



BY APPOINTMENT

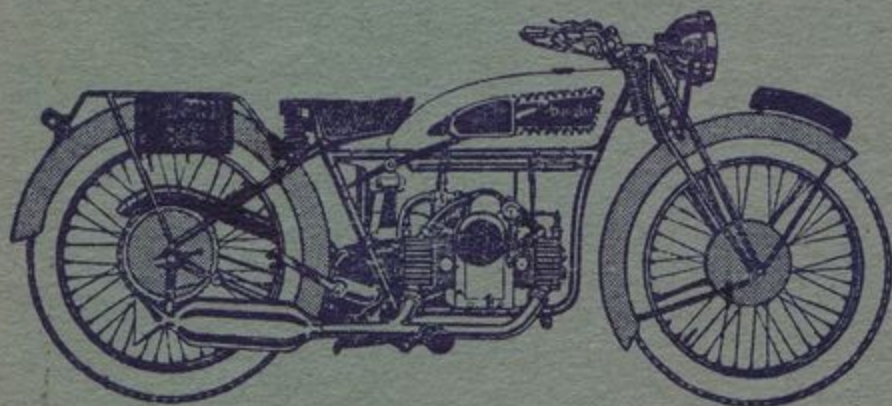
CARE & MAINTENANCE

OF THE

A. B. C. K. & M. MODELS

1932.

Douglas



Douglas Motors (1932) Ltd.,
KINGSWOOD — BRISTOL.

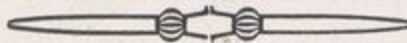
RUNNING INSTRUCTIONS

FOR

Douglas

MODELS,

A. B. C. K. & M. 1931—32.



WHEN taking delivery of the machine, make sure that no damage has been done in transit. All machines are tested before leaving the factory and should reach you in proper running order.

It is advisable to use the machine carefully for the first 500 miles, as it is impossible to give a test over such a distance before finally leaving the Works. Do not exceed 30 m.p.h. in the initial stages and do not attempt to cut the oil and petrol consumption down to the minimum until the machine is thoroughly run in.

The machine is now ready to be started. Gears should be in neutral position and petrol tap should be turned on, the tap is of the "Push" type being clearly marked, and the carburetter slightly flooded by means of the tickler on top of the float chamber. This has the effect of causing a slight

increase of fuel which enriches the mixture, and so facilitates an easy start. The air lever of the carburetter should be closed and the throttle lever opened approximately one-third.

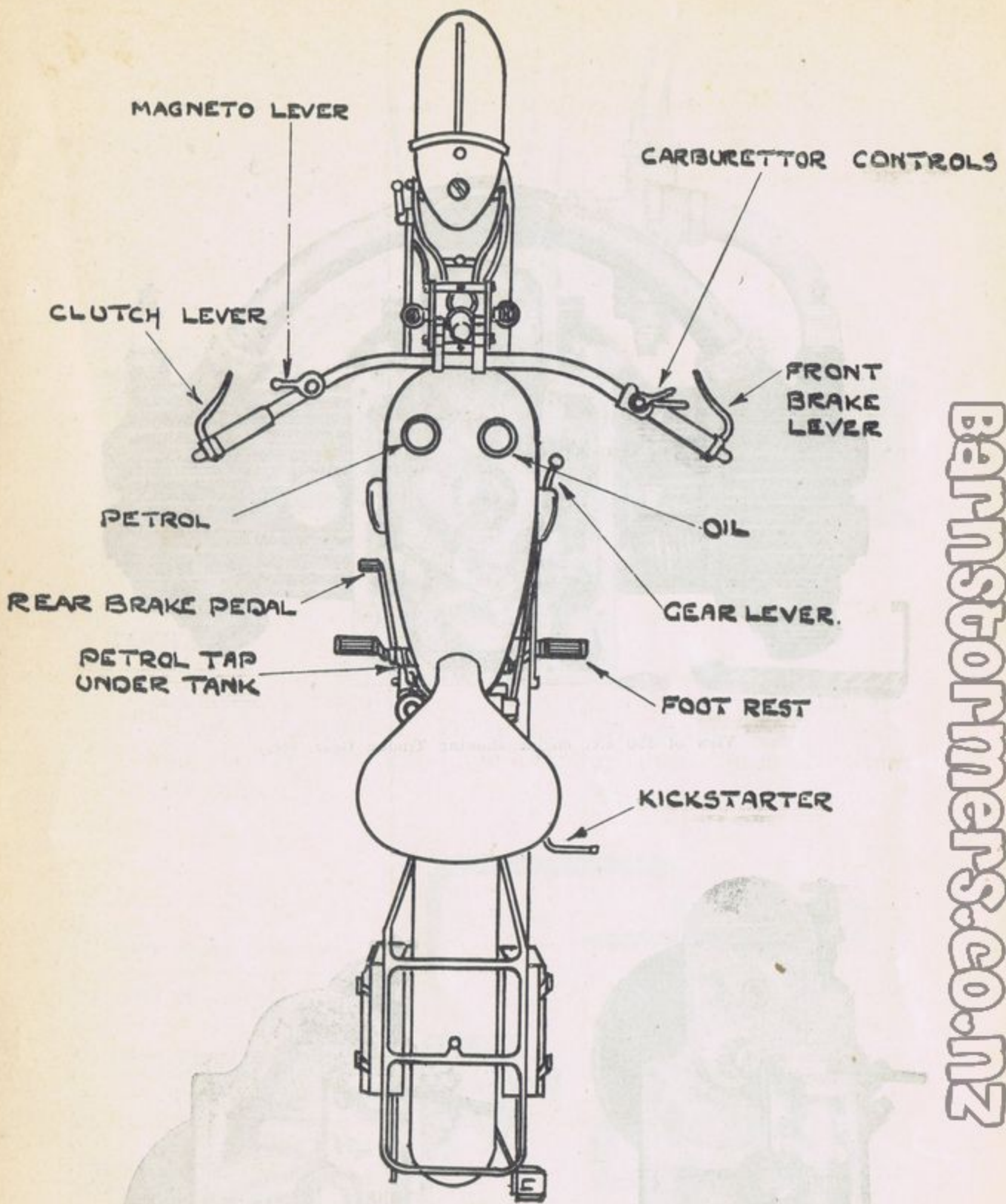
The magneto should be retarded by means of the control lever fixed to the L. H. handlebar which should be set in a position representing the middle of its range. It should be noted that to advance the ignition the lever has to be pulled inwards and that the spark should always be kept advanced except when pulling up steep hills or under a heavy load.

The engine is turned by means of depressing the kick start lever. It should be depressed quite smartly when the engine will start immediately.

If difficulty is experienced, and the plugs do not appear to be sparking, they should be removed, and any foreign matter which may have got between the plug points cleaned away.

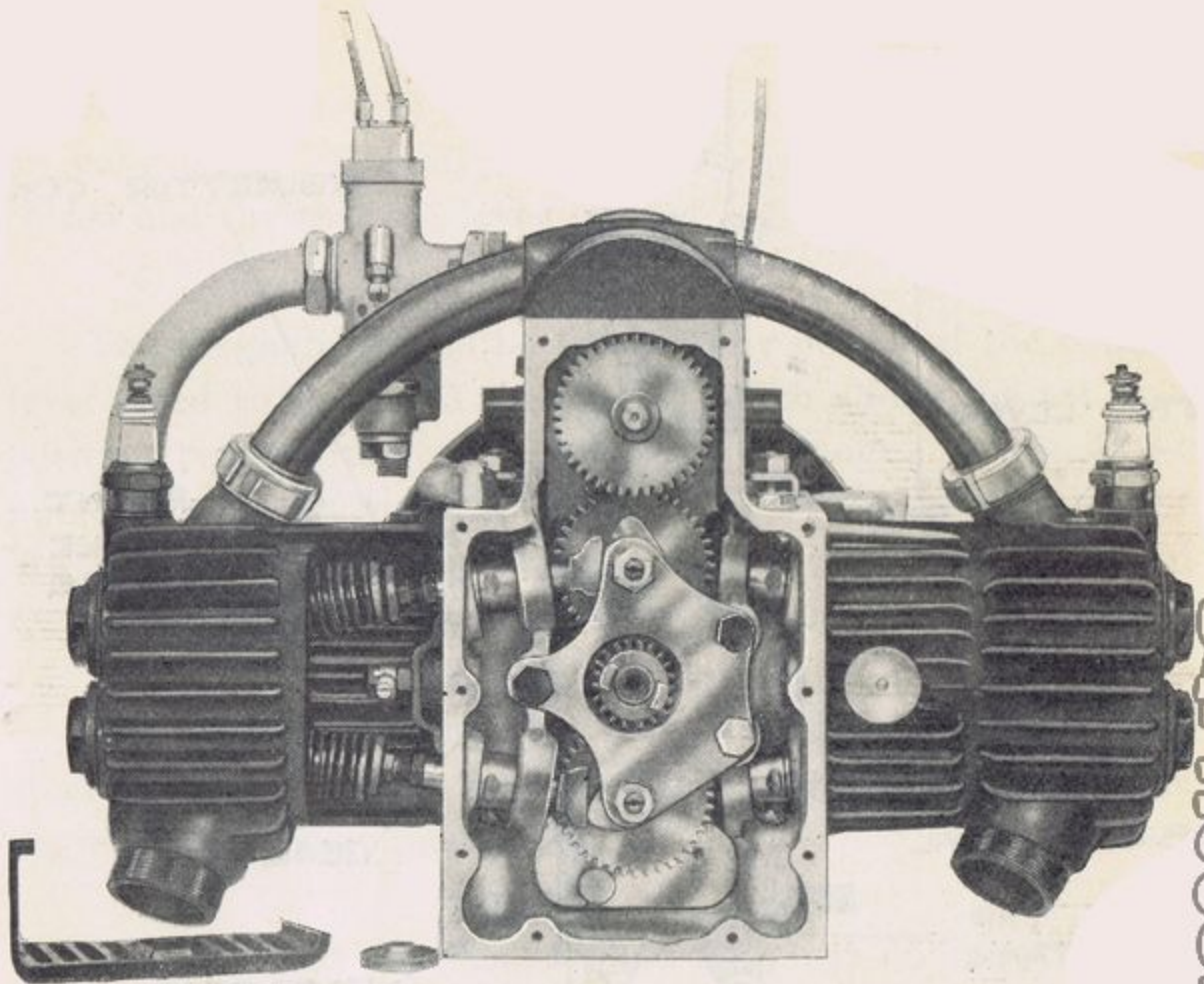
Upon sitting astride the machine the clutch lever will be found on the left bar, being of the inverted type. This lever should be depressed to the end of its travel, and the first gear engaged by pushing the ebonite knobbed gear lever into its forward or downward position. To move off, the engine speed should be very slightly increased by the opening of the lever on the right-hand handlebar, and releasing the clutch lever very carefully and slowly.

The machine should now pass gently into motion, when the speed should be increased by alteration of the throttle until it is sufficient to engage second gear, this being carried out by withdrawing the clutch lever, and pulling the gear lever into middle position. When sufficient speed is gained the same operation is carried out to engage top gear. After some time and experience much better changes can be made by closing down the throttle when changing up, but increasing the engine speed when changing down.

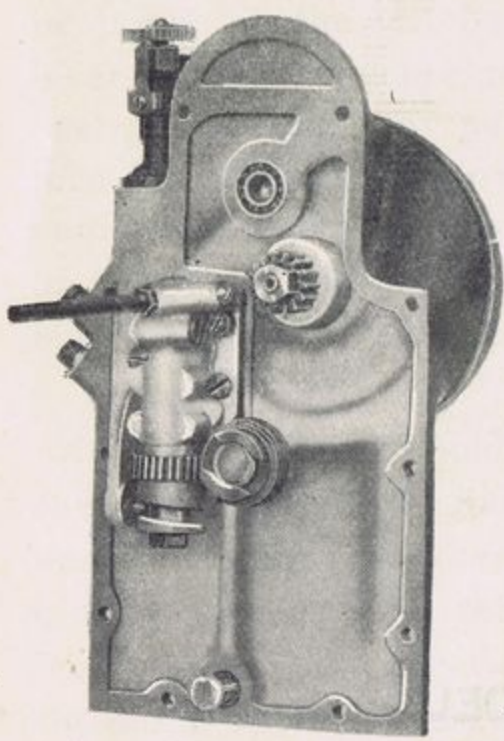


PLAN OF 350cc MODEL

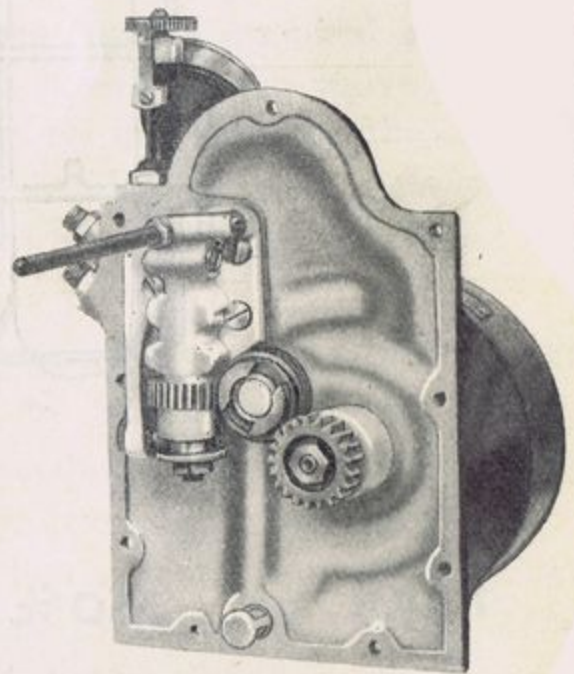
SHOWING POSITION OF
CONTROLS.



View of 350 c.c. engine showing Timing Gear, etc.

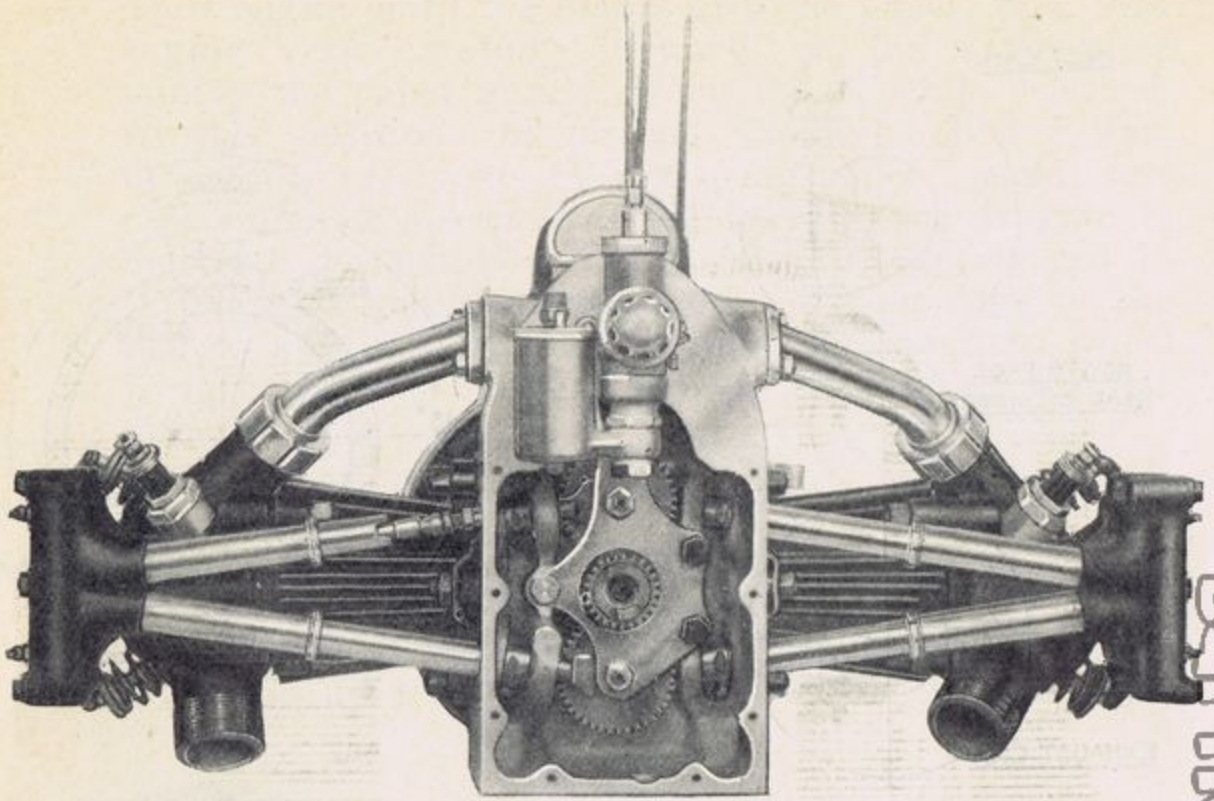


Models A. B. and C.



Models K, and M.

Timing Covers showing Oil Pump and Drive.



View of O.H.V. Engine showing Timing Gear.

TOOLS.

A set of special tools for use on these machines, has been prepared, particulars of which can be obtained from the Spares Department. These tools are conducive to quicker and better repairs. Quote the part number when ordering.

CA 8642
Valve Spring Compressor.

CA 11923 Flywheel Extractor.

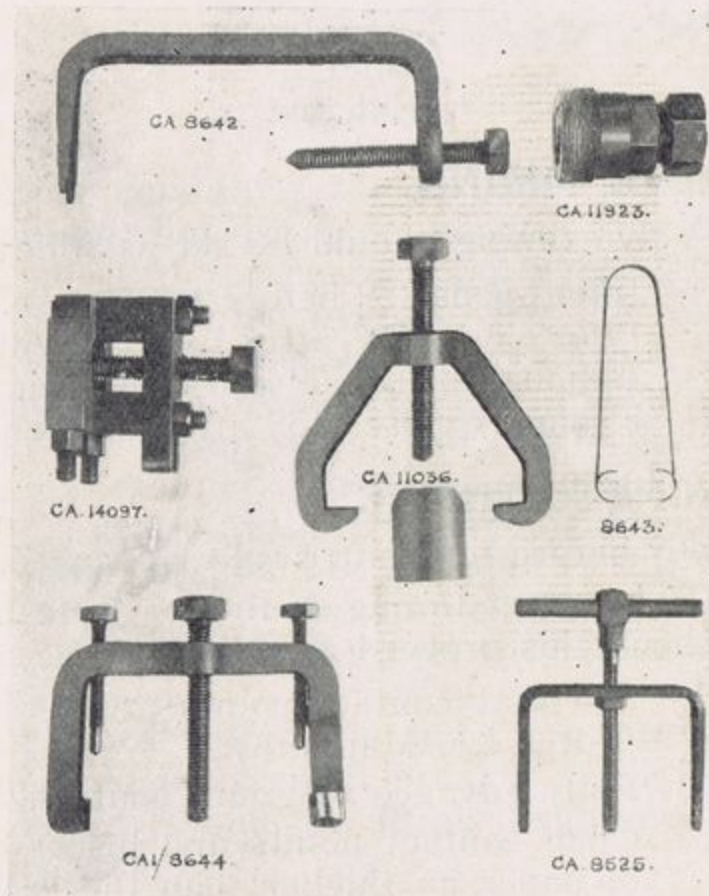
CA 14097 Tool for removing
roller bush of mainshaft.

CA 11036 Tool for removing
gear box sprocket.

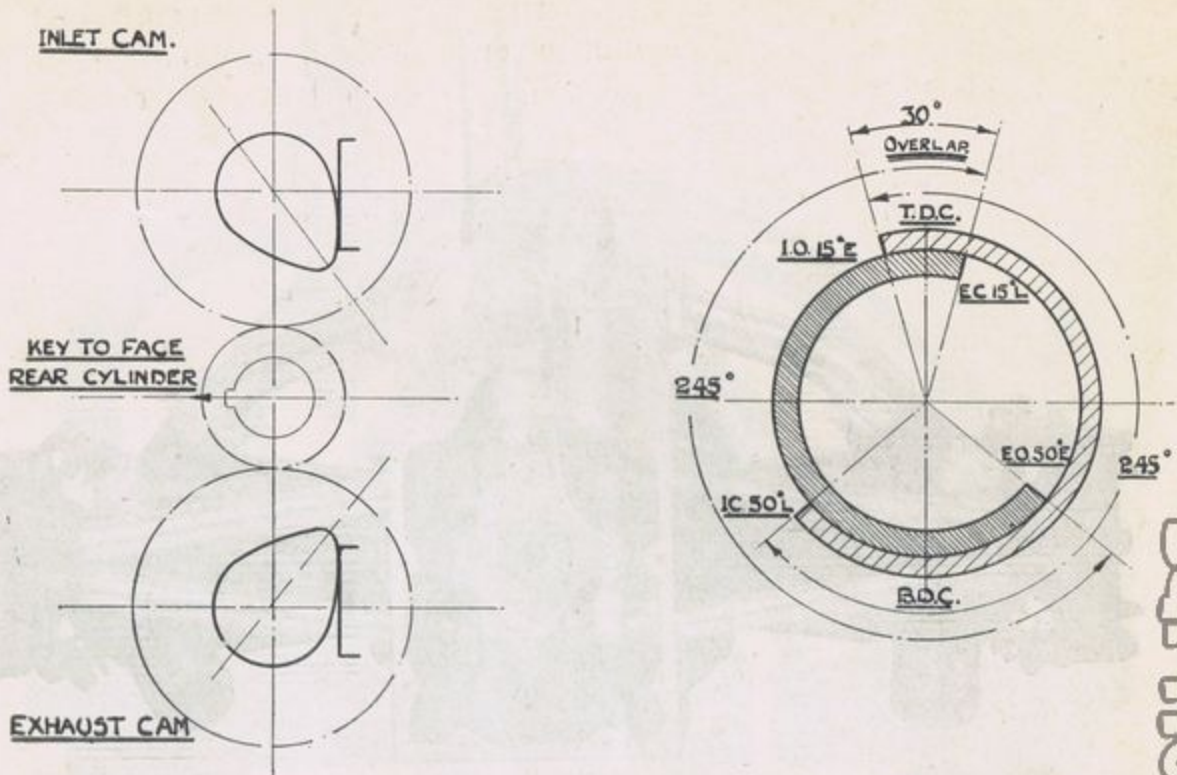
8643 Tool for inserting
Collets.

CAI 8644 Tool for removing
Gear Box Chain Wheel.

CA 8525 Tool for Compressing
Flywheel Clutch Spring.



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TAPPET CLEARANCES.

The following tappet clearances should be given.

SIDE VALVE.

Inlet	...	...	...	.006"
Exhaust	...	...	...	.006"

O.H.V.

Inlet	...	...	...	.002"
Exhaust	...	...	...	.004"

VALVE TIMING.

Valve timing should be set as follows:—

- Inlet opens 15° before top centre.
- Inlet closes 50° after bottom centre.
- Exhaust opens 50° before bottom centre.
- Exhausts closes 15° after top centre.

MAGNETO TIMING.

40° before top centre fully advanced.

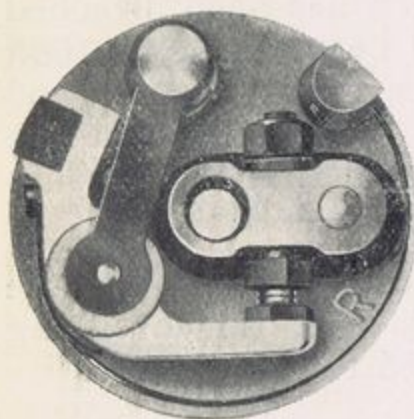
The correct timing of the magneto is most important and to check this proceed as follows:—

1. See that contact points are set to proper gap. (See Notes &c. Magneto).
2. Fully advance magneto control.
3. Open contact points and insert between them a strip of paper no thicker than this leaf.

4. Turn engine until the points grip the paper, then turn engine very carefully forward, at the same time pulling the paper gently, when the paper is released. At this position the pistons should be just $5/16$ in. before top of stroke. When using paper for this test care must be taken to avoid leaving any fragments between the points. If difficulty is experienced in setting the timing as above, the driving edge of the peg or key may be filed to allow the magneto wheel to turn further round the driving shaft in a clockwise direction.

MAGNETO.

Only magnetos of best British manufacture are fitted, the B.T.H. being used.



Contact Breaker.



Compact Megneto Spanner
and contact point gauge.

Under ordinary touring conditions the magneto requires but very little attention, but is recommended that the Tungsten points be checked for correct gap every 2,000 miles. This should be carried out by removing the cover plate on the contact breaker and slightly revolving the flywheel until the points are fully broken apart. The gap should now be checked by means of the small feeler gauge attached to the magneto spanner (included in the tool kit). This gauge should be a nice push in fit between the points and if the gap is too large it should be adjusted to suit the gauge, otherwise misfiring is likely to result. The correct gap setting is between $.010$ " and $.011$ ". If the points are dirty they should be cleaned with a piece of rag soaked in petrol, or if pitted, refaced with a file and the gap reset. The magneto spanner fits the contact breaker screw and lock nut and the latter should be firmly tightened if resetting has been necessary.

We do not advise the removing of a contact breaker unless a quantity of black deposit and oil is seen behind the contact breaker cover. The contact breaker is removed by unscrewing the hexagon set-screw located in the centre and after all foreign matter has been removed from the magneto end plate face and the carbon brush inspected, great care should be exercised in replacing the contact breaker to see that the small key on the tapered boss fits correctly into the keyway provided in the armature shaft. The hexagon set-screw should be tightened up firmly, but do not use great pressure otherwise damage is likely to occur.

After a season's running, it may be advisable to remove the high-tension pick-ups. This is carried out by unscrewing the two hexagon headed set-screws that hold them in position. All loose carbon, dust, oil, etc., should be carefully wiped off with a rag soaked in petrol and a piece of wood or a penholder, to which has been attached a piece of cotton-wool or rag should be inserted through the pick-up hole and the slip ring carefully cleaned and polished. In replacing the pick-ups, make sure that the water-proof washers are in position and that the brushes are seating correctly.

We do not advise the removal of the armature from the magneto and if the unit fails to spark after the foregoing elementary work, it should be returned to the makers.

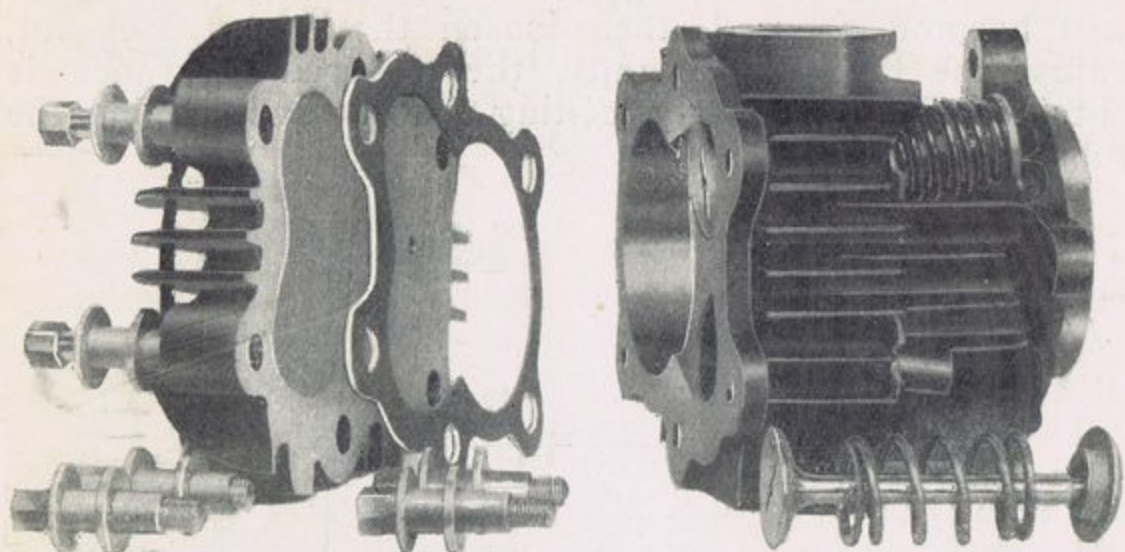
REMOVING AND RE-FITTING MAGNETO.

The whole magneto can be quickly removed by loosening the two nuts that hold the clamp plates to the magneto base and the magneto can be taken away from the crankcase complete with its driving pinion. In replacing, it is important that after the magneto has been seated on the crankcase, it should be pushed hard up against the facing of the timing chest so as to cause the rubber spigot washer to make good contact with the timing chest aperture, and thus form an oil-tight joint. Whilst being held in this position it is a simple matter to tighten up the clamping plate nuts so as to hold it securely.

MODELS B. & C.

These engines are fitted with plate heads, and if de-carbonising only is to be carried out, all that is necessary is to remove the holding down bolts and lift away the heads. Take care not to damage the head joints or they will have to be renewed.

Valves can be ground in with cylinders in position, but if any other work is to be effected, the engine should be lifted from frame, as advised for Model A.



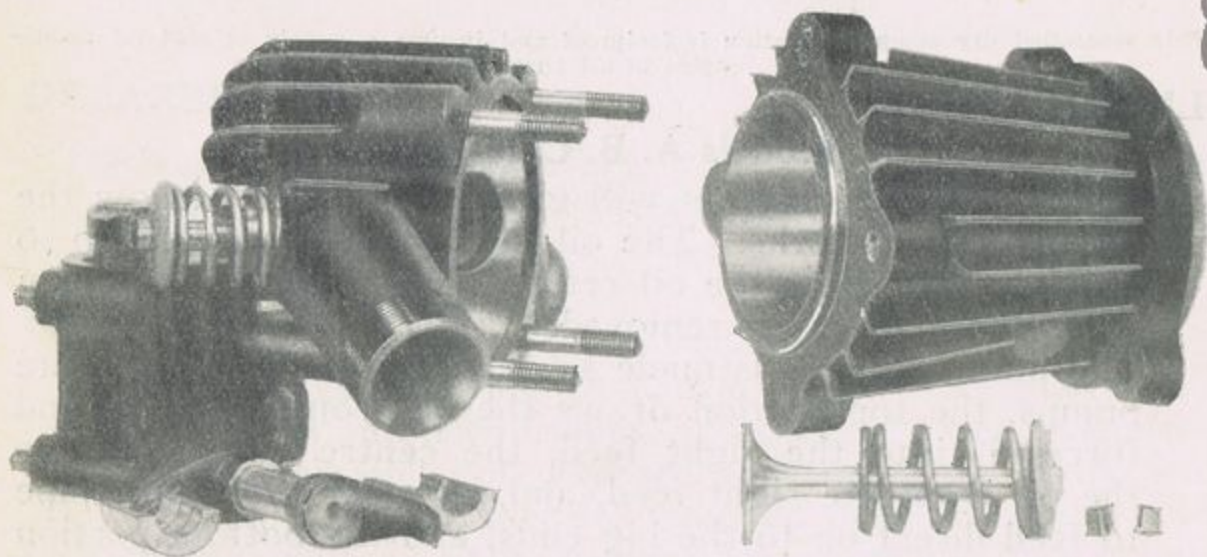
Cylinder and Detachable Head etc. as fitted to Models B. and C.

MODELS K. & M.

These engines are fitted with Overhead Valves, and should it be necessary to work on the engine, it is advisable to remove same from frame, the procedure is the same as for Model A.

The rockers are assembled in plain bushes, and if these are disturbed they must be carefully marked so as to be replaced in their original position. It is important that the rocker boxes are packed with grease, and a supply should be added by means of the grease gun every 500 miles.

Valve springs should be examined periodically, and if they are found to have shortened to any extent, they should be replaced.



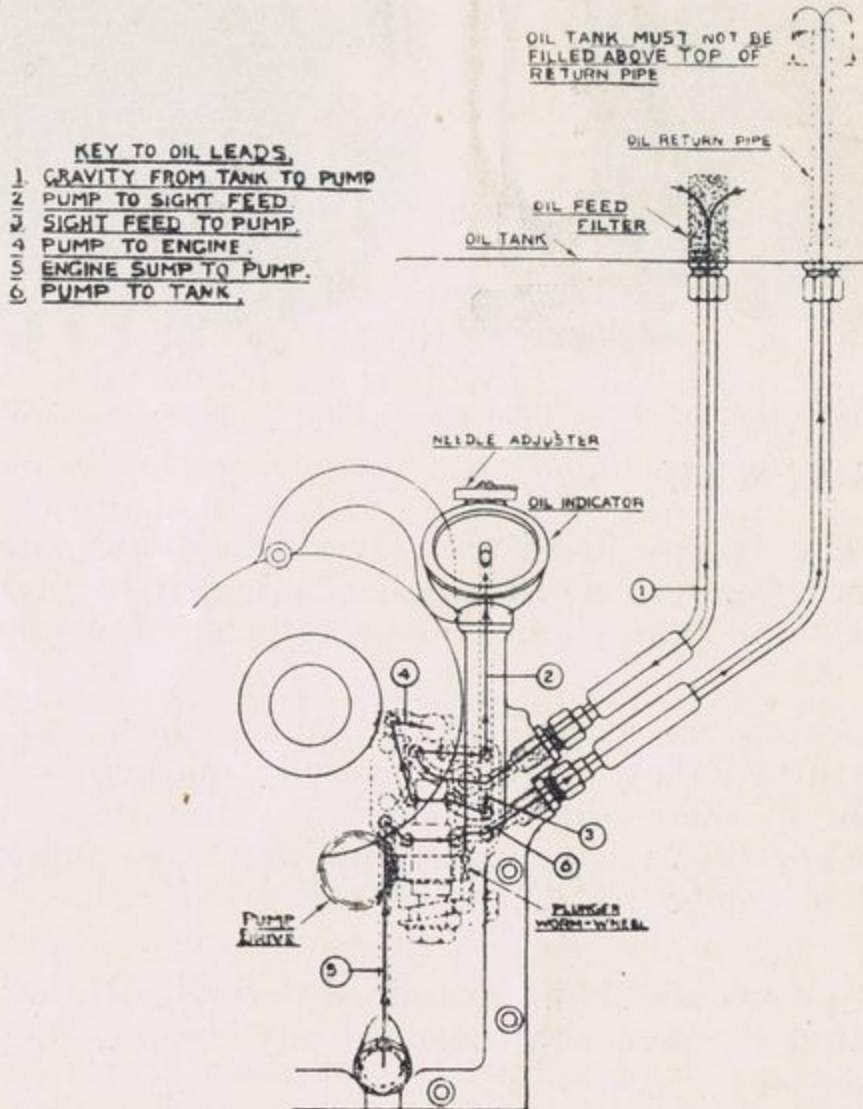
Cylinder and Detachable Head etc as fitted to Models K. and M.

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TAPPET ADJUSTMENT.

This should be done when the engine is hot.

First, unscrew the locking ring which holds the push rod cover and lift the lower portion of tube, when the tappet will become exposed, then loosen the tappet lock-nut, adjust the tappet head until the required clearance is obtained, finally securely locking the nut and refixing the tube.



This controlled dry sump lubrication is foolproof and insures a supply of cold oil to the engine at all times.

LUBRICATION.

Models A. B. C. K. & M.

A study of the diagram will give a good idea of how the oiling system works. The oil tank should be filled up to a point just below the oil return pipe, which can be seen when the filler cap is removed.

The pump plunger is made so as to act as three separate pumps, the top portion draws the oil from the tank, and forces it into the sight feed, the centre portion draws the oil from the sight feed, and forces it through a pipe to feed direct on to the big ends, and the bottom portion draws the oil from the engine, and lifts it back into the tank.

The regulator should be opened to pass as much oil as possible, only being restricted to prevent over-oiling, or increase consumption.

Remember. Only excess oil is returned to the tank, and as the return pump is of larger capacity than the inlet, there is no danger of over-oiling, as long as the engine is in good condition.

Any excess of oil that is drawn from the tank, and is not allowed to pass the sight feed because of being regulated, is taken care of by a small spring-loaded Bye-pass ball valve incorporated in the top of the pump body. A further ball valve is situated between the sight feed body and timing cover to prevent the sight feed filling when the engine is stationary. Should any dirt, or foreign matter prevent this ball seating, it should be removed and cleaned. Pistons are lubricated by splash, and the oil level in timing chest makes positive lubrication for timing gears.

TO CLEAN OILING SYSTEM.

Engine.

Remove oil filter from bottom of timing cover, and lean machine over until oil is drained out.

To clean tank, disconnect pipes and wash out with paraffin.

The system should be cleaned out after the initial running-in period, and afterwards at intervals of about 2,000 miles.

We recommend Wakefield's Castrol "X.L." oil for use in our machines.

DECARBONISING.

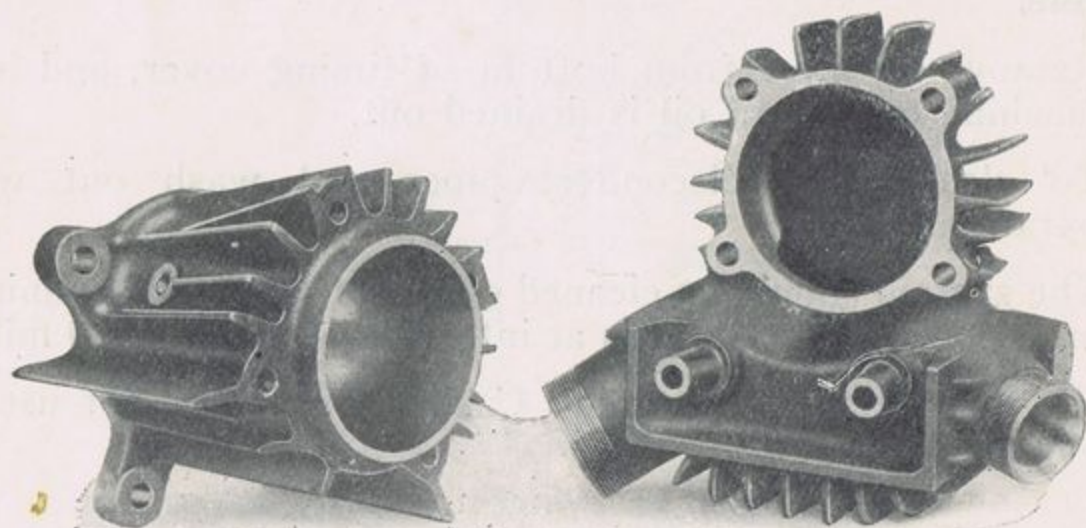
Should it become necessary to remove the cylinders at any time for decarbonising, etc., the following procedure should be adopted:—

MODEL A.

Remove exhaust and induction pipes, chain guard and chain, oil and petrol pipes, and control wires. Remove the engine bolt nuts situated underneath the crankcase. The engine may then be removed from the frame and the cylinders can be taken off by undoing the holding down nuts.

We advise this course although this model can be de-carbonised without removing the engine from the frame. With the cylinder heads on the bench it is quite a simple matter to remove the valves as only heavy finger pressure is necessary to remove the valve collets. When grinding in the valves, use only a very smooth compound. It should also be made quite certain that all parts are thoroughly clean before the valves are re-assembled. A smear of oil should be put on the valve stems before they are replaced into the heads. If the piston rings show definite signs of having passed burnt gas, they should be renewed, and the new rings should be given a free gap of .004". When replacing the cylinder heads the set-screws should be carefully tightened down alternately, this is to say every other nut should receive half a turn until they are tight, and under no circumstances should any individual nut be tightened right home before the head has been pulled into position. Smear the threads of the set-screws with graphite paste before re-fitting them, and after running about 50 to 100 miles go over them again with a spanner. On re-adjusting the valves, the tappet clearance should be set at .006".

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Cylinders and detachable heads as fitted to the 350 c.c. Model A.

CARBURETTER. (See 'Amal' Leaflet).

'Amal' carburetters are fitted to all models, types and settings being as follows:—

A.	4/007.	Main jet	60.
B.	4/007.	" "	60.
C.	4/017.	" "	80.
K.	4/017.	" "	70.
M.	4/027.	" "	80.

The settings as sent out on new machines are those proved to be the most satisfactory for ordinary work under normal conditions.

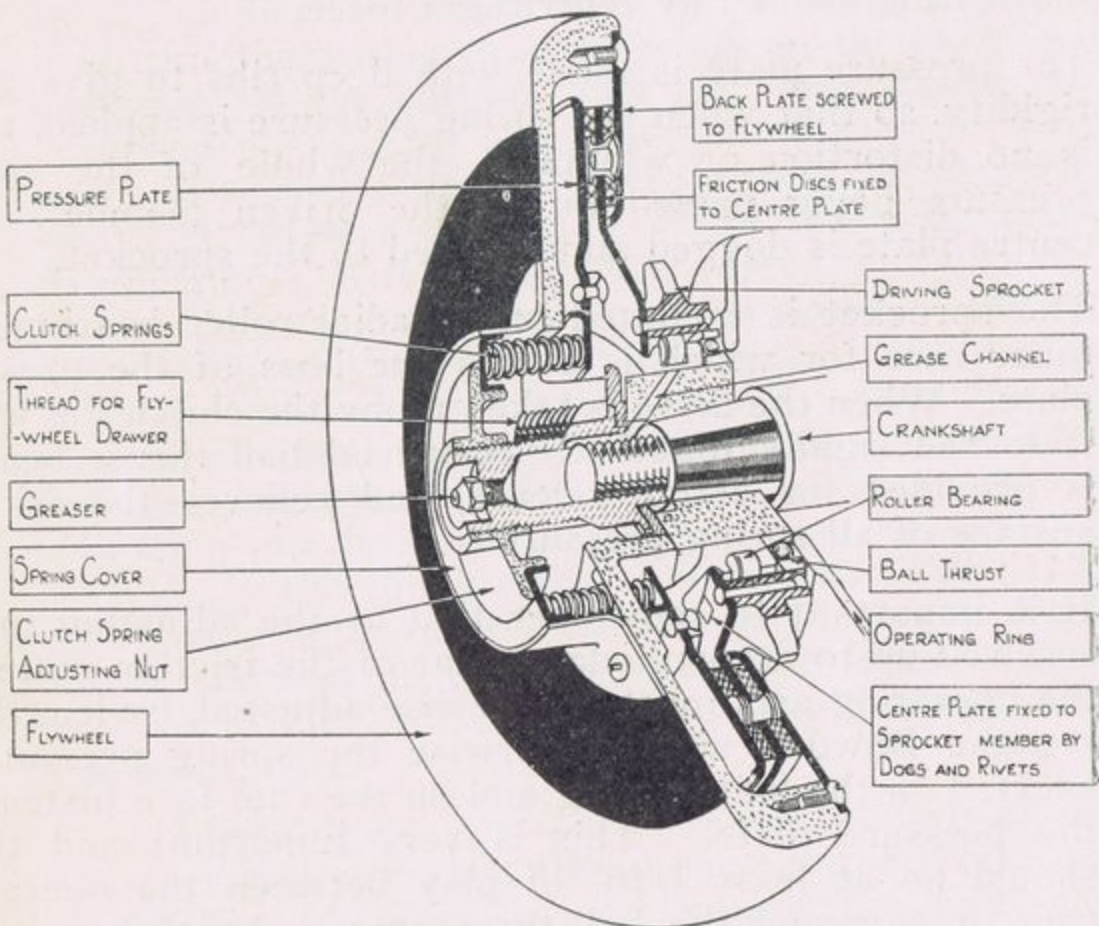
If any alterations are being made, careful consideration should be given to instructions contained in 'Amal' leaflet, a copy of which is included in the tool bag of every machine sent out.

Careful attention should at all times be given to all joints in the induction system, as if any leaks are present, difficult starting and erratic running will be brought about. When making adjustments, care should be taken with the setting of the Pilot Air Adjusting screw, which apart from controlling the slow running, has a great bearing on 'Petrol Consumption,' and it should therefore be set as weak as possible, whilst still allowing for even running at 'Tick Over' speed.

USE AND MAINTENANCE OF THE DOUGLAS FLYWHEEL CLUTCH.

One of the most interesting features of all Douglas models is the flywheel clutch. For motor cycle work this type has many advantages over existing types of clutches which are generally embodied in the gear box design. The task of putting all the desirable features of an ideal clutch into a flywheel, yet retaining its perfect and

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Section of Flywheel Clutch.

inherent balance, together with accessibility and ease of adjustment, has been found one of some difficulty. These features, however, have been obtained after very considerable thought and careful experiments. From the illustration it will be seen that there are only four main parts in the clutch—the flywheel, which also acts as a clutch body, the back plate, the centre plate, which is a driven plate and the pressure plate upon which the springs act. To alter the load capacity of the clutch, the nut on the outside has merely to be adjusted to give the required grip. The pressure plate is driven by two pegs, clearly shown in the illustration and has a bearing of large diameter on the flywheel boss. This large bearing prevents one of the commonest troubles found in clutches—the binding of the plate on its key or castellation.

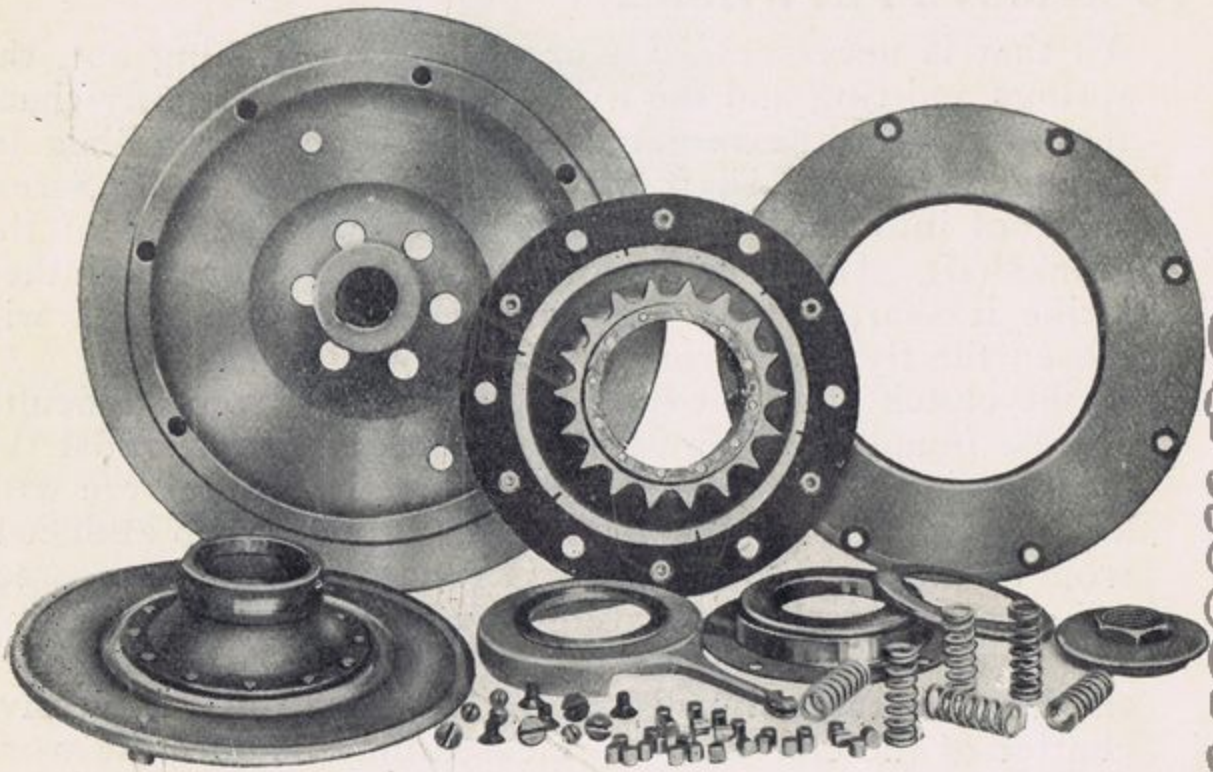
The boss must have careful attention at any time the clutch is dismantled, because if the pressure plate does not slide freely on this bearing, the working of the clutch will be very seriously interfered with. If it be carefully assembled, it should give no trouble for at least 10,000 miles. Lubrication of this bearing is provided for by a special nipple for grease gun lubrication, and is situated in the centre of the main clutch adjusting nut. This should be charged with grease, one third of a grease-gunful every 500 miles. The various parts which require lubricating are fed by centrifugal force.

The pressure plate is made with deep ribs to give great rigidity, so that when the spring pressure is applied, there is no distortion or whipping, the whole of the spring pressure being passed on to the driven member. The centre plate is dogged and rivetted to the sprocket.

The sprocket is mounted on a radial roller bearing, the inner race for which is cut in the boss of the pressure plate. When the drive is taken up by the clutch the whole is locked rigidly together. A special ball thrust bearing is provided for clutch release, and relieves the friction surface of all spring pressure.

It is important to remember that as the adjusting nut is screwed up to accommodate wear of the friction material, the operating arm must be likewise adjusted, by lengthening the Bowden wire; otherwise the spring pressure is exerted on the ball bearing and on the cam face instead of the pressure plate. This is very important and there should be at least $1/16$ " of play between the operating ring or cam and the ball-thrust race. Another point to note is that when overhauling, the clutch should be cleaned

out; Ferodo and other lining materials form a considerable amount of dust, and unless this is removed from the clutch body it will gradually pack up between the periphery of the clutch plate and the inside of the flywheel, and eventually prevent the plate functioning.



Flywheel Clutch completely dismantled.

In assembling the clutch after overhauling, it will be seen from the illustration that the whole of the parts, with the exception of the springs, flywheel nut, washer and the adjusting nut, can be assembled and placed on the crankshaft as a single unit. There should be at least $1/16$ " clearance between the end of the shaft and the face of the flywheel boss, with the flywheel forced on the shaft. With this correct, insert the washer, then screw up the lock nut. It is essential that this nut is absolutely tightly secured. With the lock nut in place the six springs should be inserted, their retaining washer put into place, and the adjusting-nut screwed on. Under no circumstances should the adjusting-nut be screwed tighter than necessary. It is well to try the clutch three or four times, and adjust until all slipping is prevented. Care should be taken that as this nut is screwed up the cam operating lever is allowed to go back towards the crankcase by lengthening the Bowden operating wire.

It is advisable to remove the Bowden wire nipple from the operating arm, and allow the arm to fall free, until the required adjustment of the spring pressure has been obtained. It will be appreciated that as the friction

plates wear, so the spring pressure will require adjustment, and the operating lever resetting accordingly. The life of the fabric is very considerable, and the life of the clutch is very great with ordinary use, and it will stand a great amount of abuse.

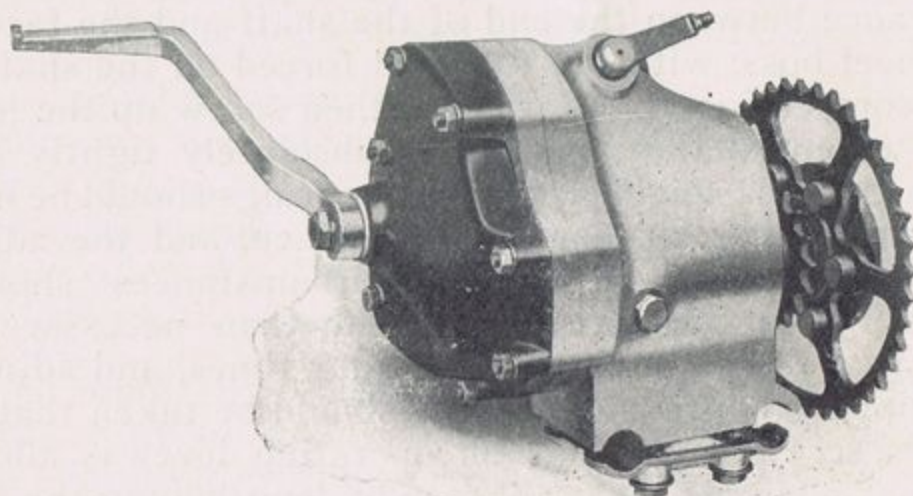
TO REMOVE FLYWHEEL.

All that is necessary is to remove the adjusting-nut, the springs and ring and the flywheel lock-nut. The flywheel, together with the remainder of the clutch, can then be removed from the shaft with the withdrawal tool. Screw the tool into the boss until it is against the end of the crankshaft. Hammer it round one turn more and then strike it sharply with the hammer, when the shock will loosen the flywheel from the taper of the shaft.

If the clutch does not disengage properly, some difficulty will be found in changing from neutral to first whilst the machine is stationary and it will sometimes interfere with a quick and noiseless change from second to top at speeds from 30 m.p.h. upwards. This is generally due to incorrect adjustment of the operating lever or excessive spring pressure. The latter can be obviated by slackening back the large hexagon headed clutch springed nut. Excessive chatter of the clutch when released may be due to a worn roller race or a badly balanced plate and should receive attention from the local agent.

GEAR BOX.

Should receive supplies of grease by means of the grease gun every 400-500 miles. It is better to add a little



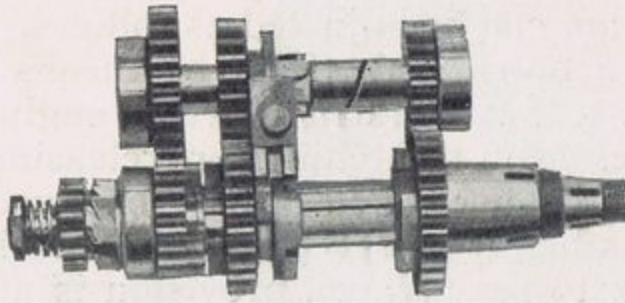
Gear Box Complete—as fitted to latest Models.

occasionally than to overfill at irregular periods. The plug in front of the box can be removed to determine if there is

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sufficient lubricant in the box. Grease should be injected until it reaches the plug level.

Wakefield's Castrolase or some other best grade lubricant should be forced through the nipple or filler plug on top of the box.



Shafts and Pinions—Gear Box.

The gear box selector plunger, consisting of a spring and ball in the middle gear pinion automatically holds the gears in full engagement as the ball is forced by the spring into counter-sunk holes in the gear shaft.

GEAR RATIOS.

Models.	Top.	Middle.	Low.
A. & B.	6.2	8.9	15
C.	5.2	7.6	12.7
K.	5.8	8	13.6
M.	5	7.3	12.2

The gears quoted are those fitted to standard sold machines; if a higher gear is required it is necessary to fit a larger final drive gearbox sprocket.

To lower the gear on Models C, K, & M, a smaller gear sprocket can be fitted, but on Models A. & B. the rear wheel sprocket has to be changed.

ADJUSTMENT OF GEARS.

Models A., B., & C.

The gears are manipulated by means of a long lever, through a short operating rod, which is adjustable for length.

The gears are correctly adjusted when the machine leaves our Works. Should this adjustment require re-setting, e.g., proceed as follows:—

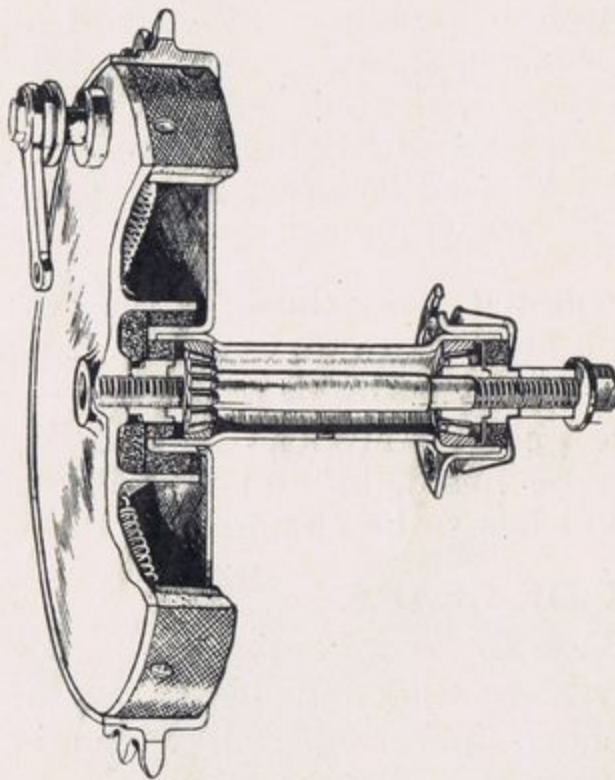
Move the gear change lever until the gears in the box are in neutral. Without moving the position of the gear rods or gears in the box, the gear change lever must then be brought to register correctly in the neutral position in the gear gate on the tank. This is done by screwing up, or unscrewing the yoke on each end of the operating rod.

Models K. & M.

Proceed as above, but make adjustment by alteration of long operating rod under tank.

CHAIN ADJUSTMENT.

The front chain can be adjusted as follows. Loosen engine holding down bolts, and adjust by means of turning the grooved nut to be found in front of engine, on left hand side of tube. By tightening or releasing this nut the engine unit is moved forward or backward to give the desired adjustment. As regards the driving chain from the gear box to rear wheel, provision is made for adjustment by means of two screws, one on either side of the chain stays, and secured by a locknut. When making this adjustment, the locknut which holds the bush carrying the operating spindle should always be loosened so as to allow the bush to move with the wheel, and should be firmly locked in position after the adjustment is completed.



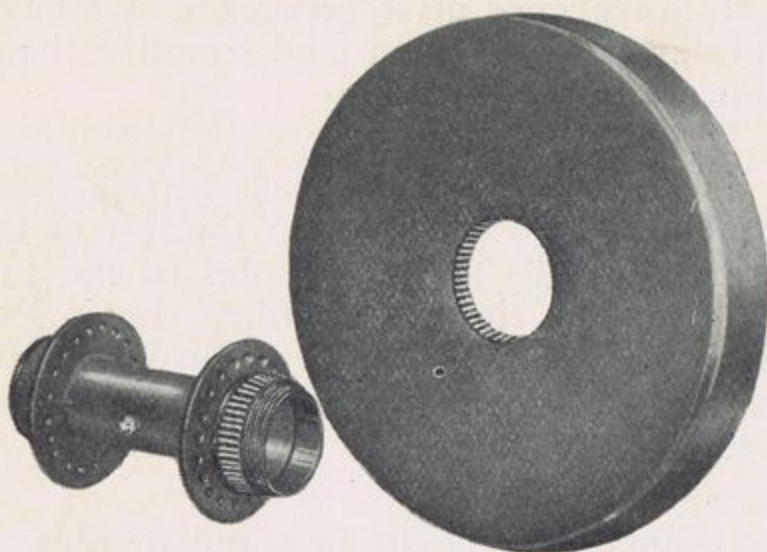
Sectional view of Douglas semi-servo acting brake.

WHEEL BEARINGS.

Great care should be taken in adjusting the taper roller wheel bearings. On no account should they be screwed up tight. All bearing must have a small running clearance, which is naturally greatly magnified if checked at the tyre. In other words, the bearings should be adjusted so that there is perceptible play present when the wheel is grasped by the tyre and rocked to and fro. Wheel spindles have left hand threads.

WHEEL ALIGNMENT.

The best way to check wheel alignment is to put the machine on the stand and put the front wheel straight with the frame. Tie one end of a piece of string to one

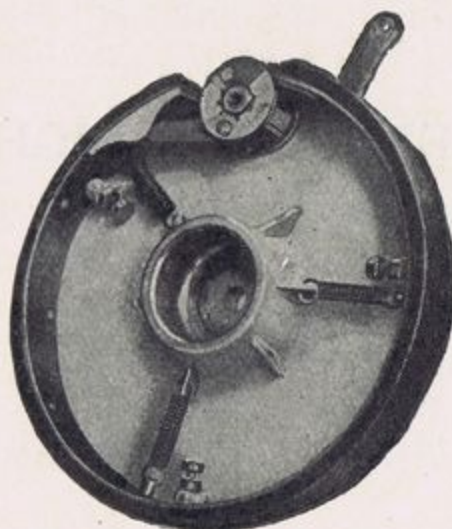


Brake Drum and Hub 1928-30.

rear wheel spoke, then pass it round the back tyre, along one side of the machine, under the footrest, and past the front wheel. Pull the string tight and bring it against the front tyre. If the wheels are in line the string will be quite straight and will touch two points on the front tyre and two on the back. Check by testing the other side of the tyres.

BRAKE ADJUSTMENT.

When the machines are delivered a certain amount of stiffness will be present in both wheels. This is due to the felt washers, which will bed in after a few hundred miles. The brakes should be adjusted so that the wheels will spin freely when the machine is on the stand. Keep the controls properly adjusted. In order to maintain the brake at its highest efficiency, the adjusting screws in the brake anchor plate should be set so that there is only the minimum of clearance between the band and the drum when the brake is not in action.



Brake Anchor Plate Complete.

FRONT FORKS.

The front forks are robust and hard wearing, and whilst retaining all the well known Douglas features, which result in stability, ease of steering, etc., we have been able by careful design to improve and simplify the methods of adjustment and lubrication.

The four fork spindles or pins pass through plain holes in the fork member and shackles on the left of the machine, and are screwed into threaded holes in the fork member and shackles on the right. To adjust the forks to take up side play, it is only necessary to turn the spindles in a clock-wise direction after loosening the locknuts at the screwed ends.

Grease passages are cut so that the nipples in the head clip and back bottom spindle not only serve to supply the top and bottom back spindles, but also the upper and lower bearings of the steering column. Grease or heavy oil should be applied at least every 500 miles, and more often in bad weather. The eyes on which the fork springs are mounted should receive a drop or two of oil at the same time.

PRESSURE GREASE GUN LUBRICATION.

All DOUGLAS machines are arranged for pressure grease gun lubrication, and the gun should be used thoughtfully and regularly, great care being taken to see that the lubricant used is of high class make, as much damage may be done to the delicate mechanism, especially ball and roller bearings, by the use of grease containing a large percentage of free acid and alkali. For this purpose we recommend Wakefield's "Castrolase."

TYPE PA GENERATOR LIGHTING SET.

As Fitted to Douglas Motor Cycles.

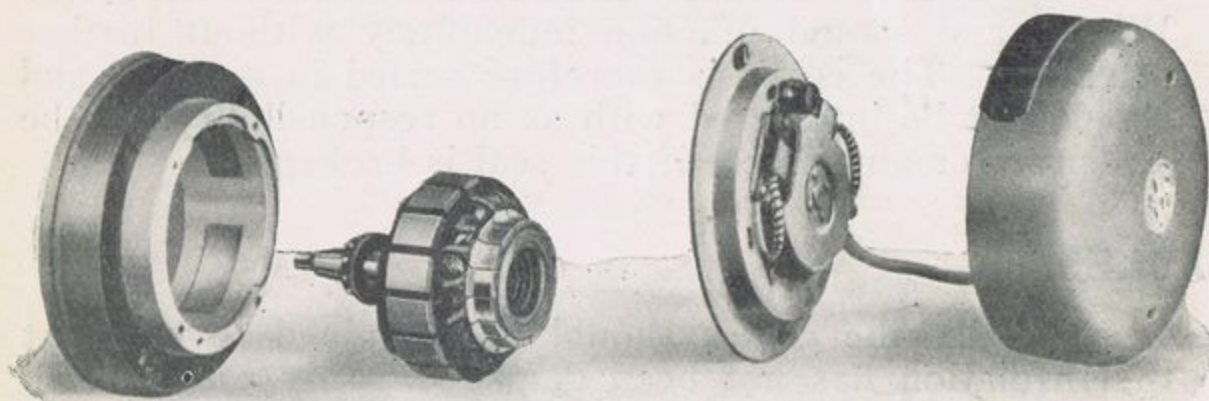
THIS lighting set employs a six-volt permanent magnet four-pole generator and separate cut-out, in conjunction with a six-volt accumulator and suitable head and tail lamps. Braided cables are used with an earth return circuit.

The generator used is the Type P.A., Form A. The output of this generator is approximately 3.4 amperes at 3,000 r.p.m.

The generator is mounted on the timing case cover of the engine.

The automatic cut-out connects the generator to the battery as soon as the speed of the former is such that sufficient output is given to charge the battery, and disconnects the battery when the generator speed is too low for charging. The cut-out is attached to the back of the accumulator carrier.

The headlamp incorporates a four-position switch, "off," "charge," "dim," and "full," and separate "dim" and "full" bulbs. A 6-7 volt, 3 watt bulb provides the "dim" light and a 6-7 volt, 12 watt bulb the "full." A resistance also incorporated in the lamp is automatically connected in the charging circuit in the "charge" and "dim" positions of the switch. This resistance reduces the charging current to approximately 50 per cent. of its normal value and protects the battery from overcharging.



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MAINTENANCE IN SERVICE.

Very little attention is required to maintain this equipment in excellent condition. Attention must, however, be paid to the following:—

BATTERY.

Examine the acid level periodically, and where evaporation has occurred, replenish with distilled water. (If acid has been accidentally spilt, fresh acid should be used and not distilled water).

Occasionally, smear the terminals with vaseline to prevent corrosion.

GENERATOR.

At intervals of 5,000 miles, the brushes should be examined by removing the cover which is secured by two small screws. On the Form C generator it will also be necessary to remove the terminal moulding before taking off the cover.

New brushes should be fitted if the others are worn down to such an extent as to prevent the controlling springs operating. It is essential that the correct grade of brush is used; otherwise the commutator may be permanently damaged. Replacements should therefore be obtained from the B.T.H. Company or one of the B.T.H. Magneto Service Stations.

NOTE.—THE ARMATURE MUST NOT BE REMOVED FROM THE HOUSING, OTHERWISE THE OUTPUT WILL BE GREATLY REDUCED AND THE MACHINE WILL REQUIRE REMAGNETISING.

CUT-OUT.

The cut-out is correctly adjusted before leaving the Works, and should function indefinitely without further attention. The cover is therefore sealed in position and should not be interfered with as no responsibility will be accepted for any defect if this seal is broken.

CABLES.

Occasionally the cables should be examined to see that the insulation has not been damaged. Any cable which has been subjected to chafing or has become damaged from any cause should be replaced or suitably bound with insulating tape. All connections should be examined to see that they are clean and tight.

LAMPS.

To remove the headlamp front, the clip situated on the underside of the lamp must be released, and the lamp front pulled forward at the bottom and lifted upwards to clear the spring clip at the top.

The "full" light is provided by a 6-7 volt, 12 watt, gas-filled, S.C.C. bulb and when renewing, the new bulb must be focussed after fitting into the bulb holder. This is done by lightly gripping the bulb and turning it to the right or left until the correct beam of light is produced. To obtain

the best results this operation should be carried out at night on a straight road when the bulb position can be adjusted to give a piercing central beam for distant illumination and less intense, wide spreading rays for near and side illumination. The "dim" light bulb is a 6-7 volt, 3 watt, S.C.C. for which no focussing arrangement is provided.

Should it be desired to inspect the switch connections, the headlamp bulbs should be removed and the reflector pulled

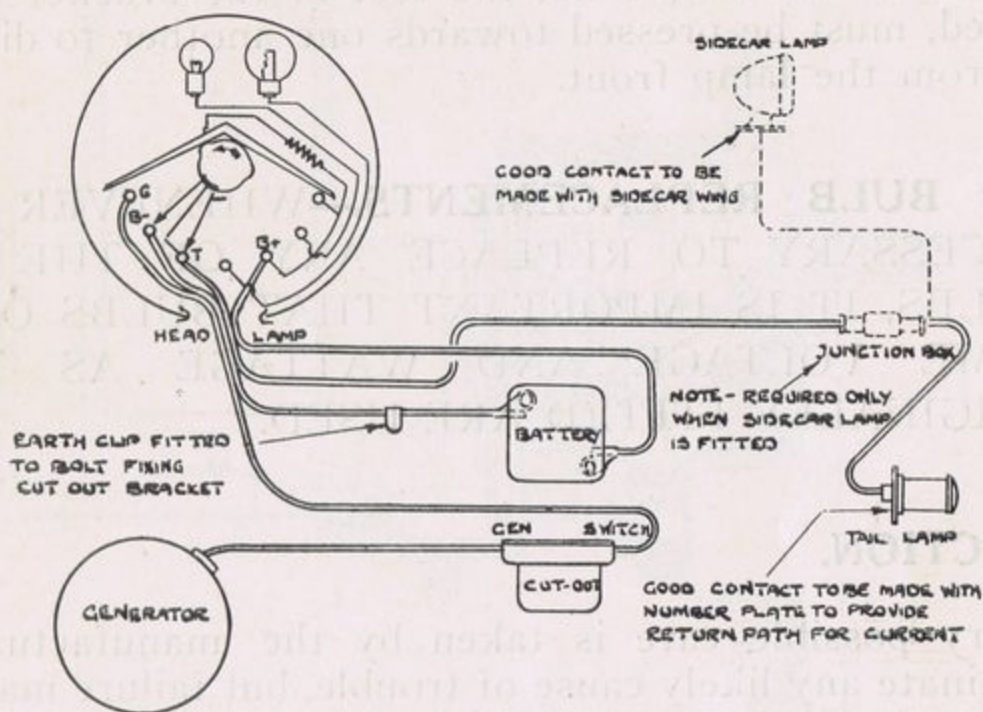
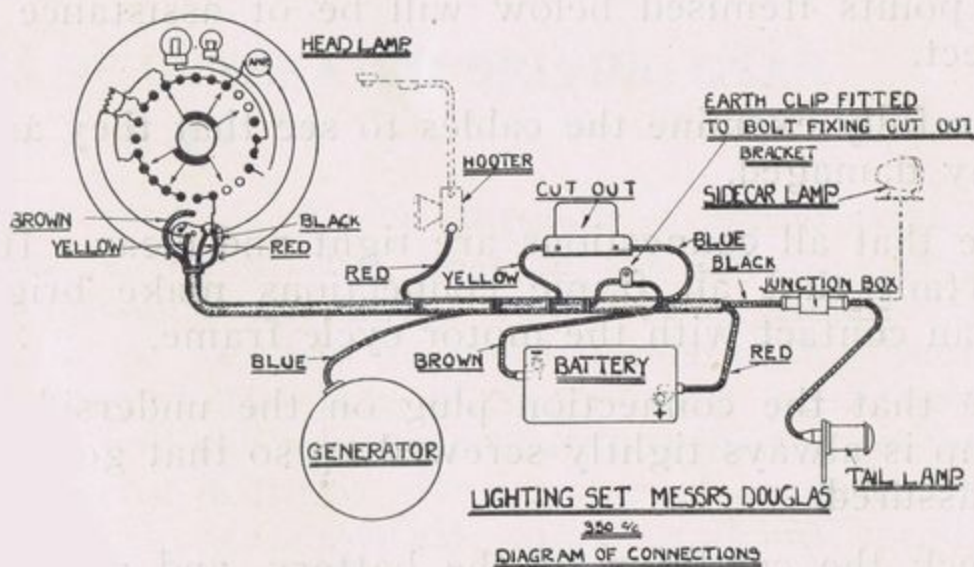


Diagram of Connections A31.



forward by gripping its edge at the top. It will then be found to come free if lowered slightly to clear the locating peg in the bottom of the reflector. Care must be taken not to finger-mark the reflector.

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To expose the tail-lamp bulb, the back of the lamp is removed by pressing and at the same time turning in an anti-clockwise direction, when it will become free. The tail-lamp bulb is a 6-7 volt, 3 watt, S.C.C. and is interchangeable with the "dim" headlamp bulb.

The sidecar lamp (if supplied) is fitted with a 6-7 volt, 3 watt bulb S.C.C., which is interchangeable with the "dim" bulb in the headlamp. By unscrewing the screw at the rear of the lamp, the front is released, and to gain access to the lamp bulb, the feet of the bracket now exposed, must be pressed towards one another to disengage it from the lamp front.

LAMP BULB REPLACEMENTS.—WHENEVER IT IS NECESSARY TO REPLACE ANY OF THE LAMP BULBS, IT IS IMPORTANT THAT BULBS OF THE SAME VOLTAGE AND WATTAGE AS THOSE ORIGINALLY FITTED ARE USED.

INSPECTION.

Every possible care is taken by the manufacturers to eliminate any likely cause of trouble, but failure may occur due to lack of attention or damage in service. For this reason a periodical inspection of the system is strongly recommended.

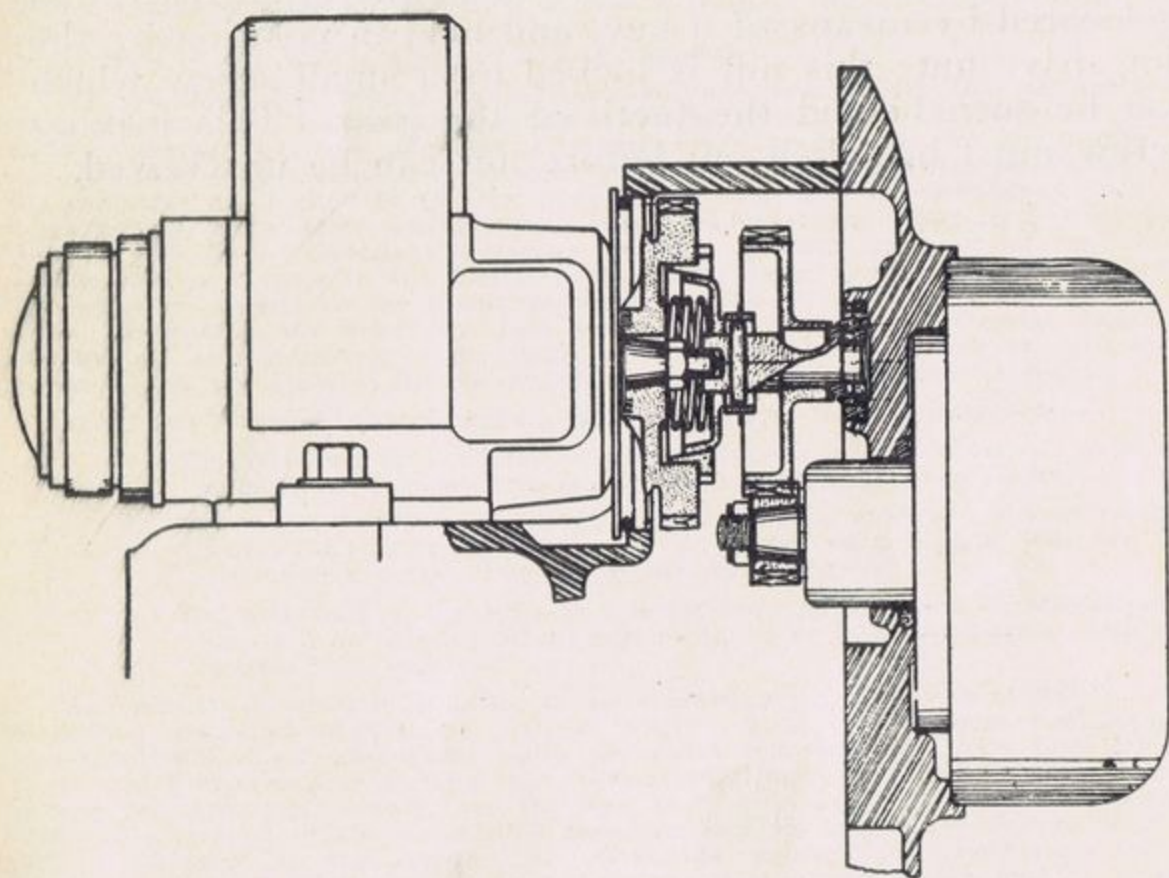
The points itemised below will be of assistance in this respect.

- (1) Carefully examine the cables to see that they are in no way damaged.
- (2) See that all connections are tight and clean. It is important that all frame connections make bright and clean contact with the motor cycle frame.
- (3) See that the connection plug on the underside of the lamp is always tightly screwed up so that good contact is assured.
- (4) Check the condition of the battery and add distilled water or acid if necessary. (See instructions under "Maintenance in Service.")
- (5) Remove the generator cover and inspect the brushes and controlling springs. (See instructions under "Maintenance in Service.")

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NOTE.—WHEN CLEANING OR MAKING ANY ADJUSTMENTS, THE HEADLAMP SWITCH SHOULD BE IN THE “OFF” POSITION.

If at any time trouble occurs which users are unable to overcome, they are urged to communicate with the British Thomson-Houston Co. Ltd., as stated below, when advice and the necessary information to overcome the trouble will be gladly given.



DETAILS OF GENERATOR DRIVING GEAR.

Models A, B & C.

The generator is driven through a metal cone clutch situated in the driving gear in the timing case. This clutch prevents any undue strain being imposed on the generator or gearing by rapid acceleration. Should the clutch become too free, through wear or a weakened spring, it will slip when moderate speeds are reached, and the generator will not give its correct output. Probably it will not charge above two amperes at any speed. This may be checked by first removing the generator from the timing case, thus exposing the driving gear of the latter. If by pressing a screwdriver against the teeth of this gear, it can be revolved easily, the clutch needs attention, either a new spring or cleaning of the cone faces, is all that is likely to be required.

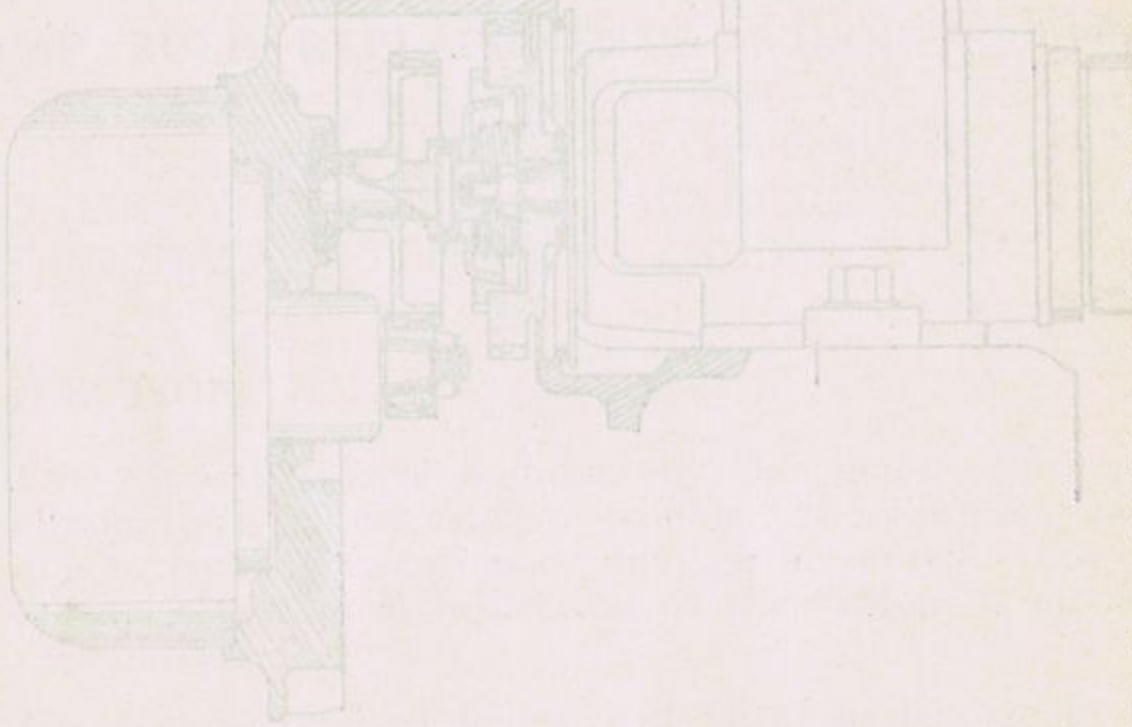
DETAILS OF GENERATOR DRIVING GEAR.

Models K & M.

The Generator on these models is driven direct by a gear wheel fixed to the crankshaft, through the generator pinion.

These wheels are of heavy construction and being positively lubricated, need no attention.

The driving wheel is a push fit on to the crankshaft, and is located by means of a key, and held in position by the dog drive nut; this nut is locked by a small screw which can be seen behind the teeth of the gear. This locking screw must be taken out before nut can be unscrewed.



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GUARANTEE.

A Reproduction is supplied in the licence holder of each motorcycle.

We give the following guarantee with our bicycles, motor cycles, motor cycle combinations and sidecars, which is given in place of any implied conditions, warranties or liabilities whatsoever, statutory or otherwise, all such implied conditions, warranties and liabilities being in all cases excluded. Any statement, description, condition or representation contained in any catalogue, advertisement, leaflet or other publication shall not be construed as enlarging, varying or overriding this guarantee. In the case of machines (a) which have been used for "hiring out" purposes, or (b) any motor cycle and/or sidecar used for any dirt track, cinder track, or grass track racing or competitions (or competition of any kind within an enclosure for which a charge is made for admission to take part in or view the competition), or (c) machines from which the trade mark, name or manufacturing number has been removed, no guarantee of any kind is given, or is to be implied.

WE GUARANTEE, subject to the conditions mentioned below, that all precautions which are usual and reasonable have been taken by us to secure excellence of material and workmanship; but this guarantee is to extend and be in force for six months only from the date of purchase, and damages for which we make ourselves responsible under this guarantee are limited to the free supply of a new part in exchange for the part of the bicycle, motor cycle, motor cycle combination or sidecar which may have proved defective. We do not undertake to replace or refix, or bear the cost of replacing or refixing such new parts in the bicycle, motor cycle, motor cycle combination or sidecar. We undertake, subject to the conditions mentioned below, to make good at any time within six months any defect in these respects. As bicycles, motor cycles, motor cycle combinations or sidecars are easily liable to derangement by neglect or misuse, this guarantee does not apply to defects caused by wear and tear, misuse or neglect.

The term "misuse" shall include, amongst others, the following acts:—

1. The attaching of a sidecar to the motor cycle in such a manner as to cause damage, or calculated to render the latter unsafe when ridden.
2. The use of a bicycle, motor cycle or of a motor cycle and sidecar combined, when carrying more persons, or a greater weight, than that for which the machine was designed by the manufacturers.
3. The attaching of a sidecar to a motor cycle by any form of attachment not provided or supplied by the manufacturers or to a motor cycle which is not designed for such use.

Any bicycle, motor cycle or motor cycle combination or sidecar sent to us to be plated, enamelled or repaired, will be repaired upon the following conditions, i.e. we guarantee that all precautions which are usual and reasonable have been taken by us to secure excellence of material and workmanship, such guarantee to extend and be in force for three months only from the time such work shall have been executed, or until the expiration of the six months above referred to, and this guarantee is in lieu and in exclusion of any common law or statute warranty or condition, and the damages recoverable are limited to the cost of any further work which may be necessary to amend and make good the work found to be defective.

Conditions of Guarantee. If a defective part should be found in our bicycles, motor cycles, motor cycle combinations or sidecars, or in any part supplied by way of exchange before referred to, it must be sent to us **CARRIAGE PAID**, and accompanied by an intimation from the owner that he desires to have it repaired or exchanged free of charge under our guarantee, and he must also furnish us at the same time with the number of the machine, the date of the purchase or the date when the alleged defective part was exchanged as the case may be.

Failing compliance with the above, such articles will lie here **AT THE RISK OF THE OWNER** and this guarantee, and any implied guarantee, warranty or condition shall not be enforceable.

We do not guarantee specialities such as tyres, saddles, chains, lamps, magnetos, generators, carburetters, etc., manufactured by other makers or any component parts supplied to the order of purchaser differing from standard specification supplied with our bicycles, motor cycles, motor cycle combinations, sidecars or otherwise.

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