



**Running Instructions
for the**

LUCAS

**COIL IGNITION
EQUIPMENT**



**JOSEPH LUCAS LTD.,
HEAD OFFICES & WORKS:
BIRMINGHAM, ENGLAND.**

TELEGRAMS & CABLES: 'LUCAS, BIRMINGHAM.'
TELEPHONE: NORTHERN 5201 (12 LINES.)

CODES USED: A.B.C. (5TH & 6TH EDITIONS), BENTLEYS
AND 2ND. BENTLEYS.

Introduction.

To ensure the best service from the electrical equipment the amount of attention needed is very small, but some attention is essential, for example, "topping-up" of the battery, which is just as important as refilling the radiator or pumping up the tyres. We therefore advise owners to make a periodical inspection and to carry out the instructions given in the following pages.

As this booklet covers equipment fitted to various cars, it may be found that an equipment differs slightly in detail from the description given, but no difficulty should be experienced as the essential information on maintenance remains unaltered.

The booklet is divided into three sections. Section I gives a brief description of the equipment and how it functions, Section II deals with operation and maintenance, while Section III is devoted to the location and remedy of possible faults.

If you are in any difficulty or require further information and advice, no matter how trivial, do not hesitate to take advantage of the wide facilities of our Service. A list of Service Depots is given on page 20.

Provided that the cam is kept clean and that the instructions on cam lubrication given on page 7 are carried out, the wear on the fibre heel is negligible, and consequently the contact breaker gap will only need adjustment at very long intervals. If the cam is dirty, it may be cleaned with a cloth moistened with petrol, and afterwards given the slightest smear of vaseline.

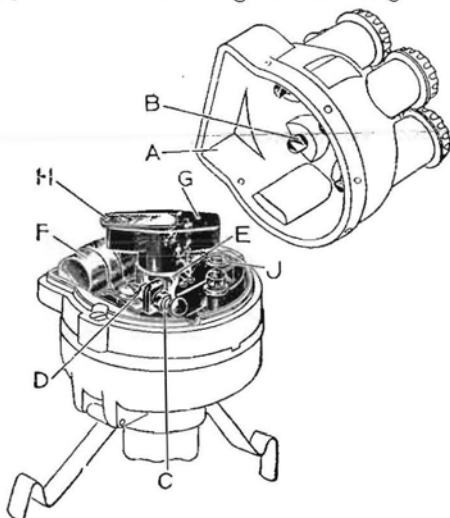


Fig. 5. DISTRIBUTOR AND CONTACT BREAKER TYPE DJ6A

- | | |
|-------------------------|-----------------------------|
| A—Distributor moulding. | F—Condenser. |
| B—Electrode. | G—Rotating distributor arm. |
| C—Contacts. | H—Metal electrode. |
| D—Lock nut. | J—Contact breaker pivot. |
| E—Rotating cam. | |

To test the contact breaker gap on DJ types of distributors, slowly turn the engine over by hand until the contacts are seen to be fully opened. Now insert the gauge (.012-.015 ins.) in the gap; if it is correct the gauge should be a sliding fit. It is not advisable to alter the setting unless the gap varies considerably from the gauge. If adjustment is necessary, proceed as follows:—When the contacts are fully opened, slacken the locking nut "D" (Fig. 5) on the stationary contact screw, and rotate it by its hexagon head until the gap is set to the thickness of the gauge. After making the adjustment, care must be taken to tighten the locking nut.

COIL IGNITION EQUIPMENT

SECTION I.

DESCRIPTION OF THE EQUIPMENT AND HOW IT FUNCTIONS.

A coil ignition set consists essentially of a coil, and a combined distributor and contact breaker.

The distributor is driven from the engine, generally by some form of skew gearing, or is sometimes driven from the dynamo shaft. The coil and distributor are sometimes mounted as one unit, conforming with magneto standards so that it is interchangeable with a magneto.

The ignition switch and an ignition warning lamp are usually incorporated in the switch box or instrument panel.

Most sets are provided with an automatic timing control which relieves the driver of constant adjustment of the hand ignition control.

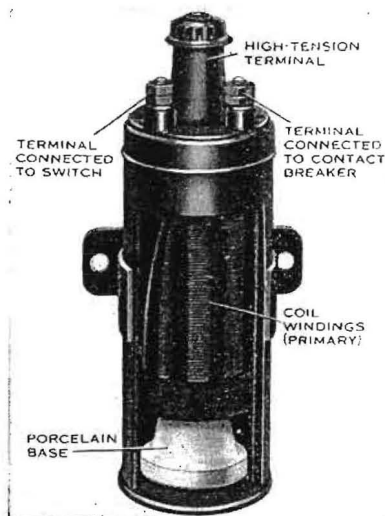


Fig. 1. TYPICAL IGNITION COIL
(with part of case cut away).

To enable the owner to understand the functioning of the system, we give a brief description of the equipment and how it works.

The coil consists of an iron core around which are wound the primary, or low tension, and the secondary, or high tension windings. The duty of the coil is to convert the battery voltage of 6 or 12 to something in the order of 6,000 volts which is required to form a spark across the plug points. When the ignition switch is "on," current flows from the battery

through the primary winding. This current is interrupted by means of the contact breaker, causing a high voltage to be induced in the secondary winding. The distributor moulding is provided on the inside with metal inserts, which are in contact with the high tension cables connected to the sparking plugs. The centre terminal of the distributor moulding is connected, on the outside, to the high tension terminal of the coil and on the inside, it is connected by means of a carbon brush contact to a rotating distributor arm.

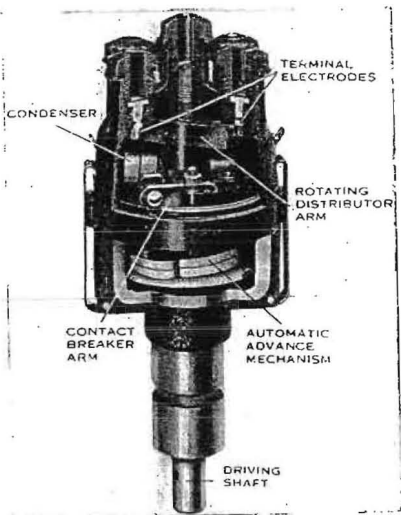


Fig. 2. TYPICAL DISTRIBUTOR WITH AUTOMATIC ADVANCE MECHANISM.

This arm is provided at its outer tip with a metal electrode, which, when the arm rotates, passes very close to the metal inserts.

The cycle of events in the operation of the set is as follows:—When the starting switch is depressed, the distributor shaft rotates, causing the contact breaker points to make and break alternately. This will give rise, every time the points open, to the high secondary voltage, which will be passed from the coil to the rotating distributor arm. From here, it jumps the gap to one of the metal inserts in the distributor moulding, which, in turn, is connected by cable to one of the sparking plugs. Immediately after the spark occurs, the contact breaker points will close and the cycle of operations will be repeated for the spark to occur in the cylinder next in firing order.

centrifugal forces, move outwards, causing the cam to move in the direction of the drive, thus advancing the timing. As motion only takes place dependent on engine acceleration and deceleration, and not on velocity, wear is negligible, and as the control is carefully adjusted and greased during assembly, it requires no attention whatever.

In addition to the centrifugally operated type, some distributors are also fitted with a vacuum operated mechanism, which gives greatly improved timing control

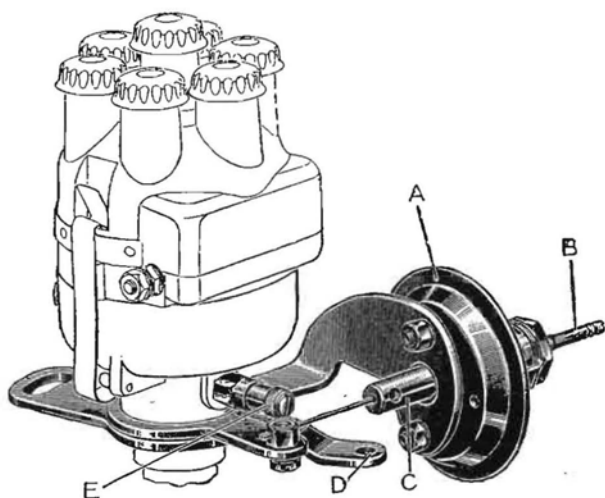


Fig. 4. DISTRIBUTOR SHOWING VACUUM-OPERATED ADVANCE MECHANISM.

- | | |
|--------------------------|--------------------------|
| A—Diaphragm housing. | C—Plunger actuating rod. |
| B—To induction manifold. | D—Manual control. |
| E—Oiler. | |

The reason for this development is that the correct point for ignition to occur is dependent, not only on the speed of the engine, but also on the load, so that the ideal control is a combination involving speed and load.

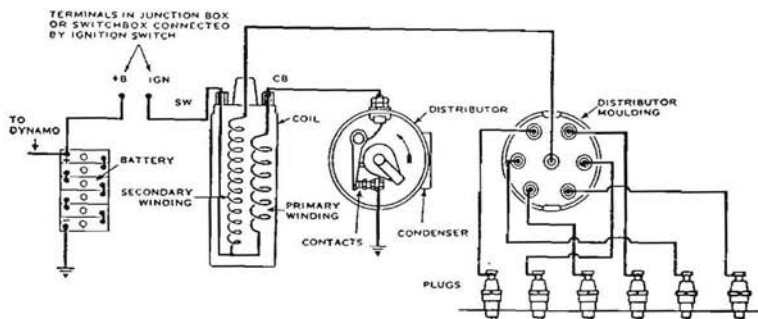


Fig. 3. WIRING OF COIL IGNITION EQUIPMENT.
(Earth Return Set for 6-cylinder Engine)

NOTE.—The wiring of 4 and 2-cylinder equipments is as shown above with the exception of the connections to the plugs. Usual order of firing with 4-cylinder cars is 1—3—4—2.

AUTOMATIC ADVANCE MECHANISM.

Most coil ignition equipments are provided with an automatic advance mechanism, which relieves the driver of the necessity of constant adjustment of the hand ignition control. Its advantages are particularly evident when accelerating, and during hill climbing, the danger of pre-ignition knocking or "pinking" being very much reduced.

Usually a small range hand ignition control is also provided so that the experienced driver can alter the firing position for special conditions of load and throttle if he desires.

The mechanism consists of a centrifugally operated governor housed in the distributor body, in which moving weights cause angular motion between the cam and the driving shaft.

The action of the mechanism is briefly as follows:—
As the engine speed increases, the weights, acted upon by

Advantage is taken of the fact that at any fixed engine speed, the intake manifold suction is roughly inversely proportional to the engine load, that is to say, with a light load, the suction in the intake is of a comparatively high order, while on full load, it is of a low value. This variation of pressure is utilised to give the most suitable ignition timing at all loads.

The control consists of a flexible diaphragm enclosed in a metal housing. The diaphragm is linked so that when acted upon by the vacuum in the induction pipe of the engine, its movement affects the rotation of the distributor head.

The vacuum control mechanism is arranged so that it is quite independent of any timing variations due to movement of the centrifugally operated mechanism inside the distributor, which is normally fitted in conjunction with vacuum control.

The control requires no lubrication or attention of any kind.

IGNITION SWITCH AND WARNING LAMP.

Besides forming a means of stopping the engine, the ignition switch is provided for the purpose of preventing the battery being discharged by the current flowing through the coil windings when the engine is stopped. A warning lamp is usually provided in the instrument panel, which gives a red light when the ignition is "on" and the car is running very slowly or is stationary, thus reminding the driver to switch off.

SECTION II. RUNNING INSTRUCTIONS & MAINTENANCE.

USE OF IGNITION CONTROL.

When an automatic timing mechanism is not fitted with the equipment, the ignition control should be retarded for starting but advanced as soon as the engine is running at speed. The ignition should be retarded when the engine is pulling slowly on full throttle, *e.g.*, when hill climbing. When starting, always retard the ignition control, otherwise there is a danger of backfiring.

When the equipment is fitted with an automatic timing control, there is no need under normal running conditions to make use of the manual control usually fitted. This is provided for use under special conditions, *e.g.*, when the engine is in need of decarbonising, the experienced driver may find that the engine is assisted by retarding with the manual control. One of the advantages of automatic timing control is that the ignition will be always be retarded when starting, consequently there is no need to use the manual control for this purpose.

LUBRICATION.

- (1) **Distributor Shaft.** Add one or two drops of thin machine oil to oiler every 1,000 miles.

On some distributors a greaser is provided instead of an oiler. Give the greaser one turn about every 500 miles.

Repack the greaser with a good quality high melting point grease when necessary.

- (2) **Cam.** About every 3,000 miles give the cam the slightest smear of vaseline.
- (3) **Distributors with Automatic Timing Control.** About every 3,000 miles withdraw the moulded rotating arm "G" (Fig. 5 or 6) from the top of the spindle by lifting it off, and add a few drops of thin machine oil. Do not remove the screw exposed to view, as there is a clearance between the screw and the inner face of the spindle through which the oil passes to lubricate the automatic timing control. Take care to refit the arm correctly and to push it on to the shaft as far as possible.

- (4) **Contact Breaker Pivot.** Every 5,000 miles, place a single drop of thin machine oil on the pivot "J" (Figs. 5 and 6) on which the contact breaker lever works.
- (5) **Distributor Gears.** When distributors are mounted on the dynamo and are driven from the dynamo shaft, the gears are packed with grease during assembly and should not need attention for a considerable time. Periodically, say, when the engine is being decarbonised, move aside the flap on the gear housing and if the gears are dry, add a little high melting point grease, such as No. 62 "Gredag" (E. G. Acheson Ltd.) a grease originally put in the gears at the Works. Care must be taken not to add excess of grease, otherwise it may work its way into the dynamo or distributor.

In warm and tropical climates, the lubrication of the moving parts will need more frequent attention.

CLEANING AND ADJUSTMENT.

Single Lever Type Distributors and Contact Breakers.

These distributors have one contact breaker lever. The distributor shaft carries a 2, 4 or 6 lobe cam according to the number of cylinders of the engine, and is driven at half engine speed so that the contacts open once, twice or three times each revolution of the engine. Occasionally remove the distributor moulding by pushing aside its two securing springs. See that the electrodes are clean and free from deposit. If necessary, wipe out the distributor with a dry duster and clean the electrodes with a cloth moistened with petrol. See that the carbon brush is clean and moves freely in its holder. Clean the outside of the moulding, particularly the spaces between the terminals. Next examine the contact breaker; it is important that the contacts "C" (Figs. 5 and 6) are kept free from any grease or oil. If they are burned or blackened, they may be cleaned with very fine carborundum stone or emery cloth and afterwards with a cloth moistened with petrol. Care must be taken that all particles of dirt and metal dust are wiped away. Misfiring may be caused if the contacts are not kept clean.

The contact breaker gap is carefully set before leaving the Works, and a gauge is provided with each distributor.

With DK and DQ types of distributors the method of adjustment is different. To re-adjust, slacken the two screws "D" (Fig. 6) the contact plate and move the plate until the contacts are set to the gauge (.010-.012 ins.). Finally tighten the screws.

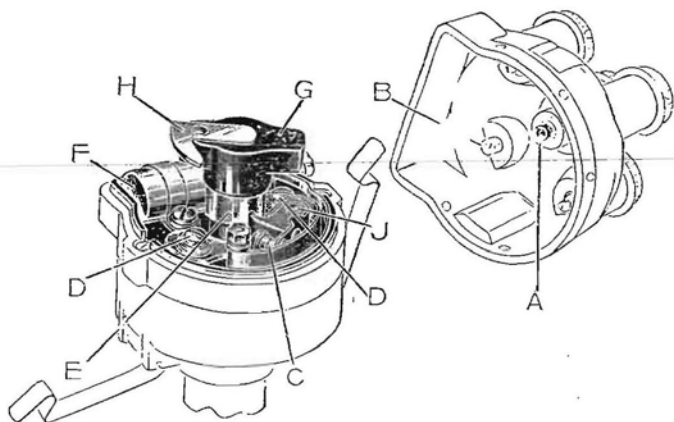


Fig. 6. DISTRIBUTOR AND CONTACT BREAKER TYPE DK4A.

- | | |
|--|-----------------------------|
| A—Carbon brush. | E—Rotating cam. |
| B—Electrode. | F—Condenser. |
| C—Contacts. | G—Rotating distributor arm. |
| D—Screws securing contact breaker plate. | H—Metal electrode. |
| | J—Contact breaker pivot. |

Double Lever Type Distributors and Contact Breakers. Some distributors for 6 cylinder engines, and all those for 8 cylinder engines, are of the double lever type. Each lever operates for half the number of cylinders a three or four lobe cam being fitted.

The distributor should be inspected and the two pairs of contacts "A" (Fig. 7) should be cleaned and the gaps between them checked as described on page 9.

It is important that both gaps are maintained to the gauge (.015 ins.) as the two contact breaker levers are synchronized at the Works with the gaps accurately set. If the contact gaps are not correct, there will be a tendency for the timing of half the cylinders to be slightly different from the rest.

To adjust the gaps, proceed as follows:—Slowly turn the engine until one pair of contacts are seen to be fully opened. Then slacken the locking screw "B" and adjust the gap to the gauge by turning the adjusting screw "C." After the adjustment, do not forget to tighten the locking screw. Adjust the other gap in the same way.

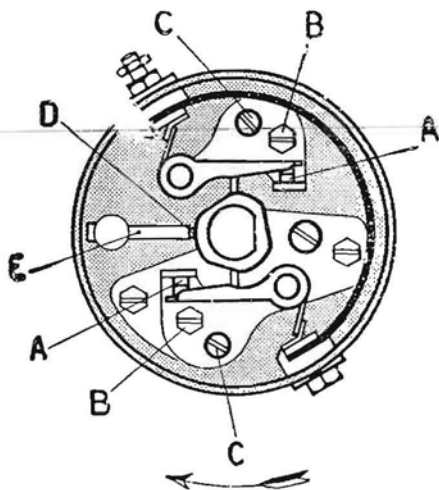


Fig. 7. PLAN VIEW OF DOUBLE LEVER TYPE DISTRIBUTOR.

- | | |
|--------------------------------------|-------------------------|
| A—Contacts. | C—Adjustment screw. |
| B—Locking screw. | D—Wick lubricating cam. |
| E—Oil hole for cam lubricating wick. | |

The owner is cautioned that it is extremely inadvisable to make any adjustment to the other screws in the contact breaker, which are locked. These are provided for synchronizing the two contact breaker levers.

Ignition Warning Lamp. The warning lamp bulb is usually rendered accessible for replacement by removal of the front carrying the red glass. With some panels, this is removed by unscrewing (Fig. 8), while with other units it is secured by two screws. When the front is not detachable, the bulb holder can be released from the back of the panel by turning it to the left.

ADJUSTMENT OF SPARKING PLUGS.

The plug electrodes burn away slightly with service, and thus, in time, the gap length increases. Occasionally examine and clean them, adjusting them if necessary to the right setting (about 20 thousandths of an inch). It is

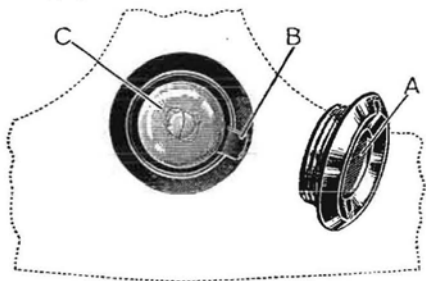


Fig. 8. IGNITION WARNING LAMP with Screw-on Front.

- A—Warning lamp front.
- B—Tab to facilitate bulb removal.
- C—Bulb.

advisable to follow the engine manufacturer's recommendations for the exact setting, as the gap depends somewhat on the type of plug fitted and the characteristics of the engine.

COIL.

The coil unit is not adjustable in any way, and requires no attention beyond seeing that the terminal connections are kept tight, and the moulded coil top is kept clean.

MAINTENANCE OF THE BATTERY AND DYNAMO.

As the ignition coil depends on the battery and dynamo for its supply of current, it is important that these units are kept in good condition by carrying out the following brief instructions:—

At least once a month remove the vent plugs and examine the acid level. If necessary, add distilled water to bring the level to the top of the separators.

Do not add acid solution unless some has been spilled, when it should be replaced with dilute sulphuric acid of the correct specific gravity.

Always keep the battery terminals spanner tight and smeared with vaseline.

The only parts of the dynamo calling for occasional attention are the brushes and commutator which are readily accessible when the end cover is removed. The brushes should slide freely in their holders. They should be clean, and the face in contact with the commutator should appear uniformly polished. Dirty brushes may be cleaned with a cloth moistened with petrol. The commutator surface must be kept clean and free from oil or brush dust.

For more detail instructions on the maintenance of the battery and the dynamo, see our booklet on Lighting and Starting Equipment.

RENEWING HIGH TENSION CABLES.

When the high tension cables show signs of perishing or cracking, they should be replaced. Use only 7 mm. rubber covered ignition cable for all high tension leads.



Fig. 9.
METHOD OF FITTING
CABLE TERMINALS.

The methods of fitting high tension cable to the distributor and coil vary with different units. Fig. 9 shows the method of fixing employed on coils and distributors in which the leads are taken from the unit vertically.

The method of connecting the cable is to thread the knurled moulded nut over the lead, bare the end of the cable for about $\frac{1}{4}$ in., thread the wire through the brass washer provided, and bend back the strands. Finally screw the nut into its respective terminal.

With some distributors, the cables are secured by means of pointed fixing screws. To fit new cables, unscrew the pointed fixing screws on the inside of the moulding and push the cables, which should not be bared but should be

cut off flush to the required length, well home into their respective terminals. Now tighten up the screws which will pierce the insulation and make contact with the cable core.

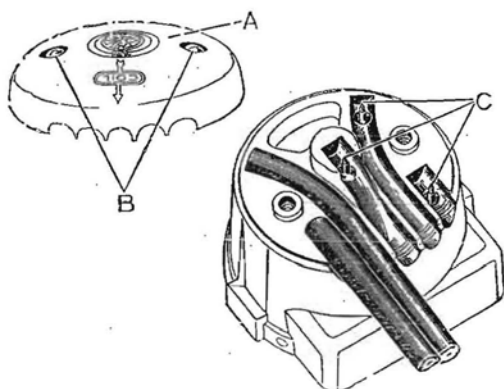


Fig. 10. METHOD OF FITTING CABLES.

- A—Moulded cover.
- B—Fixing screws.
- C—Pointed terminal studs.

With other types of distributors with horizontal leads, (Fig. 10), the cables are held in position by a moulded cover which is secured by means of two screws. The cables, which are cut off flush to the required length, are located in recesses in the distributor moulding and are pressed on to pointed terminal studs which pierce the insulation to make good contact with the cable core.

NOTES ON TIMING.

The combined distributor and contact breaker is usually carried in a clip attached to the timing lever. The timing can be adjusted by loosening the clamping screw on the clip, and turning the distributor housing in the desired direction. The contact breaker heel is thus moved round the cam, and so the positions of firing are altered.

Some distributors (types DKF and DQF) are fitted with a cam in which the drive is taken through a pin sliding in a slot. This arrangement prevents any possibility of the engine running backwards following a back-fire. The

method of drive is such that a backward movement of the engine is not immediately taken up by the cam, thus ignition is not provided for the cylinder next in firing order (in reverse direction), so back running is prevented. When setting the contacts of these distributors to break when retiming, the cam must be turned as far as possible against the normal direction of rotation.

Before removing the distributor from the engine for any reason it is advisable to mark the distributor housing and lever so that it can be replaced in the same position and so avoid retiming.

Whenever possible, follow the car manufacturer's instructions for timing, as the best position will vary according to the characteristics of the engine.

Where detail instructions are not available, the following general procedure for timing or checking the timing can be followed:—

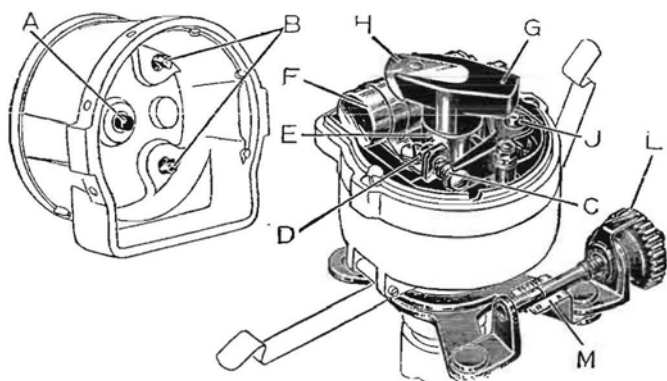
- (1) Turn the engine over until No. 1 piston is at the top of its compression stroke (that is, on top dead centre). On most engines, this position is indicated by a mark on the flywheel.
- (2) About half retard the ignition control.
- (3) With the engine and the control set in the above positions, the timing is correct if the contacts are just commencing to separate and the metal electrode on the rotating distributor arm is pointing to the insert in the moulding connected to plug No. 1. If necessary, slacken the clamping screw on the timing lever, and turn the distributor housing until this position is found. After setting the distributor, tighten the grip.

It should be seen that the plugs are connected to the distributor in sequence according to the firing order of the engine.

- (4) If, on running the engine, the firing is found to be slightly too early or too late, this may be corrected by again slackening the clamping screw, and turning the distributor a fraction in the required direction, afterwards tightening the clamping clip.

Distributors with Micrometer Timing Adjustment.

In order to obtain very fine timing of the ignition to the engine and to allow for altered engine conditions, *e.g.*, state of carbonisation of engine, change of fuel, etc. a micrometer adjustment is provided on some distributors which allows fine adjustment to be made simply by the movement of a knurled knob.



Distributor and Contact Breaker.—Showing Micrometer Timing Adjustment.

A—Carbon brush.
B—Electrode.
C—Contacts.
D—Lock nut.
E—Rotating cam.
F—Condenser.

G—Rotating distributor arm.
H—Metal electrode.
J—Contact breaker pivot
L—Knob for micrometer adjustment.
M—Scale for micrometer adjustment.

With a clean engine, and using first grade fuel, the micrometer scale should be set at O, before timing as described on page 14.

The final setting can be made by use of the micrometer adjustment after running the engine. If the firing is found to be slightly too early or too late, adjust the knurled knob until the best engine performance is obtained. The adjustment should not be altered by more than 1 distributor degree at a time (1 division on the scale is equivalent to 2 distributor degrees).

SECTION III.

LOCATION AND REMEDY OF TROUBLES.

If a failure of ignition or misfiring occurs, unless the cause is at once apparent the owner is strongly recommended to proceed in accordance with the table on page 19, which should quickly enable him to locate the trouble.

Before proceeding with the examination, make sure that the trouble is not due to defects in the engine, carburetter, petrol supply, sparking plugs, etc.

Engine will not Fire. Switch on the ignition, turn the engine and observe the ammeter reading. The engine should be turned by hand if it is known that the battery is in a low state of charge.

If an ammeter reading is given which rises and falls with the closing and opening of the contacts, then the low tension wiring is in order. If the reading does not fluctuate in this way, a short in the low tension wiring is indicated, or the contacts are remaining closed. When no reading is given, a broken or loose connection in the low tension wiring is indicated, or the battery may be exhausted.

If an ammeter is not included in the set, the low tension wiring may be checked as follows—Switch on the ignition and turn the engine by hand until the contact breaker points are closed. If the movable arm of the contact breaker is now pulled quickly aside with the fingers, thus separating the contacts, a spark should occur between them as they separate, indicating that current is flowing through the primary coil windings.

If a fault is indicated in the low tension wiring, examine the cables from switch or junction box to coil, and from coil to distributor. See that the battery terminals are tight and that the cables from the switchbox to the battery are secure. The battery may be dismissed as the cause of the trouble if the lamps will light.

Examine the high tension cables, *i.e.*, cables from the coil to the distributor, and from the distributor to the plugs. If the rubber shows signs of deterioration or cracking, the cable should be renewed. Remove the distributor moulding and examine the contacts; if necessary, clean them as described on page 8. Turn the engine over by hand, and see that the contacts come together.

Test the coil independently of the distributor, as follows:—Remove the cable from the centre distributor terminal and hold it about $\frac{1}{4}$ in. from some metal part of the chassis and turn the engine. The sparking should be strong and regular if the coil is functioning correctly.

Misfiring and Bad Starting. Examine the high tension cables and the plugs. If necessary, adjust the gaps to the correct setting (about 20 thousandths of an inch). Sooty or oiled plugs may be dismantled and washed out with petrol.

The plugs and high tension cables may be tested by removing the plugs in turn and allowing them to rest on the cylinder head and observing whether a spark occurs at the points when the engine is turned by hand. It should, however, be noted that this is only a rough test, since it is possible that a spark may not take place when the plug is under compression.

Remove the distributor moulding and see that the electrodes and contacts are clean. If necessary, clean them as described on page 8. See that the contact gap setting is correct.

If, after carrying out the examination suggested, the cause of the trouble cannot be found, we advise that the equipment should be examined by our nearest Service Depot, the addresses of which are given on page 20.

How to Locate and Remedy Trouble.

CONDITION.	METHOD OF DETECTION OF POSSIBLE CAUSES.	REMEDY.
Engine will not fire.	Starter will not turn engine and lamps do not give good light. Battery discharged.	Start engine by hand. Battery should be recharged by running car for a long period during day time with charging switch in full charge position. Alternatively recharge from an independent electrical supply.
	Controls not set correctly for starting.	See that ignition is switched on, petrol turned on and everything is in order for starting.
	Remove lead from centre distributor terminal and hold it about $\frac{1}{2}$ in. away from some metal part of the chassis, while engine is turned over. If sparks jump gap regularly, the coil and distributor are functioning correctly. If the coil does not spark, the trouble may be due to any of the following causes:—	Examine the sparking plugs, and if these are clean and the gaps correct, the trouble is due to carburetter, petrol supply, etc.
	Fault in low tension wiring. Indicated by (1) No ammeter reading when engine is slowly turned and ignition switch is on, or (2) No spark occurs between the contact points when quickly separated by the fingers when the ignition switch is on.	Examine all cables in ignition circuit and see that all connections are tight. See that battery terminals are secure.
	Dirty or pitted contact points.	Clean with fine carborundum stone or emery cloth and afterwards with a cloth moistened with petrol.
	Contact breaker points out of adjustment. Turn engine until contacts are fully opened and test gap with gauge.	Adjust gap to gauge.
Engine misfires.	Dirty or pitted contact points.	Clean with fine carborundum stone or emery cloth and afterwards with a cloth moistened with petrol.
	Contact breaker points out of adjustment. Turn engine until contacts are fully opened and test gap with gauge.	Adjust gap to gauge.
	Remove each sparking plug in turn, rest it on the cylinder head, and observe whether a spark occurs at the points when the engine is turned. Irregular sparking may be due to dirty plugs or defective high tension cables.	Clean plugs and adjust the gaps to about 20 thousandths of an inch. Replace any lead if the insulation shows signs of deterioration or cracking.
	If sparking is regular at all plugs the trouble is probably due to engine defects.	Examine carburetter, petrol supply, etc.

LUCAS-C.A.V.-ROTAX

SERVICE DEPOTS

All owners are urged to take advantage of the facilities offered by LUCAS-C.A.V.-ROTAX Service.

For the benefit of the users of our equipment we have established Service Depots in all large towns, which are not only at your disposal for repairs, overhauls and adjustments, but to give free advice. If you experience any difficulty with any part of the equipment, do not hesitate to consult us, we shall be only too pleased to be of assistance. The best course to adopt is to call at our nearest Service Depot, the addresses of which are given below, when the equipment can be examined as a whole.

If it is necessary to replace any part, order Genuine LUCAS-C.A.V.-ROTAX Spares. It is obvious that only the designers and manufacturers of the equipment are in a position to make replacement parts which will give satisfactory and lasting service.

When corresponding with Depots or when ordering spare parts, give the name, model and year of the car, the unit of equipment and particular part in question. Units of equipment are identified by letters and numbers stamped or moulded on some part of the article. It is essential to quote this marking to ensure that correct replacements are sent.

Illustrated spare parts lists are available on application. State year and make of car.

BELFAST	... ..	3/5, Calvin Street, Mount Pottinger
Telephone: BELFAST	7017	Telegrams: "SERVDEP, BELFAST"
BIRMINGHAM, 18	... ..	... Great Hampton Street
Telephone: CENTRAL	8401 (10 lines)	Telegrams: "LUCAS, BIRMINGHAM"
BRIGHTON	... ..	85, Old Shoreham Road, Hove
Telephone: PRESTON	3001 (4 lines)	Telegrams: "LUSERV, BRIGHTON"
BRISTOL	... ..	... 345, Bath Road
Telephone: BRISTOL	76001 (4 lines)	Telegrams: "KINGLY, BRISTOL"
CARDIFF	... ..	... 54a, Penarth Road
Telephone: CARDIFF	4603 (4 lines)	Telegrams: "LUCAS, CARDIFF"
COVENTRY	... ..	... Priory Street
Telephone: COVENTRY	3068	Telegrams: "LUCAS, COVENTRY"
DUBLIN	... ..	Portland St. North, North Circular Road
Telephone: DRUMCONRA	434 (6 lines)	Telegrams: "LUSERV, DUBLIN"
EDINBURGH, 11	... ..	... 32, Stevenson Road, Gorgie
Telephone: EDINBURGH	62921 (4 lines)	Telegrams: "LUSERV, EDINBURGH"
GLASGOW	... ..	... 227-229, St. George's Road
Telephone: DOUGLAS	3075 (5 lines)	Telegrams: "LUCAS, GLASGOW"
LEEDS	... ..	... 64, Roseville Road
Telephone: LEEDS	28591 (5 lines)	Telegrams: "LUSERDEP, LEEDS"
LIVERPOOL, 13	... ..	... 450/456, Edge Lane
Telephone: OLD SWAN	1408 (4 lines)	Telegrams: "LUSERV, LIVERPOOL"
LONDON	... ..	Dordrecht Road, Acton Vale, W.3
'Phone: SHEPHERDS BUSH	3160 (10 lines)	'Grams: "DYNOMAGNA, EALUX, LONDON"
LONDON	... ..	757-759, High Road, Leyton, E.10
Telephone: LEYTONSTONE	3361 (4 lines)	'Grams: "LUSERDEP, WALT, LONDON"
LONDON	... ..	... 155, Merton Rd., Wandsworth, S.W.18
Telephone: PUTNEY	5131 (6 lines) & 5501	'Grams: "LUSERV, PUT, LONDON"
MANCHESTER	... ..	... Talbot Road, Stretford
Telephone: LONGFORD	1101 (5 lines)	Telegrams: "LUCAS, STRETFORD"
NEWCASTLE-ON-TYNE, 2	... ..	... 64/66, St. Mary's Place
Telephone: CENTRAL	25571 (3 lines)	'Grams: "MOTOLITE, NEWCASTLE-ON-TYNE"

IN ADDITION THERE ARE OFFICIAL LUCAS—C.A.V.—ROTAX BATTERY SERVICE AGENTS IN IMPORTANT CENTRES THROUGHOUT THE COUNTRY.