

HYDRAULIC CONTROL UNIT (H/U)

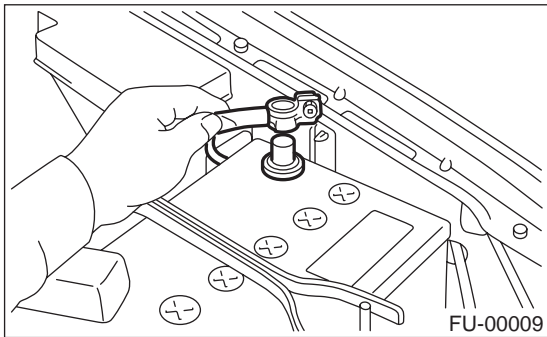
VDC

3. Hydraulic Control Unit (H/U)

A: REMOVAL

1. HYDRAULIC UNIT (H/U)

- 1) Disconnect ground cable from battery.



- 2) Remove air intake duct from engine compartment to facilitate removal of hydraulic unit.
- 3) Disconnect connector from hydraulic unit.

CAUTION:

Be careful not to let water or other foreign matter contact the H/U terminal.

- 4) Unlock cable clip.
- 5) Disconnect brake pipes from hydraulic unit.

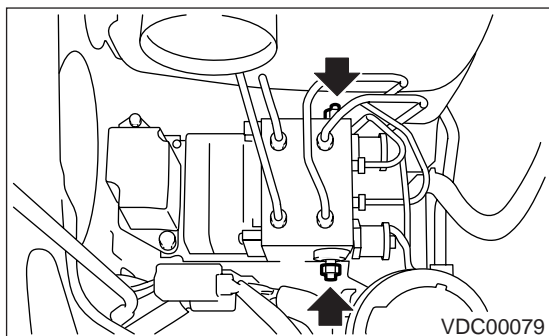
CAUTION:

Wrap brake pipes with vinyl bag to avoid spilling brake fluid on vehicle body.

- 6) Remove nuts and bolt which secure hydraulic unit bracket, and remove hydraulic unit from engine compartment.

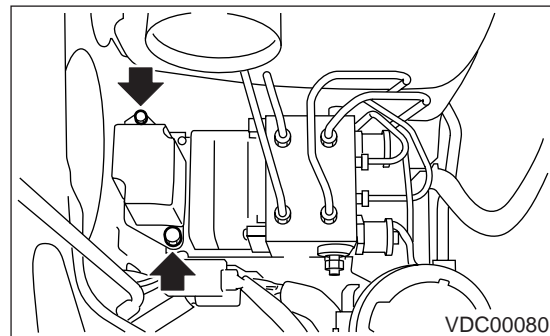
CAUTION:

- Hydraulic unit cannot be disassembled. Do not attempt to loosen bolts and nuts.
- Do not drop or bump hydraulic unit.
- Do not turn the hydraulic unit upside down or place it on its side.
- Be careful to prevent foreign particles from getting into hydraulic unit.
- When a new hydraulic unit is installed, apply a coat of rust-preventive wax (Nippeco LT or GB) to bracket attaching bolt after tightening.
- Do not pull harness disconnecting harness connector.



2. RELAY BOX

- 1) Disconnect ground cable from battery.
- 2) Remove air intake duct from engine compartment to facilitate removal of relay box.
- 3) Disconnect connector from relay box.
- 4) Unlock cable clip.
- 5) Remove nuts which secure relay box, and remove relay box and connector bracket.



CAUTION:

Do not drop or bump relay box.

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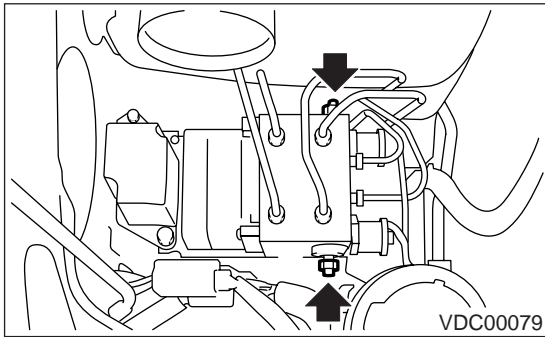
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B: INSTALLATION

1. HYDRAULIC UNIT (H/U)

- 1) Install hydraulic unit.



Tightening torque:

18 N·m (1.8 kgf·m, 13.0 ft·lb)

- 2) Connect hydraulic unit ground cable to body.

Tightening torque:

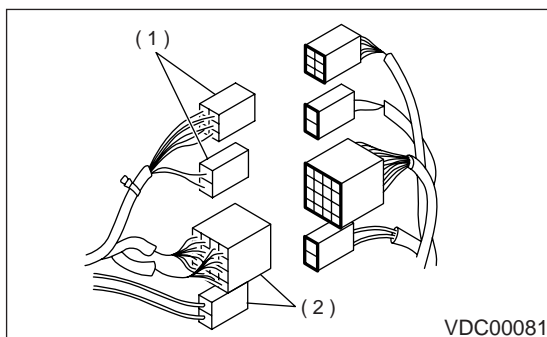
33 N·m (3.4 kgf·m, 25 ft·lb)

- 3) Connect brake pipes to their correct hydraulic unit connections.
- 4) Secure hydraulic unit connector to connector bracket.

CAUTION:

Align connector with mating receptacle.

- 5) Connect connector to hydraulic unit.



- (1) Relay box connector
- (2) Hydraulic unit connector

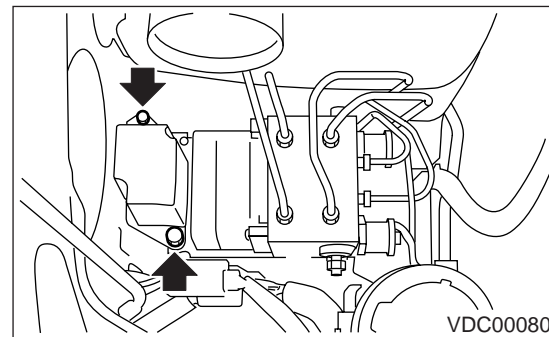
- 6) Install air intake duct.
- 7) Connect ground cable to battery.
- 8) Bleed air from the brake system.

2. RELAY BOX

- 1) Install relay box and connector bracket.

Tightening torque:

13 N·m (1.3 kgf·m, 9.4 ft·lb)

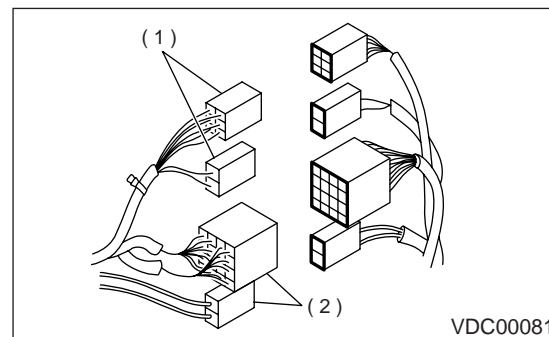


- 2) Secure relay box connector to connector bracket.

CAUTION:

Align connector with mating receptacle.

- 3) Connect connector to relay box.



- (1) Relay box connector
- (2) Hydraulic unit connector

- 4) Install air intake duct.
- 5) Connect ground cable to battery.

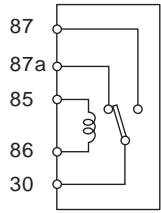
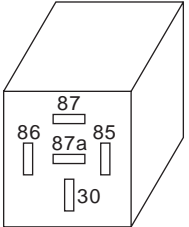
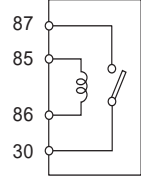
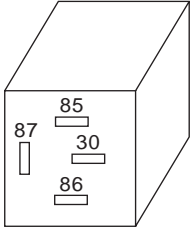
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C: INSPECTION

- 1) Check connected and fixed condition of connector.
- 2) Check valve relay and motor relay for discontinuity or short circuits.

	Condition	Terminal number	Standard	Diagram	Terminal location
Valve relay	Turning off electricity.	85 — 86	103±10 Ω	 VDC00082	 VDC00083
		30 — 87a	Less than 0.5 Ω		
		30 — 87	More than 1 MΩ		
	Turning on electricity between 85 and 86. (DC 12 V)	30 — 87a	More than 1 MΩ		
30 — 87		Less than 0.5 Ω			
Motor relay	Turning off electricity.	85 — 86	80±10 Ω	 VDC00084	 VDC00085
		30 — 87	More than 1 MΩ		
	Turning on electricity between 85 and 86. (DC 12 V)	30 — 87	Less than 0.5 Ω		

1. CHECKING THE HYDRAULIC UNIT ABS OPERATION BY PRESSURE GAUGE

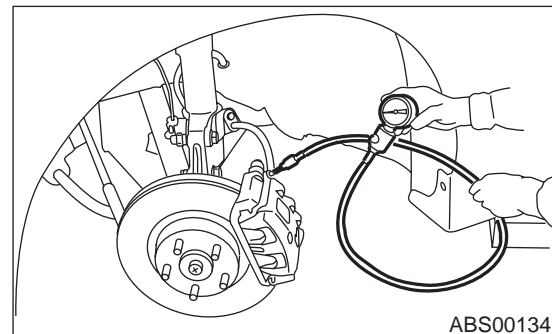
- 1) Lift-up vehicle and remove wheels.
- 2) Disconnect the air bleeder screws from the FL and FR caliper bodies.
- 3) Connect two pressure gauges to the FL and FR caliper bodies.

CAUTION:

- Pressure gauges used exclusively for brake fluid must be used.
- Do not employ pressure gauge previously used for transmission since the piston seal is expanded which may lead to malfunction of the brake.

NOTE:

Wrap sealing tape around the pressure gauge.



- 4) Bleed air from the pressure gauges.
- 5) Perform ABS sequence control.
<Ref. to VDC-16, ABS Sequence Control.>
- 6) When the hydraulic unit begins to work, and first the FL side performs decompression, holding, and compression, and then the FR side performs decompression, holding, and compression.

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7) Read values indicated on the pressure gauge and check if the fluctuation of the values between decompression and compression meets the standard values. Also check if any irregular brake pedal tightness is felt.

	Front wheel	Rear wheel
Initial value	3,432 kPa (35 kg/cm ² , 498 psi)	3,432 kPa (35 kg/cm ² , 498 psi)
When decompressed	490 kPa (5 kg/cm ² , 71 psi) or less	490 kPa (5 kg/cm ² , 71 psi) or less
When compressed	3,432 kPa (35 kg/cm ² , 498 psi) or more	3,432 kPa (35 kg/cm ² , 498 psi) or more

8) Remove pressure gauges from FL and FR caliper bodies.

9) Remove air bleeder screws from the RL and RR caliper bodies.

10) Connect the air bleeder screws to the FL and FR caliper bodies.

11) Connect two pressure gauges to the RL and RR caliper bodies.

12) Bleed air from the pressure gauges and the FL and FR caliper bodies.

13) Perform ABS sequence control.

<Ref. to VDC-16, ABS Sequence Control.>

14) When the hydraulic unit begins to work, at first the RR side performs decompression, holding, and compression, and then the RL side performs decompression, holding, and compression.

15) Read values indicated on the pressure gauges and check if they meet the standard values.

16) After checking, remove the pressure gauges from caliper bodies.

17) Connect the air bleeder screws to RL and RR caliper bodies.

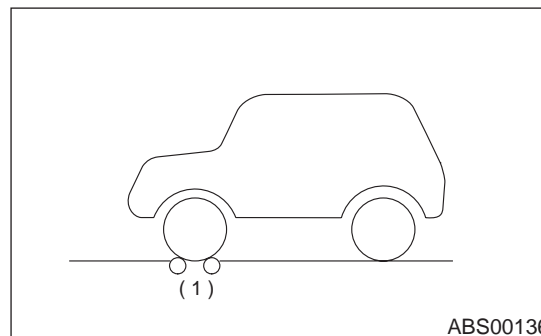
18) Bleed air from brake line.

2. CHECKING THE HYDRAULIC UNIT ABS OPERATION WITH BRAKE TESTER

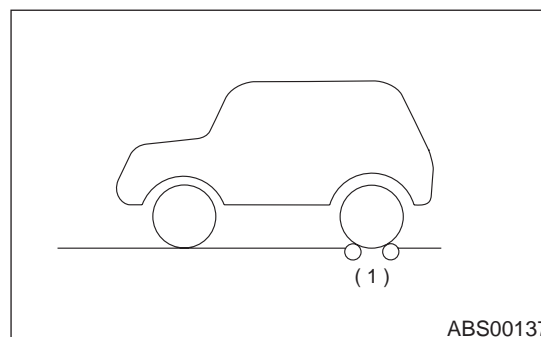
1) Prepare for operating ABS sequence control.

<Ref. to VDC-16, ABS Sequence Control.>

2) Set the front wheels or rear wheels on the brake tester and set the select lever's position at "neutral".



(1) Brake tester



(1) Brake tester

3) Operate the brake tester.

4) Perform ABS sequence control.

<Ref. to VDC-16, ABS Sequence Control.>

5) When the hydraulic unit begins to work, check the following working sequence.

(1) The FL wheel performs decompression, holding, and compression in sequence, and subsequently the FR wheel repeats the cycle.

(2) The RR wheel performs decompression, holding, and compression in sequence, and subsequently the RL wheel repeats the cycle.

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6) Read values indicated on the brake tester and check if the fluctuation of values, when decompressed and compressed, meet the standard values.

	Front wheel	Rear wheel
Initial value	981 N (100 kgf, 221 lb)	981 N (100 kgf, 221 lb)
When decompressed	490 N (50 kgf, 110 lb) or less	490 N (50 kgf, 110 lb) or less
When compressed	981 N (100 kgf, 221 lb) or more	981 N (100 kgf, 221 lb) or more

7) After checking, also check if any irregular brake pedal tightness is felt.

3. CHECKING THE HYDRAULIC UNIT VDC OPERATION BY PRESSURE GAUGE

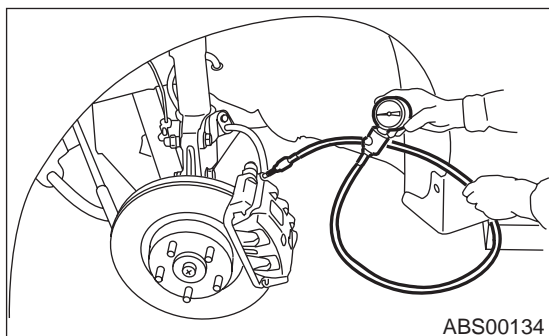
- 1) Lift-up vehicle and remove wheels.
- 2) Disconnect the air bleeder screws from the FL and FR caliper bodies.
- 3) Connect two pressure gauges to the FL and FR caliper bodies.

CAUTION:

- Pressure gauges used exclusively for brake fluid must be used.
- Do not employ pressure gauge previously used for transmission since the piston seal is expanded which may lead to malfunction of the brake.

NOTE:

Wrap sealing tape around the pressure gauge.



- 4) Bleed air from the pressure gauges.
- 5) Perform VDC sequence control.
<Ref. to VDC-19, VDC Sequence Control.>
- 6) When the hydraulic unit begins to work, and first the FL side performs decompression, holding, and compression, and then the FR side performs decompression, holding, and compression.

7) Read values indicated on the pressure gauge and check if the fluctuation of the values between decompression and compression meets the standard values. Also check if any irregular brake pedal tightness is felt.

	Front wheel	Rear wheel
When compressed	2,942 kPa (30 kg/cm ² , 427 psi) or more	1,961 kPa (20 kg/cm ² , 284 psi) or more
When decompressed	490 kPa (5 kg/cm ² , 71 psi) or less	490 kPa (5 kg/cm ² , 71 psi) or less

8) Remove pressure gauges from FL and FR caliper bodies.

9) Remove air bleeder screws from the RL and RR caliper bodies.

10) Connect the air bleeder screws to the FL and FR caliper bodies.

11) Connect two pressure gauges to the RL and RR caliper bodies.

12) Bleed air from the pressure gauges and the FL and FR caliper bodies.

13) Perform VDC sequence control.

<Ref. to VDC-19, VDC Sequence Control.>

14) When the hydraulic unit begins to work, at first the RR side performs decompression, holding, and compression, and then the RL side performs decompression, holding, and compression.

15) Read values indicated on the pressure gauges and check if they meet the standard value.

16) After checking, remove the pressure gauges from caliper bodies.

17) Connect the air bleeder screws to RL and RR caliper bodies.

18) Bleed air from brake line.

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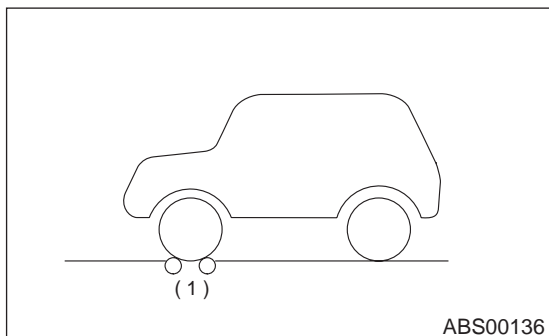
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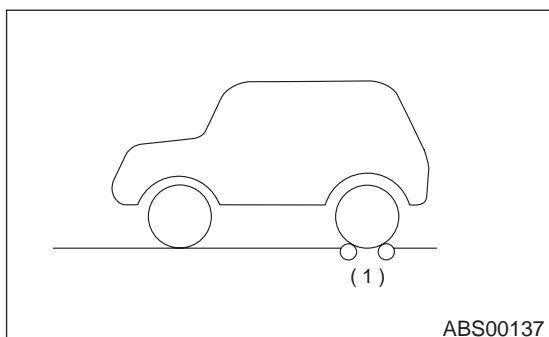
4. CHECKING THE HYDRAULIC UNIT VDC OPERATION WITH BRAKE TESTER

7) After checking, also check if any irregular brake pedal tightness is felt.

- 1) Prepare for operating VDC sequence control.
<Ref. to VDC-19, VDC Sequence Control.>
- 2) Set the front wheels or rear wheels on the brake tester and set the select lever's position at "neutral".



(1) Brake tester



(1) Brake tester

- 3) Operate the brake tester.
- 4) Perform ABS sequence control.
<Ref. to VDC-16, ABS Sequence Control.>
- 5) When the hydraulic unit begins to work, check the following working sequence.
 - (1) The FL wheel performs decompression, holding, and compression in sequence, and subsequently the FR wheel repeats the cycle.
 - (2) The RR wheel performs decompression, holding, and compression in sequence, and subsequently the RL wheel repeats the cycle.
- 6) Read values indicated on the brake tester and check if the fluctuation of values, when decompressed and compressed, meet the standard values.

	Front wheel	Rear wheel
When compressed	1,961 N (200 kgf, 441 lb) or more	981 N (100 kgf, 221 lb) or more
When decompressed	490 N (50 kgf, 110 lb) or less	490 N (50 kgf, 110 lb) or less

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