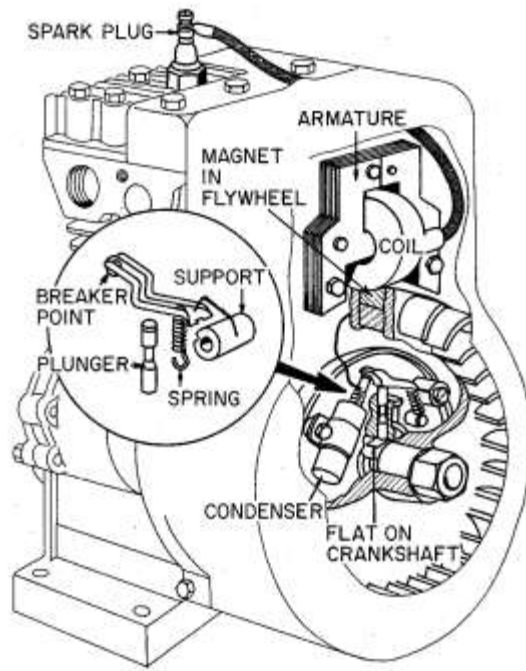
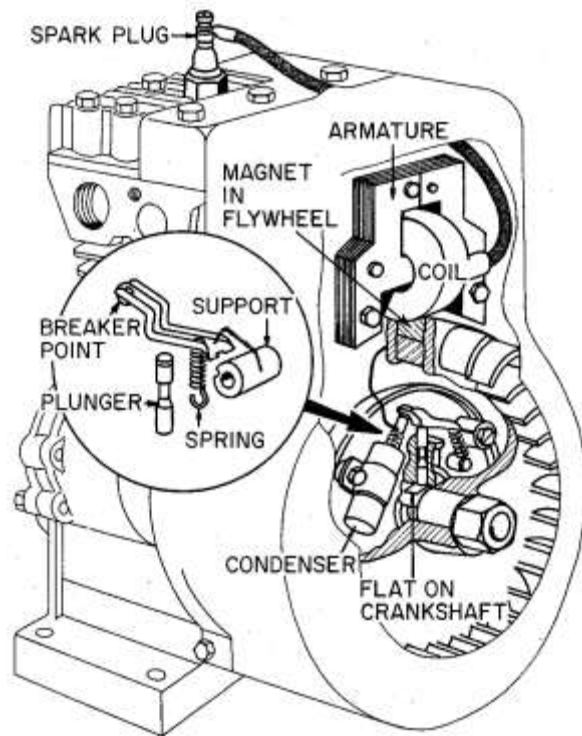


# Small Gas Engine Ignition Systems



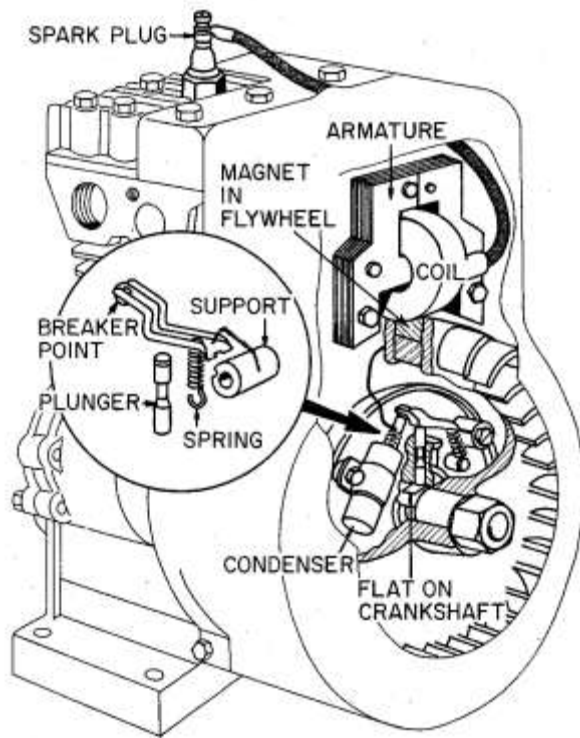
- Most older small gas engines use *magneto ignition systems* with the magneto built into the engine
- Usually it is located at one end of the crankshaft & its principal of operation is as follows;

# Small Gas Engine Ignition Systems



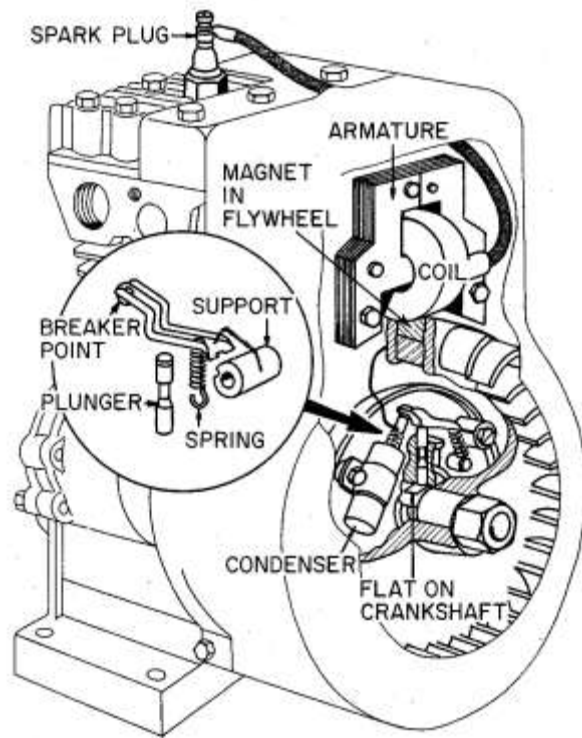
- A series of magnets are whirled past a coil of wire. The magnets are mounted on the engine flywheel
- When magnetic lines of force move through a conductor, **voltage** is induced in the conductor
- If the conductor is in a closed circuit then current will flow.

# Small Gas Engine Ignition Systems



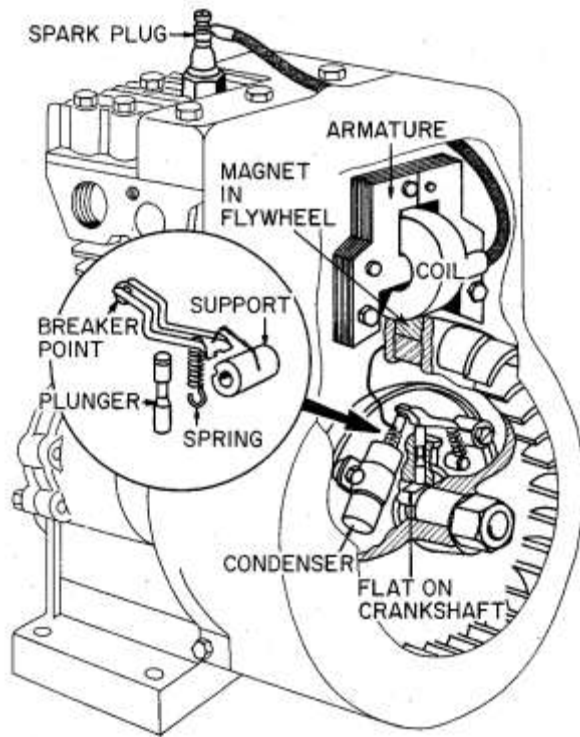
- The magneto ignition system consists of a **primary** winding of wire and a **secondary** winding
- The primary winding consists of, the coil of wire, (the primary winding) past which the magnets move and a pair of breaker points. One of these points is on a lever or arm the other is stationary

# Small Gas Engine Ignition Systems



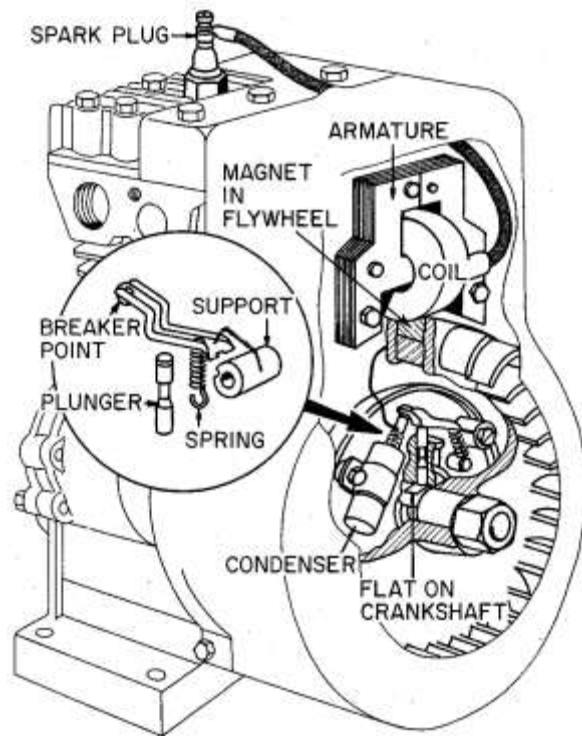
- One end of the arm rests on a plunger which rides on a cam on the crankshaft. This cam is round except for one high spot
- The breaker points remain closed until the high spot on cam passes under the plunger when the camshaft & crankshaft rotate

# Small Gas Engine Ignition Systems



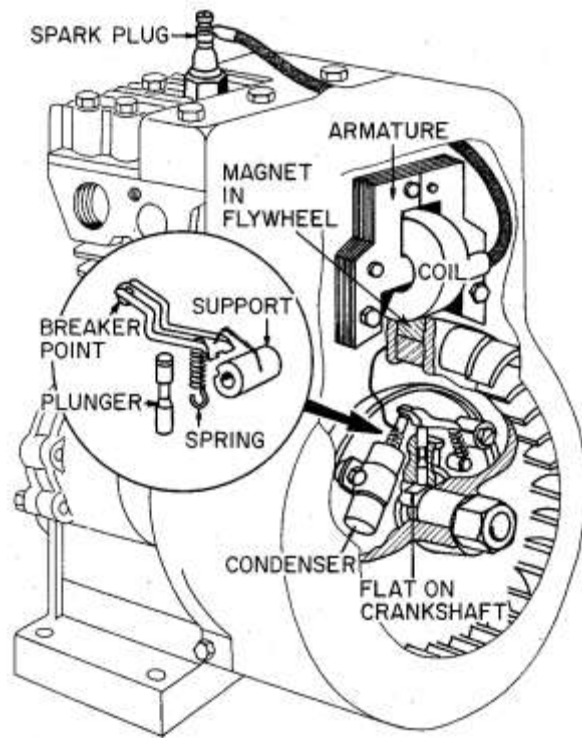
- When the engine is running the magnets are whirling past the coil in the primary winding and voltage is induced while the breaker points are closed. This current causes a strong magnetic field to build up around the winding. When the high spot on the cam comes around it lifts the plunger opening the breaker points which causes the magnetic field to rapidly collapse

# Small Gas Engine Ignition Systems



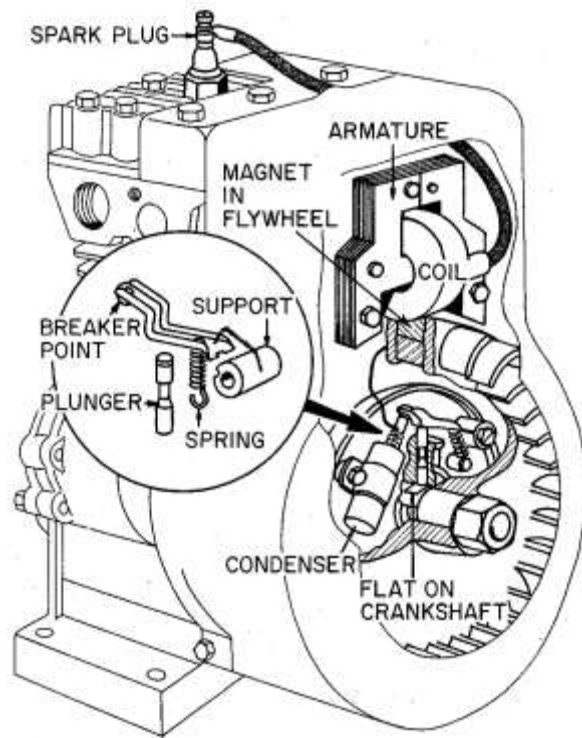
- Surrounding the primary winding is a secondary winding made of thousands of turns of fine wire
- The magnetic field from the primary winding, in collapsing, moves rapidly through the secondary winding

# Small Gas Engine Ignition Systems



- Since this is a movement of a magnetic field through a conductor, a voltage is produced.
- Since there are many thousands of turns of wire in the secondary winding, a high voltage is induced.

# Small Gas Engine Ignition Systems



- The spark plug is connected to the two ends of this secondary winding.
- One end is connected through the metal of the engine (called the ground)
- While the other end is connect through a rubber covered wire called a high-tension lead.



# Small Gas Engine Ignition Systems

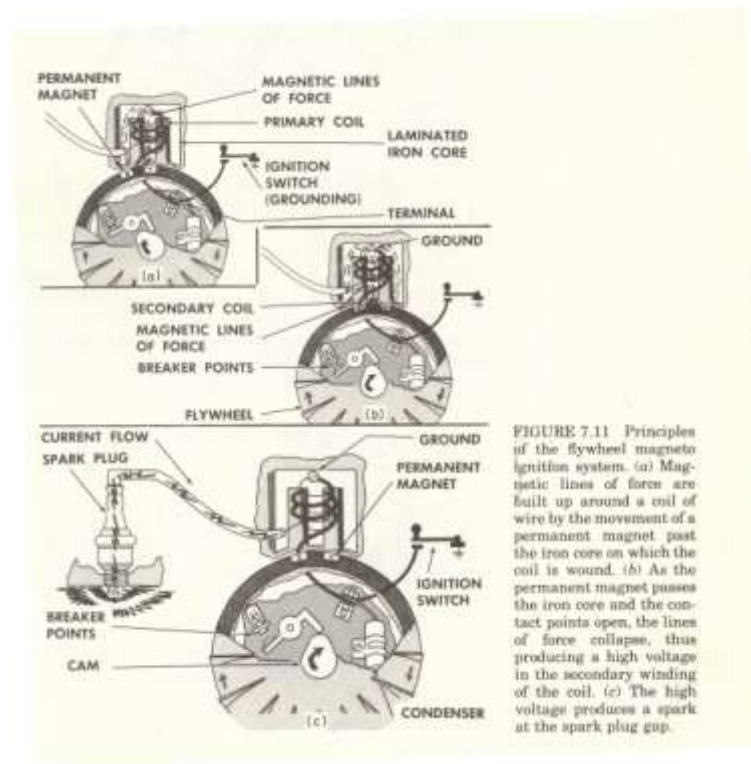


FIGURE 7.11 Principles of the flywheel magneto ignition system. (a) Magnetic lines of force are built up around a coil of wire by the movement of a permanent magnet past the iron core on which the coil is wound. (b) As the permanent magnet passes the iron core and the contact points open, the lines of force collapse, thus producing a high voltage in the secondary winding of the coil. (c) The high voltage produces a spark at the spark plug gap.