Name:_____ Date:_____
Instructor:_____ Period:_____

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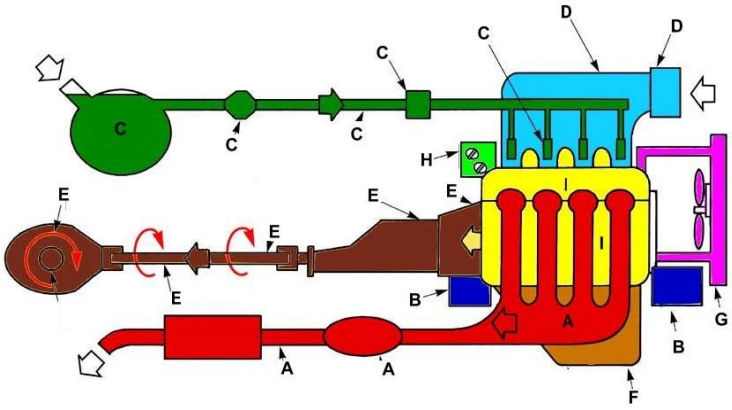
The Automobile

Objective: After completing this workbook assignment, you'll be able to identify and explain the most important systems in a vehicle.

Parts, Assemblies, and Systems

1. A(n)_____is a set of fitted parts designed to complete a function.
2. Identify the following automotive systems and parts:
(Larger Picture in textbook)



A._____
B._____
C._____
D._____
E._____
F._____
G._____
H._____
I._____

3. **List** and **Describe** four of the most common automotive body types:

A._____

_____

_____

B._____

_____

_____

C._____

_____

_____

D._____

_____

_____

Engine: Match the terms on the right with the following statements:

4. Covers and seals the top of the cylinders.
5. Devices that admit fuel and air into the cylinder of an internal combustion engine, or that allow combustion gases to exit.
6. Changes the reciprocating motion of the piston and rod into useful rotary motion.
7. A coil spring used to keep valves closed.
8. Ride on the cam lobe and transfer motion to other parts of the valve train.
9. A machined shaft with lobes that open and close engine-cylinder intake and exhaust valves.
10. The area in the cylinder where the air/fuel mixture actually ignites and burns. Located between the top of the piston and the cylinder head.
11. connecting link between crankshaft and the pistons.
12. The large part of the engine that houses the cylinders and water jacket.
13. Keeps combustion pressure and oil from leaking between the piston and cylinder wall.
14. A round cup that transfers energy of combustion to the crankshaft.

A. Camshaft
B. Cylinder Head
C. Piston
D. Combustion Chamber
E. Crankshaft
F. Valves
G. Block
H. Rings
I. Valve Springs
J. Lifters
K. Connecting Rod

4.	
5.	
6.	
7.	
8.	
9.	
10.	
11.	
12.	
13.	
14.	

Computer System

15. The automobiles' computer systems use _____ and _____ devices to monitor and control various systems in the vehicle, including _____, _____, _____, _____ _____, _____, _____ _____, _____ _____, _____ _____, and other systems.

16. Name the three primary parts of an automotive computer system: _____, _____ *(inputs)*, and _____ /_____ /_____ *(outputs)*.

17. The purpose of the automotive fuel control system is to maintain the correct mixture of ____ and _____ *(14.7-1)* under all operating conditions for _____ combustion.

18. These conditions include ____ _____, _____ _____, and ___ _____ situations.

19. Modern fuel supply systems use a _____ _____, _____ _____, _____ _____, _____ _____, _____ _____, and a _____ _____ _____ to supply fuel to the engine.

20. A modern oxygen senor detects the amount of _____ in the _____ stream and sends that information to the _____ for proper fuel control.

21. A Coolant Temperature Sensor: Measures the cooling system _____ and sends a variable _____ signal to the _____.

Electrical Systems

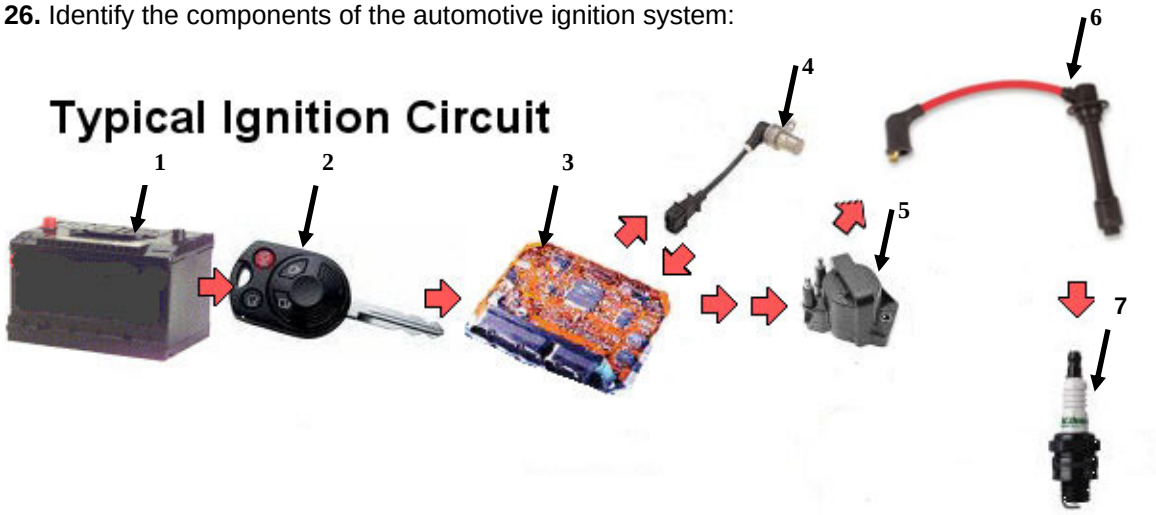
22. The purpose of the ignition system is to provide electrical energy to create _____ to ignite the _____-_____ mixture at the exact right moment for best _____.

23. The Starting System converts _____ power to _____ energy by using a large _____ _____ to turn over and start the engine.

24. The starter motor _____ the engine _____ until the engine fires and runs on its own power.

25. The _____ system provides light to see and be seen at night.

26. Identify the components of the automotive ignition system:



1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

Spark Plug
Spark Plug Wire
Powertrain Control Module
Unit Coil
Ignition Key
Crank-Trigger Ignition Sensor
Battery

Cooling and Lubrication Systems

27. The purpose of an automotive cooling system is to speed engine _____, and maintain a consistent engine _____ .

28. A cooling system protects an engine from damage by _____ heat to the atmosphere by using the _____.

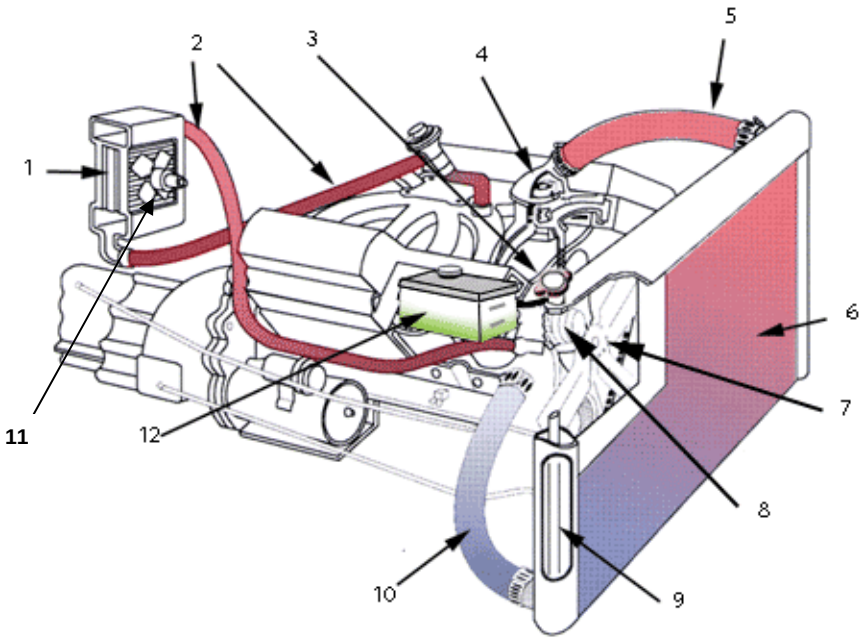
29. A fan draws cool air through the _____ .

30. The thermostat maintains a _____ engine temperature by controlling the flow of _____ into the radiator and back into the engine.

31. The function of an automotive lubrication system is to circulate filtered _____ to high friction points in the engine. The lubrication system also helps cool the engine by carrying _____ away from the engine.

32. The _____ _____ pulls oil out of the pan forces it throughout the engine to lubricate and cool various moving parts within the engine.

33. Identify the parts of the automotive cooling system shown below:



1._____

2._____

3._____

4._____

5._____

6._____

7._____

8._____

9._____

10._____

11._____

12._____

Radiator
Water Pump
Thermostat
Lower Radiator Hose (Suction)
Heater Core
Heater Hoses
Coolant Recovery Tank
Transmission Cooler
Upper Radiator Hose (Pressure)
Fan
Pressure Cap
Heater Fan

Exhaust and Emission Control Systems

34. Describe the three jobs of an automotive exhaust system:_____

_____

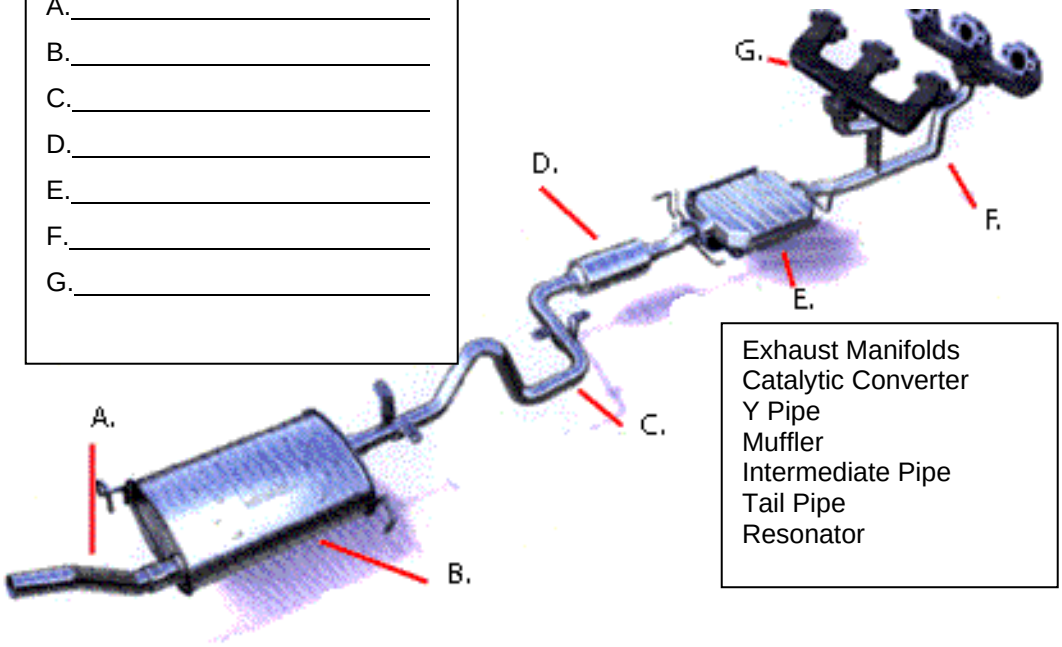
_____

_____

35. Emission control systems are designed to control the levels of _____ produced by an engine.

36. Identify and label the components of the automotive exhaust system.

A._____
B._____
C._____
D._____
E._____
F._____
G._____



Exhaust Manifolds
Catalytic Converter
Y Pipe
Muffler
Intermediate Pipe
Tail Pipe
Resonator

Drive Train Systems

Match the Terms on the left with the Statements on the right.

37. A transmission and differential in one assembly.
38. A set of gears and shafts that transmit power from the drive shafts to the axles.
39. Contains a differential and two axles.
40. Transfers power from the transmission to the rear axle assembly.
41. Uses an internal hydraulic system electronic controls to shift gears.
42. Lets the driver change gear ratios to accommodate driving conditions.
43. Uses various gear combinations, or ratios, multiply engine speed and torque to accommodate driving conditions.
44. Allows the driver to engage or disengage the engine and the manual transmission.
45. Transfers turning force from the engine crankshaft to the drive wheels.

37._____
38._____
39._____
40._____
41._____
42._____
43._____
44._____
45._____

A. Rear Drive Axle
B. Clutch
C. Drive Train
D. Transmission
E. Drive Shaft
F. Differential
G. Axles
H. Torque Converter
I. Transaxle
J. Automatic Transmission
K. Manual Transmission

Suspension, Steering, and Brake Systems

46. Suspension is the term given to the system of _____, _____ _____, and _____ that connect a vehicle to its wheels.

47. List three primary functions of an automobile suspension system:

A._____

B._____

C._____

48. The steering system allows the driver to control the direction of the vehicle by turning the _____ from left to right.

49. Brake systems are designed to slow the vehicles wheel movement through _____.

50. Label the parts of the illustrated brake system:

A._____

B._____

C._____

D._____

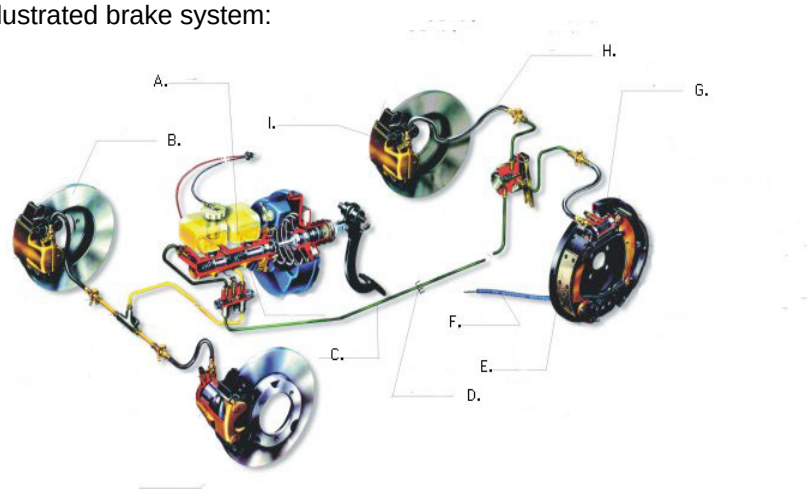
E._____

F._____

G._____

H._____

I._____



Safety and Accessory Systems

51. List four (4) examples of current automotive accessory systems:

A._____

B._____

C._____

D._____

52. List three (3) examples of current automotive safety systems:

A._____

B._____

C._____