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EQUIPMENT

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WORKSHOP INSTRUCTIONS

DISTRIBUTORS

MODELS 22D, 23D and 25D

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DISTRIBUTORS

MODELS 22D, 23D and 25D

1. GENERAL

A new range of distributors, designed to supersede the most widely-used of the existing models, has recently been introduced. This new range is comprised of three basic models, 22D, 23D and 25D, of which four and six-cylinder versions will be produced, each unit taking the number of cylinders it serves as a suffix number, e.g. 25D4 or 25D6. These incoming models and their application are as follows :

Model 25D — Incorporates centrifugal and vacuum advance together with micrometer adjustment. 25D4 and 25D6 will replace existing models DM2 and DM6 respectively.

Model 23D — Having centrifugal advance mechanism but less vacuum and micrometer adjustment. 23D4 replaces the existing D2A4.

Model 22D — Additional four and six-cylinder units (22D4 and 22D6)—similar to 25D but having bearings of increased length. These units have not yet been produced but will be made available (together with 23D6) as required.

The servicing of this new range of distributors has been simplified by the incorporation of many component parts which are directly interchangeable.

The bearings are oil-impregnated before initial fitment and lubricated automatically in service by engine oil mist. Bearing replacement is confined to four-cylinder units only, these being fitted with copper-iron bushes. The new six-cylinder distributors embody sintered iron bushes which, following fitment to the unit are honed to very fine limits, so that bearing replacement becomes impracticable.

Conventional horizontal and vertical covers are employed although vertical high voltage covers are available where higher plug voltages are experienced. To meet this contingency a re-designed cam and rotor arm are also available. Minimum flashover values for the two types of cover are :

Standard cover	...	...	16—18 KV.
High voltage cover	...	...	25 KV.

2. ROUTINE MAINTENANCE

In general, lubrication, cleaning and contact breaker adjustment constitute normal maintenance procedure.

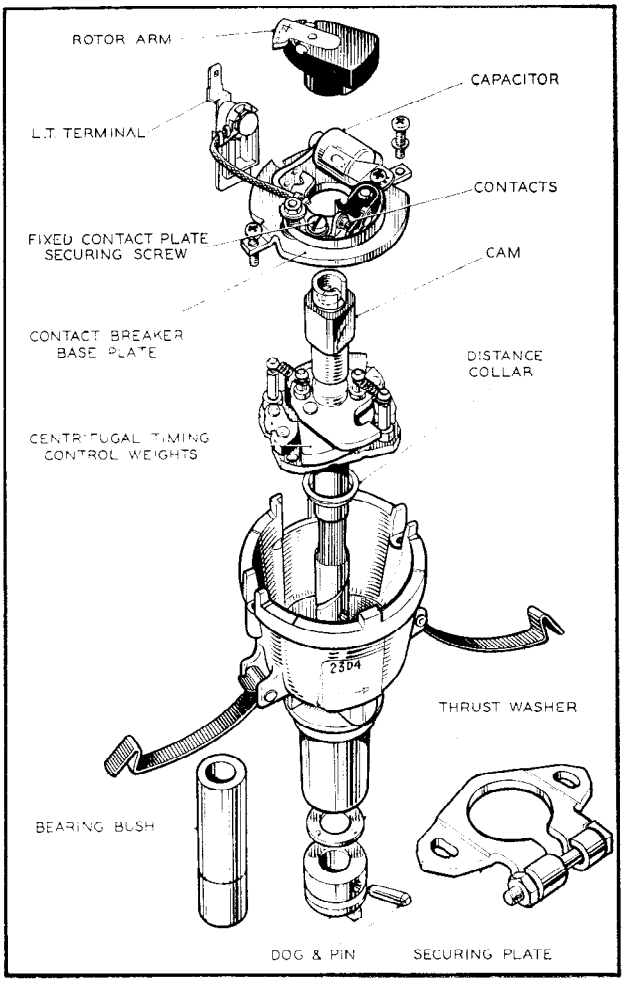

Fig. 1
Distributor Model 23D4

(a) LUBRICATION — EVERY 6,000 MILES

Take great care to prevent oil or grease getting on or near the contacts.

Add a few drops of thin engine oil (S.A.E.30) through the aperture at the edge of the contact breaker base plate to lubricate the centrifugal timing control. Apply one drop of thin engine oil to the top of the contact breaker pivot post.

Lightly smear the cam with Mobilgrease No. 2. Lift off the rotor arm and apply to the spindle a few drops of

Ragosine Molybdenised non-creep oil or thin machine oil to lubricate the cam bearing. It is not necessary to remove the exposed screw since it affords a clearance to permit the passage of oil. Refit the rotor arm locating carefully its moulded projection in the keyway in the spindle and pushing it on as far as it will go.

(*b*) CLEANING — EVERY 6,000 MILES

Throughly clean the moulded distributor cover, inside and out, with a soft dry cloth, paying particular attention to the spaces between the metal electrodes. Ensure that the carbon brush moves freely in its holder.

Examine the contact breaker. The contacts must be quite free from grease or oil. If they are burned or blackened, clean them with very fine carborundum stone or emery cloth, then wipe with a petrol-moistened cloth. Cleaning is facilitated by removing the contact breaker lever. To do this, remove the nut, insulating piece and connections from the post to which the end of the contact breaker spring is anchored. The contact breaker lever may now be removed from its pivot. Before refitting the contact breaker, smear the pivot post with Ragosine Molybdenised non-creep oil or Mobilgrease No. 2.

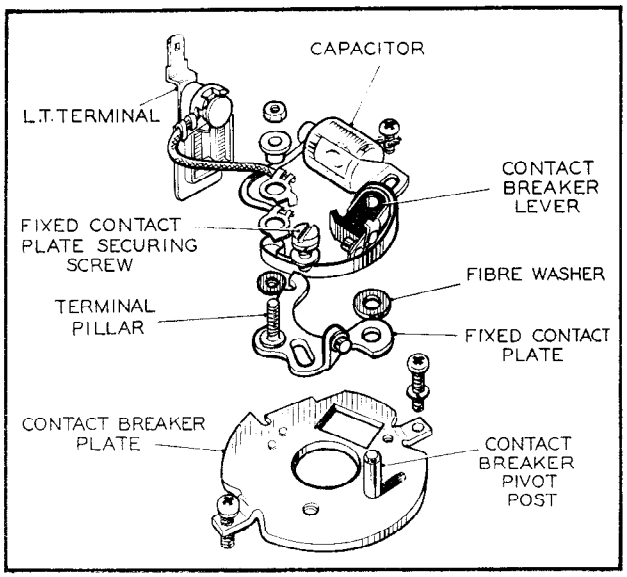

Fig. 2
Distributor Model 23D4 Contact Breaker Assembly

(*c*) CONTACT BREAKER ADJUSTMENT — AFTER FIRST 500 MILES AND SUBSEQUENTLY EVERY 6,000 MILES

Check the contact breaker setting. Turn the engine until the contacts show the maximum opening, that is when the operating heel is on the highest point on the cam. The gap between the contacts should measure 0.014" to 0.016". If the measurement is incorrect, keep the engine in the position giving maximum opening, slacken the screw securing the fixed contact plate and adjust its position to give the required gap. Tighten the screw. Re-check the setting for other positions of the engine giving maximum opening.

3. DESIGN DATA

(*a*) 4-cylinder units—
Firing angles: 0°, 90°, 180°, 270° ±1°.
Closed period: 60° ±3°.
Open period: 30° ±3°.

6-cylinder units—
Firing angles: 0°, 60°, 120°, 180°, 240°, 300° ±1°.
Closed period: 35° ±3°.
Open period: 25° ±3°.

4 and 6-cylinder units—

(*b*) Contact breaker gap : 0.014"—0.016".

(*c*) Contact breaker spring tension, measured at contacts : 18—24 oz.

(*d*) Capacitor : 0.18—0.23 microfarad.

(*e*) Automatic timing controls : Refer to Lucas Service Bulletin Department Publication SB222 against the appropriate distributor Service No. for details of operating range, etc., of the centrifugal and vacuum timing control mechanisms.

4. SERVICING

Before starting to test, make sure that the battery is not fully discharged as this will often produce the same symptoms as a fault in the ignition circuit.

(*a*) TESTING IN POSITION TO LOCATE CAUSE OF UNEVEN FIRING

Run the engine at a fairly fast idling speed. If possible, short circuit each plug in turn with the blade of an insulated screwdriver or a hammer head placed across the terminal to contact the cylinder head. Short circuiting the plug in the defective cylinder will cause no noticeable change in the running note. On the others, however, there will be a pronounced increase in roughness. If short-circuiting the sparking plugs is not possible, due to their being fitted with shrouded cable connectors, remove each plug connector in turn. Again, removal of the connection to the defective cylinder will cause no noticeable change in the running note, but there will be a definite increase in roughness when the other plugs are disconnected. Having thus located the defective cylinder, stop the engine and remove the cable from the sparking plug terminal. Restart the engine and hold the cable end about $\frac{3}{16}$" from the cylinder head. If sparking is strong and regular the fault lies with the sparking plug, and it

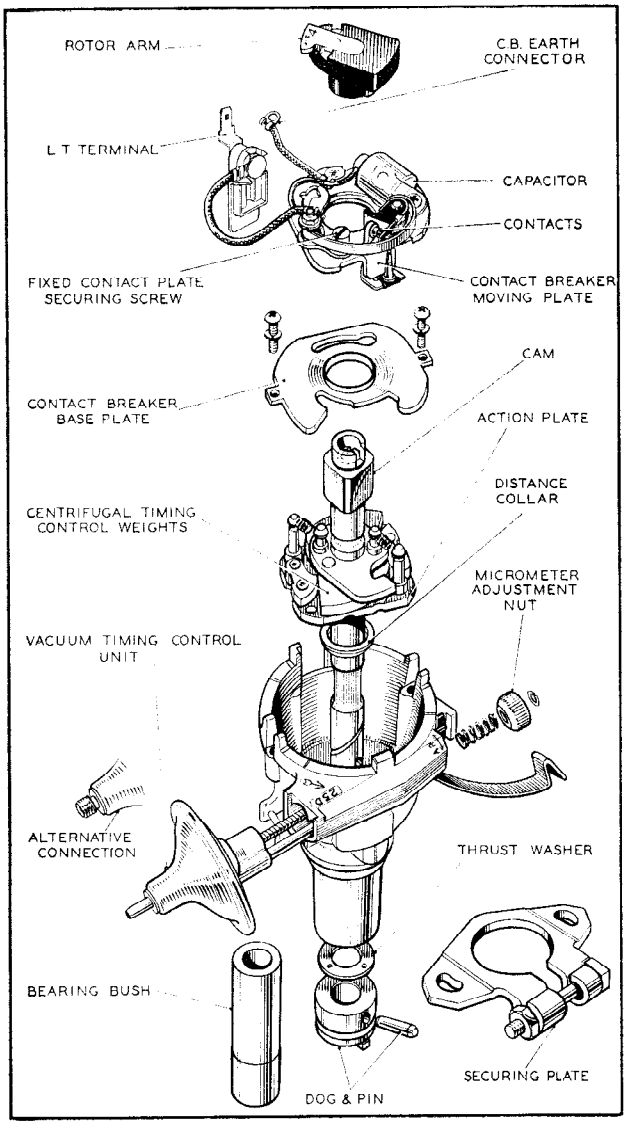

Fig. 3
Distributor Model 25D4

should be removed, cleaned and adjusted, or a replacement fitted. If, however, there is no spark, or only weak irregular sparking, examine the cable from the plug to the distributor cover.

Renew the cable if the insulation is cracked or perished. Clean and examine the distributor moulded cover for free movement of the carbon brush. If a replacement brush is necessary, it is important that the correct type is used. If tracking has occurred, indicated by a thin black line between two or more electrodes or between one of the electrodes and the body, a replacement distributor cover must be fitted.

(*b*) TESTING IN POSITION TO LOCATE CAUSE OF IGNITION FAILURE

Spring back the clips and remove the moulded cover. Lift off the rotor. Without disturbing the wiring, connect a 0—20 voltmeter between the C.B. terminal of the coil and a good earthing point. The engine will normally have stopped with the contacts closed—if so, separate the contacts with a piece of clean card. Switch on the ignition when a reading of battery voltage should be shown on the voltmeter. If no reading is given proceed as in 4(c) (i). Remove the card from between the contacts when the voltmeter reading should drop to zero. If the battery voltage reading persists, or the reading drops but not to zero volts, proceed as in 4(c) (ii).

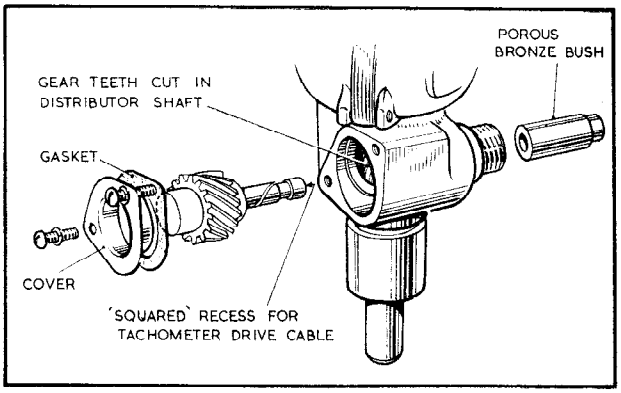

Fig. 4
Distributor with Tachometer Drive Take-off

(*c*) LOW TENSION CIRCUIT FAULT LOCATION

(*i*) *No reading in voltmeter tests with contacts separated*

Transfer the voltmeter lead from the 'CB' to 'SW' terminal of the coil. If a reading is now shown disconnect the cable from the coil 'CB' terminal and reconnect the voltmeter lead from 'SW' to 'CB'. No reading will indicate a faulty coil while a reading of battery voltage means that the contact breaker insulation or the capacitor is faulty.

(*ii*) *Voltmeter reading with contacts closed*

If a reading of battery voltage is obtained, transfer the voltmeter lead from the coil 'CB' terminal to the distributor L.T. terminal. If this results in the reading dropping to zero then the coil-to-distributor cable is faulty, while a continued reading of battery voltage means that the contacts are not 'making'. If, however, the voltmeter still shows a low reading when so connected this indicates high

resistance between the contact breaker mating surfaces. Clean or replace the contacts.

(d) HIGH TENSION CIRCUIT

If the low tension circuit is in order, remove the high tension cable from the centre terminal of the distributor cover. Switch on the ignition, the contacts being closed. Flick open the contacts while the high tension lead from the coil is held about $\frac{3}{16}$" from the cylinder block. If the ignition equipment is in good order, a strong spark will be obtained. If no spark occurs, a fault in the circuit of the secondary winding of the coil is indicated and the coil must be replaced.

If sparking occurs in the above test, but apparent ignition failure persists, test the rotor arm by substitution.

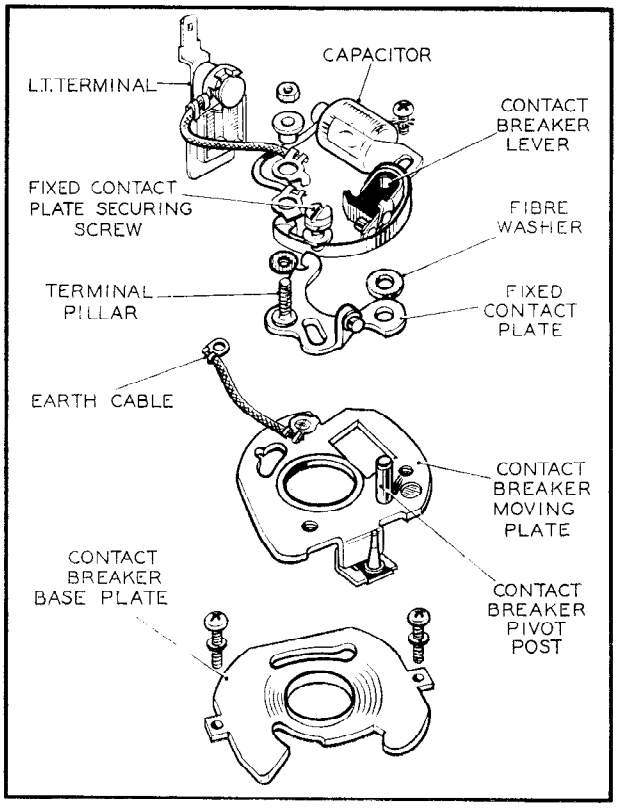

Fig. 5
Distributors Models 25D4, 25D6 & 22D6 Contact Breaker Assembly

The high tension cables must be carefully examined, and replaced if the rubber insulation is cracked or perished, using 7mm. neoprene-covered rubber-insulated ignition cable. To fit cable to the ignition coil or to a distributor cover having vertical outlets, pass the cable through the knurled moulded terminal, bare about $\frac{1}{4}$" of the end of the cable, thread the wire through the brass washer (removed from the original cable) and bend back the strands. Finally, screw the moulded terminal into the coil moulding.

To make connections to the terminals in a distributor cover having horizontal outlets, remove the cover and slacken the screws on the inside of the moulding. Cut the cables to the length required and push firmly home in the holes in the moulding. Tighten the screws, which will pierce the rubber insulation to make good contact with the cable core. The cables from the distributor to the sparking plugs must be connected in the correct firing order.

(e) DISMANTLING THE DISTRIBUTOR

When dismantling, carefully note the positions in which the various components are fitted, in order to ensure their correct replacement on reassembly. The tongue of the driving dog is offset ; note the relation between it and the rotor electrode and maintain this relation when reassembling the distributor. The amount of dismantling necessary will obviously depend on the repair required. Spring back the securing clips and remove the moulded cover. Lift the rotor arm off the spindle. With units so fitted disconnect the vacuum unit link to the contact breaker moving plate. Remove the two screws at the edge of the contact breaker baseplate. The contact breaker assembly and external terminal can now be lifted off (see (i) below). Where applicable remove the circlip on the end of the micrometer timing screw, and turn the micrometer nut until the screw and the vacuum unit assembly are freed. Take care not to lose the ratchet and coil type spring located under the micrometer nut. The complete shaft assembly, with centrifugal timing control and cam foot can now be removed from the distributor body (see (ii) below) on knocking out the dog securing pin.

(i) Contact Breaker

To dismantle the assembly further, remove the nut, insulating piece and connections from the pillar on which the contact breaker spring is anchored. Lift off the contact breaker lever and the insulating washers beneath it.

Remove the screw securing the fixed contact plate, together with the spring and plain steel washers, and take off the plate. Withdraw the single screw securing the capacitor. On models 22D and 25D dismantle the contact breaker base assembly by turning the base plate clockwise and pulling to release it from the contact breaker moving plate.

(ii) Shaft and Action Plate

When dismantling the centrifugal timing control mechanism it is important that it is carried out in the order described below otherwise damage to the springs may result.

Carefully lift off the springs, withdraw the screw inside the cam and take off the cam and cam foot, noting the position of the cam slot. The weights can now be lifted off. Note that a distance collar is fitted on the shaft beneath the action plate.

(*f*) BEARING REPLACEMENT (4-cylinder units only)

The bearing bush is of sintered copper-iron and is stepped, having the larger diameter extending $\frac{3}{4}$" in length from the bottom of the bush. Prepare the new bush for fitting by allowing it to stand completely immersed in medium viscosity (S.A.E. 30–40) engine oil for at least 24 hours. In cases of extreme urgency, this period of soaking may be shortened by heating the oil to 100°C. for 2 hours, then allowing the oil to cool before removing the bush. The following procedure should be closely followed when fitting a replacement bearing bush :

(*i*) Using a shouldered mandrel of appropriate diameter, press out the worn bush from the body end.

(*ii*) Insert the replacement bush from the drive end, with the smaller bush diameter as the leading part. The bush will be a push fit until the larger diameter comes into contact with the shank. With the mandrel in position, the bush should then be pushed fully in with a steady pressure. The bush should be a tight fit, flush with the shank at the drive end with a slight protrusion at the top end.

(*iii*) The original bush may have a hole drilled through one side. If so, using the hole in the shank as a guide, drill the replacement bush in like manner.

(*iv*) Insert the shaft and action plate assembly, with clean engine oil applied to the shaft. Make sure that there is no fraze around the hole in the shaft through which the driving dog securing pin is inserted. If the shaft is tight in the bearing when fitted, tap lightly at the drive end and withdraw the shaft. Again insert the shaft and repeat the operation as long as any tightness exists. It is important that the shaft is free to rotate without binding.

(*v*) Clamp the body and run the shaft in a test rig or lathe for about 15 minutes, re-lubricate the shaft with clean engine oil and re-assemble the distributor.

Note: Under no circumstances should the bush be over-bored by reaming or any other means.

(*g*) RE-ASSEMBLY

The following instructions assume that **complete** dismantling has been undertaken.

(*i*) Place the distance collar over the shaft, smear the shaft with Ragosine Molybdenised non-creep oil or clean engine oil, and fit it into its bearing.

(*ii*) When the unit is so fitted refit the vacuum unit into its housing and replace the spring, milled adjusting nut and securing circlip.

(*iii*) Re-assemble the centrifugal timing control weights, cam and cam foot to the shaft. Fit the cam securing screw, then engage the springs with the cam foot pillars.

(See that the springs are not stretched or damaged.)

(*iv*) Before re-assembling the contact breaker base assembly, lightly smear the base plate with Ragosine Molybdenised non-creep oil or Mobilgrease No. 2.

Where applicable, fit the contact breaker moving plate to the contact breaker base plate and secure using a reversal of the dismantling procedure. Refit the contact breaker base into the distributor body and engage the link from the vacuum unit. Insert the two base plate securing screws, one of which also secures one end of the contact breaker earthing cable (models 22D and 25D).

(*v*) Refit the capacitor. Place the fixed contact plate in position and secure lightly with the securing screw. One plain and one spring washer must be fitted under the securing screw.

(*vi*) Place the insulating washers etc. on the contact breaker pivot post and on the pillar on which the end of the contact breaker spring locates. Refit the contact breaker lever and spring.

(*vii*) Slide the terminal block into its slot.

(*viii*) Thread the low tension connector and capacitor eyelets on to the insulating piece, and place these on to the pillar which secures the end of the contact breaker spring. Refit the washer and securing nut.

(*ix*) Set the contact gap to 0.014"—0.016" and tighten the fixed contact plate securing screw.

(*x*) Refit the rotor arm, locating the moulded projection in the rotor arm with the keyway in the shaft, and pushing fully home. Refit the moulded cover.

(*h*) REPLACEMENT CONTACTS

If the contacts are so badly worn that replacement is necessary, they must be renewed as a pair and not individually. The contact gap must be set to 0.014"—0.019" ; after the first 500 miles' running with new contacts fitted, the setting should be checked and the gap reset to 0.014"—0.016" ; this procedure allows for initial 'bedding-in' of the heel.