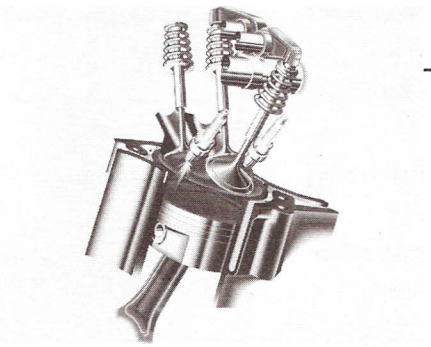


Chapter 11

Engine Fundamentals

Name: _____ Date: _____

Instructor: _____ Score: _____ Textbook pages 141–157

Objective: After studying this chapter, you will be able to explain the basic operation and construction of a modern automotive engine.

Engine Operation

1. Why is an automotive engine called a *power plant?* _____

2. The _____ is the hollow area between the top of the piston and the bottom of the cylinder head. 2. _____

3. How does an engine convert fuel into a useful form of energy? _____

4. Piston _____ is the distance the piston slides up or down from TDC/BDC. 4. _____

5. Name the four strokes of an automotive engine. _____

6. The crankshaft must rotate _____ complete revolutions to complete the four-stroke cycle. 6. _____

Engine Bottom End

7. The engine _____ forms the main body of the engine. 7. _____

8. The _____ are large, round holes machined through the block from top to bottom. 8. _____

9. Define *deck surface.* _____

10. _____ are coolant passages through the block that allow a solution of water and antifreeze to cool the cylinders. 10. _____

11. The _____ are holes machined in the bottom of the block to hold the crankshaft. 11. _____

12. _____ bolt to the bottom of the block and hold the crankshaft and main bearing inserts in place. 12. _____

13. The _____ changes the up-and-down motion of the pistons into a rotating motion. 13. _____

14. What is the purpose of crankshaft counterweights? _____

_____

_____

15. The _____ provides a mounting place for the camshaft drive mechanism, front damper, and fan belt pulleys. 15. _____

16. What is the function of the *crankshaft flange?* _____

_____

_____

17. Engine main bearings are inserts that fit between the block main bore and crankshaft _____. 17. _____

18. A main _____ limits how far the crankshaft can slide forward or rearward in the block. 18. _____

19. What is *main bearing clearance?* _____

_____

_____

20. An engine's rear main _____ can be a one- or two-piece seal. 20. _____

21. List three functions of an *engine flywheel.*

(1) _____

_____

(2) _____

_____

(3) _____

_____

22. The connecting rod transfers piston _____ and combustion pressure to the crankshaft _____. 22. _____

_____

23. _____ clearance is the small space between the rod bearing and crankshaft journal. 23. _____

24. Describe the purpose of an engine *piston.* _____

_____

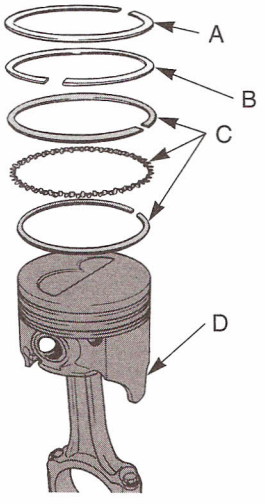
_____

_____

_____

25. Name six parts of an engine piston. _____

26. Identify the parts of the engine piston illustrated below.



(A) _____

(B) _____

(C) _____

(D) _____

27. Piston _____ must keep combustion pressure from entering the crankcase and must also keep ____ out of the combustion chamber. 27. _____

28. Name the two types of piston rings and explain their functions. _____

29. The split between the ends of a piston ring is called _____. 29. _____

Engine Top End

30. What is *engine top end?* _____

31. _____ are small pockets formed in the cylinder heads where the fuel burns. 31. _____

32. The _____ route air or air and fuel into the combustion chambers. 32. _____

33. What components normally make up a *valve train?* _____

34. Describe the function of the engine *valve train.* _____

35. Where is an engine *camshaft* normally located? _____

36. A(n) _____ usually rides on the cam lobes and transfers motion to the rest of the valve train. 36. _____

37. _____ transfer motion between the lifters and the rocker arms. 37. _____

38. Which is usually larger, the intake valve or the exhaust valve? 38. _____

39. Define *valve face.* _____

40. The valve _____ is a long shaft extending out of the valve head. 40. _____

41. Explain the function of *valve seals.* _____

42. On late-model engines, the fuel injectors and the throttle body mount on the _____ manifold. 42. _____

43. Explain the function of an *exhaust manifold.* _____

44. The _____ cover is a thin metal or plastic cover over the top of the cylinder head. 44. _____

Engine Front End

45. What is the function of an *engine front end?* _____

46. A(n) _____ is needed to turn the camshaft at one-half engine speed. 46. _____

47. Explain the purpose of an automotive engine's *crank damper.* _____