

SERVICE SHEET No. 810

Model DI

December 1948.

UP TO ENGINE No. YD1-40660

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WICO-PACY "GENI-MAG" EQUIPMENT

DESCRIPTION

The 30-watt 'Geni-mag' ignition and lighting unit embodies two assemblies, namely the Flywheel and the Stator which carries the ignition coil, lighting coils, contact breaker unit and condenser. The cam is fitted to the extended crankshaft of the engine and is located by a keyway.

The 'Geni-mag' ignition unit provides a high performance spark output over a very wide range of speeds, special attention having been paid to the needs of the modern light-weight motor-cycle of the 125 c.c. class and of the motorised bicycle. While an excellent spark performance of about 8,000 volts at only 500 r.p.m. rising to 14,000 volts at 6,000 r.p.m. is obtained, it has yet been found possible to maintain an exceptionally large air gap between rotor and stator, thus considerably increasing the probability of a trouble-free system. Additional support is provided for the end of the crankshaft by the inclusion of a self-oiling bearing located in the centre of the stator housing.

A characteristic of the magneto is that its spark output will not vary over a wide timing range, thus rendering frequent adjustment of the contacts unnecessary, and at the same time allowing a fair tolerance for the accuracy of the setting. A further feature of the magneto is the accessibility and ease of adjustment of the contact breaker and other parts without the necessity of removing the flywheel at any time.

No engine timing is necessary; fit the stator housing slots central over the studs on the crankcase, tighten up the nuts, fit the cam which locates on a key in the engine shaft, set the contacts to .015 in., and the engine is timed. Any minor adjustment can be carried out while the engine is running. To advance the magneto, slacken off the stator housing nuts and slightly rotate the magneto in the opposite direction to the rotation of the flywheel.

The lighting coils are energised by the three magnetic units which concentrate a powerful magnetic charge within a small space and volume, the characteristic being such that brilliant lighting is obtained without flickering at a low speed, while the rise of output above the rated wattage is sufficiently low as not to allow the lamps to be seriously overloaded at maximum engine speeds, which are in the region of 6,000 to 7,000 r.p.m. One of the three magnet units also energises the ignition coil.

RUNNING MAINTENANCE

The magneto requires very little maintenance and if the following notes are observed the life of the machine should prove trouble free.

Check and if necessary re-adjust the contacts once every 5,000 miles. (See Service Instructions).

Occasionally clean the contacts by inserting a dry smooth piece of paper between them and withdrawing while the contacts are in the closed position. Do not allow the engine to run with oil or petrol on the contacts or they will start to burn and blacken, and if they do, lightly polish with a piece of smooth emery cloth.

Moisten the cam lubricating pad with a few drops of thin oil every 5,000 miles.

Do not run with a faulty or damaged high-tension lead and clean away mud and dirt from around the H.T. insulator when necessary.

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If the magneto requires any attention beyond the replacement of contact points and condenser, it is recommended that the complete machine should be sent to us or to an authorised Wico service station. The following information is given for the benefit of those unable to do so:

SERVICE INSTRUCTIONS

Checking the Magneto for spark

If the engine fails to start and there is an indication of the magneto causing trouble, the spark can be checked by holding the H.T. lead $\frac{3}{16}$ in. away from a point on the frame. When the engine is kicked over in the usual way, a spark should jump this gap. If no spark is visible, see that the H.T. lead is in good condition and examine the contact breaker. Make sure there are no metallic particles inside the housing and that the contacts are perfectly clean, and the gap is correct to the recommended setting. If the contacts are found to be in a burnt or badly pitted condition, a faulty condenser is indicated. If the contact breaker appears to be in order the stator plate may be removed from the engine complete with coils and the leads of the ignition coil should be examined to ensure that there is no break in the wiring. One lead will be found to be joined to a tab which is clamped underneath one of the nuts which anchor the stator to the stator housing. If this is in order check the other end of the primary ignition coil which is connected to the back of the insulated post which projects into the contact breaker recess at the front of the magneto. The screw which locks this in position will be found underneath the lighting coil on the right-hand side looking at the inside of the stator housing when in its upright position. The condenser lead is also joined to this point. If both these are connected and the tabs are not earthing on the stator plate the ignition coil should be in working order. In the unlikely event of the H.T. insulation of the secondary coil breaking down, it should be possible to detect signs of charring either on the binding tape of the coil, the insulating gaskets or the H.T. insulator.

Replacement of Coil

To remove the coil, the H.T. insulator which is held by two screws outside the housing must be taken off. The removal of the stator is effected by unscrewing the three clamp nuts. The stator may then be gently eased off the three stator plate studs. Care must be taken not to jerk it, otherwise the lead which connects the lighting coils to the terminal on the stator may be broken. The live end of the primary ignition coil lead must then be disconnected from the contact breaker terminal post. In order to slide the coil from the iron limb, it is necessary to straighten the small brass tab which will be found on the side of the coil which faces the stator housing. If the coil is grasped firmly in one hand with the fingers under the insulator gaskets and on either side of the core, it may be quite easily pulled off. To refit the ignition coil proceed as follows:

- (a) Hold the coil in the left hand with the brass contact pointing away from the line of vision and the lead wires projecting downwards from the underside, and drop the leads through the rectangular hole in the two insulating gaskets, the extended end of which must point in the same direction as the coil tab.
- (b) With the other hand push the coil core through the coil making sure that the brass locking tab riveted to the iron is on the same side as the coil contact. Drive the fibre wedge provided in between the core and the coil on the same side as the locking tab and bend over the tab.
- (c) Connect up the sleeved lead to the terminal post placing the other parts in the following order:

Screw, shake-proof washer, condenser tab, coil lead tab, thick metal washer and insulating washer.

Then holding the outer end of the contact breaker terminal post in the square hole, with the finger of the other hand, drop the screw complete with washers into the round recess at the inner end of the square hole and drive the screw home.

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- (d) Finally, bend both tabs slightly upwards to ensure that they do not make contact with the metal housing, screw down the stator anchoring the lighting and ignition coil earthing leads under the clamp nuts making sure at the same time that the coil insulator gaskets are bent upwards towards the H.T. insulator hole in the stator housing.
- (e) Make sure that all tabs are clean and all clamped connections are tight, and before lowering the stator see that none of the coil leads become clamped in between the stator and the housing.

IMPORTANT

Bend in all stray loops of wire to behind the radius of the stator and push down the condenser wire into the well of the stator housing to ensure that they do not foul the rim of the flywheel. The flywheel rim reaches to within about $\frac{1}{16}$ in. of the head of the insulated lighting terminal stud, and it is important to see that the live wire which is soldered to it is pushed down to well below this level.

- (f) Re-fit the H.T. insulator.

Removal of Condenser

To change the condenser it is necessary to lift the stator as before described, and disconnect the lead from the terminal post and unscrew the clamp nut which is located on the contact breaker cover spring post. When replacing, make sure that the condenser lead is pushed down as far as possible into the well formed by the stator housing otherwise there is a danger of the flywheel rubbing and possibly severing it.

Adjustment and replacement of Breaker Points

The only adjustable part of the magneto is the breaker plate which provides for the setting of the breaker points.

To set these points proceed as follows :

Turn the engine over until the breaker points are fully open and insert the feeler gauge. Slacken off the locking screw which is to be found immediately above the points and if the gauge is tight rotate the eccentric adjuster in an anti-clockwise direction until the correct setting of .015 in. is obtained. Tighten up the adjusting screw.

The breaker point setting should only be adjusted in the manner described and at no time should the fixed contact be bent to provide adjustment.

The moving contact is integral with the breaker arm. If the points need replacement it is recommended that both fixed and movable points be replaced at the same time.

The breaker arm bearing is of the self-lubricating type and it is only necessary to lightly prime the pivot pin with oil or soft grease when assembling. Care must be taken to put in the correct number of thin spacing washers behind the breaker arm, in order to bring the contacts in line with one another. The end of the contact breaker spring is then anchored to the terminal post with a screw and shakeproof washer. Place one of the spacing washers over the pivot on the outer side of the breaker arm and insert the spring clip in its groove.

The Lighting Coils

In the unlikely event of any fault developing with these coils, the removal and replacement of them is a simple operation and may be performed without disturbing the ignition coil. The windings are in series and are made up in pairs complete with earthing tab and insulated terminal screw. To remove the lighting coils, take off the H.T. insulator and

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unscrew the three stator clamp nuts. Take out the insulated terminal screw which projects from one of the cavities on the face of the stator plate. Straighten with a pair of pliers the two outer laminations on each coil core, which are bent outwards to hold the coils in position, and slide off the coil formers after slightly raising the stator on the studs in the stator plate. Replace in the following order:

With the coil which carries the insulated terminal screw on the side nearest to the screw hole in the stator housing, and the slotted flanges of the two coil formers pointing towards the centre of the stator and the slots downwards, slide the two coils on to their cores. Insert the fibre wedges provided into the arc formed between the cores and the coil formers, and bend out the two outer laminations on each leg, taking care not to split the bakelite former on which one of the coils is wound. Push down the stator on to its locating spigot. See that neither the ignition leads nor the lighting coil leads become clamped between the flange at the base of the spigot and the stator. Re-assemble the insulated terminal screw into the stator housing. Finally, tighten up the clamp nuts with the tabs in position and push any wire loops well back behind the working faces of the stator legs to prevent them from fouling the flywheel.

The Flywheel

The robust construction of the flywheel reduces the possibility of any faults on this unit to a minimum. The three powerful magnet inserts are cast in the rim of the wheel and it is not possible to demagnetise them by ordinary usage. No keepers are necessary when the magneto housing and stator are removed. The boss of the flywheel is located on the crankshaft by a keyed taper and locked by a nut and shakeproof washer. It is unnecessary to remove the flywheel unless at any time the engine has to be dismantled. A thread cut on the outside of the flywheel boss enables the wheel to be removed by use of a special extractor. When replacing, the flywheel must be perfectly clean inside and outside.

CAUTION

The 27 watt 'Geni-mag' which is purely an A.C. Unit, has now been superseded by the S55/KM8 Ignition Generator.

As the new unit incorporates extra magnets in the Flywheel, all users should make careful note, that although similar in appearance the *Flywheels of the two units are not interchangeable*. The flywheel of the new type generator can easily be identified because it is clearly marked 'WIPAC AC/DC.'

Care must also be taken to use the correct flywheel with the appropriate Stator Plate, as if the new flywheel is used with the old type 'Geni-mag' Plate, trouble will be experienced with lamps blowing or alternatively if the new Stator Plate is used with the old type 'Geni-mag' Flywheel, insufficient lighting output will be obtained.

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MODELS D1, D3 and D5

Wipac Flywheel Ignition Generator Series 55 Mark 8

SPECIAL NOTES.

The Series 55 Mark 8, Spec. No. IG 1130 AC/DC Generator superseded the 27 watt "Genimag," which was purely an AC unit. This change took place on and after Engine No. YD1-40661. As this unit incorporated extra magnets in the flywheel, all users should make careful note of the fact that, although similar in appearance, the **flywheels of the two units are not interchangeable.** If the latter type flywheel is used with the "Genimag" stator plate, trouble will be experienced with bulbs blowing. Alternatively, if the "Genimag" flywheel is fitted with a later type stator plate, insufficient lighting output will be obtained.

On machines manufactured after August 1955, different generators are used for AC and DC equipment. These are marked Spec. No. IG 1452 for AC only (D1, D3 and D5 models), Spec. No. IG 1454 for DC only (D1 models), and Spec. No. IG 1450 for DC only (D3 Swinging Arm models). The two DC units are the same, except for the lengths of the leads.

When the generator complete, or the stator plate Spec. No. IG 1130, is replaced by one of the later DC units, the yellow link between terminals 9 and 11 in the headlamp switch must be removed in order to limit the charge rate in the "Low" position.

As the later type AC and DC stator plates are not interchangeable, it is necessary to specify AC or DC when ordering spares.

From 1950 onwards (Engine No. YD1-40661) the flywheels are the same for AC and DC. For models prior to this, the complete generator should be changed when renewing the stator plate.

The AC generator Spec. No. IG 1452 cannot be converted to DC by means of a Wipac

"Convertakit," unless a new three coil stator plate is also fitted.

DESCRIPTION.

This ignition and power unit consists of two assemblies, namely the flywheel rotor, and the stator plate which carries the ignition coil, low tension coils, contact breaker and condenser. The cam is fitted to the extended crankshaft of the engine and is located by a key.

Additional support is provided for the end of the crankshaft by the inclusion of a self-oiling bush in the centre of the stator housing.

The unit provides a high performance spark output over a very wide range of speeds. While approximately 10,000 volts at only 500 r.p.m. rising to 15,500 volts at 6,000 r.p.m. is obtained, it has been found possible to maintain a large air gap between rotor and stator to ensure a trouble free unit.

A characteristic of the ignition generator unit is that its spark output will not vary over a wide timing range, thus rendering frequent adjustment of the contacts unnecessary, and at the same time allowing a fair tolerance for the accuracy of the setting.

A further feature of the magneto is the accessibility and ease of adjustment of the contact breaker and other parts, without the necessity of removing the flywheel rotor. In fact, it is unlikely that, at any time, it will be necessary to remove more than the stator cover plate; the stator being so designed that all adjustments, and even condenser replacement, can be made from the front of the unit.

No engine timing is necessary; fit the stator plate slots central on the fixing screws and tighten up these screws, locate the cam on the key in the engine shaft, set the contacts to .015" and the engine is timed. Any minor adjustment can be

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made while the engine is running. To advance the magneto, slacken off the stator plate fixing screws and slightly rotate the magneto in the opposite direction to the rotation of the fly-wheel rotor.

Occasionally, it may be found that an engine will not start nor run unless the contact breaker points setting is about .006" to .008", instead of the correct figure of .015". This is caused by the points opening before the magnetic flux has been broken, so that no voltage is produced.

The first remedy to try is to reverse the small Woodruff cam key. Should this effect no improvement, a special cam, ground 5° late, can be obtained from the makers.

The low tension coils are energised by the three magnetic units, which concentrate a powerful magnetic charge within a small space. One of these units energises the ignition coil. The generator has been designed to produce AC current directly into a 6v. 30 watt load or, with the aid of a metal plate rectifier in the external circuit, produce DC current for battery charging.

With the IG 1130 generator, a maximum day charge of 2.5 amps is allowed to pass through the battery. During night use with a 6v. 30 watt lamp load, a generated balance against this battery drain is accomplished at approximately 3,000 r.p.m. of the engine. A charge of $\frac{3}{4}$ amp is allowed at maximum engine speed.

The IG 1450 and IG 1454 generators have a higher rate of charge, giving slightly more than 3 amps at maximum engine speed. At night, the full lamp load is balanced at approximately 2,800 r.p.m., and a charge of 1.5 amps is obtained at 4,500 r.p.m. Batteries of 5, 10 or 12 amp-hour rating are equally suitable for use with these generators, the higher capacities being recommended.

RUNNING MAINTENANCE.

The magneto requires very little maintenance and if the following notes are observed the life of the machine should prove trouble free.

Check] and if necessary re-adjust the contacts once every 5,000 miles. (See Service Instructions.)

Occasionally clean the contacts by inserting a dry smooth piece of paper between them and withdrawing while the contacts are in the closed position. Do not allow the engine to run with oil or

petrol on the contacts or they will start to burn and blacken, and if they do, lightly polish with a piece of smooth emery cloth.

Moisten the cam lubricating pad with a few drops of thin oil every 5,000 miles.

Do not run with a faulty or damaged high-tension lead and clean away mud and dirt from around the H.T. insulator when necessary.

If the magneto requires any attention beyond the replacement of contact points and condenser, it is recommended that the complete machine should be sent to us or to an authorised Wico service station. The following information is given for the benefit of those unable to do so:—

SERVICE INSTRUCTIONS.

Checking the Magneto for Spark.

If the engine fails to start and there is an indication of the magneto causing trouble, the spark can be checked by holding the H.T. lead $\frac{3}{16}$ " away from a point on the frame. When the engine is kicked over in the usual way, a spark should jump this gap. If no spark is visible, see that the H.T. lead is in good condition and examine the contact breaker.

Make sure there are no metallic particles inside the housing, and that the contacts are perfectly clean, and the contact breaker gap is correct to the recommended setting.

If the contacts are found to be in a burnt or badly pitted condition, a faulty condenser is indicated. If the contact breaker appears to be in order, the stator plate may be removed from the engine, complete with coils.

To do this the following procedure should be adopted:—

Unscrew the two cover securing screws and remove the cover, unscrew the cam screw and withdraw the cam free of the shaft. The small cam key in some instances may leave its keyway, so care should be taken to make sure of this point when taking the cam from the shaft. Next remove the three stator plate securing screws. The stator can now be withdrawn clear of the engine.

The leads of the ignition coil should be examined to ensure that there is no break in the wiring. One lead will be found to be joined to a tab which is clamped underneath one of the nuts which anchor

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the stator coil assembly to the stator housing. If this is in order, check the sleeved lead of the primary ignition coil which is connected to the front of the insulated post, which also carries the condenser lead and contact breaker return spring.

The screw which locks the insulated post in position will be found underneath the low tension coil on the right-hand side looking at the inside of the stator housing when in its upright position.

There is, however, no need to remove this screw for any of the investigations recommended in these instructions. The second screw lying at a larger radius and appearing over the top of the coil is the earthing screw for the No. 2 terminal on the front of the machine.

If the leads joined to the insulated post are in order and firmly clamped and the tags not earthing in any way, the ignition coil should be in working order. Should it be necessary to completely remove the stator plate entirely, the low and high tension leads should be freed from the insulated terminal boards on the front of the unit and the plugs respectively, the former by the loosening off of the grub screws and withdrawing the low tension leads which are coloured through the rubber insulator. The stator plate assembly should then be entirely free of the engine.

In the unlikely event of the H.T. insulation of the coil breaking down, provided this is not internal, it should be possible to detect signs of charring on the binding tape of the coil. If the absence of spark is due to tracking, track burns may be visible on the insulator gasket.

Replacement of Ignition Coil.

The removal of the stator coil assembly is effected by first disconnecting the ignition lead from the coil, then freeing the white, red and green low tension leads from the terminals marked 3, 1 and 4 respectively, and unscrewing the two clamp nuts. The live lead of the primary winding of the ignition coil must then be disconnected from the insulated post by removing the securing screw. The stator coil assembly may then be gently eased off the two plate studs.

In order to slide the ignition coil from the iron limb, it is necessary to straighten the small brass tab which will be found on the side of the coil which faces the stator housing. If the coil is grasped firmly in one hand with the fingers under the insulator gasket and on either side of the core, it may be quite easily pulled off.

To refit the ignition coil proceed as follows:—

- (a) Hold the coil in the left-hand with the brass contact pointing away from the line of vision and the lead wires projecting downwards from the underside, and drop the leads through the rectangular hole in the insulating gasket, the extended end of which must point in the same direction as the coil tab.
- (b) With the other hand, push the coil core through the coil, making sure that the brass locking tab rivetted to the iron is on the same side as the coil contact. Drive the fibre wedge provided in between the core and the coil, on the same side as the locking tab and bend over the tab.
- (c) Replace the stator coil assembly in position on the stator plate and before pushing right down on the studs, bring the sleeved low tension lead of the ignition coil inside the base of the right hand stator core stud. This keeps the lead clear of the flywheel rotor. Pass the low tension leads through to the front of the unit. Note also that none of the coil leads become clamped in between the stator and the housing.
- (d) Press the core down firmly and tighten down the two clamp nuts anchoring the ignition coil earth lead tab underneath the left-hand nut
- (e) Reconnect the sleeved ignition coil lead to the insulated post together with the condenser lead tab and the contact breaker return spring. Firmly screw home the securing screw.
- (f) Reconnect the ignition lead to the H.T. terminal of the ignition coil, and reconnect the low tension leads to the appropriate terminals as follows:—

The white lead to No. 3, green to No. 4 and red lead to No. 1 terminal on the front of the unit.
- (g) Make sure that all tabs are clean and all clamped connections are tight.

IMPORTANT: Bend all stray loops of wire to behind the radius of the stator to ensure they do not foul the rim of the flywheel rotor.

Removal of Condenser.

To replace the condenser, remove the condenser terminal nut and free the condenser lead. Unscrew

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the condenser bracket fixing screw and withdraw the condenser.

Adjustment and Replacement of Breaker points.

The only adjustable part of the magneto is the breaker plate which provides for the setting of the breaker points. To set these points proceed as follows:—

Turn the engine over until the breaker points are fully open and insert the feeler gauge. Slacken off the locking screw which is to be found immediately above the points, and if the gauge is tight, adjust the fixed contact plate, by means of a suitable screwdriver engaged in the recess provided, in an anti-clockwise direction until the correct setting of 0.015" is obtained. Tighten up the fixed contact plate locking screw. The breaker point setting should only be adjusted in the manner described and at no time should the fixed contact platform be bent to provide adjustment. The moving contact is integral with the breaker arm. If the points need replacement it is recommended that both fixed and moving points be replaced at the same time.

When assembling the moulded breaker arm to the magneto it is necessary to lightly prime the pivot pin with oil or soft grease and an occasional priming throughout its life will be found to be advantageous.

Care must be taken to put in the correct number of thin spacing washers behind the breaker arm in order to bring the contacts in line with one another. The free end of the contact breaker spring is then anchored to the insulated terminal post with a screw and shakeproof washer. The condenser and primary ignition coil sleeved lead is secured by the same screw and washer. Place one of the spacing washers over the pivot on the outer side of the breaker arm and insert the spring clip in its groove.

The Low Tension Coils.

These coils are robust in character and are most unlikely to develop fault. In the event of a fault developing in the coil group, the removal more so than the replacement, of the coil or coils may not be an easy operation, and it is likely that further damage to the windings will occur during the removal process. It is advisable before any steps are taken to remove the low tension coils, that the coils be thoroughly checked and proved beyond

doubt to be at fault. The coils are secured to the iron core by means of a varnish adherent assisted by a fibre wedge. Paper formers are used, so damage to the windings can occur when being taken off.

In view of this, it is strongly recommended that should a fault occur in the low tension coil group, that application be made for a coil group replacement already secured to the iron core.

The ignition coil can be removed from the stator assembly as previously described and replaced on the new stator core and coil group replacement. Having completed the coil assembly, proceed as instructed under paragraph "Replacement of Ignition Coil."

Care should be taken to see that the wire connections face toward the front of the machine when assembling the stator coil assembly into the housing.

Any wire loops or wires that could come into contact with the flywheel rotor should be pushed back clear to prevent any fouling or electrical breakdown.

Finally, when connecting the low tension leads of the frame wiring to the magneto generator, make sure that the white, red and green leads are placed on the machine terminals already carrying that colour of lead. This is part of a colour coding scheme, the complete scheme of which is given with the wiring diagram.

The Flywheel Rotor.

The robust construction of the flywheel rotor reduces the possibility of any faults on this unit to a minimum. The three powerful magnet inserts are cast in the rim of the rotor and it is not possible to demagnetise them by ordinary usage. No keepers are necessary when the magneto housing and stator are removed. The boss of the flywheel rotor is located on the crankshaft by a keyed taper and locked by a nut and shakeproof washer. It is unnecessary to remove the rotor unless at any time the engine has to be dismantled. A thread cut on the outside of the rotor boss enables it to be removed by the use of a special extractor. When replacing, the rotor must be perfectly clean inside and out.