LUCAS

RACING AND COMPETITION MAGNETOS

MAINTENANCE INSTRUCTIONS

JOSEPH LUCAS LTD . BIRMINGHAM . ENGLAND

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Racing Magnetos

The Lucas "T.T." range of racing magnetos are high-performance, light-weight machines designed for road-racing purposes. They are of the standard rotating-armature type, with ring-cam actuated contact breakers, and models are available for use with single-cylinder, horizontally-opposed twin and vee-twin engines. Each magneto is also supplied in base and flange-fixing forms, and various high tension pick-ups can be fitted to suit the layout of the particular engine.

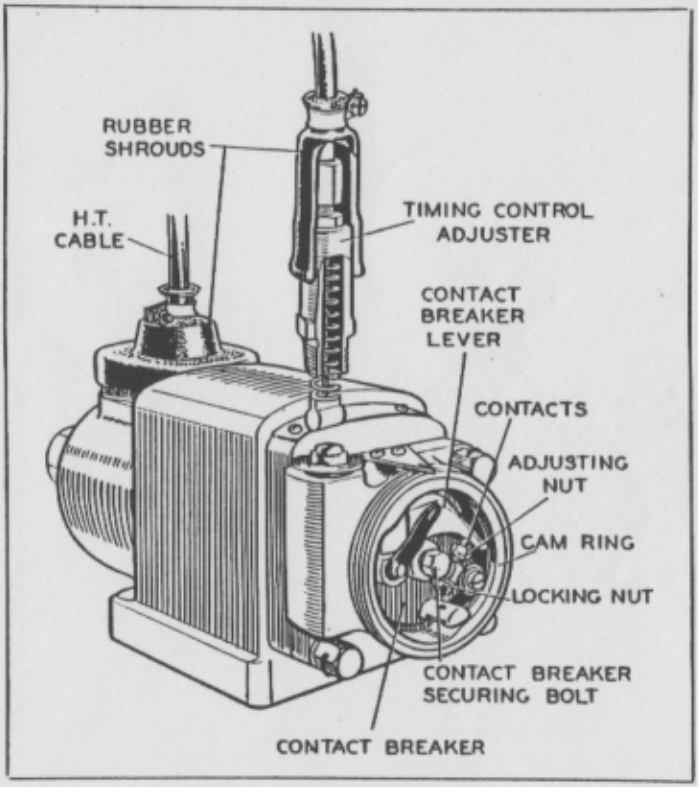

Fig. 1. Racing magneto with contact breaker cover removed.

Special attention has been paid to the water-proofing of the magneto. The high tension outlets and the Bowden timing control cable are protected by rubber shrouds; and the joints between the body and the contact breaker housing, and between the body and the high tension pick-ups, are carefully sealed to prevent the ingress of moisture. The contact breaker cover is screwed to the housing. Several designs are available, all of which incorporate a rubber washer seating on the V-section face of the housing, and a flat spring engaging with the serrated edge of the cover to prevent loosening of the cover due to vibration.

Ventilation of the armature is effected by breathing holes in the magneto body. The double-walled contact breaker cover used on certain models is pierced to ventilate the contact breaker, the cavity between the walls of the cover acting as a water-trap. On other models, and on the "Wading" magneto described overleaf, the contact breaker "breathes" through a short length of rubber tube, attached to a union in the cover.

Manual control of the ignition timing is effected by rotating the cam in its housing. The timing control is so arranged that should the cable break (in the course of a race, for instance) the timing will remain fully advanced. Racing magnetos are not normally fitted with an automatic timing control.

Racing magnetos of the "T.T." range have an aluminium finish, with red lettering. The direction of rotation is stamped in red on the magneto body.

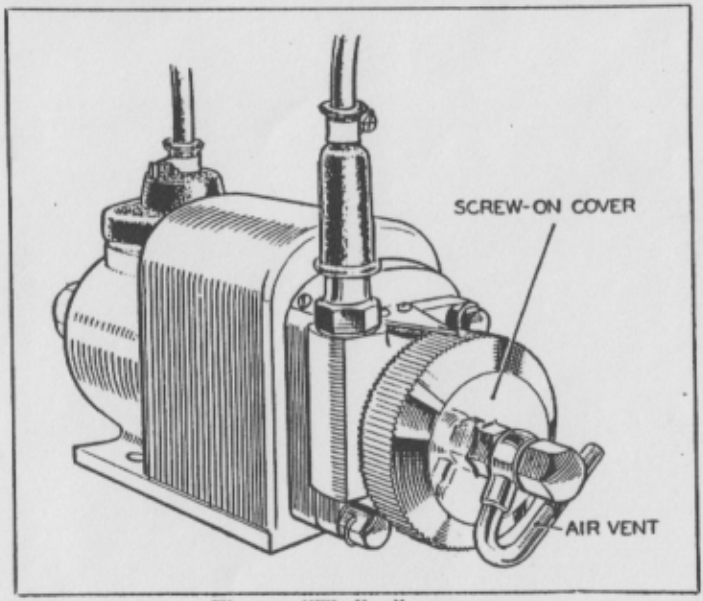

Fig. 2. "Wading" magneto.

The "Wading" magneto

The "R" range of magnetos has been developed primarily for "trials" purposes, where complete immersion of the magneto is a possibility which must be considered. Differences from the "T.T." range therefore comprise additional precautions against the entry of water and against corrosion.

The body, which is slightly larger than that of the "T.T." machines, is of aluminium; all joints are hermetically sealed, and there are no vent holes in the body.

As in some of the "T.T." magnetos, the contact breaker is ventilated by a rubber tube running from a banjo union on the end cover to a point on the motor cycle above any anticipated water level.

The magneto is finished in weather-resisting beige paint with green lettering.

How the Magneto Works

The operation of any magneto is based upon the same fundamental principle, namely the rapid change of magnetic flux in a laminated iron core carrying suitable windings.

In these magnetos the rotor, revolving between the laminated poles of a permanent magnet, carries the armature windings: a primary winding consisting of relatively few turns of thick wire and a secondary winding of several thousand turns of fine wire. A contact breaker is arranged to interrupt the primary current at the instant a spark is required.

The rotation of the armature in the magnetic field between the poles of the permanent magnet generates a low-frequency alternating current in the primary winding. As this primary current reaches one of its maximum values, it is interrupted by the contact breaker, and the subsequent abrupt collapse of the field about the coil causes a very high voltage to be momentarily induced in the secondary winding. This voltage is passed, via the high tension pick-up and cable, to the sparking plug, where it breaks down the plug gap and produces a spark to ignite the mixture.

MAINTENANCE

Important. The weatherproof qualities of the magneto may be seriously impaired if an attempt is made to dismantle it, apart from removing the contact breaker as described opposite. In the event of failure the magneto should be returned to the Lucas Racing Section for repair.

Cleaning and Lubrication

The following maintenance procedure should be carried out after every 20 hours' running under racing conditions, or after every 5,000 miles of normal running, in order to keep the magneto in the best possible condition.

Wipe the outside of the magneto to remove dirt or grease. Pull back the rubber shrouds over the high tension pick-up and the Bowden cable stop to ensure that no moisture has penetrated them. Polish the pick-up moulding with a soft, dry cloth before replacing the shroud. The high tension cable to the sparking plug must be clean and dry.

Carefully prise the cover locking clip with a screwdriver and unscrew the contact breaker cover by hand. In the case of cover No. 458792, do not apply a spanner to the hexagon head of the banjo union, since such action may leave the union insufficiently tight on re-assembly; if the cover is found to be unusually difficult to loosen, a ¼ inch Whit. spanner may be applied to the hexagon *behind* the union.

When the contact breaker cover has been removed, take great care not to damage the V-section sealing ring on the face of the contact breaker housing.

Unscrew the hexagon headed bolt in the centre of the contact breaker and withdraw the contact breaker from its housing. Push aside the arm retaining spring and prise the contact breaker arm off its pivot. Wipe away any dirt or grease from the contacts with a petrol-moistened cloth, and if necessary polish with a very fine carborundum stone. Smear the pivot pin with a small quantity of Mobilgrease No. 2 before refitting the arm in position.

Remove the cam—it is a sliding fit in its housing—and lightly smear both inside and outside surfaces with Mobilgrease No. 2. Apply **one or two drops** of thin oil to the felt cam lubricator in the housing. Replace the cam, taking care that the stop peg in the housing and the plunger of the timing control engage with their respective slots. Both removal and replacement of the cam will be made easier if the handle bar timing control is half retarded, thus taking away the cam from its stop pin.

Before refitting the contact breaker, see that the earthing brush at the back of the contact breaker base is clean and can move freely in its holder.

Replace the contact breaker. This will be facilitated if the contact breaker heel is away from the cam lobe; turn the driving shaft until the above condition is obtained. The key on the projecting part of the contact breaker base must engage with the keyway in the armature shaft, and the securing bolt must be tightened with care—it must not be too slack, neither must undue force be used.

The main bearings of the magneto are packed with grease during assembly, and need no further lubrication.

Adjustment

The contact breaker points must be set to give a gap of .012"–.015" when fully opened. To adjust the contacts, turn the engine until the contacts are fully opened; slacken the locking nut and rotate the adjustable contact by its hexagon head until the gap is set to the correct width. Tighten the lock-nut and finally recheck the gap.

To take up slackness in the timing control cable, first expose the adjuster by slackening the clip at the upper end of the waterproofing shroud and sliding the shroud up the cable. After adjustment, see that the shroud is correctly fitted over the control barrel and that the securing clip is tightened.

For details of sparking plug gaps, method of timing the engine, etc., see the engine manufacturer's instructions.

High Tension Cables

Should the high tension cables show signs of cracking or abrasion they must be replaced. Special braided racing cable should be used with the "T.T." magnetos, and 7 mm. black rubber-covered ignition cable with the "Wading" range.

Slacken the clip on the rubber shroud and push it clear of the high tension outlet. Remove the knurled terminal moulding, and soften the solder so that the brass ferrule can be pulled from the end of the cable, together with the moulded terminal and rubber shroud.

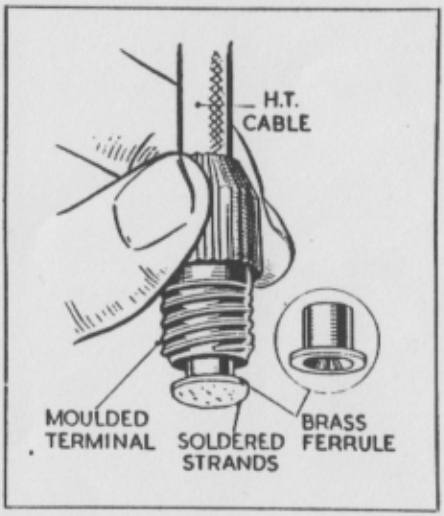

Fig. 3. High tension cable connection.

Thread the new length of cable through the rubber shroud and moulded terminal, and bare the end of it for about ½ inch. Thread the bare wire through the brass ferrule, spread the ends to fill the countersink and run solder into the hole to hold the cable in position. Screw the moulded terminal back into the pick-up, and fit the rubber shroud over it.

Timing Control Cable

The Bowden timing control cable should be renewed if it becomes frayed, as moisture may work down inside the cable casing and into the contact breaker. To do this, slip back the rubber shroud and, by means of the hexagon at the base, unscrew the plated barrel of the cable stop. If the cable and the plunger to which it is attached are pulled upwards, the nipple on the cable can be slipped out of the slot in the plunger, thus freeing the cable completely. Soften the solder and remove the nipple.

Thread the new length of cable through the rubber shroud, the cable stop, and the restoring spring. Solder the nipple to the end of the inner cable. Slip the nipple into the slot in the plunger, and screw the control barrel home into the body, ensuring that the sealing washer is correctly fitted between the barrel and the body. Take up any slack in the cable by means of the adjuster before refitting the rubber shroud into position.

LOCATION AND REMEDY OF FAULTS WITH MAGNETO ON ENGINE

Engine will not fire, or fires erratically

Remove the plug and rest it on the cylinder head while the engine is turned over. If a spark occurs, the ignition equipment is probably in order; but remember that this test is not conclusive, as a spark may not occur when the plug is under compression.

If no spark occurs, disconnect the plug and hold the end of the cable about $\frac{1}{4}$" from the cylinder head. A spark when the engine is turned over indicates that the magneto and high tension cable are in order and that the plug is probably defective. If, however, no spark occurs, fit a new length of cable and test again.

If the magneto still does not produce a spark, examine the contact breaker for dirty or worn contacts; clean and adjust as described under "Maintenance". See that the contact breaker lever can move freely and, if necessary, remove the contact breaker, prise off the lever and clean the pivot pin. Lightly smear the pivot pin with Mobilgrease No. 2 before replacing the lever. See that the earthing brush behind the contact breaker base is clean and can move freely in its holder.

Ensure that lack of lubricant round the cam has not resulted in its sticking in the "retarded" position. If necessary, remove, clean, and lubricate the cam as described under "Maintenance", taking care to avoid excess of lubricant.

If the operation of the magneto is still unsatisfactory, do not attempt to dismantle it, but get in touch, either directly or through the nearest Lucas Service Depot or Agent, with the Lucas Racing Section. The Section maintains a full-scale racing service in the field, all manner of events being covered.

LUCAS

SERVICE DEPOTS

All owners of Lucas equipment are urged to take advantage of the facilities offered by Lucas Service.

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

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

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

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In addition there are Lucas Official Battery Service Agents and Spares Stockists in important centres throughout the Country. Lists on application.

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