

Chapter 81

Brake System Diagnosis, Service, and Repair



Name _____

Date _____

Instructor _____

Score _____

Objective: After studying this chapter, you will be able to diagnose and repair common brake system problems.

Brake System Problem Diagnosis

1. What symptoms should you use when diagnosing brake system troubles?

- _____ 2. Technician A says many modern brake systems, especially those with ABS (anti-lock braking systems) provide on-board diagnostics. Technician B says no brake system has self-diagnostics. Who is right?
- (A) A only.
 - (B) B only.
 - (C) Both A and B.
 - (D) Neither A nor B.
- _____ 3. All of the following can cause brake pedal vibration, *except*:
- (A) hard spots on the brake disc.
 - (B) warped disc.
 - (C) out-of-round brake drum.
 - (D) air in the brake line.
- _____ 4. A vehicle's brakes grab. Which of the following is the *least likely* cause?
- (A) Worn brake linings.
 - (B) Grease on the linings.
 - (C) Clogged brake hose or line.
 - (D) Malfunctioning brake booster.
- _____ 5. Technician A says excessive brake pedal effort may be caused by brake fluid on the linings. Technician B says excessive brake pedal effort may be caused by air in the brake system. Who is right?
- (A) A only.
 - (B) B only.
 - (C) Both A and B.
 - (D) Neither A nor B.

6. What happens with *brake pull*, and what are the most common causes?

7. What is the most common cause of a spongy brake pedal?

8. What would be the cause of a dropping brake pedal with no fluid loss from the system?

- _____ 9. All of the following are causes of a low brake pedal, *except*:
- (A) overadjusted parking brake.
 - (B) mechanical problem in the brake assemblies.
 - (C) inoperative brake adjusters.
 - (D) maladjusted master cylinder push rod.

10. What can cause metal-on-metal grinding when braking?

11. What can cause squeaking when braking?

12. What can cause rattling when braking?

Name _____

Brake System Inspection

- _____ 13. Technician A says brake pedal height is the distance from the pedal to the floor with the pedal fully released. Technician B says brake pedal free play is the amount of pedal movement before the beginning of brake application. Who is right?
- (A) A only.
 (B) B only.
 (C) Both A and B.
 (D) Neither A nor B.

- _____ 14. The brake pedal reserve distance on a vehicle is incorrect. Which of the following is the *most likely* cause?
- (A) Weak return spring.
 (B) Air in the system.
 (C) Leaking power booster.
 (D) Inoperative brake light switch.

15. What could happen if oil, grease, and other substances contaminated the brake fluid?

16. How will brake fluid leakage show up?

17. How do you check a parking brake?

- _____ 18. During a parking brake inspection, the cables were found to be frayed. Technician A says some fraying is okay. Technician B says the cables should be replaced. Who is right?
- (A) A only.
 (B) B only.
 (C) Both A and B.
 (D) Neither A nor B.

19. How much wear would require brake pad or shoe replacement?

20. Explain the danger of and precautions concerning asbestos dust on older brake shoes and pads.

Vacuum Booster Service

21. Describe the inspection of a vacuum brake booster.

- _____ 22. Technician A says all vacuum boosters can be rebuilt. Technician B says most shops install new or rebuilt vacuum boosters. Who is right?
- (A) A only.
 - (B) B only.
 - (C) Both A and B.
 - (D) Neither A nor B.

Hydraulic Booster Service

23. If a hydraulic booster is inoperative, what should be checked first?

24. What should be done if a hydraulic booster is found to be faulty?

Master Cylinder Service

25. When a master cylinder fails and leaks internally, what happens to the brake system?

Name _____

- _____ 26. Technician A says you can clean the hydraulic parts of a brake system with conventional parts cleaners. Technician B says you can clean brake parts in gasoline. Who is right?
- (A) A only.
 (B) B only.
 (C) Both A and B.
 (D) Neither A nor B.
27. What tools should be used to measure master cylinder piston-to-cylinder clearance?

Brake System Bleeding

28. What is *brake system bleeding*?

29. How do you manually bleed a brake system?

- _____ 30. Technician A says you should start bleeding at the wheel brake assembly farthest from the master cylinder. Technician B says some brake systems require special procedures when bleeding. Who is right?
- (A) A only.
 (B) B only.
 (C) Both A and B.
 (D) Neither A nor B.
- _____ 31. All of the following are steps in pressure bleeding, *except*:
- (A) install a special adapter over the master cylinder reservoir.
 (B) pour enough brake fluid in the bleeder tank to reach the prescribed level.
 (C) fill the master cylinder with brake fluid.
 (D) charge the tank with 100–150 psi (690–1034 kPa) of air pressure.

32. What is different about pressure bleeding a brake system when the master cylinder has a plastic reservoir?

33. What is the procedure for vacuum bleeding a brake system?

34. What type of tubing should you use when replacing brake lines?

Disc Brake Service

_____ 35. All of the following are major operations needed for disc brake service, *except*:

- (A) rebuilding caliper assembly.
- (B) replacing the wheel bearings.
- (C) turning (machining) brake discs.
- (D) replacing worn brake pads.

_____ 36. Technician A says you should hang the caliper by a piece of wire if it is not being removed. Technician B says you can simply let the caliper hang by the brake hose. Who is right?

- (A) A only.
- (B) B only.
- (C) Both A and B.
- (D) Neither A nor B.

37. Why is it *not* advisable to service only the left or right brake assembly?

38. What should be done when a caliper piston is frozen?

Name _____

- _____ 39. Technician A says light imperfections on a caliper cylinder wall can be removed with a cylinder hone. Technician B says if excessive honing is required, the caliper should be replaced. Who is right?
- (A) A only.
 - (B) B only.
 - (C) Both A and B.
 - (D) Neither A nor B.

Brake Disc (Rotor) Service

40. How do you measure brake disc runout?

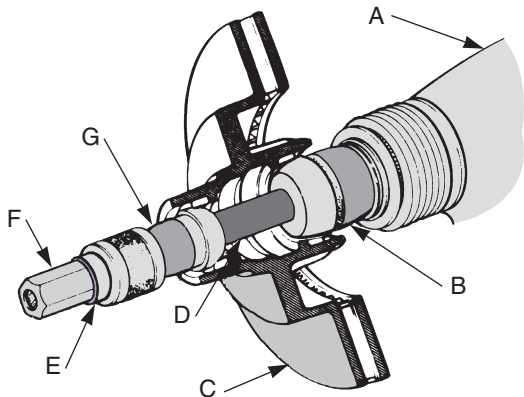
41. Minimum brake disc thickness will usually be printed on the side of the _____.

42. What can happen if a brake disc is too thin?

43. A(n) _____ needs to be wrapped around the disc to prevent high-frequency vibration and squeal.

- _____ 44. How much metal should be machined from a brake disc?
- (A) Enough to clean all imperfections.
 - (B) Just enough to true the disc.
 - (C) All the metal.
 - (D) Enough to equal the number on the disc.

45. Label the parts of the brake lathe shown below.



- (A) _____
- (B) _____
- (C) _____
- (D) _____
- (E) _____
- (F) _____
- (G) _____

46. When would an on-car disc lathe be a time-saver?

- _____ 47. All of the following are performed during disc brake reassembly, *except*:
- (A) apply high-temperature silicone on the friction linings.
 - (B) fit the caliper assembly in place.
 - (C) apply a small amount of grease to the caliper mounting bolt threads.
 - (D) torque all fasteners to specs.

48. What can happen if you accidentally get oil or grease on a brake disc during installation?

- _____ 49. Technician A says brake rotors or discs can always be changed from right to left without problems. Technician B says rotors must be reinstalled on the side they came off. Who is right?
- (A) A only.
 - (B) B only.
 - (C) Both A and B.
 - (D) Neither A nor B.

Drum Brake Service

50. What should be done if a drum is rusted to the axle flange?

51. Describe drum brake disassembly.

Name _____

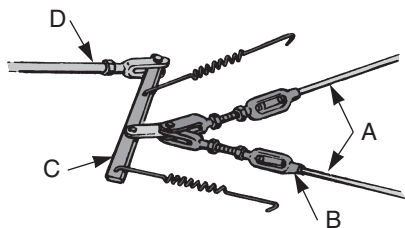
- _____ 52. A wheel cylinder shows signs of leakage when its boots are pulled back. Technician A says the wheel cylinder must be removed before disassembly. Technician B says the wheel cylinder can often be serviced while bolted to the backing plate. Who is right?
- (A) A only.
 (B) B only.
 (C) Both A and B.
 (D) Neither A nor B.
53. Describe how to hone a wheel cylinder.
- _____
- _____
- _____
- _____
54. Where is the wheel cylinder cup size printed?
- _____
- _____
55. What is *brake drum resurfacing*?
- _____
- _____
- _____
56. Why should you lubricate the small pads or bumps on the backing plate?
- _____
- _____
- _____
- _____ 57. Technician A says new brake shoes should rock slightly when moved in the drum. Technician B says they should conform perfectly when placed in the drum. Who is right?
- (A) A only.
 (B) B only.
 (C) Both A and B.
 (D) Neither A nor B.
58. A properly adjusted drum brake should _____ when _____ turned by hand.

Parking Brake Adjustment

59. What must normally be tightened to adjust the parking brake?
- _____
- _____
- _____

- _____ 60. Technician A says the parking brakes should drag lightly when released. Technician B says the parking brakes should not drag when released. Who is right?
- (A) A only.
 - (B) B only.
 - (C) Both A and B.
 - (D) Neither A nor B.

61. List the parking brake parts shown here.



- (A) _____
- (B) _____
- (C) _____
- (D) _____