

Chapter 40

Fuel Tanks, Pumps, Lines, and Filters



Name _____

Date _____

Instructor _____

Score _____

Objective: After studying this chapter, you will be able to describe and explain the components, operations, construction, and service procedures of modern automotive fuel supply systems.

Fuel Supply System

1. A fuel system must provide a(n) _____ air-fuel mixture to power the engine.

2. Name and explain the three subsystems of a modern fuel system.

(A) _____

(B) _____

(C) _____

3. Modern vehicles use _____ and _____ fuel pumps in tandem.

4. List and explain the basic parts of a fuel supply system.

5. What term describes the distance a vehicle can be driven without stopping for fuel?

6. Automotive fuel tanks are normally made of what materials?

7. The filler _____ is the extension tube that allows the gas pump nozzle to be used to fill the tank with fuel.

8. Define *spillback ball*.

9. Describe the purpose of fuel tank baffles.

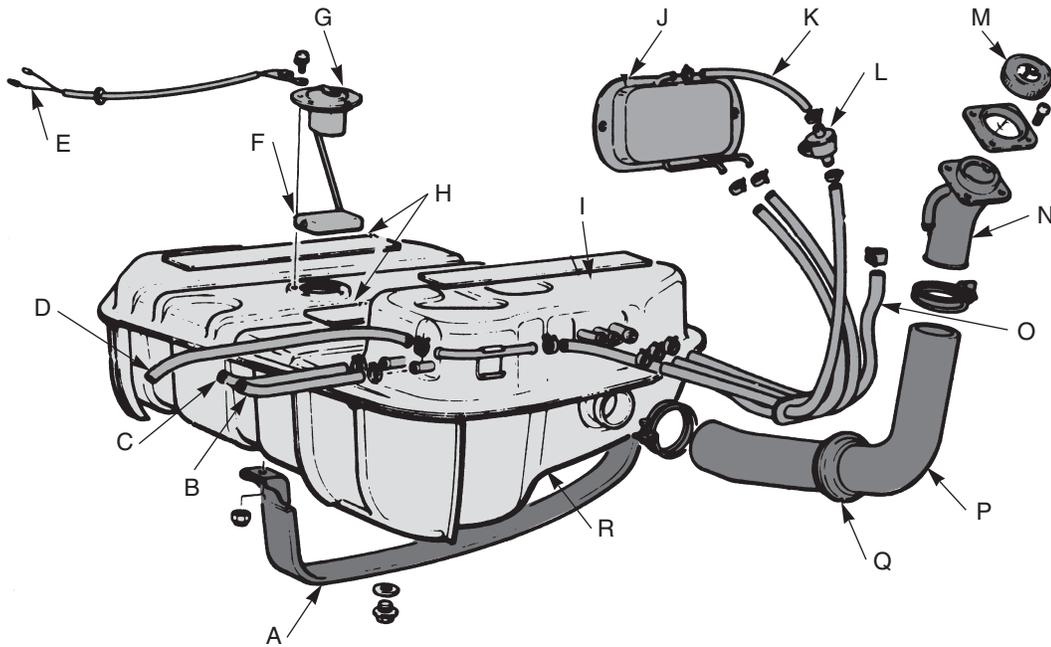
10. Fuel tank _____ are used to secure the tank to the vehicle.

11. Explain the operation of a tank pick-up sending unit.

12. Explain the function of a fuel tank pressure sensor.

Name _____

13. Identify the basic parts of the fuel tank assembly.



- | | |
|-----------|-----------|
| (A) _____ | (J) _____ |
| (B) _____ | (K) _____ |
| (C) _____ | (L) _____ |
| (D) _____ | (M) _____ |
| (E) _____ | (N) _____ |
| (F) _____ | (O) _____ |
| (G) _____ | (P) _____ |
| (H) _____ | (Q) _____ |
| (I) _____ | (R) _____ |

14. Fuel lines are normally made of what materials?

15. A fuel _____ is a large-diameter fuel line that feeds fuel to the inlet openings of the fuel injectors.

16. Fuel _____ are needed where severe movement occurs between fuel system parts.

17. Hose _____ secure fuel hoses to fuel lines or metal fittings.

18. Describe the function of a fuel return system.

19. Explain the purpose of fuel filters.

20. Where are fuel filters normally located in an automotive fuel system?

21. What is the most common fuel filter element found in gasoline fuel systems?

22. What type of fuel filter can be found on modern diesel engines?

23. Name three locations where a fuel filter may be found.

24. Describe the function of a fuel pump.

25. A(n) (mechanical, electric) _____ fuel pump is a low-pressure feed pump inside the fuel tank or in series with a fuel line.

26. A(n) (mechanical, electric) _____ fuel pump is a high-pressure fuel pump mounted on the engine.

27. A mechanical fuel pump is usually powered by a(n) _____ on the engine camshaft.

28. Mechanical fuel pumps can still be found on _____-type fuel systems.

Name _____

29. Name the two types of check valves used in mechanical fuel pumps.

30. During the fuel pump (pressure, charging) _____ stroke, the eccentric lobe pushes on the mechanical fuel pump rod and plunger.

31. On the fuel pump (pressure, charging) _____ stroke, the eccentric lobe rotates away from the fuel pump.

32. Describe the function of a fuel pump gasket.

_____ 33. Fuel pump pressures can reach as high as _____ psi.

- (A) 100
- (B) 500
- (C) 1000
- (D) 2000

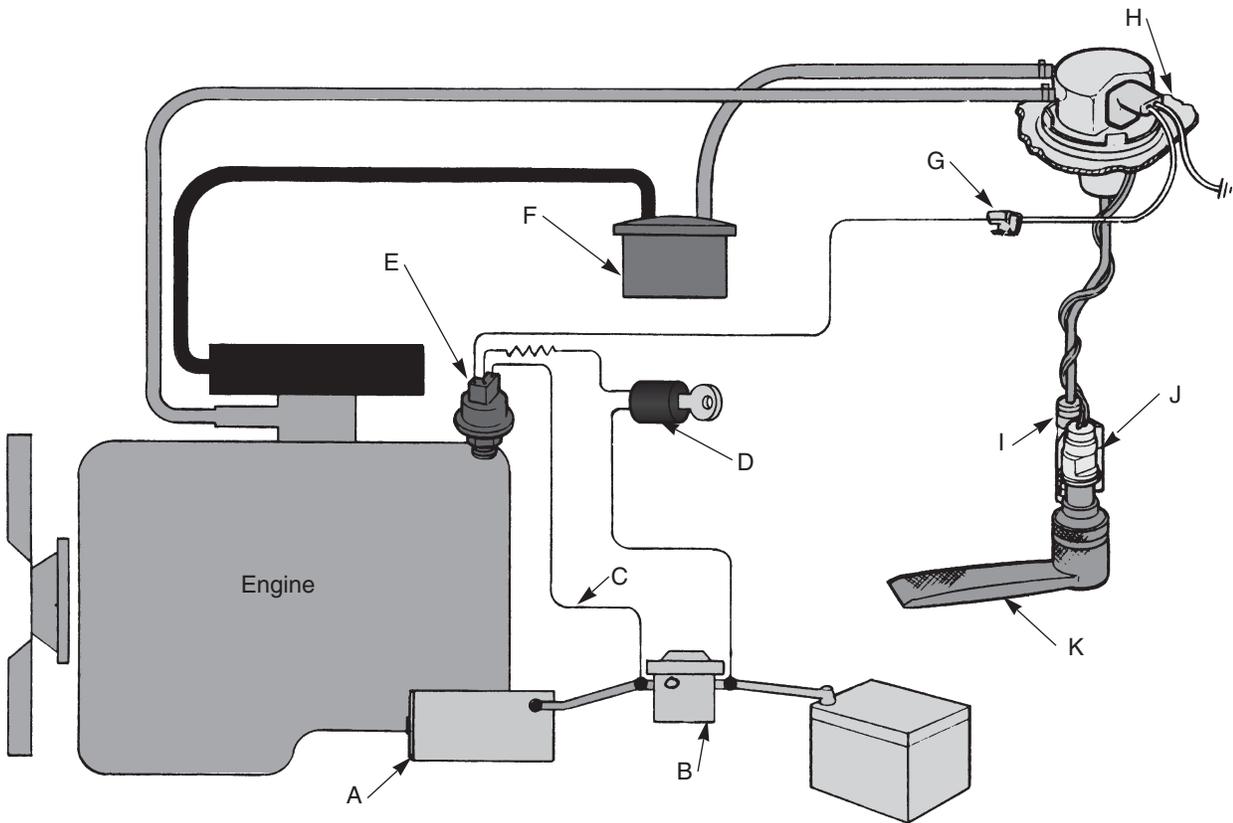
34. Where is an electric fuel pump normally located?

35. Explain some of the advantages an electric fuel pump has over a mechanical pump.

For questions 36–39, match the following terms and identifying phrases.

- | | |
|---|--------------------------------------|
| _____ 36. Uses square vanes instead of round rollers. | (A) Impeller electric fuel pump |
| _____ 37. Uses a solenoid instead of a rocker arm. | (B) Roller vane electric fuel pump |
| _____ 38. A centrifugal pump. | (C) Sliding vane electric fuel pump |
| _____ 39. A positive-displacement pump. | (D) Reciprocating electric fuel pump |

40. The ____ in a rotary electric fuel pump keep fuel from draining out of the fuel line when the pump is not running. _____
41. What limits maximum output pressure in a rotary electric fuel pump? _____
42. An inertia ____ cuts electric fuel pump power in the event of a serious auto collision or accident. _____
43. Name the safety feature that protects the engine from damage by shutting off the fuel pump if the oil pressure is low. _____
44. *True or False?* A leaking tank should be welded or soldered. _____
45. Identify the components shown below.



- | | |
|-----------|-----------|
| (A) _____ | (G) _____ |
| (B) _____ | (H) _____ |
| (C) _____ | (I) _____ |
| (D) _____ | (J) _____ |
| (E) _____ | (K) _____ |
| (F) _____ | |

Name _____

Fuel Supply System Service

46. Why is a scan tool helpful when servicing a fuel supply system?

47. Define *vapor lock*.

48. Name some typical fuel tank problems.

49. Describe the procedures used to remove an automotive fuel tank.

50. What normally is the cause of a faulty fuel tank sending unit?

51. Explain how to remove a fuel tank sending unit.

52. Some late-model fuel lines have a(n) _____-type fitting. _____

53. List and explain at least three of the rules you should remember when working with fuel lines and hoses.

(A) _____

(B) _____

(C) _____

54. How can a clogged fuel filter affect engine operation?

55. Some fuel filters have a(n) _____ that opens when the filter becomes clogged.

56. _____ fuel pump pressure can be caused by worn pump bearings, high resistance in electric pump circuit, leaking check valves, or physical wear of moving parts.

57. _____ fuel pump pressure is commonly caused by an inoperative pressure relief valve.

58. What are the usual causes of mechanical fuel pump noise?

59. What normally causes fuel pump leaks?

60. Fuel pump testing commonly involves measuring fuel pump _____ and _____.

61. Name three things that can be checked with a scan tool.

Name _____

62. Name two things that can cause a fuel pump to fail.

63. Describe how to measure fuel pump pressure.

64. What should be the fuel pressure for a diesel supply pump?

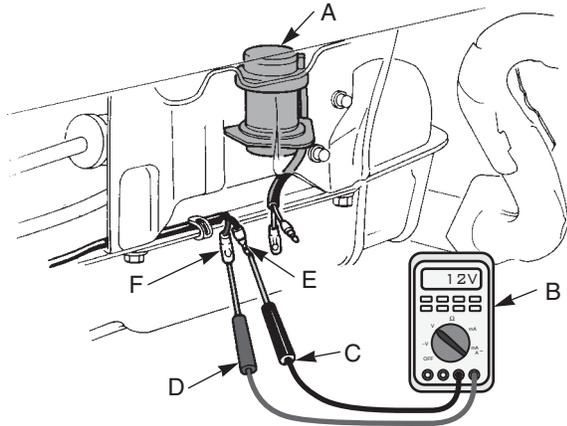
65. Describe how to check fuel pump volume.

66. Fuel pump _____ should be checked when a fuel pump fails pressure and volume tests.

67. Explain how to measure fuel pump vacuum.

68. Name some problems that can affect electric fuel pump operation.

69. Label the components and testing instruments in the following illustration depicting a fuel pump voltage supply test.



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

70. A(n) _____ can be used to block current flow to the electric fuel pump after a severe impact or collision.

71. A(n) _____ switch in the circuit signals the ECM to shut off the electric fuel pump if engine oil pressure drops too low.

72. Describe how to remove a mechanical fuel pump.

73. Explain how to remove an inline electric fuel pump.

74. What is the function of an air filter?
