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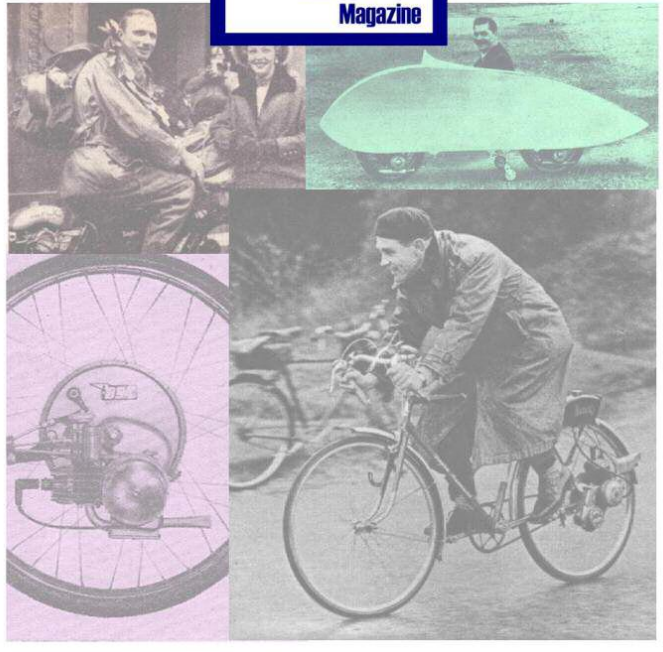

GENERAL RUNNING ★ MAINTENANCE *and* SPARE PARTS MANUAL

PRICE 3/6 NET

THE HERCULES CYCLE & MOTOR CO. LTD. · ROCKY LANE · ASTON · BIRMINGHAM 6

H.C.M. HER-CU-MOTOR

THE FIRST ALL-BRITISH MO-PED

YOUR **H.C.M. Her-cu-motor mo-ped** comes to you, through your Dealer, from a factory famous for its precision-engineering achievements. The Hercules Cycle & Motor Co. Ltd., which produces the H.C.M., has a record unique in British industry for the manufacture of bicycles which have stood up successfully to the severest road-tests in the world, including the famous Tour de France. Moreover, the Hercules Factories have behind them all the vast and advanced technical, scientific and engineering resources of the Tube Investment Organisation—unequalled in Britain.

Every component of your H.C.M. Her-cu-motor has been chosen by Hercules with scrupulous care and subjected to the most exhaustive tests. However, as in the case of a fine automobile, but not quite to the same extent, your mo-ped needs some care and maintenance.

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USING YOUR MACHINE

When you receive your new H.C.M. Her-cu-motor, it is a good plan to familiarise yourself with the controls. Try the right-hand throttle twist-grip from shut to full open, so that you can judge the various degrees of throttle opening, such as ¼ open for cold starting and slightly open for warm starting.

Try the right-hand front brake lever, rocking the machine backwards and forwards, so that you can judge the amount of pressure required to exert maximum braking.

Try the left-hand twist-grip which controls the gears. Grasp the twist-grip, with the fingers compressing the attached clutch-lever towards the grip, and rotate grip and lever through the three gear-positions—bottom (marked "1"), neutral or free middle position, and top (marked "2"). When doing this it may be necessary to rock the machine backwards and forwards so that the gears may engage. Do not use force when moving the gear control.

Make sure that you are familiar with the working of the fuel tap fitted to the tank. For normal use simply pull out the knurled knob to open the tap. Reserve is obtained from this position by turning the knob a ¼ turn in a clockwise direction and then pulling it out a further short distance. Do not run in this position in the normal way, because if you then run out of fuel there will be no reserve supply to call upon.

STARTING THE MACHINE

Assuming that you have satisfied yourself that the gearbox is filled with oil to the correct level (see notes on gearbox maintenance), that sufficient petroil fuel is in the tank *and that the fuel tap is pulled on*, there are several ways of starting the machine.

Perhaps the most usual is as follows:

Raise the hook-ended starting needle on top of the carburetter float chamber for five to seven seconds (see notes on carburetter), set the right-hand twist-grip throttle control at about ¼ open. Set the left-hand twist-grip in neutral (or middle) position, mount the machine and pedal it for a few yards at a smart pace. Then depress clutch lever and move twist-grip to top

gear (marked "2"); release clutch lever while still pedalling, when the engine should start and continue to propel the machine at a speed governed by the amount of R.H. twist-grip throttle opening.

Another method of starting is to put the machine on the stand, raise the starting needle, engage top gear and set the throttle $\frac{1}{4}$ open as described. Mount the machine and pedal a few turns until the engine starts. Close the throttle twist-grip slightly until the engine is running at a fast tick-over speed. Put the L.H. twist-grip gear control into middle or neutral position and keep the engine running for a minute or two to allow the engine to "warm up." Then, with the engine running and gear still in neutral, push the machine off its stand, which will spring up automatically. Disengage the clutch by depressing the L.H. clutch lever and engage bottom gear; then engage clutch gently by releasing clutch lever very gradually and at the same time give a turn or two to the pedals to help the engine pick up the drive. While the clutch is being engaged the throttle must, of course, be opened up a little at the same time.

Alternatively, with the machine on its stand, and the rider standing on the left side of the machine, depress the near-side pedal firmly once or twice when the engine should start. Then proceed as for the previous method.

There is a third way of starting which, with a little practice, can be the easiest of all. This is as follows :—

Raise starting needle, engage top-gear, and set throttle $\frac{1}{4}$ open as before. Disengage clutch by gripping clutch lever, push machine along the road for a few yards at the same time releasing clutch lever gently. When the engine starts, grip clutch lever and twist gear control into neutral position. Mount the saddle at leisure, engage bottom gear and release clutch lever *slowly* at the same time giving a turn or two to the pedals and opening throttle a little as the engine picks up. On a smooth-surfaced road it may be necessary to press upon the saddle with the right hand to enable the rear wheel to grip the road while pushing.

Note that when the engine is warm it is not advisable to raise the starting needle and usually only a small throttle opening is required for warm starting. The best positions of throttle opening for cold and warm starts are soon found with a little practice.

GENERAL RUNNING ON THE ROAD

SPEEDS

Although a maximum speed of well over 30 m.p.h. is obtainable from the H.C.M. Her-cu-motor when properly run in, it is not advisable to run at maximum speed or throttle opening continuously.

Better fuel consumption and longer life for all the mechanism will be attained when the speed is kept somewhat below maximum.

HILL CLIMBING

It must not be assumed that hills generally call for a change to bottom gear. The engine is designed to pull strongly at comparatively slow speeds and it will be found that all normal hills can be climbed in top gear. A few turns of the pedals will often enable the last few yards of a hill to be surmounted "in top", say at 12–14 m.p.h. If a gradient is obviously steep it will then be wise to engage the lower gear before the engine speed drops too low. It will be found that when pulling strongly on top gear a hill can be climbed better if the throttle is moved back *slightly* from the fully open position.

FUEL CONSUMPTION

Remember that fuel consumption can vary within wide limits according to the amount of work the engine is called upon to do. If you are in flat or undulating country where top gear is in use nearly all the time, the consumption will be better than in hilly districts where bottom gear is needed frequently. Similarly, hard driving on full throttle will inevitably result in heavier fuel consumption. If you look upon the throttle as a kind of tap controlling the passage of fuel you will see clearly that an open tap will pass the maximum amount of fuel. Note that it is the fuel which does the work—the engine being simply the means whereby this fuel is turned into useful work. More work, in the form of speed or hill climbing, entails the use of more fuel.

RUNNING-IN

No matter how finely shafts, piston, bearings, or gears are machined or ground there is always a microscopic roughness on the surface of these items when new. Further, all parts are made as close a fit as possible, compatible with free working. Therefore, a certain

amount of "running-in" or easy working is required so that all moving surfaces shall reach a highly polished or "bedded-in" state before maximum performance can be obtained. For this reason the first 500 miles should be covered at a modest speed, not exceeding, say, 24 m.p.h. If this is done and the initial ratio of oil-to-petrol strictly adhered to (see petroil ratio) it will be found to pay dividends and will ultimately result in a free sweet-running engine capable of maximum performance when required.

DESCENDING LONG HILLS

It is important to realise that with petroil lubrication the amount of oil fed to the engine depends upon the amount of throttle in use at a given time. This is a very good feature when hill climbing or otherwise running on full throttle, because in these circumstances the maximum amount of oil is supplied to the engine with the petrol when it is most needed. But the reverse is the case when descending a long hill with closed throttle.

Here we may have a fast-running engine in which the supply of lubricant is entirely shut off. This has been known to cause serious damage to piston and bearings. No ill effects will result on a short hill, but where the length is considerable it is wise to depress the clutch lever periodically and open the throttle for a few seconds so that the oil supply shall be maintained. Alternatively the hill may be descended with the clutch disengaged or the gear in neutral while the throttle is closed to a tick-over engine speed.

CLUTCH ENGAGEMENT

Clutch release is an essential part of the gear change operation, but apart from this it is intended to provide a smooth and easy means of starting away from standstill—with engine running—after, say, a traffic stop or at traffic lights. Successful use of the clutch under such conditions calls for some practice in the use of the handlebar clutch lever. The essential feature is that the clutch must be engaged *gradually* at the same time as the engine is speeded up, i.e., the clutch lever must be "hung-on-to," released slowly and only completely released when the machine has gathered sufficient momentum to match the engine speed. It is well worth taking the trouble to become proficient in this matter.

GEAR-CHANGING

The H.C.M.-Burman two-speed gearbox is of the simplest type, but it must be remembered that any gear change involves the engagement of gears or dogs running at different speeds. This is the case even when the clutch is disengaged—as it must be on the H.C.M. Her-cu-motor before a gear change can be made. There is, however, a way of "matching up" the speeds of the dog-clutches so that a quick and noiseless change can be made, up or down. The procedure is to speed up the engine by means of the throttle control when changing from top to bottom gear and close down the throttle momentarily when changing from bottom to top. A little practice will enable the rider to manipulate the gear twist-grip and throttle twist-grip automatically so that certain and rapid gear changes are made. Note that the clutch and gear-change controls are combined and interconnected and the clutch lever has to be depressed before the gear twist-grip can be moved from one gear to another.

PEDALLING THE MACHINE

If the rider should run out of fuel on the road, or some temporary defect develops, the machine can be pedalled to the nearest Dealer or Petrol Station. The gear should, of course, be put in neutral or middle position—do not leave gear engaged and attempt to pedal with the lever depressed, as this is much harder work than when in neutral gear. If the distance to be covered is considerable it will be worth while to raise the saddle to a more effective pedalling position.

RIDING POSITION

Both the handlebar and saddle are adjustable for height as in a cycle; although the machine is assembled with these components in what we consider to be a normal adjustment it may be well worth your while to experiment a little with the position of these two items to find the best position to suit your special needs. A comfortable position adds much to the pleasure and safety of riding.

THROTTLE SETTING

Although some users prefer the throttle twist-grip to stop the engine completely, there is much to be said for a throttle setting which, with the twist-grip shut right back, allows the engine to tick-over slowly. This

is a convenience when halted at a traffic stop and when descending hills with gear in neutral or clutch disengaged (see "Descending Long Hills").

The throttle setting for tick-over speed is by means of the cable adjuster on top of the carburetter, which can be screwed in or out to the required extent and locked by the nut underneath.

With a tick-over throttle setting the engine can be quickly stopped from idling speed by letting in the clutch gently. This puts no strain on the clutch compared with taking up the transmission drive.

POOR STARTING

Assuming that fuel is flowing through the carburetter jet, and that the sparking plug is reasonably clean and gap set correctly, easy engine-starting is practically certain—with one important exception. This exceptional case can be very puzzling and is caused by a gap-setting of the magneto contact-breaker points which is appreciably wider than the eighteen thousandths of an inch gap, which is correct when the points are fully open.

See "Magneto Maintenance and Running Instructions" for full details of the manner in which contact-breaker adjustments are made.

Variation of the points gap is comparatively infrequent but may be suspected when persistent bad starting occurs.

SPARE SPARKING PLUG

It is a wise plan to carry a spare sparking plug and it is vital that this shall be in a metal box or container. Rag or corrugated wrapping board will not prevent damage to the points if it comes in contact with tools, bolts and nuts, etc., in the toolbox.

The machine is supplied equipped with the K.L.G. Type F.50 Sparking Plug, which we have found to be very satisfactory. This plug is of the detachable type and can be dismantled for easy cleaning in the usual way. However, plugs in two-stroke engines have a tendency to become oiled up if the oil-petrol ratio has been generous, and it is more convenient to insert a pre-cleaned spare plug when needed.

PETROL RATIO

The proportion of oil to petrol which we recommend for the first thousand miles is twenty-four to one, or four filler cap measures of oil to one gallon of petrol. This is

only the case when the well-known brands of S.A.E.30 grade of oils are used.

Note that if the new self-mixing two-stroke oils are used, the proportion of oil to petrol must not be less than sixteen to one, or six measures of oil to one gallon of petrol.

On the whole we favour the use of normal S.A.E.30 oil.

FILLING UP WITH FUEL

When taking on fuel it is wise to have the petrol and oil thoroughly mixed in a clean can before pouring into the tank. If this cannot be done, *take on the petrol first.* Then add the oil a little at a time, shaking the machine sideways meanwhile. If oil is poured in before the petrol it is likely to clog up the petrol tap, petrol pipe and carburetter, necessitating the complete dismantling of these items.

Always turn off the petrol tap when filling or when putting the machine away.

DETAILS OF ENGINE

(Manufactured by J. A. Prestwich Industries Ltd., especially for The Hercules Cycle & Motor Co. Ltd.)

ENGINE. An extremely simple Two-stroke Engine of 49 c.c. Bore 42 m.m. Stroke 35.5 m.m.

Cylinder. Cast iron, well finned and secured to the crankcase by four long studs passing through the fins.

Cylinder Head. An aluminium die-casting secured by the cylinder studs and four nuts.

Piston. In LO.EX aluminium, carrying two narrow rings and gudgeon pin secured by two circlips.

Connecting Rod. A high-tensile steel stamping, bronze bushed for the gudgeon-pin at the small end and hardened and ground in the big-end to run on the $\frac{1}{8}$" diameter crankpin rollers.

Crankshaft, Built up of two steel stampings hardened and ground and connected by the high-tensile crankpin which is pressed into each crank web.

Crankshaft Bearings. The crankshaft runs on two journal ball bearings size 15 m.m. bore. Oil and compression seals are fitted in the crankcase outside of each ball bearing.

Crankcase. Aluminium die-castings in two halves, secured together by four bolts and nuts.

GENERAL MAINTENANCE

CLUTCH ADJUSTMENT

It is very important to make sure that there is some "slack" or play in the clutch-control wire. There should be at least one sixteenth of an inch slack movement of the *wire* where the cable is connected to the clutch lever, before the pressure or resistance can be felt at the handlebar clutch lever. Adjustment for the amount of slack is made by the bottom cable adjuster and lock nut on the near side of the gearbox. Screwing the adjuster into the gearbox increases the amount of slack in the wire. If there is no slack in the clutch wire there is a distinct possibility of clutch-slip taking place.

GEAR ADJUSTMENT

After some hundreds of miles initial running it may be necessary to check the adjustment of the gear control. This is carried out in much the same manner as the clutch adjustment by screwing the top cable adjuster on the nearside of the gearbox. First put the machine on the stand and set the gear twist-grip in neutral or middle position. Screw the cable adjuster in or out of the gearbox a turn or two at a time until the rear wheel can be moved freely by hand. Then check that an equal movement of the twist-grip each side of neutral causes the gears to be engaged and secure the adjuster in this position by the locking nut.

When making these adjustments to the clutch and gear controls, it is necessary to roll forward the rubber grommets or sleeves off the adjusters so that the latter may be turned easily.

When the adjustment is completed, it is most important that the rubbers are rolled back again over the small ridge on the end of the adjusters, otherwise leakage of oil may occur at these points.

CHAIN ADJUSTMENT

The rear driving chain should be kept in reasonably good adjustment for the smoothest running. It should be possible to move the chain up and down to the extent of about half-an-inch in the middle of the bottom run of the chain. A tight chain is harsh running and puts a heavy strain on gearbox and rear wheel bearings. Adjustment of this driving chain is made very simply by moving the engine-gearbox unit forward or backwards in the frame.

Proceed as follows:—Slacken off the nuts (on the

pedal-chain side) of the two top gearbox-frame bolts and slacken the strap-bolt which is screwed into the rear of the cylinder, just above and in front of the carburetter. Then screw up the central nut above the gearbox just behind the carburetter air-intake, a turn or so at a time until the chain is correctly adjusted. Tightening this nut draws the gearbox forward and tightens the chain. Unscrewing the nut allows the gearbox to be pushed back (push on front of engine by hand) and slackens chain.

When chain adjustment is correct, remember to tighten up the strap-bolt on cylinder and the two gearbox nuts.

GEARBOX LUBRICATION

The grade of lubricant suitable for gearbox and clutch is S.A.E.30. To replenish the gearbox, put the machine on its stand, remove the three slotted screws which hold the cover plate on the side of the gearbox. Also remove the hexagon-headed oil level screw on side of gearbox below the cover-plate. Pour oil into gearbox (which also lubricates clutch) until the oil is commencing to run out of oil-level hole. Replace the screw here and re-fit cover-plate, making sure that the faces are clean and the washer in position. Tighten screws firmly, to prevent oil leakage.

Check the oil level in gearbox at least every 300 miles by removing oil-level screw-plug. If no oil is visible it is time to replenish the supply.

The clutch and gear control cables are fitted with oil-proof rubber grommets sealing the outer casing of the control wires and also the adjusters which screw into the gearbox. These are to prevent oil leakage at these points. See that the rubbers are placed so that they grip the control outer casing and also grip the small circular collar or ridge formed on the adjusters.

CARBURETTER JET SIZE

With a new engine it is wise slightly to "over jet" the carburetter as the small increase in petrol-to-air ratio tends to keep the engine cooler during the running-in period. After, say, the first one thousand miles it may be possible, with advantage in running and fuel consumption, to replace the standard No. 30 jet with the next size smaller, i.e., No. 27. See Carburetter Notes for adjustment and settings.

MAIN CAUSES OF POOR PERFORMANCE

With a two-stroke engine there are three main causes of indifferent running. These are—a choked carburetter

jet, a dirty or oiled-up sparking plug, and a choked exhaust port or silencer system. These are dealt with as follows:—

CHOKED JET

Although the petrol tap is fitted with a fine gauze filter and another filter is provided in the carburetter, it is still possible for a minute particle of grit, enamel from the tank, or sometimes a brush hair, to pass the filters and partially choke the jet. When this happens the quickest remedy is to remove the jet and blow through the orifice with the tyre pump, finally washing thoroughly with fuel. See Carburetter Notes for jet removal and cleaning.

FOUL SPARKING PLUG

Dismantle plug and scrape off any accumulation of carbon, etc., with a blunt knife or scraper. Finish off with a light rub with emery-cloth and wipe clean and dry. Re-assemble and set plug gap to the standard .020" gap. Do not bend the centre pin, but slightly set the side point to obtain the required gap. See notes on Sparking Plug.

CHOKED EXHAUST PORT

A very slow but insidious loss of power can be due to the gradual closing up of the exhaust port in the cylinder by accumulated carbon. At the end of 500 miles it will be wise to undo the cylinder exhaust-pipe nut with the special "C" spanner provided in the tool-kit. Swing the exhaust pipe to one side and inspect the exhaust port where it adjoins the cylinder bore. The port should be rectangular or near-square shape and if the corners or edges are irregular or covered with black carbon, a partially choked exhaust is indicated. It is not necessary to remove the cylinder in order to clean out the ports. First turn the flywheel so that the piston is at the bottom of the stroke i.e., the top edge of the piston will be level with the bottom edge of the exhaust port. Then with a stiff piece of hooked wire or a hooked scraper the carbon can be pulled outwards to the front of the port and cleared away. Any small particles which escape inwards on to the piston will soon be blown out through the exhaust and will do no real harm, but do not deliberately push the carbon into the cylinder.

A more thorough way is to proceed as above, having first removed the cylinder head by undoing the four nuts on the top of the head. Then when the port has

been cleared of carbon the flywheel can be turned until piston is at the top of cylinder and any loose pieces of carbon wiped away. If this more thorough procedure is adopted one would naturally take the opportunity to scrape and clean the top of the piston and inside of cylinder head. When replacing head, tighten the nuts down diagonally across the head a little at a time so that all are tightened evenly to the same degree. In time the silencer may become choked by carbon. After 1,000 miles remove the internal tail-pipe by slackening the clip on the rear end of silencer. The tail-pipe can then be pulled out and all the holes and ports therein thoroughly cleaned. When replacing, note that the end of the tail-pipe which is slightly enlarged in diameter goes in last and this end should be flush or level with the rear end of silencer when clip-bolt is tightened up.

MAGNETO IGNITION TIMING

The flywheel magneto is fitted on the front end of the tapered crankshaft and secured by a locking nut and washer. A key in the tapered shaft engages with a keyway in the flywheel centre boss and this fixes the timing of the spark in relation to the engine. However, a small amount of timing adjustment is provided by short slots in the back plate or stator plate. (Fig. 3. See Miller Magneto Maintenance.)

If the two slotted-head screws within the magneto which hold the stator plate to the crankcase are slackened, the stator plate can be rotated a few degrees to the right or left. Moving the plate to the right, clockwise looking at front of engine, advances the ignition timing, while moving plate to the left, anti-clockwise, retards the timing.

We do not recommend any change from the normal position of back plate (i.e., the securing screws being approximately central in the slots) unless carried out by a competent mechanic.

TYRE PRESSURES

Highest-quality DUNLOP 23×2.00 Tyres (rim size 1522 m.m.—marked 23×2.00) as specially designed for this type of machine, are fitted as standard. To obtain best results from your machine and tyres, and to benefit from the shock-absorbing qualities of the tyres, it is essential to have correct Tyre Pressures according to the load on each wheel.

Schrader valves are fitted. We recommend you to obtain a Tyre Pressure Gauge and maintain Pressure in

accordance with the following scale :—

RECOMMENDED PRESSURE

(Maximum Speed 33-35 m.p.h.)

	Front Wheel lb/sq. in.	Back Wheel lb/sq. in.
8 st. rider and machine	24	26
9 st. rider and machine	24	28
10 st. rider and machine	25	30
11 st. rider and machine	26	32
12 st. rider and machine	28	34
13 st. rider and machine	30	36

REAR HUB

The rear hub incorporates an internal expanding brake of $4\frac{1}{4}$" diameter operated by back-pedalling, and an enclosed roller-type freewheel. But it is not a coaster hub and therefore does not require the copious lubrication essential with the coaster pattern. The hub is thoroughly packed with grease where necessary on assembly and no further lubrication is required or desirable over a long period. When pedalling the machine a faint clicking sound comes from the hub. This is quite in order and is simply a freewheel ratchet overrunning as in some cycle hub gears.

FRONT FORK

This fork, of the modern bottom-link type, is extremely simple. Rubber, totally enclosed by the aluminium die-cast links, provides the resilient member and the only moving parts are the two links into which are pressed nylon bushes which run on fixed spindles screwed into the bottom fork ends. These bushes and spindles are shrouded within the rubber and are well greased on assembly. Nylon has an extremely long life and there should be no need to interfere with these parts in the normal way. But keep tight the $\frac{1}{4}$" nut on the outside of the fork link centre and try a spanner on the four nuts—two each side—which clamp the front hub spindle in the links. Put a spot of oil frequently on the two pins, one at each end, which anchor the torque-plate link to the near side fork blade.

FRONT HUB

This hub is a straightforward internal expanding brake product, the only special features being that the side-plate carrying the brake shoes and torque-arm is free to float on flanged collars on the spindle. This is necessary to suit the link torque-anchorage of side-plate to fork. *On no account must the side-plate be clamped to the hub spindle* as on cycle hubs, as this would result in the cones becoming loose and the bearings being damaged.

NOTES ON DECARBONISING

In addition to periodical decarbonising of the exhaust port described on a previous page, it will be necessary to remove carbon from the top of piston and inside of head at intervals, depending upon the distance covered and the quantity of lubricating oil mixed with the petrol.

As a general rule the special "self-mixing" oils will give a greater mileage before decarbonising is necessary.

So long as the engine is running well it is a good rule to leave well alone, but when decarbonising is required the head and cylinder should be removed and carbon scraped from top of piston and inside of head. Before scraping these parts, rag should be placed under the piston to prevent carbon falling into the crankcase.

If the rings are free in their grooves the rings should not be disturbed, but if they are stuck in their grooves they must be freed. It is, however, not easy to free gummed rings without breaking them and we strongly recommend that spare rings should be to hand before attempting to remove gummed rings.

After removing the gummed rings, the grooves in the piston should be cleaned, and this is best done with a piece of broken piston ring. When cleaning the grooves, care must be taken to avoid damaging the stop pins which fit under the ends of the piston rings. Be certain, when fitting old rings, that they are replaced in the same groove from which they were removed and that they are fitted the same way up as before. When refitting the cylinder barrel observe that the recesses in the ends of the piston rings are engaging the stop pins, for if they are not, attempts to force the cylinder over the piston will result in ring breakages.

A new washer should always be fitted at the cylinder base joint, if the original washer has been damaged.

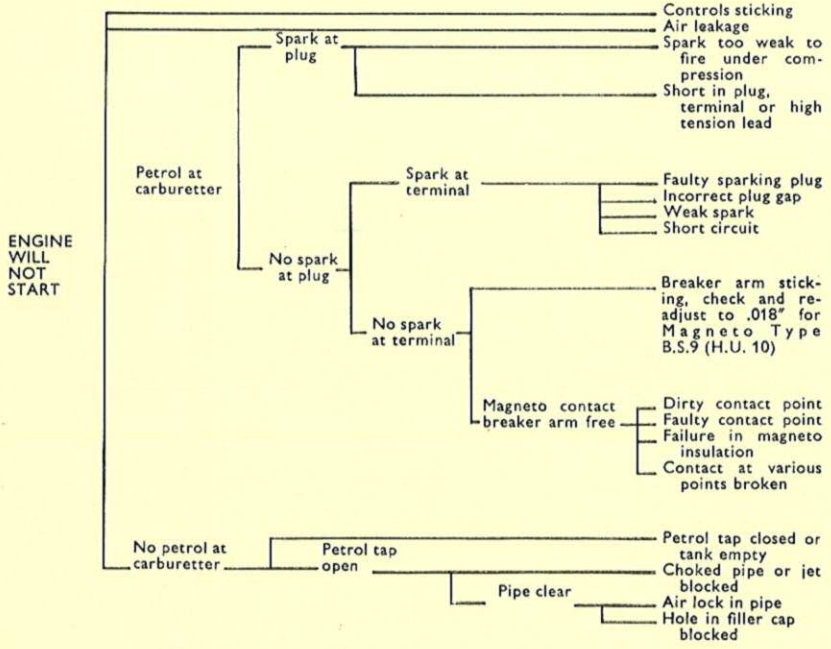
After re-assembling the engine and before starting, pour a few drops of thin oil into the sparking plug hole and rotate the crankshaft by hand, to ensure that the engine is free and has been correctly assembled.

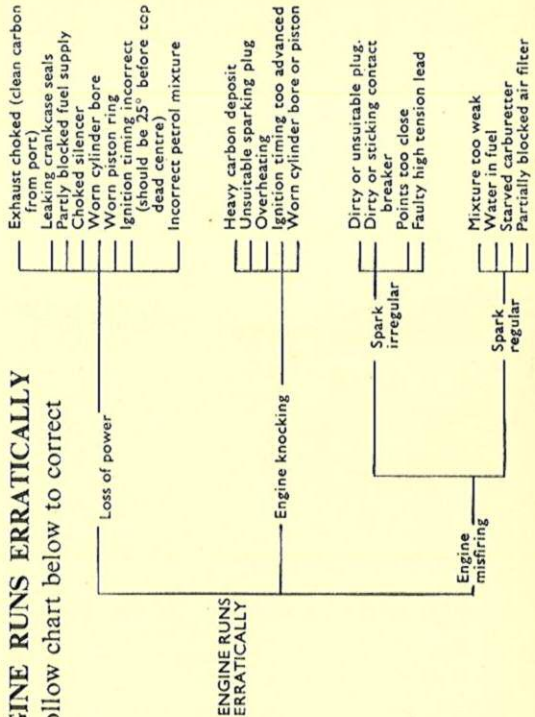
Charts on page 15 enable any possible form of trouble with the engine to be located and cured. These charts are divided under two headings:—

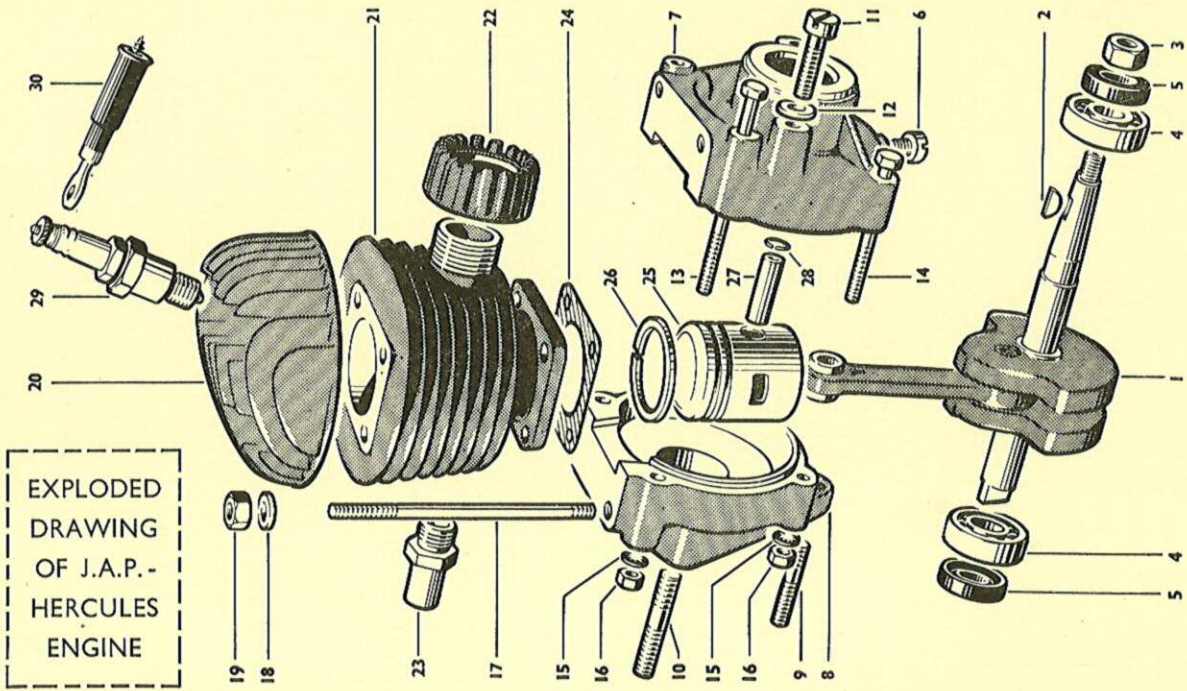
1. Engine will not start.
2. Engine runs erratically.

FAILURE TO START

This may be due to one or more of several causes, but if the instructions given in the chart below are followed carefully and systematically, it will save time and trouble.






EXPLODED DRAWING OF J.A.P.-HERCULES ENGINE
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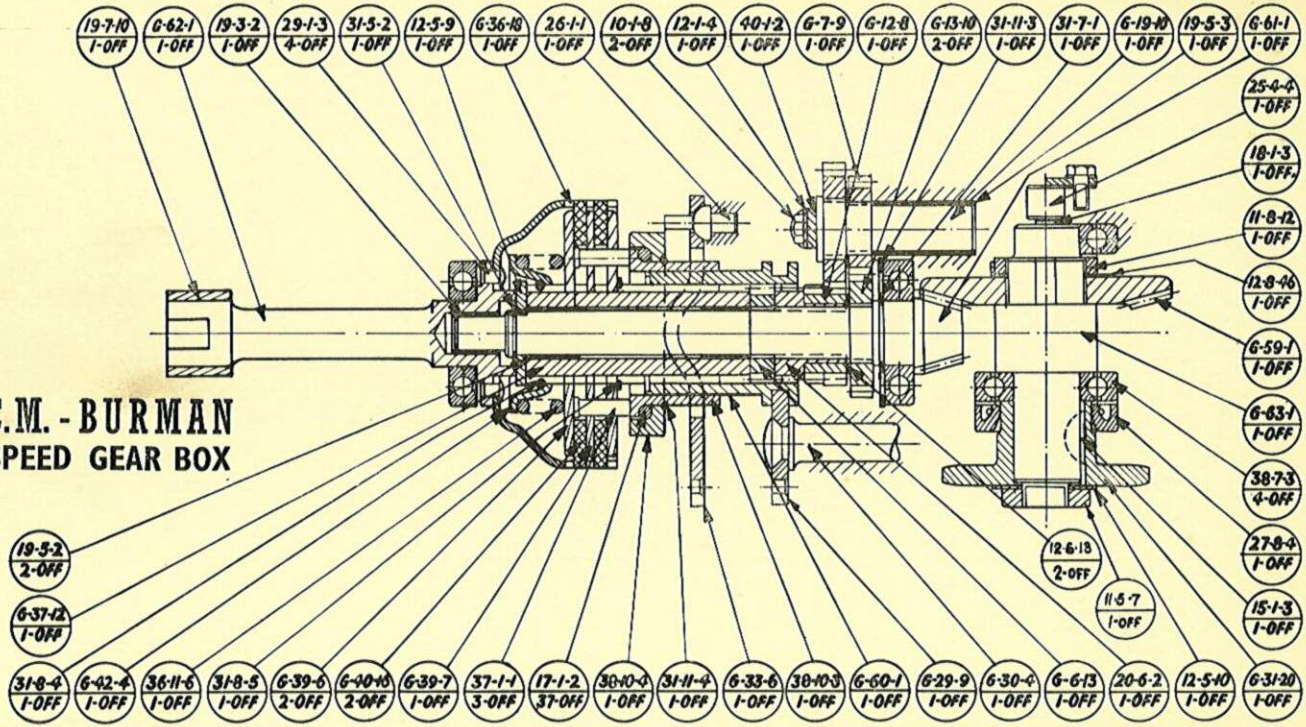
KEY TO EXPLODED DRAWING OF ENGINE

Illust. Ref. No.	Part No.	Description	Qty. per Unit
1	SA.3506	Crankshaft and Conrod Assembly	1
2	17640	Key—Magneto Fixing	1
3	285	Nut—Magneto Fixing	1
4	17572	Ball Bearing—Crankshaft	2
5	19806	Oil Seal—Crankshaft	2
6	19986	Drain Plug—Crankcase	1
7	20860	Crankcase—Magneto Side	1
8	20861	Crankcase—Drive Side	1
9	20884	Stud—Gearbox Clamping—Bottom	1
10	20883	Stud—Gearbox Clamping—Top	2
	SA.3505	Crankcase Assembly comprises the following items:— 17572 Ball Bearing (2) 19806 Oil Seal (2) 20860 Crankcase—Magneto Side (1) 20861 Crankcase—Drive Side (1) 19986 Drain Plug (1) 20883 Stud—Gearbox Clamping (2) 20884 Stud—Gearbox Clamping (1) 21425 Bolt—Crankcase Clamping (1) 6731 Nut—Clamping Bolt (1)	
11	12121	Screw—Magneto Fixing	2
12	9308	Washer—Magneto Screw	2
13	21425	Bolt—Crankcase Clamping—2½" U/HD ...	2
14	20867	Bolt—Crankcase Clamping—1¾" U/HD ...	2
15	19435	Shakeproof Washer—Clamping Bolt ...	4
16	6731	Nut—Clamping Bolt	4
17	20868	Stud—Cylinder Fixing	4
18	18315	Washer—Cylinder Fixing Stud	4
19	3574	Nut—Cylinder Head Fixing	4
20	20862	Cylinder Head	1
21	20859	Cylinder Barrel	1
22	20865	Exhaust Nut	1
23	20866	Inlet Pipe	1
24	20792	Gasket—Cylinder Base	1
25	20765	Piston with Ring Pegs	1
26	20791	Ring—Piston	2
27	20789	Gudgeon Pin—Piston	1
28	20790	Circlip—Gudgeon Pin	2
29	18593	Sparking Plug	1
30	21798	Suppressor and Terminal—Sparking Plug ...	1



The

H.C.M. - BURMAN
2-SPEED GEAR BOX

GEARBOX MAINTENANCE

THE H.C.M. - BURMAN 2-SPEED GEARBOX

(Manufactured by Burman & Sons Ltd., especially for The Hercules Cycle & Motor Co. Ltd.)

To maintain a high standard of efficiency from this gearbox, the following items must be carried out:

(1) Fill to the correct oil level with S.A.E.30 oil and check periodically.

(2) The gear change must be correctly adjusted— Screw adjuster until the same amount of lever movement is needed to engage top and bottom gear engaging dogs.

(3) The clutch lever must also be correctly adjusted— Screw adjuster until there is at least $\frac{1}{16}$" of free movement on inner cable before the clutch starts to lift.

(4) The practice of holding the clutch lever disengaged for prolonged periods is not to be recommended. Neutral should be engaged and the clutch lever disengaged.

It is recommended to return the gearbox to your Authorised Dealer for repair, but the following notes will help in the dismantling of gearbox.

Remove engine unit from gearbox. Unscrew the bolts holding driving shaft assembly to the main gear unit. Remove circlip off driving spindle and slide off in the following order: thrust washer, clutch unit, clutch ballrace, clutch lever, gear engagement piece and fork, top engaging gear, bottom engaging gear and bush. Unlock lockwasher on layshaft spindle, remove screws and withdraw layshaft and gears. Slide off the remaining gear on driving spindle.

To remove bevel gear assembly; unlock lockwasher on sprocket and unscrew nut, unscrew screws from opposite side of box and gently tap bevel gear spindle through sprocket and withdraw complete unit. Every part is now open for inspection.

To re-assemble reverse the order of dismantling.

MAINTENANCE AND RUNNING INSTRUCTIONS FOR THE MILLER FLYWHEEL MAGNETO. TYPE B.S.9 (H.U. 10)

The Magneto, type B.S.9, consists of a Stator Plate (8), Magnetic Flywheel (2) and a Cover (3). The Stator Plate is an aluminium casting, and secured to this by the means of screws are, the high tension Ignition Coil (5), Lighting Coil (7), Contact Breaker (6), Condenser (10), and the "Pick-up" (4), into which is fitted the H.T. Cable (1). The Flywheel (2) consists of a casting into which are fitted four magnets, four laminated poles, and a centre hub, which is so designed that in addition to the centre tapered hole it forms the contact breaker operating cam. The flywheel is secured to the engine crankshaft by means of a tapered shaft and fixing nut. The key in the shaft is mainly for the purpose of locating the flywheel in a correct relative position to the contact breaker and piston firing position.

When the engine is running, the flywheel revolves round the high tension and lighting coils, and the "air gap" between the flywheel poles and the coil cores is approximately .010 inch.

CONTACT BREAKER (6)

After removing the Magneto Cover (3), the contact breaker is visible and accessible through one of the slotted holes in the flywheel. It is important that at all times the contact breaker points (contacts) should be free from oil or grease, as the presence of this will cause the contacts to become burned or blackened. To clean, use a piece of fine emery cloth and after use wipe with a petrol moistened rag. Do not leave any lint on the contacts.

CONTACT BREAKER SETTING

The contact breaker gap is set accurately before leaving the Works at .018 inch, but occasionally adjustment should be made to maintain this. Adjustment is necessary owing to the wear of the lever heel. This wear is rather more during the first 500 miles than it will be after this mileage has been attained. It is, therefore, advisable to check the gap at 500 miles service and then again at 1,500 miles.

The method of adjustment is as follows:

First revolve the flywheel so that the contact lever is lifted to its highest position on the cam; then loosen the adjuster contact plate fixing screw (which is immediately under the fixed contact) just sufficiently to allow the contact plate to move with pressure from a screw driver to the correct position of .018 inch between the contacts, then tighten the fixing screw.

CONDENSER (10)

It is desirable that a small amount of sparking should occur at the contact breaker contacts, but if this becomes excessive and the running of the engine is affected then the condenser should be suspected of being at fault. To prove this try a replacement condenser, but before doing this make sure the sparking plug and leads are in good order as it may be that these parts are at fault and not the condenser.

LUBRICATION—EVERY 2,000 MILES

Apply a few drops of thin oil to the felt Cam Lubricator (9).

HIGH TENSION CABLE (1)

If this shows signs of cracking or perishing it should be replaced by use of 5 mm. or 7 mm. cable (P.V.C. covered recommended, but rubber covered can be used). To release cable from the magneto, take out the two screws which secure the cable retaining pressing, then pull out cable from "pick-up." When replacing, use a thick needle or similar tool to make an aperture in the conductors of the cable to receive the solid wire lead from the high tension coil.

HIGH TENSION COIL (5)

This coil does not call for any attention, but when making adjustments to contact breaker or assembling the stator plate on to the engine, make sure that in this process the screwdriver does not slip, as it may cause the earth wire from the coil to be broken. This cannot be repaired.

LIGHTING COIL (7)

The output from this coil is sufficient to allow the use of a 6 volt 6 watt headlamp bulb and a 12 volt 2.2 watt rear lamp bulb. The lamp set recommended for use with this magneto is the **Miller Set, Type 7/TM/SET (Head Lamp 7TM/S, Tail Lamp 596T).**

DISMANTLING

First remove the Cover (3) by pulling the spring clips outwards just sufficiently to allow them to pass over the Stator Casting (8). Do not pull spring clips out too far as they may become strained. When the cover is removed the Flywheel (2) will be exposed showing the nut which secures the wheel to the shaft. Remove the nut by using a good fitting spanner and turn in an anti-clockwise direction. As the nut should have been very tightly secured it may be necessary to give the lever of the spanner a sharp tap to release it. When the nut is removed use a two-pin extractor. When the two 2BA screws have been screwed into the two tapped holes in the flywheel hub, the centre screw of the extractor should be turned in a clockwise direction until the point of the screw has entered the centre hole of the engine shaft; keep turning the screw until the wheel is released from the tapered engine shaft.

Should it be necessary to remove the stator plate, this is done by removing the two securing screws which enter through the slotted holes.

When refitting the magneto, reverse the process as described under the heading "Dismantling," but read instructions on Page 12 with reference to Timing.

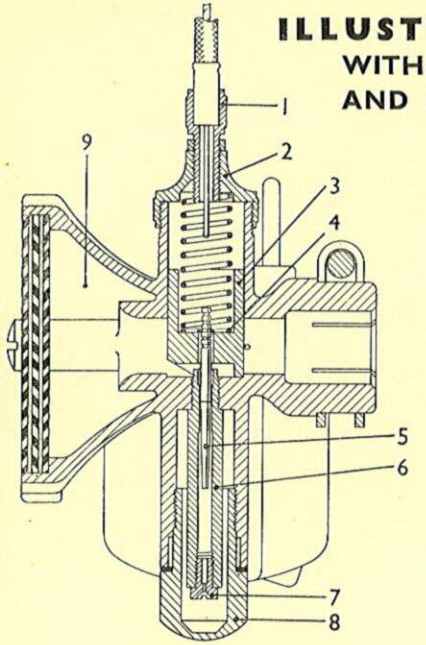
Should the magneto need attention other than the renewal of contact breaker, condenser or H.T. cable, it is recommended that the whole magneto be returned to your Authorised Dealer.

A REMINDER—

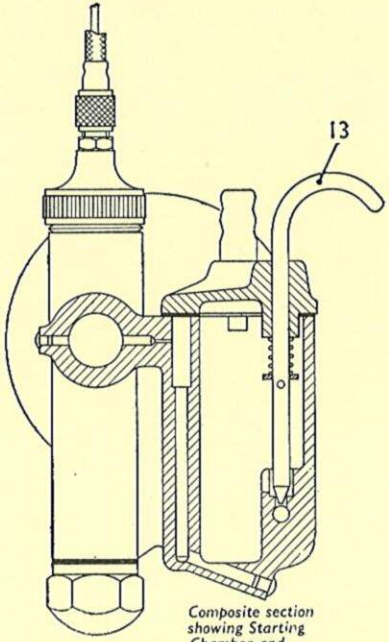
ALWAYS KEEP CONTACTS CLEAN OF GREASE OR MISFIRING WILL OCCUR.

timing 25% = 5 mm = $\frac{5}{32}$" BTDC.

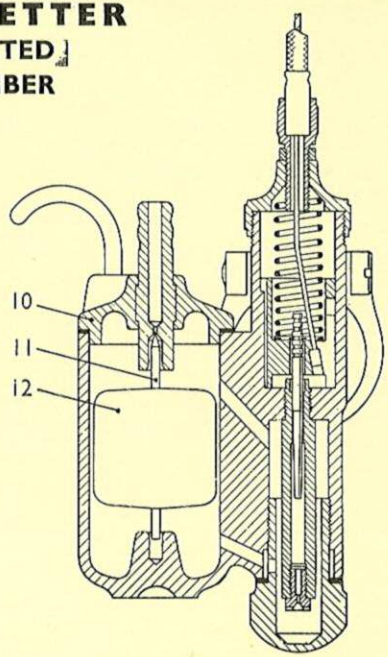
ILLUSTRATIONS OF CARBURETTER
WITH STARTING CHAMBER INCORPORATED AND HAVING A TOP FED FLOAT CHAMBER



Section through Mixing Chamber showing air intake and cross bore.



Composite section showing Starting Chamber and Mixing Chamber



Section through Float Chamber and Mixing Chamber

HINTS AND TIPS FOR AMAL CARBURETTER, TYPE 360/4

DESCRIPTION

The Type 360 carburetter is designed for small engines. Type 360 has a starting chamber. The throttle is operated by a cable with a suitable control. Air filter elements are incorporated in the main air intake. The carburetter is attached to the engine cylinder stub or inlet pipe by a clip fitting.

HOW CARBURETTER WORKS

The float chamber maintains a constant level of fuel at the jet and cuts off the supply when the engine stops. On fuel flowing from the float chamber the Float (12) falls, and its Needle (11) coming away from its seating allows fresh fuel to enter. Depression caused by movement of the engine piston causes, via the throttle opening, air to flow into the Main Air Intake (9) and fuel to flow through the Needle Jet (6) into the cross bore and mix with the incoming air forming a fuel/air mixture.

Correct fuel/air proportions for various throttle openings are governed by: **The size of the Main Jet** (7) which controls the amount of fuel fed to the Needle Jet (6) at $\frac{3}{4}$ to full open throttle. **The taper of the Jet Needle** (5) which, operating in the Needle Jet (6), controls the amount of fuel fed at lesser openings. **The parallel portion of the Jet Needle** (5) which, on entering the bore of the Needle Jet (6), and in conjunction with the amount of cutaway on the Throttle Valve (3), controls the idling mixture.

The Starting Chamber, in which fuel is fed direct to the carburetter bore on the engine side of the Throttle Valve (3) from a well, is formed by a division wall in the float chamber. Sufficient fuel for cold starting is allowed to fill the well by raising a Needle (13) in its cover.

Starting engine from cold. Raise hook-ended needle in the top of the float chamber for 5 to 7 seconds, thus allowing starting chamber to fill with fuel, set throttle valve about $\frac{1}{4}$ open, start engine, and when engine is running regularly throttle down to idling speed. No further operation of the starting needle should be necessary.

Starting when engine is warm. The starting chamber needle should not be raised, thus keeping the chamber empty of fuel. The throttle should be slightly opened and the engine started.

MAINTENANCE

Removing and fixing carburetter. If the carburetter is removed from the induction pipe, see that on refixing it is pushed right home on the pipe, before locking the clip. The carburetter should be pushed on true with a screwing motion, after having put a little oil on the pipe. Erratic slow running can be caused if there are air leaks at the point of attachment of the carburetter to the cylinder.

Dismantling when inspecting or tuning. The float chamber, float or its needle and the starting chamber and its needle, may be inspected by removing the Float Chamber Cover (10), which is secured by two hexagon headed pins. On re-assembling, ensure

that the needles are located in their respective seats when replacing the cover, and that the joint washer is undamaged.

The throttle valve complete with jet needle and attached to the cable can be withdrawn from the carburetter after the knurled Mixing Chamber Top (2) has been unscrewed.

To separate the throttle valve and jet needle from the cable release the cable at the control end and push the inner cable forward until the nipple in the throttle valve clears its hole, then withdraw the cable through the slot in the throttle valve, the nipple passing through the hole at the extreme end of the slot. On re-assembling pass the nipple through this hole via the inside of the throttle valve, ensure that the portion of the Jet Needle Clip (4) that falls in towards the jet needle is opposite the cable slot in the throttle valve, and then draw the cable forward until the nipple will pass over the end of the throttle valve and sink into its hole. On putting back this throttle valve assembly into the body, see that the key in the carburetter body engages the key-way opposite the cable slot in the throttle valve, and that the jet needle is entering the needle jet, before attempting to push the assembly home. Access to the main jet is by removing the Main Jet Cover Nut (8) and withdrawing the filter gauze. When replacing the main jet take care not to over-tighten.

Filter Gauze (not shown on illustration). A filter gauze, which is a push fit over the main jet and needle jet, should be periodically examined and cleaned if necessary by washing in clean petrol.

Fuel Feed. Ensure that the fuel tap and pipe are kept clear.

Float Chamber. Ensure that there is no continual flooding of the float chamber.

Excessive Fuel Consumption may be due to continual flooding of the float chamber; check that the float needle is not worn or bent, that the float is not leaking, that no impurities have got into the float chamber and lodged on the float needle seating. Check also that the starting needle is not bent or damaged and that there are no impurities lodged on its seating. Nearly all flooding with new machines is due to impurities (grit, fluff, etc.) in the fuel tank—so clean out the float chamber periodically until the trouble ceases. If the trouble persists, the fuel tank may be drained, swilled out, etc.

Cable Controls. See that the cable control fully opens and closes the Throttle Valve (3). A Cable Adjuster (1) with locknut is provided in the top of the carburetter and can be adjusted until correct movement is obtained.

FAULTY MIXTURES—SIGNS AND CAUSES

There are only two possible faults in carburation, either richness or weakness of mixture. Before testing for incorrect mixture, verify the correctness of fuel feed and see that there are no air leaks. Check over ignition, timing, etc.

INDICATIONS OF :—	
RICHNESS	**WEAKNESS**
Black smoke in exhaust.	Spitting back in carburetter.
Petrol spraying out of carburetter.	Erratic slow running.
Four-stroking.	Overheating.
	Poor acceleration.

INDICATIONS OF:— RICHNESS	WEAKNESS
Heavy, lumpy running.	Engine goes better if:—
Sparking plug sooty.	Throttle valve is not wide open, or if starting chamber is kept supplied with fuel.

If richness or weakness is present, check if caused by:—

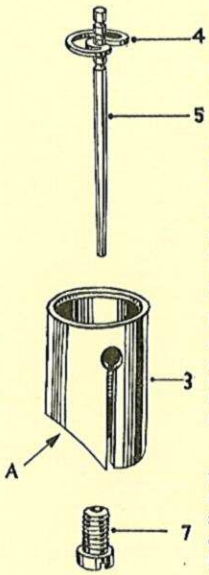
(1) Petrol feed.	Choked filter gauze on main jet. Check that the main jet, needle jet and passages are clear and that there is ample flow of fuel. Check there is no flooding of the float chamber or continual supply of fuel to the starting chamber.
(2) Air leaks.	At the connection of the carburetter to the engine.
(3) Defective or worn parts.	Such as a loose fitting throttle valve, worn needle jet, or loose needle jet or main jet.
(4) Air filter elements obstructed.	Take out plates and check for obstruction.

HOW TO TUNE UP

Illustrated are the parts to tune up with. They are:—

The **Main Jet** (7). Each main jet is calibrated and numbered, so that its exact discharge is known. Two main jets of the same number are alike. Never reamer a main jet out. Get another one of the right size, the bigger the number the bigger the flow, the numbers varying for example, 20, 22, 25, 27, 30, 32.

The **Throttle Valve** (3). The slope at (A) is called the cutaway, and its number is stamped on the bottom. Throttle valves can be had with different cutaways—the bigger the cutaway and number, the weaker the mixture produced for small throttle openings.



The **Jet Needle** (5). The jet needle is positioned in the throttle valve by the jet needle clip (4). The top of the jet needle is grooved and by springing the clip off and springing it on again in another groove, the position of the jet needle in the throttle valve is altered, either being raised or lowered.

To remedy Weakness or Richness, proceed as follows:—

Position of Throttle.	To Cure Richness.
At ¾ to full throttle.	Fit smaller main jet.
At ¼ to ¾ open, as for general running.	Lower jet needle.
Up to ¼ opening, as for idling and light running.	Fit throttle valve with larger cutaway.

Position of Throttle.	To cure Weakness.
At ¾ to full throttle.	Fit larger main jet.
At ¼ to ¾ open, as for general running.	Raise jet needle.
Up to ¼ opening, as for idling and light running.	Fit throttle valve with smaller cutaway.

Finally, if any alteration has been made to the throttle valve cutaway, it may be necessary to alter the jet needle position again; putting in a throttle valve of smaller cutaway may require the jet needle lowering by a groove, and alternatively a larger cutaway may necessitate raising the jet needle.

needle 2nd (or) groove

H.C.M. HER-CU-MOTOR CYCLE COMPONENTS SPARES

Part No.	Description	No. off
	Frame Group	
M.E.66	Frame only less Seat Stays and Stand	1
M.E.134	Seat Stays	1 pair
M.E.82	Seat Pillar	1
M.E.139	Seat Bolt with Nut	1
M.E.14	Rear Carrier	1
M.E.143	Seat Stay and Rear Carrier Bolt c/w Nuts M.F.57 and Washers	1
M.E.11	Bottom Bracket Axle	1
M.E.17	Bottom Bracket Bush	1 pair
M.E.86	Double Spring Washer	1
M.E.49	Gearbox Support Bolts (Series 1)	2
M.E.53	Gearbox Adjusting Rod c/w Nut and Washer	1
M.E.93	Engine Support Bolt	1
M.E.52	Engine Support 'D' Nuts ...	2
M.E.56	Engine Support Straps	2
M.F.43	Bolt c/w Nut and Star Washers for Support Strap (Series 1) ...	2

Part No.	Description	No. off
M.E.57	Washer — Jointing Engine to Gearbox	1
M.E.118	$\frac{1}{4}$" Nut with Washer for Jointing Engine to Gearbox	1
M.E.117	$\frac{5}{16}$" Nut with Washer for Jointing Engine to Gearbox	2
M.E.135	Stand Assembly complete ...	1
M.E.135/1	Stand Assembly only	1
M.E.25	Stand Spring	1
M.E.35	Stand Plate L.H.	1
M.E.35/A	Stand Plate R.H. with Peg ...	1
M.E.26	Stand Pivot Bolt with Nuts and Washers	1
M.E.23	Stand Pivot Bush	1
M.E.81	Seat Stay Frame Bolts c/w Nut and Washer	2
M.E.164	Gearbox Support Bolts (Series 2)	2
M.E.165	Gearbox Coned Rubber Washers and Bonded Washer (Series 2)	4
M.E.162	Distance Sleeve Tube (Series 2)	2

CYCLE COMPONENTS SPARES

Part No.	Description	No. off
M.E.163	Gearbox Bolt Shouldered Washer (Series 2)	4
M.E.159	Front Engine Supporting Strap Rubber Bush (Series 2) ...	1
	Front Fork Assembly	
M.E.133	Fork only, with Column, Crown, Blades and Bottom Lugs ...	1
M.E.2	Fork Bottom Links	2
M.E.2/1	Fork Bottom Link Fronts ...	2
M.E.7	Fork Link Spindle	2
M.E.5	Fork Link Spindle Bush ...	2
M.E.118	Fork Link Spindle Nut	2
M.E.6	Fork Link Spindle Washer ...	2
M.G.252	Fork Link Locknut	2
M.E.132	Fork Rubbers Bonded to Disc ...	1
M.E.37	Bottom Link Retaining Stud ...	4
M.E.18	Bottom Link Retaining Stud Nut	4
	Front Wheel Group	
M.E,160	Wheel complete less Tyre ...	1

Part No.	Description	No. off
M.E.128	Rim only. 23″×2″ C.P. 36H ...	1
M.E.129	Rim Tape	1
M.E.60	Spoke (Long) 9″×13G	Set of 18
M.E.61	Spoke (Short) $8\frac{9}{16}$″×13G ...	Set of 18
M.E.63	Spoke Nipple	Set of 36
M.E.64	Spoke Washer	Set of 36
M.E.72	Front Hub complete	1
M.E.92	Front Hub Spindle	1
M.G.229	Front Hub Fixed Cone	1
M.B.40	Front Hub Adjusting Cone ...	1
—	Steel Balls—$\frac{1}{4}$″ Dia.	Set of 18
M.B.49	Cover Plate with Torque Arm...	1
M.E.9	Torque Arm Link	1
M.E.8	Torque Arm Link Pin with Washer and Split Pin... ...	2
M.B.45/1	Brake Shoe and Bonded Brake Lining	1 pair
M.E.3	Sleeve Nut	2
M.G.251	Hub Nut—$\frac{3}{8}$″	1

CYCLE COMPONENTS SPARES

Part No.	Description	No. off
M.G.90	Hub Spindle Washer	
	When Speedo fitted	2 to set
	When Speedo omitted ...	4 to set
M.B.31	Locking Ring	1
M.E.142	Adjusting Cone Washer ...	1
M.G.409	Lubrication Cover Clip	1
M.B.41	Dust Excluder	1
M.B.60	Cam Lever	1
	Rear Wheel Group	
M.E.161	Rear Wheel complete less Tyre	1
M.E.128	Rim. 23″×2″ C.P. 36.H. ...	1
M.E.129	Rim Tape	1
M.E.65	Spoke (Short) $7\frac{5}{8}$″×13G ...	Set of 18
M.E.62	Spoke (Long) $7\frac{3}{4}$″×13G ...	Set of 18
M.E.63	Spoke Nipple	Set of 36
M.E.64	Spoke Washers	Set of 36
M.E.73	Rear Hub complete (less Driving Sprocket only)	1

Part No.	Description	No. off
M.E.42	Sprocket 48T	1
M.E.166	Sprocket Bolts	Set of 6
M.E.107	Star Washer for Bolt	6
M.H.16	Nut for Bolt	6
D.1446	Chain Adjusters	1 pair
M.E.148	Rear Hub Torque Arm Bolt } Complete	1
M.G.379	Washer } Complete	2
M.E.117	Nut } Complete	1
	Steering Head Group	
M.D.39	Lock Nut	1
M.E.125	Lamp Bracket	1
M.E.83	Head Clip with Bolt	1
M.E.95	Screwed Race	1
M.E.96	Top Frame Race	1
M.E.97	Bottom Frame Race	1
M.E.98	Crown Race	1
—	Steel Balls—$\frac{3}{16}$″	Set of 44

CYCLE COMPONENTS SPARES

Part No.	Description	No. off
M.F.316	Handlebar less Expander Bolt ...	1
M.F.287	Expander Bolt complete, with Cone and Washer	1
	Chain Group	
M.C.11	Chainwheel with R.H. Crank ...	1
M.C.42	Crank, L.H.	1
M.C.29	Crank Cotter with Nut and Washer	1 pair
M.H.4	Pedals—4" Rubber (Gents) ...	1 pair
M.E.74	Pedal Drive Chain $\frac{1}{2}" \times \frac{1}{8}"$ ...	1
M.E.75	Power Drive Chain $\frac{1}{2}" \times \frac{3}{16}" \times 93$ Links, Heavy Duty	1
M.E.10	Pedal Chainguard	1
M.E.12	Power Drive Chainguard ...	1
M.F.43	Bolt $\frac{3}{16}"$ c/w Nuts and Washers for fixing Power Chainguard to Frame	2

Part No.	Description	No. off
D.1344	Bolt $\frac{1}{4}"$ with Washer M.E.108 for fixing Pedal Chainguard to Frame	1
M.E.88	Bolt $\frac{1}{4}" \times 1\frac{3}{16}"$ c/w Nuts and Washers for fixing Power and Pedal Chainguard to Carrier	2
	Exhaust Group	
M.E.30	Silencer complete	1
M.E.33	Exhaust Pipe	1
M.E.58	Exhaust C. & A. Washer ...	1
M.F.310	Silencer Clip Pins	2
M.E.38	Silencer Support	1
M.E.107	Star Washer $\frac{3}{16}"$ for Silencer Clip	Set of 2
D.1344	$\frac{1}{4}"$ Bolt with Nut and Washer for Silencer Support	1
D.1344	$\frac{1}{4}"$ Bolt with Washer only for Silencer Support	1
M.E.102	Silencer End Clips	2

CYCLE COMPONENTS SPARES

Part No.	Description	No. off
M.E.108	Star Washer ¼" for Silencer Support	2
	Fuel Tank Group	
M.E.69	Fuel Tank only	1
M.E.70	Filler Cap with Oil Measure ...	1
M.E.71	Petrol Tap	1
M.E.84	Petrol Tap Washer	1
M.E.85	Petrol Pipe	1
M.E.80	Tank Rubber	Set of 4
M.E.81	Tank Bolts	Set of 6
M.C.31	Tank Bolt Washers	4
	Control Group	
M.E.152	Clutch Control Wire and Casing	1
M.E.153	Gear Control Wire and Casing	1
M.E.113	Gear and Clutch Control Unit ...	1
M.E.157	Spring for Gear Change Adjuster	1

Part No.	Description	No. off
M.E.155/1	Front Brake Control Lever, complete (Fitted to)	1
M.E.155	Front Brake Control Wire complete with Adjuster (Frame Series M-1 to M-2,000)	1
M.E.149	Throttle Control	1
M.E.154	Throttle Cable	1
	Mudguard Group	
M.E.15	Front Mudguard with Stays ...	1
M.E.16	Rear Mudguard with Stays ...	1
M.E.15/1	Front Mudguard Stays	2 pairs
M.E.16/1	Rear Mudguard Stays	1 pair
M.E.13/F	Front Number Plate	1
M.E.13/R	Rear Number Plate	1
M.E.13/F1	Front Number Plate Fittings complete, set	1
M.E.13/R1	Rear Number Plate Fittings complete, set	1

CYCLE COMPONENTS SPARES

Part No.	Description	No. off
M.E.141	Mudguard Flap	1
M.F.43	Mudguard Pin c/w Nut and Washers	1
M.E.44	Rear Mudguard Distance Piece ...	1
M.E.88	Rear Mudguard Front Bolt c/w Nut and Washer... ...	1
M.E.87	Front Mudguard Crown Bolt c/w Nut and Washers ...	1
D.1344	Bolt ¼" c/w Star Washer for Front Mudguard Stay fixing ...	2
M.E.88	Rear Mudguard Stay/Carrier Bolt c/w Nut and Washer ...	1
D.1344	Rear Mudguard Carrier Bolt c/w Nut and Washer ...	1
	Equipment Group	
M.E.151	Tool Box, c/w Lid	1
A.5499	Dumbell Spanner	1
M.E.120	Head Lamp (with Speedo) ...	1

Part No.	Description	No. off
M.E.121	Head Lamp (less Speedo) ...	1
M.E.122	Tail Lamp, c/w Wire and Terminals	1
—	Head-Lamp Bulb, 6-watt, 6-volt	1
—	Tail-Lamp Bulb, 2·2-watt, 12-volt	1
M.E.123	Horn with P.B. and Wiring ...	1
M.E.124	Speedo and Drive	1
M.E.126	Licence Holder	1
M.E.59	Combination Spanner	1
M.E.145	Plug Spanner	1
M.E.127	Licence Holder and Horn Bolt c/w Nut and Washer ...	1
M.E.144	Inflator with Connection ...	1
M.E.147	Screwdriver	1
M.E.67	Saddle	1
M.E.150	Plastic Cable Strapping	9
M.E.150/1	Plastic Cable Strapping Studs ...	9
M.E.110/1	Magneto Flywheel Extractor	1

H.C.M. - BURMAN 2-SPEED GEARBOX AND CLUTCH UNIT

Part No.	Description	No. off
G-1-12	Gearbox	1
G-2-9	Gearbox Cover	1
G-3-9	Bevel Case Cover	1
G-5-14	Joint Washer. Gearbox ...	1
G-5-15	Joint Washer. Bevel Case ...	1
10-2-12	Bolt. Gearbox ...	4
14-1-3	Screws. Bevel Case ...	4
12-2-1	Spring Washer. Gearbox Bolts	4
12-1-3	Shakeproof Washer	4
G-59-1	Crownwheel	1
G-63-1	Crownwheel Shaft	1
11-8-12	Nut	1
12-8-46	Lockwasher	1
38-7-3	Bearing	4
25-4-4	Thrust Button	1
12-4-9	Backplate	1
12-4-8	Shim ·005"	1–4
12-4-7	Shim ·010"	1–4
12-4-6	Shim ·002"	1–4

Part No.	Description	No. off
10-1-8	Bolt. Backplate and L. Shaft ...	4
G-31-20	Sprocket	1
15-1-3	Woodruff Key No. 20	1
11-5-7	Nut	1
12-5-10	Lockwasher	1
G-61-1	Bevel Driving Shaft	1
G-62-1	Driving Spindle	1
19-3-2	Bush	1
19-7-10	Collar. Driving Spindle... ...	1
12-1-5	Shakeproof Washer. Backplate	2
27-8-4	Oil Seal. Sprocket	1
18-1-3	Roller. Bevel Spindle ...	1
31-11-3	Circlip. Ballrace Outer ...	1
31-7-1	Circlip. Ballrace Inner ...	1
G-13-10	Gear 18T	2
G-7-9	Gear 14T	1
G-12-8	Gear	1
20-6-2	Bush	1
G-6-13	Gear. Top Gear Engagement ...	1

H.C.M. - BURMAN 2-SPEED GEARBOX AND CLUTCH UNIT

Part No.	Description	No. off
12-6-13	Spacer Washer	2
G-19-10	Layshaft	1
19-5-3	Bush	1
40-1-2	Plate	1
12-1-4	Lockplate	1
32-7-3	Cover Plate Cable Attachment	1
G-5-13	Joint Washer	1
14-1-2	Screws	3
14-2-13	Oil Level Plug	1
12-2-5	Washer	1
G-37-12	Clutch Centre	1
G-36-18	Clutch Case	1
G-40-16	Clutch Plate	2
G-39-6	Plain Plate, thick	2
G-39-7	Plain Plate, thin	1
31-8-5	Circlip. Clutch Assembly ...	1
12-5-9	Tab Washer	1
31-5-2	Circlip	1
29-1-3	Rivet. Clutch Case	4

Part No.	Description	No. off
36-11-6	Spring	1
G-42-4	Spring Cup	1
31-8-4	Circlip	1
19-5-2	Bush. Clutch Centre	2
38-10-4	Outer Ball Race	1
38-10-3	Inner Ball Race	1
31-11-4	Circlip	1
37-1-1	Clutch Rod	3
G-33-6	Clutch Lever	1
26-1-1	Pivot Pin	1
G-60-1	Gear Engagement Piece ...	1
G-29-9	Selector Fork	1
G-30-4	Spindle	1

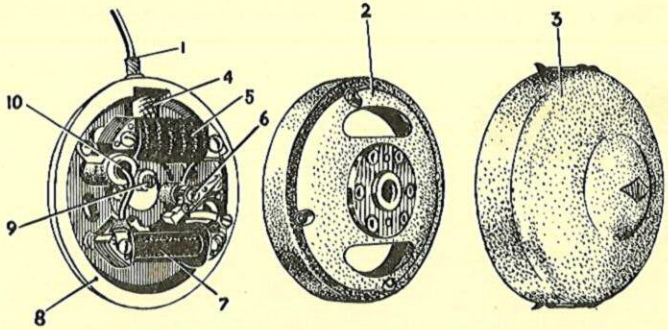
J.A.P. - HERCULES ENGINE SPARE PARTS

Part No.	Description	No. off
20862	Cylinder Head	1
3574	,, ,, Fixing Nut ...	4
18315	,, ,, ,, ,, Washer	4
20859	,, Barrel	1
20865	,, Exhaust Nut	1
20866	Inlet Pipe...	1
20868	Cylinder Fixing Stud	4
20792	,, Base Gasket	1
20765	Piston—with Pegs	1
20791	,, Ring	2
20789	,, Gudgeon Pin	1
20790	,, ,, ,, Circlip ...	2
SA.2999	Conrod Assembly	1
20786	,, Bush—Small End ...	1
16484	Crankpin	1
17552	Conrod Roller—Big End ...	18
17551	,, Washer—Big End ...	2
SA.3506	Crankshaft Assembly complete with Conrod, Crankpin, Rollers and Washers	1

Part No.	Description	No. off
20863	Crankshaft—Magneto side ...	1
20864	,, —Drive side ...	1
SA.3505	Crankcase Assembly complete with Bearings, Oil Seals, Drain Plug, Gear Box Studs and one Clamp Bolt with Nut	1
17572	Crankcase Ball Bearing ...	2
19806	,, ,, ,, Oil Seal	2
19986	,, Drain Plug	1
21425	,, Bolt, 2BA × 2½" U/HD	2
20867	,, Bolt, 2BA × 1¾" U/HD	2
6731	,, Bolt Nut	4
20883	,, Stud—Gear Box—Top	2
20884	,, Stud—Gear Box —Bottom	1
9308	Magneto Fixing Screw Washer	2
12121	,, Fixing Screw	2
17640	,, Fixing Key	1
18593	Sparking Plug	1
21463	,, ,, Suppressor ...	1

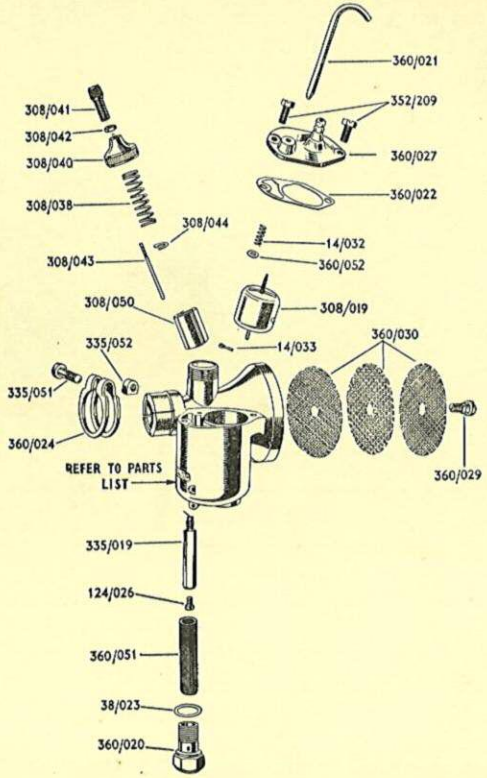
MILLER MAGNETO SPARE PARTS

Illust. Ref. No.	Part No.	Description	No. off
1	B.S.1	High Tension Cable c/w Securing Clamp and Rubber Brush ...	1
3	B.S.3	Magneto Cover	1
4	B.S.4	High Tension Pick-up	1
5	B.S.5	High Tension Coil	1
6	B.S.6	Contact Breaker, complete ...	1
7	B.S.7	Lighting Coil	1
8	B.S.8	Stator Plate Casting (machined only)	1
9	B.S.9	Lubricating Felt	1
10	B.S.10	Condenser	1
—	B.S.11	H.T. Coil Fixing Screws ...	2
—	B.S.12	Lighting Coil Screws	2
—	B.S.13	Condenser Fixing Screws ...	2
—	B.S.14	H.T. Cable Clamp Screws ...	2
—	MM.335	Holding Down Clamp for H.T. Pick-up	1



SPARE PARTS FOR AMAL CARBURETTER —TYPE 360/4 *(See illustration overleaf)*

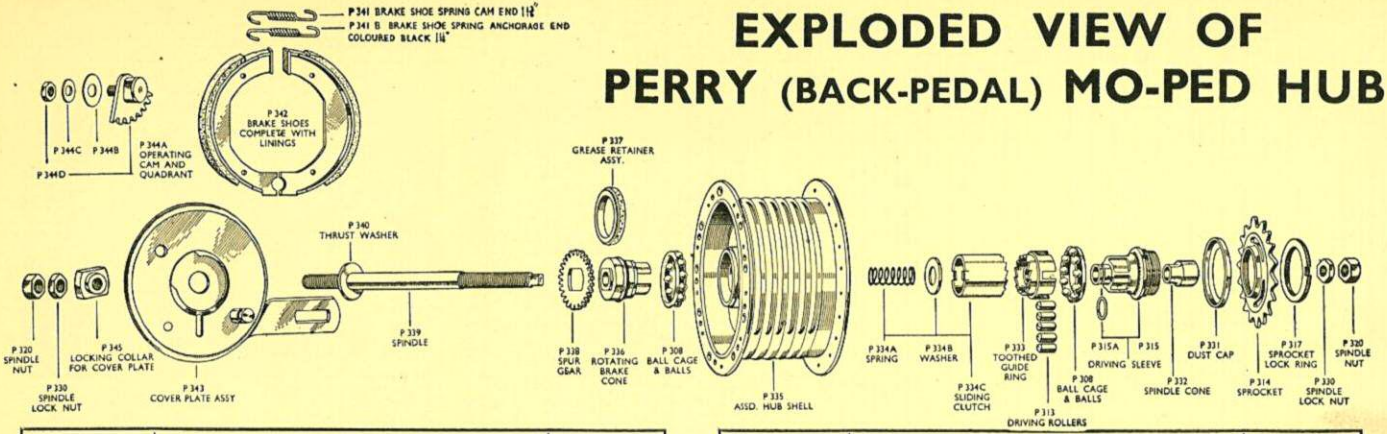
Part No.	Component	No. off
360/006	Mixing Chamber Body	1
308/040	,, ,, Top	1
308/041	Cable Adjuster	1
308/042	Cable Adjuster Locknut ...	1
308/050	Throttle Valve No. 3 Cutaway ...	1
308/038	,, ,, Spring	1
308/043	Jet Needle	1



SPARE PARTS FOR AMAL CARBURETTER—TYPE 360/4 *(Contd.)*

Part No.	Component	No. off
308/044	Jet Needle Clip	1
124/026	Main Jet No. 30	1
335/019	Needle Jet	1
360/051	Petrol Filter	1
360/020	Jet Cover Bolt	1
38/023	Jet Cover Bolt Washer	1
360/024	Outlet Clip	1
335/051	,, ,, Screw	1
335/052	,, ,, Nut	1
360/030	Air Filter Plates	3
360/029	,, ,, Plate Screw	1
360/021	Cold Start Needle	1
14/032	,, ,, ,, Spring ...	1
360/052	,, ,, ,, Cup Washer	1
360/053	,, ,, ,, Cotter Pin ...	1
308/019-21	Float and Needle Combined (Top Feed)	1 1
360/027	Float Chamber Cover	1
360/022	,, ,, ,, Joint Washer	1
352/209	,, ,, ,, Screw ...	2

EXPLODED VIEW OF PERRY (BACK-PEDAL) MO-PED HUB



Part No.	Description	No. off
P.344D	Operating Cam Spindle Nut	1
P.344C	,, ,, ,, Washer	1
P.344E	,, ,, ,, Washer	1
P.344A	Operating Cam and Quadrant ...	1
P.341	Brake Shoe Spring Cam End 1 3/16"	1
P.341B	Brake Shoe Spring Anchorage End, Coloured Black 1 1/16" ...	1
P.342	Brake Shoes complete with Linings	2
P.320	Axle Spindle Nut	2
P.330	,, ,, Lock Nut	2
P.345	Locking Collar for Cover Plate	1
P.343	Cover Plate Assembly	1
P.339	Axle Spindle	1
P.340	,, ,, Thrust Washer ...	1
P.337	Grease Retainer	1

Part No.	Description	No. off
P.338	Spur Gear	1
P.336	Rotating Brake Cone	1
P.308	Ball Cage and Balls	2
P.335	Assembled Hub Shell	1
P.334A	Spring	1
P.334B	Washer	1
P.334C	Sliding Clutch	1
P.333	Toothed Guide Ring	1
P.313	Freewheel Driving Rollers ...	5
P.315A	Circlip	1
P.315	Driving Sleeve	1
P.332	Spindle Cone	1
P.331	Dust Cap	1
P.314	Freewheel Sprocket	1
P.317	,, ,, Lock Ring	1

GENERAL RUNNING ★ MAINTENANCE *and* SPARE PARTS MANUAL

PRICE 3/6 NET

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