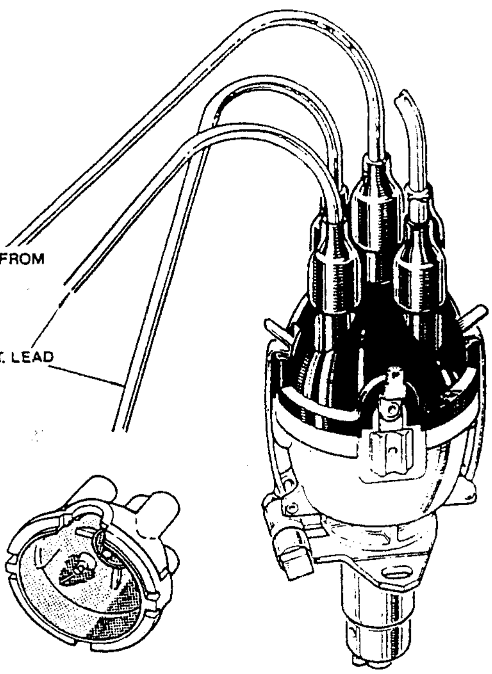

Fig. 33 Checking the distributor cover and leads

CONTACT BREAKER ASSEMBLY AND GAP SETTING (Fig. 34)

The contact breaker must be maintained in good condition. Ensure that the contact surfaces are free from oil and grease. If the contacts show signs of excessive wear, they should be replaced.

When setting the contact breaker gap ensure that the contacts are fully open (i.e. the contact heel is on the peak of the cam lobe). A gauge of the appropriate thickness, 0·35–0·40 mm (0·014″–0·016″), should make a sliding fit between the contacts. It is advisable to re-check the gap after adjustment, to ensure no movement has taken place while the screw was being tightened.

Providing the distributor is in good mechanical condition, an alternative method of setting the contact gap is to use an accurate dwell angle meter.

CONTACT BREAKER ADJUSTMENT FOR 35D DISTRIBUTORS

The contact breaker setting is adjusted by rotating the hexagon-shaped stud which protrudes through the distributor body. It is adjusted to give the correct dwell angle (contact closed period), see Fig. 35.

Adjustment should be carried out using a dwell meter with the engine running. The dwell angle should be set within the limits specified by the manufacturer. The hexagon-shaped stud is screwed anti-clockwise to increase the dwell angle (close the contact point gap) and clockwise to decrease the dwell angle (open the contact gap).

Note: Static and stroboscopic timing are described at the end of the chapter.

BALLASTED IGNITION SYSTEM

Ballasted ignition systems (Fig. 36) are used to improve engine starting especially in very cold conditions, and also to provide maximum spark efficiency at high engine speeds.

Battery voltage is at its lowest when the engine is being cranked. This drain on the battery causes the terminal voltage to fall well below its normal value. Consequently, during starting the H.T. spark is obtained from an ignition coil which is operating from a reduced voltage. In these conditions the ignition performance is usually satisfactory, but in extremely cold conditions it is preferable to use a system in which the voltage applied to an appropriate coil remains constant.

A ballast resistor is connected in series with the ignition coil primary winding, and the circuit is arranged to short out the resistor when the starting motor is operating.

The ballast resistor normally comprises a coil of resistive wire housed in a porcelain block with electrical connections by means of 'Lucar' connectors.

The ballast resistor is clamped to its fixing (often an ignition coil mounting bolt) by a bracket surrounding the porcelain block.

Note: The resistor may take the form of a resistive cable on some applications.

The cold starting performance is improved by permitting the ignition coil to operate at a voltage slightly above its normal operating voltage. Slight overloading is not detrimental to the coil as it occurs only while the engine is being cranked.

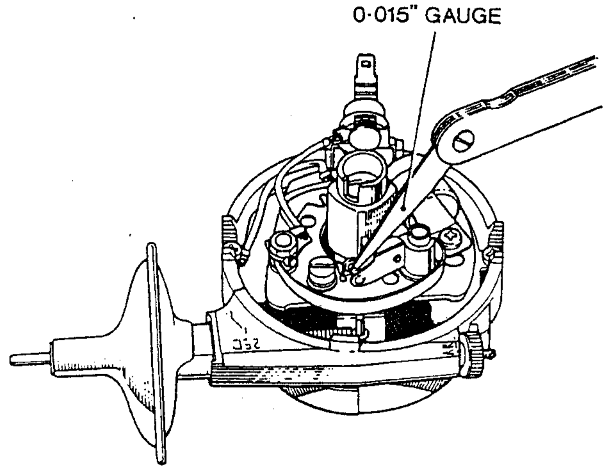

Fig. 34 Checking the contact breaker assembly and gap setting

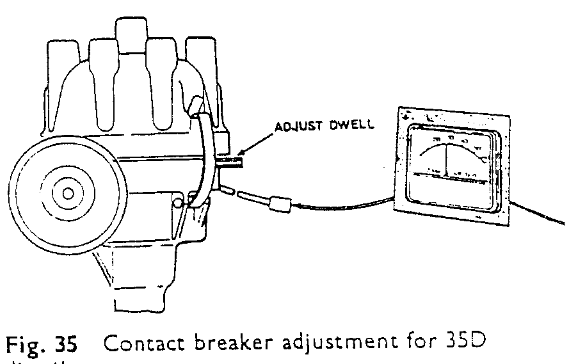

Fig. 35 Contact breaker adjustment for 35D distributors

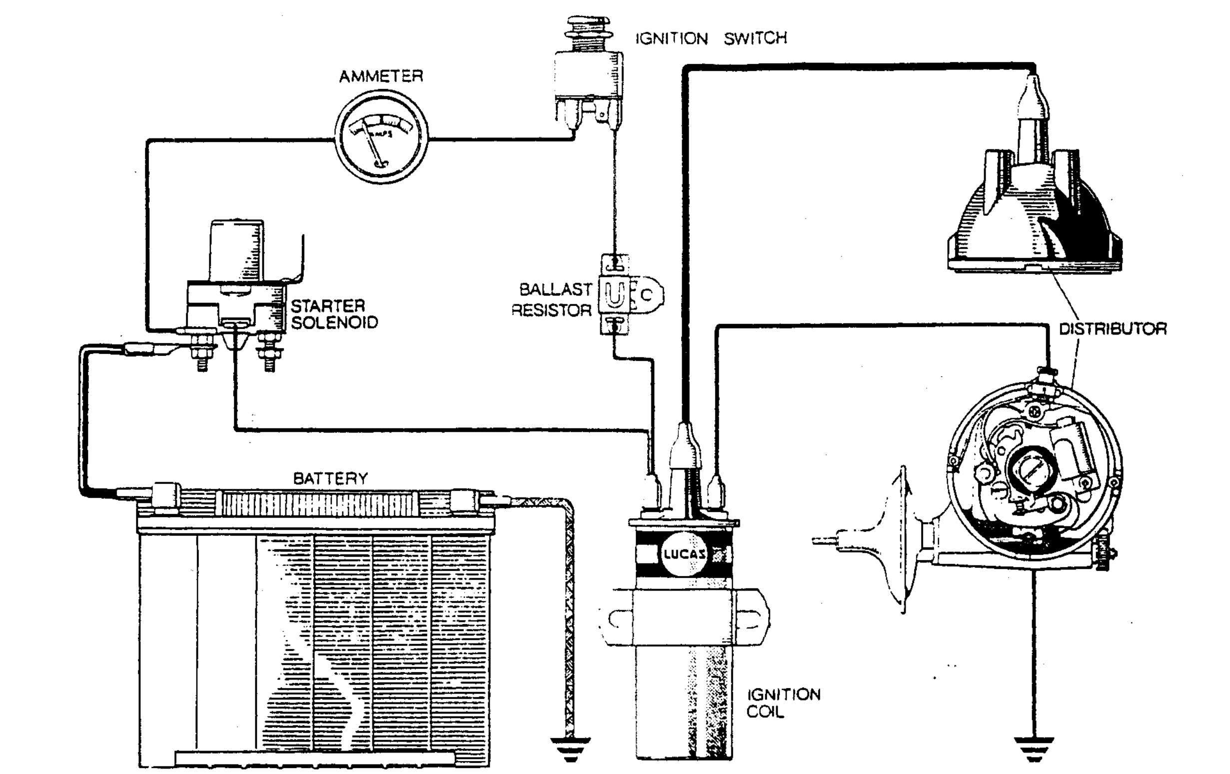

Fig. 36 Typical ballasted ignition system

The primary winding of an ignition coil (used with a ballast resistor) has a lower inductance value, which permits a more rapid build up of the magnetic field as the contact points close. There is also less heating effect inside the coil as the ballast resistor itself dissipates some of the heat produced in the circuit.

TEST 1. Voltage at '+' Terminal of Coil (Ballasted System) – (Contacts Closed)

To obtain a good H.T. spark it is necessary to have a good voltage supply to the coil.

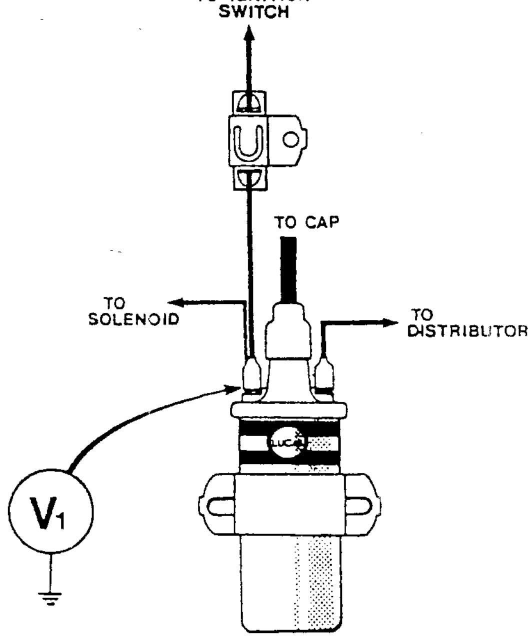

Fig. 37 Voltage at '+' terminal of coil (contacts closed)

Connect the voltmeter (V1) between the '+' terminal of the coil and a good earth, as shown in Fig. 37. The contacts should be closed during the test to enable current to flow through the primary winding.

Switch on the ignition and the voltmeter should register approx. 6V for a 12 volt ballasted system. If the correct voltage is indicated, the supply from the battery to the ignition coil is satisfactory. Next, temporarily earth the coil negative terminal and crank the engine by the starter,'any increase in the voltage indicates a satisfactory circuit. A slight decrease indicates a faulty solenoid switch or lead from the solenoid switch. Remove temporary earth connection.

If no readings are obtained, proceed with the Tests 2 and 3. If correct readings or battery volts are obtained, proceed to Test 4.

TEST 2. Voltage at '+' Side of Ballast Resistor

With the contacts closed, connect the voltmeter (V2) between the feed side of the ballast resistor and a good earth (Fig. 38). On applications with resistive supply cable, connect the voltmeter between the ignition switch end of the cable and a good earth. If battery voltage is registered, proceed to Test 3. But if no voltage is indicated, check back along supply cable.

TEST 3. Voltage at Coil Side of Ballast Resistor

Connect the voltmeter (V3) between the coil side of the ballast resistor and a good earth (Fig. 38). The ignition is switched on. No reading indicates a faulty ballast resistor.

TEST 4. Voltage at '—' Terminal of Coil (Contacts Open)

With contacts open, connect the voltmeter between the coil '—ve' terminal and earth as (V4) in Fig. 39. With ignition on, voltmeter should read battery voltage. No reading indicates open-circuit coil primary winding or short-circuit on the lead from the coil to distributor or within the distributor.

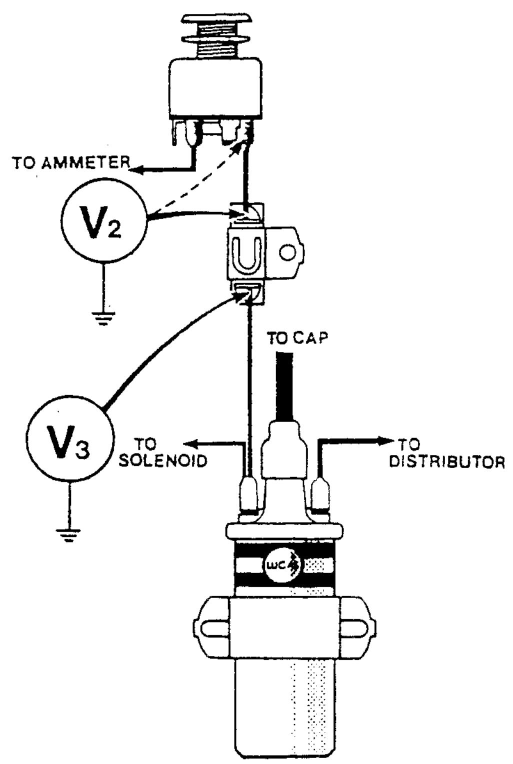

Fig. 38 Voltage at ballast resistor

Repeat test with coil '—ve' lead disconnected; if reading now appears, fault is on distributor or lead. No reading – faulty coil.

TEST 5. Distributor – Earth

If the last test has shown that the distributor is short-circuited to earth, the following points in the L.T. line should be checked, see Fig. 40.

(A) The lead between the ignition coil ('—ve' terminal) and the distributor L.T. terminal.

(B) The flexible lead, connecting the distributor L.T. terminal to the moving contact (terminal post).

(C) The flexible lead, connecting the contact breaker terminal post to the capacitor.

(D) Also, check that the tags on the end of the capacitor and flexible leads at the L.T. terminal post are under the shoulder of the nylon bush, and not under the securing nut.

(E) Finally, check that the capacitor is not earthed. This is achieved by disconnecting the capacitor from its mounting.

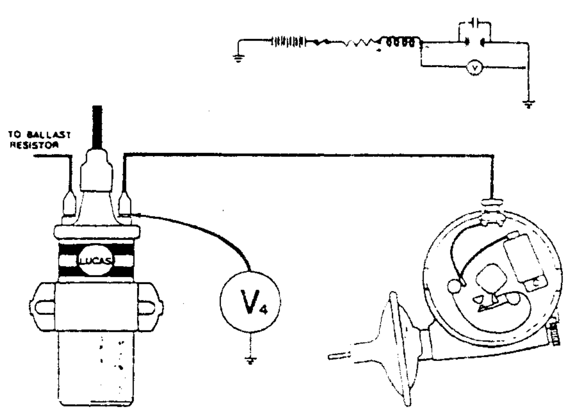

Fig. 39 Voltage at '—' terminal of coil (contacts open)

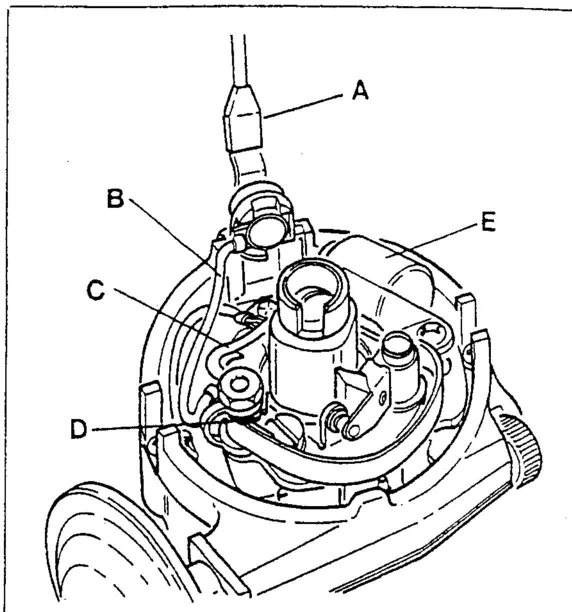

Fig. 40 Distributor: earth

TEST 6. Voltage at '—' Terminal of Coil (Contacts Closed)

When all connections are re-made, the voltmeter is left connected as in Test 4, (i.e. between the coil '—ve' terminal and a good earth) (Fig. 41). The contact points are closed by rotating the engine. When the ignition is switched on, a zero reading should be obtained. If the voltmeter registers a voltage, it is due to one of the following faults:

1. Dirty or oily contacts.
2. Bad earth connection (for instance, between the distributor shank and the engine block, or the flexible lead from the contact plate to earth).
3. Contacts not closing properly.
4. A high resistance in the circuit from the coil to the C.B. on the distributor.
5. Broken flexible lead between the distributor L.T. terminal and the contact breaker terminal post.
6. Open-circuit coil to distributor lead.

Tests for the secondary H.T. circuit are identical to those for conventional systems, as described in the previous section.

Note: Static and stroboscopic timing is described at the end of this chapter.

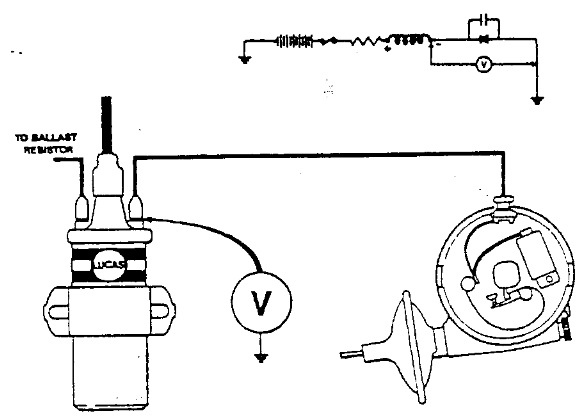

Fig. 41 Voltage at '—' terminal of coil (contacts closed)