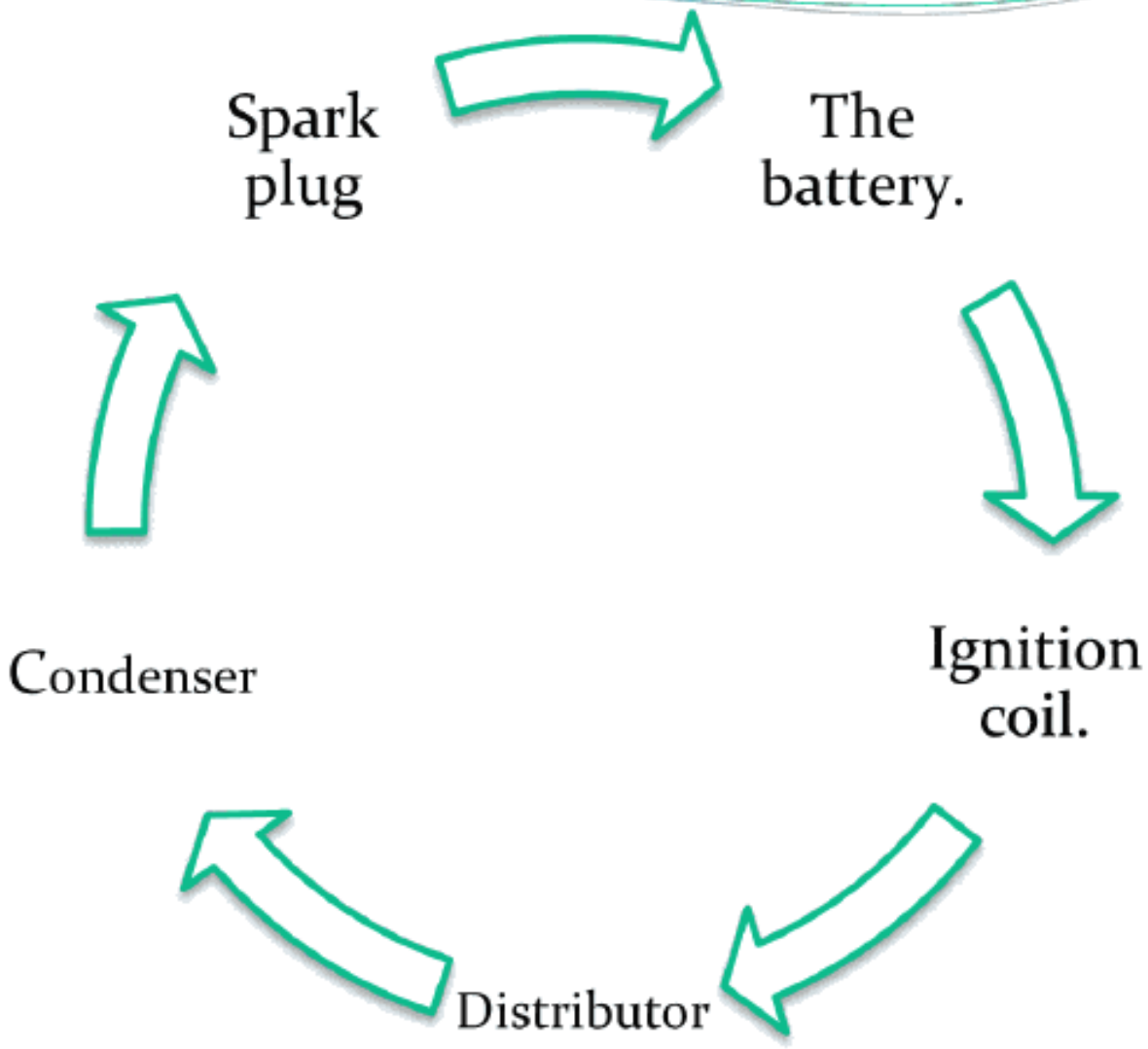
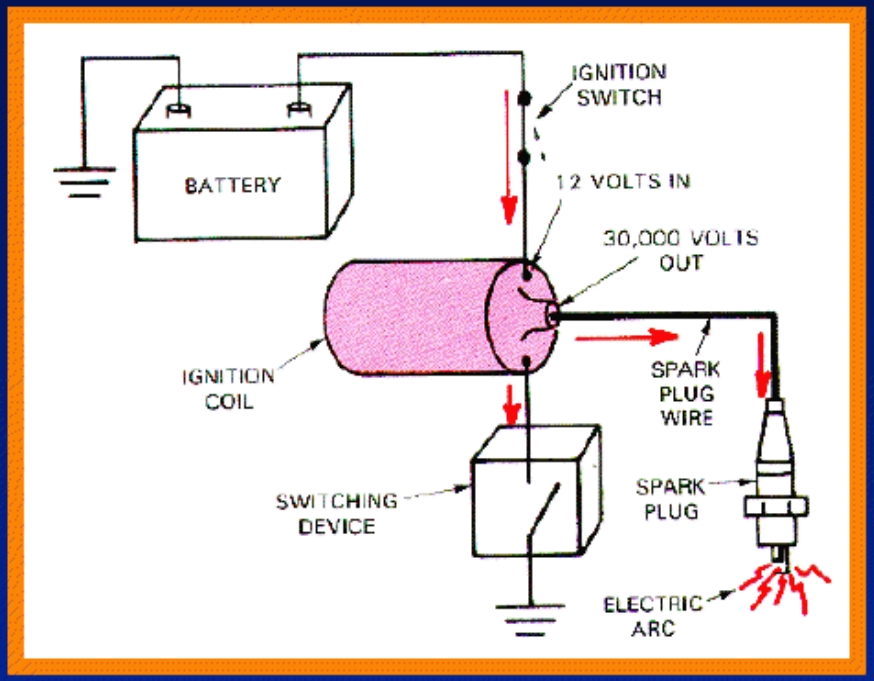
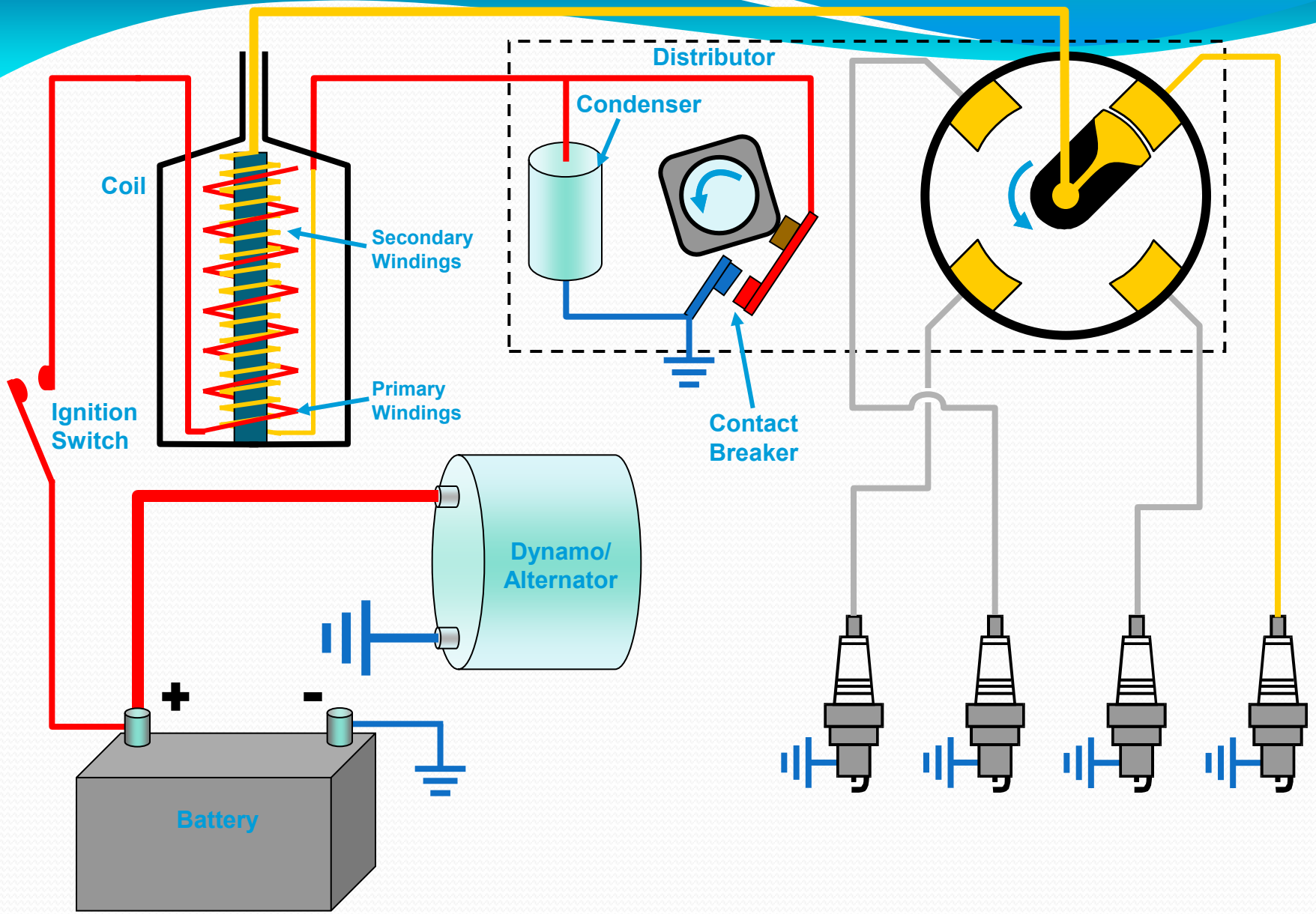
Battery Ignition System


Spark plug
The battery.
Ignition coil.
Distributor
Condenser

BASIC IGNITION SYSTEM

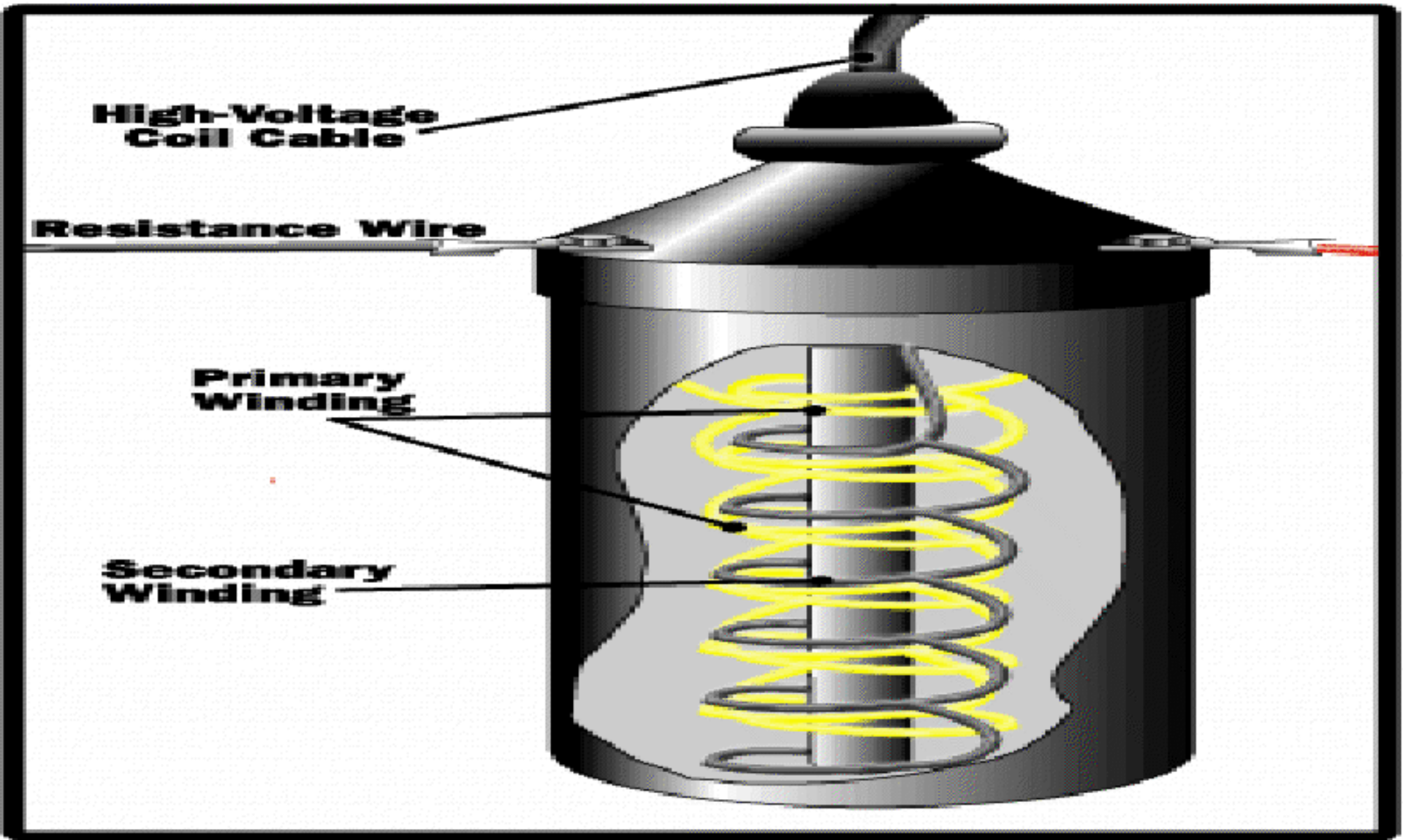
- Battery supplies power to entire system
- Ignition Switch turns engine on or off
- Coil transforms volts
- Switching device triggers ignition coil
- Spark Plug and wires distribute spark

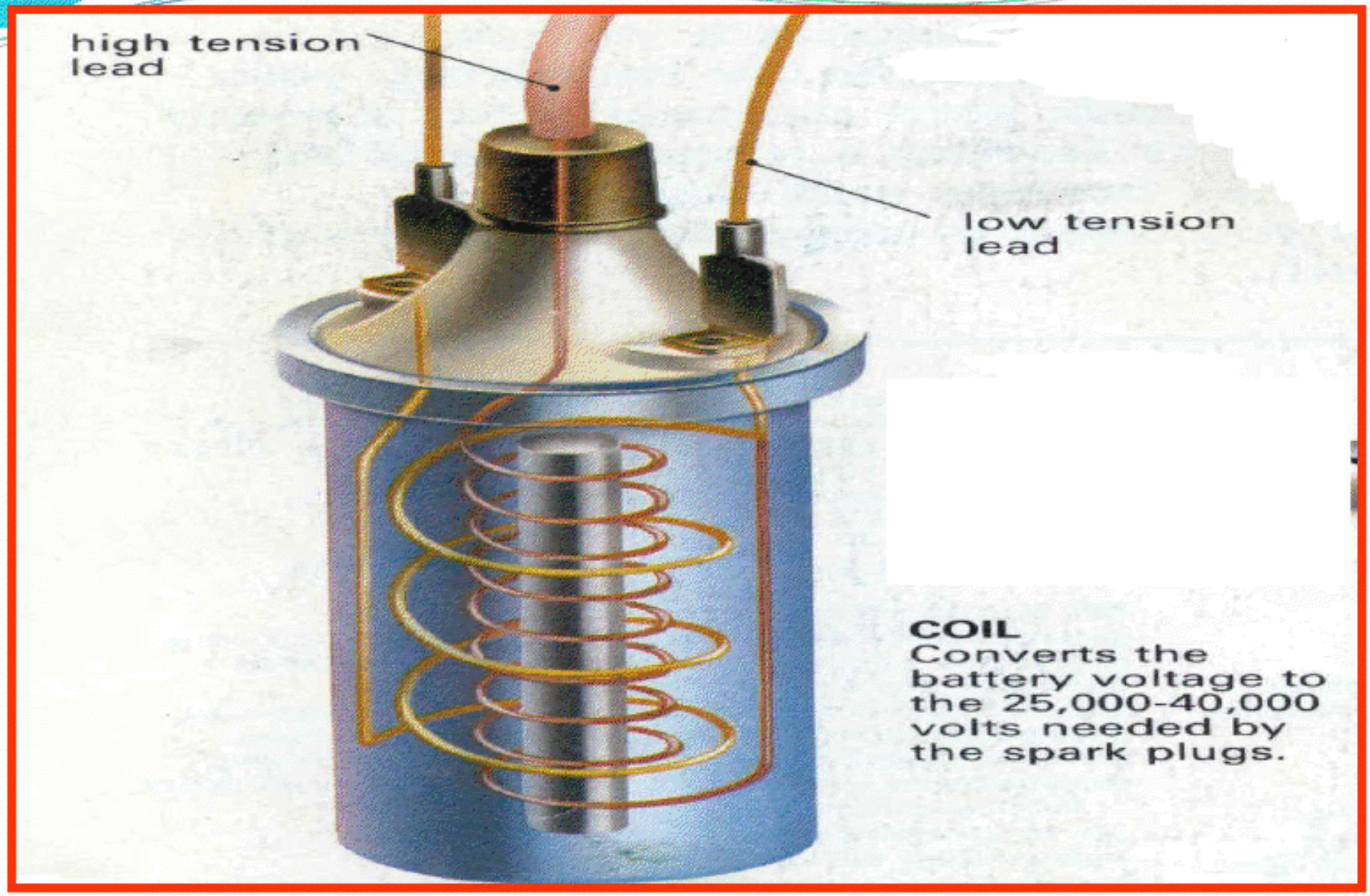




IGNITION SYSTEM – Dynamo/Alternator System

Ignition Coil




high tension lead
low tension lead
COIL
Converts the battery voltage to the 25,000-40,000 volts needed by the spark plugs.

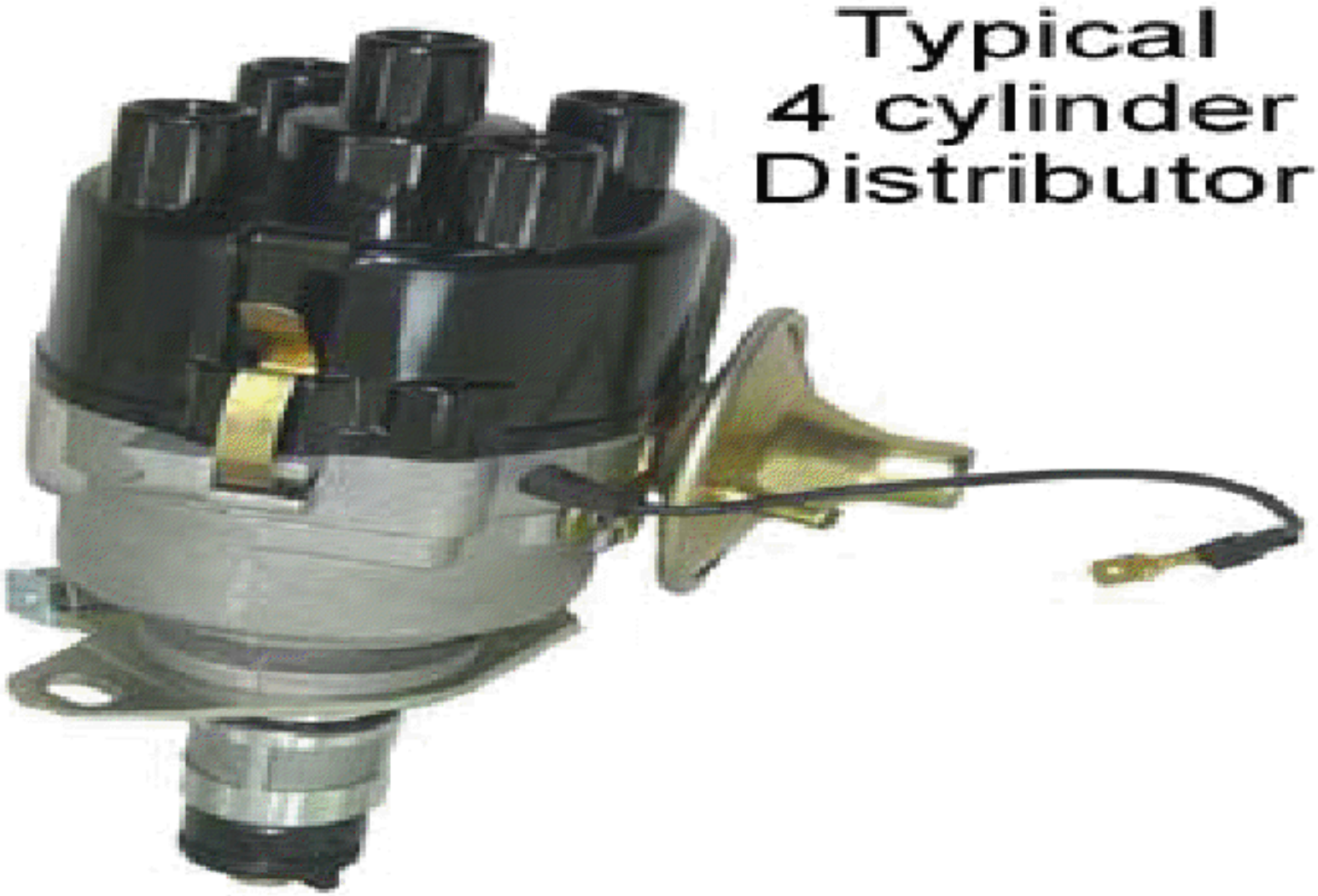
Ignition Coils (continued)

- This core increases the magnetic strength of the coil.
- Surrounding the laminated core are approximately 20,000 turns of fine wire (approximately 42 gauge).
- These windings are called the **secondary** coil windings.
- Surrounding the secondary windings are approximately 150 turns of heavy wire (approximately 21 gauge).
- These windings are called the **primary** coil windings.

How Ignition Coils Create 40,000 Volts

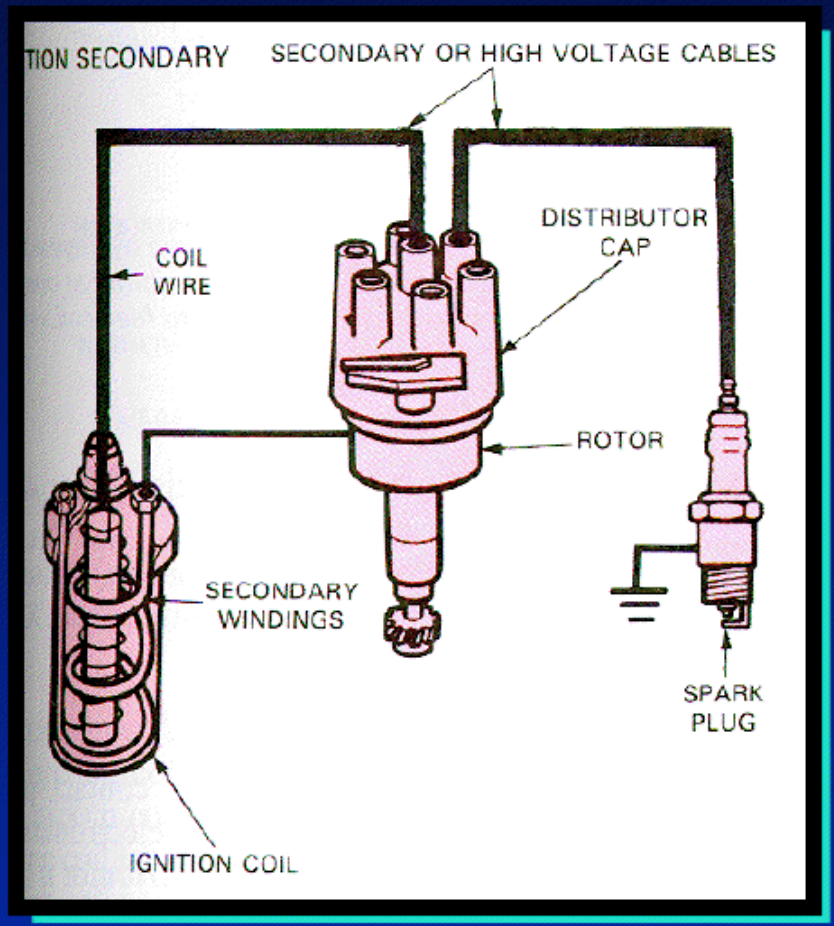
- If the primary circuit is completed, current (approximately 2 to 6 A) can flow through the primary coil windings.
- This flow creates a strong magnetic field inside the coil.
- When the primary coil winding ground return path connection is opened, the magnetic field collapses and induces a voltage of from 250 to 400 volts in the primary winding of the coil and a high-voltage (20,000 to 40,000 volts) low-amperage (20 to 80 am) current in the secondary coil windings.
- This high-voltage pulse flows through the coil wire (if the vehicle is so equipped), distributor cap, rotor, and spark plug wires to the spark plugs

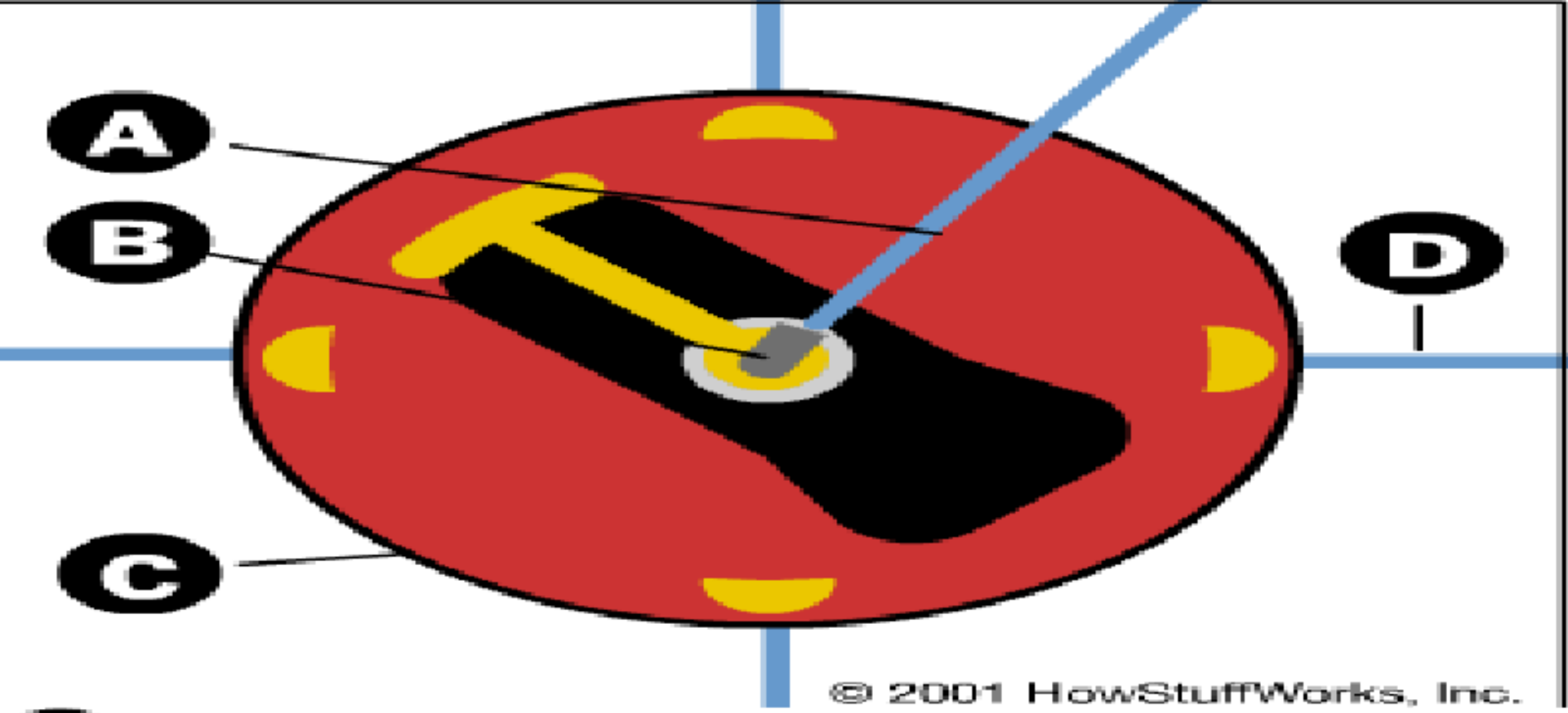
The Distributor



SECONDARY CIRCUIT

- Distributes current to individual cylinders to jump spark plug gap
- Must have thicker, heavier insulation on wires
- Typical voltage to jump gap - 10K Volts



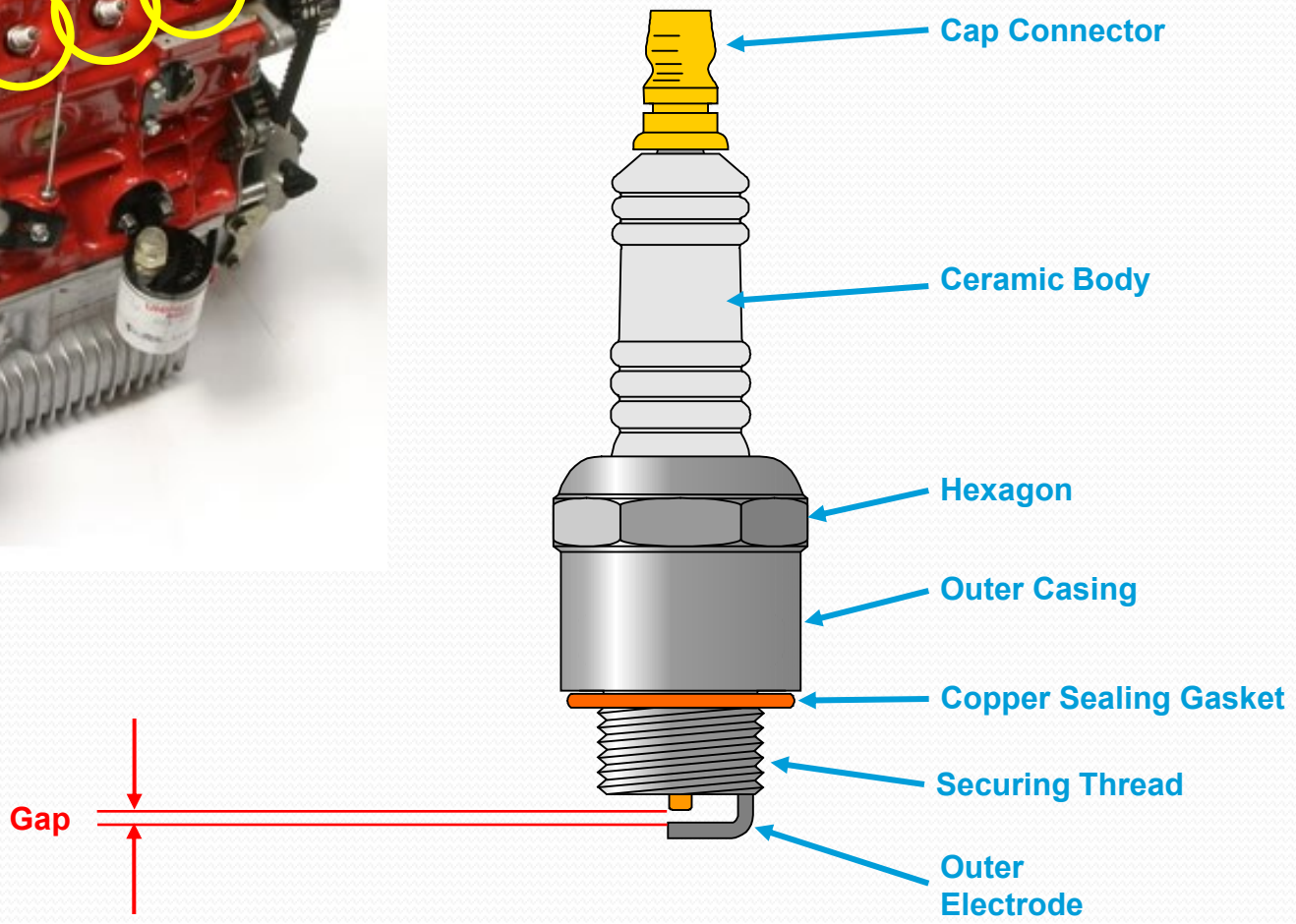


A High voltage lead from coil

B Cap/rotor contact button

C Distributor cap

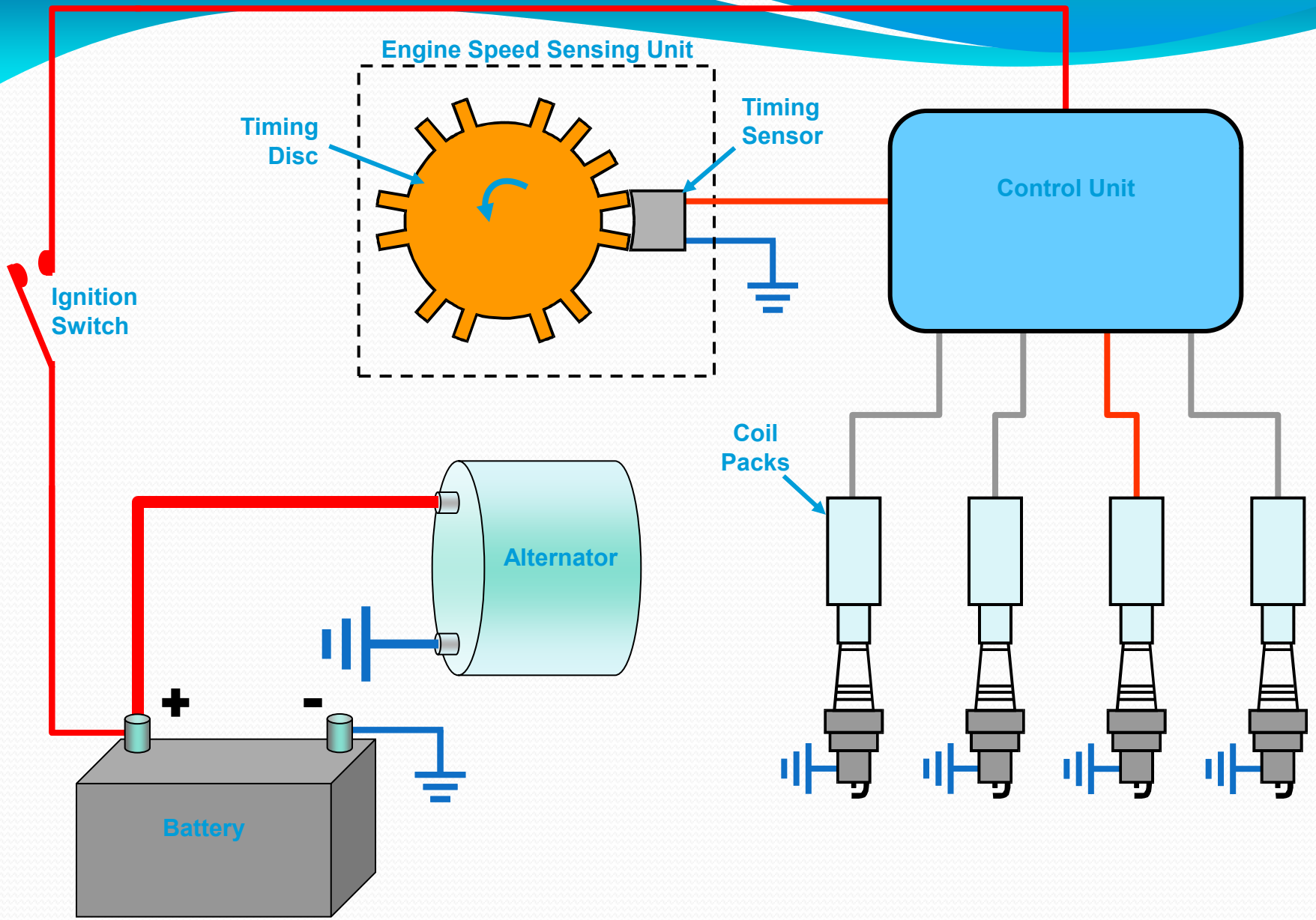
D High voltage to sparkplug



IGNITION SYSTEM – Spark Plug

Spark plug gap

Spark plugs are typically designed to have a spark gap which can be adjusted by the technician installing the spark plug, by the simple method of bending the ground electrode slightly to bring it closer to or further from the center electrode. The belief that plugs are properly gapped as delivered in their box from the factory is only partially true, as proven by the fact that the same plug may be specified for several different engines, requiring a different gap for each. Spark plugs in automobiles generally have a gap between 0.045"-0.070" (1.2-1.8mm). But it can depend on the engine: new spark plugs might be pre-gapped for a V-8 engine, installing all 8 plugs unchanged; however if installed in a 6-cylinder engine, all (6) plugs would require re-gapping



IGNITION SYSTEM – Electronic Systems