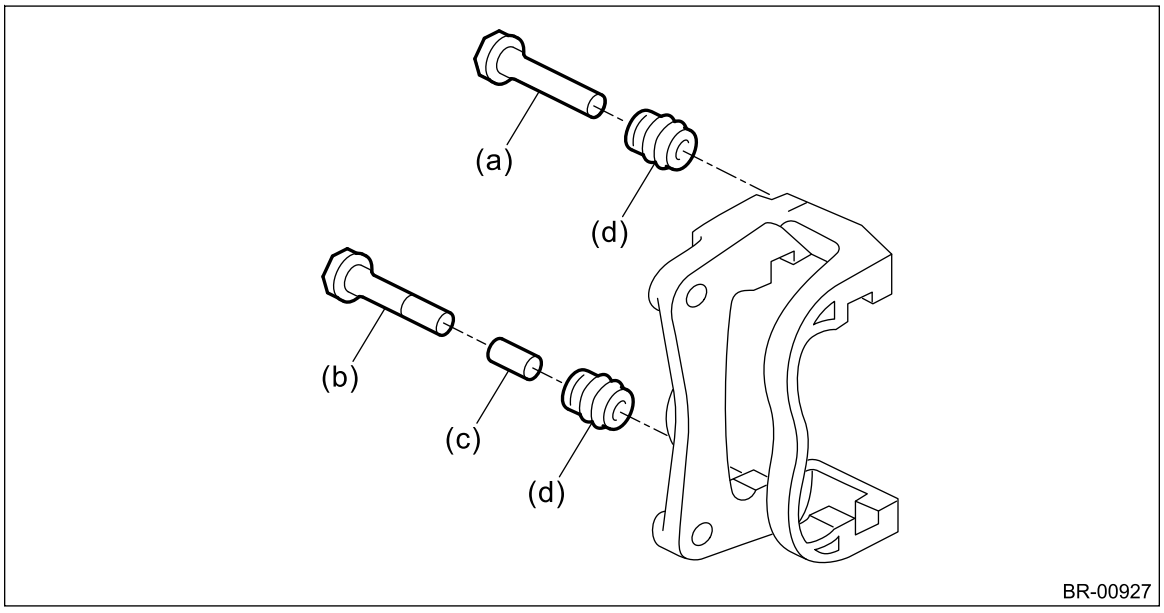
Do not damage the cylinder and piston seal groove.

Note:

Remove the 4 piston seals for the opposed 4-POT piston type, and remove the 6 piston seals for the opposed 6-POT piston type.

(A) Floating 2-POT piston type (B) Opposed 4-POT piston type (C) Opposed 6-POT piston type

5. Remove each part from support - front disc brake. (Floating 2-POT piston type)



(a) Guide pin - front brake (black) (c) Lock pin - bushing (d) Pin boot

(b) Lock pin - front brake (silver)

BRAKE > Front Disc Brake Assembly

ASSEMBLY

1. Check each part. Ref. to BRAKE>Front Disc Brake Assembly>INSPECTION.
2. Clean the inside of the caliper body using brake fluid.

   Preparation items:

   Brake fluid: FMVSS No. 116, DOT3 or DOT4
3. Install the piston seal and the piston - disc brake.

   (1) Apply a coat of brake fluid to piston seal and install the piston seal to the groove inside caliper body.

   (2) Apply a coat of brake fluid to the piston sliding part of caliper body and the entire outer surface of the piston - disc brake.

   Preparation items:

   Brake fluid: FMVSS No. 116, DOT3 or DOT4

   (3) Apply a coat of grease to the piston boot and fit to the groove on the ends of piston - disc brake.

   Preparation items:

   Grease: An item contained in the pad kit or Nippon Grease NIGLUBE RX-2

   (4) Install the piston - disc brake to the caliper body.

   Caution:

   Do not force the piston - disc brake into the sliding part of caliper body.

(A) Floating 2-POT piston type
(B) Opposed 4-POT piston type
(C) Opposed 6-POT piston type
(a) Piston - disc brake
(b) Piston boot
(c) Caliper body
(d) Piston seal

4. Apply grease contained in the piston seal kit to the lock pin - front brake, the outer surface of guide pin - front brake, the pin sliding part of the support - front disc brake, and the grooves of pin boot. (Floating 2-POT piston type)
5. Install the pin boot to the lock pin - front brake and the guide pin - front brake, and insert them into the support - front disc brake. (Floating 2-POT piston type)

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

BRAKE > Front Disc Brake Assembly

INSPECTION

1. Check the piston sliding part of caliper body and the 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.

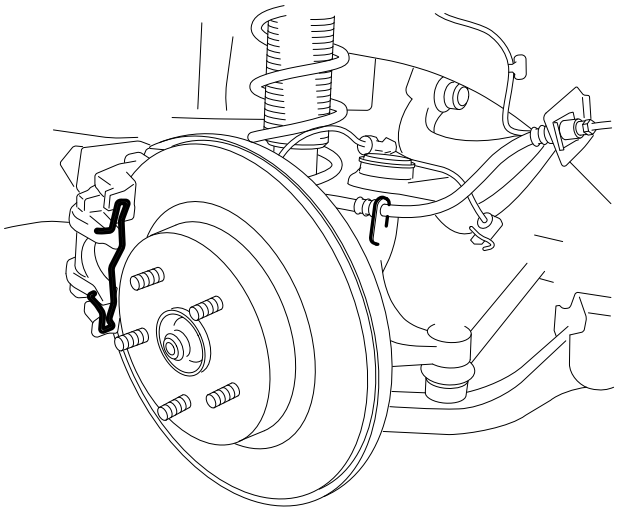
REMOVAL

1. FLOATING 1-POT PISTON TYPE (DRUM-IN-DISC TYPE)

1. Lift up the vehicle, and then remove the rear wheels.
2. Remove the pad - disc brake rear.
   (1) Remove the brake hose bracket.
   (2) Remove the caliper bolt on the lower side.
   (3) Raise the caliper body assembly and remove the pad - disc brake rear.
   Note:
   Do not disconnect the brake hose from the caliper body assembly.

2. FLOATING 1-POT PISTON TYPE (ELECTRONIC PARKING BRAKE TYPE)

1. Release the parking brake.
2. Using the Subaru Select Monitor, go to the brake maintenance mode according to the display screen.
   Ref. to PARKING BRAKE>Parking Brake System>OPERATION > BRAKE MAINTENANCE MODE.
   Note:
   For detailed operation procedures, refer to "Application help".
3. Disconnect the ground terminal from battery sensor. Ref. to NOTE>NOTE > BATTERY.
4. Lift up the vehicle, and then remove the rear wheels.
5. Remove the pad - disc brake rear.
   (1) Disconnect the connector.
   (2) Remove the pad clip and the brake hose bracket.



(3) Remove the cap and the guide pin - rear brake, and remove the caliper body assembly.
(4) Remove the pad - disc brake rear.

Preparation tool:

Hexagon wrench: 7 mm (0.28 in)

3. OPPOSED 2-POT PISTON TYPE, EXCEPT FOR WRX STI MODEL

1. Lift up the vehicle, and then remove the rear wheels.
2. Remove the pad - disc brake rear.
   (1) Remove the clip - slide pin (a), and remove the pin - disc brake (b) and cross spring (c).
   (2) While pushing back the piston with a wrench, remove the pad - disc brake rear.

4. OPPOSED 2-POT PISTON TYPE, FOR WRX STI MODEL

1. Lift up the vehicle, and then remove the rear wheels.
2. Remove the pad - disc brake rear.
   (1) Remove the pin - disc brake (a) and cross spring (b).
   (2) Remove the pad - disc brake rear.

INSTALLATION

1. FLOATING 1-POT PISTON TYPE (DRUM-IN-DISC TYPE)

Note:
Remove the pad clip before installation, 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.
   Preparation items:
   Grease: An item contained in the pad kit, Molykote M7439 or equivalent

2. Check the brake pad. Ref. to BRAKE>Rear Brake Pad>INSPECTION.
3. Apply a thin coat of grease to the pad clip, both sides of the shim - disc brake rear inner and the shim mounting surface of the pad - disc brake rear.
   Preparation items:
   Grease (pad side (A)): An item contained in the pad kit, Molykote M7439 or equivalent
   Grease (shim and pad (B)): An item contained in the pad kit or Dow Corning Molykote AS880N

(A) Pad clip - rear brake

(B) Pad - disc brake rear and the shim - disc brake rear

(a) Pad - disc brake rear outer
(b) Pad - disc brake rear inner
(c) Shim - disc brake rear inner
(d) Shim - disc brake rear inner
(e) Shim - disc brake rear outer

4. Install the pad clip.
5. Press back the piston using disc brake piston tool as needed.
   Caution:
   When the pushing-back procedure of the piston is performed, the clearance between the pad and the disc rotor increases, 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.
6. Install the pad - disc brake rear.
   Note:
   Install the pad wear indicator in proper direction.
7. Install the caliper body assembly.
   Tightening torque:
   27 N·m (2.8 kgf-m, 19.9 ft-lb)
8. Install the brake hose bracket.
   Tightening torque:
   33 N·m (3.4 kgf-m, 24.3 ft-lb)
9. Install the rear wheels.
   Tightening torque:
   120 N·m (12.2 kgf-m, 88.5 ft-lb)

2. FLOATING 1-POT PISTON TYPE (ELECTRONIC PARKING BRAKE TYPE)

Note:
Before installation, remove mud and foreign matter from the disc brake assembly.

1. Install the pad - disc brake rear.
2. Install the caliper body assembly and the cap.
   Tightening torque:
   25 N·m (2.5 kgf-m, 18.4 ft-lb)
3. Install the pad clip and the brake hose bracket.
   Tightening torque:
   33 N·m (3.4 kgf-m, 24.3 ft-lb)
4. Connect the ground terminal to battery sensor. Ref. to NOTE>NOTE > BATTERY.
5. Install the connector.
6. Using the Subaru Select Monitor, exit the brake maintenance mode according to the display screen.
   Ref. to PARKING BRAKE>Parking Brake System>OPERATION > BRAKE MAINTENANCE MODE.
   Note:
   For detailed operation procedures, refer to “Application help”.
7. After the operation is completed, apply and release the parking brake five times and ensure that the brake operates normally.
8. Install the rear wheels.
   Tightening torque:
   120 N·m (12.2 kgf-m, 88.5 ft-lb)

3. OPPOSED 2-POT PISTON TYPE, EXCEPT FOR WRX STI MODEL

Note:
Before installation, remove mud and foreign matter from the disc brake assembly.

1. Apply a thin coat of grease to the side of the pad - disc brake rear, both sides of the shim - disc brake rear inner and the shim mounting surface of the pad - disc brake rear.
   Preparation items:
   Grease (pad side (A)): An item contained in the pad kit, Molykote M7439 or equivalent
   Grease (shim and pad (B)): An item contained in the pad kit or Dow Corning Molykote AS880N

2. Install the pad - disc brake rear.
   Note:
   Install so that the arrow (a) faces upward.

3. Install the cross spring.
4. Install the pin - disc brake.
5. Install the clip - slide pin.
6. Install the rear wheels.
   Tightening torque:
   120 N·m (12.2 kgf-m, 88.5 ft-lb)

4. OPPOSED 2-POT PISTON TYPE, FOR WRX STI MODEL

Note:
Before installation, remove mud and foreign matter from the disc brake assembly.

1. Apply a thin coat of grease to the pad - disc brake rear.
   Preparation items:
   Grease (pad side (A)): An item contained in the pad kit, Molykote M7439 or equivalent
   Grease (pad side (B)): An item contained in the pad kit or equivalent

2. Install the pad - disc brake rear.
   Note:
   Install the parts with the pad wear indicator facing downward.

   (a) Pad - disc brake rear outer
   (b) Pad - disc brake rear inner
   (c) Pad wear indicator

3. Install the cross spring.
4. Install the pin - disc brake.
5. Install the rear wheels.
   Tightening torque:
   120 N·m (12.2 kgf-m, 88.5 ft-lb)

INSPECTION

1. Check the thickness of the pad - disc brake rear.
   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.**
   - **Pad wear indicators are installed on the pad - disc brake rear inner (floating 1-POT piston type & opposed 2-POT piston type except for WRX STI model) or on the pad - disc brake rear outer (opposed 2-POT piston type for WRX STI model), and a squeaking sound is heard when the pad is worn to the limit.**

- Floating 1-POT piston type (drum-in-disc type)

	Standard (A)	**Wear limit (B)**
Pad thickness	9 mm (0.354 in)	1.5 mm (0.059 in)

- Floating 1-POT piston type (electronic parking brake type)

	Standard (C)	**Wear limit (D)**
Pad thickness	9 mm (0.354 in)	1.5 mm (0.059 in)

- Opposed 2-POT piston type, except for WRX STI model

	Standard (a)	**Wear limit (b)**
Pad thickness	9 mm (0.354 in)	1.55 mm (0.061 in)

- Opposed 2-POT piston type, for WRX STI model

	Standard (c)	Wear limit (d)
Pad thickness	10 mm (0.394 in)	2.8 mm (0.11 in)

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

BRAKE > Rear Brake Pad

REPLACEMENT

1. Release the parking brake.
2. Using the Subaru Select Monitor, go to the brake maintenance mode according to the display screen.
   Ref. to PARKING BRAKE>Parking Brake System>OPERATION > BRAKE MAINTENANCE MODE.
   Note:
   For detailed operation procedures, refer to "Application help".
3. Remove the pad - disc brake rear. Ref. to BRAKE>Rear Brake Pad>REMOVAL.
4. Press back the piston - disc brake.
5. Install the pad - disc brake rear. Ref. to BRAKE>Rear Brake Pad>INSTALLATION.
6. Using the Subaru Select Monitor, exit the brake maintenance mode according to the display screen.
7. After the operation is completed, apply and release the parking brake five times and ensure that the brake operates normally.

Note:
Perform the following replacement procedure if the Subaru Select Monitor cannot be used.

1. **Remove the disc brake assembly and the pad - disc brake rear.**
2. **Remove the bolt securing the lower side of the support - rear disc brake, loosen the upper side, and then slide the support - rear disc brake upward and hold it.**
3. **Secure the disc brake assembly as shown in the figure, and push back the piston while rotating it using the tool.**
   Preparation tool:
   Disc brake piston tool: KTC disc parking tool rotor (E · F) ABX104
   Disc brake piston tool: OTC brake caliper tool adapter No. 7317A
   or equivalent

4. **Install the support - rear disc brake and the disc brake assembly to the specified tightening torque.**
   Tightening torque:
   Refer to "COMPONENT" of "General Description". Ref. to BRAKE>General Description>COMPONENT > REAR DISC BRAKE (ELECTRONIC PARKING BRAKE TYPE).

REMOVAL

1. FLOATING 1-POT PISTON TYPE (DRUM-IN-DISC TYPE)

1. Lift up the vehicle, and then remove the rear wheels.
2. Release the lever assembly - hand brake.
3. Remove the disc brake assembly.
   (1) Remove the brake hose bracket.
   (2) Remove the mounting bolt, and remove the disc brake assembly.
   (3) Prepare wiring harnesses etc. to be discarded, and suspend the disc brake assembly from the shock absorber assembly.

4. Remove the 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), and rotate the adjuster assembly - rear brake in the direction of arrow (e) by inserting a flat tip screwdriver.**

(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. **When the disc rotor is difficult to be removed from the rear hub unit bearing, screw in 8 mm (0.31 in) bolt to the threaded part of the disc rotor (A), and remove the disc rotor.**

2. FLOATING 1-POT PISTON TYPE (ELECTRONIC PARKING BRAKE TYPE)

1. Release the parking brake.

2. Using the Subaru Select Monitor, go to the brake maintenance mode according to the display screen.
   Ref. to PARKING BRAKE>Parking Brake System>OPERATION > BRAKE MAINTENANCE MODE.
   Note:
   For detailed operation procedures, refer to "Application help".
3. Disconnect the ground terminal from battery sensor. Ref. to NOTE>NOTE > BATTERY.
4. Lift up the vehicle, and then remove the rear wheels.
5. Remove the disc brake assembly.
   (1) Remove the pad clip, the connector and the brake hose bracket.
   (2) Remove the mounting bolt, and remove the disc brake assembly.
   (3) Prepare wiring harnesses etc. to be discarded, and suspend the disc brake assembly from the shock absorber assembly.

6. Remove the disc rotor.

Note:
If the disc rotor is difficult to remove, proceed as follows.
When the disc rotor is difficult to be removed from the rear hub unit bearing, screw in 8 mm (0.31 in) bolt to the threaded part of the disc rotor (A), and remove the disc rotor.

3. OPPOSED 2-POT PISTON TYPE, EXCEPT FOR WRX STI MODEL

1. Lift up the vehicle, and then remove the rear wheels.
2. Release the lever assembly - hand brake.
3. Remove the disc brake assembly.
   (1) Remove the brake hose bracket.
   (2) Remove the mounting bolt, and remove the disc brake assembly.
   (3) Prepare wiring harnesses etc. to be discarded, and suspend the disc brake assembly from the shock absorber assembly.
   Caution:
   Since the 17-inch (Brembo) caliper body is easily scratched and the paint may be stripped, protect it from being contacted with other parts or tools.

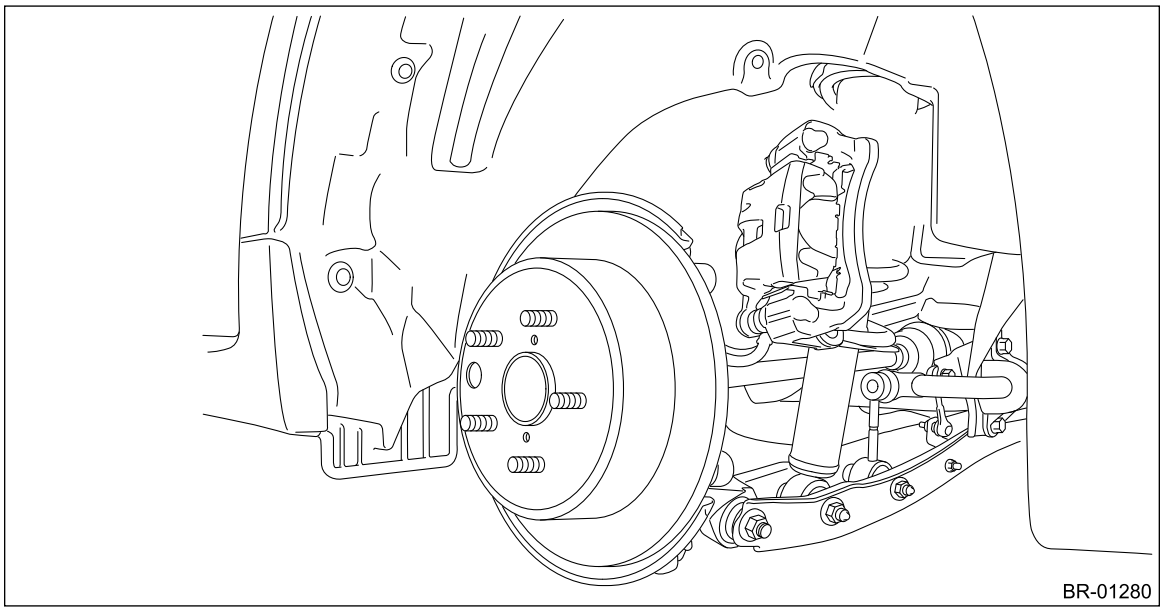
4. Remove the disc rotor.

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

1. Remove the adjusting hole cover (A), and rotate the adjuster assembly - rear brake in the direction of arrow (e) by inserting a flat tip screwdriver.

(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. When the disc rotor is difficult to be removed from the rear hub unit bearing, screw in 8 mm (0.31 in) bolt to the threaded part of the disc rotor (A), and remove the disc rotor.



4. OPPOSED 2-POT PISTON TYPE, FOR WRX STI MODEL

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

2. Release the lever assembly - hand brake.
3. Remove the disc brake assembly.
   (1) Remove the brake hose bracket.
   (2) Remove the mounting bolt, and remove the disc brake assembly.
   (3) Prepare wiring harnesses etc. to be discarded, and suspend the disc brake assembly from the shock absorber assembly.
   Caution:
   Since the 18-inch (Brembo) caliper body is easily scratched and the paint may be stripped, protect it from being contacted with other parts or tools.

4. Remove the 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), and rotate the adjuster assembly - rear brake in the direction of arrow (e) by inserting a flat tip screwdriver.**

(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

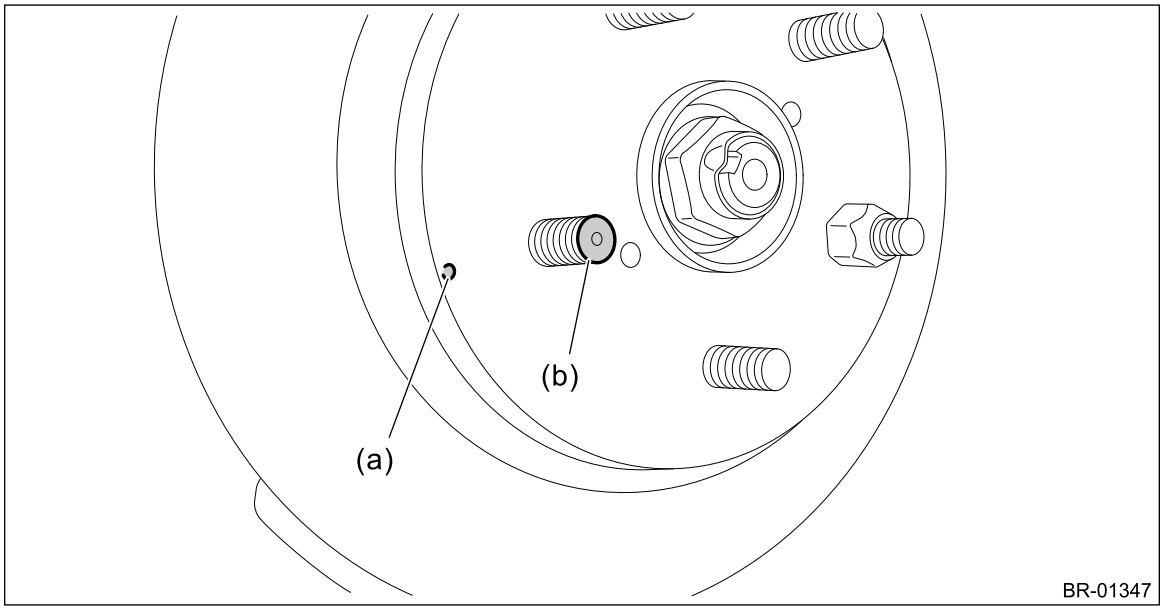
2. **When the disc rotor is difficult to be removed from the rear hub unit bearing, screw in 8 mm (0.31 in) bolt to the threaded part of the disc rotor (A), and remove the disc rotor.**

INSTALLATION

1. FLOATING 1-POT PISTON TYPE (DRUM-IN-DISC TYPE)

Note:
Before installation, remove mud and foreign matter from the disc brake assembly.

1. Check the rear disc rotor. Ref. to BRAKE>Rear Disc Rotor>INSPECTION.
2. Install the disc rotor.
   Note:
   When installing the rear disc rotor, match the alignment mark (a) of the rear disc rotor and the alignment mark (b) of the hub bolt.



3. Adjust the parking brake. Ref. to PARKING BRAKE>Parking Brake Assembly (Rear Disc Brake)>ADJUSTMENT.
4. Install the disc brake assembly and the brake hose bracket.
   Tightening torque:
   Mounting bolt: Refer to "COMPONENT" of "General Description" for the tightening torque. Ref. to BRAKE>General Description>COMPONENT > REAR DISC BRAKE (DRUM IN DISC TYPE).
   Brake hose bracket: 33 N·m (3.4 kgf-m, 24.3 ft-lb)
5. Install the rear wheels.
   Tightening torque:
   120 N·m (12.2 kgf-m, 88.5 ft-lb)

2. FLOATING 1-POT PISTON TYPE (ELECTRONIC PARKING BRAKE TYPE)

Note:
Before installation, remove mud and foreign matter from the disc brake assembly.

1. Check the rear disc rotor. Ref. to BRAKE>Rear Disc Rotor>INSPECTION.
2. Install the rear disc rotor.
   Note:
   When installing the rear disc rotor, match the alignment mark (a) of the rear disc rotor and the alignment mark (b) of the hub bolt.

3. Install the disc brake assembly.
4. Install the pad clip, connector, and brake hose bracket.
   Tightening torque:
   Mounting bolt: Refer to "COMPONENT" of "General Description" for the tightening torque. Ref. to BRAKE>General Description>COMPONENT > REAR DISC BRAKE (ELECTRONIC PARKING BRAKE TYPE).
   Brake hose bracket: 33 N·m (3.4 kgf-m, 24.3 ft-lb)
5. Connect the ground terminal to battery sensor. Ref. to NOTE>NOTE > BATTERY.
6. Using the Subaru Select Monitor, exit the brake maintenance mode according to the display screen. Ref. to PARKING BRAKE>Parking Brake System>OPERATION > BRAKE MAINTENANCE MODE.
   Note:
   For detailed operation procedures, refer to "Application help".
7. After the operation is completed, apply and release the parking brake five times and ensure that the brake operates normally.
8. Install the rear wheels.
   Tightening torque:
   120 N·m (12.2 kgf-m, 88.5 ft-lb)

3. OPPOSED 2-POT PISTON TYPE, EXCEPT FOR WRX STI MODEL

Note:
Before installation, remove mud and foreign matter from the disc brake assembly.

1. Check the rear disc rotor. Ref. to BRAKE>Rear Disc Rotor>INSPECTION.
2. Install the disc rotor.
   Note:
   When installing the rear disc rotor, match the alignment mark (a) of the rear disc rotor and the alignment mark (b) of the hub bolt.

3. Adjust the parking brake. Ref. to PARKING BRAKE>Parking Brake Assembly (Rear Disc Brake)>ADJUSTMENT.
4. Install the disc brake assembly and the brake hose bracket.
   Caution:
   When installing the disc brake assembly, be sure to temporarily tighten the bolts (both locations) until the bolts seat (until the bolt washers contact the housing). Use new bolts if faulty such as peeling is found at the dacrotizing treatment (especially the threads) of the mounting bolts.
   Tightening torque:
   Mounting bolt: 73 N·m (7.4 kgf-m, 53.8 ft-lb)
   Brake hose bracket: 33 N·m (3.4 kgf-m, 24.3 ft-lb)
5. Install the rear wheels.
   Tightening torque:
   120 N·m (12.2 kgf-m, 88.5 ft-lb)

4. OPPOSED 2-POT PISTON TYPE, FOR WRX STI MODEL

Note:
Before installation, remove mud and foreign matter from the disc brake assembly.

1. Check the rear disc rotor. Ref. to BRAKE>Rear Disc Rotor>INSPECTION.
2. Install the disc rotor.
   Note:
   When installing the rear disc rotor, match the alignment mark (a) of the rear disc rotor and the alignment mark (b) of the hub bolt.

3. Adjust the parking brake. Ref. to PARKING BRAKE>Parking Brake Assembly (Rear Disc Brake)>ADJUSTMENT.
4. Install the disc brake assembly and the brake hose bracket.
   Tightening torque:
   Mounting bolt: 73 N·m (7.4 kgf-m, 53.8 ft-lb)
   Brake hose bracket: 33 N·m (3.4 kgf-m, 24.3 ft-lb)
5. Install the rear wheels.
   Tightening torque:
   120 N·m (12.2 kgf-m, 88.5 ft-lb)

BRAKE > Rear Disc Rotor

INSPECTION

1. DISC ROTOR RUNOUT CHECK

1. Check the rear hub unit bearing 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:
   Floating 1-POT piston type (drum-in-disc type): 0.05 mm (0.002 in)
   Floating 1-POT piston type (electronic parking brake type): 0.05 mm (0.002 in)
   Opposed 2-POT piston type: 0.07 mm (0.0028 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:

Floating 1-POT piston type (drum-in-disc type): 0.05 mm (0.002 in)
Floating 1-POT piston type (electronic parking brake type): 0.05 mm (0.002 in)
Opposed 2-POT piston type: 0.07 mm (0.0028 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 inspection result shows that the disc rotor runout exceeds service limit, perform the following procedure.

- Floating 1-POT piston type & opposed 2-POT piston type except for WRX STI model: Grind the disc rotor. Check the disc rotor thickness after grinding. Ref. to BRAKE>Rear Disc Rotor>INSPECTION > DISC ROTOR THICKNESS CHECK.

- Opposed 2-POT piston type for WRX STI model: Replace the disc rotor. Ref. to BRAKE>Rear Disc Rotor>REMOVAL > OPPOSED 2-POT PISTON TYPE, FOR WRX STI MODEL.

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)	15-inch	10 mm (0.39 in)	8.5 mm (0.335 in)	286 mm (11.26 in)
	17-inch (floating 1-POT piston type)	17 mm (0.67 in)	15 mm (0.59 in)	300 mm (11.81 in)
	17-inch (opposed 2-POT piston type)	20 mm (0.79 in)	18 mm (0.71 in)	316 mm (12.44 in)
	18-inch	20 mm (0.79 in)	18 mm (0.71 in)	326 mm (12.83 in)

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

3. CHECK DISC ROTOR FOR CRACK AND DAMAGE (OPPOSED 2-POT PISTON TYPE FOR WRX STI MODEL)

1. Check the sliding surface of the disc rotor for cracks (a), damage and wear. If defective, replace the disc rotor.

Caution:
If there is a 5 mm (0.2 in) crack around the holes of disc rotor, always replace the disc rotor with a new one.

REMOVAL

1. FLOATING 1-POT PISTON TYPE (DRUM-IN-DISC TYPE)

1. Lift up the vehicle, and then remove the rear wheels.
2. Remove the union bolt and the caliper bolt, and remove the caliper body assembly.
   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.**
   - **Prepare a container to catch grease or oil, etc. If any grease or oil spills, wipe it off and clean immediately to prevent from penetrating into floor or flowing outside.**

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

2. FLOATING 1-POT PISTON TYPE (ELECTRONIC PARKING BRAKE TYPE)

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.**
- **Prepare a container to catch grease or oil, etc. If any grease or oil spills, wipe it off and clean immediately to prevent from penetrating into floor or flowing outside.**
- **Do not remove the parking brake actuator assembly except when there are system malfunctions (such as emergency release of parking brake or abnormal actuator) or when the caliper is replaced. When the parking brake actuator assembly is reused, always replace the O-ring with a new part contained in the caliper body assembly.**

1. Release the parking brake.
2. Using the Subaru Select Monitor, go to the brake maintenance mode according to the display screen.
   Ref. to PARKING BRAKE>Parking Brake System>OPERATION > BRAKE MAINTENANCE MODE.
   Note:
   For detailed operation procedures, refer to "Application help".
3. Lift up the vehicle, and then remove the rear wheels.
4. Disconnect the ground terminal from battery sensor. Ref. to NOTE>NOTE > BATTERY.
5. Remove the parking brake actuator. Ref. to PARKING BRAKE>Parking Brake Actuator>REMOVAL > PARKING BRAKE ACTUATOR.
6. Remove the caliper body assembly.
   Caution:
   - **Do not detach the brake hose except when replacing the caliper body assembly.**
   - **Install the plug bolt to the caliper body assembly when the brake hose is disconnected. If air enters or fluid leaks by tilting, replace the caliper body assembly.**

   (1) Remove the union bolt, and then disconnect the brake hose.
   (2) Install the fluid leakage protection plug to the caliper body.
   Preparation items:
   Part No.: PLUG BOLT (26642AL000)

Part No.: PLUG GASKET (26642AL010)

Tightening torque:

20 N·m (2 kgf-m, 14.8 ft-lb)

(3) Remove the pad clip.

(4) Remove the cap and the guide pin - rear brake, and remove the disc brake assembly.

Preparation tool:

Hexagon wrench: 7 mm (0.28 in)

7. Remove the support - rear disc brake.

(1) Remove the pad - disc brake rear.

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

3. OPPOSED 2-POT PISTON TYPE, EXCEPT FOR WRX STI MODEL

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 pad - disc brake rear. Ref. to BRAKE>Rear Brake Pad>REMOVAL > OPPOSED 2-POT PISTON TYPE, EXCEPT FOR WRX STI MODEL.
3. Remove the union bolt and the mounting bolt, and remove the disc brake assembly.
   Caution:
   - **Since the 17-inch (Brembo) caliper body is easily scratched and the paint may be stripped, protect it from being contacted with other parts or tools.**
   - **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.**
   - **Prepare a container to catch grease or oil, etc. If any grease or oil spills, wipe it off and clean immediately to prevent from penetrating into floor or flowing outside.**

4. OPPOSED 2-POT PISTON TYPE, FOR WRX STI MODEL

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 pad - disc brake rear. Ref. to BRAKE>Rear Brake Pad>REMOVAL > OPPOSED 2-POT PISTON TYPE, FOR WRX STI MODEL.
3. Remove the union bolt and the mounting bolt, and remove the disc brake assembly.

Caution:

- **Since the 18-inch (Brembo) caliper body is easily scratched and the paint may be stripped, protect it from being contacted with other parts or tools.**
- **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.**
- **Prepare a container to catch grease or oil, etc. If any grease or oil spills, wipe it off and clean immediately to prevent from penetrating into floor or flowing outside.**

INSTALLATION

1. FLOATING 1-POT PISTON TYPE (DRUM-IN-DISC TYPE)

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

1. Check each part. Ref. to BRAKE>Rear Disc Brake Assembly>INSPECTION.
2. Apply a thin coat of grease to the support - rear disc brake.
   Preparation items:
   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: Refer to "COMPONENT" of "General Description" for the tightening torque. Ref. to BRAKE>General Description>COMPONENT > REAR DISC BRAKE (DRUM IN DISC TYPE).
4. Apply a thin coat of grease to the pad clip, both sides of the shim - disc brake rear inner and the shim mounting surface of the pad - disc brake rear.
   Preparation items:
   Grease (pad clip (A)): An item contained in the pad kit, Molykote M7439 or equivalent
   Grease (shim and pad (B)): An item contained in the pad kit or Dow Corning Molykote AS880N

(A) Pad clip - rear brake
(B) Pad - disc brake rear and the shim - disc brake rear
(a) Pad - disc brake rear outer
(b) Pad - disc brake rear inner
(c) Shim - disc brake rear inner
(d) Shim - disc brake rear inner
(e) Shim - disc brake rear outer

5. Install the pad clip.
6. Press back the piston using disc brake piston tool as needed.
   Caution:
   When the pushing-back procedure of the piston is performed, the clearance between the pad and the disc rotor increases, 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 pad - disc brake rear.
   Note:
   Install the pad wear indicator in proper direction.
8. Install the caliper body assembly.
   Tightening torque:
   27 N·m (2.8 kgf-m, 19.9 ft-lb)
9. Install the brake hose bracket.
   Tightening torque:
   33 N·m (3.4 kgf-m, 24.3 ft-lb)
10. Connect the brake hose. Ref. to BRAKE>Brake Hose>INSTALLATION > REAR BRAKE HOSE.
11. Bleed air from the brake system. Ref. to BRAKE>Air Bleeding>PROCEDURE > BRAKE LINE.
12. Install the rear wheels.
    Tightening torque:
    120 N·m (12.2 kgf-m, 88.5 ft-lb)

2. FLOATING 1-POT PISTON TYPE (ELECTRONIC PARKING BRAKE TYPE)

Note:
Before installation, remove mud and foreign matter from the disc brake assembly.

1. Check each part. Ref. to BRAKE>Rear Disc Brake Assembly>INSPECTION.
2. Install the support - rear disc brake to the housing assembly - rear axle.
   Tightening torque:
   Refer to "COMPONENT" of "General Description" for the tightening torque. Ref. to BRAKE>General Description>COMPONENT > REAR DISC BRAKE (ELECTRONIC PARKING BRAKE TYPE).
3. Install the caliper body assembly.
   Tightening torque:
   25 N·m (2.5 kgf-m, 18.4 ft-lb)
4. Connect the brake hose using a new brake hose gasket.
   Tightening torque:
   26 N·m (2.7 kgf-m, 19.2 ft-lb)
5. Install the parking brake actuator. Ref. to PARKING BRAKE>Parking Brake Actuator>INSTALLATION > PARKING BRAKE ACTUATOR.
6. Bleed air from the brake system. Ref. to BRAKE>Air Bleeding>PROCEDURE > BRAKE LINE.
7. Connect the ground terminal to battery sensor. Ref. to NOTE>NOTE > BATTERY.
8. Using the Subaru Select Monitor, exit the brake maintenance mode according to the display screen. Ref. to PARKING BRAKE>Parking Brake System>OPERATION > BRAKE MAINTENANCE MODE.
   Note:
   For detailed operation procedures, refer to "Application help".
9. After the operation is completed, apply and release the parking brake five times and ensure that the brake operates normally.
10. Install the rear wheels.
    Tightening torque:
    120 N·m (12.2 kgf-m, 88.5 ft-lb)

3. OPPOSED 2-POT PISTON TYPE, EXCEPT FOR WRX STI MODEL

Note:
Before installation, remove mud and foreign matter from the disc brake assembly.

1. Check each part. Ref. to BRAKE>Rear Disc Brake Assembly>INSPECTION.
2. Install the disc brake assembly.
   Caution:
   Be sure to temporarily tighten the bolts (both locations) until the bolts seat (until the bolt washers contact the housing). Use new bolts if faulty such as peeling is found at the dacrotizing treatment (especially the threads) of the mounting bolts.
   Tightening torque:
   73 N·m (7.4 kgf-m, 53.8 ft-lb)
3. Apply a thin coat of grease to the side of the pad - disc brake rear, both sides of the shim - disc brake rear inner and the shim mounting surface of the pad - disc brake rear.
   Preparation items:
   Grease (pad clip (A)): An item contained in the pad kit, Molykote M7439 or equivalent
   Grease (shim and pad (B)): An item contained in the pad kit or Dow Corning Molykote AS880N
4. Install the pad - disc brake rear.
   Note:
   Install so that the arrow (a) faces upward.
5. Install the cross spring.
6. Install the pin - disc brake.

7. Install the clip - slide pin.
8. Install the brake hose bracket.
   Tightening torque:
   33 N·m (3.4 kgf-m, 24.3 ft-lb)
9. Connect the brake hose. Ref. to BRAKE>Brake Hose>INSTALLATION > REAR BRAKE HOSE.
10. Bleed air from the brake system. Ref. to BRAKE>Air Bleeding>PROCEDURE > BRAKE LINE.
11. Install the rear wheels.
    Tightening torque:
    120 N·m (12.2 kgf-m, 88.5 ft-lb)

4. OPPOSED 2-POT PISTON TYPE, FOR WRX STI MODEL

Note:
Before installation, remove mud and foreign matter from the disc brake assembly.

1. Check each part. Ref. to BRAKE>Rear Disc Brake Assembly>INSPECTION.
2. Install the disc brake assembly.
   Tightening torque:
   73 N·m (7.4 kgf-m, 53.8 ft-lb)
3. Apply a thin coat of grease to the pad - disc brake rear.
   Preparation items:
   Grease (pad side (A)): An item contained in the pad kit, Molykote M7439 or equivalent
   Grease (pad side (B)): An item contained in the pad kit or equivalent

4. Install the pad - disc brake rear.
   Note:
   Install the parts with the pad wear indicator facing downward.

(a) Pad - disc brake rear outer

(b) Pad - disc brake rear inner

(c) Pad wear indicator

5. Install the cross spring.
6. Install the pin - disc brake.
7. Install the brake hose bracket.

Tightening torque:

33 N·m (3.4 kgf-m, 24.3 ft-lb)

8. Connect the brake hose. Ref. to BRAKE>Brake Hose>INSTALLATION > REAR BRAKE HOSE.
9. Bleed air from the brake system. Ref. to BRAKE>Air Bleeding>PROCEDURE > BRAKE LINE.
10. Install the rear wheels.

Tightening torque:

120 N·m (12.2 kgf-m, 88.5 ft-lb)

BRAKE > Rear Disc Brake Assembly

DISASSEMBLY

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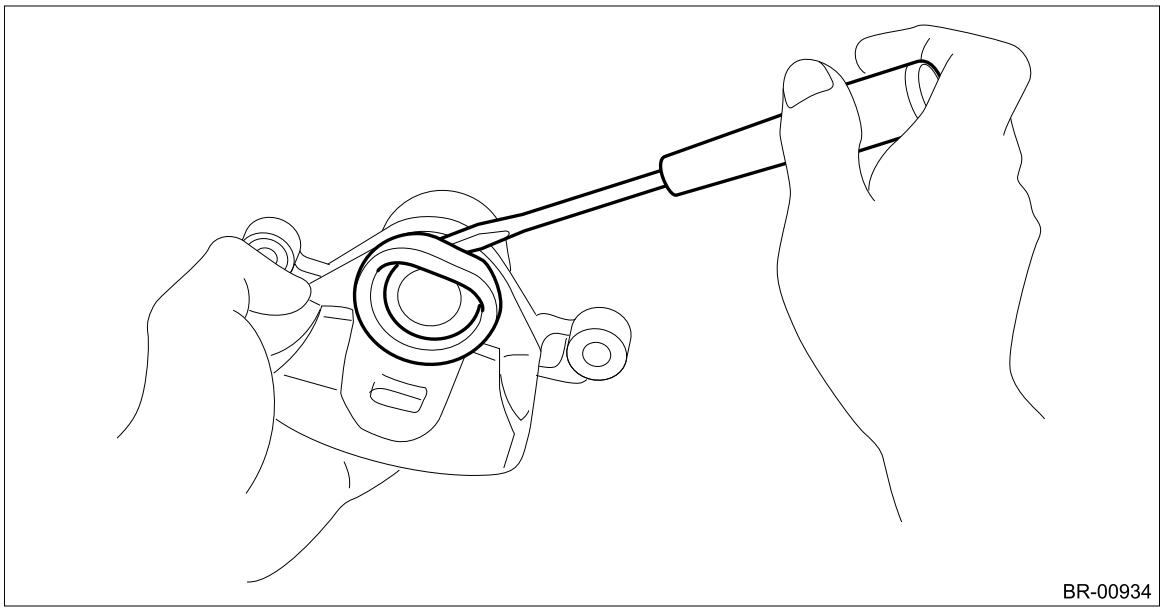
1. FLOATING 1-POT PISTON TYPE (DRUM-IN-DISC TYPE)

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.



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.

Caution:

Do not damage the piston sliding part and the piston seal groove.

5. Remove each part from support - rear disc brake.

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

2. FLOATING 1-POT PISTON TYPE (ELECTRONIC PARKING BRAKE TYPE)

Caution:

- **The piston cannot be removed from the caliper body assembly.**
- **Do not remove the parking brake actuator assembly except when there are system malfunctions (such as emergency release of parking brake or abnormal actuator) or when the caliper is replaced. When the parking brake actuator assembly is reused, always replace the O-ring with a new part contained in the caliper body assembly.**

1. Remove mud and foreign matter from the caliper body assembly.

2. Remove the piston boot.

3. Remove the bushing from the support - rear disc brake.

3. OPPOSED 2-POT PISTON TYPE, EXCEPT FOR WRX STI MODEL

Caution:

- **Be careful not to allow foreign matter to enter the brake hose connector.**
- **Since the 17-inch (Brembo) caliper body is easily scratched and the paint may be stripped, protect it from being contacted with other parts or tools.**

1. Remove mud and foreign matter from the caliper body assembly.
2. Remove the piston boot.
   Note:
   Remove two piston boots.

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.

Note:

Instead of removing the pistons one by one, remove all pistons at once after adjusting the amount of protrusion evenly using a wooden block.

4. Remove the piston seal.

Caution:

Do not damage the piston sliding part and the piston seal groove.

Note:

Remove two piston seals.

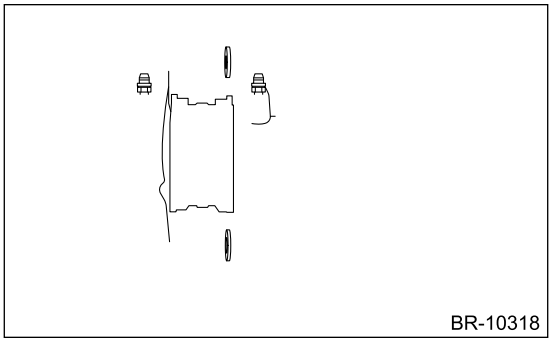
4. OPPOSED 2-POT PISTON TYPE, FOR WRX STI MODEL

Caution:

- **Be careful not to allow foreign matter to enter the brake hose connector.**
- **Since the 18-inch (Brembo) caliper body is easily scratched and the paint may be stripped, protect it from being contacted with other parts or tools.**

1. Remove mud and foreign matter from the caliper body assembly.
2. Remove the piston boot.
   Note:
   Remove two piston boots.

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.
   Note:
   Instead of removing the pistons one by one, remove all pistons at once after adjusting the amount of protrusion evenly using a wooden block.



4. Remove the piston seal.
   Caution:
   Do not damage the piston sliding part and the piston seal groove.
   Note:
   Remove two piston seals.

BRAKE > Rear Disc Brake Assembly

ASSEMBLY

1. FLOATING 1-POT PISTON TYPE (DRUM-IN-DISC TYPE)

1. Check each part. Ref. to BRAKE>Rear Disc Brake Assembly>INSPECTION.
2. Clean the inside of the caliper body using brake fluid.
   Preparation items:
   Brake fluid: FMVSS No. 116, DOT3 or DOT4
3. Install the piston seal and the piston - disc brake.
   (1) Apply a coat of brake fluid to piston seal and install the piston seal to the groove inside caliper body.
   (2) Apply a coat of brake fluid to the piston sliding part of caliper body and the entire outer surface of the piston - disc brake.
   Preparation items:
   Brake fluid: FMVSS No. 116, DOT3 or DOT4
   (3) Apply a coat of grease to the piston boot and fit to the groove on the ends of piston - disc brake.
   Preparation items:
   Grease: An item contained in the pad kit or Nippon Grease NIGLUBE RX-2
   (4) Install the piston - disc brake to the caliper body.
   Caution:
   Do not force the piston - disc brake into the sliding part of caliper body.

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

4. Apply grease contained in the piston seal kit to the lock pin - rear brake, the outer surface of guide pin - rear brake, the pin sliding part of the support - front disc brake, and the grooves of pin boot.
5. Install the pin boot to the lock pin - rear brake and guide pin - rear brake, and insert them into the support - rear disc brake.

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

2. FLOATING 1-POT PISTON TYPE (ELECTRONIC PARKING BRAKE TYPE)

Note:
If the brake hose is disconnected, air enters inside. Therefore, this operation should be performed on the vehicle without the brake hose disconnected.

1. Check each part. Ref. to BRAKE>Rear Disc Brake Assembly>INSPECTION.
2. Install the bushing.
3. Apply a coat of grease to the inside of the new piston boot.
   Preparation items:
   Grease: Nippon Grease NIGLUBE RX-2 or equivalent
4. Using the ST, install the piston boot.
   Preparation tool:
   ST: PISTON BOOT INSTALLER (99099AL000)

3. OPPOSED 2-POT PISTON TYPE, EXCEPT FOR WRX STI MODEL

1. Check each part. Ref. to BRAKE>Rear Disc Brake Assembly>INSPECTION.
2. Clean the inside of the caliper body using brake fluid.
   Preparation items:
   Brake fluid: FMVSS No. 116, DOT3 or DOT4
3. Install the piston seal and the piston - disc brake.
   (1) Apply a coat of brake fluid to piston seal and install the piston seal to the groove inside caliper body.
   (2) Apply a coat of brake fluid to the piston sliding part of caliper body and the entire outer surface of the piston - disc brake.
   Preparation items:
   Brake fluid: FMVSS No. 116, DOT3 or DOT4
   (3) Apply a coat of grease to the piston boot and fit to the groove on the ends of piston - disc brake.
   Preparation items:
   Grease: An item contained in the pad kit or Nippon Grease NIGLUBE RX-2
   (4) Install the piston - disc brake to the caliper body.

Caution:
Do not force the piston - disc brake into the sliding part of caliper body.

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

4. OPPOSED 2-POT PISTON TYPE, FOR WRX STI MODEL

1. Check each part. Ref. to BRAKE>Rear Disc Brake Assembly>INSPECTION.
2. Clean the inside of the caliper body using brake fluid.
   Preparation items:
   Brake fluid: FMVSS No. 116, DOT3 or DOT4
3. Install the piston seal and the piston - disc brake.
   (1) Apply a coat of brake fluid to piston seal and install the piston seal to the groove inside caliper body.
   (2) Apply a coat of brake fluid to the piston sliding part of caliper body and the entire outer surface of the piston - disc brake.
   Preparation items:
   Brake fluid: FMVSS No. 116, DOT3 or DOT4
   (3) Apply a coat of grease to the piston boot and fit to the groove on the ends of piston - disc brake.
   Preparation items:
   Grease: An item contained in the pad kit or Nippon Grease NIGLUBE RX-2
   (4) Install the piston - disc brake to the caliper body.
   Caution:
   Do not force the piston - disc brake into the sliding part of caliper body.

(a) Piston - disc brake

(b) Piston boot

(c) Piston seal

BRAKE > Rear Disc Brake Assembly

INSPECTION

1. Check the piston sliding part of caliper body and the 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.

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.**
- **Prepare a container to catch grease or oil, etc. If any grease or oil spills, wipe it off and clean immediately to prevent from penetrating into floor or flowing outside.**
- **After the master cylinder assembly is removed, check the seal attaching surface of the seal sub assembly and vacuum booster assembly.**
- **When the seal attaching surface of the vacuum booster assembly has flaking paint, scratches, rust, etc., it may cause vacuum pressure leakage. Therefore, replace the vacuum booster assembly with a new one.**

1. Disconnect the ground terminal from battery. Ref. to NOTE>NOTE > BATTERY.
   Note:
   For model with battery sensor, disconnect the ground terminal from battery sensor.
2. Remove the collector cover. Ref. to INTAKE (INDUCTION)(w/o STI)>Collector Cover>REMOVAL.
3. Drain brake fluid from the reservoir tank completely.
4. Remove the master cylinder assembly.
   (1) Disconnect the fluid level gauge connector (a).
   (2) Disconnect the clutch hose (b). (MT model)
   (3) Disconnect the brake pipe (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 surely relieve vacuum pressure in the vacuum booster 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 circumference of the vacuum booster assembly inner diameter.

Preparation items:

Grease: Fluorine grease or equivalent

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

Preparation items:

Grease: Fluorine grease or equivalent

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

Preparation items:

Grease: Silicone grease or equivalent

(5) Apply grease to the entire circumference of the master cylinder assembly piston rod portion.

Preparation items:

Grease: Silicone grease or equivalent

Caution:

- **Be sure to apply fluorine grease to the entire circumference. If there is an application-missed area, it may cause rust.**
- **Be careful not to mistake each grease application area.**

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

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

(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:
19 N·m (1.9 kgf-m, 14 ft-lb)

3. Bleed air from the brake system and clutch system (MT model). Ref. to BRAKE>Air Bleeding>PROCEDURE.
4. Install the collector cover. Ref. to INTAKE (INDUCTION)(w/o STI)>Collector Cover>INSTALLATION.
5. Connect the battery ground terminal. Ref. to NOTE>NOTE > BATTERY.

BRAKE > Master Cylinder

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.

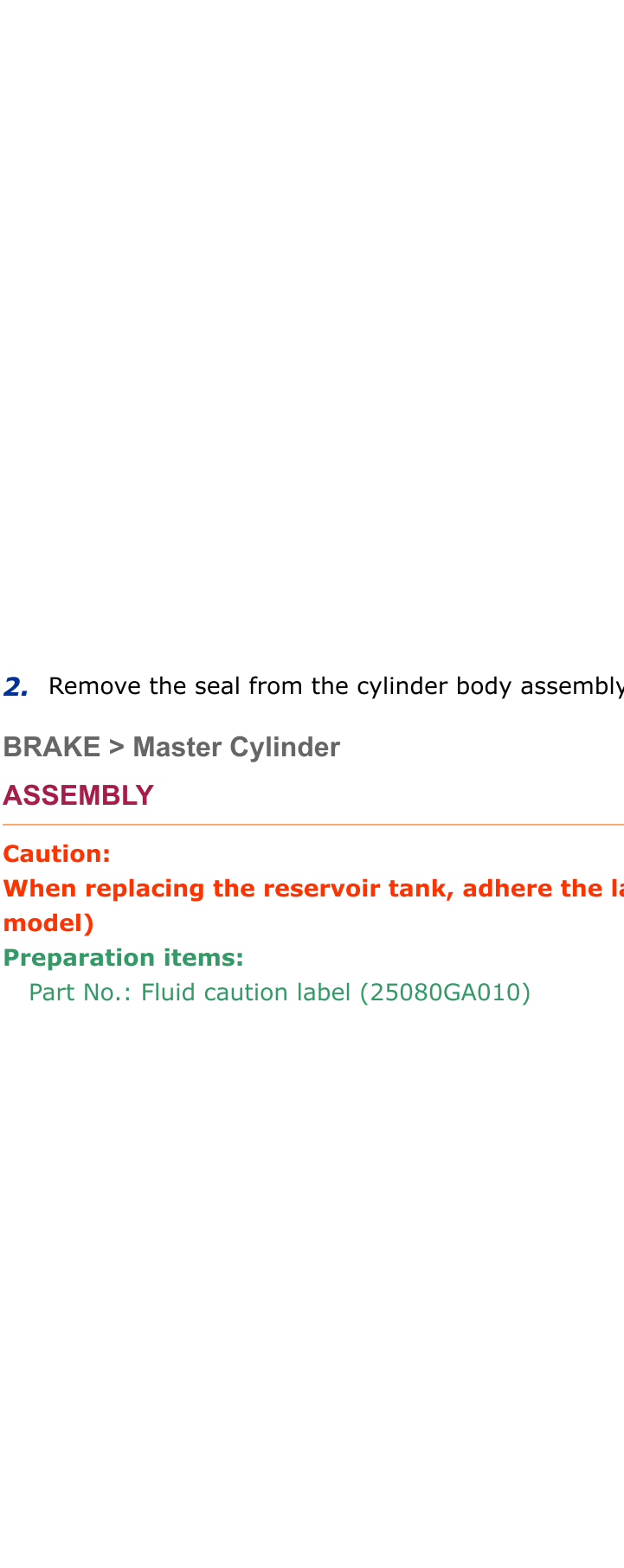
BRAKE > Master Cylinder

ASSEMBLY

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

Preparation items:

Part No.: Fluid caution label (25080GA010)



(a) 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.

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.**
- **Before performing service on the airbag module, always refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM" section. Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **When the master cylinder assembly is removed, check the seal attaching surface of the seal sub assembly and vacuum booster assembly.**
- **When the seal attaching surface of the vacuum booster assembly has flaking paint, scratches, rust, etc., it may cause vacuum pressure leakage. Therefore, replace the vacuum booster assembly with a new one.**

1. Disconnect the ground terminal 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 collector cover. Ref. to INTAKE (INDUCTION)(w/o STI)>Collector Cover>REMOVAL.
3. Remove the intercooler.
   - Except for STI model Ref. to INTAKE (INDUCTION)(w/o STI)>Intercooler>REMOVAL.
   - STI model Ref. to INTAKE (INDUCTION)(STI)>Intercooler>REMOVAL.
4. Disconnect the air conditioner pipe. Ref. to HVAC SYSTEM (HEATER, VENTILATOR AND A/C)>Hose and Pipe>REMOVAL.
5. Remove the vacuum hose.
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. Ref. to AIRBAG SYSTEM>Airbag Connector>PROCEDURE > KNEE AIRBAG MODULE.
10. Remove the universal joint assembly - steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint>REMOVAL.

    Caution:

    To prevent damage to the universal joint assembly - steering and improper steering effort, make sure to remove the universal joint assembly - steering.
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. Disconnect the vacuum sensor connector. (Except for STI model)

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.**

14. 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.

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 new parts, and apply thin coat of NIGTIGHT LTS No. 2 grease to the clevis pin.**
- **When installing the master cylinder assembly, replace the seal sub assembly with a new part, apply grease, and install it to the vacuum booster assembly.**

Preparation items:

Grease: An item contained in the seal kit or equivalent

(a) Primary piston

(b) Seal sub ASSY

(c) Install the seal sub ASSY to this surface.

(1) Apply grease to the entire circumference of the vacuum booster assembly inner diameter.

Preparation items:

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

(2) Apply grease to the entire circumference of the seal sub assembly outer diameter.

Preparation items:

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

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

Preparation items:

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

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

Preparation items:

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

Caution:

- **Be sure to apply fluorine grease to the entire circumference. If there is an application-missed area, it may cause rust.**
- **Be careful not to mistake each grease application area.**

(a) Master cylinder ASSY

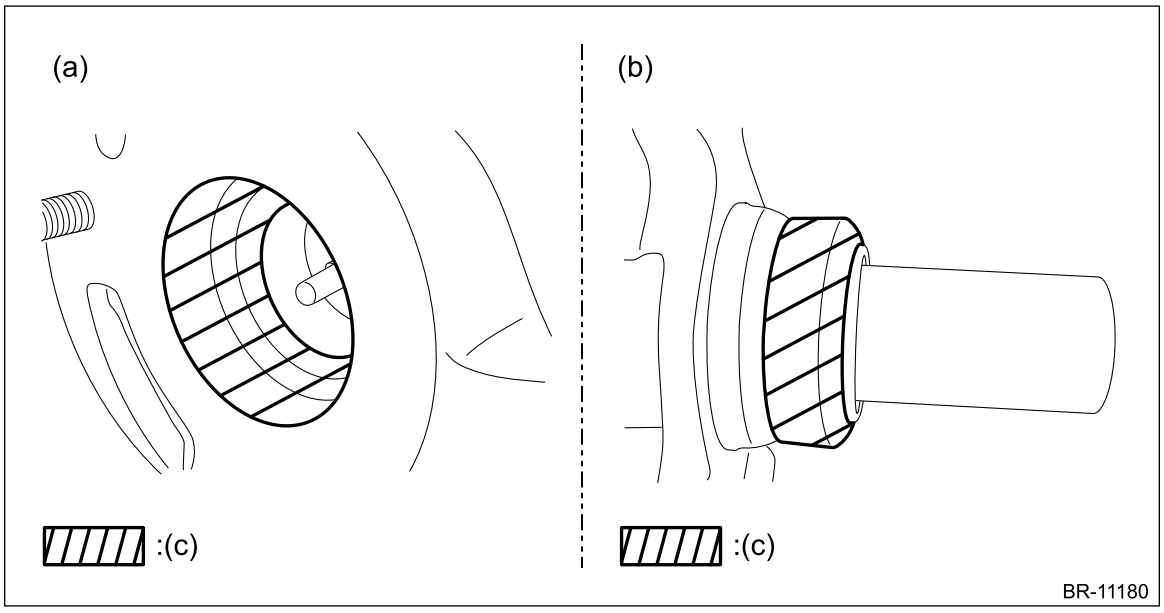
(b) Piston rod portion

(c) Seal sub ASSY

(d) Vacuum booster ASSY

(e) Fluorine grease application area

(f) Silicone grease application area



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

(5) Install the vacuum booster.

Tightening torque:

18 N·m (1.8 kgf-m, 13.3 ft-lb)

3. Install the column assembly - steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Column>INSTALLATION.
4. Install the universal joint assembly - steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint>INSTALLATION.

Caution:

- **Always install the universal joint assembly - steering after installing the steering column to avoid damage to the universal joint assembly - steering.**
- **Be sure to follow the tightening order and tightening torque of the universal joint assembly - steering to avoid the steering effort from becoming heavy. After confirming that the steering column position is in the neutral position, tighten the universal joint assembly - steering.**
- **Always place the tilt lever to the lock position after the steering column is adjusted.**

5. Install the knee airbag module.

Tightening torque:

7.5 N·m (0.8 kgf-m, 5.5 ft-lb)

6. Install the cover assembly - instrument panel LWR driver.
7. Install the master cylinder assembly. Ref. to BRAKE>Master Cylinder>INSTALLATION.
8. Install the vacuum hose.
9. Install the air conditioner pipe. Ref. to HVAC SYSTEM (HEATER, VENTILATOR AND A/C)>General Description>COMPONENT > AIR CONDITIONING UNIT.
10. Install the intercooler.
    - Except for STI model: Ref. to INTAKE (INDUCTION)(w/o STI)>Intercooler>INSTALLATION.
    - STI model: Ref. to INTAKE (INDUCTION)(STI)>Intercooler>INSTALLATION.

11. Charge refrigerant. Ref. to HVAC SYSTEM (HEATER, VENTILATOR AND A/C)>Refrigerant Charging Procedure>PROCEDURE.
12. Bleed air from the brake system. Ref. to BRAKE>Air Bleeding>PROCEDURE.
13. Install the collector cover. Ref. to INTAKE (INDUCTION)(w/o STI)>Collector Cover>INSTALLATION.
14. Connect the battery ground terminal. Ref. to NOTE>NOTE > BATTERY.
15. Perform a road test to make sure the brakes do not drag.

BRAKE > Brake Booster

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.

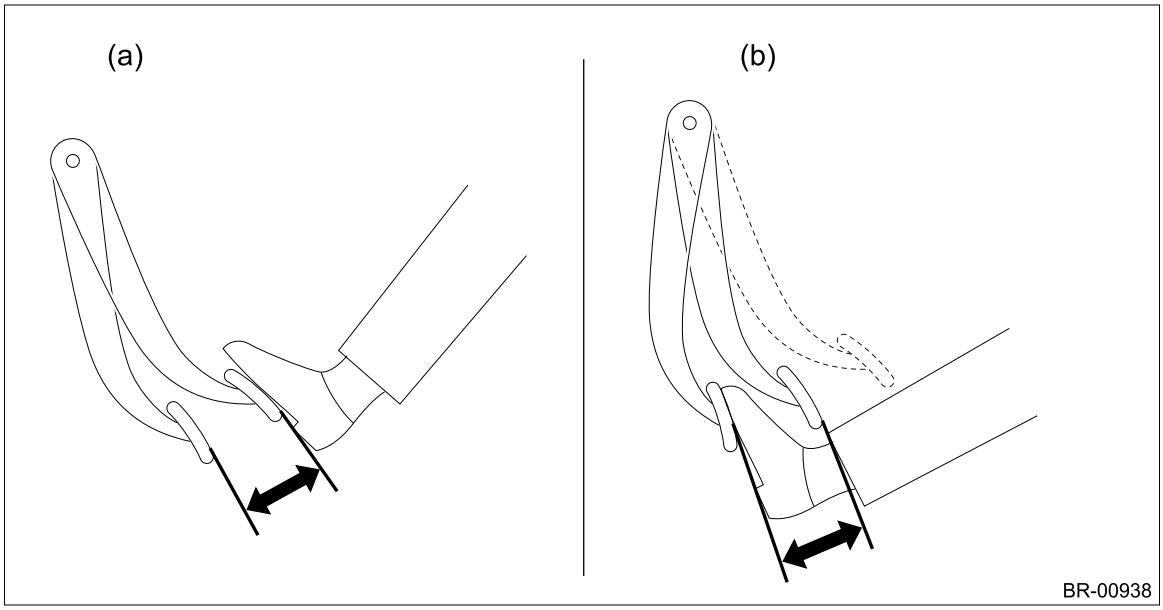
(A) Normal
(B) Not OK
(a) 1st
(b) 2nd
(c) 3rd

Note:

- **In case of defective operation, inspect the condition of the seal attaching surface of the check valve, vacuum hose, seal sub assembly and vacuum booster assembly.**
- **When the parts are damaged or the seal attaching surface of the vacuum booster assembly has flaking paint, scratches, rust, etc., it may cause vacuum 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)	451 (4.6, 65)	1,344 (13.7, 195)

- **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)	4,766 (48.6, 691)	9,885 (100.8, 1,434)

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. Ref. to BRAKE>Air Bleeding>PROCEDURE.

   Preparation items:

   Recommended brake fluid: FMVSS No. 116, DOT3 or DOT4

   Note:

   Repeat the full stroke depressing operation of the brake pedal slowly, until new brake fluid comes out from a transparent vinyl tube. (On each brake caliper, 20 times or more of pedal operations is necessary in order for new brake fluid from the master cylinder to come out from the bleeder - screw.)

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.**
- **After air bleeding operation, wipe off fluid around each bleeder - screw and the reservoir tank.**
- **Only when replacing the Brembo type brake caliper with a new part, perform the operations (1) to (6) written under the step 2-6), for air bleeding of the brake line. Ref. to BRAKE>Air Bleeding>PROCEDURE > BRAKE LINE.**

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.**
    - **For brembo type, in the order from inside → outside, bleed air starting from the front RH → front LH → rear LH → rear RH.**
18. Tighten the bleeder - screw to the specified torque.
    Tightening torque:
    Front (floating 2-POT piston type): 8 N·m (0.8 kgf-m, 5.9 ft-lb)
    Front (opposed 4-POT piston type): 20 N·m (2.0 kgf-m, 14.8 ft-lb)
    Front (opposed 6-POT piston type): 18.5 N·m (1.9 kgf-m, 13.6 ft-lb)
    Rear (floating 1-POT piston type): 8 N·m (0.8 kgf-m, 5.9 ft-lb)
    Rear (except for WRX STI model, opposed 2-POT piston type): 18.5 N·m (1.9 kgf-m, 13.6 ft-lb)
    Rear (WRX STI model, opposed 2-POT piston type): 18.5 N·m (1.9 kgf-m, 13.6 ft-lb)
    Rear (electronic parking brake type): 17 N·m (1.7 kgf-m, 12.5 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.**
   - **For brembo type, in the order from inside → outside, bleed air starting from the front RH → front LH → rear LH → rear RH.**
6. Only when replacing the Brembo type brake caliper with a new part, perform the following operations.
   (1) Remove the cross spring and pad clip bolt (front only).
   (2) Depress and hold the brake pedal with a little force (approx. 5 mm (0.2 in) of pedal stroke).
   (3) Loosen the bleeder - screw, and insert the disc brake piston tool between the pad - disc brake outer and the pad - disc brake inner to expand the pad - disc brake outer and the pad - disc brake inner.
   (4) Slowly depress the brake pedal with a full stroke, and once the brake pedal reaches the full stroke position, tighten the bleeder - screw in a quick manner and return the brake pedal.
   (5) Repeat depressing the brake pedal two or three times.
   (6) Repeat steps (2) through (5) until there are no more air bubbles in the transparent vinyl tube.
7. Tighten the loosened bleeder - screw, repeat firmly depressing of the brake pedal 5 to 6 times, and then depress and hold the brake pedal.
8. 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.
9. Repeat steps 7) and 8) until there are no more air bubbles in the transparent vinyl tube.

10. Perform the steps 7) to 9) above on each brake caliper.
    Note:
    - **Perform in the order starting from the front RH → front LH → rear LH → rear RH.**
    - **For brembo type, in the order from inside → outside, bleed air starting from the front RH → front LH → rear LH → rear RH.**
11. 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 12) to 17).**
    - **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.**
12. 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.
13. 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.**
    - **For brembo type, in the order from inside → outside, bleed air 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.**
14. Perform the VDC sequence control mode. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Sequence Control.
15. Perform the air bleeding operation of steps 3) and 4) for the bleeder - screw on each caliper.
16. Repeat from steps 12) to 15) for three cycles.
17. In case air still remains at step 16), repeat steps 12) to 15) again until all air is removed.
18. Fill the reservoir tank with brake fluid up to the “MAX” level.
19. Tighten the bleeder - screw to the specified torque.
    Tightening torque:
    Front (floating 2-POT piston type): 8 N·m (0.8 kgf-m, 5.9 ft-lb)
    Front (opposed 4-POT piston type): 20 N·m (2.0 kgf-m, 14.8 ft-lb)
    Front (opposed 6-POT piston type): 18.5 N·m (1.9 kgf-m, 13.6 ft-lb)
    Rear (floating 1-POT piston type): 8 N·m (0.8 kgf-m, 5.9 ft-lb)
    Rear (except for WRX STI model, opposed 2-POT piston type): 18.5 N·m (1.9 kgf-m, 13.6 ft-lb)
    Rear (WRX STI model, opposed 2-POT piston type): 18.5 N·m (1.9 kgf-m, 13.6 ft-lb)
    Rear (electronic parking brake type): 17 N·m (1.7 kgf-m, 12.5 ft-lb)
20. Install the cap - bleeder to each bleeder - screw.
21. Check that there are no brake fluid leaks at the flare nut portion or in the entire brake system.
22. After inspection, wipe off fluid around each bleeder - screw and the reservoir tank.

23. Perform a road test and ensure that the brakes operate normally.

3. HYDRAULIC CONTROL UNIT

1. Perform steps 1) to 23) in procedure 2 for air bleeding of the brake line. Ref. to BRAKE>Air Bleeding>PROCEDURE > BRAKE LINE.

Caution:

- **If there is a possibility that air enters the pressure control section in the hydraulic control unit, perform steps 12) to 17) in procedure 2.**
- **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.)**
- **Always start the operations in ABS sequence control mode prior to VDC sequence control mode.**

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 11) to 17) for brake lining.)

4. CALIPER

1. Perform steps 1) to 23) in procedure 2 for air bleeding of the brake line. Ref. to BRAKE>Air Bleeding>PROCEDURE > BRAKE LINE.

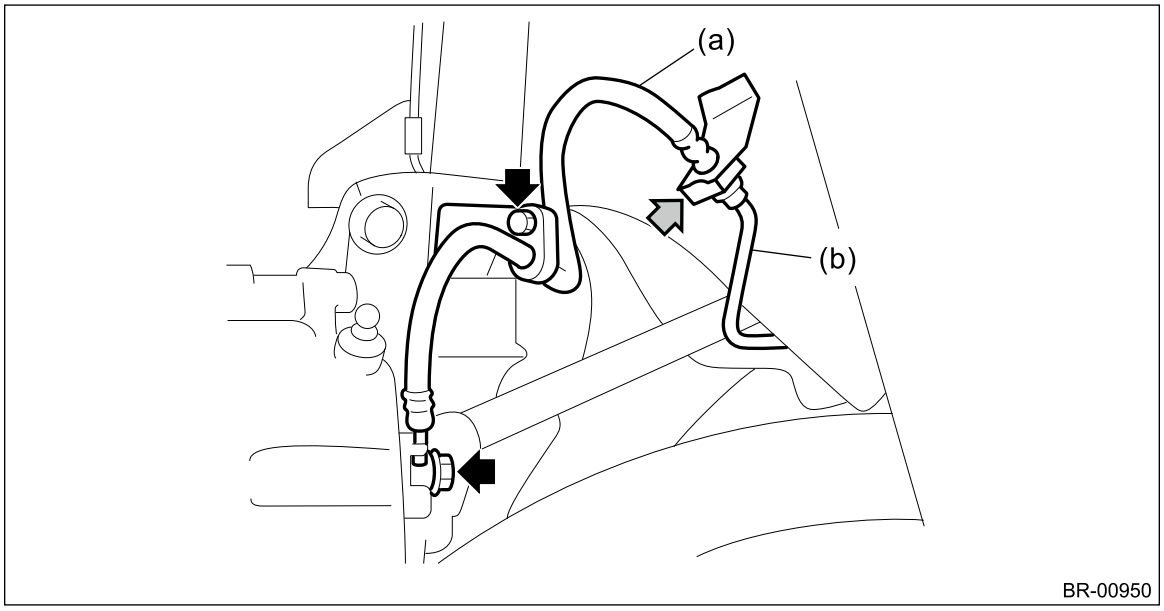
Caution:

- **For the caliper with electronic parking actuator, never drain the brake fluid in the caliper.**
- **When removing the caliper with electronic parking actuator from the vehicle, make sure to apply the brake fluid seal before disconnection.**
- **Do not remove the brake fluid seal of the caliper with replacement electronic parking actuator, except when the caliper is installed on the vehicle.**

REMOVAL

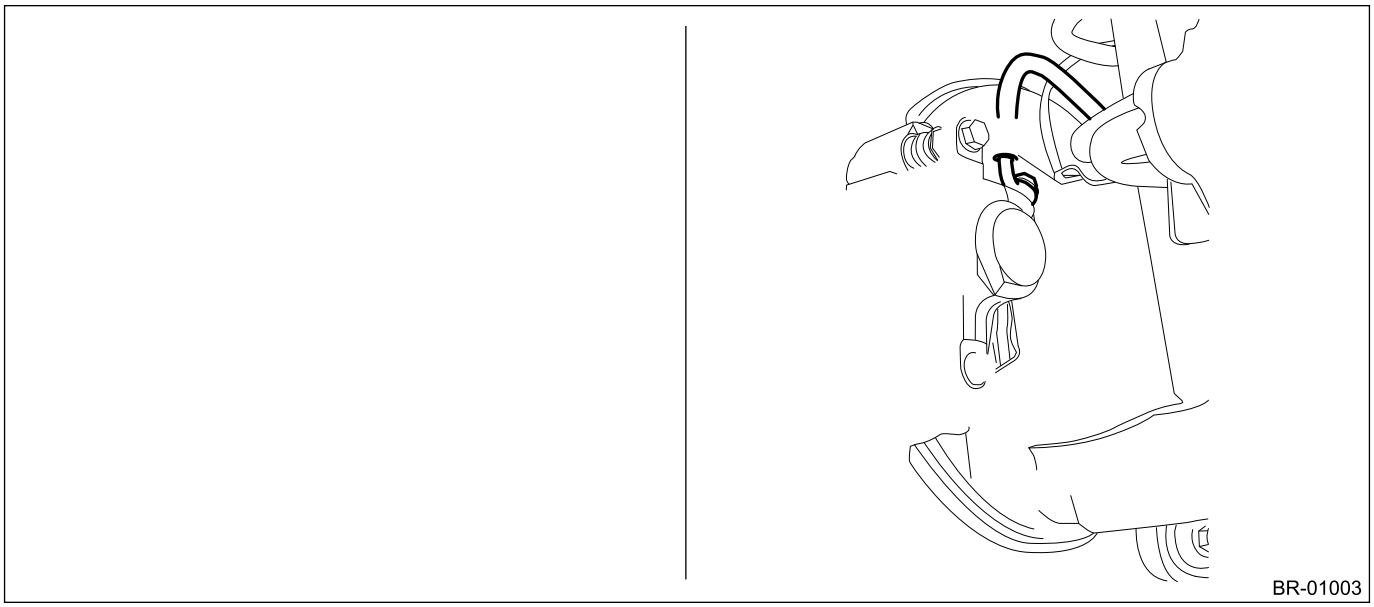
1. FRONT BRAKE HOSE

1. Disconnect the brake hose (a) and the brake pipe (b).
   Preparation tool:
   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. Disconnect the brake pipe (a).
   Preparation tool:

Flare nut wrench

3. Remove the brake hose clamp (b), and remove the rear brake hose (c).

BRAKE > Brake Hose

INSTALLATION

1. FRONT BRAKE HOSE

1. Secure the brake hose to the brake hose mount part of strut COMPL.
   Tightening torque:
   Brake hose: 33 N·m (3.4 kgf-m, 24.3 ft-lb)
2. Apply brake grease to the union bolt as (a) or (b) shown in the figure. (Brembo type only)

(a) Apply to the peripheral surface of the tip part

(b) Apply linearly from the tip part to the flange part

Caution:
DO NOT apply the grease as follows:

- **Apply to the entire perimeter except for the tip part**
- **Apply from the middle of the bolt thread part to the flange part**
- **Apply an insufficient amount to the tip part**

Preparation items:
Grease: Nippon Grease NIGLUBE RX-2 or equivalent

3. Connect the brake hose to the caliper body assembly using a new gasket. (Brembo type only)
   (1) Temporarily tighten the union bolt by hand to its seating position.
   (2) Tighten to the specified torque.
   Tightening torque:
   Union bolt: 26 N·m (2.7 kgf-m, 19.2 ft-lb)
4. After tightening, make sure that the grease is squeezed out from the entire perimeter of the flange part. (Brembo type only)
   Caution:
   If there is no protruding of the grease, go back to step 2) and perform the operation again.
   Note:
   Wipe off the protruding grease (a) with cloth, and clean with brake cleaner, etc.

5. Connect the brake hose to the caliper body assembly using a new gasket. (Brembo type only)
   Tightening torque:
   Union bolt: 26 N·m (2.7 kgf-m, 19.2 ft-lb)
6. Position the disc rotor 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.
7. Connect the brake pipe and the hose, then temporarily tighten the flare nut.
8. Secure the brake hose to wheel apron bracket with clamp.
9. Turn and tighten the flare nut (b) by hand while pushing the brake pipe (a) away from yourself.

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: 15 N·m (1.53 kgf-m, 11.1 ft-lb)

10. 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 (3.4 kgf-m, 24.3 ft-lb)
3. Apply brake grease to the union bolt as (a) or (b) shown in the figure. (Brembo type only)

(a) Apply to the peripheral surface of the tip part
(b) Apply linearly from the tip part to the flange part

Caution:
DO NOT apply the grease as follows:

- **Apply to the entire perimeter except for the tip part**
- **Apply from the middle of the bolt thread part to the flange part**
- **Apply an insufficient amount to the tip part**

Preparation items:
Grease: Nippon Grease NIGLUBE RX-2 or equivalent

4. Connect the brake hose to the caliper body assembly using a new gasket. (Brembo type only)
(1) Temporarily tighten the union bolt by hand to its seating position.
(2) Tighten to the specified torque.
Tightening torque:
Union bolt: 26 N·m (2.7 kgf-m, 19.2 ft-lb)

5. After tightening, make sure that the grease is squeezed out from the entire perimeter of the flange part. (Brembo type only)
Caution:
If there is no protruding of the grease, go back to step 3) and perform the operation again.
Note:
Wipe off the protruding grease (a) with cloth, and clean with brake cleaner, etc.

6. Install the brake hose to rear caliper body using a new gasket. (Brembo type only)
Tightening torque:
Union bolt: 26 N·m (2.7 kgf-m, 19.2 ft-lb)

7. Turn and tighten the flare nut (b) by hand while pushing the brake pipe (a) away from yourself.
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: 15 N·m (1.53 kgf-m, 11.1 ft-lb)

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

BRAKE > Brake Hose

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.

BRAKE > Brake Pipe

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.

BRAKE > Brake Pipe

INSTALLATION

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 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.

BRAKE > Brake Pipe

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.

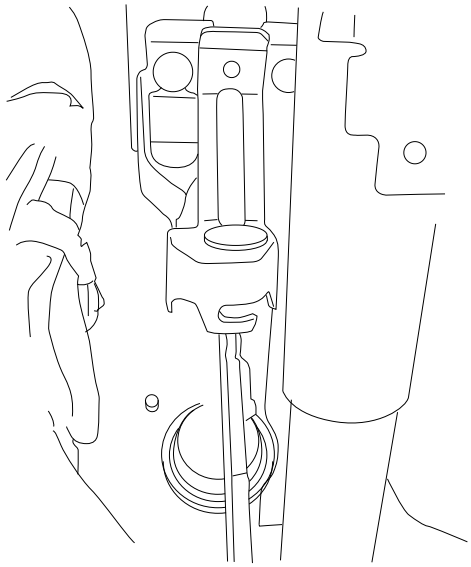
REMOVAL

1. CVT MODEL

Caution:
Before performing service on the airbag module, always refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM" section. Ref. to AIRBAG SYSTEM>General Description>CAUTION.

1. Disconnect the ground terminal from the battery sensor, and wait for at least 60 seconds before starting work. Ref. to NOTE>NOTE > BATTERY.
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 universal joint assembly - steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint>REMOVAL.
   Caution:
   To prevent damage to the universal joint assembly - steering and improper steering effort, make sure to remove the universal joint assembly - steering.
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.

BRAKE > Brake Pedal

INSTALLATION

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. Install the brake pedal assembly.
   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 LTS No. 2 grease to the clevis pin.**

   Tightening torque:
   Brake pedal: 18 N·m (1.8 kgf-m, 13.3 ft-lb)
2. Install the column assembly - steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Column>INSTALLATION.
3. Install the universal joint assembly - steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint>INSTALLATION.

Caution:

- **Always install the universal joint assembly - steering after installing the steering column to avoid damage to the universal joint assembly - steering.**
- **Be sure to follow the tightening order and tightening torque of the universal joint assembly - steering to avoid the steering effort from becoming heavy. After confirming that the steering column position is in the neutral position, tighten the universal joint assembly - steering.**
- **Always place the tilt lever to the lock position after the steering column is adjusted.**

4. Install the knee airbag module.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
5. Install the cover assembly - instrument panel LWR driver.
6. Connect the battery ground terminal. Ref. to NOTE>NOTE > BATTERY.
7. Check that the brake light operate properly.
8. Check the brake pedal after installation. Ref. to BRAKE>Brake Pedal>INSPECTION.

2. MT MODEL

Note:

Brake pedal is integrated with the clutch pedal.

For installation procedure of the brake pedal, refer to Clutch section. Ref. to CLUTCH SYSTEM>Clutch Pedal>INSTALLATION.

BRAKE > Brake Pedal

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 mm (0.197 in) or less

(a) Brake pedal (CVT 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) Stop light switch (c) Toe board (d) Brake booster operating rod
(b) Mat

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 (2.2 kgf-m, 16.2 ft-lb)

Note:

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

BRAKE > Stop Light Switch

REMOVAL

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

BRAKE > Stop Light Switch

INSTALLATION

1. Install the stop light switch.
   (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 the knee airbag module.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
4. Install the cover assembly - instrument panel LWR driver.
5. Connect the battery ground terminal. Ref. to NOTE>NOTE > BATTERY.

BRAKE > Stop Light Switch

INSPECTION

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

Terminal No.	Inspection conditions	Standard
	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.

BRAKE > Stop Light Switch

ADJUSTMENT

1. Measure the brake pedal stroke which turns on the stop light switch.

(1) Release the lock of the handle, tilt the steering column to the lowest end, and push in the column by the telescopic system.

(2) Attach the masking tape (a) to protect the handle, and pass the measure (b) through the handle and secure to the center position in vertical direction of the brake pedal.

Caution:

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

(3) Fully extend the measure (b) from the brake pedal, and add a marking (c) to the masking tape (a).

(4) Operate the brake pedal, and read the position where the stop light illuminates (pedal stroke volume) from the marking added above.

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:

- **Be careful that, when the stop light illumination position is less than 3 mm (0.12 in), the stop light may illuminate due to vibrations, etc. during driving, even if the brake is not operated.**
- **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 (2.2 kgf-m, 16.2 ft-lb)

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

REMOVAL

Note:
Only other models than STI are equipped with the brake vacuum pump.

1. Disconnect the ground terminal from battery sensor. Ref. to NOTE>NOTE > BATTERY.
2. Remove the collector cover. Ref. to INTAKE (INDUCTION)(w/o STI)>Collector Cover>REMOVAL.
3. 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.

4. Remove the bolts, and then remove the bracket - generator.

INSTALLATION

1. Install the bracket - generator.
   Tightening torque:
   19 N·m (1.9 kgf-m, 14.0 ft-lb)
2. Install the vacuum pump assembly.
   Tightening torque:
   6.4 N·m (0.7 kgf-m, 4.7 ft-lb)
3. Install the vacuum hose COMPL.
   Note:
   Install the clip to the position (arrowed) of alignment mark ▼ of intake manifold.

4. Install the collector cover. Ref. to INTAKE (INDUCTION)(w/o STI)>Collector Cover>INSTALLATION.
5. Connect the ground terminal to battery sensor. Ref. to NOTE>NOTE > BATTERY.

BRAKE > Brake Vacuum Pump

INSPECTION

1. BRAKE VACUUM PUMP

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

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

	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 bearing	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.

	Trouble and possible cause	Corrective action
	(6) Improper disc caliper operation	Repair or replace.
	(7) Defective hub unit 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 bearing	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.

PARKING BRAKE

PB

1. General Description
2. Parking Brake Lever
3. Parking Brake Cable
4. Parking Brake Assembly (Rear Disc Brake)
5. Parking Brake System
6. Relay and Fuse
7. Parking Brake Actuator
8. Parking Brake Switch
9. Emergency Release of Electronic Parking Brake
10. General Diagnostic Table

SPECIFICATION

- Drum in disc type model

Item		Specification	
Type		Drum in disc duo servo type	
Effective drum diameter	mm (in)	190 (7.48)	
Lining dimensions (Length × Width × Thickness)	mm (in)	165 × 30 × 3.5 (6.51 × 1.181 × 0.14)	
Inside diameter	mm (in)	Standard	190 (7.48)
		Limit	191 (7.52)
Lining thickness	mm (in)	Standard	3.5 (0.14)
		Limit	1.5 (0.059)
Clearance adjustment		Manual adjustment	
Free play adjusting method		Auto adjuster	
Operation method		Manual lever type	
Lever stroke	Notches/N (kgf, lbf)	7 — 8/200 (20.4, 45)	

- Electronic parking brake model

Item	Specification
Type	Electric type
Clearance adjustment	Automatic adjusting
Operation method	Switch type

COMPONENT

1. PARKING BRAKE (DRUM IN DISC TYPE MODEL)

(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) Spring - shoe clamp
(14) Parking brake shoe (primary)
(15) Pin - shoe hold-down

2. PARKING BRAKE LEVER & CABLE

- Drum in disc type model

(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 (1.8, 13.3)

- Electronic parking brake model

(1) Switch ASSY - electronic parking brake
(2) Console box harness
(3) Electronic parking brake harness RH
(4) Electronic parking brake harness LH
(5) Bracket

Tightening torque: N·m (kgf-m, ft-lb)

T: 18 (1.8, 13.3)

3. PARKING BRAKE ACTUATOR

(1) Support - rear disc brake
(2) Guide pin - rear brake
(3) Parking brake actuator ASSY
(4) O-ring
(5) Cap
(6) Bleeder - screw
(7) Cap - bleeder
(8) Pin boot
(9) Piston boot
(10) Caliper body
(11) Pad - disc brake rear inner
(12) Pad - disc brake rear outer
(13) Pat clip
(14) Disc rotor (ventilated type)

∗1: 14 mm (width across flats)
∗2: 17 mm (width across flats)

Tightening torque: N·m (kgf-m, ft-lb)

T1: 8 (0.8, 5.9)
T2: 17 (1.7, 12.5)
T3: 25 (2.5, 18.4)
T4: 66 (6.7, 48.7)
T5: 110 (11.2, 81.1)

∗: The component cannot be reused when the emergency release of parking brake was performed or when the actuator has a malfunction.

CAUTION

- When performing any work, always wear work clothes, a work cap and protective shoes. Additionally, wear a helmet, protective goggles, etc. if necessary.
- When performing a repair, identify the cause of trouble and avoid unnecessary removal, disassembly and replacement.
- Some vehicle components are extremely hot immediately after driving. Be wary of receiving burns from heated parts.
- Use SUBARU genuine grease, the recommended 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.
- Always use the jack-up point when the shop jacks or rigid racks are used to support the vehicle.
- Apply grease onto sliding or revolving surfaces before installation.
- Be sure that the surface of brake disc, brake pad or brake shoe is free from grease or oil.

PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
	—	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.

REMOVAL

1. Set the wheel stoppers to tires.
2. Disconnect the ground cable from battery. 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.**
   - **For the power seat, move the seat to the front-most position before removing the battery ground terminal.**
3. Remove the driver's seat. Ref. to SEATS>Front Seat>REMOVAL.
4. Remove the console box assembly. Ref. to EXTERIOR/INTERIOR TRIM>Console Box>REMOVAL.
5. Remove the bracket - console box.

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).

PARKING BRAKE > Parking Brake Lever

INSTALLATION

1. Install the inner cable end to equalizer.
2. Install the bracket - console box.
   Tightening torque:
   6.5 N·m (0.7 kgf-m, 4.8 ft-lb)
3. Install the lever assembly - hand brake.
   Tightening torque:
   18 N·m (1.8 kgf-m, 13.3 ft-lb)
   Caution:
   Do not reuse the adjusting nut (self locking nut). Always replace with a new part.
4. Be sure to adjust the lever stroke. Ref. to PARKING BRAKE>Parking Brake Lever>ADJUSTMENT.
5. Install the console box assembly.
6. Install the driver's seat. Ref. to SEATS>Front Seat>INSTALLATION.
7. Connect the battery ground terminal. Ref. to NOTE>NOTE > BATTERY.
   Note:
   For CVT models, after connecting the battery sensor terminal, place the select lever in the P position.

PARKING BRAKE > Parking Brake Lever

INSPECTION

1. LEVER ASSY

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.

PARKING BRAKE > Parking Brake Lever

ADJUSTMENT

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

REMOVAL

Caution:
Airbag system satellite safing sensor is located in the lower of the rear seat cushion center. Before removing the rear seat, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM" section. Ref. to AIRBAG SYSTEM>General Description>CAUTION.

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.**
   - **On CVT models, shift the select lever into "N" before disconnecting the battery ground cable.**
   - **For the power seat, move the seat to the front-most position before removing the battery ground terminal.**
2. Remove the console box assembly. Ref. to EXTERIOR/INTERIOR TRIM>Console Box>REMOVAL.
3. Remove the lever assembly - hand brake. Ref. to PARKING BRAKE>Parking Brake Lever>REMOVAL.
4. Remove the nut and remove the clamp A - hand brake cable (a).
5. Remove the inner cable end (c) from the equalizer (b).

6. Remove the rear seat cushion assembly. Ref. to SEATS>Rear Seat>REMOVAL.
7. 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.

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

9. Turn over the floor carpet and remove the grommet of the cable assembly - parking brake from the rear floor.
10. Lift up the vehicle, and then remove the rear wheels.
11. Remove the fuel tank protector.
    - Except for STI model Ref. to FUEL INJECTION (FUEL SYSTEMS)(w/o STI)>Fuel Tank Protector>REMOVAL.
    - STI model Ref. to FUEL INJECTION (FUEL SYSTEMS)(STI)>Fuel Tank Protector>REMOVAL.
12. Remove the exhaust pipe and muffler.
    - Center exhaust pipe & rear exhaust pipe: Ref. to EXHAUST(STI)>Rear Exhaust Pipe>REMOVAL.
    - Muffler: Ref. to EXHAUST(STI)>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 cable assembly - parking brake.
    (1) Remove the clamp B - hand brake cable (a) from the back plate - rear brake.

(2) Remove the cable clamp (b) from the lateral link assembly - front.
(3) Remove the cable clamp (c) from the sub frame support.
(4) Remove the cable clamp (d) from the rear floor.

PARKING BRAKE > Parking Brake Cable

INSTALLATION

Caution:
- **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.**

1. Install the cable assembly - parking brake.
   Tightening torque:
   Cable clamp: 18 N·m (1.8 kgf-m, 13.3 ft-lb)
2. Install the cable assembly - parking brake to the lever section of parking brake shoe. Ref. to PARKING BRAKE>Parking Brake Assembly (Rear Disc Brake)>INSTALLATION.
3. Install the grommet to the rear floor.
4. Install the propeller shaft assembly. Ref. to DRIVE SHAFT SYSTEM>Propeller Shaft>INSTALLATION.
5. Install the exhaust pipe and muffler.
   - Center exhaust pipe & rear exhaust pipe: Ref. to EXHAUST(STI)>Rear Exhaust Pipe>INSTALLATION.
   - Muffler: Ref. to EXHAUST(STI)>Muffler>INSTALLATION.
6. Install the fuel tank protector.
   - Except for STI model Ref. to FUEL INJECTION (FUEL SYSTEMS)(w/o STI)>Fuel Tank Protector>INSTALLATION.

- STI model Ref. to FUEL INJECTION (FUEL SYSTEMS)(STI)>Fuel Tank Protector>INSTALLATION.

7. Place the floor mat to the original position, and then attach the clip and the knob of the hook - seat cushion rear.
8. Install the side sill covers - rear INN on the right and left side.
9. Install the rear seat cushion assembly.
10. Install the inner cable end to equalizer, and install the clamp A - hand brake cable.
11. Install the lever assembly - hand brake.
    Tightening torque:
    18 N·m (1.8 kgf-m, 13.3 ft-lb)
12. Install the console box assembly.
13. Install the rear wheels.
    Tightening torque:
    120 N·m (12.2 kgf-m, 88.5 ft-lb)
14. Connect the battery ground terminal. Ref. to NOTE>NOTE > BATTERY.
    Note:
    For CVT models, after connecting the battery sensor terminal, place the select lever in the P position.

PARKING BRAKE > Parking Brake Cable

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.

REMOVAL

1. DRUM IN DISC TYPE MODEL

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

5. Remove the parking brake shoe on the primary side.
   (1) Remove the strut - brake (a) and the spring - strut (b).
   (2) Remove the adjuster assembly - rear brake (c) and the spring - adjuster (d).
   (3) Remove the pin - shoe hold-down (e) and the spring - shoe clamp (f), and remove the parking brake shoe (g).

6. Remove the pin - shoe hold-down (a) and the spring - shoe clamp (b), and remove the secondary side parking brake shoe.

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

8. Remove the retainer - rear brake and the spring washer - rear brake, and remove the parking lever - rear and the brake shoe.

2. ELECTRONIC PARKING BRAKE MODEL

Note:
For parking brake assembly removal and disassembly of electronic parking brake model, refer to "BRAKE" section.

- **Removal: Ref. to BRAKE>Rear Disc Brake Assembly>REMOVAL > FLOATING 1-POT PISTON TYPE (ELECTRONIC PARKING BRAKE TYPE).**
- **Disassembly: Ref. to BRAKE>Rear Disc Brake Assembly>DISASSEMBLY > FLOATING 1-POT PISTON TYPE (ELECTRONIC PARKING BRAKE TYPE).**

INSTALLATION

1. DRUM IN DISC TYPE MODEL

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

1. Apply brake grease to the following locations.
   Preparation items:
   Brake grease: Dow Corning Molykote 44MA 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 parking lever - rear to the secondary side parking brake shoe.
   Note:
   Install the pin - parking lever and spring washer - rear brake to the parking lever - rear, and swage the retainer - rear brake to secure.
3. Install the cable assembly - parking brake to the parking lever - rear.
   Note:
   Check that the cable assembly - parking brake does not fall from the cable guide.
4. Attach the adjuster assembly - rear brake and the spring - adjuster to the primary side and the secondary side parking brake shoes.
   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. Install the parking brake shoes to the back plate - rear brake with the pins - shoe hold-down and the springs - shoe clamp.
6. 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.
7. Install the return springs on the primary side first, and then the secondary side.
8. Install the rear disc rotor. Ref. to BRAKE>Rear Disc Rotor>INSTALLATION.
9. Adjust the parking brake. Ref. to PARKING BRAKE>Parking Brake Assembly (Rear Disc Brake)>ADJUSTMENT.
10. Install the rear wheels.
    Tightening torque:
    120 N·m (12.2 kgf-m, 88.5 ft-lb)
11. 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. Ref. to PARKING BRAKE>Parking Brake Assembly (Rear Disc Brake)>ADJUSTMENT.

2. ELECTRONIC PARKING BRAKE MODEL

Note:
For parking brake assembly installation and assembly of electronic parking brake model, refer to "BRAKE" section.

- **Installation: Ref. to BRAKE>Rear Disc Brake Assembly>INSTALLATION > FLOATING 1-POT PISTON TYPE (ELECTRONIC PARKING BRAKE TYPE).**
- **Assembly: Ref. to BRAKE>Rear Disc Brake Assembly>ASSEMBLY > FLOATING 1-POT PISTON TYPE (ELECTRONIC PARKING BRAKE TYPE).**

PARKING BRAKE > Parking Brake Assembly (Rear Disc 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: 190 mm (7.48 in)
   Service limit: 191 mm (7.52 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.

PARKING BRAKE > Parking Brake Assembly (Rear Disc Brake)

ADJUSTMENT

1. SHOE CLEARANCE

1. Return the lever assembly - hand brake completely.
   Note:
   If the pulling allowance of the hand brake lever is less than the standard (with no shoe clearance adjustment), loosen the adjusting nut on the lever side to make the cable free.
2. Remove the adjusting hole cover (A).
3. Insert a flat tip screwdriver from the adjustment hole, and rotate the adjuster assembly - rear brake in the direction of arrow (d) until the disc rotor cannot be turned by hand.

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

4. 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.**
5. Install the adjusting hole cover to the disc rotor.
6. Check the operation stroke of the parking lever, and adjust on the lever side if necessary. 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.

PARKING BRAKE > Parking Brake System

WIRING DIAGRAM

Refer to “Parking Brake / Brake Fluid Level Warning Light System” in the wiring diagram. Ref. to WIRING SYSTEM>Parking Brake / Brake Fluid Level Warning Light System>WIRING DIAGRAM.

PARKING BRAKE > Parking Brake System

ELECTRICAL SPECIFICATION

Refer to the Control Module I/O Signal of “Vehicle Dynamics Control (VDC) (DIAGNOSTICS)”. Ref. to VEHICLE DYNAMICS CONTROL (VDC) (DIAGNOSTICS)>Control Module I/O Signal>ELECTRICAL SPECIFICATION.

PARKING BRAKE > Parking Brake System

OPERATION

1. BRAKE MAINTENANCE MODE

Caution:

- **DTC: When DTC other than C1984 is detected, repair or replace the faulty parts and perform the brake maintenance mode.**
- **When the brake maintenance mode is started, DTCs may be recorded. Be sure to clear DTCs after the brake maintenance mode is completed.**
- **When the brake maintenance mode is completed, the electronic parking brake automatically operates. Check if any other works are not performed in advance. Sufficient safety consideration is required.**

Note:

- **This function is used when inspecting and repairing the rear brake related parts.**
- **When the brake maintenance mode is performed, the electronic parking brake warning light illuminates, the electronic parking brake operation light illuminates, and DTC: C1984 is stored. If the system returns from the brake maintenance mode to the normal mode, the electronic parking brake warning light goes off, and DTC is cleared.**
- **During the brake maintenance mode, the electronic parking brake cannot be applied/released.**

1. Connect the Subaru Select Monitor.
   Note:
   For detailed operation procedures, refer to “Application help”.
2. Turn the ignition to ON.
3. On «Start» display, select «Diagnosis».
4. On «Vehicle selection» display, input the target vehicle information and select «Confirmed».
5. On «Main Menu» display, select «Each System».
6. On «Select System» display, select «Brake Control System» and select «Enter».
7. On «Select Function» display, select «Work Support».
8. From the work support item list, select «Brake Maintenance Mode». And then, start the operation.
9. After the operation is complete, exit the brake maintenance mode according to the display screen.

PARKING BRAKE > Parking Brake System

INSPECTION

Refer to Basic Diagnostic Procedure of “Vehicle Dynamics Control (VDC) (DIAGNOSTICS)”. Ref. to VEHICLE DYNAMICS CONTROL (VDC) (DIAGNOSTICS)>Basic Diagnostic Procedure.

PARKING BRAKE > Parking Brake System

NOTE

For procedure of each component in the parking brake system, refer to the respective section.

- Parking brake actuator: Ref. to PARKING BRAKE>Parking Brake Actuator.
- Parking brake switch: Ref. to PARKING BRAKE>Parking Brake Switch.
- Emergency release of electronic parking brake: Ref. to PARKING BRAKE>Emergency Release of Electronic Parking Brake.

LOCATION

Relay & fuse box	Fuse 15 A (EPB control switch)	(A)

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

INSPECTION

1. CHECK FUSE

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

REMOVAL

1. PARKING BRAKE HARNESS

1. Disconnect the ground terminal from battery sensor. Ref. to NOTE>NOTE > BATTERY.
2. Remove the console box assembly. Ref. to EXTERIOR/INTERIOR TRIM>Console Box>REMOVAL.
3. Remove the connector and clip.

4. Remove the rear seat cushion assembly. Ref. to SEATS>Rear Seat>REMOVAL.
5. Lift up the vehicle, and then remove the rear wheels.
6. Remove the bolt and nuts and remove the fuel tank protector.

7. Remove the electronic parking brake harness.
   (1) Disconnect the connector (a).
   (2) Remove the harness clamp (b) from the back plate - rear brake.

(3) Remove the harness clamp (c) from the lateral link.
(4) Remove the harness clamp (d) from the support - sub frame.
(5) Remove the harness clamps (e), (f) and (g) from the rear floor.
(6) Remove the grommet (h) from the rear floor.

2. PARKING BRAKE ACTUATOR

Caution:

- **Do not remove the parking brake actuator assembly except when there are system malfunctions (such as emergency release of parking brake or abnormal actuator) or when the caliper is replaced. When the parking brake actuator assembly is reused, always replace the O-ring with a new part contained in the caliper body assembly.**
- **Do not reuse the parking brake actuator assembly when the emergency release of parking brake was performed or when the actuator has a malfunction. Always replace with a new parking brake actuator assembly.**

1. Release the parking brake.
2. Using the Subaru Select Monitor, go to the brake maintenance mode according to the display screen.
   Ref. to PARKING BRAKE>Parking Brake System>OPERATION > BRAKE MAINTENANCE MODE.
   Note:
   For detailed operation procedures, refer to "Application help".
3. Disconnect the ground terminal from battery sensor. Ref. to NOTE>NOTE > BATTERY.
4. Lift up the vehicle, and then remove the rear wheels.
5. Remove the parking brake actuator assembly.
   (1) Disconnect the connector.
   Caution:
   - **Be careful that no water and dust enter inside the connectors.**
   - **When removing the parking brake actuator assembly, do not use any tools. Slide it upward and downward by hand to remove.**
   (2) Remove the bolts, and remove the parking brake actuator assembly.
   Preparation tool:

Hexagon wrench: 5 mm (0.2 in)

INSTALLATION

1. PARKING BRAKE HARNESS

1. Install the electronic parking brake harness.
   Tightening torque:
   Harness clamp: 18 N·m (1.8 kgf-m, 13.3 ft-lb)
2. Install the fuel tank protector.
   Note:
   Use a new self-locking nut (a).
   Tightening torque:
   T1: 9 N·m (0.9 kgf-m, 6.6 ft-lb)
   T2: 18 N·m (1.8 kgf-m, 13.3 ft-lb)

(A) Self-locking nut

3. Install the rear seat cushion assembly. Ref. to SEATS>Rear Seat>INSTALLATION.
4. Install the console box assembly. Ref. to EXTERIOR/INTERIOR TRIM>Console Box>INSTALLATION.
5. Connect the ground terminal to battery sensor. Ref. to NOTE>NOTE > BATTERY.
6. Install the rear wheels.
   Tightening torque:
   120 N·m (12.2 kgf-m, 88.5 ft-lb)

2. PARKING BRAKE ACTUATOR

Caution:

- **Do not remove the parking brake actuator assembly except when there are system malfunctions (such as emergency release of parking brake or abnormal actuator) or when the caliper is replaced. When the parking brake actuator assembly is reused, always replace the O-ring with a new part contained in the caliper body assembly.**
- **Do not reuse the parking brake actuator assembly when the emergency release of parking brake was performed or when the actuator has a malfunction. Always replace with a new parking brake actuator assembly.**

1. Install the parking brake actuator assembly.
   Tightening torque:
   8 N·m (0.8 kgf-m, 5.9 ft-lb)
2. Connect the ground terminal to battery sensor. Ref. to NOTE>NOTE > BATTERY.
3. Using the Subaru Select Monitor, exit the brake maintenance mode according to the display screen.
   Ref. to PARKING BRAKE>Parking Brake System>OPERATION > BRAKE MAINTENANCE MODE.
   Note:
   For detailed operation procedures, refer to "Application help".
4. After the operation is completed, apply and release the parking brake five times and ensure that the brake operates normally.
5. Install the rear wheels.

Tightening torque:

120 N·m (12.2 kgf-m, 88.5 ft-lb)

REMOVAL

1. DRUM IN DISC TYPE MODEL

1. Set the wheel stoppers to tires.
2. Disconnect the ground cable from battery. Ref. to NOTE>NOTE > BATTERY.
   Note:
   - **For model with battery sensor, disconnect the ground terminal from battery sensor.**
   - **For CVT models, set the select lever to the "N" position before disconnecting the battery.**
   - **For the power seat, move the seat to the front-most position before removing the battery ground terminal.**
3. Remove the driver's seat. Ref. to SEATS>Front Seat>REMOVAL.
4. Remove the console box assembly. Ref. to EXTERIOR/INTERIOR TRIM>Console Box>REMOVAL > MODEL WITH PARKING BRAKE LEVER.
5. Remove the switch assembly - hand brake.

2. ELECTRONIC PARKING BRAKE MODEL

1. Set the wheel stoppers to tires.
2. Disconnect the ground terminal from battery sensor. Ref. to NOTE>NOTE > BATTERY.
   Note:
   - **For CVT models, set the select lever to the "N" position before disconnecting the battery.**
   - **For the power seat, move the seat to the front-most position before removing the battery ground terminal.**
3. Move the front seat to the front-most position.
4. Remove the console box assembly. Ref. to EXTERIOR/INTERIOR TRIM>Console Box>REMOVAL > MODEL WITH ELECTRONIC PARKING BRAKE SWITCH.
5. Remove the screws to remove the switch assembly - electronic parking brake.

INSTALLATION

1. DISC IN DRUM TYPE MODEL

1. Install the switch assembly - hand brake.
2. Install the console box assembly. Ref. to EXTERIOR/INTERIOR TRIM>Console Box>INSTALLATION > MODEL WITH ELECTRONIC PARKING BRAKE SWITCH.
3. Install the driver's seat. Ref. to SEATS>Front Seat>INSTALLATION.
4. Connect the battery ground terminal. Ref. to NOTE>NOTE > BATTERY.

2. ELECTRONIC PARKING BRAKE MODEL

1. Install the switch assembly - electronic parking brake.
2. Install the console box assembly. Ref. to EXTERIOR/INTERIOR TRIM>Console Box>INSTALLATION > MODEL WITH ELECTRONIC PARKING BRAKE SWITCH.
3. Move the front seat back to the original position.
4. Connect the ground terminal to battery sensor. Ref. to NOTE>NOTE > BATTERY.

   Note:

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

PARKING BRAKE > Parking Brake Switch

INSPECTION

1. SWITCH ASSY - HAND BRAKE

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 the result of inspection is not within the specified value, replace the switch assembly - hand brake.

2. SWITCH ASSY - ELECTRONIC PARKING BRAKE

Check the resistance between switch assembly - electronic parking brake terminals.

Switch position	Terminal No.	Standard
Press (Release)	6 and 2 6 and 5	Less than 1 Ω
Neutral	6 and 1 2 and 5	Less than 1 Ω
Pull (Lock)	6 and 1 6 and 2	Less than 1 Ω

Note:
Replace the switch if the inspection result is not within the standard value.

OPERATION

Caution:

- **Perform this operation only when the parking brake must be released in emergency situation such as a system malfunction.**
- **When performing this procedure, be sure to fully confirm safety in the nearby area and park the vehicle on a horizontal ground.**
- **Always use the jack-up point when the shop jacks or rigid racks are used to support the vehicle.**

1. Disconnect the ground terminal from battery sensor. Ref. to NOTE>NOTE > BATTERY.
2. Set the wheel stoppers to front tires.
3. Jack-up the rear side of vehicle and support it with rigid racks.
4. Remove the rear wheels.
5. Remove the parking brake actuator assembly.

   Caution:

   - **When removing the bolt, the parking brake actuator assembly turns due to reaction force generated by the motor. Be careful not to pinch your hand.**
   - **Wrap the tip of a screwdriver with cloth in order not to damage the caliper body that will be reused.**
   - **Do not insert a tool into the seal surface (a) on the parking brake actuator assembly.**
   - **Always remove the parking brake actuator assembly while holding it by hand because the parking brake actuator assembly falls off during removal.**

   (1) Disconnect the connector and remove the bolt.

   (2) Put a crowbar between the parking brake actuator assembly and the support - rear disc brake (b).

   (3) Push out the parking brake actuator assembly toward yourself.

   (4) Insert a crowbar into the gap (c) made by pushing the parking brake actuator assembly, and then remove it.

6. Turn the caliper body spindle bolt clockwise by approx. 1 rotation.

Note:

Turn both sides of LH and RH clockwise.

Preparation tool:

TORX® E12

7. Confirm that the parking brake lock is released and the disc rotor rotates.
8. Temporarily install the parking brake actuator assembly.

Caution:

- **When the emergency release of parking brake was performed, replace the parking brake actuator assembly after the system trouble is resolved.**
- **Do not connect the actuator connector. It may be locked again due to continuity.**
- **If the vehicle needs to be moved, cover the actuator connector with vinyl tape to prevent foreign matter from entering, and secure it in an area where no interference occurs.**

Tightening torque:

8 N·m (0.8 kgf-m, 5.9 ft-lb)

9. When the emergency release of parking brake was performed, be sure to perform the inspection related to the parking brake system.

Note:

For inspection, refer to Basic Diagnostic Procedure of "Vehicle Dynamics Control (VDC) (DIAGNOSTICS)". Ref. to VEHICLE DYNAMICS CONTROL (VDC) (DIAGNOSTICS)>Basic Diagnostic Procedure.

INSPECTION

- Drum in disc type model

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.
	Spring - shoe clamp is faulty.	Replace.

- Electronic parking brake model

Symptoms	Possible cause	Corrective action
Brake drag	Defective parking brake switch	Replace.
	Defective parking brake harness	Replace.
	Defective parking brake actuator	Replace.
	Loose parking brake actuator and support installation bolt	Tighten to the specified torque.
Noise from brake	Worn or hardened pad	Replace.
	Defective parking brake actuator	Replace.