

INSTRUCTIONS FOR

LUCAS

ELECTRIC LIGHTING

and

IGNITION EQUIPMENT

*With Compensated Voltage
Dynamo Control*



FOR MOTOR-CYCLES

**INSTRUCTIONS FOR LUCAS ELECTRIC
LIGHTING AND IGNITION EQUIPMENT
FOR MOTOR CYCLES
(With Compensated Voltage Control.)**

THIS booklet covers the different compensated voltage control dynamo equipments fitted to various motor cycles. Refer to the Index on the next page in order to locate the information relating to the equipment fitted on your motor cycle.

**JOSEPH LUCAS LIMITED,
BIRMINGHAM, 19, ENGLAND.**

INDEX

"Magdyno" Equipment

	Page
Battery	3
Dynamo	4
Lamps	6
Magneto	10
Horn	16

Location and Remedy of Faults :

Dynamo	18
Lighting	19
Magneto	20

Coil Ignition Equipment

Battery	3
Dynamo	4
Lamps	6
Ignition Equipment	14
Horn	16

Location and Remedy of Faults :

Dynamo	18
Lighting	19
Ignition Equipment	21

Separate Dynamo and Magneto Equipment

Battery	3
Dynamo	4
Lamps	6
Magneto	10
Horn	16

Location and Remedy of Faults :

Dynamo	18
Lighting	19
Magneto	20

BATTERY

Lead Acid Type

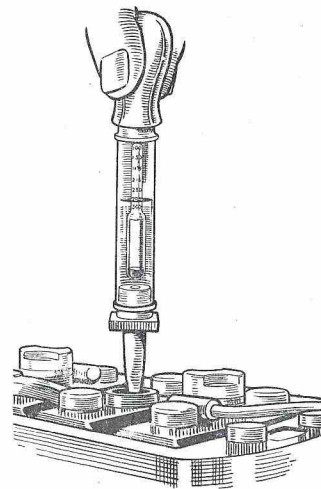
About once a month, remove the battery lid, unscrew the filler caps and examine the level of the acid in the cells. If necessary, add distilled water to bring the acid level with the tops of the separators. Do not use tap water as it contains impurities detrimental to the battery. When examining the cells, do not hold naked lights near the vent holes as there is a danger of igniting the gas coming from the plates.

Once a month examine the condition of the battery by taking hydrometer readings. There is no better way of ascertaining the state of charge of the battery. The hydrometer contains a graduated float which indicates the specific gravity of the acid in the cell from which the sample is taken. The specific gravity readings and their indications are as follows. 1.280—1.300: battery fully charged. About 1.210: battery about half discharged. Below 1.150: battery fully discharged. These figures are given assuming the temperature of the solution is about 60° F.

The readings for each of the three cells should be approximately the same. If one cell gives a reading very different from the rest, it may be that acid has spilled or has leaked from this particular cell, or there may be a short circuit between the plates. In this case the battery must be examined by a Lucas Service Depot or Agent.

Never leave the battery in a discharged condition for any appreciable length of time.

If the motor cycle is to be out of use for any time, see that the battery is fully charged and about every fortnight give it a short freshening charge to prevent any tendency to permanent sulphation of the plates.



Taking Hydromete Readings.

Lucas Jelly Acid Type

About once a month a tablespoonful of distilled water should be added to each cell and the battery allowed to stand for two hours. At the end of this time any surplus liquid on the top of the jelly should be drawn off.

DYNAMO

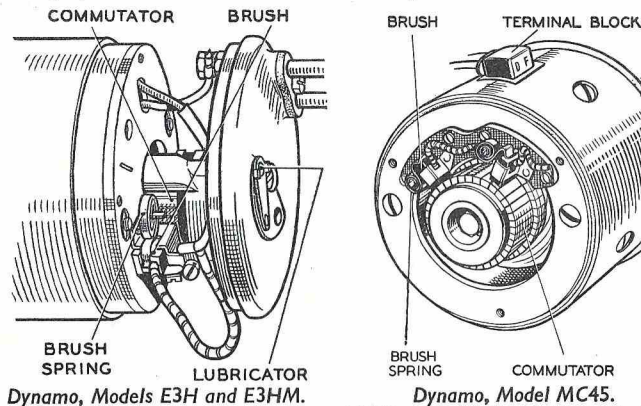
Output Control

The dynamo is of the compensated voltage control type and works in conjunction with a regulator unit which is mounted together with the cut-out. The regulator and cut-out units are accurately set and do not require any adjustment.

The regulator provides a completely automatic control. It causes the dynamo to give an output which varies according to the load on the battery and its state of charge. When the battery is discharged the dynamo gives a high output, but if the battery is fully charged then the dynamo gives only a trickle charge so as to keep the battery in a good condition. In addition to controlling the output of the dynamo according to the condition of the battery, the regulator provides for an increase of output to balance the current taken by lamps when in use.

Ammeter Readings

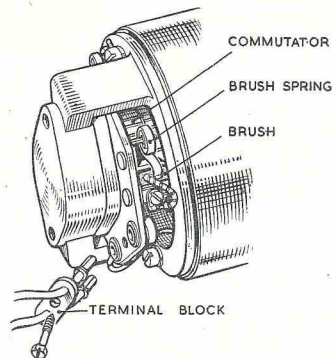
Normally during day-time running when the battery is in good condition, the dynamo gives only a trickle charge so that the ammeter reading will seldom be more than 1 or 2 amperes.



Dynamo, Models E3H and E3HM.

Dynamo, Model MC45.

NOTE.—Model MC45L is fitted with four brushes.



Dynamo, Models C35S and C35SD.

A discharge reading may be observed immediately after switching on the headlamp. This usually happens after a long run when the battery voltage is high. After a short time the battery voltage will drop and the regulator will respond, causing the dynamo output to balance the lamp load.

Lubrication

Models E3H and E3HM are fitted with a lubricator on the commutator end bracket which must be given a few drops of good grade thin machine oil every 1,000 miles. The bearing at the driving end is packed with grease and will last until the machine is taken down for a general overhaul.

Models E3AR, E3L, C35S and C35SD. No lubrication is required to these models as ball bearings are fitted at both ends. These bearings are packed with grease during assembly and will last until the machine is taken down for a general overhaul. Similarly, the gear drive to the distributor on Model C35SD is packed with grease and requires attention only at overhaul.

Models MC45 and MC45L. No lubrication is required to these models since the armature is mounted directly on an extension of the crankshaft and there are therefore no separate bearings in the dynamo.

Inspection of Commutator and Brushes

About once every six months remove the dynamo cover for inspection of commutator and brushes.

The brushes must make firm contact with the commutator. The brushes are held in boxes by means of springs; move the brush to see that it is free to slide in its holder; if it sticks, remove it and clean with a cloth moistened with petrol. Care must be taken to replace the brushes in their original position, otherwise they will not "bed" properly on the commutator. If after long service the brushes have become worn to such an extent that they will not bear properly on the commutator they must be replaced. Always use genuine Lucas brushes. Brushes should be fitted by a Service Agent so that they can be properly bedded to the commutator. Now examine the commutator. It should be free from any trace of oil or dirt and should have a highly polished appearance. Clean a dirty or blackened commutator by pressing a fine dry cloth against it while the engine is slowly turned over by means of the kick starter crank. If the commutator is very dirty, moisten the cloth with petrol.

When replacing the cover of the model MC45 dynamo, be careful to position the rubber seal between cover and yoke correctly.

Dynamo output

The dynamo output is accurately set to suit the requirements of the motor cycle and in normal service the battery will be kept in a good condition. If due to special running conditions you should find that the battery is not kept in a charged condition or is being overcharged, we advise you to have the regulator reset by a Lucas Service Depot or Agent. Do not attempt adjustment yourself.

LAMPS

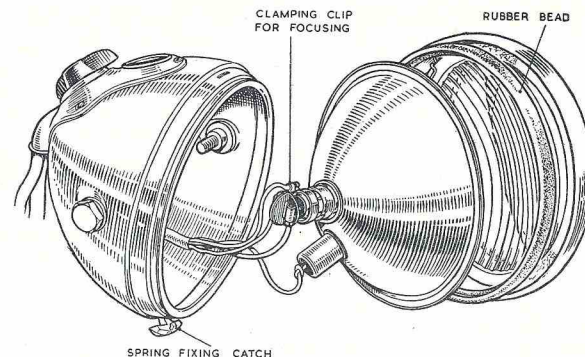
Headlamp—Checking the alignment

The best way to check the alignment is to take the motor cycle on a straight level stretch of road at night and examine the beam of the main driving light. Adjust the lamp by slackening the two fixing screws and moving the lamp until its beam is straight ahead and parallel with the road surface. Tighten the fixing screws after adjustment.

Focusing

In order for the headlamp to give the best results the driving light filament of the main bulb must be as near as possible to the focal point of the reflector. Before the lamp is despatched from the Works the bulb is correctly focused, and provided that the correct genuine Lucas Bulb is fitted as a replacement it should not be necessary to disturb the setting. If for any reason a Lucas bulb is not obtainable, and an ordinary bulb has to be used, it may be necessary to re-focus. To do this, remove the lamp front and reflector, slacken the clamping clip at the back of the reflector and move the bulb holder backwards and forwards, until the lamp gives a long range beam without a dark centre.

When the best position for the bulb has been found see that the clamping screw is tightened.



Headlamp ("M" Type) with front and reflector removed.

Removing Headlamp front and reflector

"D" Type Lamps. Press back the fixing clip at the bottom of the lamp. The front and reflector can then be removed. When refitting, locate the top of the rim first, then press on at the bottom and secure by means of the clip.

The bulb holders can be removed from the rear of the reflector for bulb replacement.

"M" Type Lamps. Release the spring catch at the bottom of the lamp, when the front can be removed. The reflector is secured to the lamp body by means of a rubber bead, and can be withdrawn when the rubber is removed. When refitting, locate the thinner lip of the rubber bead between the reflector rim and the edge of the lamp body. To replace the front, locate the metal tongue in the slot at the top of the lamp, press the front on and secure by means of the fixing catch.

NOTE: See page 23 for supplementary information on headlamps model SSU700P.

Tail Lamps

The portion of this lamp carrying the red glass can be removed by pushing in and turning to the left. When refitting, engage the bayonet fixing, push in and turn to the right to secure the body in position.

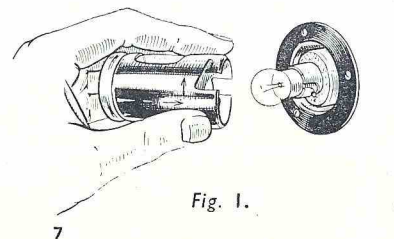


Fig. 1.

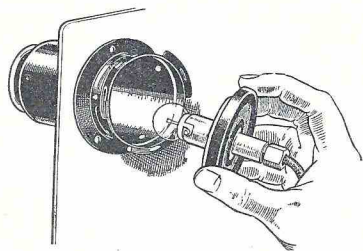


Fig. 2.

Access to the bulb is obtained by slackening the single securing screw. The cover and glass can then be withdrawn. The replacement is Lucas No. 988 6v. 3 watt.

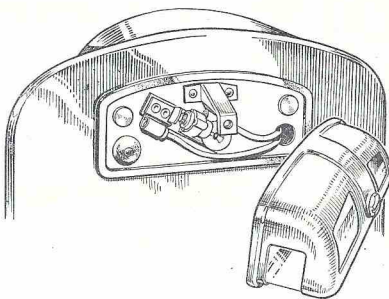


Fig. 3.

Access to the bulb is obtained by turning the front to the left and withdrawing. To replace, engage the projections on the front in the slots and turn to the right to secure in position.

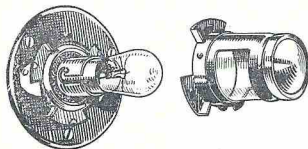


Fig. 4.

Stop Tail Lamp

This lamp employs a double filament bulb (6v. 3/18w.) the 3 watt filament being the normal tail lamp and the 18 watt coming into operation on movement of the brake pedal. When replacing the bulb it is important to ensure that it is fitted in the correct position so that the higher wattage filament is illuminated when the brake is applied. This lamp is similar in construction to the one shown in Fig. 4 page 8.

Replacement of Bulbs

When the replacement of a bulb is necessary, it is important not only that the same size bulb is fitted, but that it has a high efficiency and will focus in the reflector. Cheap and inferior replacement bulbs often have the filament of such a shape that it is impossible to focus correctly; for example, the filament may be to the one side of the axis of the bulb resulting in loss of range and light efficiency.

It always pays you to fit bulbs recommended by the lamp manufacturers as these problems will than not arise.

When fitting a main headlamp bulb, care must be taken to insert it the correct way round, i.e., with the dipped beam filament above the centre filament.

Lucas Genuine Spare Bulbs

Lucas Genuine Spare Bulbs are specially tested to check that the filament is in the correct position to give the best results with Lucas lamps. To assist in identification, Lucas bulbs are marked on the metal cap with a number. When fitting a replacement, see that it has the same number as the original bulb.

Cleaning

Care must be taken when handling the lamp to prevent the reflector from becoming finger-marked. If it does become marked, however, a transparent and colourless covering enables any finger marks to be removed by polishing with a chamois leather or a very soft dry cloth. Do not use metal polish on the reflector. The black lamp body may be cleaned with a good car polish, and the plated rim polished with a chamois leather or soft dry cloth after any dirt has been washed off with water.

Dipper Switch

Every 5,000 miles the moving parts of the dipper switch must be lubricated with a thin machine oil.

Replacement bulbs are as follows :—

	Headlamp (Main)	Headlamp (Pilot)	Tail Lamps
Magneto Ignition with Models E3AR, E3H and E3HM Dynos	Lucas No. 168 6v. 24/24w.	Lucas No. 200 6v. 3w.	Lucas No. 200 6v. 3w.
Magneto Ignition with Model E3L Dynamo	Lucas No. 169 6v. 30/30w.	do.	do.
Magneto Ignition with Model C35S Dynamo	Lucas No. 169 6v. 30/30w.	do.	do.
Coil Ignition with Models E3AR and E3H Dynamos	Lucas No. 180 6v. 18/18w.	do.	do.
Coil Ignition with Models MC45 and E3L Dynamos	Lucas No. 168 6v. 24/24w.	do.	do.
Coil Ignition with with Model MC45L Dynamo	Lucas No. 169 6v. 30/30w.	do.	do.
Coil Ignition with Model C35SD Dyn- amo	Lucas No. 169 6v. 30/30w.	do.	do.

NOTE.—Bulb replacement for Tail Lamp Model 467 (Fig. 3, page 8) is Lucas No. 988 6 volt 3 watt.

MAGNETO

Ignition Timing Control

Some magnetos are provided with an automatic timing control which automatically varies the firing point according to the requirements of the engine. Such magnetos, of course, are not fitted with hand ignition control.

When the equipment is not fitted with an automatic timing mechanism, retard the hand ignition control for starting, but advance it as soon as the engine is running at speed. For normal running, the control should be kept in the advanced position, and should be retarded only when the engine is pulling slowly on full throttle.

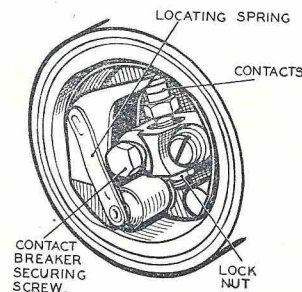
Cleaning

Dirty contacts can be cleaned with a fine carborundum stone, or if this is not available, fine emery cloth can be used. Wipe away any dirt or metal dust with a cloth moistened with petrol. Contact breaker springs should be examined and any rust wiped away. To render the contacts accessible for cleaning, proceed as outlined below.

After cleaning, check the contact breaker setting.

Ring cam type

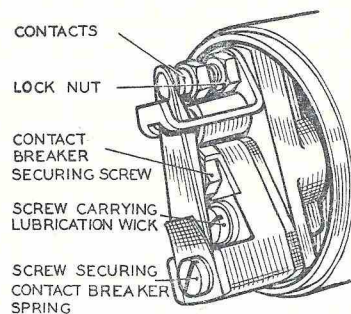
Withdraw the contact breaker from its housing by unscrewing the hexagon headed contact breaker securing screw. The contact breaker can be pulled off the taper shaft on which it fits. Push aside the locating spring and prise the rocker arm off its bearing, when it will be possible to clean the contacts. When replacing the contact breaker, take care to ensure that the projecting key, on the tapered portion of the contact breaker base, engages with the keyway cut in the armature spindle, otherwise, the timing of the magneto will be upset. Tighten the hexagon headed screw with care—it must not be too slack, nor must undue force be used.



Ring Cam type Contact Breaker.

Face cam type

Remove the spring arm carrying the moving contact by withdrawing the securing screw. When replacing the arm, see that the small backing spring is fitted immediately under the securing screw and spring washer, with the bent portion facing outwards.



Face Cam type Contact Breaker.

Next examine the pick-up or high tension terminal. Wipe the moulding clean with a dry cloth. See that the carbon brush moves freely in its holder, being careful not to stretch the brush spring unduly. With the pick-up still removed, clean the slipping track and flanges by holding a soft cloth on the ring while the engine is slowly turned by hand.

Adjustment

The gap to which the contact breaker contacts must be set, when they are fully opened, is about 12 thousandths of an inch. A gauge of this thickness is provided on the spanner supplied. Do not alter the setting unless the gap varies considerably from the gauge.

If the contacts need adjustment, turn the engine over until contacts are fully opened. Then slacken the locknut and rotate the contact screw by its hexagon head until the gap is set to the thickness of the gauge. Finally tighten the locknut.

Lubrication

Ring cam type

The cam is lubricated by a length of felt contained in the contact breaker housing. A small hole in the cam, fitted with a wick, enables the oil to find its way on to the surface of the cam. Every 5,000 miles, a few drops of thin machine oil through the small hole provided in the cam. Do not allow any oil to get on the contacts. At the same time the contact breaker rocker arm pivot should be lightly smeared with Mobilgrease No. 2 or an equivalent; to do this remove the complete contact breaker (as described on Page 11), then push aside the rocker arm retaining spring and lift the rocker arm off its pivot.

Face cam type

The cam is lubricated by a wick contained in the contact breaker base. Add a few drops of thin machine oil to the wick every 5,000 miles. To render the wick accessible, remove the spring arm carrying the moving contact and withdraw the screw carrying the wick. When replacing, see that the small backing spring is fitted immediately under the securing screw and spring washer and with bent portion facing outwards.

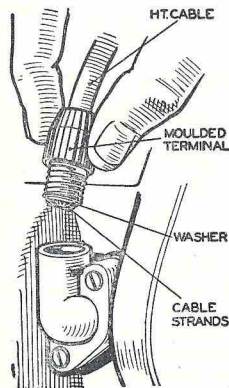
The bearings are packed with grease during assembly and will not need attention until the motor cycle is dismantled for general overhaul, when it is advisable to have the magneto inspected by a Lucas Service Depot or Agent.

Renewing high tension cables

When high tension leads show signs of cracking or perishing, they must be replaced. 7 m.m. rubber covered ignition cable must be used for high tension leads.

The method of fitting the cable is as follows :—

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

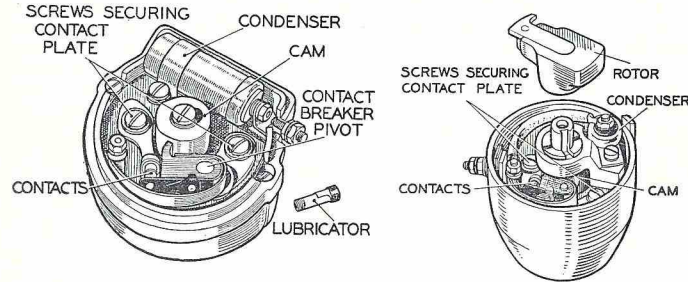


Method of fitting high tension cable.

COIL IGNITION EQUIPMENT.

IGNITION TIMING CONTROL

On some motor cycles, the ignition is provided with an automatic timing mechanism which automatically varies the firing point according to the requirements of the engine.



Contact Breakers incorporating Automatic Timing Control.

When the equipment is not fitted with an automatic timing mechanism retard the hand ignition control for starting, but advance it as soon as the engine is running at speed. For normal running the control should be kept in the advanced position and should be retarded only when the engine is pulling slowly on full throttle, e.g., when hill climbing.

CONTACT BREAKER

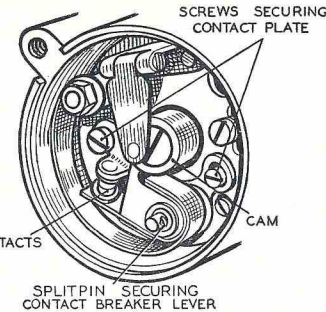
Cleaning

Occasionally remove the moulded cover and examine the contact breaker; it is important that the contacts are kept clean and free from oil or grease. If they are burned or blackened, clean with fine carborundum stone, or if this is not available fine emery cloth may be used; afterwards wipe with a cloth moistened with petrol. If the contacts have been allowed to get into bad condition remove the arm carrying the moving contact. To do this, unscrew the nut securing the end of the contact breaker spring, and remove the nut together with the spring washer. Remove the metal bush, and lift the contact breaker lever off its bearing. With some types, remove the split pin securing the rocker arm before lifting the rocker arm from its housing.

After cleaning, replace the moving contact assembly and check the contact breaker setting.

Adjustment

The contact breaker gap is carefully set to .010"—.012" before leaving the Works and will need adjustment only at very long intervals.



To test the contact breaker gap, slowly turn the engine over until the contacts are seen to be fully opened. Now insert the gauge provided 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 screws

so that the plate carrying the stationary contact can just be moved. Adjust the position of the plate until the gap is set to the thickness of the gauge. Tighten the locking screws and re-check the gap.

With contact breakers which have the condenser mounted in the moulded cover, the hinged spring blade on the contact breaker must make good contact with the condenser case when the cover is fitted in position. If the blade does not press firmly against the case, there will be excessive sparking and burning away of the contacts.

Lubrication—to be carried out every 3,000 miles

Lightly smear the surface of the cam with Mobilgrease No. 2, or, if this is not available, clean engine oil may be used.

Remove the contact breaker lever and lightly smear the pivot with Mobilgrease No. 2 or clean engine oil.

When an automatic timing control is provided, remove the contact breaker cover, and add a few drops of clean engine oil through the hole in the contact breaker base through which the cam passes. Do not allow any oil to get on or near the contacts. With this type of contact breaker also add a few drops of thin machine oil to the lubricator (when fitted) on the contact breaker shank.

(Note: This is not applicable in the case of horizontally mounted contact breaker units).

THE COIL

The coil requires no attention whatever beyond keeping its exterior clean, particularly between the terminals, and occasionally checking that the terminal connections are tight.

Renewing the High Tension Cable

When the high tension cable shows signs of perishing or cracking it must be replaced by 7 m.m. rubber covered ignition cable. To connect the cable, 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 metal washer provided and bend back the strands. Finally screw the nut into its terminal.

WARNING LIGHT

The ignition warning lamp gives a red light when the engine is stationary and the ignition is switched on, in order to warn the rider to switch off. It will also light up when the engine is idling. After long service the bulb may burn out. However, this will not affect the ignition, but it should be replaced as soon as possible, so as to act as a safeguard to the battery.

When the lamp is mounted in an instrument panel it is sometimes necessary to remove the panel front, when the bulb may be unscrewed from its holder. With other types the bulb can be removed when the glass front is unscrewed.

If the warning light is combined with the ammeter in the headlamp, remove the lamp front and reflector to render the bulb accessible.

The bulb used is a Lucas No. 970 (2.5 volts 0.2 amp.).

ELECTRIC HORN

These horns, before being passed out of the Works, are adjusted to give their best performance, and will give a long period of service without any attention ; no subsequent adjustment is required.

If the horn becomes uncertain in its action, giving only a choking sound, or does not vibrate, it does not follow that the horn has broken down. First ascertain that the trouble is not due to some outside source, e.g., a discharged battery, a loose connection, or short circuit in the wiring of the horn. In particular, ascertain that the horn push bracket is in good electrical contact with the handlebars.

It is also possible that the performance of a horn may be upset by its mounting becoming loose.

If the cause of the trouble cannot be found, do not attempt to dismantle the horn, but return it to a Lucas Service Depot for examination.

WIRING OF EQUIPMENT

On the majority of motor cycles the negative terminal of the battery is earthed. A few motor cycles, however, have the positive terminal earthed.

Before making any alterations to the wiring or removing the switch from the headlamp or instrument panel, disconnect the positive cable (for negative earth equipment) or the negative cable (for positive earth equipment) from the battery to avoid the danger of short circuits. This cable (about 1ft. long) is connected to the cable from the switch by means of a brass connector. The connector is insulated by a rubber shield which must be pushed back to enable the connector to be unscrewed. Care must be taken that it does not touch any metal part of the frame as this will short circuit the battery. When connecting up again, do not forget to pull the rubber shield over the connector.

All cables to type DU and MU headlamps are taken direct to the switch, which, together with the ammeter is incorporated in a small panel. The panel can be withdrawn when the three securing screws are removed.

The ends of all the cables are identified by means of coloured sleeves. The colour scheme and the diagram of connections are given on the wiring diagram. When making a connection to the switch, proceed as follows :—Bare about $\frac{3}{8}$ in. of the cable, twist the wire strands together and turn back about $\frac{1}{4}$ in. so as to form a small ball. Remove the grub screw from the appropriate terminal and insert the wire so that the ball fits in the terminal post. Now replace and tighten the grub screw ; this will compress the ball to make a good electrical connection.

To make a connection to the dynamo or regulator terminals, slacken the fixing screw on the terminal block and remove the clamping plate. Withdraw the metal sleeves from each terminal. Pass about 1 in. of cable through the holes in the clamping plate and bare the ends for $\frac{3}{8}$ in. Fit the metal sleeves over the cables, bend back the wire over the sleeves and push them well home into their terminals. Finally screw down the clamping plate.

The cables connected to the "D" and "F" terminals of the dynamo and regulator units must not be reversed. To prevent this occurring, the screw in the dynamo terminal block is off-centre and the screws which secure the regulator terminal clamping plate are of different size.

HOW TO LOCATE AND REMEDY TROUBLE WITH COMPENSATED VOLTAGE CONTROL DYNAMO EQUIPMENT

SYMPTOMS	PROBABLE FAULT	REMEDY
Battery in low state of charge.	Dynamo not charging, indicated by ammeter failing to show charge reading when running with no lights in use, due to : Broken or loose connection in dynamo circuit, or regulator not functioning correctly.	Examine charging and field circuit wiring. Tighten loose connection or replace broken lead. Particularly examine battery connections. If trouble persists, have equipment examined by a Lucas Service Depot or Agent.
	Commutator greasy or dirty.	Clean with soft rag moistened in petrol.
	Dynamo giving low or intermittent output, indicated by ammeter showing low or intermittent charge reading, when running steadily in top gear, due to : Loose or broken connections in dynamo circuit.	Examine dynamo wiring. Tighten loose connections or replace broken lead. Particularly examine battery connections.
Battery over-charged, shown by burnt-out bulbs and frequent need for topping-up.	Commutator or brushes greasy.	Clean with soft rag moistened with petrol.
	Brushes worn or not fitted correctly.	Replace worn brushes. See that brushes "bed" correctly.
	Regulator not functioning correctly.	Have equipment examined by a Lucas Service Depot or Agent.
	Dynamo giving high output, indicated by ammeter giving high charge reading when lights are in use, due to : Regulator not functioning correctly.	Have equipment examined by a Lucas Service Depot or Agent.

If, after following the above table, the trouble cannot be rectified, have the dynamo, regulator and battery examined by a Lucas Service Depot or Agent.

HOW TO LOCATE AND REMEDY LIGHTING TROUBLE

SYMPTOMS	PROBABLE FAULT	REMEDY
Lamps give dim, flickering, or no light when the engine is not running.	Bulb filament broken.	Replace with new bulb.
	Bulb discoloured with use.	Replace with new bulb.
	Bulb out of focus.	Focus the bulb until the best illumination is obtained.
	Dirty reflector or bulb.	Clean dirty reflector with chamois leather or a soft cloth
	Severed or worn cable, or loose connections at head-lamp switch, dipper switch, dynamo or battery.	Tighten loose connections and replace faulty cables.
	Faulty earthing of headlamp or reflector.	Tighten loose connections, and replace faulty cable or make sure earthing clip is in good contact with reflector.
	Faulty earthing of battery. The cable from the earthed battery terminal must be securely connected to a metal part of the machine.	Tighten loose connections and replace faulty cables.
	Battery exhausted. Take hydrometer readings when acid level is correct and when electrolyte is thoroughly mixed. When half discharged, readings are about 1.210. When fully discharged readings are about 1.150.	Machine should be taken on the road for a long daytime run, or battery charged from independent electrical supply.

HOW TO LOCATE AND REMEDY TROUBLE IN MAGNETO IGNITION EQUIPMENT

SYMPTOMS	PROBABLE FAULT	REMEDY
Engine will not fire or fires erratically.	Remove plug and allow to rest on cylinder head. If a spark occurs at plug points when engine is slowly turned over, the ignition equipment is in order.	Look for engine defects and check ignition timing.
	If no spark occurs at plug points remove lead and plug, replace with new length of cable and test independently of plug by holding cable end about $\frac{1}{4}$ in. from metal part of engine. If magneto sparks, H.T. lead or plug is faulty.	Replace H.T. cable if perished or cracked. Clean plug electrodes, adjust gap to about 20 thousandths of an inch.
	If magneto does not spark, possible causes of trouble are :— Contact breaker gap out of adjustment or contacts dirty.	Clean dirty or pitted contacts with fine carborundum stone or fine emery cloth and afterwards with a cloth moistened with petrol. To adjust gap, turn engine slowly until the contacts are seen to be fully opened, then slacken locking nut and rotate fixed contact screw by its hexagon head until the gap is set to thickness of gauge. After the adjustment, tighten locking nut.
	Contact breaker rocker arm sticking (Ring Cam Type).	Remove contact breaker and prise rocker arm off its bearing. Clean steel pin if necessary with fine emery cloth and then, having removed all dirt, lightly smear with Mobil-grease No. 2 or clean engine oil before replacing the lever.
	Pick-up brush worn or broken.	Fit new brush. Before fitting, clean slip ring track.

HOW TO LOCATE AND REMEDY TROUBLE IN COIL IGNITION EQUIPMENT

SYMPTOMS	PROBABLE FAULT	REMEDY
Engine will not fire.	Battery discharged. Indicated if lamps do not light.	Recharge the battery from an independent electrical supply. In case of emergency, a start can be obtained with 2 flash lamp batteries connected in series (the short terminal strip of the one battery connected to the long strip of the second). Connect the positive battery terminal (usually the short strip) to the coil terminal marked "SW" and the other battery terminal to the frame. As soon as the dynamo begins to charge, the flash lamp battery can be removed.
	Controls not set correctly for starting.	See that ignition is switched on, petrol turned on and everything is in order for starting.
	Contact breaker cover not fitting correctly, preventing circuit from being complete. (When condenser is mounted in moulded cover).	The hinged spring blade on the contact breaker should press firmly against condenser body, and brass ring on contact breaker cover should make good contact with the contact breaker housing.
	Remove lead from plug terminal and hold it about $\frac{1}{4}$ in. away from some metal part of the engine while engine is turning over. If sparks jump gap regularly, the coil and contact breaker 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.

(Continued on next page.)

COIL IGNITION EQUIPMENT (Contd.)

SYMPTOMS	PROBABLE FAULT	REMEDY
Engine Misfires.	Fault in low tension wiring. Indicated if no ammeter reading is shown when engine is slowly turned and ignition switch is on.	Examine all cables in ignition circuit, and see that all connections are tight. See that battery connections are secure.
	Dirty or pitted contacts.	Clean with fine carborundum stone and afterwards with a cloth moistened with petrol.
	Contact breaker out of adjustment. Turn engine until contacts are fully opened and test gap with gauge of 10-12 thousandths of an inch thickness.	Adjust gap to gauge.
	Contact breaker cover not fitting correctly, preventing circuit from being complete. (When condenser is mounted in moulded cover).	The hinged spring blade on the contact breaker should press firmly against condenser body, and brass ring round contact breaker cover should make good contact with the contact breaker housing.
	Dirty or pitted contacts.	Clean with fine carborundum stone and afterwards with a cloth moistened with petrol.
	Contact breaker out of adjustment. Turn engine until contacts are fully opened and test gap with gauge.	Adjust gap to gauge.
	Remove sparking plug, rest it on top of the cylinder and observe whether a spark occurs at the points when the engine is turned. Irregular sparking may be due to a dirty plug, or defective high tension cable. If sparking is regular, the trouble is probably due to engine defects.	Clean plug and adjust the gap to about 20 thousandths of an inch. Replace high tension lead if the insulation shows signs of deterioration or cracking. Examine carburetter, petrol supply, etc.

Supplementary Information on Headlamps Model SSU700P

These headlamps are fitted with a Lucas Light Unit, which consists of a combined reflector and front lens assembly. In some cases, a special "prefocus" bulb is used which ensures that the filament of the bulb is correctly positioned in relation to the reflector and no focusing is necessary. In other cases the small bayonet cap type bulb is used and focusing must be carried out as described on Page 6.

The pilot bulb on both types is mounted at the rear of the Light Unit, and provides illumination through a transparent window in the reflector.

Removing Lamp Front and Light Unit

Slacken the securing screw at the top of the lamp. It will then be possible to detach the front rim complete with Light Unit assembly. To replace, locate the metal tongue in the slot at the bottom of the lamp body, press the front on and secure in position by tightening the securing screw.

Replacement of Bulbs

Use only the same type of bulbs as those originally fitted.

Pilot Bulb

This is accessible at the rear of the reflector.

Main Bulb ("Prefocus" Type)

Twist the back shell in an anti-clockwise direction and pull it off. The bulb can now be removed from the rear of the reflector. Place the correct replacement bulb in the holder in either of the alternative positions, engage the projections on the inside of the back shell with the slots in the bulb holder, press on and secure by twisting to the right.

Main Bulb (Small Bayonet Cap)

The bulb holder is held in the rear of the reflector, being located by two spring-loaded pegs. Remove the bulb holder and replace the bulb in the correct position (see that the word "Top" on the bulb cap is uppermost.) Finally, refit the bulb holder.

