

# QUESTIONS - Brakes

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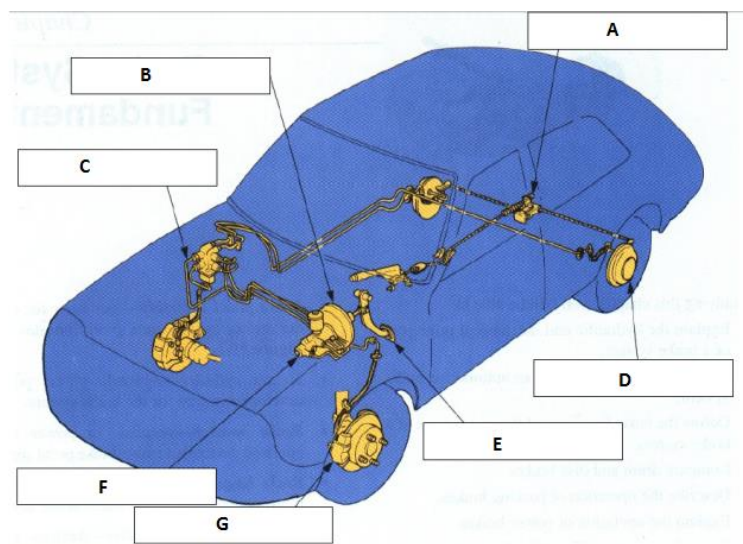
First & Last Name:

Using the information located in [www.gwellwood.com/subjects/mechanics/brakes/](http://www.gwellwood.com/subjects/mechanics/brakes/), the internet, your brain, and other sources to answer the following questions.

This is a BIG unit. Work quickly.

1. Identify the components:

- a.
- b.
- c.
- d.
- e.
- f.
- g.



2. There are two common types of brake systems. What are they?

- a.
- b.

3. What does “Self-Energizing” mean?

4. On a Self-Energizing brake system, the brake shoes will come with two sizes. Which brake shoe is installed facing front?

5. On a Self-Energizing brake system, what do you think would happen if you put the primary and secondary shoes facing the incorrect way?

6. What requires more EFFORT to stop – Old-School Drum Brakes, or Modern Disc Brakes?

7. VIDEO QUESTION (Donut Media): The wheel has energy in the form of \_\_\_\_\_. The brakes apply friction and create \_\_\_\_\_.

8. VIDEO QUESTION (Donut Media): Describe in your own words how a DRUM BRAKE works:

9. VIDEO QUESTION (Donut Media): \_\_\_\_\_ brakes use pressurized fluid to push the brakes.

10. VIDEO QUESTION (Donut Media): What is the major drawback of Drum Brakes?

11. VIDEO QUESTION (Donut Media): Describe in your own words how a DISC BRAKE works:

12. VIDEO QUESTION (Donut Media): The front brake does about \_\_\_\_\_ % of the work.
13. VIDEO QUESTION (Donut Media): Squealing brakes means something is \_\_\_\_\_.

### Force, Pressure and Area

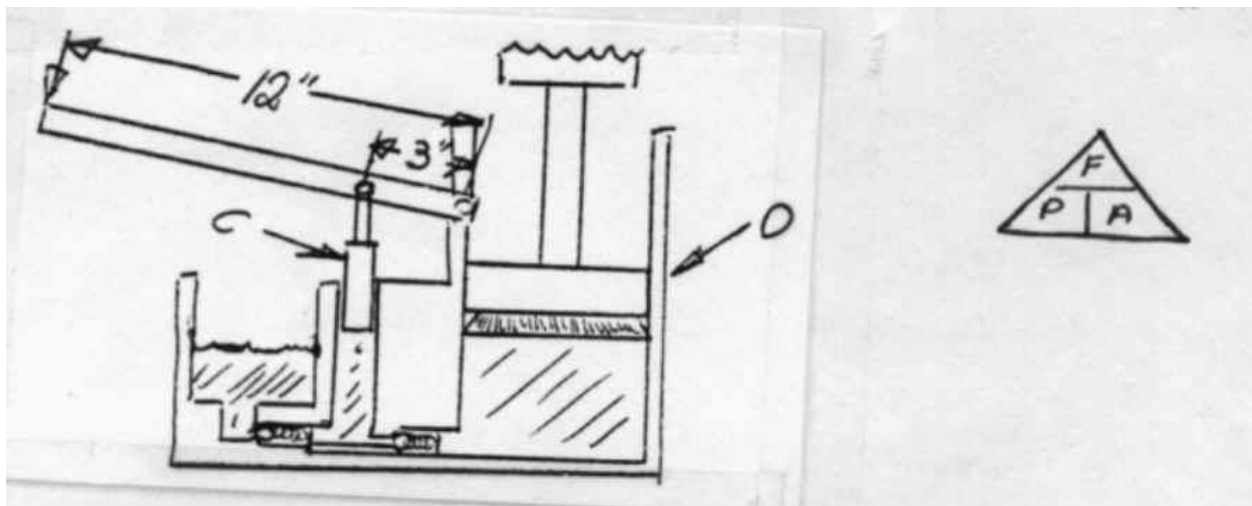
*When a liquid in an enclosed container is pressurized, that pressure is distributed equally throughout the system. That force is measured in POUNDS per SQUARE INCH (PSI). We can increase this force by increasing the surface area*

$$\text{Force} = \text{Pressure} \times \text{Area}$$

$$\text{Pressure} = \text{Force} / \text{Area}$$

$$\text{Area} = \text{Force} / \text{Pressure}$$

Use the picture below for the following questions



14. If I apply 1 pound of force to the lever in the diagram, how much force is applied to the piston? (tip: The applying force is 12" away from the pivot, the receiving force is 3" away from the pivot.)

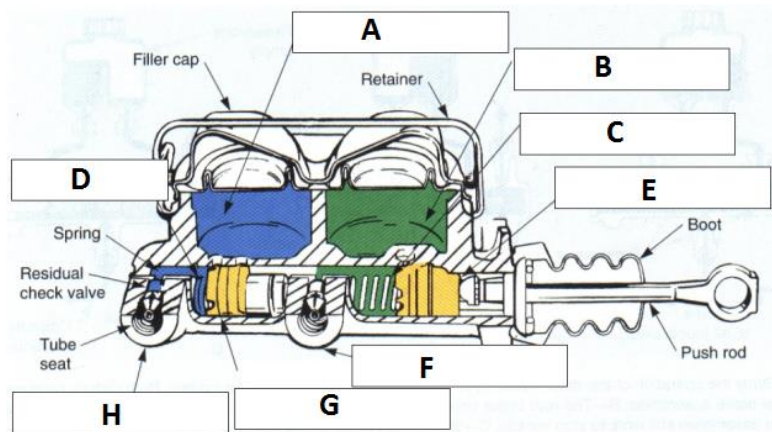
15. If 10 pounds of force is applied to piston "C", how much pressure is applied to the fluid if the piston is 1 square inch in area? (tip:  $Pressure = Force / Area$ )

16. If 10 pounds of force is applied to piston "C", how much pressure is applied to the fluid if the piston is 1/2 square inch in area?

17. If 10 psi is applied to the hydraulic fluid, how much force is applied to piston "D" if the piston is 10 square inches in area? (tip:  $Force = Pressure \times Area$ )

18. Identify the components:

- a.
- b.
- c.
- d.
- e.
- f.
- g.
- h.



19. How does a Tandem Master Cylinder continue to work when half the system has a leak?

20. Why are *Diagonally-Split* brake systems used on Front Wheel Drive (FWD) cars?

21. What are two things you should look for when inspecting master cylinders?

a.

b.

22. Brake lines usually have a flexible section near the wheels – why do you think this is?

23. Identify the following components:

a.

b.

c.

d.

e.

f.

g.

h.

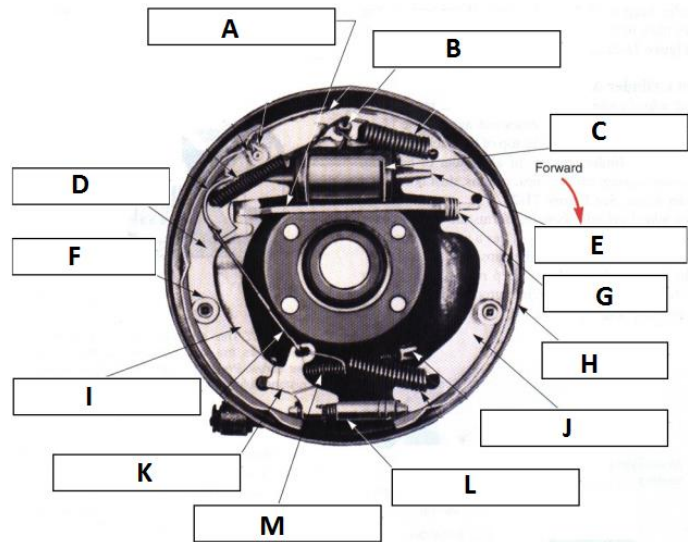
i.

j.

k.

l.

m.

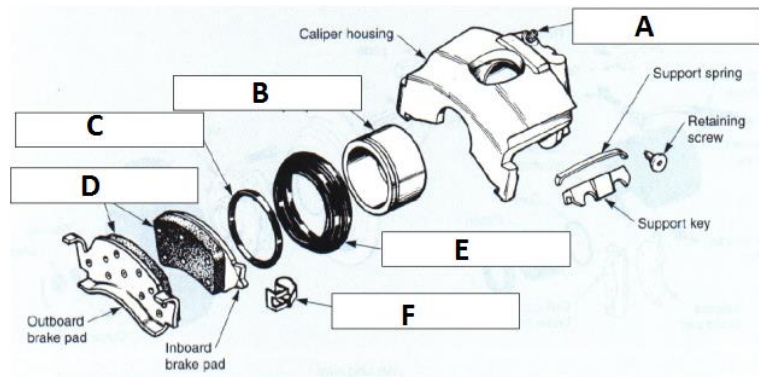


24. What are FIVE (5) things to remember when doing a Drum Brake Job (you've passed them – in Green)

- a.
- b.
- c.
- d.
- e.

25. Identify the components:

- a.
- b.
- c.
- d.
- e.
- f.



26. What part of a Disc Brake caliper allows it to “self-adjust,” and *HOW DOES IT DO THAT?*

27. How does a floating caliper apply *both* pads at the same time? (hint: it's *because* it floats that this happens)

28. What are two things to keep in mind when doing a disc brake job?

a.

b.

29. What is the significant advantage of Fixed Calipers?

30. What is the health risk of brake friction material?

31. What are two properties of Brake Fluid?

a.

b.

32. VIDEO QUESTION (Scotty Kilmer): Describe in your own words "How to Replace Brake Pads in Your Car":



33. Why should a brake rotor be either re-machined, or just replaced with new, when doing a brake job?

34. What happens if the brake rotor is machined too thin?

35. VIDEO QUESTION (Me): Describe in your own words how to repack wheel bearings:



36. What are two important things to know about brake fluid?

a.

b.

37. What are two important things to NEVER do with brake fluid?

a.

b.

38. VIDEO QUESTION (Popular Mechanics): Describe in your own words, how to bleed brakes:

39. Cars with Discs AND Drums have a Metering Valve. What does it do?

40. Describe, using your own words, the PURPOSE of the Pressure Differential Valve:

41. VIDEO QUESTION (Nashville Early Bronco): Describe, using your own words, the PURPOSE of the Proportioning Valve:

42. Why is a Combination Valve called a combination valve?

43. What are two ways in which a Parking Brake is used on a vehicle equipped with four wheel disc brakes

a.

b.

44. Why does the Parking Brake usually seize on vehicles with Automatic Transmissions?

45. Why, in your opinion, do most vehicles today have Power Brakes?

46. Describe, using your own words, how the Power Brake Booster works:

47. What is the advantage of Anti-Lock Brakes?

48. VIDEO QUESTION (Peter Winther Friis): ABS brake systems consist of:

- a.
- b.
- c.
- d.
- e.

49. VIDEO QUESTION (Peter Winther Friis): As the wheel turns, a small \_\_\_\_\_ is induced into the pickup, and sent to the ECU.

50. VIDEO QUESTION (Peter Winther Friis): If the control unit detects that a wheel might lock, it sends a signal to the \_\_\_\_\_ unit.

51. In what driving situation do –you- think Anti-Lock Brakes be LESS effective than regular brakes?



52. A Disc/Drum vehicle has a low, but hard brake pedal. What is the most likely problem?

53. A brake pedal is soft and squishy. What is the most likely problem?

54. A disc brake caliper shows the inside pad (closest to the piston) is worn out, and the outside pad (closest to the wheel) is hardly used. What is the most likely problem?

55. How would you fix the problem in the question above?