

Chapter 01: Classroom Manual Automotive Engines

1. Automotive engines are called internal combustion engines because the fuels burn within the engine.

- a. True
- b. False

ANSWER: True

2. The powertrain includes the engine, transmission, axles, and suspension system.

- a. True
- b. False

ANSWER: False

3. The camshaft is a shaft with eccentrically-shaped lobes on it to force the opening of the valves.

- a. True
- b. False

ANSWER: True

4. Both the cooling and lubrication systems remove heat from the engine.

- a. True
- b. False

ANSWER: True

5. Henry Ford's Model T used a 2.7 liter engine that produced 80 horsepower.

- a. True
- b. False

ANSWER: False

6. A modern engine can provide good performance and smooth operation in a variety of temperatures, pressures, and operating conditions.

- a. True
- b. False

ANSWER: True

7. During the previous 100 years, ICE performance has remained about the same while emissions have improved slightly.

- a. True
- b. False

ANSWER: False

8. Refinements to modern engines have allowed gains in performance; however, the gains have come with a cost of decreased fuel efficiency.

- a. True
- b. False

ANSWER: False

9. The powertrain control module controls fuel delivery to the engine.

- a. True

Chapter 01: Classroom Manual Automotive Engines

b. False

ANSWER:

True

10. Lighter materials within the engine have allowed weight reductions.

a. True

b. False

ANSWER:

True

11. All of the following are characteristics of modern engines, EXCEPT:

- a. increased fuel economy.
- b. increased maintenance requirements.
- c. reduced emissions.
- d. reduced weight.

ANSWER:

b

12. All of the following are parts of the combustion chamber, EXCEPT:

- a. piston.
- b. intake valve.
- c. exhaust valve.
- d. camshaft.

ANSWER:

d

13. All of the following are contained in the engine block, EXCEPT:

- a. pistons.
- b. crankshaft.
- c. valves.
- d. connecting rods.

ANSWER:

c

14. Engine location is being discussed. Technician A says most trucks use a transversely mounted engine. Technician B says longitudinally mounted engines are common in RWD vehicles. Who is correct?

- a. Technician A
- b. Technician B
- c. both A and B
- d. neither A nor B

ANSWER:

b

15. Basic engine operation is being discussed. Technician A says camshafts control the operation of the valves. Technician B says camshafts control the timing of the valves. Who is correct?

- a. Technician A
- b. Technician B
- c. both A and B
- d. neither A nor B

Chapter 01: Classroom Manual Automotive Engines

ANSWER:

c

16. Valve timing refers to:

- a. how long the valves are held open.
- b. the relationship between cam and crank rotation.
- c. the relationship between how long a valve is open compared to closed.
- d. none of these

ANSWER:

b

17. The engine in a vehicle with an automatic transmission will be connected to the transmission by which of the following?

- a. flexplate
- b. flywheel
- c. clutch
- d. pressure plate

ANSWER:

a

18. All of the following are functions of the transmission EXCEPT:

- a. torque multiplication to increase power.
- b. reduce torque and increase speed.
- c. gear reduction to decrease torque.
- d. manipulate torque to drive the wheels.

ANSWER:

c

19. Engine heat is removed by which of the following?

- a. air passing over the radiator
- b. oil lubricating moving components
- c. engine surface area to the surrounding air
- d. all of these

ANSWER:

d

20. Engine breathing is being discussed. Technician A says the engine breathes through the intake and exhaust systems. Technician B says any restriction in intake or exhaust system will negatively affect an engine's performance. Who is correct?

- a. Technician A
- b. Technician B
- c. both A and B
- d. neither A nor B

ANSWER:

c

21. All of the following are part of the cylinder head EXCEPT:

- a. camshaft.
- b. connecting rods.
- c. valves.

Chapter 01: Classroom Manual Automotive Engines

- d. rocker arms.

ANSWER:

b

22. All of the following are components of the valvetrain EXCEPT:

- a. pushrod.
- b. lifter.
- c. springs.
- d. crankshaft.

ANSWER:

d

23. What can result from a failure of the timing belt or chain?

- a. bent valves
- b. piston damage
- c. complete engine failure
- d. all of these

ANSWER:

d

24. The piston is attached to the crankshaft by:

- a. a valve.
- b. the engine block.
- c. a connecting rod.
- d. a pushrod.

ANSWER:

c

25. Camshafts are being discussed. Technician A says the camshaft is driven by a belt or chain. Technician B says the valves are opened by the camshaft. Who is correct?

- a. Technician A
- b. Technician B
- c. both A and B
- d. neither A nor B

ANSWER:

a

26. A severely worn lifter can cause which of the following?

- a. rough idle
- b. lack of power
- c. low compression
- d. all of these

ANSWER:

d

27. Bearings support components and reduce wear because their material is _____.

ANSWER: softer

28. A few vehicles use a mid-engine design where the engine is placed between the rear axle and _____.

ANSWER: driver

Chapter 01: Classroom Manual Automotive Engines

29. Cylinder bores are located within the engine _____.

ANSWER: _____ block

30. When bearings wear excessively, they cause low oil pressure and engine _____.

ANSWER: _____ knocking

31. The relationship between the crankshaft and camshaft rotation creates proper _____.

ANSWER: _____ valve timing

32. The camshaft has eccentric lobes which open the _____.

ANSWER: _____ valves

33. The timing and quantity of fuel delivery are precisely controlled by the _____.

ANSWER: _____ powertrain control module

34. Compared to powertrains of the 1960s, today's powertrains produce 95% less _____.

ANSWER: _____ toxic emissions

35. Performing a rebuilding on an engine to a nearly new condition is known as an engine _____.

ANSWER: _____ overhaul

36. Cylinder rings scrape excess oil from the cylinder _____.

ANSWER: _____ walls

37. On the power stroke, the piston is pushed down by the force of combustion to turn the _____.

ANSWER: _____ crankshaft

38. Describe the timing mechanism of an engine.

ANSWER: Proper valve timing is necessary to keep the valves opening and closing at the correct times. This is achieved by the timing mechanism. A sprocket or gear on the crankshaft is attached by a gear, belt, or chain to a sprocket or gear on the camshaft.

39. Why are transversely mounted engines popular in modern vehicle design?

ANSWER: A transversely mounted engine allows for shorter hood lines, which provides greater passenger compartment space.

40. Describe the operation of a liquid-cooling system.

ANSWER: A liquid-cooling system is used on all current gas automobile engines to remove excess heat from the engine. An engine belt or gear drives a water pump that circulates coolant throughout the engine to keep all areas at an acceptable temperature, about 200°F (110°C). When the coolant reaches a certain temperature, a thermostat opens to allow coolant to flow through the radiator to cool it down. Air flowing across the radiator lowers the temperature of the coolant, then the water pump pulls the coolant back into the engine and recirculates it. The cooling system must retain heat to speed the warm-up period to enhance combustion and lower emissions after cold starts.

41. How does an engine connect to a manual and to an automatic transmission?

Name _____ Class _____ Date _____
: _____ : _____ e: _____

Chapter 01: Classroom Manual Automotive Engines

ANSWER: The engine is attached to the transmission through the flywheel and clutch on a manual transmission or through the flexplate and torque converter on an automatic transmission.

42. What is the function of the valvetrain?

ANSWER: The valvetrain components are responsible for the opening and closing of the valves in conjunction with the movement of the crankshaft and pistons.