

Modern Automotive Technology Chapter 33

Charging System Fundamentals



Learning Objectives

- List the basic parts of a charging system.
- Explain charging system operation.
- Describe the construction of major charging system components.
- Compare alternator and voltage regulator design differences.
- Explain charging system indicators.
- Describe safety practices to follow when working with charging systems.

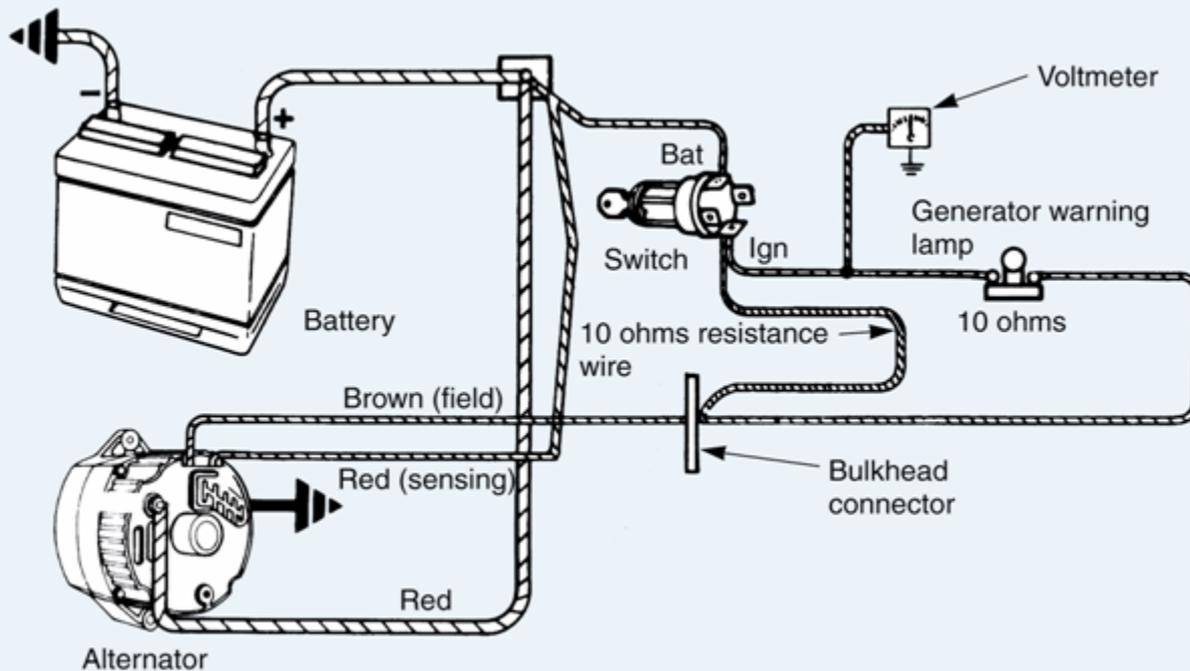


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1. The **CHARGE INDICATOR** is either the ammeter, voltmeter, or warning light that informs the driver of the condition of the charging system
2. The **CHARGING SYSTEM HARNESS** is the wiring that connects all the parts of the charging system



Basic Charging System



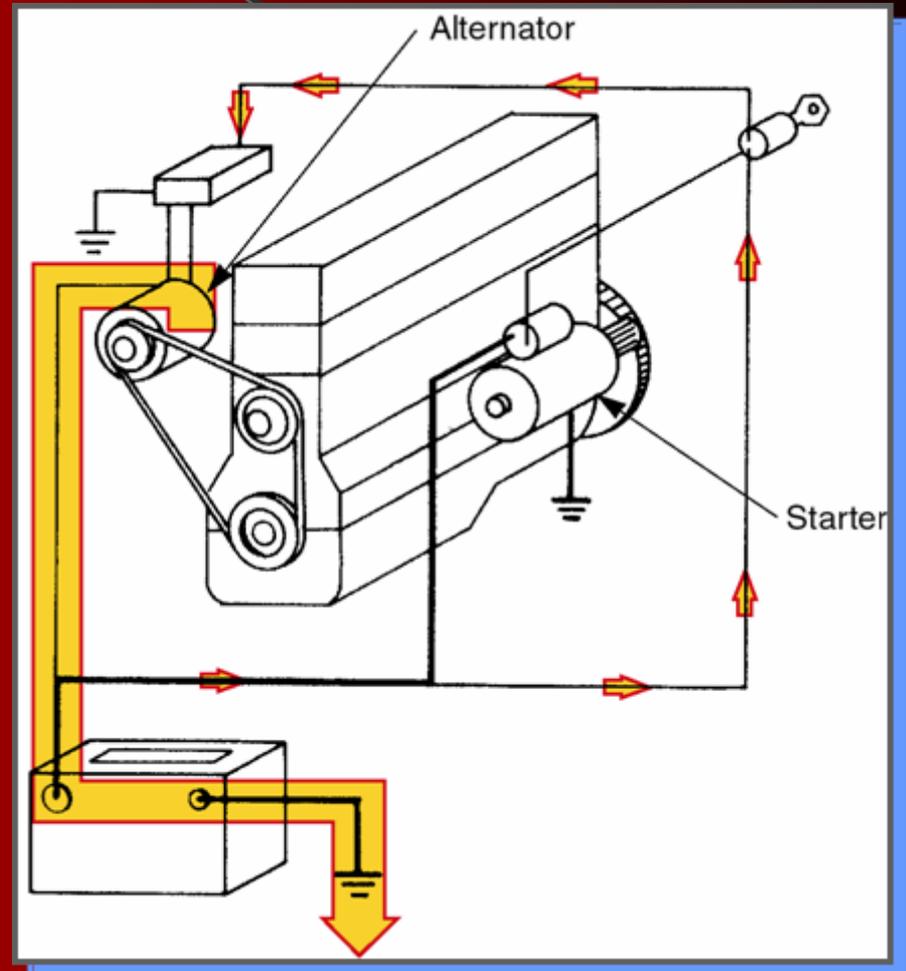
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3. The ALTERNATOR is a generator that uses mechanical power to produce electricity
4. The DIODE TRIO may be used to supply current to the rotor field windings



Charging System

The alternator recharges the battery and supplies electricity when the engine is running



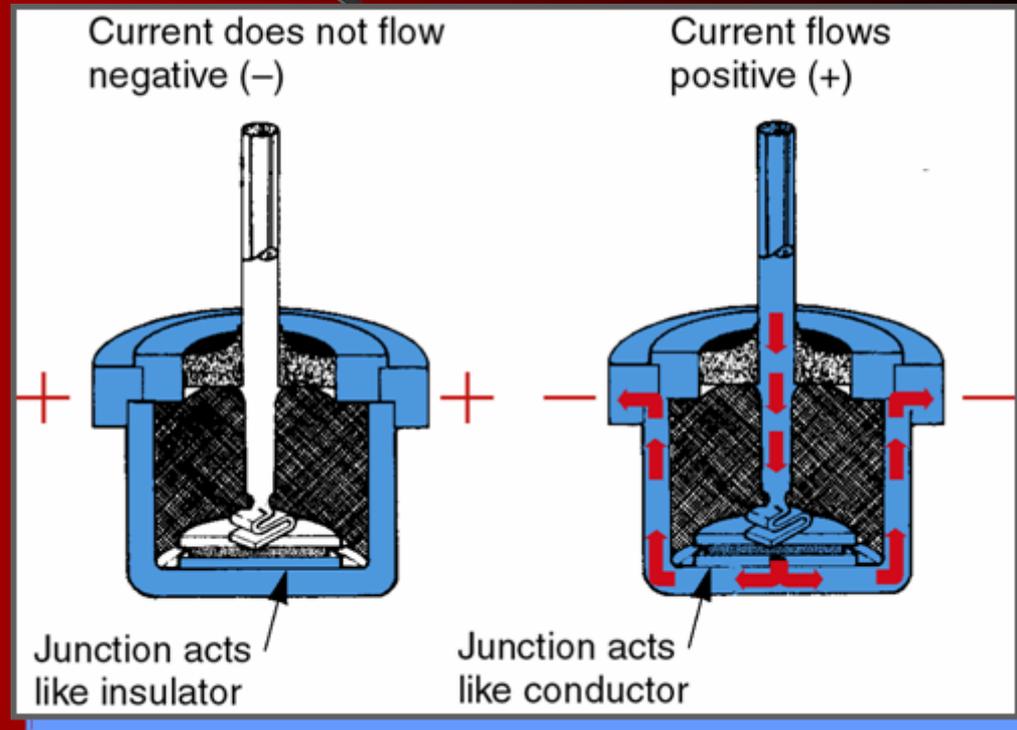
Diodes

Automobile's electrical system requires direct current (DC) which flows one way

Alternator output must be *rectified* (changed) from AC to DC

Diode allows current flow in only one direction

Several are connected into a rectifier bridge



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5. The ROTOR creates a rotating magnetic field

6. ALTERNATOR BEARINGS are used to produce a low-friction surface for the rotor shaft

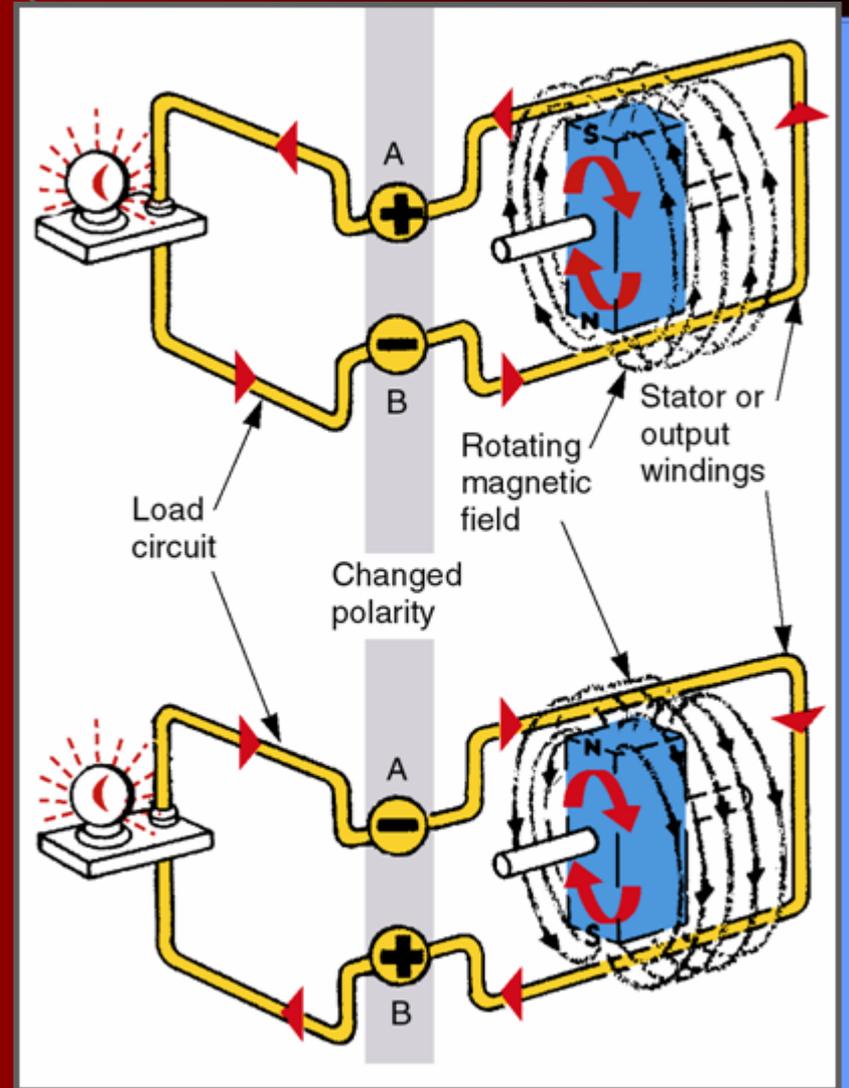


Current Flow

Alternating current flows one way, then the other

As the rotor turns into one stator winding, current is induced

When the same rotor pole moves into the other stator winding, current reverses direction

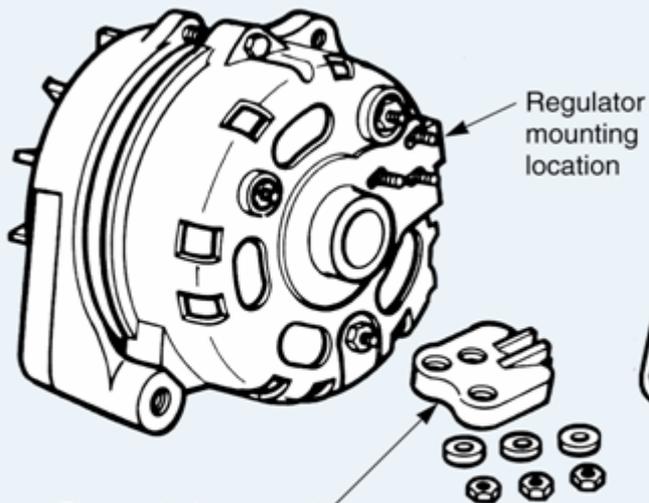


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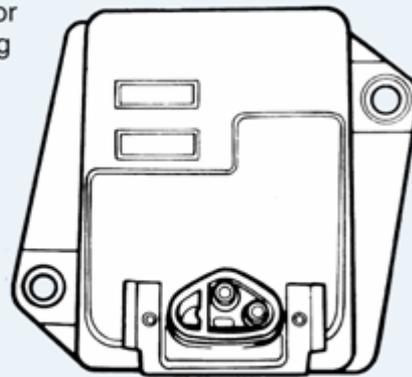
7. The **VOLTAGE REGULATOR** is an electronic device that controls output voltage and current of alternator
8. The vehicle **BATTERY** provides the current to initially energize the alternator and helps stabilize alternator output



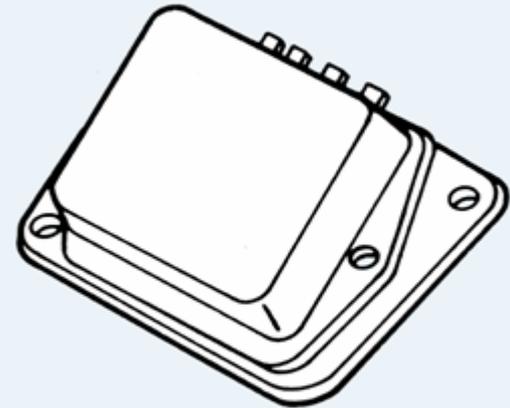
Voltage Regulators



Electronic, integrated circuit (IC) regulator



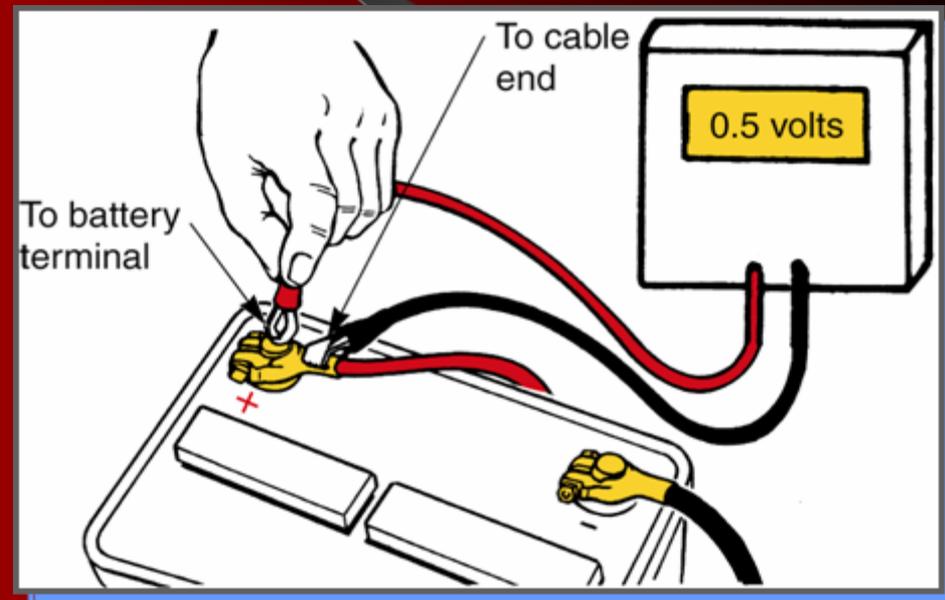
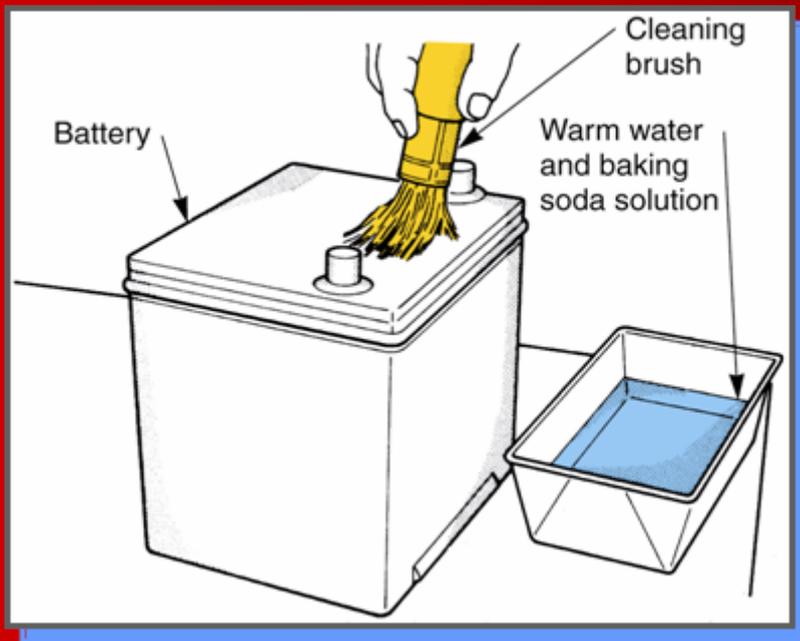
Remotely mounted electronic or transistorized regulator



Contact point or electromechanical regulator



Battery Service



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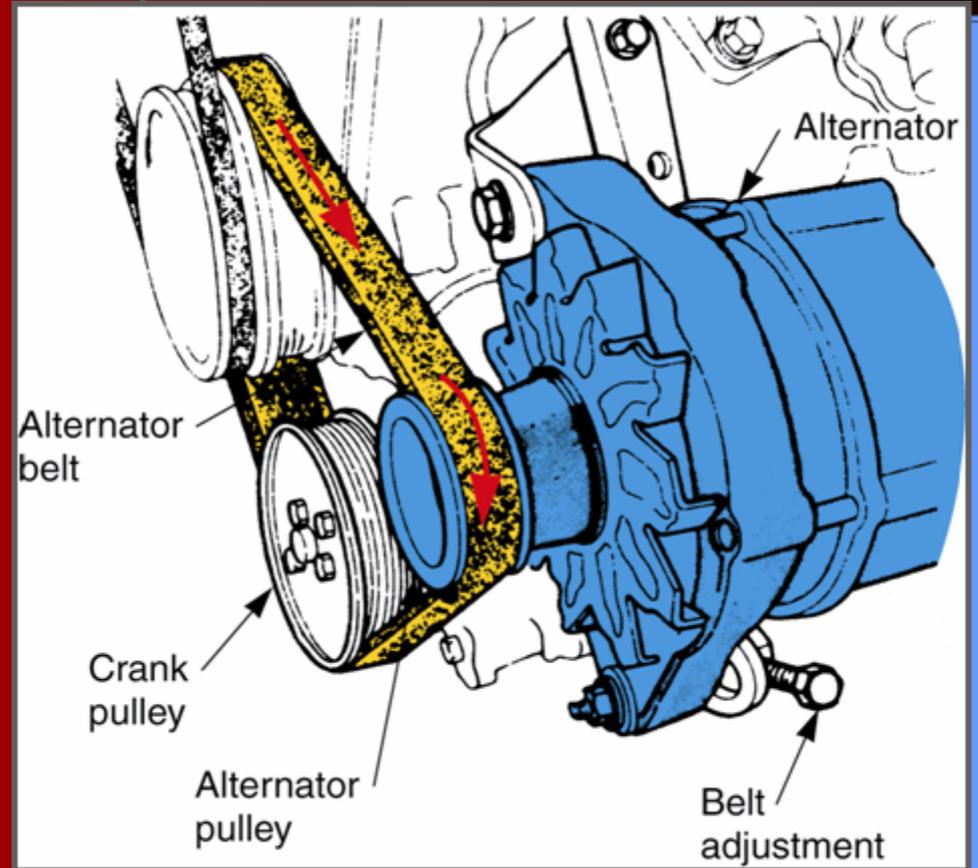
9. The ALTERNATOR BELT links engine crankshaft pulley with alternator pulley to drive alternator

10. The STATOR is a stationary set of windings in the alternator

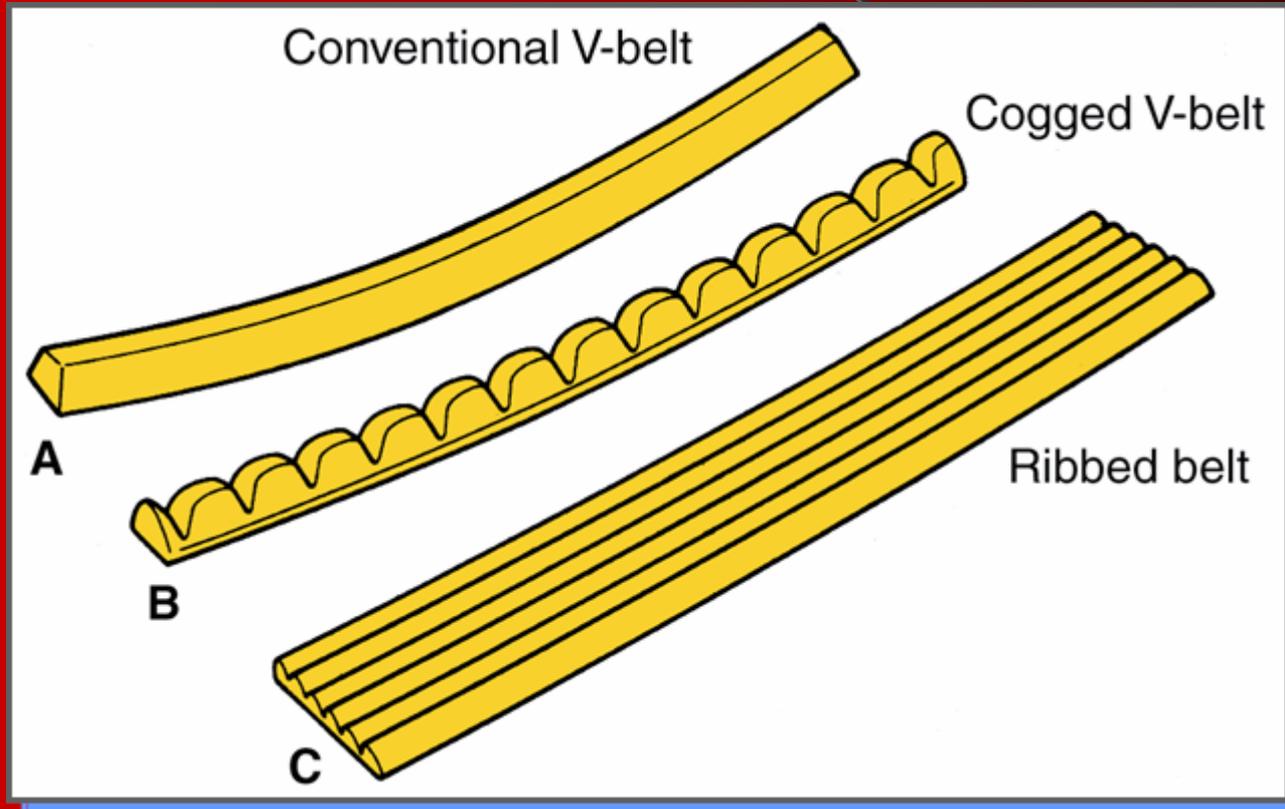


Fan Belts

The crankshaft turns the alternator belt.
A loose/slipping belt will cause the battery to discharge.



Type of Belts



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