Chapter 4 Ignition system

For modifications and information applicable to later models, see Supplement at end of manual

Contents

Degrees of difficulty

Easy, suitable for novice with little experience 

Fairly easy, suitable for beginner with some experience 

Fairly difficult, suitable for competent DIY mechanic 

Difficult, suitable for experienced DIY mechanic 

Very difficult, suitable for expert DIY or professional 

Specifications

System type

Except ES engines	Battery, coil mechanical breaker distributor
ES engines	Marelli Digiplex electronic with breakerless distributor
Firing order	1 - 3 - 4 - 2 (No. 1 cylinder at crankshaft pulley end)

Mechanical breaker distributor

Type	Marelli or Ducellier
Contact breaker points gap	0.37 to 0.43 mm (0.015 to 0.017 in)
Condenser capacity	0.20 to 0.25 µF
Dwell angle	52 to 58º
Rotor rotational direction	Clockwise
Ignition timing (dynamic)	
903 cc engine	5º BTDC at idle
1116 and 1301 cc engines	10º BTDC at idle
Centrifugal advance:	
903 cc engine	Between 30 and 34º max
1116 and 1301 cc engines	Between 22 and 24º max
Vacuum advance	Between 10 and 14º max

Ignition coil

Primary winding resistance at 20ºC (68ºF)	Between 2.6 and 3.3 ohms depending upon make of coil
Secondary winding resistance at 20ºC (68ºF)	Between 6745 and 12 000 ohms depending upon make of coil

Marelli Digiplex electronic ignition

Rotor arm resistance	1000 ohms
Advance range	Between 6 to 10º and 47 to 51º

Engine speed sensor

Resistance on flywheel	612 to 748 ohms
Sensor to flywheel tooth gap	0.25 to 1.3 mm (0.0099 to 0.0512 in)

TDC sensor

Resistance on pulley	612 to 748 ohms
Sensor to pulley tooth gap	0.4 to 1.0 mm (0.016 to 0.039 in)

Ignition coil

Primary winding resistance at 20ºC (68ºF)	0.310 to 0.378 ohms
Secondary winding resistance at 20ºC (68ºF)	3330 to 4070 ohms

Spark plugs

Type	Champion RN9YCC or RN9YC
Electrode gap	0.8 mm (0.031 in)

HT leads

903 cc (45)	Champion LS-07
1116, 1299 and 1301 cc (55, 60 and 70)	Champion LS-05

Torque wrench setting	Nm	lbf ft
Spark plugs	25	18

1 General description

On all models except the 903 ES engine version, a mechanical contact breaker type distributor is fitted.

On 45 Super ES models which have the 903 ES engine, an electronic (Digiplex) ignition system is used which incorporates a breakerless distributor.

Mechanical contact breaker system

For the engine to run correctly, it is necessary for an electrical spark to ignite the fuel/air mixture in the combustion chamber at exactly the right moment in relation to engine speed and load. The ignition system is based on feeding low tension voltage from the battery to the coil where it is converted to high tension voltage. The high tension voltage is powerful enough to jump the spark plug gap in the cylinders under high compression pressures, providing that the system is in good condition and that all adjustments are correct.

The ignition system is divided into two circuits, the low tension (LT) circuit and the high tension (HT) circuit.

The low tension (sometimes known as the primary) circuit consists of the battery, the lead to the ignition switch, the lead from the ignition switch to the low tension or primary coil windings, and the lead from the low tension coil windings to the contact breaker points and condenser in the distributor.

The high tension circuit consists of the high tension or secondary coil windings, the heavy ignition lead from the centre of the coil to the centre of the distributor cap, the rotor arm, and the spark plug leads and spark plugs.

The system functions in the following manner: High tension voltage is generated in the coil by the interruption of the low tension circuit. The interruption is effected by the opening of the contact breaker points in this low tension circuit. High tension voltage is fed from the centre of the coil via the carbon brush in the centre of the distributor cap to the rotor arm of the distributor.

The rotor arm revolves at half engine speed inside the distributor cap, and each time it comes in line with one of the four metal segments in the cap, which are connected to the spark plug leads, the opening of the contact breaker points causes the high tension voltage to build up, jump the gap from the rotor arm to the appropriate metal segment, and so via the spark plug lead to the spark plug, where it finally jumps the spark plug gap before going to earth.

The ignition timing is advanced and retarded automatically, to ensure the spark occurs at just the right instant for the particular load at the prevailing engine speed.

The ignition advance is controlled mechanically, and by vacuum. The mechanical governor mechanism consists of two weights, which move out from the distributor shaft as the engine speed rises, due to centrifugal force. As they move

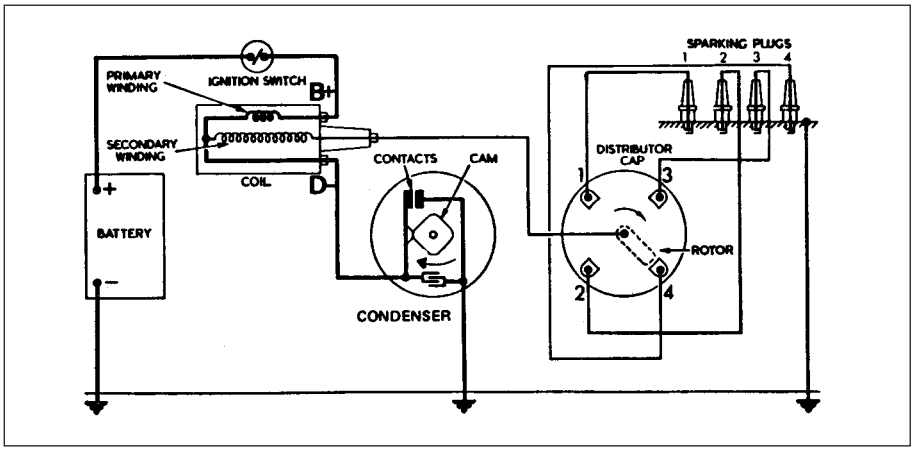


Fig. 4.1 Typical ignition circuit (mechanical contact breaker distributor) (Sec 1)

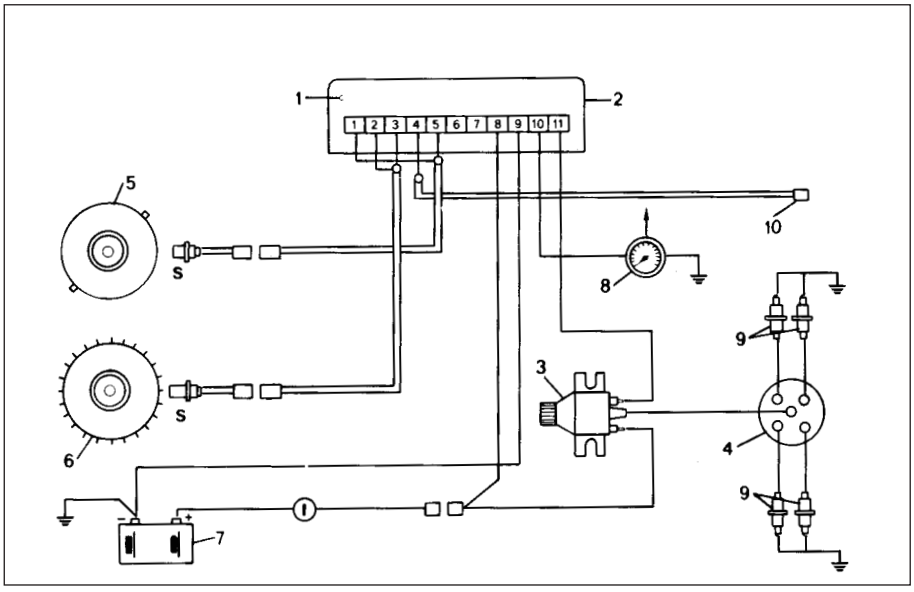


Fig. 4.2 Digiplex electronic ignition system (Sec 1)

1 Control unit
2 Multi-plug
3 Ignition coil
4 Distributor cap
5 Crankshaft pulley
6 Flywheel
7 Battery
8 Rev counter
9 Spark plugs
10 Wiring connector
S1 Engine speed sensor
S2 TDC sensor

outwards, they rotate the cam relative to the distributor shaft, and so advance the spark. The weights are held in position by two springs and it is the tension of the springs which is largely responsible for correct spark advancement.

The vacuum advance is controlled by a diaphragm capsule connected to the carburettor venturi. The vacuum pressure varies according to the throttle valve plate opening and so adjusts the ignition advance in accordance with the engine requirements.

Digiplex ignition system

This electronic system eliminates the mechanical contact breaker and centrifugal advance mechanism of conventional distributors and uses an electronic control unit to provide advance values according to engine speed and load. No provision is made for adjustment of the ignition timing.

Information relayed to the control unit is provided by two magnetic sensors which monitor engine speed and TDC directly from the engine crankshaft.

A vacuum sensor in the control unit converts intake manifold vacuum into an electric signal.

The control unit selects the optimum advance angle required and a closed magnetic circuit resin coil guarantees a spark owing to the low primary winding resistance.

Five hundred and twelve advance values are stored in the control unit memory to suit any combination of engine operating conditions.

No maintenance is required to the distributor used on this system.

Distributor drive

The mechanical breaker type distributor on 903 cc engines and the Digiplex type distributor on 903 cc ES engines are mounted on the cylinder head and driven from a gear on the camshaft through a shaft which also drives the oil pump.

The distributor on 1116 cc and 1301 cc engines is mounted on the crankcase and is driven from a gear on the auxiliary shaft as is also the oil pump.

2 Mechanical contact breaker - points servicing

1 At the intervals specified in "*Routine Maintenance"*, prise down the clips on the distributor cap and place the cap with high tension leads to one side.
2 Pull off the rotor.
3 Remove the spark shield. Mechanical wear of the contact breaker reduces the gap. Electrical wear builds up a "pip" of burned metal on one of the contacts. This |prevents the gap being measured for re-adjustment, and also spoils the electric circuit.

Ducellier type distributor

4 To remove the contact breaker movable arm, extract the clip and take off the washer from the top of the pivot post.
5 Extract the screw and remove the fixed contact arm.
6 Clean the points by rubbing the surfaces on a fine abrasive such as an oil stone. The point surface should be shaped to a gentle convex curve. All the "pip" burned onto one contact must be removed. It is not necessary to go on until all traces of the crater have been removed from the other. There is enough metal on the contacts to allow this to be done once. At alternate services, fit new points. Wash debris off cleaned points and preservatives off new ones.
7 Now the distributor should be lubricated. This lubrication is important for the correct mechanical function of the distributor, but excess lubrication will ruin the electrical circuits, and give difficult starting.
8 Whilst the contact breaker is off, squirt some engine oil into the bottom part of the distributor, onto the centrifugal advance mechanism below the plate.
9 Wet with oil the felt pad on the top of the distributor spindle, normally covered by the rotor arm.
10 Put just a drip of oil on the pivot for the moving contact.
11 Smear a little general purpose grease onto the cam, and the heel of the moving contact breaker.
12 Refit the contact points and then set the gap in the following way.
13 Turn the crankshaft by applying a spanner to the pulley nut or by jacking up a front wheel, engaging top gear and turning the roadwheel in the forward direction of travel. Keep turning until the plastic heel of the movable contact arm is on the high point of a cam lobe on the distributor shaft.
14 Set the points gap by moving the fixed contact arm until the specified feeler blades are a sliding fit. Tighten the fixed contact arm screw.
15 Check the contact end of the rotor arm. Remove any slightly burnt deposits using fine abrasive paper. Severe erosion will necessitate renewal of the rotor.
16 Wipe out the distributor cap and check for cracks or eroded contacts (photo). Renew if evident or if the carbon brush is worn.
17 Refit the spark shield, rotor and distributor cap.
18 Setting the contact breaker gap with a feeler blade must be regarded as a means of ensuring that the engine will start. For optimum engine performance, the dwell angle must be checked and adjusted as described in Section 3.

Marelli type distributor

19 Open the points with a finger nail and inspect their condition. If they are badly eroded or burned, then they must be renewed. The contact points can only be renewed complete with carrier plate as an assembly.
20 Release the low tension leads from the terminals on the distributor body (photo).
21 Extract the screws which hold the vacuum advance capsule to the distributor body. Tilt the capsule and release its link rod from the contact breaker carrier plate (photo).
22 Prise out the E-clip from the breaker carrier and then withdraw the contact assembly from the top of the distributor shaft.

2.16 Interior of distributor cap showing carbon brush

2.20 Marelli distributor

2.21 Extracting vacuum diaphragm unit screw

2.22A Marelli contact breaker E-clip

2.22B Washers above contact breaker

Fig. 4.3 Marelli contact breaker (Sec 2)

Fig. 4.4 Adjusting Marelli type contact breaker points gap (Sec 2)

4.2 Distributor vacuum hose

Note the washers above and below the contact assembly (photos).

23 Fit the new contact assembly by reversing the removal operations.

24 Although the points gap is normally set in production, check it using feeler blades when the plastic heel of the movable arm is on a high point of the shaft cam. Adjust if necessary by inserting an Allen key (3.0 mm) into the socket-headed adjuster screw.

25 Carry out the operations described in paragraphs 14 to 17 in this Section.

3 Dwell angle - checking

The dwell angle is the number of degrees through which the distributor cam turns between the instants of closure and opening of the contact breaker points.

1 Connect a dwell meter in accordance with the maker's instruction. The type of meter that operates with the engine running is to be preferred; any variation in contact breaker gap, caused by wear in the distributor shaft or bushes, or the height of the distributor cam peaks, is evened out when using this.

2 The correct dwell angle is given in the Specifications at the beginning of this Chapter. If the angle is too large, increase the contact points gap. If the angle is too small, reduce the points gap. Only very slight adjustments should be made to the gap before re-checking.

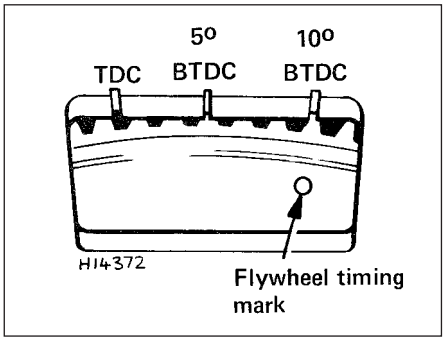


Fig. 4.5 Flywheel housing timing marks (Sec 4)

3 On Ducellier distributors, adjustment of the dwell angle can only be carried out by switching off the ignition, removing the distributor cap, rotor and spark shield and adjusting the points gap.

4 Re-check once the engine is running. Adjustment may have to be carried out several times to obtain the correct dwell angle.

5 On Marelli distributors, adjustment of the points gap (dwell angle) is carried out with the engine running by inserting a 3.0 mm Allen key in the hole provided in the distributor body.

6 Always check and adjust the dwell angle before timing the ignition as described in Section 4.

4 Ignition timing

1 Timing the ignition on engines with mechanical breaker distributors is carried out in the following way.

2 Disconnect the vacuum hose from the distributor diaphragm capsule (photo).

3 Have the engine at normal operating temperature and idling with a stroboscope connected in accordance with the manufacturer's instructions.

4 Point the stroboscope at the timing marks on the flywheel and the index on the aperture on the flywheel housing. The mark on the flywheel should be opposite to the BTDC mark on the index specified for your particular engine. Alternatively, use the notch on the crankshaft pulley and the marks on the timing belt cover (photo), but this will necessitate removal of the wheel arch shield.

5 If the marks are not in alignment, release the distributor clamp plate and turn the distributor gently until they are (photo).

6 Tighten the clamp plate nut, switch off the ignition, reconnect the vacuum hose and remove the stroboscope.

7 If there is any difficulty in seeing the timing marks clearly, highlight them by painting with quick-drying white paint.

4.4 Ignition timing marks on belt cover

5 Condenser (capacitor) - removal, testing and refitting

The purpose of the condenser (sometimes known as the capacitor) is to ensure that when the contact breaker points open there is no sparking across them which would weaken the spark and cause rapid deterioration of the points.

The condenser is fitted in parallel with the contact breaker points. If it develops a short circuit it will cause ignition failure as the points will be prevented from interrupting the low tension circuit.

1 If the engine becomes very difficult to start (or begins to misfire whilst running) and the breaker points show signs of excessive burning, suspect the condenser has failed with open circuit. A test can be made by separating the points by hand with the ignition switched on. If this is accompanied by a bright spark at the contact points, it is indicative that the condenser has failed.

2 Without special test equipment, the only sure way to diagnose condenser trouble is to replace a suspected unit with a new one and note if there is any improvement.

3 To remove the condenser from the distributor, take out the screw which secures it to the distributor body and disconnect its leads from the terminals.

4 When fitting the condenser, it is vital to ensure that the fixing screw is secure. The lead must be secure on the terminal with no chance of short circuiting.

6 Distributor - removal and refitting

1 Remove the spark plug from No. 4 cylinder and then turn the crankshaft either by applying a spanner to the pulley nut or by jacking up a front wheel, engaging top gear and turning the wheel in the forward direction of travel.

2 Place a finger over the plug hole and feel the compression being generated as the piston rises up the cylinder bore.

3 Alternatively, if the rocker cover is off, check that the valves on No. 1 cylinder are closed.

4 Continue turning the crankshaft until the flywheel and flywheel housing (BTDC) ignition timing marks are in alignment. Number 4 piston is now in firing position.

5 Remove the distributor cap and place it to one side complete with high tension leads.

6 Disconnect the distributor vacuum hose and low tension lead (photo).

7 Mark the distributor pedestal mounting plinth in relation to the crankcase. Also mark the contact end of the rotor in relation to the rim of the distributor body.

4.5 Distributor clamp plate nut

6.6 Distributor LT connection

8 Unbolt the clamp plate and withdraw the distributor.

9 Refit by having No. 4 piston at its firing position and the distributor rotor and pedestal marks aligned, then push the distributor into position, mating it to the splined driveshaft.

10 If a new distributor is being fitted then of course alignment marks will not be available to facilitate installation in which case, hold the unit over its mounting hole and observe the following.

903 cc engine: Distributor cap high tension lead sockets pointing towards alternator and at 90º to centre line of rocker cover. Contact end of rotor arm pointing towards No. 4 contact in distributor cap (when fitted).

1116 cc and 1301 cc engine: Distributor vacuum unit pointing downwards at 135º to rear edge of timing belt cover. Contact end of rotor arm pointing towards No. 4 contact in distributor cap (when fitted).

11 Tighten the distributor clamp bolt, reconnect the vacuum hose and the low tension leads. Refit the distributor cap. Screw in the spark plug.

12 Check the ignition timing as described in Section 4.

7 Distributor (mechanical breaker type) - overhaul

Ducellier

1 The cap must have no flaws or cracks and the HT terminal contacts should not be severely corroded. The centre spring-loaded carbon contact is renewable. If in any doubt about the cap, buy a new one.

2 The rotor deteriorates minimally, but with age the metal conductor tip may corrode. It should not be cracked or chipped and the metal conductor must not be loose. If in doubt, renew it. Always fit a new rotor if fitting a new cap.

3 With the distributor removed as described in the preceding Section, take off the rotor and contact breaker.

4 To remove the contact breaker movable arm, extract the clip and take off the washer from the top of the pivot post.

5 Extract the screw and remove the fixed contact arm.

6 Carefully record the setting of the advance toothed segment and then remove the spring clip and vacuum capsule fixing screws and withdraw the capsule with link rod.

7 Pick out the lubrication pad from the recess in the top of the distributor shaft. Unscrew the screw now exposed.

8 Mark the relationship of the cam to the counterweight pins and then remove the cam assembly.

9 There is no way to test the bob weight springs other than by checking the performance of the distributor on special test equipment, so if in doubt, fit new springs anyway. If the springs are loose where they loop over the posts, it is more than possible that the post grooves are worn. In this case, the various parts which include the shaft will need renewal. Wear to this extent would mean that a new distributor is probably the best solution in the long run. Be sure to make note of the engine number and any serial number on the distributor when ordering.

10 If the mainshaft is slack in its bushes or the cam on the spindle, allowing sideways play, it means that the contact points gap setting can only be a compromise; the cam position relative to the cam follower on the moving point arm is not constant. It is not practical to re-bush the distributor body unless you have a friend who can bore and bush it for you. The shaft can be removed by driving out the roll pin from the retaining collar at the bottom. (The collar also acts as an oil slinger to prevent excess engine oil creeping up the shaft.)

Marelli

11 With the distributor removed from the engine, take off the spark shield and rotor.

12 Remove the contact breaker and carrier as described in Section 2.

13 Refer to paragraphs 9 and 10 for details of counterweight springs and shaft bushes (photo).

7.13 Marelli distributor centrifugal weights and springs

Reassembly

14 This is a reversal of dismantling. On Ducellier distributors, make sure that the advance toothed segment is returned to its original setting otherwise the advance curves for your particular engine will be upset.

8 Ignition coil (mechanical breaker ignition)

1 Coils normally last the life of a car. The most usual reason for a coil to fail is after being left with the ignition switched on but the engine not running. There is then constant current flowing, instead of the intermittent flow when the contact breaker is opening. The coil then overheats, and the insulation is damaged (photo).

2 If the coil seems suspect after fault finding, the measurement of the resistance of the primary and secondary windings (usually an ohmmeter) can establish its condition. If an ohmmeter is not available, it will be necessary to try a new coil.

9 Digiplex (electronic) ignition - location of components and precautions

1 The main components of this system are located within the engine compartment as shown.

2 On cars equipped with this system, it is

8.1 Ignition coil

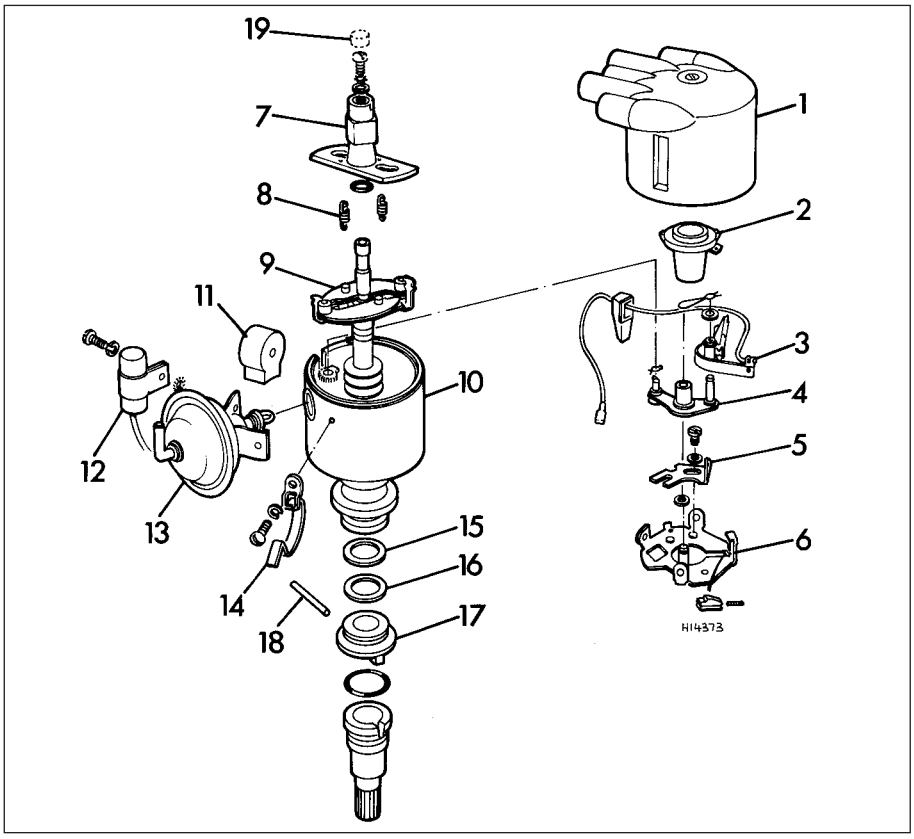
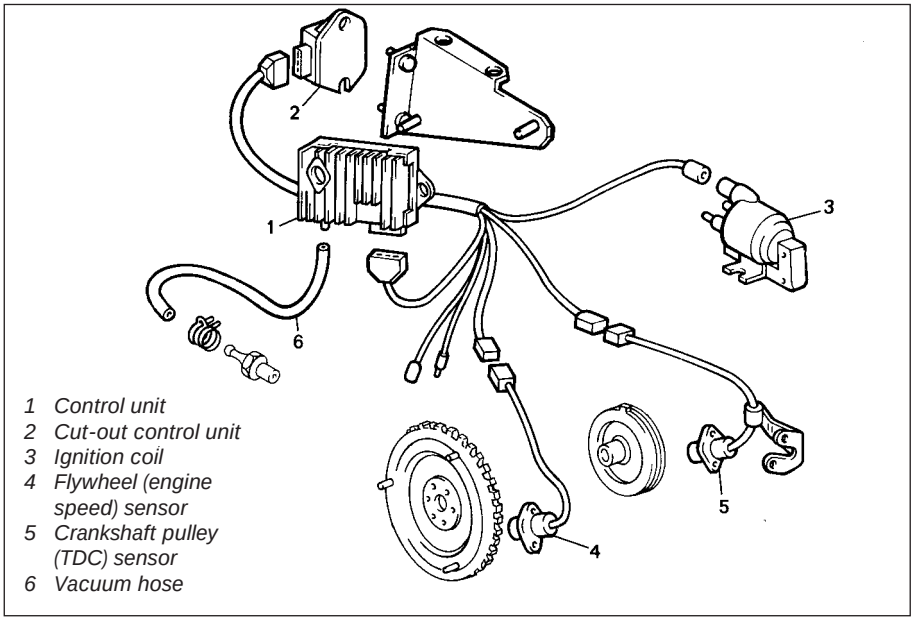


Fig. 4.6 Exploded view of typical Ducellier distributor (Sec 7)

1 Cap
2 Rotor
3 Movable breaker arm
4 Vacuum advance link
5 Fixed contact breaker arm
6 Contact breaker baseplate
7 Cam assembly
8 Centrifugal advance weight control springs
9 Driveshaft and plate
10 Body
11 LT insulator
12 Condenser
13 Vacuum capsule
14 Cap retaining spring
15 Thrust washer
16 Spacer washer
17 Driving dog
18 Retaining pin
19 Felt pad



1 Control unit
2 Cut-out control unit
3 Ignition coil
4 Flywheel (engine speed) sensor
5 Crankshaft pulley (TDC) sensor
6 Vacuum hose

Fig. 4.7 Main components of Digiplex ignition system (Sec 9)

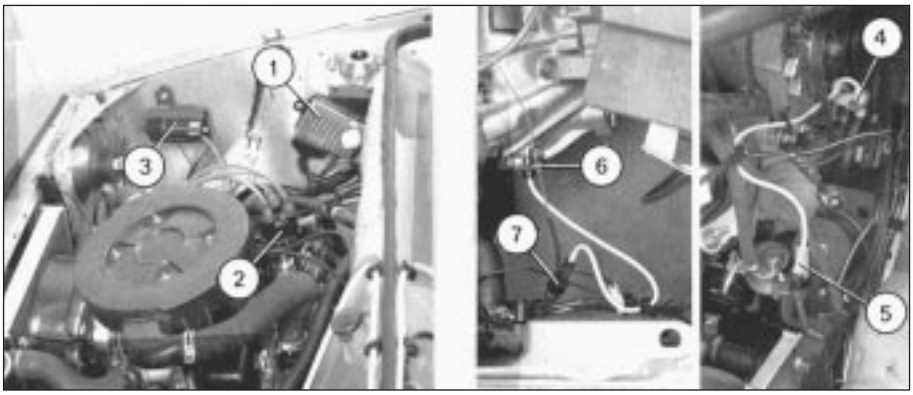


Fig. 4.8 Location of Digiplex ignition system components (Sec 9)

1 Control unit
2 Distributor
3 Ignition coil
4 TDC sensor
5 Wiring connector plug
6 Engine speed sensor
7 Wiring connector plug

important that the following precautions are observed.

3 Never start the engine if the battery leads are loose.

4 Do not stop the engine by pulling off a battery lead.

5 Remove the control unit if ambient temperature (paint drying oven) is above 80ºC (176ºF).

6 Never connect or disconnect the multi-plug at the control unit unless the ignition is switched off.

7 Disconnect the battery negative lead before carrying out electric body welding.

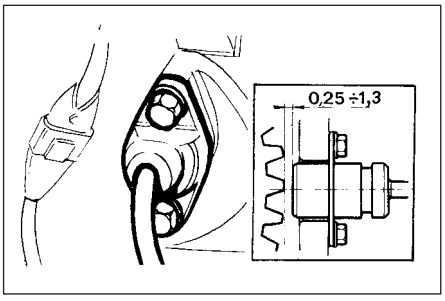


Fig. 4.10 Engine speed sensor gap (Sec 10)

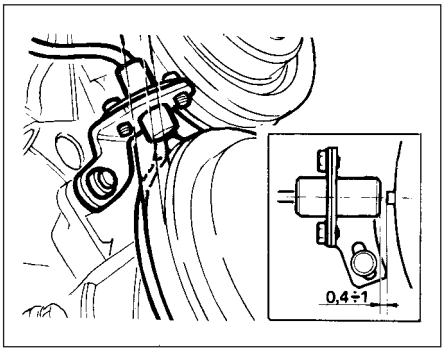


Fig. 4.11 TDC sensor gap (Sec 10)

10 Digiplex (electronic) ignition - checks and adjustments

1 Without special equipment, any work on the system components should be restricted to the following.

Engine speed sensor

2 The gap between the sensor and the teeth of the flywheel should be between 0.25 and 1.3 mm (0.0099 to 0.0512 in). Any deviation will be due to mechanical damage to the sensor, no adjustment being possible.

TDC sensor

3 The gap between the sensor and one of the TDC reference marks on the crankshaft pulley should be between 0.4 and 1.0 mm (0.016 to 0.039 in).

4 Any deviation will be due to the sensor plate becoming loose. To reposition it will necessitate setting No. 1 piston at TDC which can only be carried out accurately by your dealer using special tools.

Fig. 4.12 Test lamp connected between terminals 11 and 9 of control unit multi-plug (Sec 10)

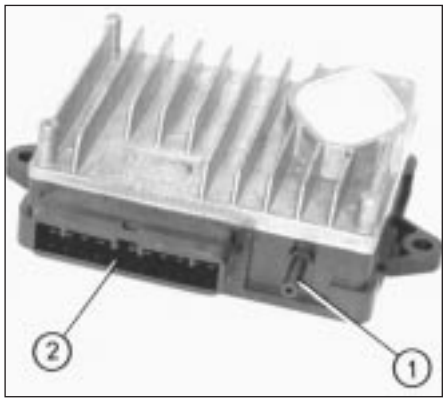


Fig. 4.9 Digiplex control unit (Sec 9)

1 Vacuum hose connector
2 Multi-plug socket

Supply circuit and continuity of coil primary winding

5 Connect a test lamp between contacts 11 and 9 of the multi-plug having first pulled it from the control unit.

6 Switch on the ignition, the test lamp should come on. If it does not, either the connection at the positive pole of the control unit or the coil primary winding is open.

Control unit earth

7 Connect a test lamp between contacts 8 and 9 of the multi-plug having first pulled it from the control unit. Switch on the ignition, the test lamp should come on. If it does not, improve the earth connection.

11 Spark plugs

1 The correct functioning of the spark plugs is vital for the correct running and efficiency of the engine. It is essential that the plugs fitted are appropriate for the engine, and the suitable type is specified at the beginning of this chapter. If

Fig. 4.13 Test lamp connected between terminals 8 and 9 of control unit multi-plug (Sec 10)

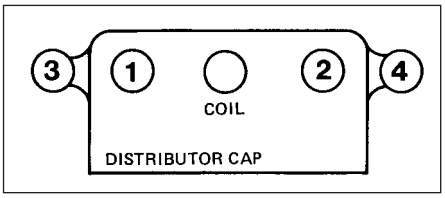


Fig. 4.14 Spark plug connections on 903 cc engine (Sec 11)

this type is used and the engine is in good condition, the spark plugs should not need attention between scheduled replacement intervals. Spark plug cleaning is rarely necessary and should not be attempted unless specialised equipment is available as damage can easily be caused to the firing ends.

2 At the specified intervals, the plugs should be renewed. The condition of the spark plug will also tell much about the overall condition of the engine.

3 If the insulator nose of the spark plug is clean and white, with no deposits, this is indicative of a weak mixture, or too hot a plug. (A hot plug transfers heat away from the electrode slowly - a cold plug transfers it away quickly.)

4 If the tip of the insulator nose is covered with sooty black deposits, then this is indicative that the mixture is too rich. Should the plug be black and oily, then it is likely that the engine is fairly worn, as well as the mixture being too rich.

5 The spark plug gap is of considerable importance, as, if it is too large or too small the size of the spark and its efficiency will be seriously impaired. The spark plug gap should be set to the gap shown in the Specifications for the best results.

6 To set it, measure the gap with a feeler gauge, and then bend open, or close, the outer plug electrode until the correct gap is achieved. The centre electrode should never be bent as this may crack the insulation and cause plug failure, if nothing worse.

7 When fitting new plugs, check that the plug seats in the cylinder head are quite clean. Refit the leads from the distributor in the correct firing order, which is 1-3-4-2; No 1 cylinder being the one nearest the flywheel housing (903 cc) or timing belt (1116 or 1301 cc). The distributor cap is marked with the HT lead numbers to avoid any confusion. Simply connect the correctly numbered lead to its respective spark plug terminal (photo).

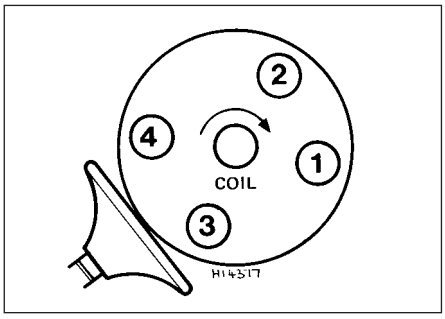


Fig. 4.15 Spark plug connections on 1116 cc and 1301 cc engines (Sec 11)

12 Ignition switch - removal and refitting

1 Access to the steering column lock/ignition switch is obtained after removing the steering wheel and column shrouds (Chapter 10) and the column switch unit (Chapter 9).

2 In the interest of safety, disconnect the battery negative lead and the ignition switch wiring plug (photo).

3 Insert the ignition key and turn to the STOP position (photo).

4 Pull the two leads from the switch.

5 Turn the ignition key to MAR.

6 Using a screwdriver depress the retaining tabs (1) (Fig. 4.16) and release the ignition switch.

7 Set the switch cam (2) so that the notches (3) are in alignment.

8 Insert the switch into the steering lock and engage the retaining tabs.

9 Turn the ignition key to STOP and connect the two leads.

10 Reconnect the battery and refit the steering wheel, switch and shrouds.

11 Removal and refitting of the steering column lock is described in Chapter 10.

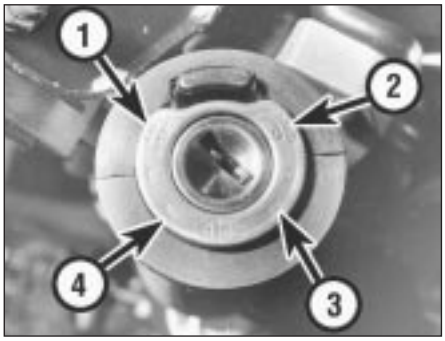
Note: *The ignition key is removable when set to the STOP position and all electrical circuits will be off. If the interlock button is pressed, the key can be turned to the PARK position in order that the parking lamps can be left on and the steering lock engaged, but the key can be withdrawn.*

11.7 Distributor cap HT lead markings

HAYNES HiNT

It's often difficult to insert spark plugs into their holes without cross-threading them. To avoid this possibility, fit a short piece of rubber hose over the end of the spark plug. The flexible hose acts as a universal joint, to help align the plug with the plug hole. Should the plug begin to cross-thread, the hose will slip on the spark plug, preventing thread damage.

12.2 Ignition switch and lock



12.3 Ignition key positions

1 AVV (Start)
2 Park (Parking lights on)
3 Stop (Lock)
4 MAR (Ignition)

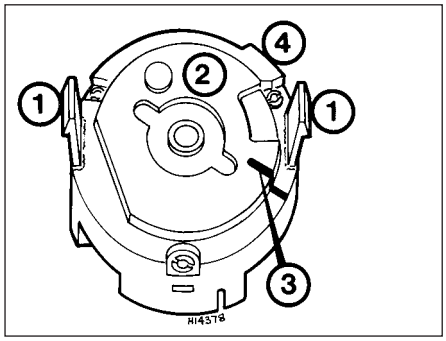


Fig. 4.16 Typical ignition switch (Sec 12)

1 Retaining tabs
2 Switch cam
3 Alignment notches
4 Locating projection

Fault finding - mechanical breaker ignition system

Engine fails to start

- ☐ Loose battery connections
- ☐ Discharged battery
- ☐ Oil in contact points
- ☐ Disconnected ignition leads
- ☐ Faulty condenser

Engine overheats, lacks power

- ☐ Seized distributor weights
- ☐ Perforated vacuum pipe
- ☐ Incorrect ignition timing

Engine starts and runs but misfires

- ☐ Faulty spark plug
- ☐ Cracked distributor cap
- ☐ Cracked rotor arm
- ☐ Worn advance mechanism
- ☐ Incorrect spark plug gap
- ☐ Incorrect contact points gap
- ☐ Faulty condenser
- ☐ Faulty coil
- ☐ Incorrect timing
- ☐ Poor engine/transmission earth connections

Fault finding - Digiplex (electronic) ignition system

Engine fails to start

- ☐ Excessive gap on TDC sensor
- ☐ TDC or engine speed sensor short circuited or earthed
- ☐ Defective ignition control unit
- ☐ Control unit multi-plug contacts corroded
- ☐ Defective coil

Engine lacks power, high fuel consumption

- ☐ Incorrect ignition advance
- ☐ TDC sensor incorrectly set
- ☐ Distributor vacuum hose blocked