DISTRIBUTOR MODELS 43D, 44D AND 45D

1 H.T. moulded cover
2 H.T. brush and spring
3 Sub-assembly
4 Rotor arm
5 Contact-breaker assembly
6 Capacitor, L.T. terminal and fly-lead assembly
7 C.B. bearing plate assembly
8 Sub-assembly
9 Felt lubricating pad (cam spindle)
10 Centrifugal auto-advance springs
11 Cam
12 Centrifugal auto-advance weights
13 Sub-assembly (cam, weights, shaft and plate)
14 Nylon distance collar. (Note correct method of assembly, with chamfer underneath)
15 Steel thrust washer
16 Sealing cover screws (2)
17 Sealing cover
18 Clamping plate, bolt and nut assembly ('a' shoulder for retaining nut or bolt captive)
19 Thrust washer
20 Driving dog
21 Mills pin
22 'O' ring oil-seal

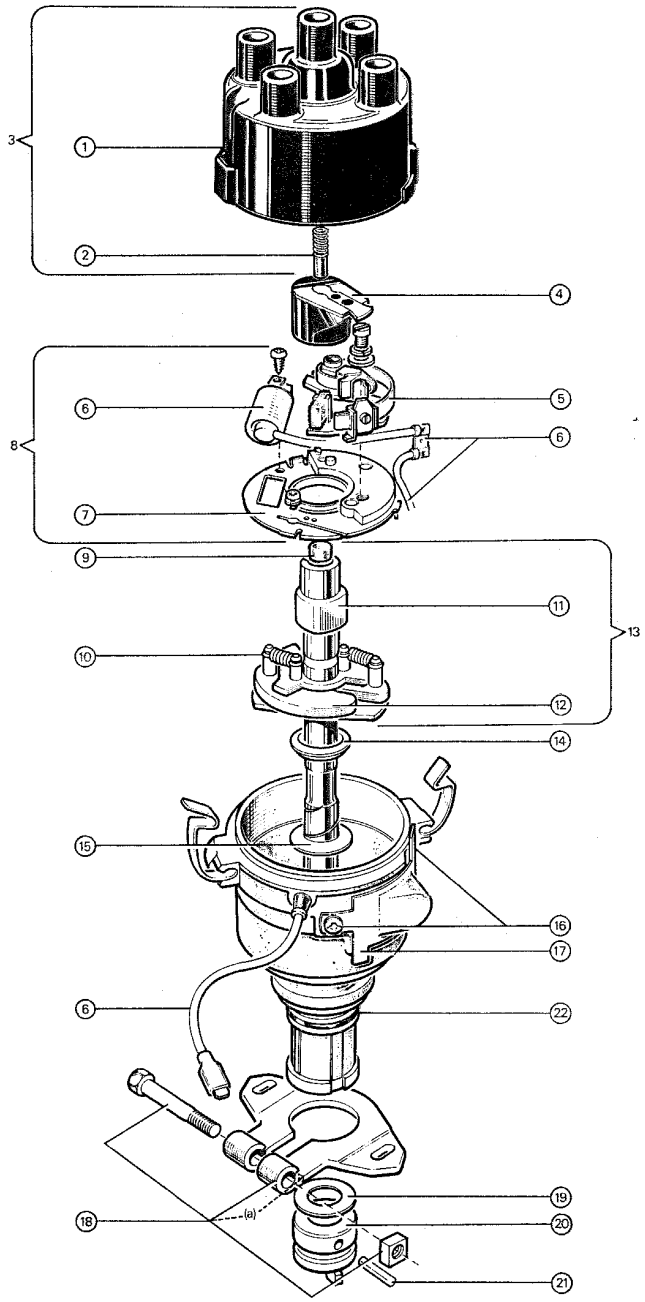
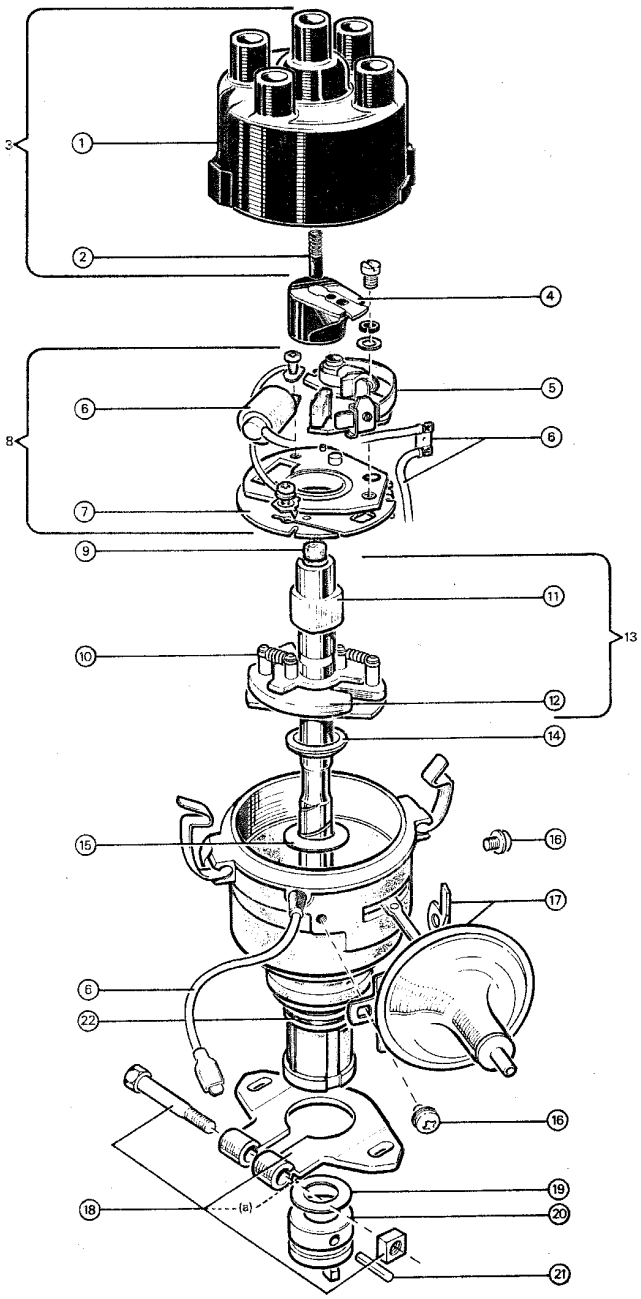


Fig. 1 Typical model 43D distributor

(i) 4-cylinder could be 6-cylinder (Type references 43D4 and 43D6 respectively)
(ii) Driving dog could be driving gear



1 H.T. moulded cover
2 H.T. brush and spring
3 Sub-assembly
4 Rotor arm
5 Contact-breaker assembly
6 Capacitor, L.T. terminal and fly-lead assembly
7 C.B. bearing plate and base plate assembly
8 Sub-assembly
9 Felt lubricating pad (cam spindle)
10 Centrifugal auto-advance springs
11 Cam
12 Centrifugal auto-advance weights
13 Sub-assembly (cam, weights, shaft and plate)
14 Nylon distance collar. (Note correct method of assembly, with chamfer underneath)
15 Steel thrust washer
16 Vacuum unit securing screw(s) and washer(s)
17 Vacuum unit and bracket assembly (advance-acting)
18 Clamping plate, bolt and nut assembly ('a' shoulder for retaining nut or bolt captive)
19 Thrust washer
20 Driving dog
21 Mills pin
22 'O' ring oil-seal

Fig. 2 Typical model 45D distributor

(i) 4-cylinder could be 6-cylinder (Type references 45D4 and 45D6 respectively)
(ii) Driving dog could be driving gear
(iii) Vacuum unit type and fitting position could vary

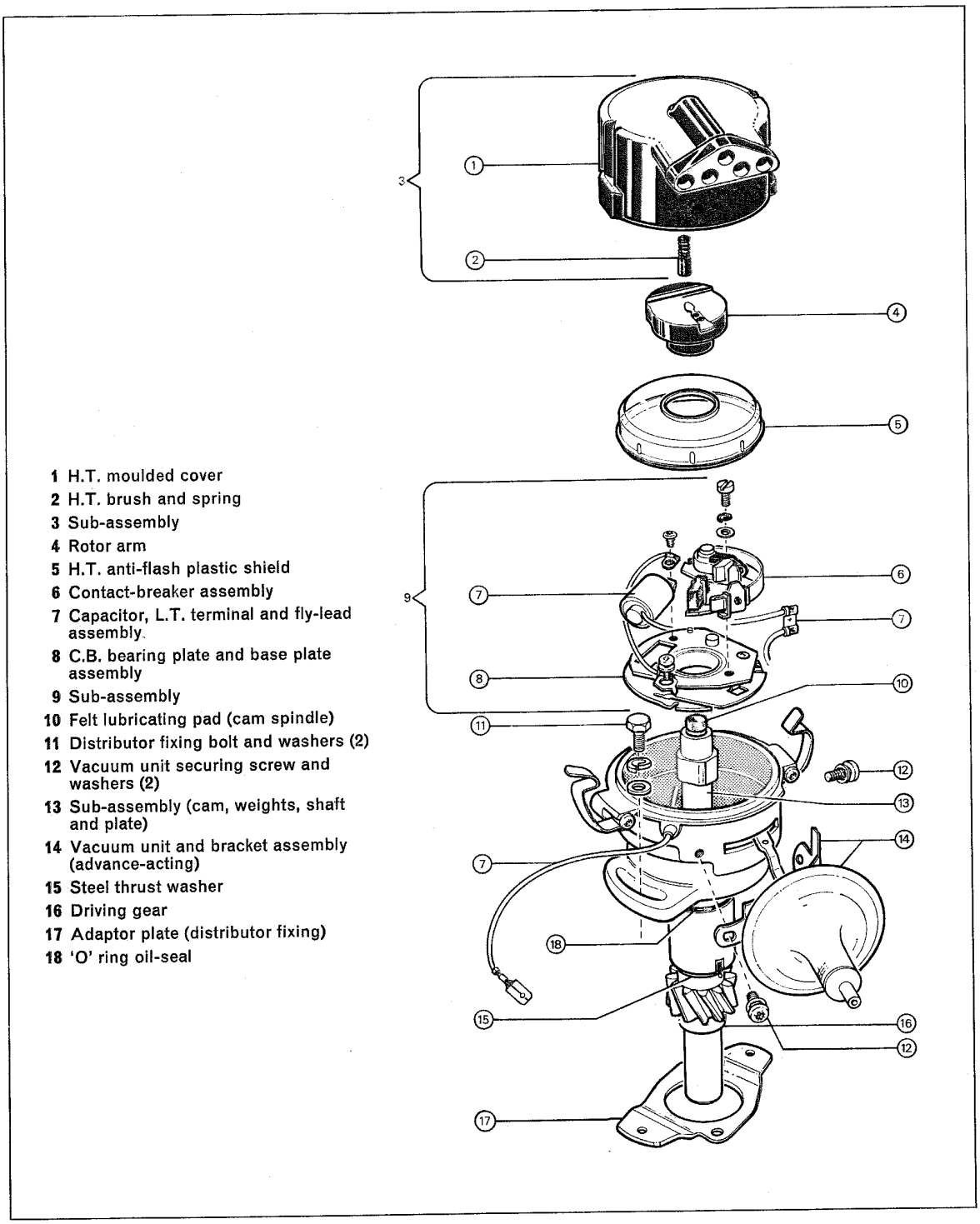


Fig. 3 Early-design model 44D distributor (Part No. 41402)

Note: Superseded by later-design distributor (Part No. 41589). See Fig. 4

1 H.T. moulded cover
2 H.T. brush and spring
3 Sub-assembly
4 Rotor arm
5 H.T. anti-flash plastic shield
6 Contact-breaker assembly
7 Capacitor, L.T. terminal and fly-lead assembly
8 C.B. bearing plate and base plate assembly. (Note 'POZIDRIV' securing screws have a special self-tapping thread)
9 Sub-assembly
10 Felt lubricating pad (cam spindle)
11 Distributor fixing bolt and washers (2)
12 Vacuum unit securing screw and washers (2)
13 Sub-assembly (cam, weights, shaft and plate)
14 Vacuum unit and bracket assembly (advance-acting)
15 Steel thrust washer
16 Driving gear
17 Adaptor plate (distributor fixing)
18 'O' ring oil-seal

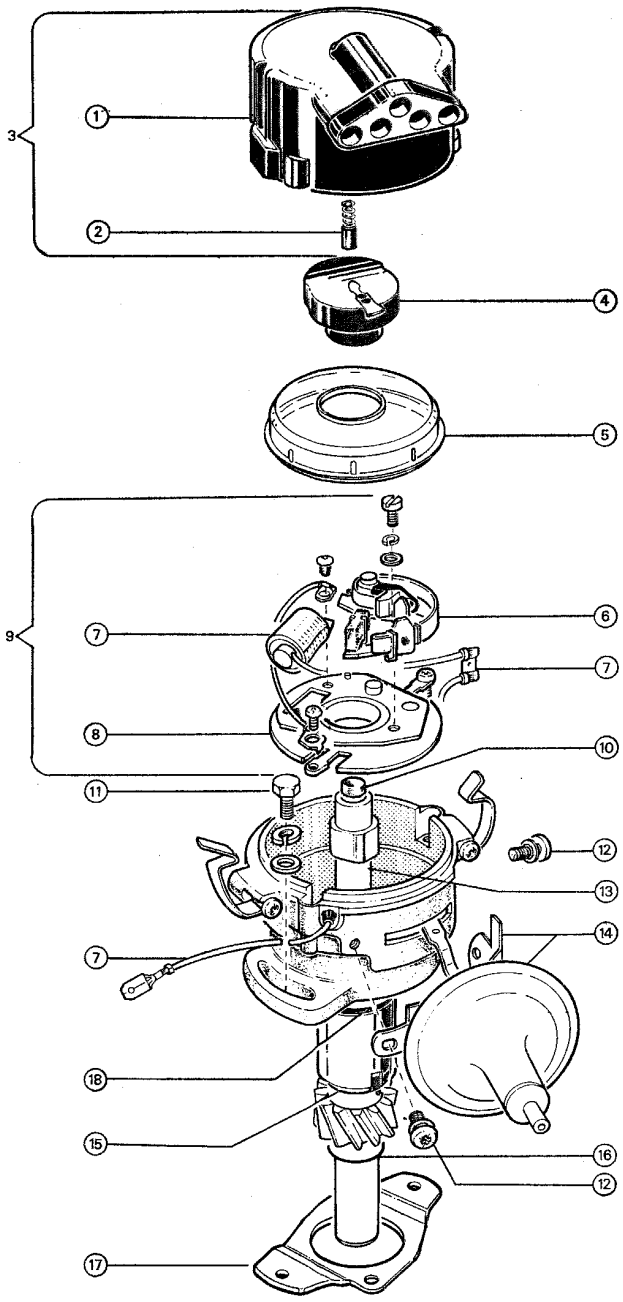


Fig. 4 Later-design model 44D distributor (Part No. 41589)
Note: Same as Fig. 3 except for item 8 and body and cover design

1. GENERAL

(a) Special Features

Compared with the 23/25D range, these distributors have improved performance, lighter weight, easier servicing, quieter operation and splash-proof cover.

(i) Improved performance

Achieved by a lightweight contact-breaker modified cam profile and re-designed auto-advance mechanism. The contact-breaker has a low operating inertia and this in conjunction with the modified cam profile prevents contact-breaker bounce at high engine speeds. This maintains the dwell-angle (closed-contact) period within certain limits, providing sufficient time for the ignition coil primary windings to be energised at high engine speeds and resulting in an improved ignition spark.

(ii) Lighter weight

Achieved by the combined lightweight construction of major components.

(iii) Easier servicing

Achieved by new design contact-breaker sub-assembly, incorporating one-piece lightweight contact-breaker (or contact set) with clip-in method of L.T. terminal connection. This facilitates quick renewal of the contact set, because small sundry parts associated with the conventional terminal post are eliminated.

(iv) Quieter operation

Achieved jointly by:

1. The lightweight contact-breaker and modified cam profile which (besides improving distributor performance) reduces make-and-break noise of the contact-breaker.
2. A new design auto-advance mechanism, which is both simpler and lighter in construction.

(b) Application and Design Variations

(i) Models 43D and 45D (Figs. 1 and 2)

These distributors supersede and interchange with the 23D and 25D range of distributors, fitted to cars and light commercial vehicles. Model 43D supersedes 23D and model 45D supersedes 25D. Produced in 4- and 6-cylinder versions, type references are 43D4, 43D6, 45D4 and 45D6.

Model 43D is less vacuum unit, whereas model 45D incorporates either an advance-type or retard-type vacuum unit (later-production 45D distributors may incorporate a double-acting advance/retard vacuum unit).

Later-production model 45D distributors may also incorporate micrometer timing adjustment, except when fitted with a double-acting vacuum unit.

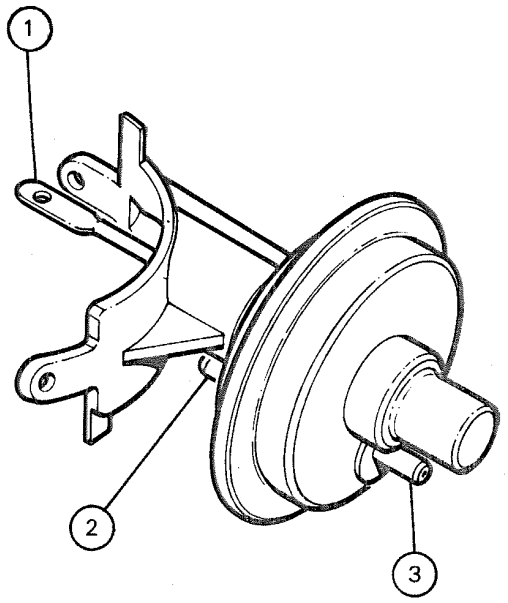


Fig. 5 Double-acting advance/retard vacuum unit (Retard function used in conjunction with exhaust emission control, incorporated in the engine design)

1 Actuating lever (connection to tapered peg, riveted to underside of contact-breaker base plate)
2 Vacuum-retard pipe connection
3 Vacuum-advance pipe connection

Note: An advance-type vacuum unit is fitted to improve fuel economy, when the throttle is partially open, while a retard-type vacuum unit is provided to operate in conjunction with an exhaust emission control system, incorporated in the engine design. The retard-type vacuum unit retards ignition timing during engine idling and over-run conditions. The associated emission control system is designed to reduce air pollution from the vehicle exhaust fumes.

(ii) Model 44D (Figs. 3 and 4)

This is a specially designed 4-cylinder distributor, type reference 44D4. Application is limited to vehicles where the positioning of the distributor on the engine, prevents the engine compartment from accommodating the basic 45D4 distributor.

In addition to being shorter than a 45D4 distributor, other special features of the 44D4 distributor are:

1. Extra-shallow side-entry type H.T. moulded cover (instead of H.T. moulded cover with vertical-entry cable connections).

2. Rotor arm with H.T. anti-flash groove around underside of moulding (necessary because reduced length of distributor results in close proximity of the rotor-arm electrode to distributor frame).
3. H.T. anti-flash plastic shield, located on the rim of the distributor body and completely covering the contact-breaker sub-assembly (necessary for the reason given in 2 above, and also because of close proximity of H.T. moulding electrodes to distributor frame).
4. Distributor fixing: Larger diameter shank than 45D and flange-and-adaptor plate fixing (instead of clamp-plate fixing).

Note: RADIO/TELEVISION INTERFERENCE SUPPRESSION. The carbon brush in the H.T. moulded cover is a non-resistive type, not capable of suppressing radio and television interference signals. Legal requirements in this respect are achieved by using suppression (resistive-type) H.T. cables.

2. ROUTINE MAINTENANCE

Occasionally wipe clean the outside of the distributor moulded cover, the H.T. leads and insulated tops of the sparking plugs.

(a) After the first 1600 kilometers (1,000 miles)

Check the contact-breaker gap

Either by using a special gauge, which eliminates turning the engine, or by carrying out the following basic procedure.

Turn engine until the heel of the contact-breaker rests on a peak of the cam (removing the sparking plugs facilitates this operation). Insert feeler gauge between the contacts and check whether the gap is within the limits 0.35–0.40 mm (0.014–0.016″). If necessary, slacken the cheese-headed screw securing the fixed-contact and adjust the gap (see Fig. 6).

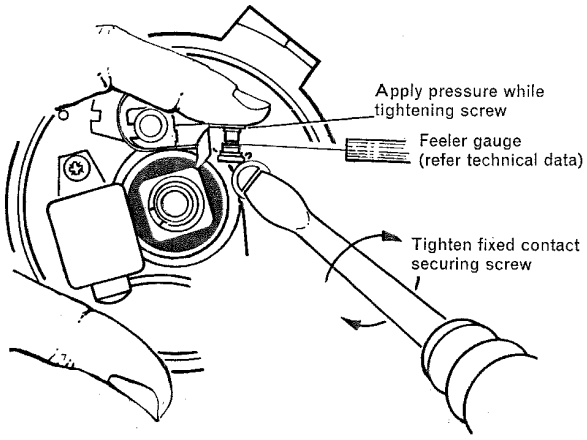


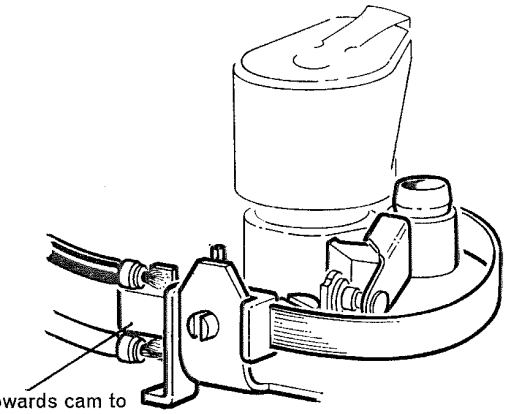
Fig. 6 Contact-breaker adjustment

(b) Every 9600 kilometers (6,000 miles)

(i) Examine the contact-breaker

If cleaning is necessary, use a petrol-moistened cloth. If the contact surfaces show signs of burning or excessive wear, dismantle the contact-breaker and refinish the contact surfaces with a carborundum stone or fine emery cloth, then wipe clean with the petrol-moistened cloth. Alternatively, renew the contact-breaker (one-piece contact set).

To remove the contact-breaker: Press the terminal end of the moving-contact spring towards the cam. This will disengage the spring from the insulating-piece attached to the terminal post, the capacitor lead and fly-lead can then be detached from the



Note: Correct method of assembly of L.T. terminal (Cable clips must face outward)

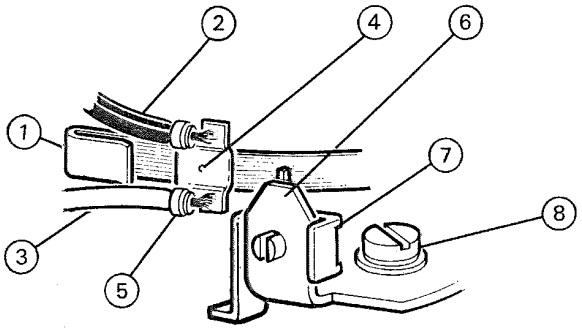


Fig. 7 Contact-breaker and L.T. terminal arrangement (Dismantling and correct reassembly of L.T. terminal)

1 Folded end of moving-contact spring
2 L.T. fly-lead (Black)
3 Capacitor lead (Orange)
4 L.T. terminal
5 Cable clips
6 Terminal post
7 Nylon insulating piece
8 Fixed-contact securing screw

folded end of the spring (see Fig. 7). Remove the cheese-headed screw securing the fixed-contact and lift the contact-breaker from the base plate.

Note 1: The cheese-headed screw securing the contact-breaker should be fitted with two washers, a plain flat washer (lower) and a spring washer (upper). If the spring washer is inadvertently omitted, the end of the screw will foul the bearing plate. This would interfere with the action of the base plate and vacuum unit (44D and 45D distributors) and insufficient securing of the contact-breaker (43D distributors).

Note 2: When refitting the capacitor and fly-lead connecting terminal in the folded end of the moving-contact spring, ensure the cable clips face outward (see Fig. 7), otherwise the lower clip may foul the fixing contact plate and short-circuit the contact-breaker.

After servicing and refitting the contact-breaker, set the contact gap to 0.35–0.40 mm (0.014–0.016″). Procedure is detailed in 2 (a). If a new contact set is fitted, set the contact gap to 0.40–0.45 mm (0.016–0.018″) to allow for initial bedding-in of the plastic heel.

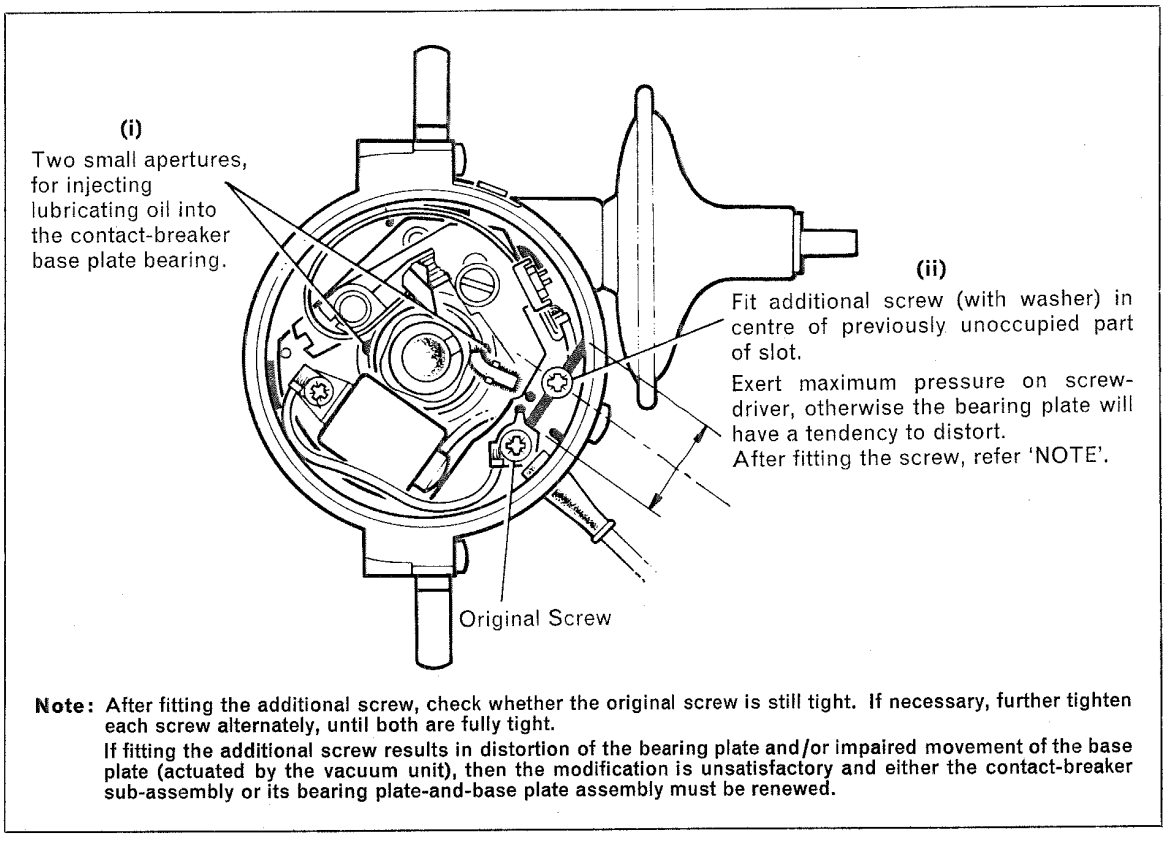
(ii) Lubrication

Shell Retinax 'A' or equivalent grease

Lightly smear the contact-breaker pivot post, and also the working surface of the cam. The felt pad fitted to the contact-breaker augments lubrication of the cam. This does not require periodic lubrication, as it is impregnated before fitting.

Shell Turbo '41' oil, or clean engine oil

Apply the oil sparingly: To the felt pad in the top of the cam, beneath the rotor arm (to lubricate the cam spindle) and, except distributors without a vacuum unit, through two small apertures in the contact-breaker base plate, see Fig. 8, (to lubricate the base plate bearing).



Note: After fitting the additional screw, check whether the original screw is still tight. If necessary, further tighten each screw alternately, until both are fully tight.
If fitting the additional screw results in distortion of the bearing plate and/or impaired movement of the base plate (actuated by the vacuum unit), then the modification is unsatisfactory and either the contact-breaker sub-assembly or its bearing plate-and-base plate assembly must be renewed.

Fig. 8

(i) Where to lubricate the contact-breaker base plate bearing

(ii) Fitting an additional securing screw in the contact- breaker bearing plate of early-design model 44D distributors (fig. 3 and Text 4(a), part (iii) refers). The additional screw and associated washer must be the same as the original fitment: Screw 54123366 and Washer 129066, obtainable by special order through LUCAS depots and agents.

The auto-advance mechanism does not require periodic lubrication. The mechanism is initially smeared with a special long-lasting oil lubricant (specified in 5. Reassembly), which is sufficient until the distributor is either renewed or overhauled.

3. TECHNICAL DATA

Direction of rotation:	According to arrow-marking on distributor body.
Firing angles:	0–90° – 180°–270° ±1° (4-cylinder) 0–60° – 120°–180° etc. ±1° (6-cylinder)
Dwell-angle: (closed-contact period)	51° ±5° (4-cylinder) 34° ±5° (6-cylinder)
Contact-breaker gap:	0.35–0.40 mm (0.014–0.016″) 0.40–0.45 mm (0.016–0.018″) Initial setting for new contact set.
Contact-breaker spring loading: (measured at contacts)	5.7N or 522–680 gf (18–24 ozf)
Capacitor:	0.18–0.25 microfarad
Clamping plate tightening torques: (except 44D distributors)	34.59 kg cm or 3.40 Nm (30 lbf in) trapped bolt and rotating nut. 57.66 kg cm or 5.65 Nm (50 lbf in) trapped nut and rotating bolt.

4. SERVICING, DISMANTLING AND REASSEMBLY

(a) Bench servicing and dismantling

Except in the case of removing and refitting the driving dog, or driving gear, servicing is facilitated by lightly clamping the distributor upright in the jaws of a vice.

(i) Check the H.T. moulded cover

Look for obvious damage to the cover, necessitating its renewal. Damage to the brush-and-spring housing (caused by the rotor not being fully-located on the shaft) will not only necessitate the cover being renewed, but also the rotor.

Closely inspect the cover, looking for a crack or signs of a breakdown in insulation ('tracking' or short-circuiting of the H.T. spark), usually indicated by a thin greyish-white line or sometimes more obviously by charring of the moulding. In either case, the cover will need renewing.

Note 1: During inspection of the inside of the cover, slight burning of the distributing-segments will be noticed. This is a normal condition and no attempt should be made to remove this burning from the segments, otherwise the air gap between the segments and rotor electrode will be adversely increased. This in turn will cause excessive burning of the segments and rotor electrode, and also overload the ignition coil.

Check the carbon brush for freedom-of-movement in its housing and at the same time check whether the brush is excessively worn. The length of brush freely protruding from the moulding should be approximately 4 mm (0.156″ or $\frac{5}{32}$″) and the tip of the brush should be bevelled. If these conditions are not as stated, the brush and its associated spring must be renewed, as a service-assembly.

Note 2: Wear of the H.T. carbon brush is normally negligible. If the tip of the brush is flat (it should be bevelled), the brush is excessively worn and this could have been caused by excess spring pressure (deliberate over-stretching of the spring) or inferior finish of the rotor electrode at its point-of-contact with the brush. This particular point on the rotor electrode should have a smooth finish, but not necessarily bright.

Do not use either emery cloth or glass-paper to refinish the rotor electrode, as scoring of the electrode will cause excessive brush-wear.

(ii) Check the rotor

Look for obvious damage to the rotor, necessitating its renewal.

The rotor may be damaged due to it fouling the brush-and-spring housing inside the H.T. moulded cover.

Alternatively, the rotor moulding may show signs of a breakdown in insulation. This would be indicated by a thin greyish-white line, or more obviously by charring of the moulding, caused by 'tracking' (short-circuiting) of the H.T. spark.

If neither of these fault conditions apply, and providing there is no evidence of excessive wear of the H.T. carbon brush due to scoring of the rotor electrode at its point-of-contact with the brush, it is reasonable to assume the rotor is satisfactory.

Note 1: Slight burning of the edge of the rotor electrode, is a normal condition. It is not necessary to remove this burning from the rotor electrode ('Note 1' under previous heading (i) refers).

Note 2: If a misfiring fault persists (during testing the distributor, or when it is refitted to the vehicle), the rotor can be proved by substitution or, alternatively, proved in situ by utilising the ignition coil H.T. voltage for testing the insulation of the rotor electrode. Position the ignition coil H.T. cable-end conductor near the rotor electrode, and carry out the procedure necessary to produce a H.T. spark. **No spark, or only a very faint trace of a spark should occur.**

(iii) Servicing the contact-breaker

Procedure for servicing the contact-breaker is detailed in 2. ROUTINE MAINTENANCE, sub-heading (b) part (i).

If the contact-breaker sub-assembly is a type which is an expansion-fit in the distributor body (Fig. 8), do not unnecessarily disturb the 'POZIDRIV' self-tapping securing screw. (Two screws are incorporated in early-design later-production model 44D distributors).

Removing this type of contact-breaker sub-assembly from the distributor body should be confined to occasions when it is necessary to renew either the auto-advance springs or the assembly comprising cam, weights, shaft-and-plate. (Subsequent heading (vi) refers.)

When servicing the contact-breaker, it is sufficient to check whether the contact-breaker sub-assembly is secure in the distributor body. If not, and the condition cannot be rectified by further tightening of the 'POZIDRIV' screw(s), then it will be necessary to renew either the contact-breaker sub-assembly or its associated bearing plate-and-base plate assembly. (Subsequent heading (vi) refers.) An exception would be early-design first-production model 44D distributors (produced before November 1973) with only one 'POZIDRIV' screw securing the contact-breaker sub-assembly in the body. Providing this screw is already tight, or can be further tightened until fully-tight, loose-fitting of the contact-breaker sub-assembly can usually be rectified by fitting an additional securing screw, and washer. (Positioning the additional screw is important, so are other special conditions relating to the modification. See Fig. 8.) If the modification proves to be unsatisfactory, in which case either the contact-breaker sub-assembly or its associated bearing plate-and-base plate assembly must be renewed, it is still advisable to fit the additional securing screw.

(iv) Capacitor

Complete failure of the capacitor is confirmed, if d.c. electrical continuity exists between terminal and case. Check this with a battery-operated ohmmeter, or test lamp.

Providing the preliminary test is satisfactory, it is reasonable to assume the capacitor is in good condition but if the history of the distributor is known and there is reason to suspect otherwise (e.g. difficult

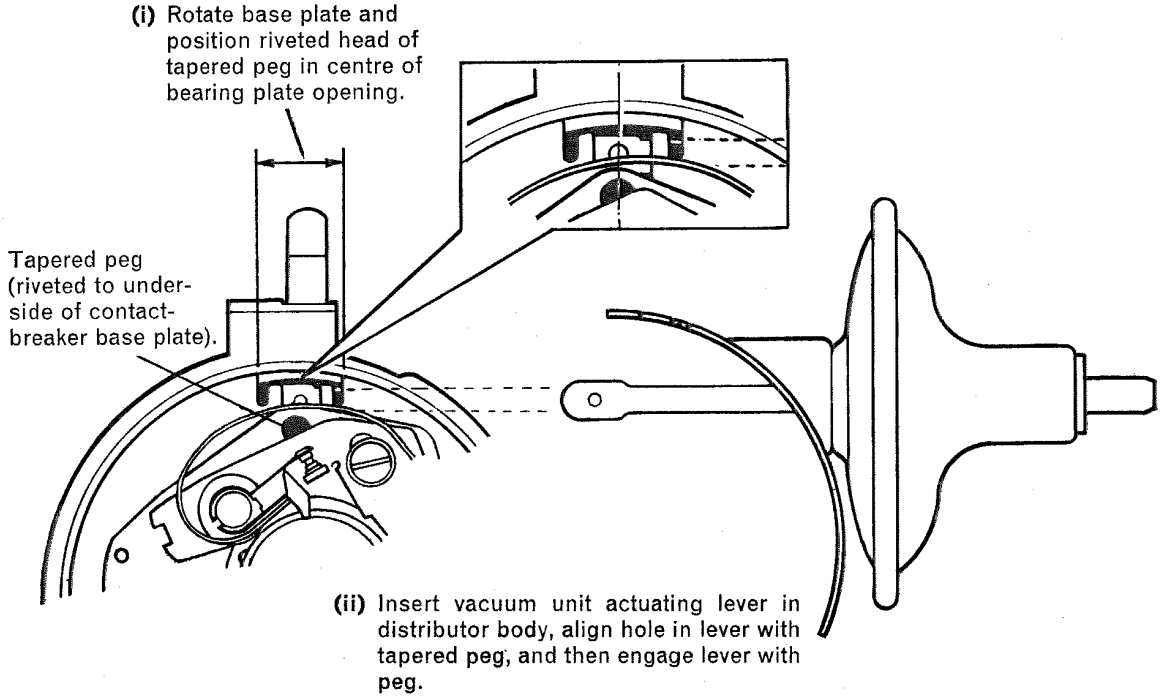


Fig. 9 Positioning contact-breaker base plate, to facilitate fitting the vacuum unit

starting, misfiring, or the contact-breaker excessively burnt, sometimes to the extent that the plastic heel of the moving contact is partially melted and consequently distorted), then the capacitor should be proved by substitution.

(v) Renewing the vacuum unit
(Not applicable to 43D distributor)

Remove the two screws securing the vacuum unit to the distributor body. Grip the vacuum unit in the hand, and with a downward movement disengage the vacuum unit actuating-lever from the tapered peg of the contact-breaker base plate (moving plate), then withdraw the vacuum unit from the body.

Refitting the vacuum unit is facilitated by swivelling the contact-breaker base plate so that the riveted head of the tapered peg is positioned as shown in Fig. 9. This enables the hole in the vacuum unit actuating-lever to be visually aligned with the tapered peg of the contact-breaker base plate, so facilitating engagement of the lever with the peg. It is then only necessary to refit the vacuum unit securing screws.

(vi) Renewing:

Contact-breaker sub-assembly

Auto-advance springs

Assembly comprising cam, weights, shaft-and-plate

Unless preliminary dismantling has already been carried out, now remove:

H.T. moulded cover
Rotor arm
H.T. anti-flash shield (model 44D distributor)
Vacuum unit (44D and 45D distributors)

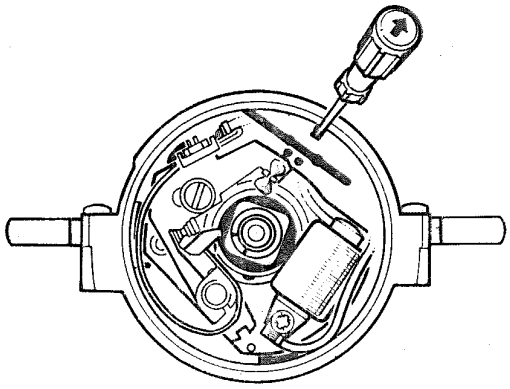
Following removal of the previously-mentioned parts, the contact-breaker sub-assembly can be removed. Recommended procedure for removing an expansion-fit type contact-breaker sub-assembly from the distributor body is detailed in Fig. 10.

Later-design model 44D distributors, Part No. 41589 (Fig. 4), incorporate a contact-breaker sub-assembly of conventional type, secured in the distributor body by two small 'POZIDRIV' screws diametrically opposed. Following removal of these screws, the contact-breaker sub-assembly can be withdrawn from the body.

Note 1: An expansion-fit type contact-breaker sub-assembly is unsuitable for refitting once it has been removed from the distributor body. It is recommended that either the contact-breaker sub-assembly or its associated bearing plate-and-base plate assembly is renewed, otherwise difficulty may be experienced in securing the contact-breaker sub-assembly in the body.

Note 2: In the case of model 44D distributor (Part No. 41402), the expansion-fit type contact-breaker sub-assembly should be fitted with an additional securing screw (see Fig. 8).

Following removal of the contact-breaker sub-assembly, the auto-advance springs can be renewed



Note:
Before carrying out this dismantling, refer Text 4(a) part (iii).

(i) Remove 'POZIDRIV' screw(s) from slot in contact-breaker bearing plate.
(ii) Insert small electrician's-type screwdriver in slot provided in edge of contact-breaker bearing plate. Lever screwdriver in direction of arrow and prise the edge of the limb from the groove in the body.
(iii) Disengage grommet and L.T. fly-lead from entry hole in body.
(iv) Insert shaft of medium-sized screwdriver through the elongated aperture in side of body. Lever screwdriver in direction of arrow, so that the end of the screwdriver forces the contact-breaker bearing plate upwards from the groove in the body. Following this operation, the contact-breaker sub-assembly should be free to be withdrawn from the body.

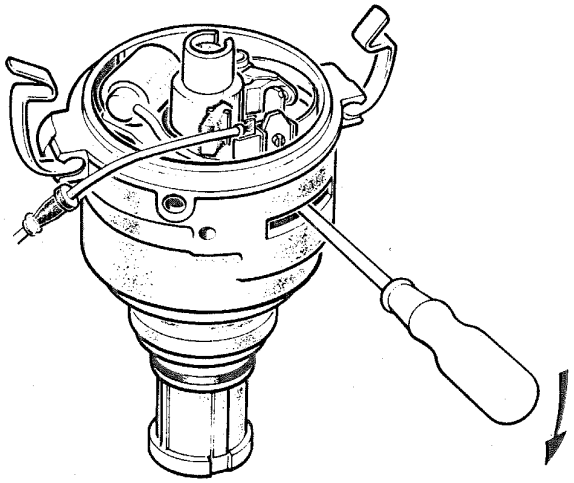


Fig. 10 Dismantling procedure: expansion-fit type contact-breaker sub-assembly

Driving Gear Drill Size 3·2 mm ($\frac{1}{8}$" or 0·125")

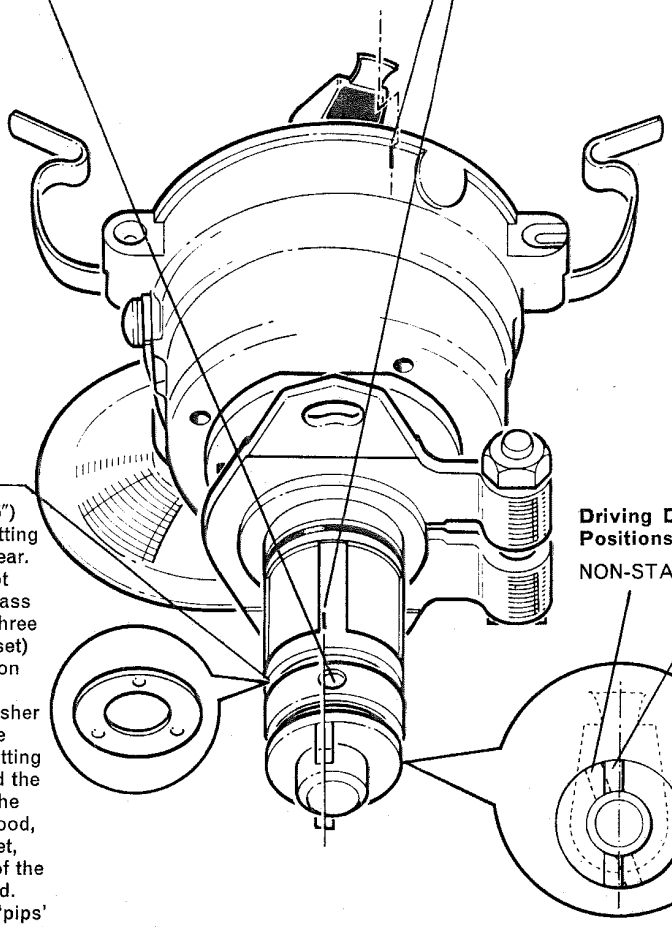
Driving Dog Drill Size 4·8 mm ($\frac{3}{16}$" or 0·187")

Ring punch both sides of driving dog, after fitting mills pin.

A driving gear (fixed with a roll pin) does not require ring punching.

SCRIBE MARKS

The fitting position of the driving dog should be determined before it is removed from the shaft. If neither of the driving dog positions illustrated (inset) apply, make scribe marks indicating relevant positioning between rotor arm electrode and driving dog tongues.



End Float

Insert 0·13 mm (0·005") feeler gauge, while fitting the driving dog or gear. A feeler gauge is not required, if a new brass thrust washer with three raised 'pips' (see inset) is fitted in conjunction with a driving dog. Assemble thrust washer with 'pips' facing the driving dog. After fitting the driving dog, hold the distributor body in the hand and using a wood, hide, or plastic mallet, strike the end-face of the shaft at the drive-end. This will flatten the 'pips' on the thrust washer and providing the shaft can be rotated freely by hand, the end-float is satisfactory. If necessary, repeat the operation with the mallet, until the shaft is free.

Driving Dog Fitting Positions

NON-STANDARD

STANDARD

(Note driving dog tongues offset to centre line).

NOTE: A standard driving gear has no particular fitting position. In the case of a non-standard driving gear (with extended shaft), refer Fig. 12.

Fig. 11 Removing and refitting a driving dog, or gear (refer 'Note')

but dismantling will need extending to include removal of the driving dog, or gear, if the assembly comprising cam, weights, shaft-and-plate is to be renewed. This would neither be economical nor result in a satisfactory repair, if the shaft bearing in the body is excessively worn (more than just perceptible side-movement of the shaft). In this case the distributor should be exchanged for a factory reconditioned unit, in preference to carrying out a repair.

Should it be decided to renew the assembly comprising cam, weights, shaft-and-plate, in the case of a distributor fitted with a driving dog, the fitting position of the driving dog must be identified before it is removed from the shaft (see Fig. 11).

A driving dog is fitted to the shaft with a mills pin. A driving gear is fixed to the shaft with a roll pin. A mills pin is solid steel, a roll pin is formed from sheet steel.

Carefully support the shank of the distributor and press the fitting pin from the driving dog or gear, using a suitably-sized pin punch according to the fitting pin-size. Alternatively, lightly clamp the shank of the distributor in a vice and drive the fitting pin from the driving dog or gear. In some cases it may be necessary to file away ring punching from both sides of the driving dog or gear, to enable the pin to be removed.

After removing the driving dog or gear, the assembly comprising cam, weights, shaft-and-plate can be withdrawn from the distributor body.

Before commencing reassembly, refer subsequent heading 5.

5. REASSEMBLY

(a) Fitting the assembly comprising cam, weights, shaft and plate

Ensure the nylon distance collar and the steel thrust washer are assembled on the shaft, beneath the action plate. Sequence of assembly of these parts, and correct fitting of the distance collar with the

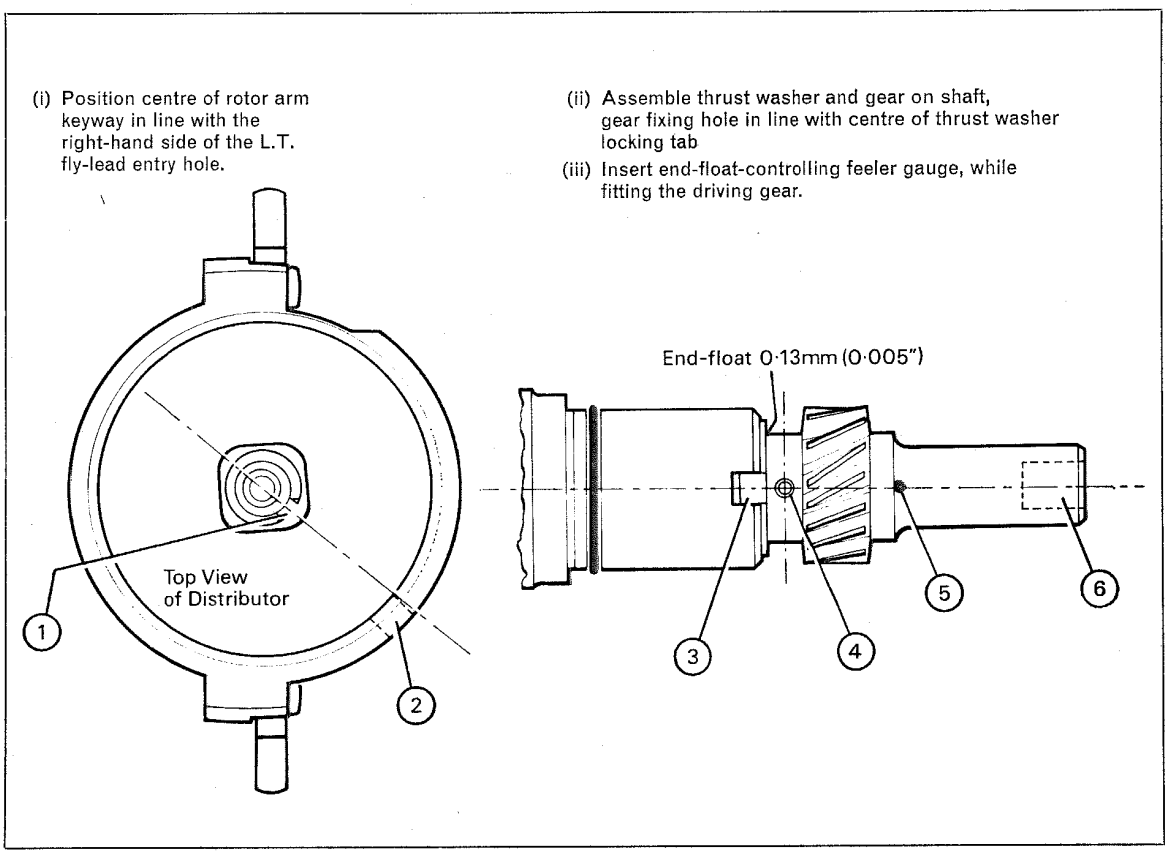


Fig. 12 Fitting a non-standard driving gear (with extended shaft)

1 Rotor arm keyway in shaft
2 L.T. fly-lead entry hole
3 Thrust washer locking tab
4 Roll pin, drill size 3.2 mm ($\frac{1}{8}$" or 0.125") diameter
5 Oil hole
6 'Auxiliary' hexagon take-off drive incorporated in shaft

chamfer underneath, is important (see Figs. 1 and 2, items 14 and 15). This also applies to distributors illustrated in Figs. 3 and 4, where the distance collar and thrust washer are not shown.

Prior to assembling the shaft in the bearing, lubricate the bearing and the bearing portion of the shaft and the centrifugal auto-advance mechanism with Rocol MP (molypad) oil. Alternatively, use clean engine oil to lubricate the bearing and the bearing portion of the shaft, but alternative lubricant for the auto-advance mechanism should be heavy-duty and equivalent to that specified.

(b) Fitting the driving dog, or gear

Refer Figs. 11 and 12.

(c) Fitting an expansion-fit type contact-breaker sub-assembly

The 'POZIDRIV' self-tapping securing screw, and associated washer, should be as specified and an additional screw and washer should be fitted in the case of a model 44D distributor (see Fig. 8).

(d) Fitting the vacuum unit

(Distributor models 44D and 45D)

Refer Fig. 9.

(e) Contact-breaker adjustment

Refer Fig. 6.

(f) Final lubrication

Smear Shell Retinax 'A' (or equivalent) grease, on the working surface of the cam.

Apply Shell Turbo '41' oil (or clean engine oil), sparingly to the felt pad in the top of the cam. Except distributors without a vacuum unit, apply the same oil sparingly through two small apertures in the contact-breaker base plate (see Fig. 8). **Do not oil the felt pad fitted to the contact-breaker** (Part 2 b, para. ii, refers).

Finally, fit rotor arm and H.T. moulded cover.