

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



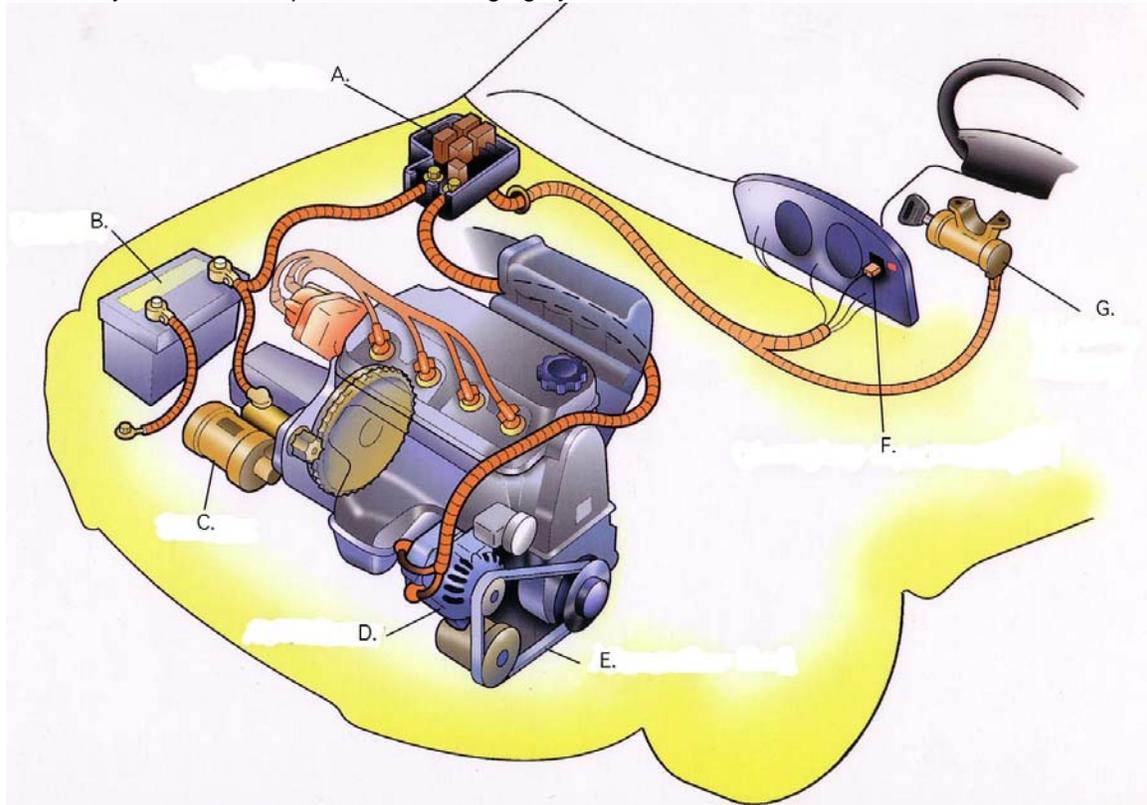
Charging System Fundamentals



Objective: After studying this chapter, you will be able to explain charging system operation.

Basic Charging System Parts

1. Identify the indicated parts of this charging system



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

2. Define **Alternator**. _____

3. What is the purpose of the **voltage regulator**? _____

4. The alternator belt is driven by the _____.
5. The **charge indicator** informs the driver of charging system _____.
6. The **charging system harness**, or the wiring harness, connects the electrical components together into a _____.

7. List three (3) functions a battery performs in an automobile:
- A. _____
 - B. _____
 - C. _____

8. Automotive alternators have a **preset charging voltage** of _____ volts D.C.

Charging System Functions

9. List and describe **four(4)** primary functions of a automotive charging system:
- A. _____
 - B. _____
 - C. _____
 - D. _____

Types of Charging Systems

10. An **alternator** or **ac generator**, has several benefits over a **dc generator**. List four benefits of an alternator:
- A. _____
 - B. _____
 - C. _____
 - D. _____
11. Alternators are constructed in _____ of a dc generator.

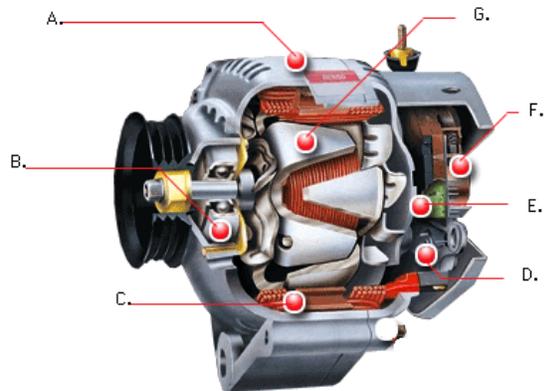
Alternator Operation

12. **Alternators** are constructed with a _____ to convert alternating current (ac) output into direct current (dc) to store in the battery.
13. A **diode** is a type of check valve that allows electrical current to flow in only _____.
14. Alternators are constructed with multiple diodes to increase the alternator's _____.

Alternator Construction

15. List the components of an alternator:
- A. _____
 - B. _____
 - C. _____
 - D. _____
 - E. _____
 - F. _____
 - G. _____

Alternator Cutaway



16. The primary components of an **alternator rotor** are the _____ windings and the claw-shaped _____.
17. The alternator brushes ride on the _____ to make a sliding connection to the rotor.
18. Small coil _____ hold the brushes in light, constant contact to the slip rings.
19. List the two types of anti-friction bearings are found in modern alternators:
- A. _____
 - B. _____

20. Diodes are mounted in **trios**. There are a total of _____ diodes in an automotive alternator.
21. The **diode trio** is often used to supply current to the _____ windings.
22. An alternator's fan draws air _____ and _____ the alternator .
23. The primary drive method for an automotive alternator is a _____ .
24. A **voltage regulator** controls alternator output by controlling _____ flowing through the rotor windings.
25. List the **three (3)** types of automotive voltage regulators:
 A. _____ B. _____ C. _____
26. An **electronic voltage regulator** uses a **battery thermistor** to measure battery _____ to alter charging output accordingly.
27. Modern automotive **powertrain control modules (PCM)** often supplement or even replace the conventional voltage regulator in order to more _____ the charging circuit.
28. List three (3) advantages of using the **PCM** to control the charging circuit:
 A. _____
 B. _____
 C. _____
29. The PCM can react to the charging system by switching on and off up to _____ times per second.
30. A **fail-safe** circuit will protect the sensitive computer controls by disconnecting the _____ if the voltage levels become too high.
31. A **warning-light charge indicator** illuminates when alternator output _____ a specified voltage.
32. A defective voltage regulator can cause a battery to _____ .

