RUNNING INSTRUCTIONS
FOR THE
LUCAS "MAGDYNO"
LIGHTING AND IGNITION SET
FOR MOTOR-CYCLES

JAMES

LUCAS

BRITISH MADE

DESIGNED AND MANUFACTURED BY
JOSEPH LUCAS LIMITED, BIRMINGHAM, ENGLAND.

Instruction Booklet No. 171A.

RUNNING INSTRUCTIONS
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JOSEPH LUCAS LIMITED,

HEAD OFFICES AND WORKS:
BIRMINGHAM, ENGLAND.

TELEGRAMS & CABLES: "LUCAS, BIRMINGHAM." TELEPHONE: NORTHERN 5201 (12 LINES)
CODES USED—A.B.C (5TH & 6TH EDITIONS), BENTLEYS & 2ND BENTLEYS.

PF/12/L

Running Instructions for Lucas "Magdyno" Equipment.

The "Magdyno" as the name suggests consists of two units: the magneto for ignition and the dynamo for charging the battery.

The dynamo unit is detachable, so that owners who wish to use their machines for racing and competitions can easily strip off all their lighting equipment. A suitable fitment can be supplied which protects the gears when it is desired to run the machine without the dynamo unit.

Some "Magdyno" equipments include the type H52 headlamp which incorporates the control switch and ammeter, while others include the MC140, MP40 or S51 headlamp together with an instrument panel which houses the switches and ammeter along with the speedometer, oil gauge and other instruments.

DYNAMO.

The dynamo is mounted above the ignition unit, being driven from the magneto spindle by gears.

The dynamo is fitted with two main brushes, the positive is insulated and the negative earthed. A third brush is provided on the underside of the commutator bracket which controls the output at high speeds, keeping it within safe limits.

CUT-OUT.

The cut-out which is mounted on the dynamo end bracket, is an automatic switch which prevents discharge of the battery when the dynamo is stationary. Its contacts close when the

MOST IMPORTANT POINTS

TO ENSURE THE BEST SERVICE

FROM LUCAS "MAGDYNO" EQUIPMENT.

BATTERY. Inspect the battery regularly and keep acid level ¼in. above the top of the plates, by adding distilled water. UNLESS YOU DO THIS YOUR BATTERY WILL QUICKLY DETERIORATE.

WIRING. Keep all connections and terminals tight. See that the cables are clear of moving parts.

DYNAMO. Keep brushes and commutator clean.

MAGNETO. Keep contact breaker clean. If necessary polish the contacts with fine emery cloth and afterwards wipe with cloth moistened with petrol.

Occasionally check contact breaker opening (using gauge on ignition spanner).

Replace high-tension cable if it becomes worn or perished.

HEADLAMP. Focus headlamp after fitting new bulb.

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TO PRINCIPAL SECTIONS.

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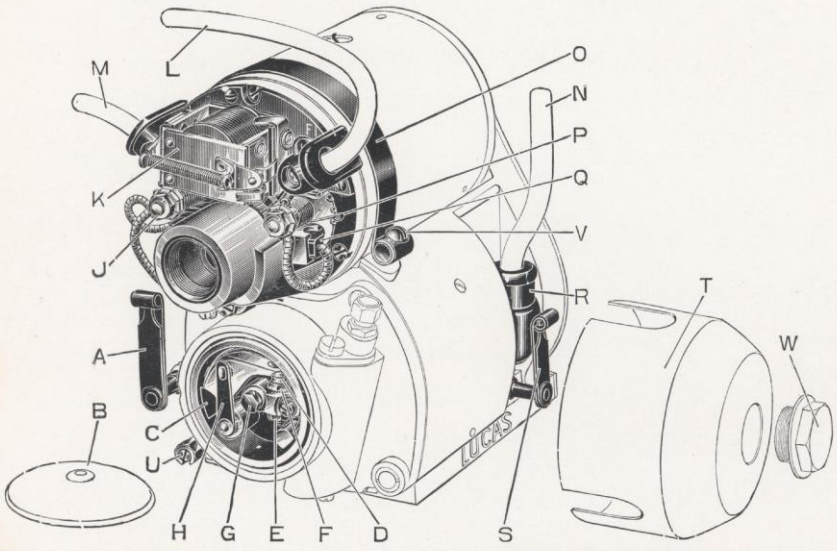


A—Securing spring for contact breaker cover.
B—Contact breaker cover.
C—Fibre heel.
D—Contact points.
E—Locking nut.
F—Adjustable contact point.
G—Contact breaker fixing screw.
H—Locating spring.
J—Nut securing brush eyelet.
K—Cut-out.
L—Cable to headlamp switch terminal marked FI.
M—Cable to headlamp switch terminal marked +.
N—Cable to sparking plug.
O—Dynamo securing strap.
P—Spring lever holding brush in position.
Q—Carbon brush.
R—Pick-up.
S—Securing spring for pick-up.
T—Cover.
U—Earthing terminal.
V—Screw securing dynamo strap.
W—Cover fixing screw.

Fig. 1. VIEW OF "MAGDYNO."

Illustration shows a machine arranged for driving in an anti-clockwise direction. With a clockwise machine the positions of the terminals marked + and FI are interchanged, and the control brush box is situated on the opposite side of the contact breaker housing.

dynamo voltage rises above that of the battery as the engine is speeded up, and open when the speed drops and the voltage falls below that of the battery. It does not prevent over-charging.

The cut-out is accurately set before leaving the Works and should not be tampered with or adjusted.

HEADLAMP.

The headlamp is fitted with a double-filament bulb. One filament is arranged to be approximately at the focus of the reflector and gives the normal driving light, while the second one, mounted slightly above the other, gives a dipped, anti-dazzling beam for use when meeting traffic or driving in fog or mist. This anti-dazzle device is controlled by a switch mounted on the handle-bar or in the instrument panel. A small pilot bulb is also provided for use when the machine is stationary or for town riding.

LIGHTING AND CHARGING SWITCHING ARRANGEMENT.

The control switch which is mounted either at the back of the headlamp or in the instrument panel has the following positions :—

"Off"—Lamps off, and dynamo not charging.

"C"—Lamps off and dynamo giving about half its normal output.

"H"—Headlamp (main bulb), tail lamp and side-car lamp (when fitted) on; dynamo giving maximum output.

"L"—With the exception that the pilot bulb is in the place of the main bulb the conditions are exactly the same as in position "H."

The method of controlling the dynamo output is obtained by inserting a resistance in the dynamo field circuit which is automatically cut out whenever the lamps are switched on. This control arrangement has the merit of simplicity and entire absence of moving parts.

AMMETER.

This instrument gives a reading of the amount of current flowing into, or from the battery. It gives an indication that the equipment is working satisfactorily.

MAINTENANCE OF BATTERY, DYNAMO AND LAMPS.

The equipment should receive regular inspection, and where necessary, should be cleaned and adjusted in accordance with the instructions given in the following pages.

BATTERY (LEAD ACID TYPES).

Topping Up.

At least once a month, the vent plugs in the top of the battery should be removed, and the level of the acid solution examined. If necessary, distilled water, which can be obtained at all chemists and most garages, should be added to bring the level above the top of the plates, but well short of the bottom of the vent plugs. If, however, acid solution has been spilled, it should be replaced by a diluted sulphuric acid solution of the strength, 1.285. When examining the cells do not hold naked lights near vents, as there is a danger of igniting the gas coming from the plates.

Storage.

If the equipment is laid by for several months, the battery must be given a small charge from a separate source of electrical energy about once a fortnight, in order to obviate any

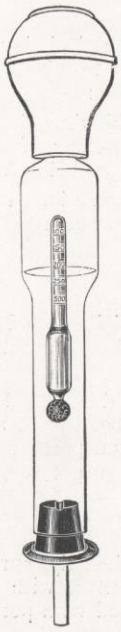


Fig. 2. LUCAS HYDROMETER.

permanent sulphation of the plates. In no circumstances must the electrolyte be removed from the battery and the plates allowed to dry, as certain changes take place which result in loss of capacity.

Testing the condition of the Battery.

It is advisable to complete the inspection by measuring the specific gravity of the acid, as this gives a very good indication of the state of charge of the battery.

An instrument known as a "hydrometer" is employed for this purpose. These can be bought at any of our Service Depots.

The specific gravity figures are:—

1.285—1.300 when fully charged, about 1.210 when half discharged, and about 1.150 when fully discharged. These figures are given assuming the temperature of the solution is about 60°F. For fuller particulars regarding temperature corrections, see our "First Charge" instructions, a copy of which can be obtained on application.

Take readings of the acid in each cell. The readings should be approximately the same. If one cell gives a reading very different from the rest it may be that the acid has been spilled or has leaked from this particular cell, or there may be a short between the plates. In this case we advise the owner to have his battery examined by a Service Depot to trace the cause and prevent the trouble from developing.

Use of the Charging Switch.

The conditions under which motor-cycles are used vary very considerably, and obviously the amount of charging a battery will require is directly dependent on the extent to which the lamps are used. However, the following suggestions will serve as a rough guide:—

The switch should be left in the "C" position for about 1 hour daily. This time should only be increased if the period of night running is considerable, or when the battery is found to be in a low state of charge (if the specific gravity of the acid solution is 1.210 or below).

The battery must never be left in a fully discharged condition, and unless some long runs are to be taken, it is advisable to have the battery removed from the machine and charged up from an independent electrical supply.

DYNAMO.

Before removing the dynamo cover for any reason, **disconnect the positive lead of the battery** to avoid the danger of reversing the polarity of the dynamo, or short circuiting the battery, either of which might cause serious damage.

The lead from the positive battery terminal (about 1ft. long) is connected to the lead from the switch by means of a brass connector. To disconnect, remove the rubber shield and unscrew the cable connector; 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.

Brushes.

Examine the dynamo brushes, they can be removed from their holders when the spring lever is held aside. They should slide freely in their holders, and make good contact with the commutator. If the brushes are dirty or greasy, clean them with a cloth moistened with petrol.

When replacing the brushes care must be taken that they are replaced in their original position.

After long service, when the brushes have become worn so that they will not bear properly on the commutator, they should be replaced. It is recommended that none but genuine Lucas brushes are fitted as these are specially made and will give the best results and the longest life. We advise owners to have the brushes fitted at a Lucas Service Depot so that they can be properly "bedded" to the commutator.

Commutator.

Keep the commutator clean and free from oil. The best way to clean the commutator is, without disconnecting any leads, to remove from its holder one of the main brushes, and inserting a fine duster hold it, by means of a suitably shaped piece of wood, against the commutator surface, at the same time turning the engine so as to rotate the armature.

Lubrication.

As all the bearings and the gear wheels are packed with grease before leaving the Works, lubricators are not provided. After the motor-cycle has run several thousands of miles, the "Magdyno" should be dismantled for cleaning, adjustment and repacking the bearings and gear wheels with grease. This is carried out, preferably at the nearest Lucas Service Depot.

"LUCAS NI-FE" STEEL PLATE BATTERY TYPE C105.

Special attention should be given to the following instructions relating to nickel-iron alkaline type batteries, as the attention required for their maintenance differs from that needed for the more familiar lead acid type.

The Important Points are:—

1. Maintain the electrolyte above the plates by adding distilled water.
2. Every precaution must be taken that **no trace of acid gets into the battery.**
3. Occasionally take hydrometer readings. If the reading has fallen below 1.17, fresh electrolyte must be added.
4. The electrolyte must be completely changed about every 12 months.

MAINTENANCE.

Topping up the Battery. At least once a month, the vent plugs should be removed, and, if necessary, distilled water should be added to bring the level ½-inch above the tops of the plates. Do not overfill as this will cause slopping when the machine is running over rough roads. Care should be taken when "topping-up" cells, taking specific gravity readings, etc., that no liquid is spilled on the tops of the cells. When examining cells, naked lights must not be held near the vents; the gases evolved from a NI-FE cell are just as inflammable as those evolved from a lead cell.

The slightest trace of acid will ruin the NI-FE cell. The greatest care must be taken that funnels and containers which have been used for acid are not used. Further, the owner must see that he uses only pure distilled water. We stress this point, because we have heard of garages keeping their "battery water" in acid carboys, causing it to be definitely acidic.

Use of the Charging Switch. On long daylight runs, the switch should be left in the "C" position for not more than one hour, and then switched to the "OFF" position. This time should only be increased if the period of night running is considerable, as it must be remembered that the dynamo automatically gives its full output whenever the lights are switched on.

It is important that these instructions are carried out, as overcharging, although it will not damage the battery, may cause a temporary high voltage which will appreciably shorten the life of the small bulbs.

If the battery inadvertently becomes overcharged (indicated by exceptionally bright pilot bulb), this may be remedied by running for a few minutes with the switch in the "H" position.

It should be noted that excessive voltage is only likely to occur immediately after a considerable period of daytime running with the switch in the "C" position.

Taking Hydrometer Readings. The density of the electrolyte in a NI-FE cell does not vary with the state of charge or discharge, and therefore the hydrometer does not give readings by which the state of charge of the cell is known, as is the case with the lead battery. The density of the electrolyte should be 1.19 under normal working conditions. In regular use, the solution will become gradually diluted until when the reading is 1.17 the battery will begin to lose its efficiency and become sluggish. Consequently, the electrolyte must be completely renewed when this condition is reached, which, with a battery in regular service, is about every 12 months.

If the density of the electrolyte is found to be less than 1.17 after only a short period of service, it is probable that this is due to spillage, and in this case some of the diluted electrolyte must be renewed and fresh solution added to bring the density between the limits 1.17-1.21.

Finally, keep the tops of the cells clean and see that the terminals are kept tight and smeared with vaseline to prevent corrosion. Care should be taken not to allow any grease to come into contact with the electrolyte, as this causes frothing.

Renewal of Electrolyte. In normal use it will be necessary to renew the electrolyte about once in 12-18 months.

Renewal solution ready for immediate use can be obtained from any of our Service Depots or Agents in the United Kingdom. Abroad, however, the electrolyte is supplied in solid form, and must be dissolved in water, in strict accordance with the instructions given on page 10.

When refilling, the battery must first be completely discharged, the cells shaken in order to loosen dirt, and the solution poured out. Rinse out with clean water until the cells are thoroughly cleansed of sediment, and then invert the cells for half an hour, so as to drain away the water completely. Do not leave the cells standing with the plates exposed to the atmosphere unless they have been thoroughly washed out with clean water, and even then not for more than half an hour. Fill up with the new solution, and give the battery a charge of 2.5 amperes for a period of 12 hours, when it will be fully charged and ready for use.

STORAGE.

The battery may be stored indefinitely, provided that care is taken to keep the electrolyte above the tops of the plates. Before storing, the battery should be fully charged and then half discharged. When required for service after a long period of idleness, it should be given a "First Charge," as described below.

FIRST FILLING AND CHARGING OF NEW BATTERIES.

Batteries are sometimes supplied in a dry, uncharged condition. Electrolyte is supplied in a separate container, and in the case of batteries supplied in the United Kingdom is ready for immediate use. The electrolyte supplied with export batteries is in a solid form and must be dissolved in water in accordance with the instructions given below.

The cells should be filled with electrolyte to a height of ½-inch above the tops of the plates. On pouring the solution into the cells, the specific gravity will gradually fall to the correct working figure of 1.19. After filling, give the battery a charge of 2.5 amperes for a period of 12 hours. It will then be fully charged and ready for immediate use. Subsequent charging should be at the rate of 2.5 amps. for 6 hours.

Preparing the Electrolyte (when supplied in solid form for Export Batteries). This material, and the solution to be made from it, are both **highly corrosive,** and must not come in contact with the clothes or fingers. Iron or porcelain vessels must be used for mixing and filling; on no account use galvanised vessels or vessels with soldered joints. Vessels which have been used for acid at any time should not be used. After making sure that the mixing receptacle is perfectly clean, dissolve the material in the proportion of 1 lb of solid to 2 lb. of distilled water.

For stirring during the mixing process, use a clean, unpainted wooden stick.

During the process of mixing, heat is given out, and the liquid must be allowed to cool before its specific gravity is taken. The final specific gravity of the solution before pouring into the cells must be 1.21. If the solution as obtained above is too strong, further small quantities of distilled water must be added until the correct figure is obtained. Stir the solution thoroughly before testing its strength.

Remove any floating scum by means of a bent strip of clean sheet iron or steel before filling the cells.

LAMPS.

REPLACEMENT OF BULBS AND FOCUSSING.

Headlamp Types H52 and S51.

To remove the lamp front, press the front rim evenly and then rotate to the left (looking at the front of the lamp).

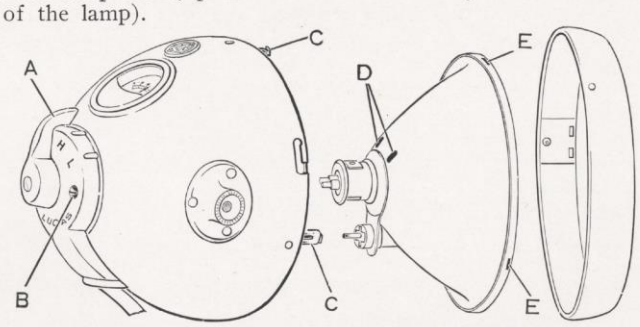


Fig. 3. HEADLAMP TYPE H52 DISMANTLED.

A—Switch.
B—Fixing Screw.
C—Reflector supports.
D—Apertures through which light passes to illuminate ammeter.
E—Slots in reflector rim.

When removing the main bulb for replacement, screw it out two or three turns in an anti-clockwise direction. This will enable the bulb to be withdrawn easily. Care should be taken that the bulb is fitted the correct way round, *i.e.*, with the dipped beam filament above the centre filament.

To enable the lamp to be focussed, the bulb holder is arranged so that it can be adjusted. By turning the bulb in a clockwise direction it is moved inwards, and by turning it in an anti-clockwise direction, it is moved outwards. The best position can be readily found by trial. The normal driving light should, of course, be switched on while focussing is being carried out.

In adjusting the bulb, it is important that it is given a complete turn at a time so that the filaments are in the correct position; a spring stop is incorporated in the bulb holder which indicates every time the bulb has been given a complete turn by a click action.

Headlamp Type MC140.

To remove the lamp front, slacken the fixing screw and lift the front from the body.

To focus the lamp, withdraw the reflector from its three supports and slacken the clamping clip on the bulb holder at the back of the reflector. This will enable the bulb holder to be moved backwards and forwards to obtain the best results. Lock the adjustment by tightening the clamping clip.

Headlamp Type MP40.

The lamp front and reflector can be withdrawn for a bulb replacement when the fixing screw is slackened.

To remove the bulb holder, press down the ends of the securing springs and withdraw them from the slots in which they locate.

To focus the head lamp, remove the lamp front and reflector and slacken the clamping screw which secures the bulb holder. Move the bulb and holder until the best results are obtained, and finally tighten the clamping screw.

Side-car Lamp Type R370.

The front together with the reflector can be removed by slackening the fixing screw. The bulb holder can be withdrawn from the back of the reflector for bulb replacement. The bulb holder is provided with alternative locations for the bulb. Each position should be tried for the best result.

Tail Lamp Type MT110.

The rear portion of this lamp is removed for a bulb replacement by giving it half a turn to the left when it becomes detached from its fixing.

Stop Tail Lamp Type ST20.

To remove the front of this lamp for a bulb replacement, move aside the spring catch which secures it, at the one end of the lamp. When refitting the front, first locate the slot with the tongue on the body, then secure it by means of the spring catch.

REPLACEMENT BULBS.

When the replacement of any bulb is necessary, we strongly recommend that Lucas Official bulbs are used. The filaments are arranged to be in focus and give the best results with our reflectors. Particulars of replacement bulbs are as follows :—

FOR.	No.	WATTS.	REMARKS.
Headlamp (driving and dipped beam lights).	624 DVMC	24 & 24	Special double filament gas filled bulb.
Headlamp (pilot light), Sidecar, Tail and Stop Lamps.	B.A.S.8.S	3	Centre contact bulb.
Panel Lamps.	B.A.S.8.S or 353MES	3 1.05	„ „ „ Screw cap type.

CLEANING.

The lamp reflectors are protected by a transparent and colourless covering, which enables any accidental finger marks to be removed with a soft cloth or chamois leather, without affecting the surface of the reflector. On no account should any metal polishes be used on Lucas reflectors. Ebony black finishes can be polished with a good furniture or car polish. Chromium plated finishes only need wiping over with a damp cloth to remove dust or dirt.

WIRING OF THE EQUIPMENT.

Before making any alteration to the wiring, or removing the switch from the back of the headlamp, disconnect the positive lead at the battery to avoid the possibility of short circuits.

The cables are bound together to form a cable assembly or harness. This method of wiring allows the cables to be removed as a complete assembly when taking the electrical equipment off the machine at any time.

All cables to the type H52 headlamp are taken directly into the switch which can be easily withdrawn from the lamp body when the two fixing screws " B " (Fig. 3) are removed.

The ends of all the cables are identified by means of coloured sleevings. The colour scheme and the diagram of connections are given at the end of the booklet. 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 $\frac{1}{8}$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.

MAINTENANCE OF THE MAGNETO.

The magneto portion of the Magdyno requires very little attention to ensure it gives its best service.

Cleaning.

Occasionally examine the contact breaker, the contacts " D " (Fig. 1) must be kept clean and free from any traces of oil. If the contacts are burned or blackened they may be cleaned as follows :—Withdraw the contact breaker from its housing by unscrewing the hexagon headed screw " G " by means of the magneto spanner. The whole contact breaker can

then be pulled off the tapered shaft on which it fits. Now push aside the locating spring " H " and prise the rocker arm off its bearings, when it will be possible to begin cleaning the contacts. Polish them with very fine emery cloth, and afterwards wipe with a cloth moistened with petrol. Care must be taken that all particles of dirt and metal dust are wiped away.

Before replacing the contact breaker, feel if the cam is dry. If necessary, it should be given the slightest smear of vaseline to prevent wear of the fibre heel of the rocker arm.

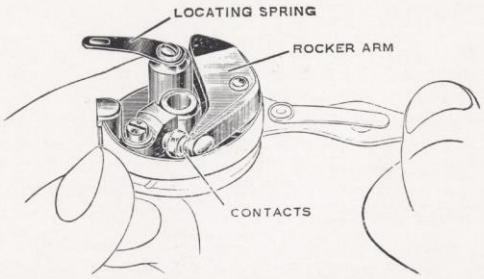


Fig. 4. VIEW OF CONTACT BREAKER SHOWING METHOD OF REMOVING ROCKER ARM FOR CLEANING CONTACTS.

When replacing the contact breaker, care should be taken to ensure that the projecting key on the tapered portion of the contact breaker base engages with the key-way cut in the armature spindle, or the whole timing of the magneto will be upset. The hexagon-headed screw should be tightened up with care; it must not be too slack, nor must undue force be used.

Next remove the pick-up " R " (Fig. 1) (there are two in Magdynos for two cylinder engines). 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, carefully clean the slip ring track and flanges by holding a soft cloth on the ring by means of a suitably shaped piece of wood, while the engine is slowly turned round.

Adjustment of the Contact Breaker.

The contacts only need adjustment at long intervals, and unless the gap varies considerably from the gauge (12 thousandths), the owner is warned that it is not desirable to alter the setting. To adjust, turn the engine slowly by hand until the points are seen to be fully opened. Then slacken the locking nut " E " (Fig. 1), and rotate the contact screw by its hexagon head until the gap is set to the gauge on the magneto spanner. After the adjustment tighten the locking nut.

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; this should be about 20 thousandths of an inch.

USE OF IGNITION CONTROL.

The ignition control should be retarded for starting, but advanced as soon as the engine is running at speed. For normal running the ignition 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.

INSTRUCTIONS FOR TIMING.

For Twin and " V " Cylinder Engines.

1. Slacken the magneto coupling securing nuts on the armature spindle, or the magneto chain sprocket to enable the " Magdyno " to be turned independently of the engine.

2. The order of firing having been ascertained, rotate the engine till No. 1 Piston is at the top of its compression stroke (that is, on top dead centre). On " V " twin cylinder engines, the rear cylinder is usually No. 1.

3. Remove No. 1 pickup and turn the " Magdyno " spindle forward, *i.e.*, in the normal direction of rotation, until the brass segment of the slip-ring can be seen.

4. With the " Magdynos " provided with variable ignition, the ignition control or the timing lever should be moved to the fully retarded position, that is, to the limit of its travel in the forward direction.

5. Remove the contact breaker cover and turn the magneto spindle in its normal direction of rotation until the fibre heel " C " (Fig. 1) begins to rise on the inclined plane of the cam ring just sufficiently to separate the points " D." This position is the firing point, and the magneto drive should be permanently fixed in this position.

NOTE.—The above setting is standard for most types of engines; that is the magneto is fully retarded when the piston is on top dead centre. In all cases, however, the engine-maker's instructions should be consulted when retiming any magneto.

6. It is always advisable to check the timing after tightening up, to ensure that no movement has taken place.

For Single Cylinder Engines.

The timing may be proceeded with exactly as for two cylinder engines, except for the obvious fact that there is no firing order to be ascertained.

Engines with Fixed Ignition.

The magneto is usually timed to fire at an angle of from 15° to 20° before top dead centre, or about two inches measured on the flywheel rim. It is impossible to give more definite instructions, the engine-maker's recommendations should be followed.

FITTING OF HIGH TENSION CABLE.

Use 7 m.m. diameter cable. Cut the cable flush to the required length. Remove the pick-up and from it withdraw the carbon brush " A " (Fig. 5). Slacken the pointed screw " B," and push the cable " C " hard home. Secure by tightening the screw " B," which will pierce the insulation and make good contact with the cable core.

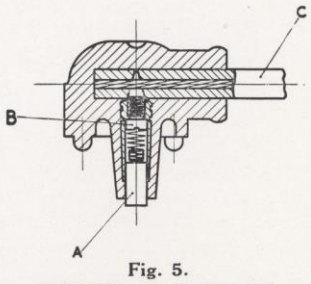


Fig. 5.
METHOD OF SECURING CABLE TO PICK-UP.

INSTRUCTIONS FOR FITTING BOWDEN CABLE TO THE SPRING CONTROL.

Remove the screw " A " (Fig. 6), then, without dismantling any part of the control, thread the Bowden cable through the cable stop " B." Pass it through the control until it emerges at the hole left by the screw " A." Now solder the brass nipple " C " to the end of the cable, and then pull it from the other end until it is felt that the nipple fits into the end of the main body of the plunger " D," when the screw " A " should be replaced.

By referring to Fig 6, it will be seen that on applying a tension to the Bowden cable, the plunger " D " will move the cam ring " E " and so alter the timing of the magneto.

Instructions cannot be given for fitting the cable to the ignition control lever, as the types of these vary with different makes of machines. It should be noted, however, that the cable stop " B " can be adjusted if necessary to take up any slight slackness of the cable covering between the magneto and the lever control.

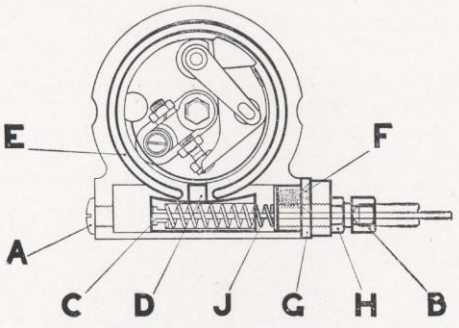


Fig. 6. SECTION OF SPRING CONTROL.

A—Screw. B—Cable stop.
C—Brass nipple. D—Plunger.
E—Cam ring. F—End plate fixing screw.
G—End plate. H—Lock nut.
J—Spring.

Should it become necessary at any time to dismantle the spring control and Bowden cable, proceed as follows :

First remove the metal cover of the contact breaker, which is held in position by a spring arm, and then withdraw the cam ring " E." Next, unscrew the fixing screw " F," which is sunk flush with the surface of the end plate " G." Then pull the Bowden cable and this will come out, together with cable stop " B " (which screws into the end plate), lock nut " H," end plate " G," and plunger " D."

These operations should, of course, be reversed when assembling.

HINTS FOR THE DETECTION AND REMEDY OF FAULTS.

Although every precaution is taken to eliminate all possible causes of trouble, failure may occasionally develop through lack of attention to the equipment or damage to the wiring. The most probable faults are tabulated, according to the symptoms which are displayed in the fault-finding tables at the end of the booklet.

We give a few hints on the best way to make use of these tables, as the sources of many troubles are by no means obvious.

Much evidence can be gained from observation of the ammeter. If, for instance, no reading is indicated, when the engine is running at, say 20 miles per hour with the switch in the " C " position, the dynamo is failing to charge. To ensure that the ammeter is not at fault, the engine should be stopped and the switch turned to the " H " position, when a reading on the discharge side of the scale should be observed. Again, if the needle fluctuates, when the engine is running steadily, an intermittent dynamo output can be suspected. The dynamo may have been neglected, and the trouble could be caused by, say, worn brushes or a dirty commutator.

All connections on the equipment should be examined as follows. First, disconnect the positive battery lead as a precaution against short circuits. Then see that all terminals on the switch are tight, move the switch through its four positions, and see that the spring triggers "D" (Fig. 7) make good contact with the terminals. It sometimes happens that one of the leads fouls the trigger or a portion of the insulation gets clipped between the terminal and the contact. Slight rearrangement of the wire or cutting back the insulation a fraction will remedy this.

See that the leads to the two moulded terminals on the Magdyno are tight, and also that the earthing lead from the head lamp is secured to the terminal at the side of the contact breaker housing.

Finally re-connect the battery positive terminal and see that the end of the cable from the negative terminal makes good contact with the frame.

A possible cause of the dynamo failing to charge is the reversal of its polarity due either to the headlamp being ineffectively earthed or to the accidental "shorting" of a terminal or "live" part of the cut-out, when the cover is removed, without the precaution being taken of disconnecting the positive battery lead.

Having examined all cable connections, the polarity of the machine can be corrected by running the engine slowly, putting the switch in the "C" position, and then pressing the cut-out contacts momentarily together, when the machine should begin to generate again.

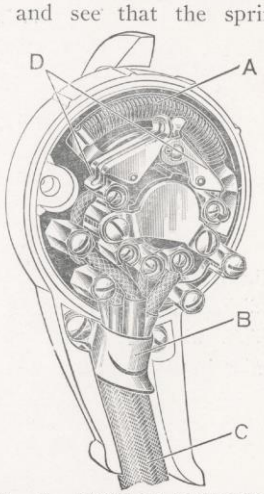


Fig. 7. SWITCH REMOVED FROM BACK OF HEADLAMP TYPE H52.
A—Resistance.
B—Clamping clip for cables.
C—Cable harness.
D—Spring triggers.

HOW TO LOCATE AND REMEDY TROUBLE

TABLE No. 1 (LIGHTING)

CONDITION.	POSSIBLE CAUSES AND METHODS OF DETECTION.	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 (see page 12).
	Dirty reflector or bulb.	Clean dirty reflector with chamois leather or a soft cloth.
	Severed or worn cable, or loose connections at headlamp switch, dynamo, or battery.	Tighten loose connections and replace faulty cables.
	Faulty earthing of headlamp. The earthing lead from the lamp or switch must be securely connected to the earthing terminal on "Magdyno."	Tighten loose connections and replace faulty cables.
	Faulty earthing of battery. The cable from the negative 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 (¼in. above plates) and after a run 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 with switch in "C" position, or battery charged from independent electrical supply.

HOW TO LOCATE AND REMEDY TROUBLE

TABLE No. 2 (LIGHTING)

CONDITION.	POSSIBLE CAUSES AND METHODS OF DETECTION.	REMEDY.
After carrying out examination on Table I, and lamps still give dim, flickering, or no light when the engine is running.	Dynamo not charging, or charging intermittently. Ammeter should give a reading on the charge side when the machine is running at say 20 m.p.h., with switch in "C" position. Possible causes of dynamo trouble are :—	
	Loose connections at headlamp switch, dynamo or battery.	Tighten loose connections.
	Faulty contacts in headlamp switch.	Examine spring triggers and see that they make good contact with terminals (see page 21).
	Worn or dirty brushes.	Clean dirty or greasy brushes with a cloth moistened with petrol. Badly worn brushes must be replaced.
	Dirty commutator.	To clean dirty commutator, remove one of the main brushes, from its holder and insert a fine duster, holding it pressed against the comutator surface by means of a suitably shaped piece of wood, at the same time slowly turning the engine. If commutator has been badly neglected, clean with very fine glass paper.
	Reversed polarity of dynamo.	To correct polarity of machine, run engine slowly, put switch in "C" position, and then press cut-out contacts momentarily together.

HOW TO LOCATE AND REMEDY TROUBLE

TABLE No. 3 (IGNITION)

CONDITION.	POSSIBLE CAUSES AND METHODS OF DETECTION.	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 O.K.	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 ¼in 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 and contacts dirty.	Clean dirty or pitted contacts with fine emery cloth and afterwards with a cloth moistened with petrol. To adjust gap, turn engine slowly until the points 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.	Remove contact breaker and prise rocker arm off its bearing. Clean steel pin if necessary with fine emery cloth and then, having removed all grit, moisten with a few drops of oil before replacing the lever.
	Pick-up brush worn or broken.	Fit new brush. Before fitting, clean slip ring track.

LUCAS SERVICE DEPOTS

In the event of any difficulty with any part of the equipment, no matter how trivial, we shall be only too pleased to give every assistance possible. The best course to adopt is to call at the nearest Lucas Service Depot (the addresses of which are given below), when the equipment can be examined as a whole. The depots are not only at your disposal for repairs, overhauls and adjustments, but to give free advice. If it is necessary, however, to communicate, or when ordering spare parts, always give the type and number of the unit in question, the make, and if possible, the date of the Motor-Cycle on which it is fitted.

BELFAST	**3/5, Calvin Street, Mount Pottinger**	Telephone: BELFAST 7017. Telegrams: "SERVDEP, BELFAST"
BIRMINGHAM	**Great Hampton Street**	Telephone: CENTRAL 8401 (10 lines) Telegrams: "LUCAS, BIRMINGHAM"
BRIGHTON	**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 Street North, North Circular Road**	Telephone: DRUMCONDRA 434 (6 lines) Telegrams: "LUSERV, DUBLIN"
EDINBURGH	**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	**450/456, Edge Lane**	Telephone: OLD SWAN 1408 (4 lines) Telegrams: "LUSERV, LIVERPOOL"
LONDON	**Dordrecht Road, Acton Vale, W.3**	Telephone: SHEPHERD'S BUSH 3160 (10 lines) Telegrams: "DYNOMAGNA, ACT, LONDON"
LONDON	**759, High Road, Leyton, E.10**	Telephone: LEYTONSTONE 3361 (4 lines) Telegrams: "LUSERDEP, WALT, LONDON"
LONDON	**155, Merton Road, Wandsworth, S.W.18**	Telephone: PUTNEY 5131 (6 lines) & 5501. Telegrams: "LUSERV, WANDS, LONDON"
MANCHESTER	**Talbot Road, Stretford**	Telephone: LONGFORD 1101 (5 lines) Telegrams: "LUCAS, STRETFORD"
NEWCASTLE-ON-TYNE	**64/66, St. Mary's Place**	Telephone: NEWCASTLE 25571 (3 lines) Telegrams: "MOTOLITE, NEWCASTLE-ON-TYNE"

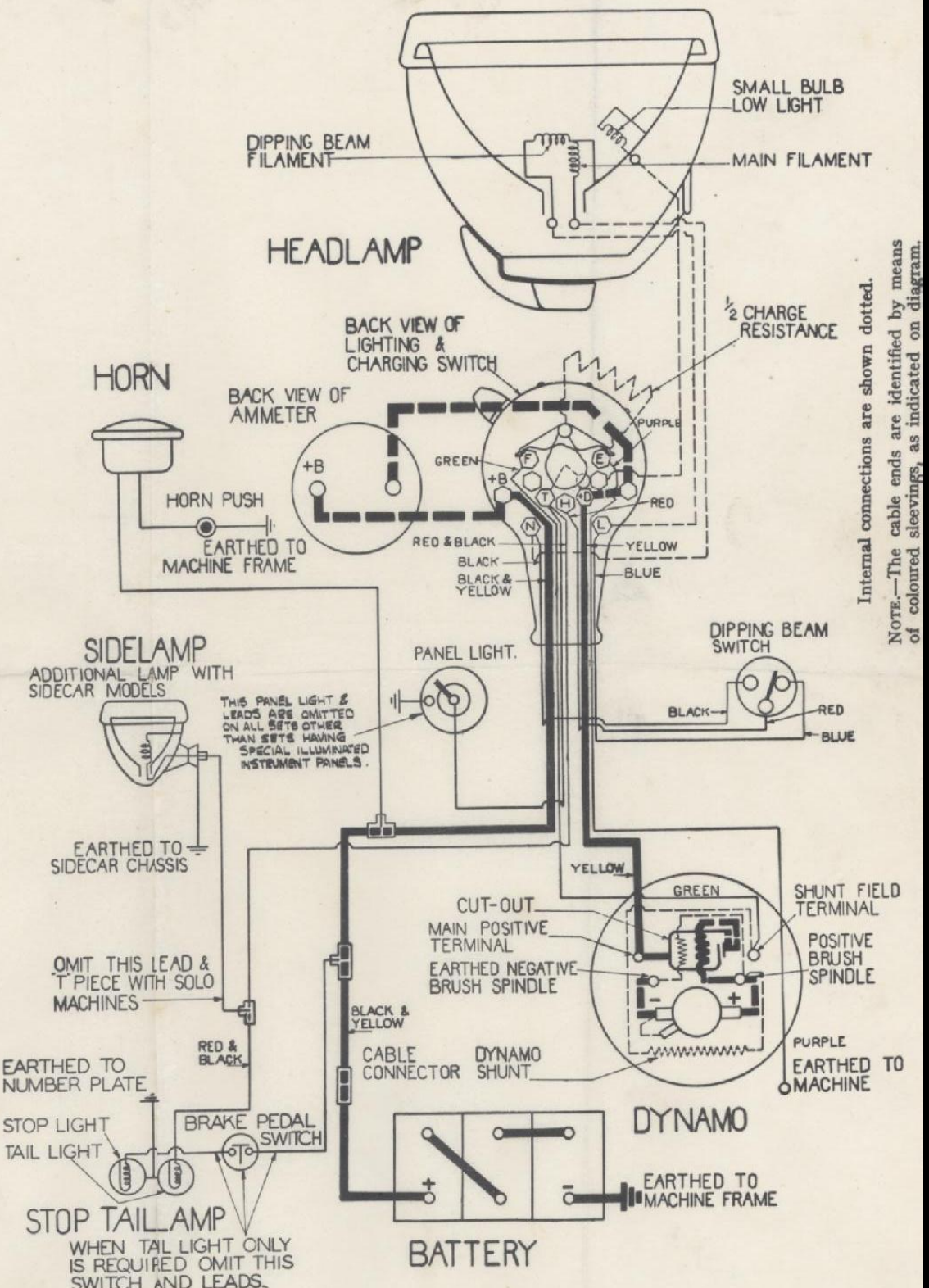
DR'G. No. MA255-3

WIRING DIAGRAM FOR LUCAS "MAGDYNO" LIGHTING EQUIPMENT AS FITTED TO MOTOR-CYCLES

SPECIFICATION

"MAGDYNO" TYPE MS.

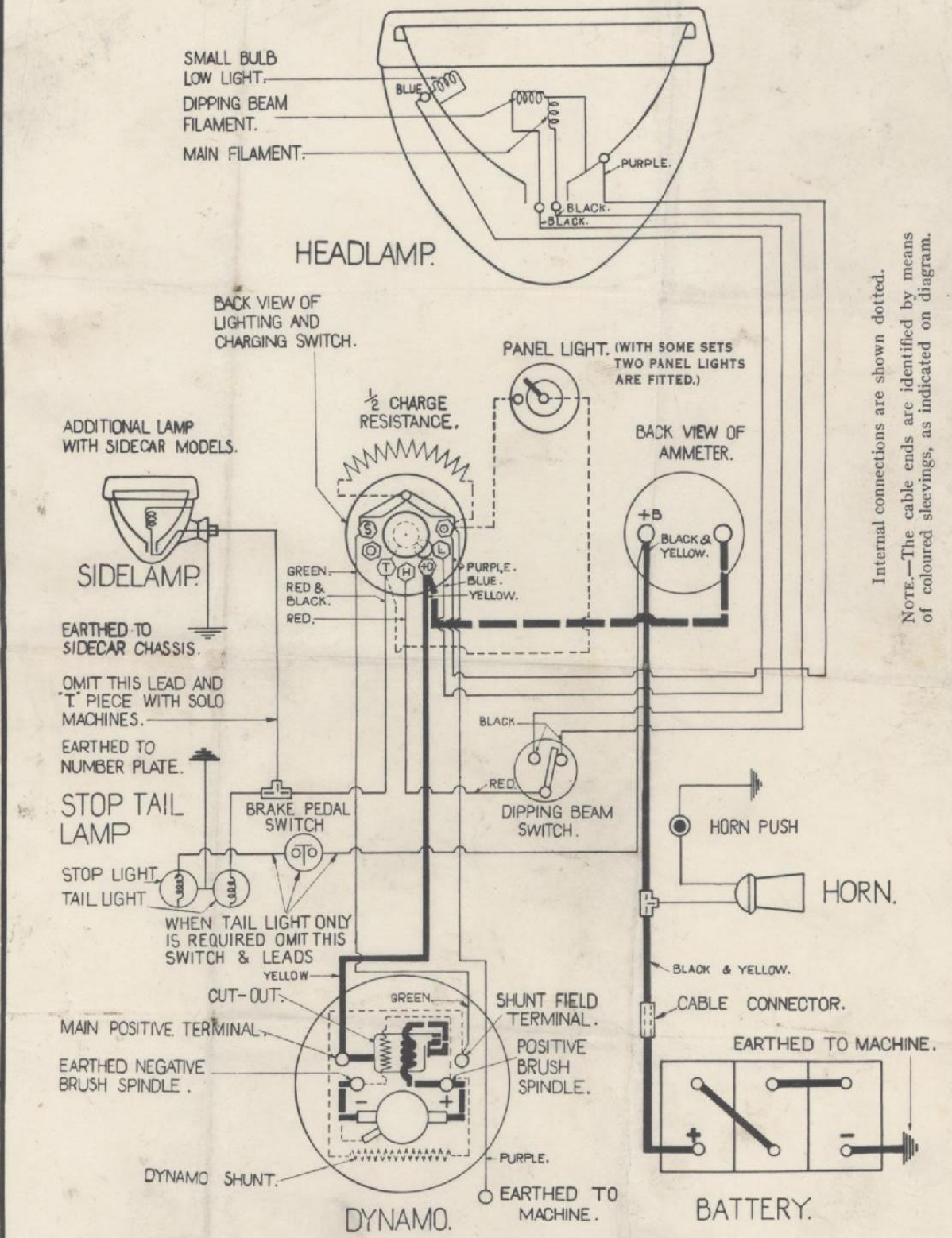
HEADLAMP TYPE H52.



DRG. No. MA259

WIRING DIAGRAM FOR
LUCAS "MAGDYNO" LIGHTING & IGNITION EQUIPMENT
(WITH INSTRUMENT PANEL)
AS FITTED TO MOTOR-CYCLES

"MAGDYNO" TYPE MS
INSTRUMENT PANEL
HEADLAMP TYPE MC140
OR MP40



Internal connections are shown dotted.

NOTE.—The cable ends are identified by means of coloured sleevings, as indicated on diagram.