

Hydraulic Control Assembly - Antilock Brakes: Testing and Inspection

ON-VEHICLE INSPECTION

1. INSPECT BRAKE ACTUATOR OPERATION

a. Pre-check preparation

1. Move the shift lever to the P position. Apply the parking brake and connect the intelligent tester to the DLC3.
2. Turn the power switch ON (IG).
3. Turn on the intelligent tester. Select "MAS CYL PRS 1", "MAS CYL PRS 2", "FR PRESS SENS", "FL PRESS SENS", "RR PRESS SENS" and "RL PRESS SENS".

b. Check FR system solenoid (SLA**, SLR**, SMC1, SMC2)

Standard output voltage

Sensor	10 to 20 sec. after check start (V)	35 sec. or more after check start (V)
MAS CYL PRS 1	0.3 to 0.7	0.3 to 0.7
MAS CYL PRS 2	0.3 to 0.7	0.3 to 0.7
FR PRESS SENS	2.5 to 4.5	0.3 to 0.7
FL PRESS SENS	0.3 to 0.7	0.3 to 0.7
RR PRESS SENS	0.3 to 0.7	0.3 to 0.7
RL PRESS SENS	0.3 to 0.7	0.3 to 0.7

1. Select "SLAFR CUR"--> Set the current to **1.2 A**. --> Check the output voltage.

NOTE: Do not depress the brake pedal.

HINT: It takes approximately **35 seconds** to complete the check.

If incorrect, troubleshoot the brake system.

c. Check FL system solenoid (SLA**, SLR**, SMC1, SMC2)

Standard output voltage

Sensor	10 to 20 sec. after check start (V)	35 sec. or more after check start (V)
MAS CYL PRS 1	0.3 to 0.7	0.3 to 0.7
MAS CYL PRS 2	0.3 to 0.7	0.3 to 0.7
FR PRESS SENS	0.3 to 0.7	0.3 to 0.7
FL PRESS SENS	2.5 to 4.5	0.3 to 0.7
RR PRESS SENS	0.3 to 0.7	0.3 to 0.7
RL PRESS SENS	0.3 to 0.7	0.3 to 0.7

1. Select "SLAFL CUR"--> Set the current to **1.2 A**. --> Check the output voltage.

NOTE: Do not depress the brake pedal.

HINT: It takes approximately **35 seconds** to complete the check.

If incorrect, troubleshoot the brake system.

d. Check RR system solenoid (SLA**, SLR**, SMC1, SMC2)

Standard output voltage

Sensor	10 to 20 sec. after check start (V)	35 sec. or more after check start (V)
MAS CYL PRS 1	0.3 to 0.7	0.3 to 0.7
MAS CYL PRS 2	0.3 to 0.7	0.3 to 0.7
FR PRESS SENS	0.3 to 0.7	0.3 to 0.7
FL PRESS SENS	0.3 to 0.7	0.3 to 0.7
RR PRESS SENS	2.5 to 4.5	0.3 to 0.7
RL PRESS SENS	0.3 to 0.7	0.3 to 0.7

1. Select "SLARR CUR" --> Set the current to **1.2 A**. --> Check the output voltage.

NOTE: Do not depress the brake pedal.

HINT: It takes approximately **35 seconds** to complete the check.

If incorrect, troubleshoot the brake system.

- e. Check RL system solenoid (SLA**, SLR**, SMC1, SMC2)

Standard output voltage

Sensor	10 to 20 sec. after check start (V)	35 sec. or more after check start (V)
MAS CYL PRS 1	0.3 to 0.7	0.3 to 0.7
MAS CYL PRS 2	0.3 to 0.7	0.3 to 0.7
FR PRESS SENS	0.3 to 0.7	0.3 to 0.7
FL PRESS SENS	0.3 to 0.7	0.3 to 0.7
RR PRESS SENS	0.3 to 0.7	0.3 to 0.7
RL PRESS SENS	2.5 to 4.5	0.3 to 0.7

1. Select "SLARL CUR" --> Set the current to **1.2 A**. --> Check the output voltage.

NOTE: Do not depress the brake pedal.

HINT: It takes approximately **35 seconds** to complete the check.

If incorrect, troubleshoot the brake system.

- f. Check SMC1, SMC2

1. Select and enter "ELECTRONICALLY CONTROLLED BRAKE SYSTEM INVALID" to prohibit the brake control (ELECTRONICALLY CONTROLLED BRAKE SYSTEM) on the intelligent tester menu screen.
2. Check that the ELECTRONICALLY CONTROLLED BRAKE SYSTEM warning light comes on.

Standard difference in output voltage

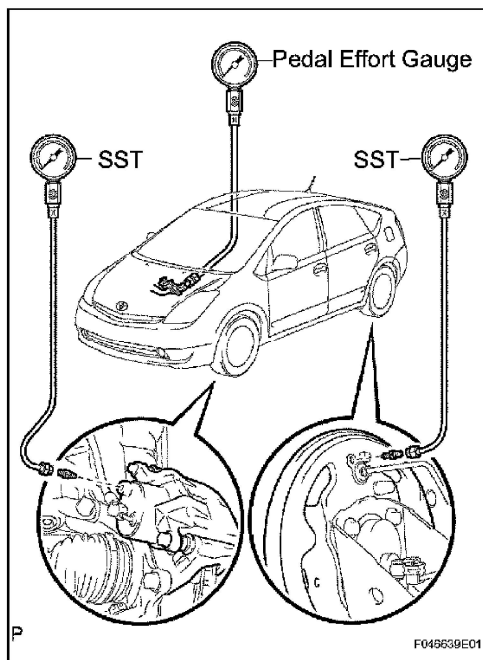
Sensor	Specified Condition
Between "MAS CYL PRES 1" and "FR PRESS SENS"	Less than 0.4 V
Between "MAS CYL PRES 2" and "FL PRESS SENS"	Less than 0.4 V

3. Check the output voltage by depressing the brake pedal.
4. Press the return key on the intelligent tester and cancel brake control prohibition (ELECTRONICALLY CONTROLLED BRAKE SYSTEM INVALID).

2. INSPECT PRESSURE SENSOR OPERATION

- a. Check battery voltage.

Standard battery voltage: **10 to 14 V** (during engine stop)



b. Connect the hydro booster pressure gauge and pedal effort gauge.

1. Install the LSPV gauge (SST) and brake pedal effort gauge.

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2. Bleed the air out of the hydro booster pressure gauge.
3. Move the shift lever to the P position. Connect intelligent tester to the DLC3 with the parking brake applied.
4. Turn the power switch ON (IG).
5. Clear the DTC.

c. Check wheel cylinder pressure sensor and master pressure sensor.

1. Turn on the intelligent tester. Select "MAS CYL PRS 1", "MAS CYL PRS 2", "FR PRESS SENS", "FL PRESS SENS", "RR PRESS SENS" and "RL PRESS SENS".
2. Check the brake effort, pressure gauge reading, and output pressure voltage.

Standard output voltage

Brake effort N (kgf, lbf)	MAS CYL PRS 1 (V)	MAS CYL PRS 2 (V)
200 (20.4, 45)	0.9 to 1.2	0.9 to 1.2
500 (51, 112)	1.7 to 2.2	1.7 to 2.2

Brake effort N (kgf, lbf)	Front right wheel hydraulic pressure MPa (kgf/cm ² , psi)	FR PRESS SENS (V)
50 (5.1, 11)	3.6 (36.4, 518)	1.15 to 1.35
100 (10.2, 22)	6.9 (70.0, 996)	1.8 to 2.0
150 (15.3, 34)	9.1 (93.3, 1,327)	2.25 to 2.45
200 (20.4, 45)	11.4 (115.9, 1,648)	2.65 to 2.95

Brake effort N (kgf, lbf)	Front left wheel hydraulic pressure MPa (kgf/cm ² , psi)	FL PRESS SENS (V)
50 (5.1, 11)	3.6 (36.4, 518)	1.15 to 1.35
100 (10.2, 22)	6.9 (70.0, 996)	1.8 to 2.0
150 (15.3, 34)	9.1 (93.3, 1,327)	2.25 to 2.45
200 (20.4, 45)	11.4 (115.9, 1,648)	2.65 to 2.95

Brake effort N (kgf, lbf)	Rear right wheel hydraulic pressure MPa (kgf/cm ² , psi)	RR PRESS SENS (V)
50 (5.1, 11)	3.9 (39.4, 560)	1.2 to 1.4
100 (10.2, 22)	4 (40.8, 580)	1.25 to 1.5
150 (15.3, 34)	4 (40.8, 580)	1.25 to 1.5
200 (20.4, 45)	4 (40.8, 580)	1.25 to 1.5

Brake effort N (kgf, lbf)	Rear left wheel hydraulic pressure MPa (kgf/cm ² , psi)	RL PRESS SENS (V)
50 (5.1, 11)	3.9 (39.4, 560)	1.2 to 1.4
100 (10.2, 22)	4 (40.8, 580)	1.25 to 1.5
150 (15.3, 34)	4 (40.8, 580)	1.25 to 1.5
200 (20.4, 45)	4 (40.8, 580)	1.25 to 1.5

If incorrect, troubleshoot the brake system.

- d. Check accumulator (ACC) pressure sensor.
 1. Move the shift lever to the P position. Apply the parking brake and connect the intelligent tester.
 2. Turn the power switch ON (IG).
 3. Turn on the intelligent tester. Select the accumulator (ACC) pressure sensor 1 ("ACC PRESS SENS").
 4. Temporarily operate the pump motor by depressing the brake pedal 4 to 5 times.
 5. After confirming that the pump motor stops, check the pressure output voltage.

If incorrect, troubleshoot the brake system.

Standard output voltage: **2.6 to 3.8 V**