

BRAKE SYSTEM

PRECAUTIONS

1. HANDLING AND OPERATING PRECAUTIONS

NOTICE:

This maintenance operation may affect the SRS air bag. Make sure to read the precautionary items of the SRS air bag before starting work. (See page RS-164)

2. Care must be taken to replace each part properly as it could affect the performance of the brake system and result in a driving hazard. Replace the parts with the same part or equivalent.
3. During the maintenance of the braking system, be sure to keep the repair parts and the surrounding environment clean.
4. If the vehicle is equipped with a radio communication system, refer to the precaution in the INTRODUCTION section.

OPERATION CHECK

1. CHECK BRAKE BOOSTER

(a) INSPECT AIR TIGHTNESS OF BRAKE BOOSTER

- (1) Start the engine, then stop it after 1 or 2 minutes of idling.
- (2) Step on the brake pedal several times with the normal force used for normal braking operation. Then check the changes of the brake pedal height.

Standard:

The height of the brake pedal should be higher the second and third times than the first time. (The intervals between the first and second, and the second and third should be at least 5 seconds.)

(b) INSPECT BRAKE BOOSTER OPERATION

- (1) Step on the brake pedal several times with the engine stopped using the same level of force, and check that the height of the brake pedal does not change.
- (2) While stepping on the brake pedal, start the engine and check for changes in the height of the brake pedal.

Standard:

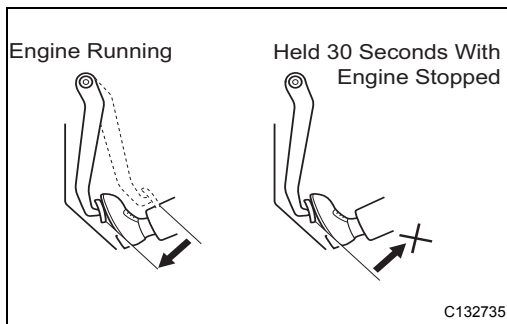
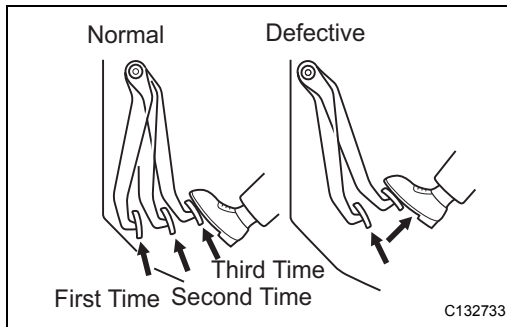
When starting the engine with the brake pedal depressed, the brake pedal will move back slightly.

(c) INSPECT LOAD AIR TIGHTNESS OF BRAKE BOOSTER

- (1) With the engine is running, step on the brake pedal. Stop the engine and let stand for 30 seconds, then check the height of the brake pedal.

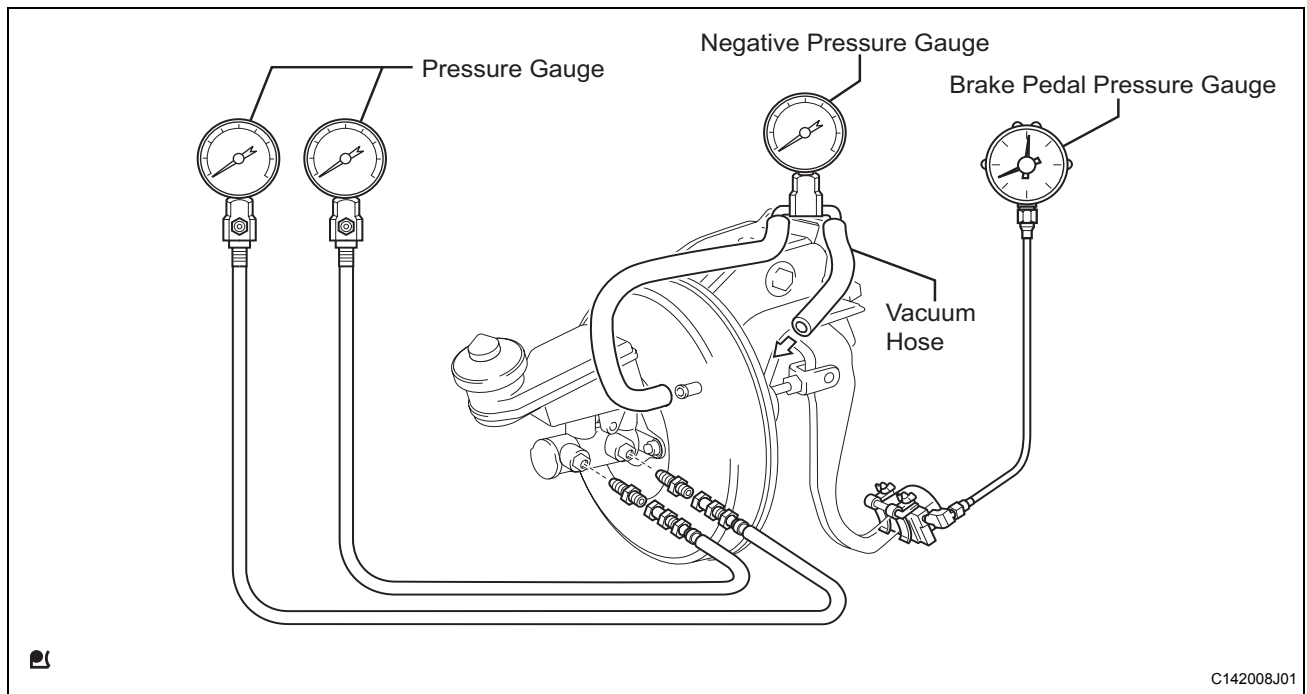
Standard:

No change in the height of the pedal



2. INSPECT BRAKE BOOSTER FUNCTION

(a) PREPARE FOR INSPECTION



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- (1) Connect the portable brake tester as shown in the illustration.

- (2) Bleed air from the portable brake tester.

(b) INSPECT AIR TIGHTNESS FUNCTION

- (1) Start the engine, then stop it at the negative pressure of 66.7 kPa (500 mm Hg) and check for changes in pressure.

Standard:

No reduction of the negative pressure for 15 seconds.

(c) INSPECT LOAD AIR TIGHTNESS FUNCTION

- (1) Start the engine, step-on the brake pedal with a force of 196 N (20 kgf), then stop the engine at the negative pressure of 66.7 kPa (500 mm Hg). Check for changes in pressure.

Standard:

Within 15 seconds, the reduction of the negative pressure is within the 3.3 kPa (25 mm Hg)

(d) INSPECT NON-BRAKE BOOSTER OPERATION

- (1) Stop the engine and operate the brake pedal several times, then check the fluid pressure without applying a vacuum.

Standard:

For vehicles without VSC

Pedal Force [N (kgf)]	Fluid Pressure [MPa (kgf/cm ²)]
98{10}	0.17{1.73}
294{30}	1.78{18.2}

With VSC

Pedal Force [N (kgf)]	Fluid Pressure [MPa (kgf/cm ²)]
98{10}	0.24{2.45}
294{30}	1.88{19.2}

(e) INSPECT BRAKE BOOSTER OPERATION

- (1) Start the engine, have the negative pressure 66.7 kPa (500 mm Hg) inside the brake booster, then check the fluid pressure for each pedal force.

Standard:

For vehicles without VSC

Pedal Force [N (kgf)]	Fluid Pressure [MPa (kgf/cm ²)]
49{0}	3.11{31.7}
98{10}	5.81{59.3}
147{15}	8.81{89.9}
196{20}	9.21{93.9}

With VSC

Pedal Force [N (kgf)]	Fluid Pressure [MPa (kgf/cm ²)]
49{0}	3.23{32.9}
98{10}	5.98{61.0}
147{15}	9.02{92.0}
196{20}	9.43{96.2}

HINT:

If the brake booster assembly is defective, inspect the check valve; if the check valve has no error, replace the brake booster assembly.

- (f) Remove the portable brake tester.
 (g) Bleed air from the braking system. (See Page BR-5.)

3. INSPECT CHECK VALVE

- (a) Slide the clip, and disconnect the vacuum hose.
 (b) Check that there is air flow from the brake booster side to the engine side, and no air flow from the engine side to the brake booster side.

HINT:

If any defect is found, replace the vacuum check valve.

- (c) Connect the vacuum hose with the clip.

PROBLEM SYMPTOMS TABLE

Symptom	Suspected Area	See Page
The pedal drops down; feels soft when depressed	Brake system (fluid leaks)	-
	Brake system (air mixing)	BR-5
	Piston seals (abrasion or damage)	BR-25
	Wheel cylinder cup (broken) (rear drum)	BR-30
	Master cylinder (defect)	BR-15

Symptom	Suspected Area	See Page
Dragging of the brake	Brake pedal freeplay (minimum)	BR-12
	Parking brake lever clearance (out of adjustment)	-
	Brake shoe clearance (out of adjustment) (rear drum)	BR-32
	Parking brake wire (sticking)	-
	Pad (cracked or deformed) (front disc)	BR-25
	Brake shoe (cracked or deformed) (rear drum)	BR-32
	Piston (sticking) (front disc)	BR-25
	Wheel cylinder piston (sticking) (rear drum)	BR-30
	Piston (stuck) (front disc)	BR-25
	Wheel cylinder piston (stuck) (rear drum)	BR-30
	Tension or return spring (defect) (rear drum)	BR-30
	Booster system air leaks	BR-1
	Master cylinder (defect)	BR-15
Brake pulling to one side	Piston (sticking) (front disc)	BR-25
	Wheel cylinder piston (sticking) (rear drum)	BR-30
	Pad (oily) (front disc)	BR-25
	Brake shoe (oily) (rear drum)	BR-32
	Piston (stuck) (front disc)	BR-25
	Wheel cylinder piston (stuck) (rear drum)	BR-30
	Front disc (scratched)	BR-25
	Rear drum (scratched)	BR-32
	Pad (cracked or deformed) (front disc)	BR-25
	Brake shoe (cracked or deformed) (rear drum)	BR-32
The pedal is hard to depress, but the braking power is insufficient	Brake system (fluid leaks)	-
	Brake system (air mixing)	BR-5
	Piston (sticking) (front disc)	BR-25
	Wheel cylinder piston (sticking) (rear drum)	BR-30
	Pad (cracked or deformed) (front disc)	BR-25
	Brake shoe (cracked or deformed) (rear drum)	BR-32
	Pad (oily) (front disc)	BR-25
	Brake shoe (oily) (rear drum)	BR-32
	Pad (burned) (front disc)	BR-25
	Brake shoe (burned) (rear drum)	BR-32
	Front disc (scratched)	BR-25
	Rear drum (scratched)	BR-32
	Booster system air leaks	BR-1
Abnormal braking noise	Pad (cracked or deformed) (front disc)	BR-25
	Brake shoe (cracked or deformed) (rear drum)	BR-32
	Installation bolt (loose) (front disc)	BR-27
	Installation bolt (loose) (rear drum)	BR-32
	Front disc (scratched)	BR-25
	Rear drum (scratched)	BR-32
	Pad support plate (loose) (front disc)	BR-25
	Sliding pin (worn) (front disc)	BR-24
	Pad (dirty) (front disc)	BR-25
	Pad (burned) (front disc)	BR-25
	Lining (burned) (rear drum)	BR-32
	Tension or return spring (defect) (rear drum)	BR-30
	Anti-squeal shim (front disc)	BR-25
	Hold down spring (rear drum)	BR-30

