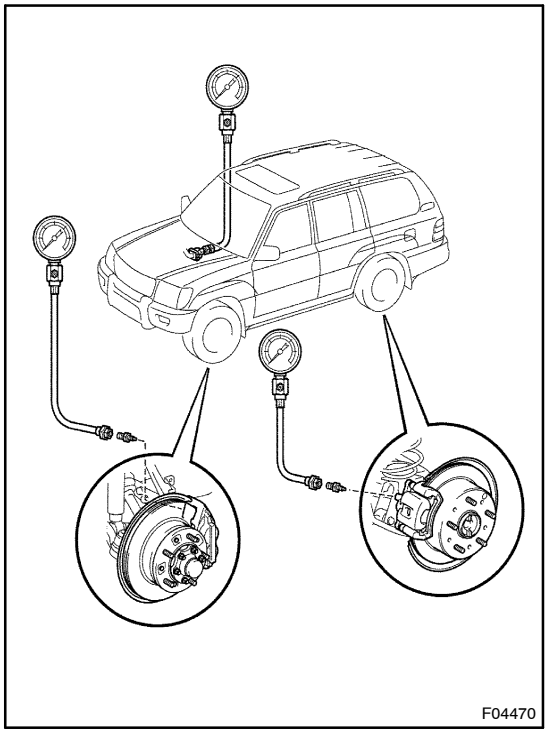

F04470

HYDRAULIC BRAKE BOOSTER

BR0W1–01

ON–VEHICLE INSPECTION

1. CHECK HYDRAULIC BRAKE BOOSTER FLUID PRESSURE CHANGE

(a) Inspect the battery voltage.

Battery voltage: 10 – 14 V

(b) Turn the ignition switch OFF, depress the brake pedal more than 40 times.

HINT:

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

(c) Install LSPV gauge (SST) and brake pedal effort gauge, 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
2,700 kPa (27.5 kgf/cm^2, 391 psi) or more	0 kPa (0 kgf/cm^2, 0 psi)

At 343 N (35 kgf, 77 lbf):

Front brake pressure	Rear brake pressure
3,950 kPa (40 kgf/cm^2, 568 psi) or more	0 kPa (0 kgf/cm^2, 0 psi)

(e) When booster operate

(1) Turn the ignition switch ON and wait until the pump motor has stopped.

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

At 49 N (5 kgf, 11 lbf):

Front brake pressure	Rear brake pressure
1,821 – 3,146 kPa (16.5 – 28.5 kgf/cm^2, 234 – 405 psi)	1,931 – 3,256 kPa (17.5 – 29.5 kgf/cm^2, 249 – 419 psi)

At 98 N (10 kgf, 22 lbf):

Front brake pressure	Rear brake pressure
4,967 – 6,291 kPa (45 – 57 kgf/cm^2, 639 – 809 psi)	3,587 – 4,911 kPa (32.5 – 44.5 kgf/cm^2, 462 – 632 psi)

At 147 N (15 kgf, 33 lbf):

Front brake pressure	Rear brake pressure
8,112 – 9,437 kPa (73.5 – 85.5 kgf/cm^2, 1,043 – 1,214 psi)	5,187 – 6,511 kPa (47 – 59 kgf/cm^2, 667 – 838 psi)

At 196 N (20 kgf, 44 lbf):

Front brake pressure	Rear brake pressure
11,147 – 12,471 kPa (101 – 113 kgf/cm^2, 1,434 – 1,604 psi)	6,789 – 8,112 kPa (61.5 – 73.5 kgf/cm^2, 873 – 1,044 psi)

2. IN CASE OF USING HAND –HELD TESTER:

INSPECT HYDRAULIC BRAKE BOOSTER OPERATION

(a) Inspect the battery voltage.

Battery voltage: 10 – 14 V

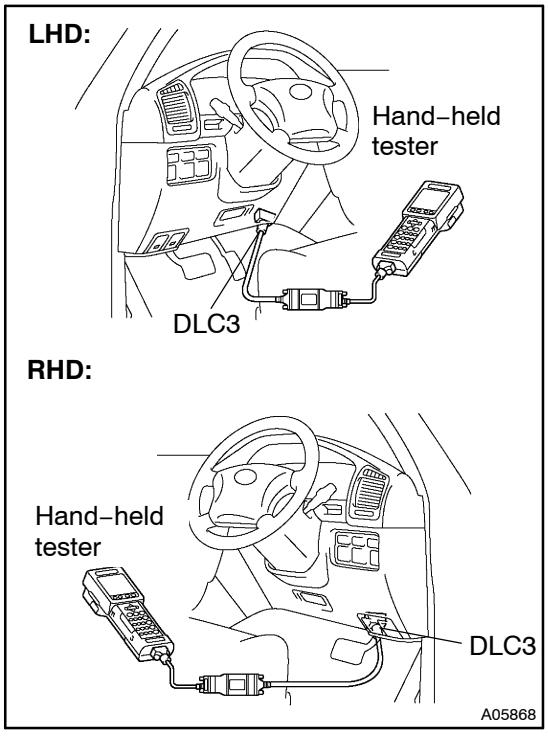
(b) Turn the ignition switch OFF, depress the brake pedal more than 40 times.

HINT:

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

(c) Turn the ignition switch ON, check the pump motor operation noise.

If the pump motor does not operate, check and replace the wire harness and pump motor.



(d) Connect the hand –held tester.

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

(2) Turn the ignition switch ON.

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

HINT:

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

(e) Inspect the front ABS switching solenoid operation.

(1) Select "SA1" and "SA2" on the hand –held tester.

(2) With "SA1" and "SA2" turned ON simultaneously with the hand –held tester, depress the brake pedal with stable force and check that the pedal cannot be depressed.

HINT:

To protect the solenoids, hand –held tester turns OFF automatically for 2 secs. after every solenoid has been turned ON.

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

NOTICE:

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

(3) Once, release the brake pedal.

(4) When the solenoids are OFF, after depressing the brake pedal again and check that the brake pedal can be depressed.

If the pedal cannot be depressed, replace the hydraulic brake booster.

(f) Inspect the front ABS solenoid operation.

(1) Select "SFRH" and "SFLH" on the hand –held tester.

(2) With "SFRH" and "SFLH" turned ON simultaneously with the hand –held tester, depress the brake pedal with stable force and check that the brake pedal cannot be depressed.

HINT:

To protect the solenoids, hand –held tester turns OFF automatically for 2 secs. after every solenoid has been turned ON.

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

(3) Once, release the brake pedal when the solenoids are OFF, check that the brake pedal can be depressed.

If the pedal cannot be depressed, replace the hydraulic brake booster.

(4) Once, release the brake pedal. After depressing and holding the brake pedal with stable force, turn the SFRH and SFRR solenoids ON simultaneously.

HINT:

To protect the solenoids, hand –held tester turns OFF automatically for 2 secs. after every solenoid has been turned ON.

(5) When the solenoids are OFF, check that the brake pedal can be depressed.

If the pedal cannot be depressed, replace the hydraulic brake booster.

(6) Once, release the brake pedal. After depressing and holding the brake pedal with stable force, turn the SFLH and SFLR solenoids ON simultaneously.

HINT:

To protect the solenoids, hand –held tester turns OFF automatically for 2 secs. after every solenoid has been turned ON.

(7) Once release the brake pedal when the solenoids are OFF, check that the brake pedal can be depressed.

If the pedal cannot be depressed, replace the hydraulic brake booster.

(g) Jack up and support the vehicle.

(h) Release the parking brake lever.

(i) Inspect the rear ABS solenoid.

(1) Select the "SRH" on the hand –held tester.

(2) Turn the "SRH" ON with the hand –held tester and depress the brake pedal with stable force, and check that the right rear wheel by rotating it by hand.

HINT:

- To protect the solenoids, hand –held tester turns OFF automatically for 2 secs. 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.
- When solenoid is OFF, the wheel might stop temporarily. However if the wheel rotates again, the function works normally.

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

(3) Once, release the brake pedal and turn the "SRH" OFF, after depressing the brake pedal with stable force and check that the light rear wheel by stopping it by hand.

HINT:

- To protect the solenoids, hand –held tester turns OFF automatically for 2 secs. 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.

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

(4) Depress the pedal with stable force, then turn the "SRH" and "SRR" ON simultaneously.

(5) When the solenoids are ON, check that the right rear wheel by rotating it by hand.

(j) Lower the vehicle.

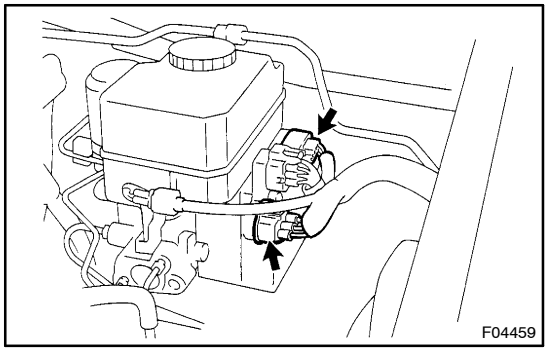
(k) Disconnect the hand –held tester.

3. IN CASE OF USING ABS ACTUATOR CHECKER (SST):

INSPECT HYDRAULIC BRAKE BOOSTER OPERATION

(a) Inspect the battery voltage.

Battery voltage: 10 – 14 V



(b) Disconnect the 2 connectors from hydraulic brake booster.

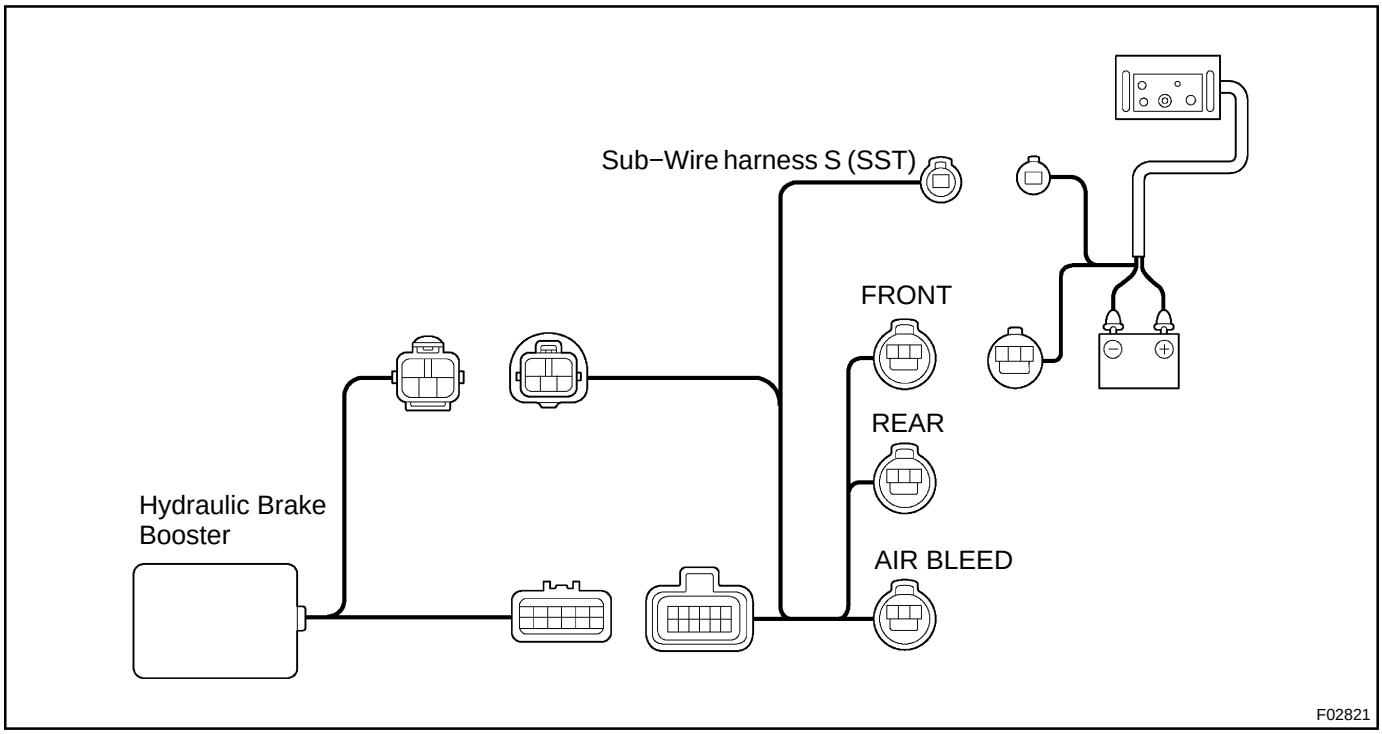
(c) Connect the actuator checker (SST) to the hydraulic brake booster side wire harness via the sub –wire harness (SST), as shown in the chart on the next page.

SST 09990 –00150, 09990 –00480

HINT:

Connect the connector with the label of "FRONT" attached to the connector of actuator checker.

(d) Connect the red cable of the checker to the battery positive (+) terminal and the black cable to the negative (−) terminal.



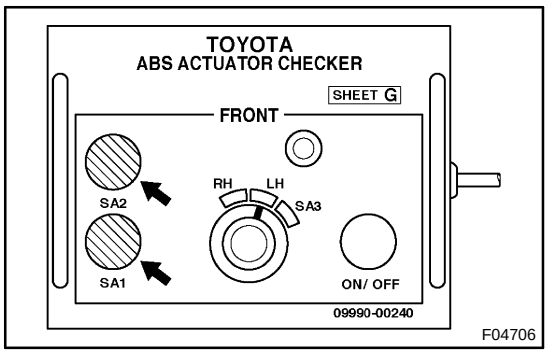
(e) Place "SHEET G" (SST) of "FRONT" on actuator checker.
SST 09990−00240

(f) Turn the ignition switch OFF, depress the brake pedal more than 40 times.

HINT:
When a pressure in power supply system is released, reaction force becomes light and stroke becomes longer.

(g) Turn the ignition switch ON, check the pump motor operation noise.

If the pump motor does not operate, check and replace the wire harness and pump motor.



(h) Inspect the front ABS switching solenoid operation.
(1) Push in and hold the "SA1" and "SA2" switches simultaneously, depress strongly and hold the brake pedal with stable force.

NOTICE:
Do not keep the "SA1" and "SA2" pushed down for more than 10 seconds. When operating it continuously, set the interval of more than 20 seconds.

(2) Check that the brake pedal cannot be depressed.

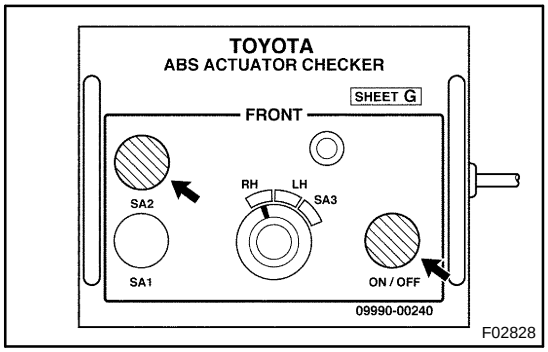
If the pedal can be depressed, replace the hydraulic brake booster.

(3) Release the ”SA1” switch and check that the brake pedal can be depressed.

If the pedal cannot be depressed, replace the hydraulic brake booster.

(4) Release the ”SA2” switch and check that the brake pedal can be depressed.

If the pedal cannot be depressed, replace the hydraulic brake booster.



(i) Inspect the right front ABS solenoid operation.

(1) Turn the selector switch to ”RH” position.

(2) Push and hold in the MAIN push switch and ”SA2” switch simultaneously depress and hold the brake pedal with stable force.

NOTICE:

Do not keep the MAIN push switch and ”SA2” switch pushed down for more than 10 seconds. When operating it continuously, set the interval of more than 20 seconds.

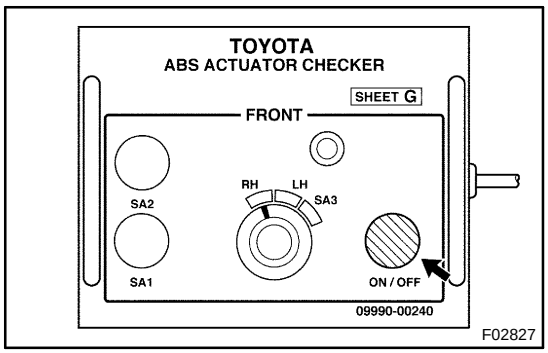
(3) Check that the brake pedal cannot be depressed.

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

(4) Release the MAIN push switch and ”SA2” switch simultaneously and check that the brake pedal can be depressed.

If the pedal cannot be depressed, replace the hydraulic brake booster.

(5) Release the brake pedal.



(6) Depress and hold the brake pedal with stable force, push and hold in MAIN push switch.

NOTICE:

Do not keep the MAIN push switch pushed down for more than 10 seconds. When operating it continuously, set the interval of more than 20 seconds.

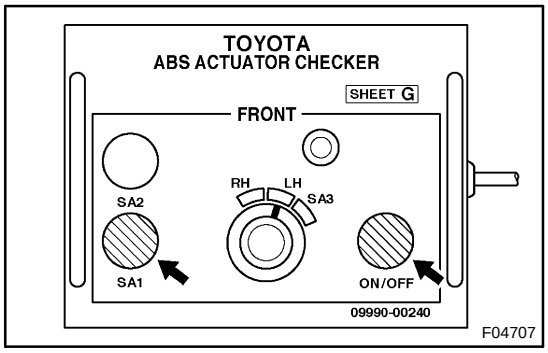
(7) Check that the brake pedal cannot be depressed.

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

(8) Release the MAIN push switch, and check that the brake pedal can be depressed.

If the pedal cannot be depressed, replace the hydraulic brake booster.

(9) Release the brake pedal.



(j) Inspect the left front ABS solenoid operation.

(1) Turn the selector switch to ”LH” position.

(2) Push and hold in the MAIN push switch and ”SA1” switch simultaneously, depress and hold the brake pedal with stable force.

NOTICE:

Do not keep the MAIN push switch and ”SA1” switch pushed down for more than 10 seconds. When operating it continuously, set the interval of more than 20 seconds.

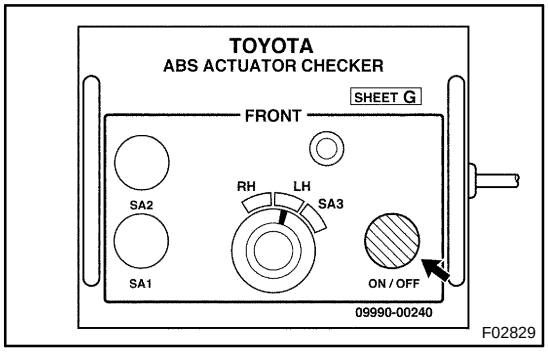
(3) Check that the brake pedal cannot be depressed.

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

(4) Release the MAIN push switch and ”SA1” switch simultaneously, and check that the brake pedal can be depressed.

If the pedal cannot be depressed, replace the hydraulic brake booster.

(5) Release the brake pedal.



(6) Depress and hold the brake pedal with stable force, push and hold in MAIN push switch.

NOTICE:

Do not keep the MAIN push switch pushed down for more than 10 seconds. When operating it continuously, set the interval of more than 20 seconds.

(7) Check that the brake pedal cannot be depressed.

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

(8) Release the MAIN push switch, and check that the brake pedal can be depressed.

If the pedal cannot be depressed, replace the hydraulic brake booster.

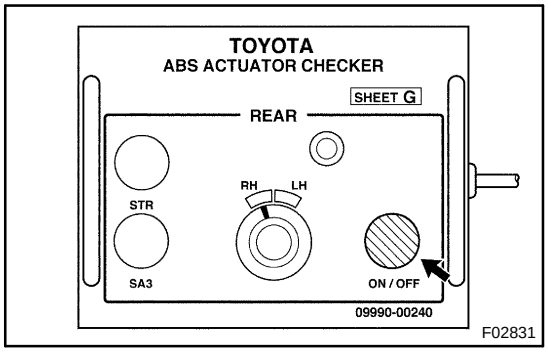
(9) Release the brake pedal.

(k) Turn the ignition switch OFF, then reconnect the connector of sub−wire harness from the one with label of ”FRONT” to ”REAR”.

(l) Place ”SHEET G” of ”REAR” on the actuator checker.

(m) Jack up and support the vehicle.

(n) Start the engine and run it at idle.



(o) Inspect the rear ABS position.
  (1) Turn the selector switch to ”RH” position.
  (2) Depress the brake pedal several times and release the pedal when the pump begins rotating. Wait until the pump stops.
  (3) Turn the ignition switch OFF.
  (4) With the brake pedal with a force of 343 N (35 kgf, 77 lbf) check the fluid surface in the reservoir tank of the hydro booster.
  (5) Press the MAIN push switch for 10 secs., and check that the fluid surface in the reservoir tank of the hydro booster dose not rise up at this time.

NOTICE:
Do not press MAIN push switch for more than 10 secs. When operating the switch continuously, do it an interval of more than 20 secs
If the fluid surface level rises up, replace the hydro booster.

  (6) Check that brake pedal is not hard to depress.

If pedal is hard to depress, replace the hydraulic brake booster.

  (7) Start the engine and run it at idle.
  (8) Depress the brake lever.
  (9) Release the parking brake pedal and shift the shift lever to ”L” position.
  (10) Once, release the brake pedal. After depressing the brake pedal with stable force, then push and hold MAIN push switch.
  (11) Check that the right rear wheel rotates.

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

(p) Stop the engine and lower the vehicle.
(q) Remove the ”SHEET G” (SST) and disconnect the actuator checker (SST) and sub−wire harness (SST) from the hydraulic brake booster.
(r) Connect the 2 connectors to the actuator.
(s) Clear the DTC (See page DI−312).