

Maintenance and Running Instructions for the "MILLER"
Lighting and Coil Ignition Systems for Motor Cycles
1935



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Guarantee

ALL MILLER productions are fully tested in whole and in part before leaving our factory. No efforts or expense are spared to ensure their giving unfailing satisfaction to the owner.

Any defective part that may exist by reason of faulty material or workmanship, and that has not been caused by wear and tear, misuse or negligence, should be returned to the dealer or our factory, when it will either be repaired or replaced free of charge.

This guarantee is in lieu of any other guarantee, conditions, warranty or liability implied by statute or otherwise, which might exist but for this provision, and any damages for which we make ourselves responsible are limited to the cost of repair or replacement by us or to our order.

General description of "MILLER" Lighting and Ignition Systems.

DYNAMOS.

	<i>Type.</i>	<i>Output</i>	<i>Description.</i>
Dynamo and Cutout combined ..	D.M.3.G. ..	6v. 36 watt	Suitable for lighting also ignition, when contact breaker attached to engine.
Dynamo and Cutout combined ..	D.M.S. ..	6v. 24 watt	Suitable for lighting.
Dynamo and Cutout combined ..	D.9.S. ..	6v. 50 watt	Suitable for lighting also ignition, when contact breaker attached to engine.
Dynamo, Cutout and Ignition Timer or Contact Breaker combined ..	D.M.3.G.I. ..	6v. 36 watt	Timer on dynamo, variable control.
Dynamo, Cutout and Ignition Timer or Contact Breaker combined ..	D.M.S.I. ..	6v. 24 watt	Timer on dynamo, variable control.
Dynamo, Cutout and Ignition Timer or Contact Breaker combined ..	D.9.S.I. ..	6v. 50 watt	Timer on dynamo, variable control. Gear Driven (Raleigh and J.M.B.).
Dynamo, Cutout and Ignition Timer or Contact Breaker combined ..	D.I.F. ..	6v. 36 watt	Fixed contact breaker.
Dynamo, Cutout and Ignition Timer or Contact Breaker combined ..	D.M.I. ..	6v. 24 watt	Fixed contact breaker.
Dynamo and Magneto combined ..	Dyo. D.M.3.G.M. Mag. M.K.	6v. 36 watt.	
Dynamo and Magneto combined ..	Dyo. D.M.S.M. Mag. M.K.	6v. 24 watt.	

All the preceding dynamos are of the third brush shunt field regulating type. Both the positive and third brushes are insulated from the frame of the dynamo, and the negative brush is earthed owing to its being screwed direct to the dynamo bearing bracket. The regulating brush is situated close to the positive main brush, and as the regulating brush forms one terminal of the field circuit, the remaining terminal is connected to earth or frame by means of the shunt cable and switch when a charge is required.

Two cables only are used to connect the dynamo to the system B+ and S.H., the yoke of the dynamo is the negative terminal and must therefore make good metallic and electrical contact with the fixing clamps or frame of machine.

The cutout is housed under the dynamo cover; and it is fixed on the commutator end bracket. It consists of an electro magnet for attracting automatically an iron plate which carries a silver contact point. When charging is taking place this contact point is drawn up and held tightly into contact with a second similar point.

The opening and closing of the dynamo and battery circuit by means of the automatic cutout is governed by the dynamo generated voltage, and this depends, firstly, on the position of the control switch, and secondly, on the speed of rotation of the dynamo. With the switch in the " off " position the cutout contacts should at all times be separated. With the switch on " charge " the cutout contacts will be found to close at a road speed of 20 m.p.h. whilst with the switch in the H. and L. positions, the contacts should close at 12 m.p.h. approximately.

BATTERIES. These are installed to provide storage capacity for all power generated over and above immediate requirements and to provide a source of power when the dynamo is stationary, or its speed is such that no current is available from the dynamo. Their capacity, together with the dynamo output, have been arranged to meet all reasonable demands without the aid of frequent day charging.

Combined Headlamp and Switch Controls.

Switch Control—Lighting only.

Headlamp Type.

74 E.S.	..	4 positions	1. Off.
		(less Switch Key)	2. C. half charge.
			3. H. (high). Full charge—Side and Tail. Main bulb.
			4. L. (low). Full charge—Side and Tail. Pilot bulb.
			Main bulb Diplite Control.

Lighting and Ignition.

Headlamp Type.

73 E.I.	..	5 positions	..	1. Parking.	Pilot, Side and Tail.
				2. Off.	
				3. Charge.	Dynamo half charge—Ignition—Tell-tale.
				4. High.	Full charge—Ignition—Tell-tale—Side and Tail. Main bulb.
				5. Low.	Full charge—Ignition—Tell-tale—Side and Tail. Pilot bulb.
					Main bulb Diplite Control.

The tell-tale bulb lights BRIGHTLY only when timer contacts are closed—Engine Stationary.

Switch and Instrument Panels and Head Lamp 70.E.

Switch Control—Lighting only. (Magneto Ignition).

Panel Type.

C.17	..	4 positions	..	1. Off.	
				2. C. half charge.	
				3. H. (high).	Full charge—Side and Tail. Main bulb.
				4. L. (low).	Full charge—Side and Tail. Pilot bulb.
					Main bulb Diplite Control.

Lighting and Coil Ignition—Raleigh, Calthorpe, etc.

Panel Type.

C.17.E.I.	..	5 positions	..	1. Parking.	Pilot, Side and Tail.
				2. Off.	
				3. Charge.	Dynamo half charge—Ignition—Tell-tale.
				4. High.	Full charge—Ignition—Tell-tale—Side and Tail. Main bulb.
				5. Low.	Full charge—Ignition—Tell-tale—Side and Tail. Pilot bulb.
					Main bulb Diplite Control.

The tell-tale bulb lights BRIGHTLY only when timer contacts are closed—Engine Stationary.

SIDE AND TAIL LAMPS.

The side lamps are in essentials small replicas of the head lamps, and require no detailed explanation. Tail lamps are arranged for rear number plate fixing in various designs.

BULBS.

Single contact bulbs are used throughout with the exception of the Diplite Bulbs.

6 volt Dynamo Head { Main 6v. 18w. S.C.C. Gasfilled.

{ Pilot 6v. 3 w. S.C.C. Vacuum.

Diplite 6v. 18/18w. Gasfilled.

„ 6v. 12/3w. S.B.C.

„ 6v. 9/3w. S.B.C.

Side 6v. 3w.

Tail 6v. 3w.

Tell-tale bulbs.

Ignition tell-tale or warning lamp, 2.5v. flash type, small screw cap.

4 volt Dynamo Head { Main 4v. 6w. S.C.C. Gasfilled.

{ Pilot—Side and Tail 4v. 3w. Vacuum.

DYNAMO FIXING AND DRIVE.

The Dynamo must be rigidly fixed. All clamps, etc., must make good electrical contact with the frame of the motor cycle.

To ensure perfect earthing of the dynamo it may be necessary to connect an earthing cable between the dynamo cover fixing screw and some bright part of the engine. The presence of enamel on engine brackets and frame joints renders the return path of the current to the dynamo a doubtful one, and the above precaution is advisable, especially if any trouble is experienced in getting the dynamo to generate.

The drive must be smooth running. If chain driven, both the driving and driven sprockets must be perfectly in line; preference should be given to a $\frac{3}{8}$ in. pitch chain over $\frac{1}{2}$ in. pitch, as this will admit of a greater number of teeth on the sprockets—at least 17 teeth on the driven sprocket should be aimed at, the minimum number to be 14. **Avoid a tight chain.**

BATTERY FIXING.

The battery must be securely clamped in the carrier, and its position should be such that vibration due to road shock is a minimum. Place as near the centre of the cycle as possible.

When rubber buffers have been fitted in the battery lid, care should be taken when removing and fixing lid to ensure that these are always in position. (See pages 8, 9 and 11 for Battery Instruction.)

WIRING.

The cables should be run in such a manner as to prevent possible damage due to chafing and bending.

Use the clips provided to secure the cables to the frame of the machine. Make quite sure that sufficient slack cable is allowed to admit of complete and free movement of the handlebars. All connections between the terminals and cables must be clean and tightly made. In all cases, use the cable terminal ends or eyes provided by us.

MILLER ELECTRIC HORNS. These, together with push button, can be supplied by us. Both have been arranged
4v. 2.73-3 amps., 6v. 1.5-2 amps. for handlebar fixing.

CONNECTING UP. Two cables only are required—one from the Battery + terminal to Horn and another from
Horn to push button. The casing of the latter must make good contact with the handle-bar
as this forms the negative terminal for the Horn circuit.

EXIDE BATTERIES.

Our Ref.		Capacity			Maker's Ref.			Normal charge rate.
B612	..	6v. 12 a.h.	..	..	3ES7A	..	..	1 amp.
B61	..	6v. 10 a.h.	..	..	3ET5	..	..	1 amp.
B68	..	6v. 8 a.h.	..	..	3LF2	..	..	$\frac{3}{4}$ amp.

First Charge. Fill to underside of bus bars with pure sulphuric acid of 1.280 specific gravity (1.210 for tropical climates). Leave for 12 hours. Add more acid to restore to original level. Connect as for re-charge. When time permits, charge at $\frac{1}{2}$ ampere for at least 96 hours. Alternatively the first charge may be given at $\frac{3}{4}$ ampere for at least 70 hours. If the cell temperature exceeds 100°F. reduce to $\frac{1}{2}$ ampere, and if necessary suspend the charge temporarily. In any case the charge must be continued until gas is freely evolved from all the plates and the voltage has remained constant for 5 hours.

These first charge instructions must be adhered to.

Trying Out.

IMPORTANT. Until the battery has received its **first charge** and has been properly installed—connections clean and tightly made—the dynamo must not be run up with the control switch in any position other than "OFF"

ENGINE STANDING. With the engine standing, try out the lights. If all connections have been correctly made, the dim head, tail and side bulbs will light brightly with the control switch on "L" or low position, and the main head, tail and side bulbs will also light brightly on the "H" or high position of the switch.

Should all bulbs be only dimly lighted, examine battery connections, including the earth or frame contact of the negative cable. If only the head bulbs light dimly, examine earth connection of head lamp negative cable; possibly a

poor contact is being made, due to enamel on the frame, etc. These remarks apply to either the side or tail lights should they appear to be only dimly lighted. Approximate ammeter indication :—

Dim head, side and tail, 1.5 amps.

Bright head, side and tail, 4 to 4.5 amps.

**ENGINE RUNNING—
Switch on Charge.**

The cut-out contacts should close at approximately 18-20 miles per hour, and an ammeter (if fitted) will indicate a maximum of 3.5 to 4 amps. when the engine is rev'd up.

Switch on Low or High.

The cut-out contacts should close at a road speed of 12-14 m.p.h., with gear in top. The bulbs will brighten slightly as the engine is rev'd up and charging takes place. The ammeter will indicate 3.5 to 4 amps. maximum on "low" and 1 to 1.5 amps. maximum on "high." Failure of cut-out contacts to close or the ammeter to indicate charge may be due to an incorrect rotation dynamo being fitted. Dynamos are specially arranged for clock and anti-clock rotation. Oscillation of the ammeter pointer when on "charge," "high" and "low," invariably indicates reversal of dynamo polarity (see chart).

**POOR LIGHT,
LOW CHARGE RATE.**

If the head light can be improved (brightened up) when a wire is temporarily connected, say, to the medallion on lamp or one of the bright fixing lamp studs and to the frame of the cycle or bright engine part, then the earth contact can be improved. An increased charge current will also flow on improved earth connection.

Maintenance.

WARNING.

Before making any adjustments to the Head Lamp or Dynamo, disconnect one of the Battery terminal connections, otherwise an over-heated or burnt-out Ammeter may result, or the Dynamo polarity may be reversed.

**DYNAMO—
Lubrication.**

Use oil very sparingly. A supply of lubricant has been placed in the bearings when assembled, and this should prove sufficient for 1,000 miles. A few drops of good quality oil should be inserted through the oiler provided at the driving end every 500 miles, and a small quantity of lubricating grease pressed into the hole (to be seen in the end of the commutator end bearing casting) every 1,000 miles. Avoid using too much grease and pressure, otherwise the grease may be forced through the bearing, and this may eventually reach the commutator and cause trouble.

Commutator and Brushes.

When in position, brush should **press firmly** on the **commutator**. On no account should carbon brushes be replaced by other than our own special make. The commutator and brushes should be periodically inspected.

Remove all trace of carbon dust and grease, and **see that all the brushes move freely in the holders.**

When brush is removed see that the brush pressure spring is clear of the brush holder ; if distorted it may foul, thus it will be unable to exert its full pressure on the brush when the brush wears down and irregular charging will result.

To clean a blackened or dirty commutator, use fine glass paper. A commutator with a highly polished surface (dark bronze colour) should be left untouched.

It is advisable to change the brushes just before they are worn out : this will prevent the sparking which gives rise to blackening of the commutator and unsteady charging current.

If you are desirous of increasing the dynamo output, see normal and abnormal indication chart.

DYNAMO DRIVE.

See that the chain (if chain driven) is well oiled and that it moves smoothly, and that the sprocket teeth enter and leave the chain openings with a complete absence of jerks or knocks as these tend to set up vibrations which traverse the armature shaft and lead to fractured conductors. Place the hand on the dynamo from time to time, lack of smoothness in the drive will be readily felt and should be immediately remedied. Renew a chain the links of which have become stretched badly. Avoid too slack or too tight chain tension. After adjusting chain check timing.

A Dynamo Chain will give satisfaction if regularly and frequently oiled just prior to a standing period.

BATTERY.

The instructions given on the sheet attached to the battery should be rigidly adhered to, as failure in this may lead to serious trouble. The battery manufacturers' advice should be obtained if in doubt about this unit.

Inspection.

Examine at least once a fortnight and even more frequently in hot weather and tropical climates. The acid in the cells should just cover the tops of the plates, and, if low, PURE DISTILLED WATER only should be added. This should be added just before commencing a charge run, as the agitation due to running and the gassing will thoroughly mix the solution. If the solution has been spilled by accident, add acid of equal specific gravity to that remaining in the cell. When the inspection is carried out, hydrometer readings (specific gravity values) should be taken of the solution in one of the cells and occasionally of that in all the cells. These readings are the most reliable method of indicating accurately the condition of the cells. Examine battery connections regularly, remove all trace of corrosion from contact surfaces, replace and tighten ; loose and dirty connections will give rise to serious irregularities, i.e., failure of charge—excess charging rate—fusing of bulbs.

Charging.

The amount of charging required varies considerably owing to the various running conditions of motor cycles. If the light is poor and falls off rapidly when the machine is standing, charging should be carried out immediately.

In most cases it is necessary (to obtain satisfaction) for a slight charge to flow to the battery at average road speeds (night running).

Charging a battery after discharge raises its specific gravity.

Discharging lowers the specific gravity. Place on charge immediately any battery whose specific gravity has fallen as low as 1.140, and if inconvenient to charge on the motor cycle, remove it and have it charged from some other source. Take hydrometer readings whenever trouble is experienced with any part of the electric system.

The behaviour of one cell differing from that of the others in the same battery calls for prompt attention and more frequent inspection, especially if the difference increases with time. Should the level of acid fall more rapidly in one cell than in any of the others, the container of this cell is probably leaky and needs repairing; again, if the specific gravity of one of the cells is lower than that of the others, and observation reveals that this loss continues, this cell should be given expert attention at once. In the summer, when night runs (with lights on) are short or infrequent, the battery should be given a gassing charge at least once a fortnight. This may be done either on the machine or from a separate source.

If battery appears to lose its charge, have it charged from a separate source and observations made to check its capacity.

Overcharging.

A sure sign of overcharging is a too frequent necessity to top up the cells to maintain correct acid level.

Battery not in use.

If the battery is not required for some considerable time, it is advisable to remove it from the machine and give it a special charge, making sure that the specific gravity has reached its final value. Store in a cool place, and at intervals of every six or eight weeks inspect, and give it a charge until gassing freely. When the battery is removed it is advisable to remove the dynamo driving chain or belt. This will safeguard the system against excess voltage, conditions which would occur should the control switch be inadvertently moved from the "off" position.

HEAD LAMP—Bulb Replacement and Focussing.

Insert bulb in the usual manner, but when the bayonet pins have arrived home, a further twisting force to the right will enable both the bulb and holder to slide either backwards or forwards, and on removal of the extra twisting

force the bulb will be securely held in that position. The range of backward and forward movement will be found to be sufficient to cover all variations likely to be met with in standard bulbs.

Cleaning Reflector. Should reflector be merely dusty, just wipe gently with a "Selvyt." Metal polish will only make the surface dull.

SIDE LAMP—Bulb Replacement. See instructions under "Head Lamp."

Cleaning Reflector. See instructions under "Head Lamp."

TAIL LAMP—Bulb Replacement. Remove front, which is fixed by ordinary right-hand threaded screw. Be careful glass does not fall, as it is fitted loose to ensure easy replacement.

CABLES. Repair from time to time (by means of taping with black adhesive tape) any chafed or worn insulation. Renew cables if they are being subjected to a considerable amount of bending or acid corrosion and show signs of suffering in consequence.

Fitting and Maintaining the Dyno-Mag.

The base fixing holes and chain line centres are made to B.E.S.A. standard dimensions, with the exception of $\frac{5}{16}$ " standard Whitworth thread instead of $\frac{1}{4}$ " Whitworth, and standard type K. taper spindle. The type K.45 m/m. centre height is obtained with an adaptor base plate secured by screws and dowels.

Permanently screwed-in studs are recommended for holding down wherever possible to obviate the possibility of stripped threads in base.

To fit control cable, thread cable adjusting screw and nut over inner cable, and solder nipple on about 2" from end of outer cable, remove bottom control plug, pass nipple and cable down through top cap, spring and slide, screw adjusting screw right down, push C. washer over cable and draw up into recess in slide, afterwards adjusting cable screw in the usual manner and replacing lower plug.

When contacts require adjusting, rotate magneto until adjustable contact and nut are opposite enlarged portion of cam, when adjustments may be carried out by means of spanner provided without having to remove cam or contact breaker. Set contacts to open from .015" to .018", apply a spot of oil to cam track occasionally. Do not forget to tighten locking nut.

Main bearings are packed with High Speed grease and require no further attention.

Do not remove armature from tunnel as this will demagnetize magnets.

Both magneto and dynamo driving chains must be kept well lubricated and their tensions correctly adjusted. A worn chain, which causes appreciable variations in tension as the result of rotation, should be discarded. If it continues in service, it will certainly cause serious damage.

Coil Ignition Instructions.

BATTERY. This must at all times be maintained in a healthy condition. Endeavour to keep it at least half charged, and from time to time see that it is fully charged. See that the electrolyte is maintained at its correct level, and that the **terminal connections are clean and tightly made.**

A call at one of the numerous battery service stations every three months for a general inspection would be time well spent, and any corrective measures required could then be taken and trouble avoided.

COIL. The coil being a stationary unit, no wear takes place, and once installed it calls for no attention. Its function is to convert the available battery voltage to a higher one suitable for spark plug purposes. Insulated sleeve and terminal cap should be wiped clean with a benzole cloth occasionally. Water should not be allowed to reach the terminals of coil.

CONDENSER. The condenser is usually attached to the coil or timer. It is essential for healthy spark production at the plug and for the elimination of sparking at the timer contact points. Like the coil it requires no maintenance attention, and once installed may be ignored. **It is connected to that terminal of the coil to which is also connected the coil to contact breaker cable.** If connected to the other coil terminal the condenser is rendered inoperative and firing will be very erratic. In some instances one connection only will appear to be made to the condenser; in such cases the metal fixing plate of this must be in perfect metal-to-metal contact with the frame of the machine, otherwise the condenser is rendered inoperative and ignition will be erratic.

Where condenser is fitted in the insulated cap or cover of timer, examine the swing-over clip spring, see that it is clean and presses firmly on to the contact stud in centre of cap—a loose or dirty contact will cause erratic firing.

TIMER OR CONTACT BREAKER.

Examination of the wiring diagram will make clear the position of this (electrically) in the ignition circuit. It will be observed that the flow of current from the battery + terminal through the coil to earth or battery — terminal will be interrupted when the timer contacts are separated.

Separation of these contacts is brought about by the rotation of a cam which is attached to either the engine main of half time shaft, or in some cases, to the shaft of a chain or gear-driven dynamo.

The effect of interrupting the coil current successfully is the production of a perfect spark at the points of the spark plug.

Upon examination of the timer a fixed but adjustable contact point will be seen attached to an *insulated* terminal post, a second contact point is fixed to a movable but *uninsulated* lever.

Attached to this lever is a pad which presses firmly on to the cam during part of the latter's rotation, and whilst doing so the contact points are separated 0.018" to 0.02" and the coil circuit is open. During the remaining period in the cam's rotation, the cam leaves the pad and this allows the contacts to meet and thus close the coil circuit.

The lever bearing pad, rotating cam and contact points are the only wearing points for this form of ignition. They should be given periodical attention ; the lever bearing should be clean and highly polished, the cam smeared lightly with vaseline, the least sign of sluggishness should be remedied by polishing and lubrication of pivoting spindle and bearing. The contact points must be free of oil, otherwise they may become pitted and dirty, and it will be necessary to file them smooth and flat to ensure perfect contact. They should at all times be **clean**, and a petrol-soaked rag should be used for this purpose. When in order, the contact surfaces present a grey, frosted appearance.

When the cam is clear of the pad, the contacts should be pressed firmly together by means of the spring provided. Binding at the pivot bearing will weaken this pressure and prevent the smart make and break so essential for satisfactory results.

If the contacts are badly burnt, the condenser should be tested and if faulty, replaced. To test condenser, remove it and apply a lighting main's voltage to its terminals—a lamp should be used in series, and thus avoid a short circuit in the event of the condenser proving faulty or breaking down during the test. If in order, on removing main's voltage, an appreciable snappy spark will be obtained on short circuiting the terminals of condenser, even after a few seconds' pause. If leaky or partially shorted, no spark will be obtainable.

Excess voltage will give rise to burnt contact points ; see that the battery circuit connections are clean and securely made.

Timers attached to dynamos call for a little extra attention inasmuch as the half time shaft must be maintained lubricated, and this is done by giving the greaser cap provided a few turns every 500 miles. The greaser cap is situated immediately under the timer housing.

TELL-TALE OR WARNING LAMP.

The warning lamp will be found to brighten as the engine slows down, and on stopping remain full bright if the switch is left on and the contact breaker or timer contacts remain closed.

It is connected in parallel with a small resistance, and both bulb and resistance are connected in series with the coil circuit when the switch is on. Thus, should the bulb get broken, the ignition will remain unaffected. However, the bulb should be replaced at the earliest opportunity. A replacement bulb will be obtainable almost anywhere, same being a 2.5 volt flash lamp type.

COMBINED LIGHTING AND IGNITION SWITCH.

Complete the ignition circuit in the "charge" — "high" — "low" positions only, see description on pages 4 and 5.

TESTS IF TROUBLE IS EXPERIENCED.

The low tension of battery side of the ignition may be checked by turning the ignition switch on and rotating engine slowly. If the ammeter reading fluctuates between zero and 3.5 amps. with the battery up, this part of the system is satisfactory. On reaching

average engine speeds this current value should drop to .75 or .5 amp. ; if it does not, examine timer contact clearance, and if reduced due to pad wear, adjust to proper clearance.

NOTE.—An excess demand by the ignition system will give rise to symptoms which might be diagnosed as low dynamo output, therefore check ignition demands with dynamo plug removed temporarily.

The high tension may be checked by removing the high tension cable from the plug and holding the terminal, say, $\frac{1}{8}$ " to $\frac{1}{4}$ " away from some engine part. Repeat the operation indicated above for low tension test. A spark should be obtainable (when the low tension circuit is broken). If all appears to be in order, examine plug, clean, and if unable to discover the cause of failure, try another plug. If a spark is unobtainable between the high tension terminal and engine body examine cable, and renew if damaged in any way, or if the rubber appears to have deteriorated.

If satisfied that the cable is in order, check condenser, and if this appears to be in order, return coil to us.

IMPORTANT.—In the event of serious Battery trouble, the ignition system will work satisfactorily for twenty minutes to half an hour if a medium sized flash lamp type battery (cells connected 4 in series to give approximately 6 volts), is used temporarily in its place. After a rest of ten minutes, a further run of twenty minutes is obtainable, and so on until the Battery is completely exhausted. The dynamo plug must be removed when running under these temporary conditions.

Any part of this ignition system, if returned to us, will be tested immediately and a report forwarded by return of post.

Upon receipt of a postcard, any part of this coil ignition system will be forwarded per return, C.O.D., and the amount charged will be refunded in the event of any faulty part being returned to us and same being found to have broken down due either to faulty material or workmanship on our part.

WIRING DIAGRAMS.

These may be obtained on application, price 3d. each.

To ensure correct diagram being forwarded, please refer to the following list before applying. This list will also be useful when requiring a replacement set of cables, etc. Please quote diagram number and details of motor cycle.

<i>Diagram No.</i>	<i>Description of Head Lamp</i>	<i>Dynamo Type</i>	<i>Remarks</i>
628	6" with ammeter	D.M.3.G.	Single pole system and single core cables throughout.
676	7" with ammeter	D.M.2 4-volt and D.M.3.G 6-volt ..	Single pole system and single core cables. (Magneto Ignition).
677	7" with ammeter	Ditto	Ditto ditto Diplite light bulb and control.
678	7" with ammeter	D.M.3.G	Single pole system. Separate Coil Ignition control switch on Head Lamp, single core cables throughout.
679	7" with ammeter	D.M.3.G.1 Contact Breaker	Ditto ditto.
680	7" with ammeter	Maglita systems	Single pole system and single core cables throughout.
731	7" less ammeter (70 E)	D.M.3.G.	Instrument switch panel Lighting and Coil Ignition, single core cables.

—continued on next page.

WIRING DIAGRAMS—continued.

Diagram No.	Description of Head Lamp	Dynamo Type	Remarks
733	7" less ammeter (70 E)	D.M.3.G.	Instrument switch panel Lighting only, single core cables.
773	Pair 5" Lamps	D.M.3.G.	Twin filament Head Lamp Bulbs, C.17 switch box.
787	7" with ammeter	D.M.3.G and D.M.3.G.I.	Single pole system, Diplite main bulb coil ignition control switch on head lamp.
821	7" less ammeter, with Ignition, Tell-Tale	D.M.I.	Lighting and Coil Ignition, Double Contact Bulb, 9 v., 3 w.—5 position switch. Coventry Eagle, Cotton, etc.
822	7" Head Lamp Pair Wing Lamps	D.9.S.I.	Instrument switch panel Lighting and Coil Ignition. 5 position switch. (Raleigh).
889R	7" with ammeter (78 E.I.)	D.M.3.R	Lighting and Coil Ignition. Diplite main bulb. Tell-Tale in Head Lamp.
896	7" with ammeter	Mag-generator, B.T.H. ..	Diplite main bulb, reduced charge resistance. 4 position switch.
897	—	—	Lighting and Coil Ignition. Diplite main bulb (diagrammatic arrangement). 5 position switch.
900	7" Head Lamp (73 E.I.)	—	Lighting and Coil Ignition. Diplite main bulb. Tell-Tale or warning lamp in Head Lamp.

6" lamp—Type 64 E.

7" lamp—Type 74 E.

All communications requiring advice or information should be accompanied by a 1½d. stamp for a reply.

SERVICE AGENTS. BRITISH ISLES.

Aberdeen	—	—	Alexander & Co., 339, Union Street.	Belfast	—	—	McIntyre Bros., 50, May Street.
Aldershot, Hants	—	—	Archer & Son, Victoria Road.	Bellshill	—	—	J. Potts & Co., 30, Hamilton Road.
Amesbury, Wilts.	—	—	R. Bugden, Motor Cycle Agent.	Birmingham	—	—	Service Department, Aston Brook Street.
Ashford, Kent	—	—	C. Hayward & Sons, New Street.	*Birmingham	—	—	The Premier Motor Co., Aston Road.
Ashford, Middx.	—	—	Simpsons Motors, London Road.	Bristol	—	—	Waycott Bros., King Street.
*Aylesbury, Bucks.	—	—	The Aylesbury Battery Co., Havelock Street.	Bristol	—	—	F. O. Coward & Co., Ltd., 46a, Stokes Croft.
Ayr	—	—	Marr & Fitzpatrick, 74, Dalblain Road.	*Bristol	—	—	H. Haskins, City Road.
Barnstaple	—	—	Knighton-Delve, Newport Garage, Newport.	Bolton	—	—	Charleson Accumulator and Electrical Eng. Co., 136, St. George's Road.
Barnsley, Yorks	—	—	T. Garner & Sons, Ltd., Eldon Arcade.	Bo'ness, West Lothian	—	—	Wm. Davidson, Forthview Garage.
Bath	—	—	V. Anstice, 23, Westgate Buildings.	Bromley, Kent	—	—	Dalton Stephens Co., Masons Hill.
Blackburn	—	—	Shuttleworth & Geldart, 10, St. Peters Street.	Bournemouth	—	—	Bournemouth Motor-cycle Co., 40, Holdenhurst Road.
Blackpool	—	—	Stuarts, 247, Lytham Rd., South Shore.	Bury-St. Edmunds	—	—	V. H. A. Brewster, St. Mary's Wks., Sparhawk St.
*Bradford	—	—	E. Jones (Bradford), Ltd., Olympia Wks., Thornton Road.	Cambridge	—	—	King & Harper, 4, Bridge Street.
Bedford	—	—	A. W. Chattell & Son, The Bridge.	Canterbury, Kent	—	—	A. T. Bates, 70, Bargate.
*Belfast	—	—	J. Robertson (B.O.), Ltd., 46, May Street.				

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*Canterbury, Kent.	-	G. R. Barrett & Son, Westgate.
*Cardiff	-	E. C. T. Mackadam & Co., Wood Street.
Carmarthen	-	E. Stephens, Motor-cycle Expert, Water St.
Cheltenham	-	The Cheltenham Motor & Cycle Co., High Street.
Chester	-	Davies Bros., Bridge Street.
Chesterfield	-	Service Motors, Knivesmithgate.
Chichester	-	Goodridge & Co., East Street.
Chippenham	-	County Electrical Services, 30, Market Street.
Coventry	-	The Ignition & Electrical Services Ltd., 87, Little Park Street.
Darlington	-	White Bros., Northgate.
Dartford, Kent	-	J. C. Beadle, Ltd., Spital Street.
Denbeath, Fife	-	J. G. Maidment, Motor-cycle Agent.
Devizes	-	W. S. Sloper, 27, Sidmouth Street.
Derby	-	W. Ingle, Derby Road, Ripley.
Doncaster	-	Millns & Co., High Street.
Dorchester	-	Tilleys, South Street.

*Dover	-	P. H. Niblett & Son, Ladywell Garage, Park Place.
Dublin	-	Little & Brennan, Auto Engineers, 126, Upper Abbey Street.
Dumfries	-	Grant & Irving, Motor-cycle Agents, Buccleuch Street.
Dursley, Glos.	-	Phillips & Son.
East Barnet, Hants.	-	Atkins & Son, 6, Clockhouse Parade.
Edinburgh	-	Alexander & Co., 113, Lothian Road.
Edinburgh	-	H. Nelson, Ltd., Playhouse Buildings.
*Ely, Cambs.	-	The Walbro Motor & Cycle Co., Lynn Road.
Elgin	-	J. McDonald, High Street.
Exeter	-	Express Magneto (Repairs) Electrical Co., Ltd., 18, Holloway Street.
Erith, Kent	-	Ramseys, Britannia Garage, Grayford Rd.
*Exeter	-	P. Pike & Co., Alphington Street.
Falmouth, Cornwall	-	Auto Service Electric Co., The Moor.
*Folkestone, Kent	-	C. H. & H. L. Blundell, Christchurch Road.
Glasgow	-	W. H. Bairsto & Sons, 243, Paisley Road.
Glasgow	-	J. W. Burton & Co., 98, Great Western Road.

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*Glasgow, C3.	—	The Western Motor Co., Ltd., 117, Berkeley Street.
Gravesend, Kent	—	The Gravesend Service Garage, Wrotham Road.
Gravesend, Kent	—	Gravesend Car Electrical Co., 22, Harmer Street.
Gt. Yarmouth	—	Osman Atkinson, Regent Road.
Grimsby	—	H. Wardell, Cleethorpes Road.
Gillingham, Kent	—	The Precision Garage, Borough Road.
*Gloucester	—	Autocar Electrical Co., Worcester Street.
Goodmayes, Essex	—	A. A. Gooding, White House, High Road.
Guildford	—	Jeffrey & Sons, 137, High Street.
Guernsey, C.I.	—	Express Magneto (Repairs) Electrical Co., Ltd.
High Wycombe, Bucks.	—	M. Manley, Motor & Cycle Agent, Desborough Road.
Hove, Sussex	—	Bradshaws Cycle & Motor Depot, Western Road.
*Huddersfield	—	Woods' Auto Electrical Co., Ltd., Half Moon Street.
Hull	—	Miller & Garness, 151, Anlaby Road.
Ipswich	—	Val Revett & Sons, Clarkson Street.

Jersey, C.I.	—	Express Magneto (Repairs) Electrical Co., Ltd.
*Keighley, Yorks	—	Auto Electrical Repairs, Ltd., Queen Street.
Kingston-on-Thames	—	G. W. Wilkin, Motor-cycle Agent, 26, London Road.
Pwll, Llanelly	—	W. Thomas & Son, Motor Agents.
Lancaster	—	A. Jepson, Penny Street.
Launceston	—	Wooldridge & Son, Western Road.
Llandudno	—	G. L. Emery, Penrhyn Bay.
*Leicester	—	A. B. Butt, Ltd., Auto Engineers, Queen Street.
Leatherhead	—	Goddards, 45, High Street.
*Leeds	—	Adams Motor Service, Stoney Rock Lane.
*Leeds	—	W. Marsden & Sons, St. Michael's Lane, Headingley.
*Liverpool	—	G. D. Curtis, 1, Mount Pleasant.
*Liverpool	—	Pulford Bros., Ltd., 102, Whitechapel.
Chiswick, London, W.4.	—	British Ignition Co., 1 & 2, Station Approach, Gunnersby.

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London, W.	—	Kay's, Bond Street, Ealing.
London, E.	—	A. E. Warwick Motors, 420, Barking Road, East Ham.
London, E.17.	—	The Essex Magneto Co., Ltd., 123, Markhouse Road.
London	—	Stolworthy & Co., Mill Lane, Woodford Green.
*London, W.C.1.	—	H. Miller & Co., Ltd., 6b, Ridgmount Street, Store Street.
*London, W.3	—	L. Stevens, Ltd., 149, Goldhawk Road Shepherds Bush.
London, E.11	—	Rivetts, High Road, Leytonstone.
London, S.W.	—	Hall, 48, High Road, Balham.
London, S.E.12.	—	A. H. Tooley, 2a, Burnt Ash Hill, Lee.
London, S.E.13	—	Rawlings & Co., Elthruda Road, Hither Green.
London, S.W.9	—	Rowbeck Auto Electric Services, 26, Stockwell Road.
Loughborough	—	T. B. Bowler, 138, Nottingham Road.
*Lowestoft	—	Taylor Bros., London Road.
Luton, Beds.	—	Dunham & Haines, Castle Street.
Lymington, Hants.	—	C. S. Barrow, High Street, Lymington.

Maidstone	—	Hylands, 70a, King Street.
Manchester	—	Alexanders Motor Stores, 72, City Road, Hulme.
*Manchester	—	Anderson's Garage Ltd., Wilmslow Road, Fallowfield.
Maidenhead, Berks.	—	Harris, Motor-cycle Agent, Maidenhead.
Middlesbrough	—	E. Upton & Sons, Service Depot, Linthorpe Road.
Newcastle-on-Tyne	—	The Dene Motor Co., Ltd., Haymarket.
*Newcastle-on-Tyne	—	Mico Limited, 18, Ridley Place.
Newcastle-on-Tyne	—	Adams & Gibbons, St. Thomas Street.
*Northampton	—	P. C. Spokes, Henry Street.
Norwich	—	H. Chapman, Motor-cycle Agent, Duke Street.
Norwich	—	R. O. Clarke, 2a, Upper King Street.
Norwich	—	Willmott Bros., Prince of Wales' Road.
*Nottingham	—	F. Mitchell (Nottingham) Ltd., Derby Road.
Nottingham	—	G. S. Pond, Arkwright Street.
Oldham	—	F. Goldthorpe, 248, Manchester Street.

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*Oxford	—	—	A. E. Malins, 27, Little Clarendon Street, St. Giles.
*Peterborough	—	—	Burchnell's Battery Service, 102, High Street, Old Fletton.
Perth	—	—	Valentines Motors Ltd., City Hall Square.
Perth	—	—	Nicholson's Motor-cycle & Cycle Depot, 49, North Methven Street.
Preston	—	—	S. Marks, Ltd., Lancaster Road.
Preston	—	—	E. Dewhurst, Ltd., Mount Street Works.
Pulborough, Sussex	—	—	Gray & Rowsell, Bury Gate Garage, Arundel Road.
*Plymouth	—	—	P. Pike & Co., Union Street.
Plymouth	—	—	Express Magneto (Repairs) Electrical Co., Ltd., 1, Station Road, Millbay.
Rainham, Kent	—	—	Hayward, High Street.
Redhill	—	—	T. G. Meeten, Earlswood Road, Earlswood.
Reading	—	—	The Southern Globe Electrical Co., Ltd., 52, Minster Street.
Redruth	—	—	W. Jones, West End.
Reigate	—	—	G. Harris (Reigate Motor Cycle Depot), West Street.

Romford, Essex	—	—	The Rhosha Motor Co., Market Place.
Salisbury	—	—	E. J. Longman, Fisherton Street.
Swansea	—	—	J. Brayley, Picton Place.
St. Leonards-on-Sea	—	—	West Marina Motor Depot, West Marina.
St. Austell	—	—	S. H. Kellaway, South Street.
St. Albans	—	—	Giffens Limited, Chequer Street.
Sevenoaks, Kent	—	—	The Station Garage, Station Parade.
Sheerness-on-Sea	—	—	Mathews Cycle & Motor Cycle Depot, High Street.
Sheffield, 2	—	—	D. Bradbury, 224, London Road.
Slough	—	—	Bates & Co., High Street.
*Southampton	—	—	The B'ham & Coventry Cycle Co., Above Bar.
Southampton	—	—	A. Bennett, Broadway Garage, Portswood.
Southend-on-Sea	—	—	Kay & Hendrie, 10, Nelson Street, Southend.
Southsea, Hants	—	—	R. W. Burnett & Sons, 5, Eldon Street.
Southsea, Hants	—	—	Warren's Cycle & Motor Depot, Elm Grove.

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Stockton-on-Tees	—	S. Jones, Bridge Road.
Stoke-on-Trent	—	Broadway Motors Ltd., Liverpool Road.
Strood, Kent	—	B & B Garage, High Street.
*Sunderland	—	Dunn & Jameson, Hylton Road.
Taunton	—	A. C. Westlake, Station Road.
Torquay	—	J. Harris, Union Street.
Trowbridge	—	C. Stroud Sims, Town Garage.
Tunbridge Wells	—	Read Bros., 2-4-6, Goods Station Road.
Turriff	—	W. Dickie, Cycle Emporium, Turriff.
Walsall	—	W. G. Hough, The Walsall Motor Cycle Mart, Stafford Street.
Wakefield, Yorks.	—	Walter Robb, Ltd., 12, Cross Square.
*Watford	—	Russell's Auto Electric Co., 18, Queen's Road.

Wellingborough	—	H. V. Briggs, Ltd., High Street.
Weybridge	—	Farrow, High Street, Weybridge.
Weymouth	—	Tilleys, Ltd., County Garage.
Wrexham	—	Eames, King Street Parking Ground.
Wrexham	—	Hanmer Bros., Motor-cycle Depot, 62, Regent Street.
Wigan	—	Wigan Magneto Repair Works, Ltd., 45, Mesnes Street.
*Winchester	—	Hampshire Ignition & Lighting Service, 9, Cheesehill Street.
Winchester	—	Winchester Cycle & Motor Co., Ltd., Jewry Street.
Wolverhampton	—	J. Devey & Co., Ltd., 6, Pipers Row.
Yeovil	—	The Express Magneto Repair & Electrical Co., Ltd., Goldcroft.
York	—	J. D. Shearsmith, Blossom Street.

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OVERSEAS AGENTS.

South Africa—

Electric Service Corporation Ltd.,
93, St. Andrew Street,
Bloemfontein.
Auto Electric Supply (Cape) Ltd.,
20, Bree Street,
Cape Town.
Auto Electric Supply (Natal) Ltd.,
199, Smith Street,
Durban.
J. A. McLennan Ltd.,
143, Oxford Street,
East London.
United Motor Services Ltd.,
31, Queen Street,
Port Elizabeth.
Electrical Equipment Co.,
190, Commercial Road,
Maritzburg.
Automobile Electric Supply Co.,
Aesco Buildings, Corner Eloff
and Albert Streets,
Johannesburg.

Argentine, S.A.—

Raul A. Pinero,
Casilla de Correo 1400,
Buenos Aires.

Austria—

Max Wittels,
VIII/2, Laudongasse 46,
Vienna.

Australia—

E. T. Fisher & Co.,
61, Grote Street,
Adelaide.

Belgium—

Elphinstones Ltd.,
Adelaide Street,
Brisbane.
Finlay Bros. M/C Pty. Ltd.,
332/4, Elizabeth Street,
Melbourne, Victoria.
Auto Elec. Service Co.,
48, Wentworth Avenue,
Sydney, N.S.W.

Canada—

D'Haenens,
Rue Sergeant de Bruyne, 51,
Brussels.
The H.B. Co.,
1072, Beaver Hall Hill,
Montreal, P.Q.

Czecho-Slovakia—

Stepar Hanak & Co.,
Schnirchova 1084.
Prague, V.II.

Denmark—

Simonsen & Nielsen, A/S.,
Frederiksholms Kanal 4,
Copenhagen.

Dutch East Indies—

L. Platon Handel Mij. N.V.,
Batavia.

Germany—

Hoock & Co., G.m.b.H.,
Probsteigasse 15,
Cologne.

Holland—

J. Jansen,
Sweelincklaan 7,
Bilthoven.

Hungary—

Biro Jeno,
VI, Liszt Ferenc Ter 2,
Budapest.

Italy—

S.A.T.A.M.V.,
Via Settembrini 33,
Milan.
Main Service Station and other
14 service stations.

Japan—

A. Cameron & Co.,
93, Yedo Machi,
Kobe.

New Zealand—

Watson, Steel & Ganley Ltd.,
Auckland.
R. V. Bristol & Co. (Pty.) Ltd.,
Wellington.

Spain—

Tomas Padrosa,
Napoles 109,
Barcelona.

Switzerland—

Gebruder Kapp,
Konradstrasse 32,
Zurich.



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