

IGNITION Auto-mobile Engineering

6th semester Mechanical Engineering

Introduction :-

Suryaprakash S.ithi

The spark ignition engines require some device to ignite the compressed air-fuel mixture inside the cylinder at the end of the compression stroke. Ignition system serves this purpose. It is a part of electrical system which carries the electrical current to spark plug which gives spark to ignite the air-fuel mixture at the correct time. The ignition system consists of a battery, switch, ignition distributor, ignition coil, spark plugs and necessary wiring. Some systems use transistors to reduce the load on the distributor contact points.

Types Of An Ignition System :-

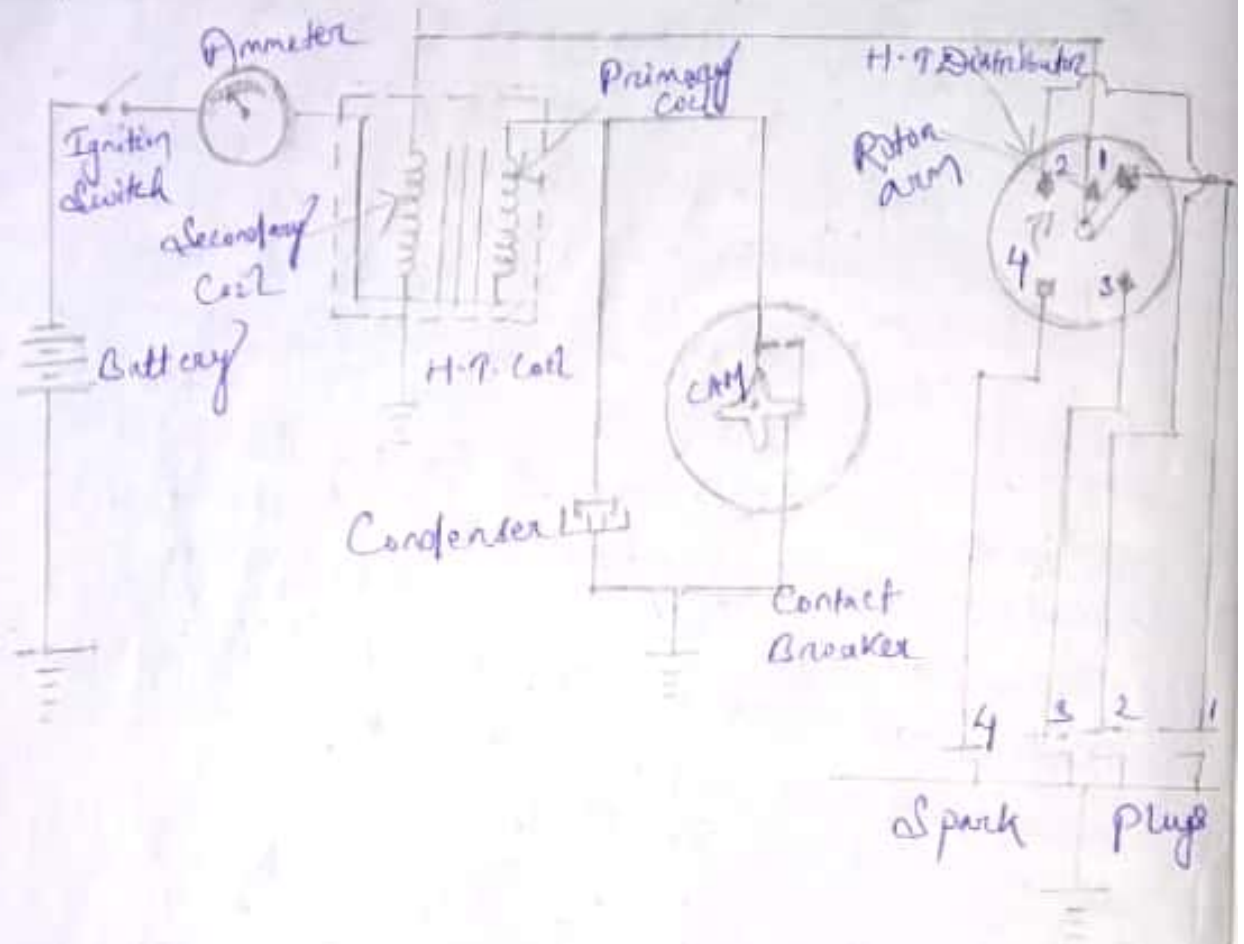
There are two types of ignition systems used in petrol engines.

1. Battery Ignition System (or Coil Ignition System)
2. Magneto Ignition System

Battery Ignition System :-

The figure shows battery ignition system for a four-cylinder engine. It consists of a battery, ammeter, switch,

ignition coil, condenser, contact breaker, distributor and spark plug.



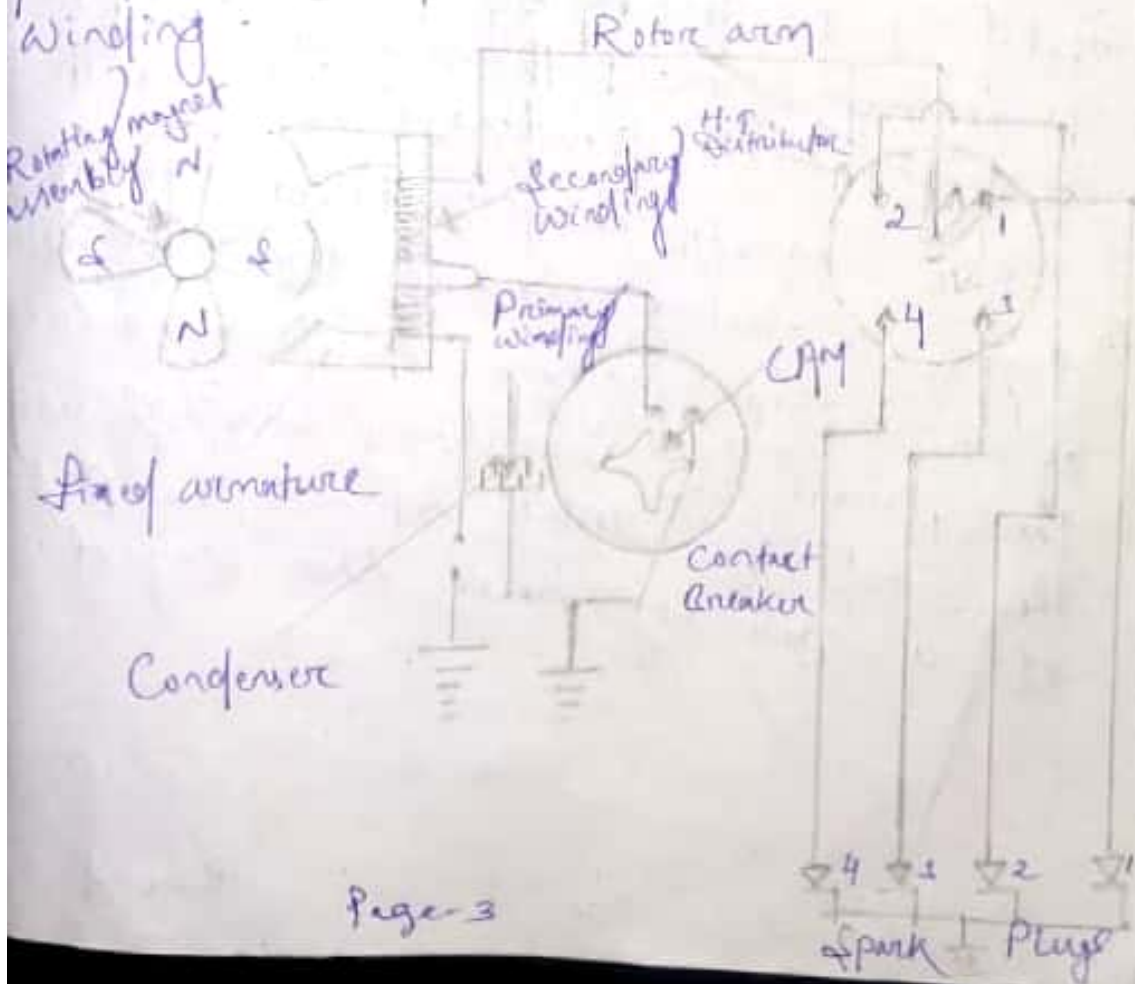
The primary ignition circuit starts at the battery & passes through the switch, ammeter, primary winding, contact breaker points to the ground. A condenser is also connected in parallel to the contact breaker points. One end of the condenser is connected to the contact breaker arm & the other is grounded.

The secondary ignition circuit is not connected electrically to the primary ignition circuit. It starts from the ground & passes through the secondary winding, distributor & spark plug to the ground.

A battery ignition system has a 6- or 12-volt battery charged by an engine-driven generator to supply electricity, an ignition coil to increase the voltage, a device to interrupt current from the coil, a distributor to direct current to the correct cylinder and a spark plug projecting into each cylinder.

2. Magneto Ignition System -

The fig. shows magneto ignition system for a four-cylinder engine. It consists of a magneto, instead of a battery, which produces & supplies current in the primary winding.



The remaining arrangement in this system is the same as that in the battery ignition system. The magneto consists of a fixed armature having primary and secondary windings and a rotating magnetic assembly which is driven by the engine. When the magnets rotate, current flows in the primary winding. The secondary winding gives high voltage current to the distributor, which distributes it to the respective spark plugs.

In a magneto, the magnetic field is produced by means of permanent magnets whereas in conventional generator, the magnetic field is produced by passing some of the generated current through the field winding which produces the magnetic field.

The magneto may be either rotating armature type or rotating magnetic type. In rotating armature type magneto, the armature carrying the primary & secondary windings and the condenser, rotate between the poles of a stationary horse shoe magnet.

Comparison of Battery Ignition & Magneto Ignition System

Battery Ignition System

1. Current is obtained from the battery.
2. Sparking is good even at low speed.
3. Starting of engine is easier.
4. If the battery is dis-charged, the engine can't be started.
5. Occupies more space.
6. Complicated wiring.
7. Less costly.
8. Spark intensity falls as the engine speed rises.
9. Used in cars, buses, trucks.

Magneto Ignition System

1. Current is generated by the magneto.
2. Poor sparking at low speed.
3. Difficult starting.
4. No such difficulty as battery is not needed.
5. Occupies less space.
6. Simple wiring.
7. More costly.
8. Spark intensity improves as the engine speed rises.
9. Used in motor cycles, scooters, racing cars.