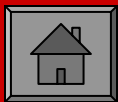




# Modern Automotive Technology Chapter 33

## Charging System Fundamentals



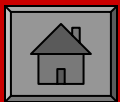
# Learning Objectives

- 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.

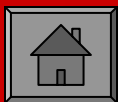
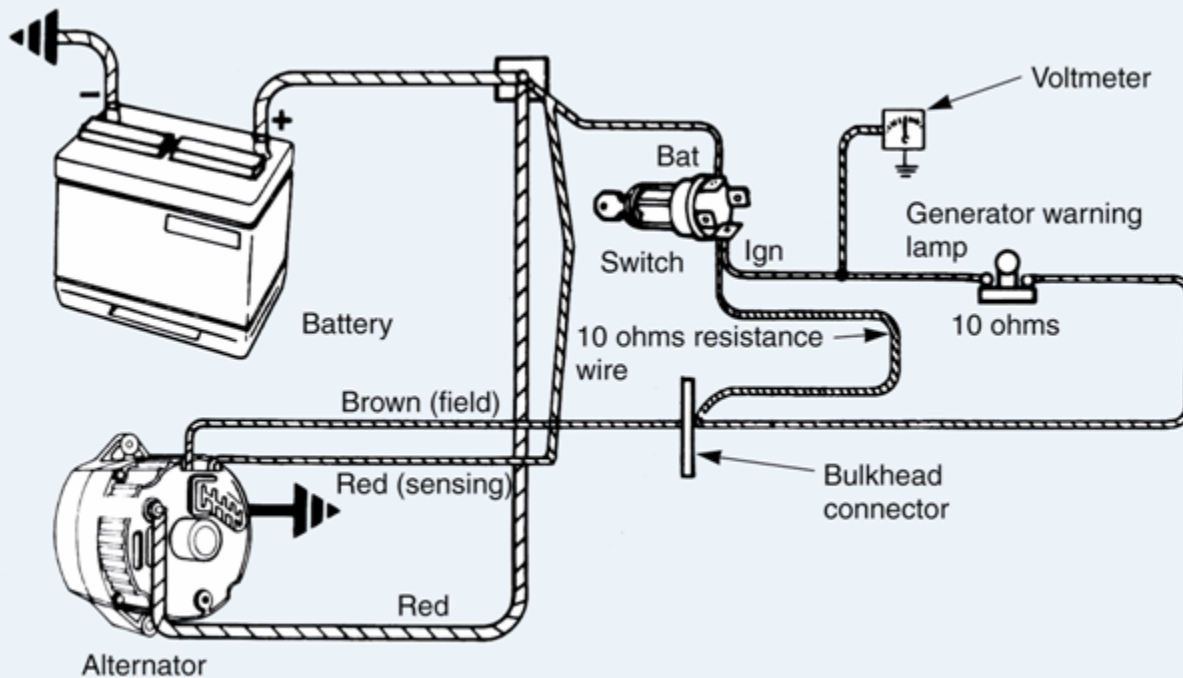


# Chapter 33

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

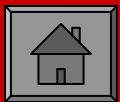


# Basic Charging System



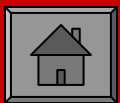
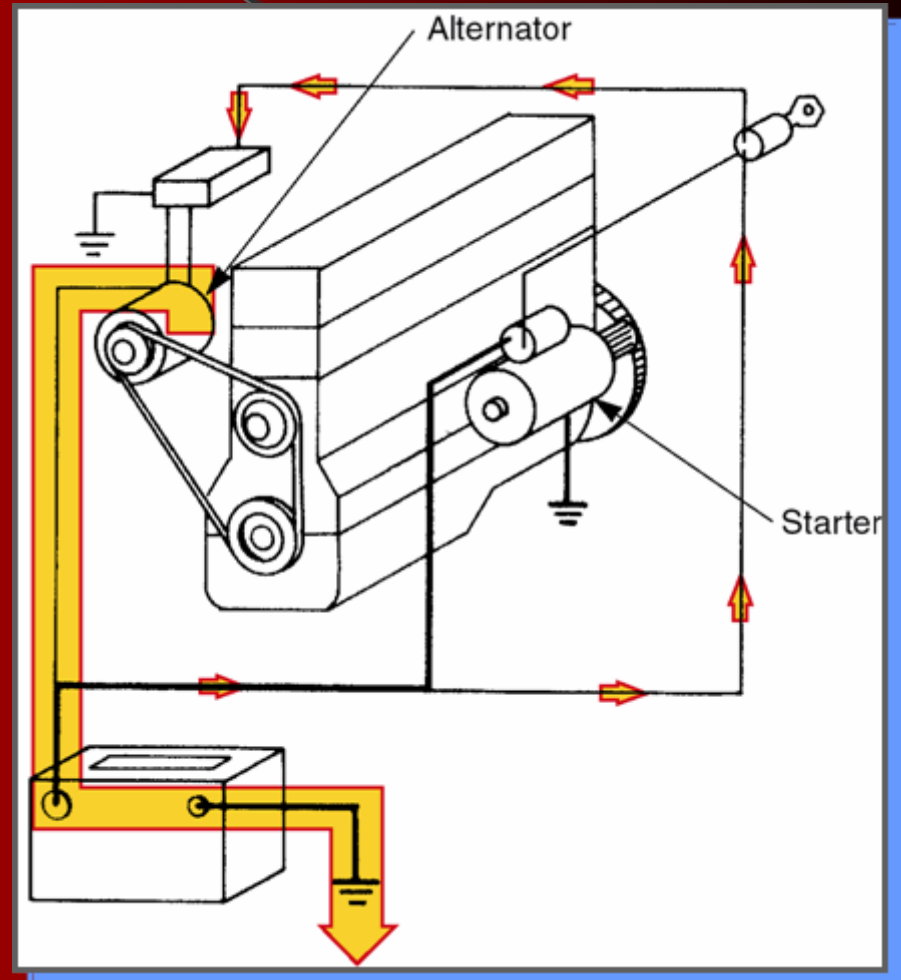
# Chapter 33

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



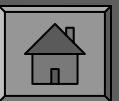
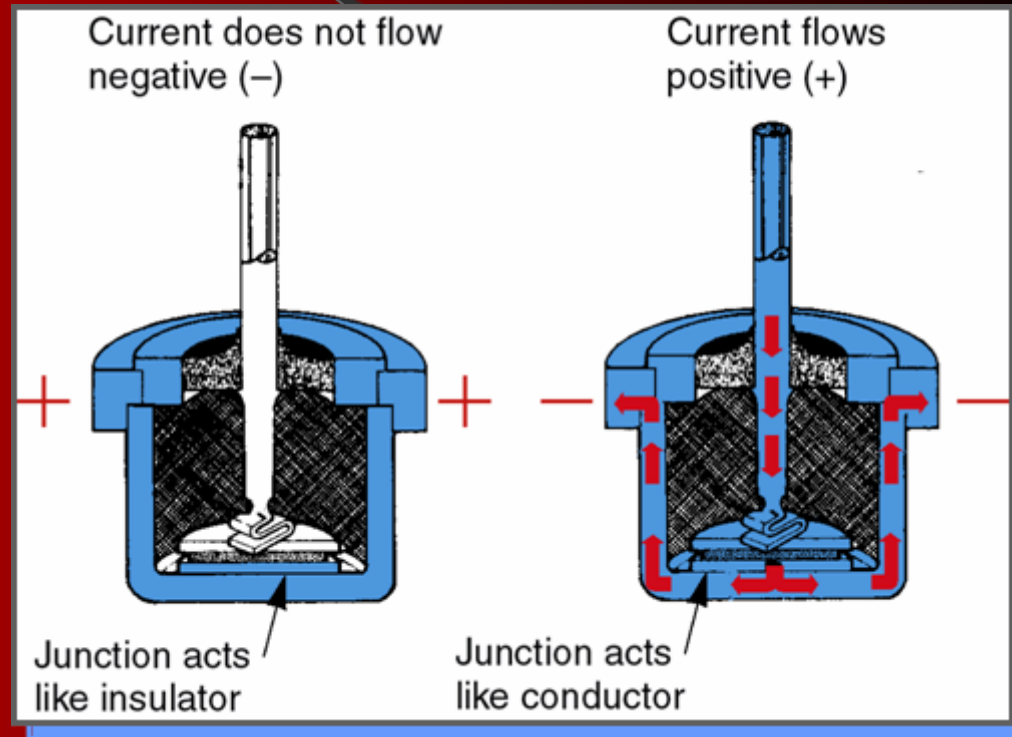
# Diodes

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



# Chapter 33

5. The ROTOR creates a rotating magnetic field

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



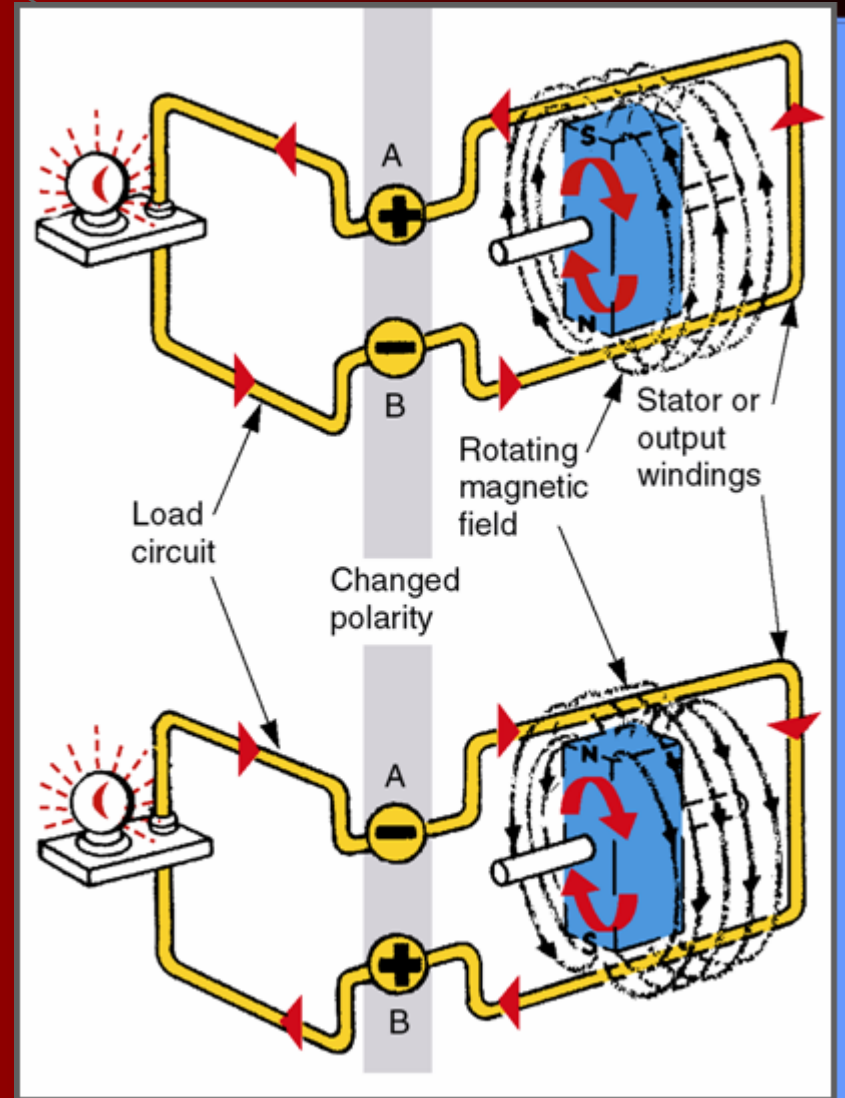


# Current Flow

Alternating current flows one way, then the other

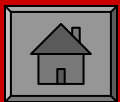
As the rotor turns into one stator winding, current is induced

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

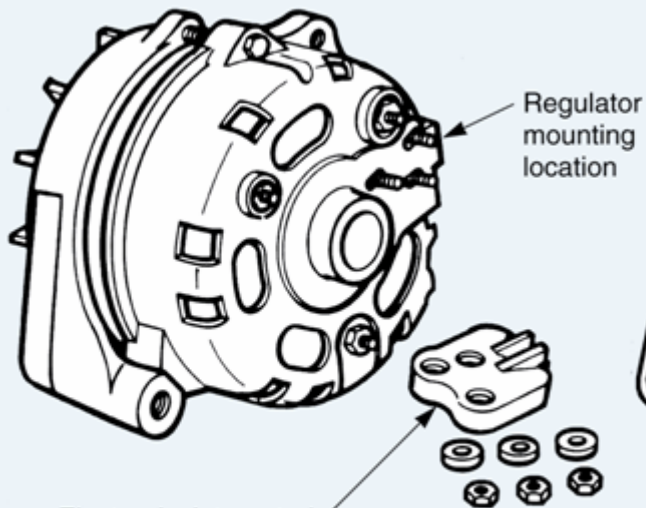


# Chapter 33

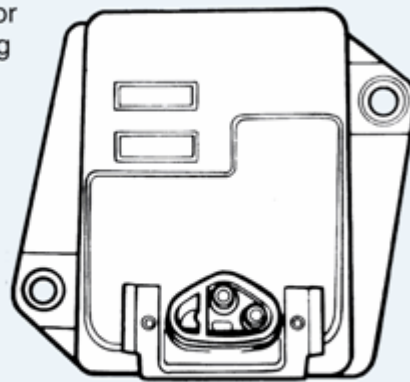
7. The **VOLTAGE REGULATOR** is an electronic device that controls output voltage and current of alternator
8. The vehicle **BATTERY** provides the current to initially energize the alternator and helps stabilize alternator output



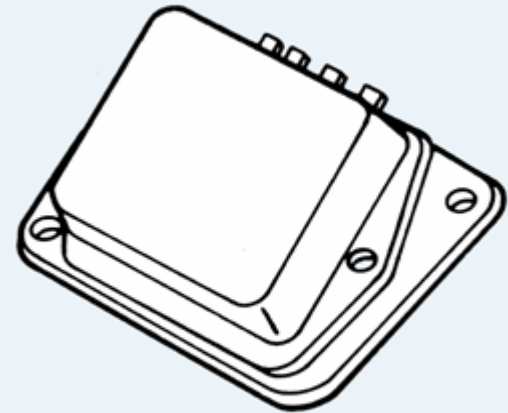
# Voltage Regulators



Electronic, integrated circuit (IC) regulator



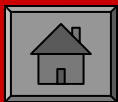
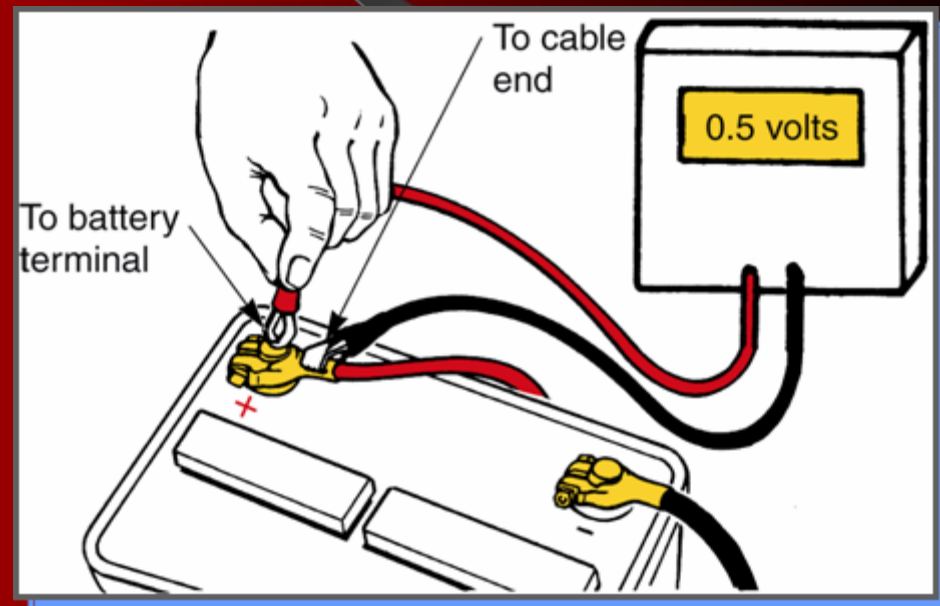
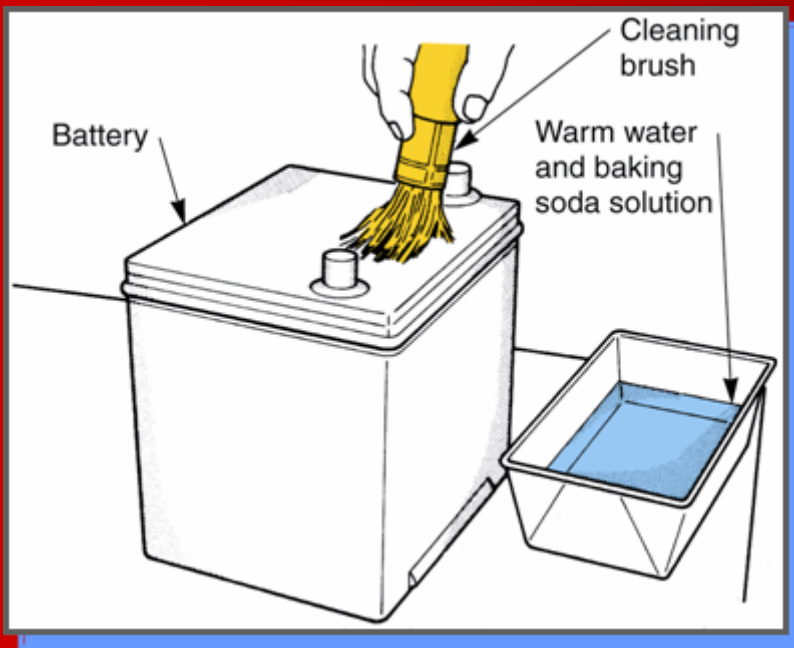
Remotely mounted electronic or transistorized regulator



Contact point or electromechanical regulator



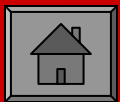
# Battery Service



# Chapter 33

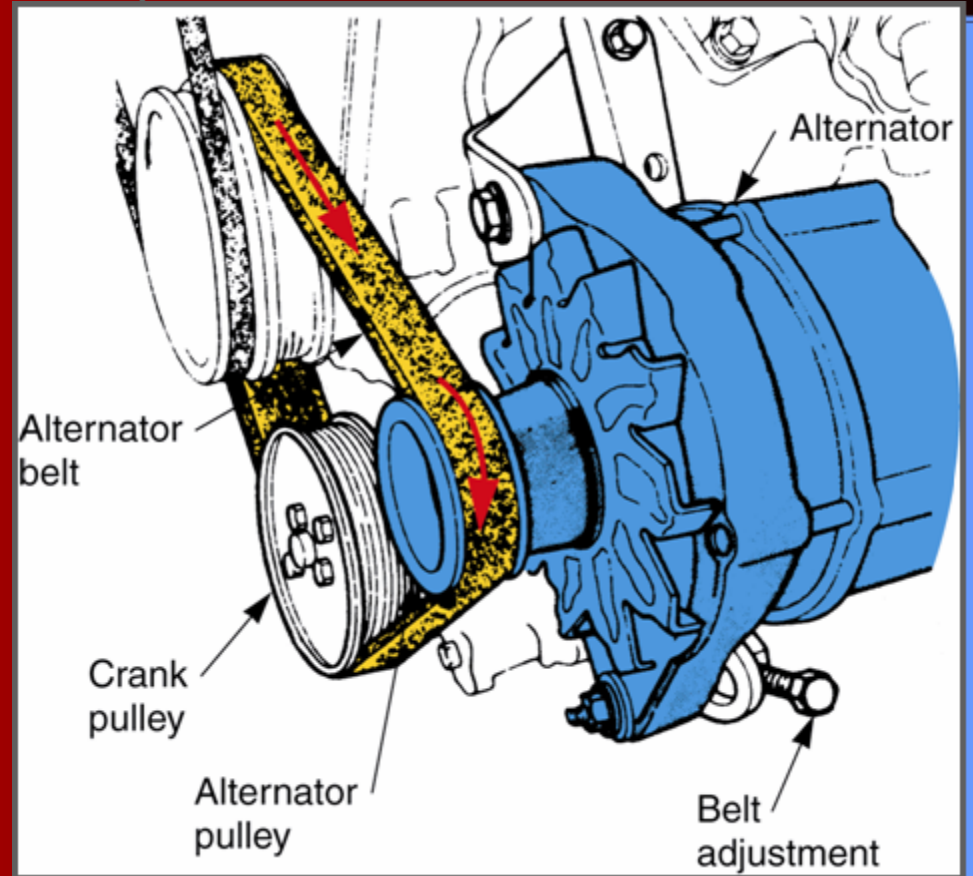
9. The ALTERNATOR BELT links engine crankshaft pulley with alternator pulley to drive alternator

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



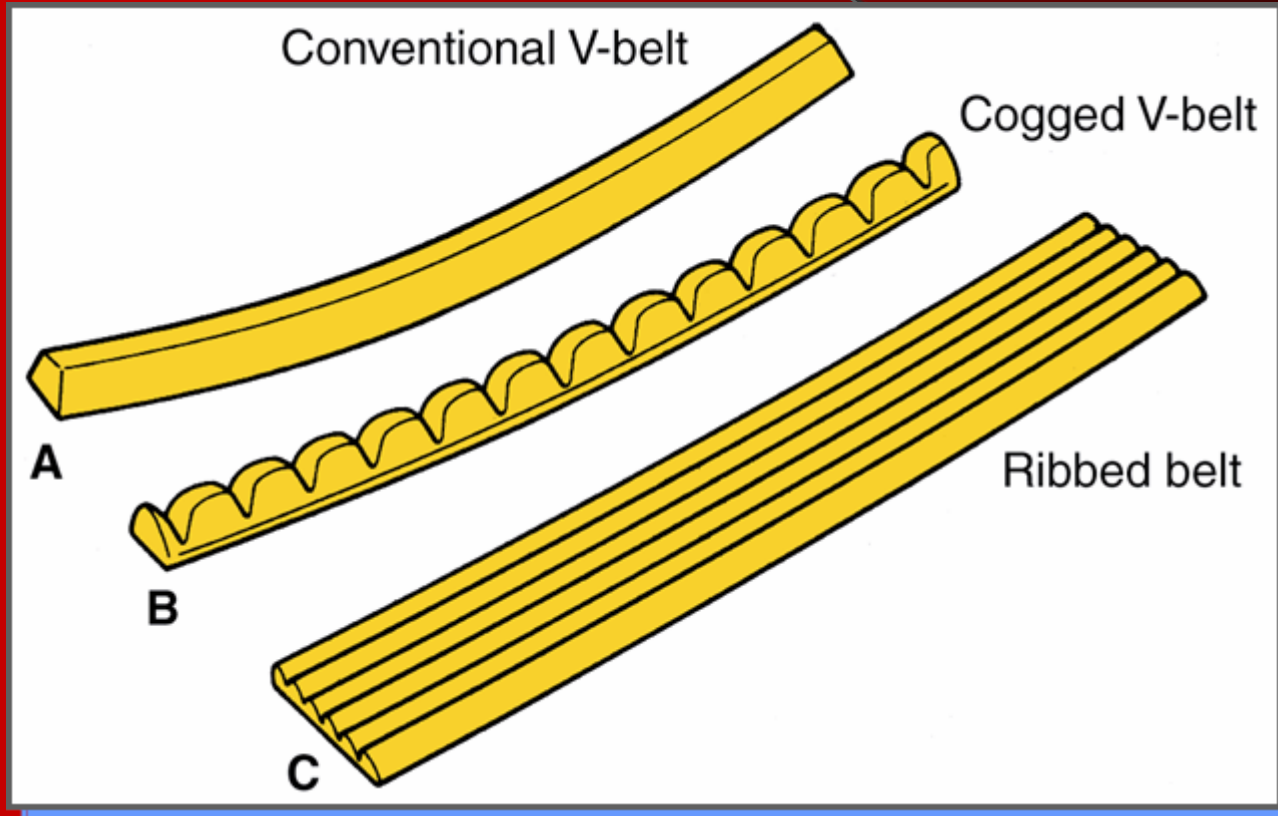
# Fan Belts

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





# Type of Belts



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