BSA SERVICE SHEET No. 802

October, 1948
Reprinted, Feb., 1959

B and M Group Models
MAGDYNO

The Magdyno is a combined generator and magneto unit the generator being mounted above the magneto and driven through gears from the magneto driving shaft. Details of the E3HM generator which is incorporated in the Magdyno are given in Service Sheet No. 809. The Magdyno is arranged for variable ignition by means of hand control.

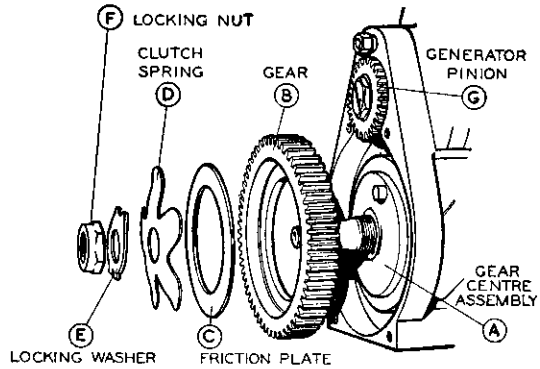

Fig. Y.5. Arrangement of slipping clutch.

A shock absorbing drive is incorporated in the larger of the two gears which take the drive from the magneto shaft to the generator. This considerably relieves the peak loading on the teeth of the driving gear and gives far longer life. The drive is taken from the gear centre 'A' (Fig. Y.5) which is keyed to the magneto shaft, through the fabric gear 'B' which is held against the gear centre under the pressure of a star-shaped spring 'D' to the pinion 'G' on the generator shaft. The effect of a violent overload is to cause the fabric gear to slip relative to the gear centre and so prevent shock from being transmitted to the fabric gear.

ROUTINE MAINTENANCE

Lubrication

To be carried out every 3,000 miles.

The cam is lubricated from a wick contained in the contact breaker base. To reach the wick, take out the screw securing the spring arm carrying the moving contact and lift off the backing spring and spring arm. The screw carrying the wick can then be withdrawn. At the same time, unscrew the contact breaker securing screw, take the tappet which operates the contact spring from its housing and lightly smear with thin machine oil. When replacing, see that the backing spring is fitted on top of the spring arm and that its bent portion is facing outwards.

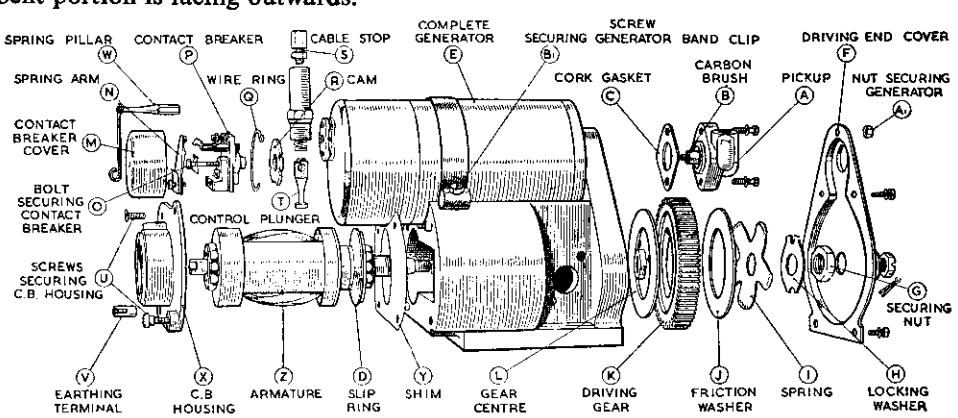

Fig. Y.6. The Magdyno (Exploded view)

Adjustment

To be carried out every 3,000 miles.

Remove the contact breaker cover and turn the engine until the contacts are fully opened. Check the gap with a gauge having a thickness of .012 in. If the setting is correct, the gauge should be a sliding fit, but if the gap varies appreciably from the gauge it should be adjusted. Keep the engine in the position to give maximum opening of the contacts, slacken the locknut and turn the contact screw by its hexagon head until the gap is set to the gauge. Finally tighten the locknut and re-check the setting.

Cleaning

To be carried out every 6,000 miles.

Take off the contact breaker cover and examine the contact breaker. If the contacts are burned or blackened, clean them with fine carborundum stone or with very fine emery cloth, and afterwards wipe away any dust or dirt with a petrol-moistened cloth. Cleaning of the contacts is made easier if the moving contact arm is removed. Procedure is given above.

Remove the high tension pick-up, wipe clean and polish with a fine dry cloth. The high tension pick-up brush must move freely in its holder. If it is dirty, clean with a cloth moistened with petrol. If the brush is worn to within $\frac{1}{8}$ in. of the shoulder it must be renewed. While the high tension pick-up is removed, 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.

Replacement of High Tension Cable

If, on inspection, the high tension cable shows signs of perishing or cracking, it must be replaced by a suitable length of 7 mm. rubber-covered ignition cable.

To fit a new high tension cable to a pick-up terminal, bare the end of the cable for about $\frac{1}{4}$ in., thread the knurled moulded nut over the cable, thread the bare wire through the washer removed from the end of the old cable and bend back the strands. Finally screw the nut into the pick-up.

SERVICING

Testing Magneto in position on engine

Testing magneto in position to locate cause of misfiring or failure of ignition:

Disconnect the cable from the sparking plug and hold it so that the terminal end is about $\frac{1}{8}$ in. from some part of the cylinder block while the engine is turned over.

If the spark that jumps from the cable end is strong and regular, the fault lies in the sparking plug, which must be removed for examination and if necessary cleaned and adjusted, or replaced.

Next examine the high tension cable. After long service it may have become cracked or perished and the magneto may be sparking through to a metal part of the engine or frame.

If the Magneto has been replaced recently it may be incorrectly timed. For instructions on retiming refer to Service Sheet No. 604. If the performance of the Magneto is still not satisfactory, the contact breaker may require cleaning or adjustment. (See Routine Maintenance.)

If the contacts are badly burned they should be renewed by a replacement contact set. If the contact breaker is in good order, there may be an internal fault in the magneto.

To Dismantle

Take off the driving end cover 'F' (Fig. Y.6) by unscrewing the four countersunk head screws. To dismantle the slipping clutch it will be necessary to use a jig (Fig. Y.7) to hold the larger gear whilst the securing nut is being undone. This consists simply of a length of $\frac{1}{4}$ in. diameter mild steel rod bent to a flat U the ends being cut short with their centres $3\frac{3}{16}$ in. apart, so that one can be slipped in the hole in the wheel whilst the other is engaged with the hole in the top of the casting through which the dynamo securing stud usually goes. A $\frac{7}{16}$ in. box spanner can then be used on the securing nut 'G' (Fig. Y.6). Note that the tab of the locking washer 'H' must be bent back first.

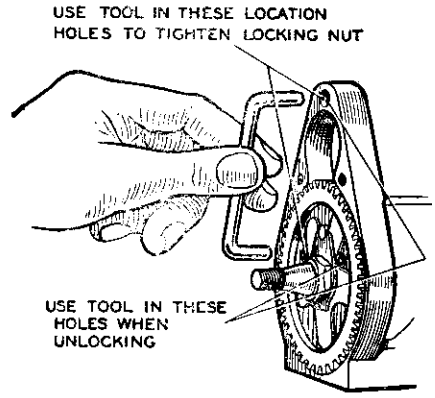

Fig. Y.7. Dismantling slipping clutch

Remove the locking washer 'H', clutch spring 'I', friction washer 'J', and driving gear 'K'.

Take off the contact breaker cover 'M', remove the spring arm 'N' carrying the contact, unscrew the bolt 'O' securing the contact breaker 'P', and draw the contact breaker off the shaft. Spring the wire ring 'Q' securing the cam 'R' out of its location in the contact breaker housing, and remove the cam. The timing control barrel and cable will have been removed when taking the Magdyno off the motor cycle. Remove the control plunger 'T'.

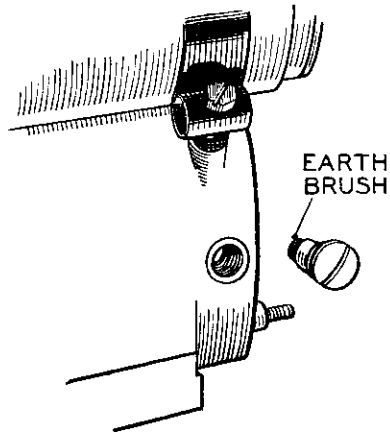

Fig. Y.8. Location of earthing brush

Remove the pick-up holder and the small earthing brush (Fig. Y.8), which will be found on the side of the Magdyno. Unscrew the screws 'U' (Fig. Y.6), earthing terminal 'V' and pillar 'W' from the contact breaker end plate 'X', and remove the plate from the

Magdyno together with the shims 'Y'. The armature 'Z' can then be removed from the machine by tapping the driving end of the shaft with a rawhide mallet to detach it from the gear centre 'L'. There is no need to put a keeper across the magnet as it retains its magnetic properties more or less indefinitely. Although it loses a certain immaterial amount of power in the first removal of the armature, subsequent removals do not affect it. Do not allow the magneto body to come in close contact with any iron filings as they may become attracted to the magnet and cause the armature to bind.

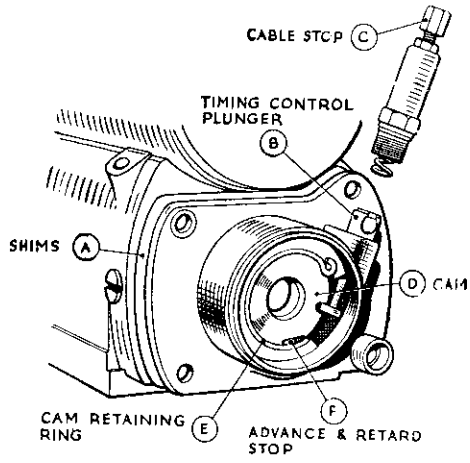

Fig. Y.9. Contact breaker housing, showing timing control mechanism

When the armature is removed, it should be examined for mechanical faults such as a cracked or bent shaft. Any defect in the winding or condenser needs special equipment to detect, and in the event of trouble being suspected, a complete service armature should be fitted.

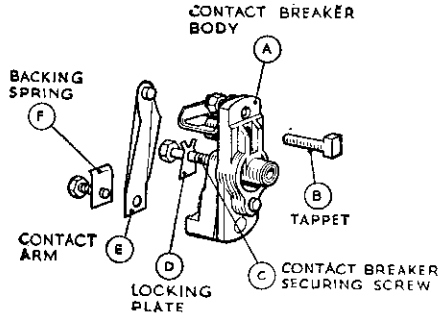

Fig. Y.10. Contact breaker tappet

It is important that the two ball bearings which support the armature shaft are in good condition. If they are packed on assembly with a suitable high melting point grease they will stand an almost unlimited amount of normal wear, but if they start to fail due to a bent shaft or other cause, they must be replaced. The balls and cages can readily be removed off the inner races which can then be pulled off the armature shaft using an extractor. The outer races can be removed with an expanding collet type extractor.

Carefully examine the slip ring and if it is damaged in any way it must be replaced. To do this take off the inner race of the bearing using an extractor, lift off the shims and the grease flinging plate and pull the slip ring off the shaft. (Note: When removing the inner race the extractor must bear on the brass shaft extension and not on the electric contact or insulator down the centre of the shaft. A disc of appropriate diameter can be placed across the face of the shaft extension.) Carefully straighten the wire coming from the armature and see that the bared end is clean and then fit the new slip ring over the shaft, taking care that the wire enters the hole in the boss in the slip ring and that it goes fully home without bending. Seal the lead-in to the slip ring boss with varnish—a special air drying varnish is used at the works but shellac varnish can be used in an emergency.

Replace the grease flinging plate, the full number of shims and inner race of the bearing.

TESTING

If test apparatus is not available, a rough check of the armature windings can be made by means of a two-volt battery (a tapping across one cell of the motor cycle battery) and an ammeter.

To check the primary winding of the armature

Screw the contact breaker retaining screw into the end of the armature shaft.

Connect one terminal of the battery to one terminal of the ammeter.

Connect the second terminal of the ammeter to the screw in the armature shaft.

Connect the second terminal of the battery to the metal body of the armature.

The ammeter will record the current taken by the armature primary winding and should be approximately 4 amperes.

To check the secondary winding of the armature

Leave the connections as detailed above for the primary winding check.

Take a piece of high tension cable about 15 in. long and bare one end back about $\frac{1}{2}$ in. and the other end about 4 in. Wrap the longer bared end round the brass insert of the slip ring and hold the other end about $\frac{1}{8}$ in. from the body of the armature.

If the lead from the battery which was connected to the armature body to test the primary winding is then flashed quickly on and off the body, a spark should occur between the high tension wire and the armature body.

Failure to spark indicates a fault either in the armature windings or the condenser and a replacement armature must be fitted.

An armature test can be carried out by connecting in series an 8-volt accumulator, a four lobe cam and contact breaker (having 45° closed period) and the armature under test, the contact breaker to coil connection being at earth potential. A 0.2 mfd. condenser must be connected across the contacts. Run the contact breaker at 750 r.p.m., giving 3,000 operations of the contacts per minute, and connect the high tension cable from the

coil to either a 3-point spark gap or rotary gap set to 13 kv. Regular sparking should occur under these conditions. Explore the surface of the winding with an earthed pointer—no flashover must occur.

It should be noted that in the above test, sparking will occur, provided that the armature winding is in order, even if the condenser in-built with the armature is open-circuited. Disconnect the 0.2 mfd. condenser from the supply circuit above when regular sparking should continue. Failure to do so indicates that the armature condenser is faulty and a replacement armature must be fitted.

If satisfactory performance is not obtained during the above test, measurement should be made of the maximum primary running current. To do this, include also in the above series circuit a moving coil ammeter (of not more than 5 amperes full scale deflection) and a variable resistance of approximately 5 ohms (of adequate current rating for cool running). Connect the H.T. cable from the coil to a 3-point spark gap set to 5.5 mm. or a rotary gap set to 9.5 kv. Run the contact breaker as before, and adjust the variable resistance until occasional missing occurs, that is, when the coil is just failing to spark regularly. Under these conditions, the permissible primary currect as read on the ammeter should be not more than 1.2 amperes.

In both the above tests, it is important that the supply voltage be maintained at 8 volts, that the cam speed be kept constant, and that the winding under test is not subjected to any external magnetic influence (e.g., it must not be tested on an iron bed-plate).

Reassembly

See that the bearings are clean and if necessary wash them in petrol and dry thoroughly. Lightly pack them with high melting point grease. Fit the inner races on the armature shaft using a hand press and a length of tube fitting over the shaft and locating on the race. Fit the balls and cages in position over the inner races and press the outer races into their housings with a mandrel of the type shown, taking care to ensure that a suitable serrated insulating washer is positioned between each race and its housing to ensure that the race is a tight fit in its housing.

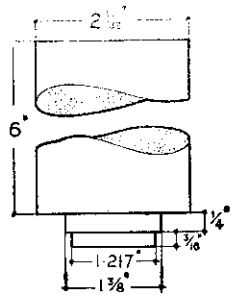

Fig. Y.11. Mandrel for replacement of outer races

See that the slip ring and metal insert are clean; if necessary carefully wipe it clean with a petrol moistened cloth. See that the inside of the magneto body is clean and free from swarf and insert the armature in the body, drive end first.

Refit the contact breaker end plate, taking care that the end plate shims are in position, and replace and tighten the end plate fixing screws. Also replace the pillar carrying the cover fixing arm.

Check the armature for end play. It should revolve freely when turned by hand, but no end play should be felt. If necessary adjust by adding or removing shims behind the contact breaker plate until adjustment is correct.

Replace the cam and contact breaker as follows:

Insert the timing control plunger in its housing, followed by the spring, and screw the timing control tube, together with cable stop, into the housing.

Place the cam in its housing with the formed surface facing outwards, position the broad slot in the cam over the timing range pin and locate the end of the control plunger in the appropriate slot in the cam. Secure the cam by springing the circlip into its location. Note that a recess is provided for the 'eye' at one end of the circlip.

See that the tappet moves freely in the contact breaker body, add a few drops of thin machine oil to the cam lubrication wick, and place the contact breaker body on the end of the armature shaft. Place the specially shaped tag washer over the contact breaker fixing screw and locating the flat side of the washer against the location provided for it in the contact breaker body, screw the bolt home and lock by bending the tags of the washer over the flats on the head of the bolt.

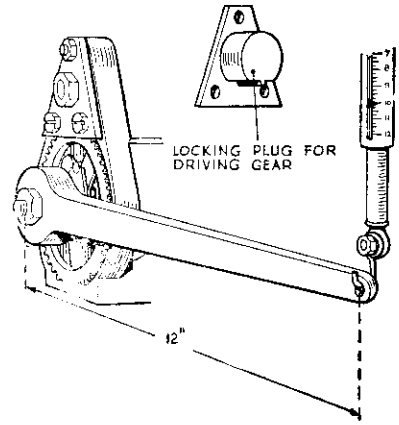

Fig. Y.12. Method of checking clutch setting

Fit the spring arm carrying the contact and also the backing spring (bent portion facing outwards), place a lock washer over the fixing screw, and fully tighten it.

Adjust the contacts to the correct setting (see Routine Maintenance) and replace the contact breaker cover.

See that the pick-up is clean and the brush moves freely. Place the cork washer in position on the magneto body, followed by the pick-up and secure by means of the fixing screws or spring arm.

Check that the earthing brush moves freely in its holder and screw it into the magneto body.

To reassemble the slipping clutch, key the gear centre 'A' (Fig. Y.5) on to the spindle, replace the driving gear 'B', friction washer 'C', clutch spring 'D', locking washer 'E', and secure by tightening the fixing nut 'F' fully. The U-shaped jig must be used to prevent rotation of the shaft while tightening the nut.

After assembling, the setting of the clutch must be checked, This can easily be done by locking the driving gear and applying a steady load on the driving spindle, as shown in Fig. Y.12. The clutch should slip with a torque of 4—10 lbs. feet or more, i.e., a 4—10 lb. pull measured on a spring balance via a spanner 12 in. long. If slipping occurs at a value outside these limits, a new clutch spring must be fitted.

B.S.A. MOTOR CYCLES LTD.
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JU/B2983

Printed in England.