

Vehicle:	Year/Prod. Date:	Engine:	Transmission:

Objectives

After you complete the worksheet, check either “Yes” or “I Have Questions” for each objective. Your instructor will be checking with you to make sure you can complete each task.

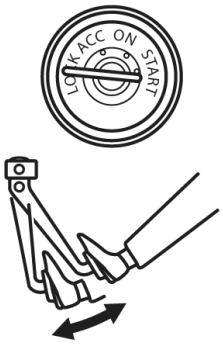
	Yes	I Have Questions
Demonstrate a booster operation check, describe normal results, and list two possible causes for abnormal results.	❑	❑
Demonstrate an air tightness check, describe normal results, and list three possible causes for abnormal results.	❑	❑
Demonstrate an air tightness test under load, describe normal results, and list three possible causes for abnormal results.	❑	❑

Tools and Equipment

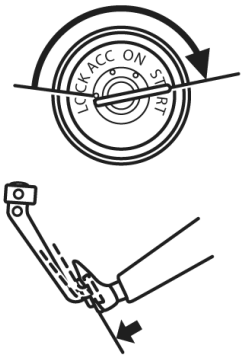
- Vehicle

Booster Operation Check

Engine Off



Engine Start



Procedure

1. Depress the brake pedal several times with the engine OFF to bleed off the booster vacuum.

2. With the brake pedal depressed, start the engine.

Summary

3. What happened to the brake pedal?

   _____

4. If the brake pedal position did not change, what are some likely causes?

   _____

   _____

5. If the brake pedal position did change, what does this tell you about the condition of the booster?

   _____

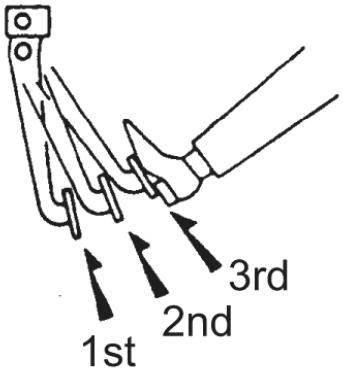
   _____

6. What caused the brake pedal to change position?

   _____

   _____

Air Tightness Check



Procedure

7. Start the engine and let it run for 1 or 2 minutes, then turn the engine off.

8. Press down on the brake pedal several times and note the position of the pedal each time. (Wait about 5 seconds between each stroke of the brake pedal.)

Summary

9. What happened to the brake pedal position after pressing down the brake pedal each time?

_____

_____

10. If the brake pedal position did not change, what are some likely causes?

_____

_____

11. If the brake pedal position did change, what does this tell you about the condition of the booster?

_____

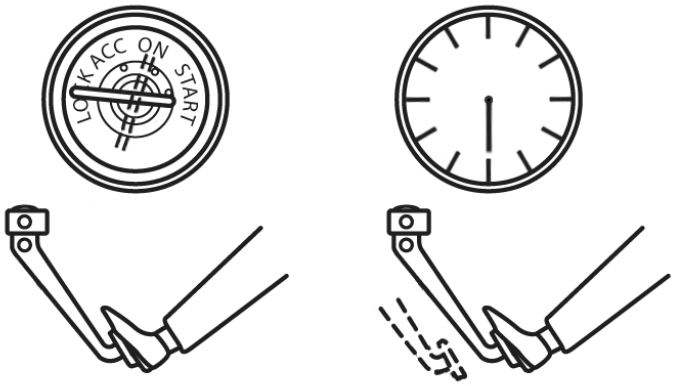
_____

12. What caused the brake pedal to change position?

_____

_____

Air Tightness Under Load



Procedure

13. Depress the brake pedal with the engine running, and then turn the engine OFF.

14. Hold the brake pedal for 30 seconds and note any change in position.

Summary

15. If the brake pedal position did not change, what does this tell you about the condition of the booster?

    _____

    _____

16. If the brake pedal position did change, what is a likely cause?

    _____

    _____

17. If the pedal slowly sinks to the floor, what is a likely cause?

    _____

    _____



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Objectives

After you complete the worksheet, check either “Yes” or “I Have Questions” for each objective. Your instructor will be checking with you to make sure you can complete each task.

	Yes	I Have Questions
Locate Brake Booster Push Rod SSTs on TIS.	❑	❑
Using an SST, demonstrate measurement of booster push rod to master cylinder clearance and adjust it to specifications.	❑	❑
Using a depth gauge, demonstrate measurements and calculations required to determine booster push rod to master cylinder clearance.	❑	❑
Describe the most likely symptoms of too little clearance and of too much clearance between booster push rod and master cylinder.	❑	❑

Tools and Equipment

- TIS access
- Depth micrometer
- Straight edge
- Push rod gauge (SST specific to vehicle)
- 10 mm combination wrench
- Tubing wrench set
- Plugs for master cylinder ports
- Vehicle

Locating Special Service Tools (SSTs) on TIS

1. Login to TIS.

2. On the TIS Home page, click **Special Service Tools** in the Service Resources section to open the Special Service Tools window.

3. In the Special Service Tools window, click **Brake** in the left-side navigation menu to open the Brake (BR) page 1.

4. How many pages is the list of Brake (BR) SSTs?

5. On the Brake (BR) page 1, which tools are indicated as “essential”?

6. On the Brake (BR) page 1, which tools are indicated as having “multiple tool components”?

7. On the Brake (BR) page 1, click **09737-00006-02** in the Tool Number column to view the Brake Push Rod Adjustment Tool. Which vehicle(s) is this tool for?

8. Click **Brake (BR)** in the “breadcrumb” navigation trail (i.e. Brake (BR) > 09737-00006-02) at the top of the screen to return to Brake (BR) page 1.

9. Which vehicle(s) is the 09737-00012-01 Brake Booster Push Rod Gauge for?

10. Which vehicle(s) is the 09737-00016-01 Brake Push Rod Adjustment Tool Set for?

11. How many Brake Push Rod Adjustment Tool Sets are available on the Brake (BR) page 2?

12. How many Brake Push Rod Wrenches are available on the Brake (BR) page 2?

13. Close the Special Service Tools window and logout of TIS before continuing with this worksheet.

Vehicle Preparation

14. With the engine off, pump the brake pedal several times to reduce vacuum in the booster.

15. Loosen and remove the brake tubes from the master cylinder.

16. Remove the master cylinder from the brake booster.

Measurement Using the Special Service Tool

17. Place a new gasket on the master cylinder.

18. Center the push rod gauge pin over the master cylinder piston and position the gauge on the gasket of the master cylinder.

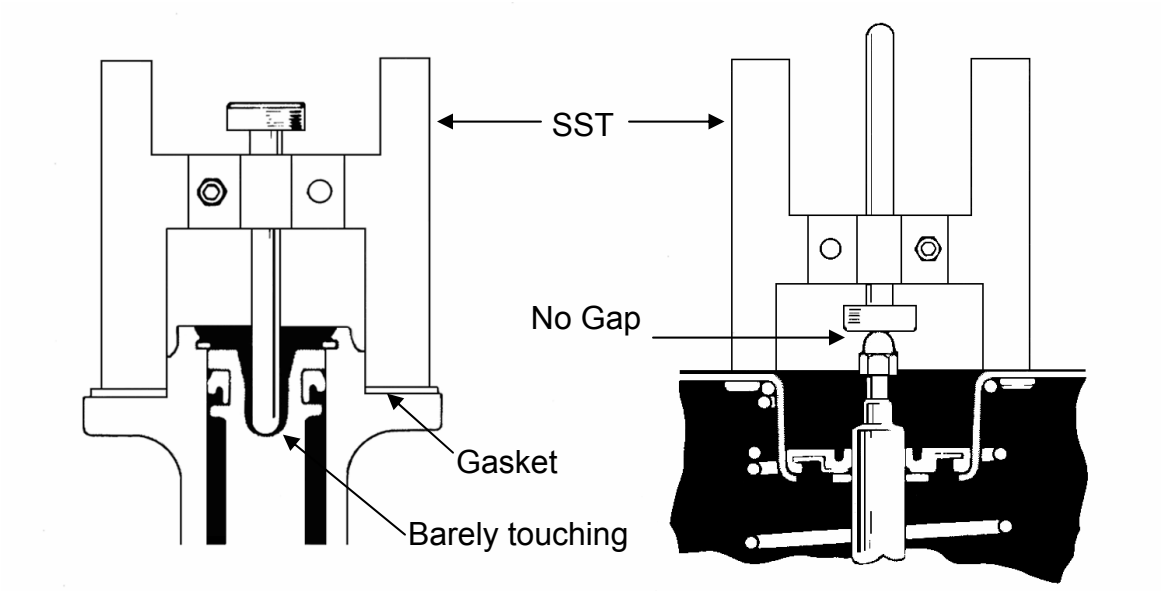
19. Lower the pin into the piston until it lightly touches the bottom of the bore.

20. Start the engine and turn the opposite end of the gauge and center the head of the pin over the booster push rod.

21. Adjust the push rod as needed to ensure that there is no gap between the push rod and the head of the pin.

22. Turn the engine OFF, deplete the vacuum in the booster by depressing the brake pedal several times.

23. Place the gauge over the booster push rod and push the pin toward the push rod.
    Did the pin move? _____
    Why? _____



Establishing Piston Depth **Adjusting Booster Push Rod**

Summary

24. List two occasions when this adjustment should be done.

_____

_____

25. What difference is there between performing the adjustment with the engine running and not running?

_____

_____

26. If the push rod was too long, what is the most likely result?

_____

_____

27. If the push rod is too short (the clearance between the push rod and master cylinder piston is too great), what is the most likely result?

_____

_____