

HYDRAULIC BRAKE BOOSTER (w/ VSC)

BR1Y8-01

ON-VEHICLE INSPECTION

1. CHECK HYDRAULIC BRAKE BOOSTER FLUID PRESSURE CHANGE

- (a) Inspect the battery voltage.
Battery voltage: 10 to 14 V
- (b) Turn the ignition switch off, and depress the brake pedal more than 20 times.

HINT:

When pressure in the accumulator power supply system is released, reaction force becomes light and stroke becomes longer.

- (c) Install the brake pedal effort gauge (SST), and bleed air.
SST 09709-29018
- (d) When booster does not operate:
Depress the brake pedal and check fluid pressure.

At 245 N (25 kgf, 55 lbf):

Front brake pressure	Rear brake pressure
2,050 to 3650 kPa (20.9 to 37.2 kgf/cm ² , 297 to 529 psi)	0 kPa (0 kgf/cm ² , 0 psi)

At 343 N (35 kgf, 77 lbf):

Front brake pressure	Rear brake pressure
3,270 to 4870 kPa (33.3 to 50 kgf/cm ² , 474 to 711 psi)	0 kPa (0 kgf/cm ² , 0 psi)

- (e) When booster operates:
 - (1) Turn the ignition switch on and wait until the pump motor has stopped.

HINT:

Pump operating sound can be heard.

- (2) Turn the ignition switch off, and depress the brake pedal more than 20 times.

HINT:

When pressure in the accumulator is released, reaction force becomes light and stroke becomes longer.

- (3) Repeat (1) and (2) 5 times.
- (4) Make sure that the interval between pump start and pump stop is 8 to 14 seconds.

If it takes 14 seconds or more, repeat (3).

(5) Depress the brake pedal and check fluid pressure.

At 49 N (5 kgf, 11 lbf):

Front brake pressure	Rear brake pressure
933 to 2,533 kPa (9.5 to 25.8 kgf/cm ² , 135 to 367 psi)	993 to 1,888 kPa (10.1 to 19.3 kgf/cm ² , 144 to 274 psi)

At 98 N (10 kgf, 22 lbf):

Front brake pressure	Rear brake pressure
3,109 to 4,709 kPa (31.7 to 48.0 kgf/cm ² , 451 to 683 psi)	2,087 to 3,181 kPa (21.3 to 32.4 kgf/cm ² , 303 to 461 psi)

At 147 N (15 kgf, 33 lbf):

Front brake pressure	Rear brake pressure
5,284 to 6,884 kPa (53.9 to 70.2 kgf/cm ² , 766 to 998 psi)	3,713 to 5,311 kPa (37.9 to 54.2 kgf/cm ² , 539 to 770 psi)

At 196 N (20 kgf, 44 lbf):

Front brake pressure	Rear brake pressure
7,460 to 9,060 kPa (76.1 to 92.4 kgf/cm ² , 1,082 to 1,314 psi)	5,843 to 7,441 kPa (59.6 to 75.9 kgf/cm ² , 848 to 1,079 psi)

2. INSPECT HYDRAULIC BRAKE BOOSTER OPERATION

(a) Inspect the battery voltage.

Battery voltage: 10 to 14 V

(b) Turn the ignition switch off, and depress the brake pedal more than 20 times.

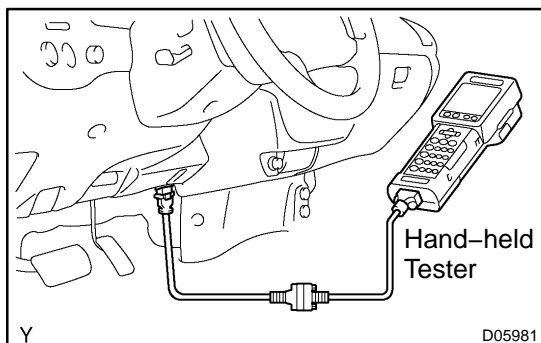
HINT:

When pressure in the accumulator power supply system is released, reaction force becomes light and stroke becomes longer.

(c) Check that the brake pedal becomes light to depress. If the pedal does not become light to depress, check and replace the brake line and hydraulic brake booster.

(d) Turn the ignition switch on, and check the pump motor operation noise.

If the pump motor does not operate, check and replace the wire harness and pump motor (See page [BR-90](#)).



(e) Connect the hand-held tester.

(1) Connect the hand-held tester to the DLC3.

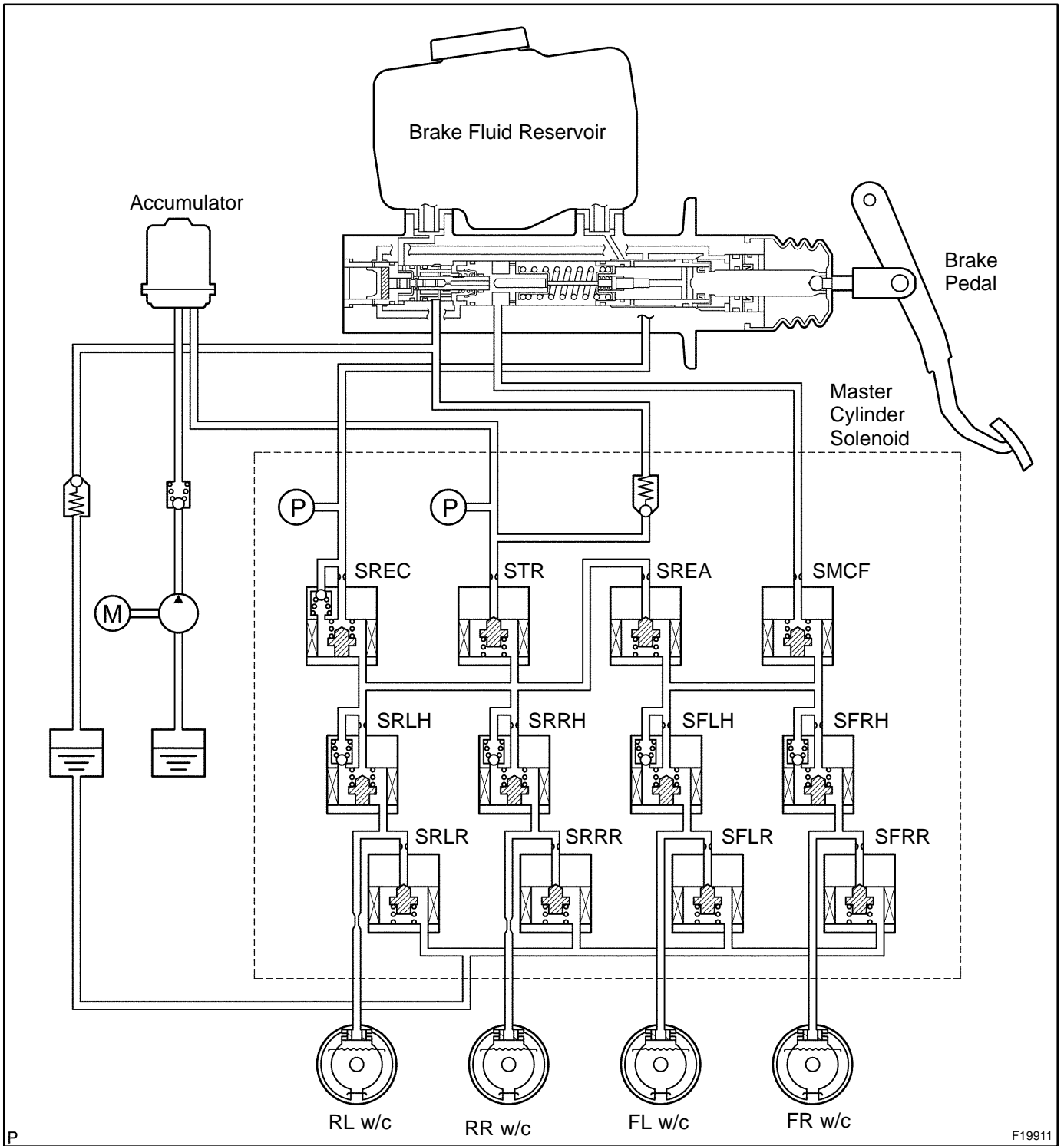
(2) Turn the ignition switch on.

(3) Select "ACTIVE TEST" mode on the hand-held tester.

HINT:

- Please refer to the hand-held tester operator's manual for further details.
- To protect solenoids, hand-held tester turns off automatically 2 sec. after every solenoid has been turned on.

3. INSPECTION PROCEDURE



Inspection order (step)	SOL selected by active test	SOL to be activated
(a)	SRCF (SA1)	SMCF
(c)	SRCF (SA1) and SRCR (SA2)	SREA and SMCF
(d)	SFRH	SFRH
(e)	SFLH	SFLH
(f)	SFRR & SFRH	SFRR and SFRH
(g)	SFLR & SFLH	SFLR and SFLH
(h)	SRMF (SMCF, SA3)	SREC
(i)	SRMF (SMCF, SA3) and SRMR (SMCR, STR)	STR and SREC
(j)	SRRH	SRRH
(k)	SRLH	SRLH
(l)	SRH & SRR	SRRR and SRRH
(m)	SRLR & SRLH	SRLR and SRLH

(a) Inspect front VSC solenoid (SMCF) operation.

HINT:

- ON: Activate SMCF and check that the brake pedal cannot be depressed (the pedal feels tight).
- OFF: Deactivate SMCF and check that the brake pedal can be depressed.
 - (1) Select "SRCF (SA1)" on the hand-held tester.
 - (2) Turn the "SRCF (SA1)" on by the hand-held tester, then depress the brake pedal with stable force and check that the pedal cannot be depressed.

If the pedal can be depressed, replace the hydraulic brake booster.

HINT:

To protect the solenoids, the hand-held tester turns off automatically 2 seconds after every solenoid has been turned on.

NOTICE:

When operating it continuously, set the interval of more than 20 seconds.

- (3) Release the brake pedal.
- (4) When the solenoid is off, depress the brake pedal again and check that the brake pedal can be depressed.

If the pedal can be depressed, replace the hydraulic brake booster.

(b) PREPARE THE VEHICLE

- (1) Jack up and support the vehicle.
- (2) Release the parking brake lever.
- (3) Shift the transfer shift lever to the "N" position and check the rear wheels by rotating them by hand.

(c) Inspect front VSC solenoid (SREA) operation.

HINT:

- ON: Activate SREA and SMCF, depress the brake pedal, and then check that the front wheels do not rotate.
- OFF: Deactivate SREA and SMCF. Reactivate SMCF, depress the brake pedal, and then check that the front wheels rotate.
 - (1) Select "SRCR (SA2)" and "SRCF (SMCF)" on the hand-held tester.
 - (2) Turn the "SRCR (SA2)" and "SRCF (SMCF)" on simultaneously by the hand-held tester, then depress the brake pedal with stable force.
 - (3) When the solenoids are on, check that the front wheels do not rotate by hand.

If the front wheels rotate, replace the hydraulic brake booster.

NOTICE:

When operating it continuously, set the interval of more than 20 seconds.

HINT:

- To protect the solenoids, the hand-held tester turns off automatically 2 seconds after every solenoid has been turned on.
- When rotating the wheels fast, the fail-safe function is activated and judgement cannot be made properly.
So rotate the wheels as slowly as possible.
 - (4) When the solenoids are off, turn the "SRCF (SMCF)" on again, then depress the brake pedal and check the front wheels by rotating them by hand.

If front wheels stop, replace the hydraulic brake booster.

- (5) When the "SRCF (SMCF)" is off, depress the brake pedal again and check that the brake pedal can be depressed.

If the pedal can be depressed, replace the hydraulic brake booster.

(d) Inspect front ABS solenoid (SFRH) operation.

HINT:

- ON: Activate SFRH, depress the brake pedal, and then check that the right front wheel rotates.
- OFF: Deactivate SFRH, depress the brake pedal, and then check that the front right wheel does not rotate.
 - (1) Select "SFRH" on the hand-held tester.
 - (2) Turn the "SFRH" on by the hand-held tester, then depress the brake pedal with stable force.
 - (3) When the solenoid is on, check the right front wheel by rotating it by hand.

If the right front wheel stops, replace the hydraulic brake booster.

NOTICE:

When operating it continuously, set the interval of more than 20 seconds.

HINT:

- To protect the solenoids, the hand-held tester turns off automatically 2 seconds after every solenoid has been turned on.
- When rotating the wheel fast, the fail-safe function is activated and judgement cannot be made properly.
So rotate the wheel as slowly as possible.

- (4) When the solenoid is off, depress the brake pedal again and check that the right front wheel does not rotate by hand.

If the right front wheel rotates, replace the hydraulic brake booster.

(e) Inspect front ABS solenoid (SFLH) operation.

HINT:

- ON: Activate SFLH, depress the brake pedal, and then check that the left front wheel rotates.
- OFF: Deactivate SFLH, depress the brake pedal, and then check that the front left wheel does not rotate.
 - (1) Select "SFLH" on the hand-held tester.
 - (2) Turn the "SFLH" on by the hand-held tester, then depress the brake pedal with stable force.
 - (3) When the solenoid is on, check the left front wheel by rotating it by hand.

If the left front wheel stops, replace the hydraulic brake booster.

NOTICE:

When operating it continuously, set the interval of more than 20 seconds.

HINT:

- To protect the solenoids, the hand-held tester turns off automatically 2 seconds after every solenoid has been turned on.
- When rotating the wheel fast, the fail-safe function is activated and judgement cannot be made properly.
So rotate the wheel as slowly as possible.
 - (4) When the solenoid is off, depress the brake pedal again and check that the left front wheel does not rotate by hand.

If the left front wheel rotates, replace the hydraulic brake booster.

(f) Inspect front ABS solenoid (SFRR) operation.

HINT:

- ON: Depress the brake pedal, activate SFRR and SFRH, and then check that the right front wheel rotates.
- OFF: Deactivate SFRR and SFRH, depress the brake pedal, and then check that the right front wheel does not rotate.
 - (1) Select "SFRR & SFRH" on the hand-held tester.
 - (2) Depress the brake pedal with stable force, then turn the "SFRR & SFRH" on simultaneously by the hand-held tester.
 - (3) When the solenoids are on, check the right front wheel by rotating it by hand.

If the right front wheel stops, replace the hydraulic brake booster.

NOTICE:

When operating it continuously, set the interval of more than 20 seconds.

HINT:

- To protect the solenoids, the hand-held tester turns off automatically 2 seconds after every solenoid has been turned on.
- When rotating the wheel fast, the fail-safe function is activated and judgement cannot be made properly.
So rotate the wheel as slowly as possible.
 - (4) When the solenoids are off, depress the brake pedal again and check that the right front wheel does not rotate by hand.

If the right front wheel rotates, replace the hydraulic brake booster.

(g) Inspect front ABS solenoid (SFLR) operation.

HINT:

- ON: Depress the brake pedal, activate SFLR and SFLH, and then check that the left front wheel rotates.
- OFF: Deactivate SFLR and SFLH, depress the brake pedal, and then check that the left front wheel does not rotate.
 - (1) Select "SFLR & SFLH" on the hand-held tester.
 - (2) Depress the brake pedal with stable force, then turn the "SFLR & SFLH" on simultaneously by the hand-held tester.
 - (3) When the solenoids are on, check the left front wheel by rotating it by hand.

If the left front wheel stops, replace the hydraulic brake booster.

NOTICE:

When operating it continuously, set the interval of more than 20 seconds.

HINT:

- To protect the solenoids, the hand-held tester turns off automatically 2 seconds after every solenoid has been turned on.
- When rotating the wheel fast, the fail-safe function is activated and judgement cannot be made properly.
So rotate the wheel as slowly as possible.
 - (4) When the solenoids are off, depress the brake pedal again and check that the left front wheel does not rotate by hand.

If the left front wheel rotates, replace the hydraulic brake booster.

(h) Inspect rear VSC solenoid (SREC) operation.

HINT:

- ON: Depress the brake pedal and activate SREC. Release the brake pedal and check that the rear wheels do not rotate.
- OFF: Deactivate SREC and check that the rear wheels rotate.
 - (1) Select "SRMF (SMCF, SA3)" on the hand-held tester.
 - (2) Depress the brake pedal with stable force, then turn the "SRMF (SMCF, SA3)" on by the hand-held tester.
 - (3) Release the brake pedal when the solenoid is on, and check that the rear wheels do not rotate by hand.

If the rear wheels rotate, replace the hydraulic brake booster.

NOTICE:

When operating it continuously, set the interval of more than 20 seconds.

HINT:

- To protect the solenoids, the hand-held tester turns off automatically 2 seconds after every solenoid has been turned on.
- When rotating the wheels fast, the fail-safe function is activated and judgement cannot be made properly.
So rotate the wheels as slowly as possible.
 - (4) When the solenoid is off, check the rear wheels by rotating them by hand.

If the rear wheels stop, replace the hydraulic brake booster.

(i) Inspect rear VSC solenoid (STR) operation.

HINT:

- ON: Activate STR and SREC, then check that the rear wheels do not rotate.
- OFF: Deactivate STR and SREC. Reactivate SREC and check that the rear wheels rotate.
 - (1) Select "SRMR (SMCR, STR)" on the hand-held tester.
 - (2) Turn the "SRMR (SMCR, STR)" on simultaneously by the hand-held tester.
 - (3) When the solenoids are on, check that the rear wheels do not rotate by hand.

If the rear wheels rotate, replace the hydraulic brake booster.

NOTICE:

When operating it continuously, set the interval of more than 20 seconds.

HINT:

- To protect the solenoids, the hand-held tester turns off automatically 2 seconds after every solenoid has been turned on.
- When rotating the wheels fast, the fail-safe function is activated and judgement cannot be made properly.
So rotate the wheels as slowly as possible.
 - (4) When the solenoids are off, check the rear wheels by rotating them by hand.

If the rear wheels stop, replace the hydraulic brake booster.

- (5) When the "SRMF (SREC)" is off, depress the brake pedal again and check that the rear wheels do not rotate by hand.

If the rear wheels rotate, replace the hydraulic brake booster.

(j) Inspect rear ABS solenoid (SRRH) operation.

HINT:

- ON: Activate SRRH, depress the brake pedal, and then check that the right rear wheel rotates.
- OFF: Deactivate SRRH, depress the brake pedal, and then check that the right rear wheel does not rotate.
 - (1) Select "SRRH" on the hand-held tester.
 - (2) Turn the "SRRH" on by the hand-held tester, then depress the brake pedal with stable force.
 - (3) When the solenoid is on, check the right rear wheel by rotating it by hand.

If the right rear wheel stops, replace the hydraulic brake booster.

NOTICE:

When operating it continuously, set the interval of more than 20 seconds.

HINT:

- To protect the solenoids, the hand-held tester turns off automatically 2 seconds after every solenoid has been turned on.
- When rotating the wheel fast, the fail-safe function is activated and judgement cannot be made properly.

So rotate the wheel as slowly as possible.

 - (4) When the solenoid is off, depress the brake pedal again and check that the right rear wheel does not rotate by hand.

If the right rear wheel rotates, replace the hydraulic brake booster.

(k) Inspect rear ABS solenoid (SRLH) operation.

HINT:

- ON: Activate SRLH, depress the brake pedal, and then check that the left rear wheel rotates.
- OFF: Deactivate SRLH, depress the brake pedal, and then check that the left rear wheel does not rotate.
 - (1) Select "SRLH" on the hand-held tester.
 - (2) Turn the "SRLH" on by the hand-held tester, then depress the brake pedal with stable force.
 - (3) When the solenoids is on, check the left rear wheel by rotating it by hand.

If the left rear wheel stops, replace the hydraulic brake booster.

NOTICE:

When operating it continuously, set the interval of more than 20 seconds.

HINT:

- To protect the solenoids, the hand-held tester turns off automatically 2 seconds after every solenoid has been turned on.
- When rotating the wheel fast, the fail-safe function is activated and judgement cannot be made properly.
So rotate the wheel as slowly as possible.
 - (4) When the solenoid is off, depress the brake pedal again and check that the left rear wheel does not rotate by hand.

If the left rear wheel rotates, replace the hydraulic brake booster.

(I) Inspect rear ABS solenoid (SRRR) operation.

HINT:

- ON: Depress the brake pedal, activate SRRR and SRRH, and then check that the right rear wheel rotates.
- OFF: Deactivate SRRR and SRRH, depress the brake pedal, and then check that the right rear wheel does not rotate.
 - (1) Select "SRH & SRR" on the hand-held tester.
 - (2) Depress the brake pedal with stable force, then turn the "SRH & SRR" on simultaneously by the hand-held tester.
 - (3) When the solenoids are on, check the right rear wheel by rotating it by hand.

If the right rear wheel stops, replace the hydraulic brake booster.

NOTICE:

When operating it continuously, set the interval of more than 20 seconds.

HINT:

- To protect the solenoids, the hand-held tester turns off automatically 2 seconds after every solenoid has been turned on.
- When rotating the wheel fast, the fail-safe function is activated and judgement cannot be made properly.
So rotate the wheel as slowly as possible.
 - (4) When the solenoids are off, depress the brake pedal again and check that the right rear wheel does not rotate by hand.

If the right rear wheel rotates, replace the hydraulic brake booster.

(m) Inspect rear ABS solenoid (SRLR) operation.

HINT:

- ON: Depress the brake pedal, activate SRLR and SRLH, and then check that the left rear wheel rotates.
- OFF: Deactivate SRLR and SRLH, depress the brake pedal, and then check that the left rear wheel does not rotate.
 - (1) Select "SRLR & SRLH" on the hand-held tester.
 - (2) Depress the brake pedal with stable force, then turn the "SRLR & SRLH" on simultaneously by the hand-held tester.
 - (3) When the solenoids are on, check the left rear wheel by rotating it by hand.

If the left rear wheel stops, replace the hydraulic brake booster.

NOTICE:

When operating it continuously, set the interval of more than 20 seconds.

HINT:

- To protect the solenoids, the hand-held tester turns off automatically 2 seconds after every solenoid has been turned on.
- When rotating the wheel fast, the fail-safe function is activated and judgement cannot be made properly.
So rotate the wheel as slowly as possible.
 - (4) When the solenoids are off, depress the brake pedal again and check that the left rear wheel does not rotate by hand.

If the left rear wheel rotates, replace the hydraulic brake booster.