DESCRIPTION AND MODIFICATIONS

DESCRIPTION

The electronic ignition system eliminates the contact breaker points and their associated service and performance problems. It controls ignition timing and dwell very accurately.

The distributor body, advance mechanism, rotor and distributor cap are the same as those in a conventional ignition system. The pick-up unit and reluctor have replaced the distributor cam and contact breaker. A condenser (capacitor) is not required and the ballast resistor is replaced by a dual resistor. The electronic control unit amplifies the timing signal from the distributor and controls the interruption of current through the primary winding of the ignition coil.

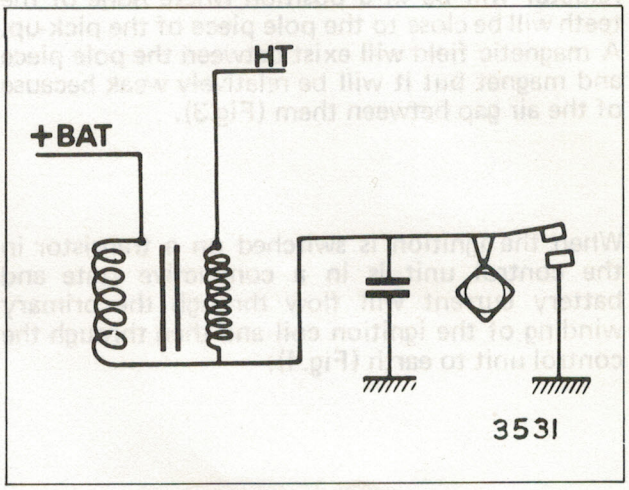


Fig. 1 *Conventional ignition system*

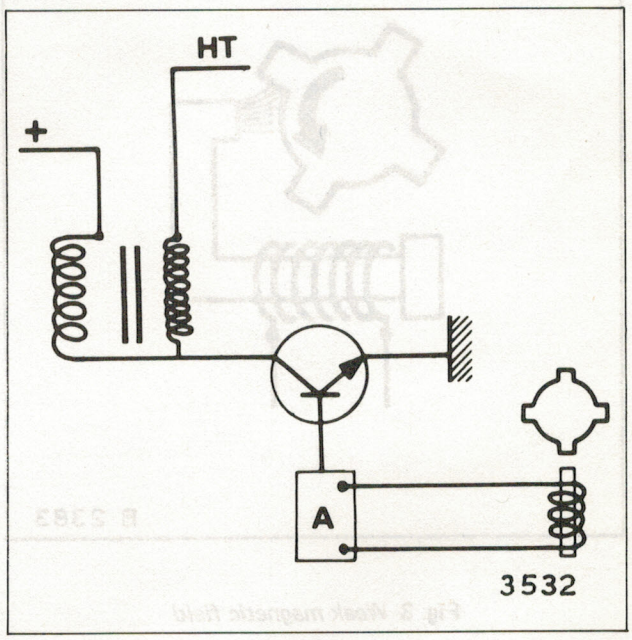


Fig. 2 *Electronic ignition system*

Reluctor

The reluctor is a gear-like component and is attached to the distributor shaft in the same position as the cam in a conventional distributor. It has as many teeth as there are engine cylinders.

Pick-up

The pick-up consists of a coil wound on a pole piece that is attached to a permanent magnet. The pole piece is separated from the teeth of the rotating reluctor by a small air gap. The air gap on the Chrysler Presolite distributor is adjustable. Voltage induced in the coil is fed to the control unit.

Control Unit

This amplifies the negative voltage from the pick-up coil. This signal is used to operate the power transistor that controls the interruption of the current flowing through the winding of the ignition coil.

Ballast Resistor

There are two separate resistors on the same mounting. One is a 1.25 Ohm ballast resistor as used in a conventional ignition system. It maintains constant primary current with variations in engine speed, protecting the coil against high current flow at low engine speed. This ballast resistor is by-passed when cranking so that full battery voltage is applied to the coil.

The second resistor is of 5 Ohms and it limits the current flow to the control unit to protect the electronic circuits.

OPERATION

Normally, when the engine is stationary, the reluctor will be in a position where none of the teeth will be close to the pole piece of the pick-up. A magnetic field will exist between the pole piece and magnet but it will be relatively weak because of the air gap between them (Fig.3).

When the ignition is switched on a transistor in the control unit is in a conductive state and battery current will flow through the primary winding of the ignition coil and then through the control unit to earth (Fig.4).

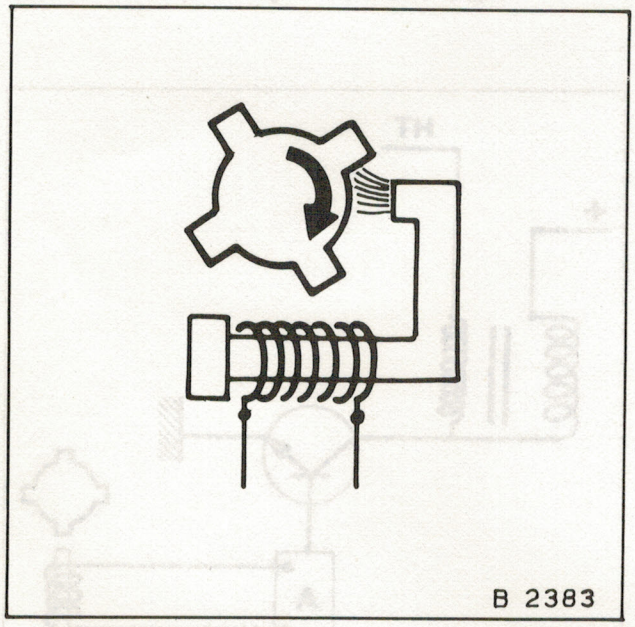


Fig. 3 *Weak magnetic field*

When the engine is cranked one of the teeth of the reluctor will come close to the pole piece, providing a better magnetic circuit (reducing the reluctance). The flux change will induce a positive voltage in the coil of the pick-up. The positive voltage will be at a maximum when the reluctor tooth is exactly opposite the pole piece (Fig.5)

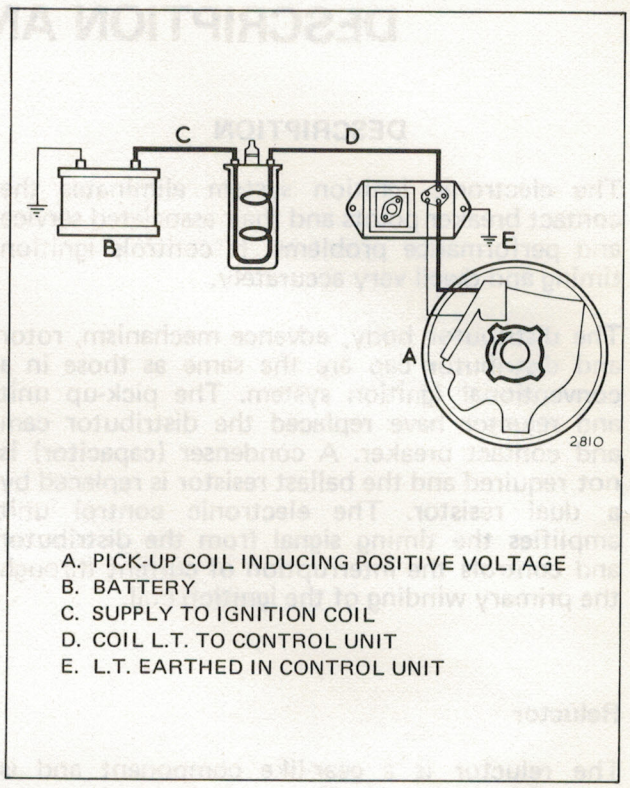


Fig. 4 *Current flow through control unit*

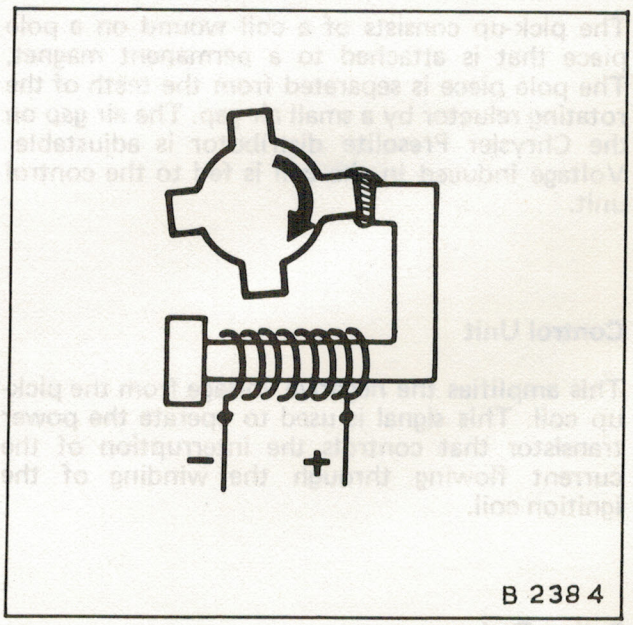


Fig. 5 *Strong magnetic field inducing positive pulse*

As the reluctor tooth passes the pole piece the air gap starts to increase and the field strength to decrease. The flux change in the field induces a negative voltage in the pick-up coil (Fig.6). The negative voltage is fed to the control unit and amplified. The signal triggers the electronic circuitry to "switch" the power transistor and interrupts the current flow through the ignition coil (Fig.7). This will cause a rapid collapse of the primary winding magnetic field through the secondary winding, resulting in a high tension (H.T.) voltage being produced at the H.T. output terminal of the ignition coil in the conventional way.

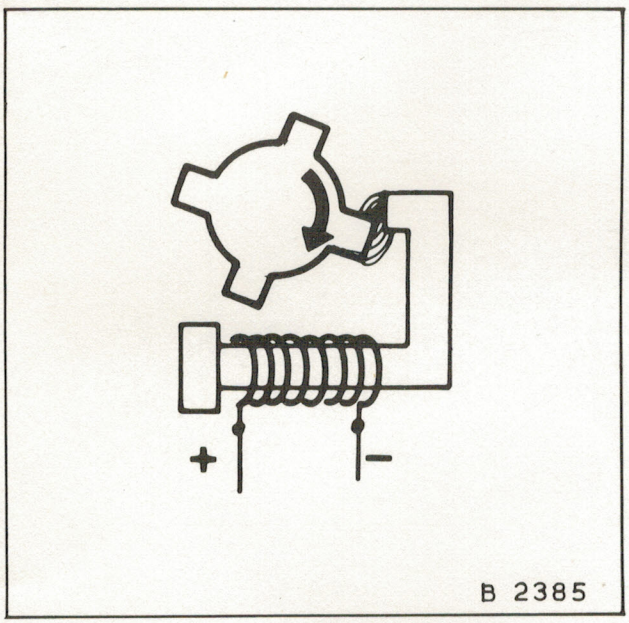
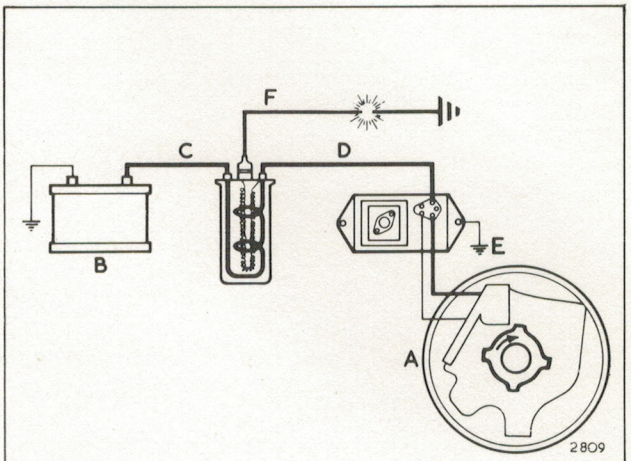


Fig. 6 *Flux change inducing negative pulse*

The control unit also determines electronically how long the ignition coil primary current is allowed to flow before it is interrupted. This is the dwell period and as the control unit circuitry is sealed the dwell cannot be changed.

The reluctor and the pick-up determine ignition timing. The control unit determines dwell.

Warning: The control unit of the electronic ignition is mounted on the left hand wing valance. The circular protusion on the control unit is the power transistor that carries a high voltage. Take care not to touch the transistor when the engine is running.



A. PICK-UP COIL INDUCING NEGATIVE VOLTAGE
B. BATTERY
C. SUPPLY TO IGNITION COIL
D. COIL L.T. TO CONTROL UNIT
E. L.T. OPEN CIRCUIT IN CONTROL UNIT
F. H.T. INDUCED IN COIL SECONDARY

Fig. 7 *L.T. current interrupted in control unit*

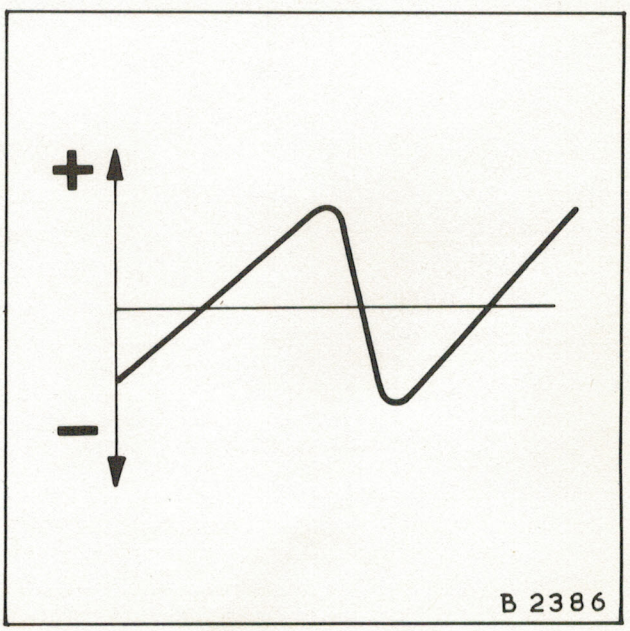


Fig. 8 *Voltage change in pick-up*