

Ducati
CUCCIOLO
CYCLE AUXILIARY MOTOR

INSTRUCTIONAL MANUAL



K.V.P. MOTORS LTD

**3 Central Parade
Gunnersbury Lane
Acton Town, W.3**

Price: 2/6d.

ACOrn 6005

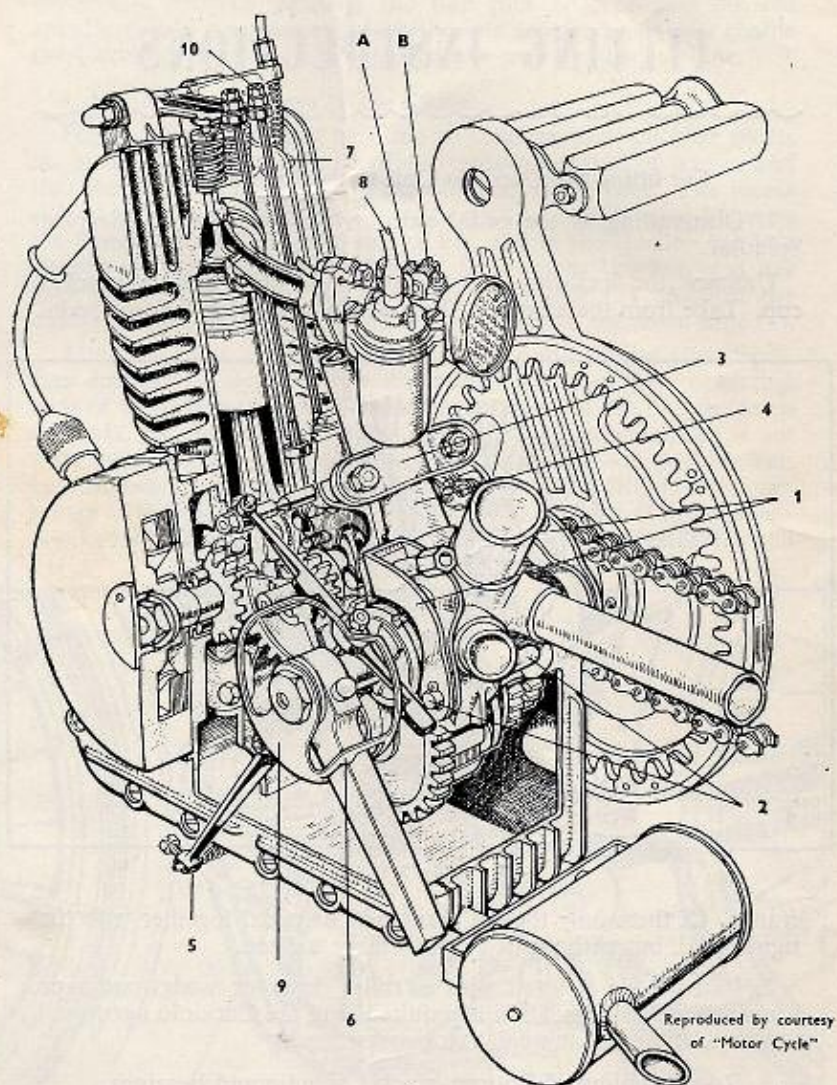


Fig. 1

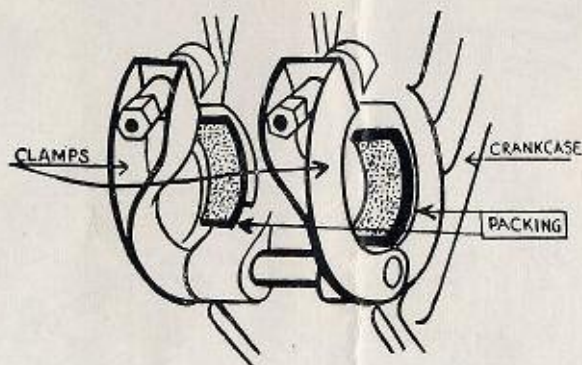
THE 48 c.c. 4 STROKE O.H.V. CYCLE AUXILIARY MOTOR

FITTING INSTRUCTIONS

For fitting the Cucciolo Unit to the Bicycle Frame.

1. Dismantling of the pedal axle and cranks (Bottom Bracket Spindle).

Unscrew the lock-ring and the near-side (left) bottom bracket cup. Take from the assembly the axle (spindle) with the two pedal



Method of using additional packing when the bicycle frame is not perfectly "true"

Fig. 2

cranks. Of these only the left crank and its pedal together with the right pedal, but without its crank, will be utilised.

2. If the cycle is fitted with a 'roller' lever or wedgwood type brake, a small modification is required, and the Cucciolo agent will fit this to the cycle at small extra cost.

3. Re-assembling of Bottom bracket spindle and bearings.

The original spindle should be replaced with the new Cucciolo spindle supplied with the Unit. When re-assembling the bearings, pack the cups with fresh grease, this will also hold the balls in position and fitting is made easier. The Cucciolo Spindle must be fitted with the threaded end on the near-side (left) side of the

bicycle. Three different types of axles are used, the only varying distinction between each, is the ball race spacing and the old spindle should be compared with the one supplied, this will enable the Cucciolo agent to supply the correct one for the machine.

4. Fitting of the Motor to the frame.

The motor unit should be fitted so that the semi-circular recess fits snugly on the lower part of the bottom bracket of frame, and that the cradle holds firmly to bicycle front down tube. The recess should fit around the bottom bracket with packing placed between the crank case and the bottom bracket, and at the cradle—the two clamps (1) encircle the top part of the bottom bracket, and are kept in position by the pin attaching the motor (2). Against the cradle is fitted the clamp (3) which clamps round the down tube (4).

Attention must be given while tightening the clamps (the necessary spanner is supplied with the motor) that the valve operating rods of the motor do not touch or are too near to the bicycle down tube (4). (A clearance of $\frac{3}{32}$ " is sufficient). If the clearance is not sufficient, an extra layer or two of red fibre or metal packing can be inserted. Attention must also be paid to the distance between centre of the slip sprocket (see Fig. 4) and the centre of the bottom-bracket spindle, which is $2\frac{5}{8}$ ". If distance is not correct either the

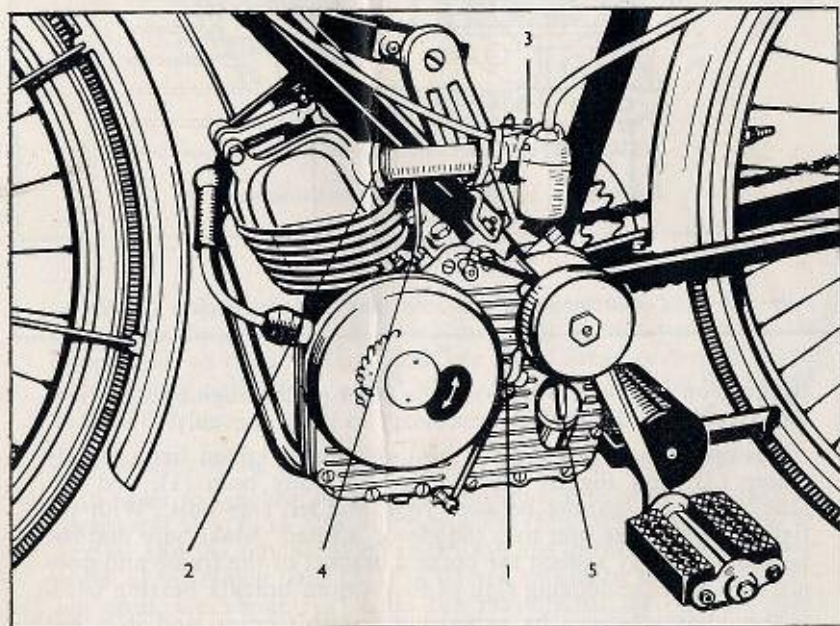


Fig. 3

inner teeth of the crank-wheel will engage too deeply into the slip sprocket causing stiffness in pedalling, or will not engage enough, resulting in undue strain and eventual damage to the slip sprocket. It is equally important that the crank support be $\frac{1}{8}$ " past the line of the slip sprocket as shown in Fig. 5. By sighting from the top, correct alignment can be checked. Twisted frames or lugs sometimes require uneven packing of the engine so that this will line-up with the chain. (See Figs. 2 and 5). As an example, the thicker

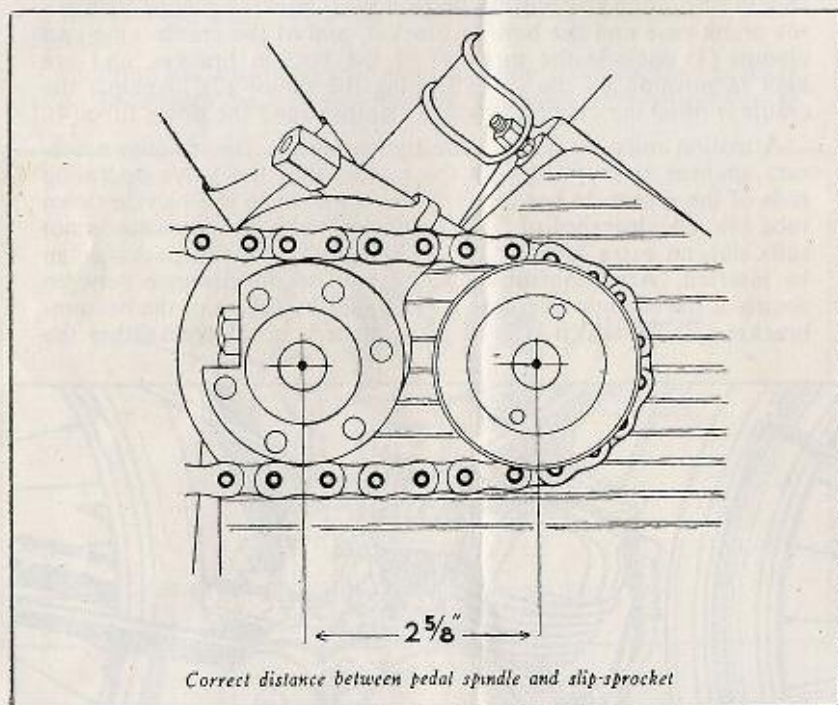


Fig. 4

packing on the right will move the front of the engine to the left, and vice-versa. It is seldom necessary to pack unevenly.

Clamps (1 and 3) can then be tightened. Tighten first, slightly clamp (3) then slightly clamp (1), then fully both (1), and (3), alternating the spanner between right and left side nuts. With the tightening of these four nuts the motor is fitted. Make sure that the engine fits snugly against the bottom bracket of the frame and does not step over the locking ring of the bottom bracket bearing cups.

Should interference be experienced at this point, and it is not possible to tighten clamps (1), it will be necessary to remove with a

file or grinding wheel the excess portion of the locking ring where protruding.

5. Fitting of crankwheel support and crankwheel.

The crankwheel support may now be assembled on to the right end of the Cucciolo spindle, making sure to fit the cotter pin carefully and tightly. The support must be $\frac{1}{8}$ " past the line of the slip sprocket. The crankwheel is then secured to the crank support by means of the six bolts, after seeing the toothed insert runs freely and true in the centre of the rollers of the slip sprocket. Check for smooth and silent revolving of crankwheel and correct meshing of teeth with slip sprocket. Now fit the guard over the six screws and

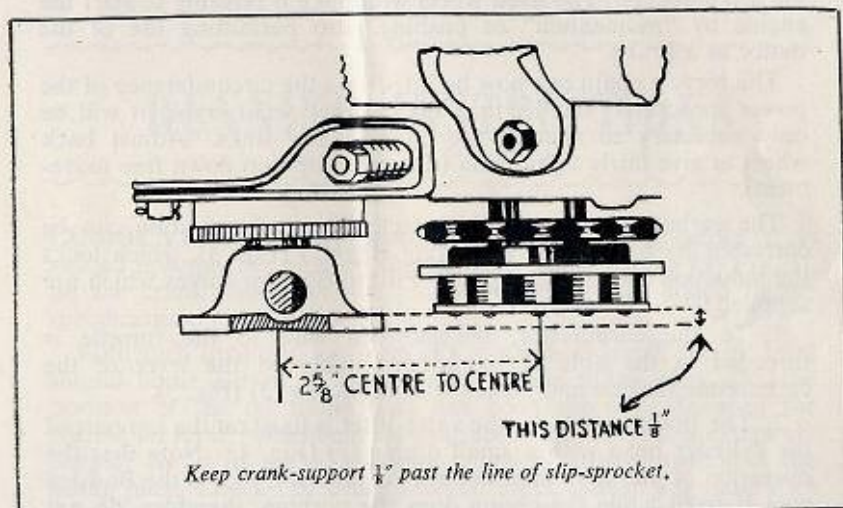


Fig. 5

screw the original pedal into the end of the crank. Incidentally, it may be found that the pedal thread is rather tight; this is intentional, as pedal axle threads are often loose or worn; when fitting a very tight pedal, a $\frac{9}{16}$ " 20 t.p.i. tap will open out the thread as required.

6. Synchronising of the Automatic Gear Pre-Selector.

In order to synchronise the gear change it is necessary to slacken completely the clutch adjusting screw (1) (Fig. 3). With the gear in neutral and the left pedal down, thread the Bowden wire into the eyelet of the clutch lever (5) (Fig. 1) and pull until the two contacting parts are about $\frac{5}{32}$ " from the pre-selector bell-shaped cam. The Bowden wire should then be locked with the screw (5) (Fig. 1).

The screw (1) (Fig. 3) is then adjusted to give $\frac{1}{8}$ " play at handlebar lever.

With the left pedal forward the low gear will automatically be engaged by actuating the clutch lever.

With the left pedal down the gear change will be back in neutral position. With the left pedal backwards (or correspondingly the right pedal forward) the top gear will be engaged, upon operation of the clutch.

7. Transmission.

A fixed sprocket can be fitted on the back wheel. This will not eliminate the free wheel riding of the cycle, this being obtained by the slip sprocket. The fixed wheel will make it possible to start the engine by "momentum" or pushing, also permitting use of the motor as a brake.

The bicycle chain can now be fitted. As the circumference of the power sprocket is smaller than the original pedal crank, it will be only necessary to shorten the chain a few links. Adjust back wheel to give fairly tight chain (about $\frac{1}{2}$ " up and down free movement).

The carburettor should be perfectly level. Its position can be corrected by loosening the locking ring (2) (Fig. 3), which locks the induction tube to the engine. Fit the Bowden cables which are supplied :—

1. To the carburettor, the Bowden wire to the throttle is threaded in the hole of the little thimble on the lever of the carburettor throttle and locked with the screw (3) (Fig. 3).

2. The Bowden wire for the valve lifter is fixed on the top part of the cylinder head with a small nipple (7) (Fig. 1). Note that the operation of the valve lifter control is "inverse", that is the Bowden wire is fixed while the casing does the pushing, therefore, do not tape the casing too tightly to the bicycle frame. For neatness the casing can be passed through a small piece of metal tubing or sleeve, 1" long, and this sleeve can be then neatly taped to the down-bar, together with the clutch and throttle Bowden control casings. It is recommended to oil or grease the inner cable of all Bowden controls before fitting, thus ensuring smooth and long life service.

Fit the plastic petrol tube to the petrol tap and to the carburettor (8) (Fig. 1). (For easy fitting dip ends of tube in hot water for a few seconds).

Electric current (A.C) at 6 volts is generated by the flywheel magneto when the engine is running.

A 6-volt, 6-watt bulb should be fitted to the headlamp and a 6-volt 3-watt bulb should be fitted to the rear lamp. The bicycle

headlight wire should be secured to the insulated terminal (4) (Fig. 3). Check that the engine is in good electrical contact with the bicycle frame, also the headlamp bracket. About twelve watts are available from the flywheel generator, sufficient for bright headlight and tail light illumination.

Check brakes for efficiency, especially if the free-wheel back sprocket has been retained, as the motor will not then contribute as a brake.

Fitting is straight-forward and calls for attention only at the bottom bracket assembly in order that correct alignment and clearance between the valve operating rods, and the front down bar is obtained.

RUNNING INSTRUCTIONS

LUBRICATION: Every motor is delivered dry; before it is started unscrew the plug on the left side of the engine (5) Fig. 3), fill the crank case with one pint of motor oil, as stated in the specification.

With such quantity, and with the motor horizontal, the oil level should come almost to the opening of the filling plug. As the position of the oil filling plug has been specially designed for correct oil level, subsequent topping up of the oil level is extremely simple. Never let the oil level fall below $\frac{3}{8}$ " of the opening of the filling plug. Check this every 150-200 miles, and in any case after the first 150-200 miles, and then every 500-700 miles, the oil should be completely drained and new oil put in. Drainage is effected by unscrewing the plug under the crank case with the tube spanner, supplied with the tool kit. To obtain a full drainage, this operation should preferably be done whilst the engine is warm.

PRIMING: Open the tap under the petrol tank, and make sure that the petrol reaches the carburettor by pressing for a few seconds the brass priming rod on the top of the carburettor. This operation (which should not be overdone) is advisable when starting a cold engine, but is not necessary when the motor is warm as this would over enrich carburation and make starting the engine more difficult.

Upper Cylinder Lubrication is advisable during the "running-in" period, but not necessary afterwards. Add this lubricant to the first gallon of petrol in the proportion normally supplied by any petrol service station.

FIXED WHEEL BACK SPROCKET

Starting the Engine : "Momentum starting."

1. With the gear change into neutral position, pedal the cycle until a speed of 3 or 4 m.p.h. is reached.

2. Pull in valve-lifter trigger.

3. With the right pedal forward, pause and pull clutch lever in fully and release again, thus engaging high gear which will immediately start the engine revolving. Rotation of the engine is thus obtained by the momentum gained while pedalling.

4. Release valve lifting control and open throttle slightly. The engine will fire immediately. You may commence pedalling as soon as the clutch is released in order to help the engine.

Operation of the Gears : From what has been said before, the automatic operation of the pre-selector is already evident ; operating the clutch lever disengages the gear simultaneously.

With the pedals in a vertical position (left or right pedal down) actuating the clutch will disengage either gear into neutral position (remember to slightly close the throttle when operating the clutch, so as to "float" the power of the motor).

If the clutch is not actuated the pedals are completely free either with the motor engaged in one or other gear, or neutral position.

From this it will be understood that the clutch should never be actuated while pedalling. Therefore, it is advisable to have the pedals in the desired position before actuating the clutch lever and actuate the lever without moving the pedals. When the engine is not running, it may be found necessary to move the machine back and forth while the clutch lever is kept about half-way, in order that the gear may find its way into mesh.

To change gear "smartly" while riding, operate as follows :—

(a) To change from high into low gear, slightly close the throttle just before pressing the clutch and open the throttle decisively before releasing the clutch.

(b) To change from low into high gear, close the throttle slightly and open it after the clutch has been pressed and released. These particulars will be best learned in actual practice, just as when first learning to ride or drive a motor cycle or a car.

To use the machine as a normal bicycle, select neutral gear.

When it is necessary to use the clutch, but without changing gear, just remember to have the pedals in the position corresponding to the gear in operation at that time.

The clutch does not wear if it is kept "pulled" even for minutes at a time (riding through traffic, stopping at traffic lights, etc.).

To stop the engine, actuate the clutch and operate the valve-lifter lever holding the left pedal down in order to pre-select into neutral gear at the same time, and be set for the next start.

To change into low gear, have left pedal forward, pull and release clutch while opening throttle. Decrease throttle if changing from low into high or neutral gear. When riding downhill (with fixed sprocket back wheel) the motor will be a helpful brake.

For the first 150/200 miles it is not advisable to exceed more than 15 m.p.h. to avoid excessive over-heating. For any kind of motor the running-in period is most important and the life of the engine depends on it. Use small throttle openings, without labouring of the engine until about 1 gallon of petrol is used. Careful running-in will amply repay.

MAINTENANCE

Every 500-700 miles. Remove sump drain plug, located under crankcase, drain oil and flush with one of the many brands of flushing oils available. (This is best carried out when engine is warm). Re-fit plug and washer, and re-fill with 1 pint engine oil.

Summer Grade 40/50 S.A.E.

Winter Grade 30 S.A.E.

Lubricate valve stems, rockers and pull rod guides, with one drop of engine oil.

Treat controls in similar fashion.

Lubricate cable thoroughly, particularly in wet weather. Slipping or fierce clutch is usually due to dry control cable.

Every 1,000-1,500 miles. Check tappet adjustment with engine cold, there should be:

Inlet .006 in.

Exhaust .008 in.

To check: Insert feeler gauge between rocker and valve stem cap.

To adjust : Slacken lock nuts and adjust tappet nut to give a sliding fit with the feeler gauge in position. Finally tighten lock nuts. This adjustment should be carried out with the piston at top dead centre of compression stroke and flywheel mark "M" in line with corresponding mark on crankcase.

Contact breaker points. These are accessible by rotating the inspection cover on flywheel (either to left or right).

To adjust : Slacken large-headed screw, and rotate eccentric screw. Points should break when flywheel mark "A" corresponds with mark on crankcase.

A .010 in. (ten thou.) feeler should slide between points when correctly adjusted.

Sparking Plug. Clean plug and re-set gap to .018 in. Correct type plug is Champion L.10.S.

Important. If it is necessary to carry out any adjustment to the magneto (other than re-setting contact breaker points gap) the flywheel must be removed. It is essential that the correct extractor is used (obtainable from your Dealer). Never attempt to remove flywheel by levering or tapping the end of the shaft, as extensive damage may result.

Note : The flywheel nut has a **left-hand** thread.

Clutch. Trouble free service will be given if the correct adjustment is maintained.

Cable is adjusted to give $\frac{1}{8}$ " play at handlebar. Adjusted by screw and lock nut at left of oil filler cap, slacken lock nut and tighten screw until screw touches push rod, slacken screw a $\frac{1}{4}$ turn and lock in position.

Rear Chain. Adjust to give approximately $\frac{1}{2}$ " up and down movement.

Petrol Filter and Carburettor. Both tank and carburettor are provided with filters. To clean, drain tank and remove tap, filter being screwed into this component.

A bicycle pump or an air line is a convenient method to use.

The carburettor filter is removed as follows :

Pull off petrol pipe and remove the two screws retaining carburettor top. Unscrew needle valve assembly and filter will be revealed.

Should it be necessary to adjust the slow running, or carburation, carry out adjustment in the following order :

1. Check level of carburettor and tightness of induction locking ring, also flange bolts.

2. Blow out pilot and main jets. Pilot jet is on top of carburettor. Main jet is underneath.

3. Slow running is controlled by the lower screw at side of instrument which should be screwed right home and then slackened approximately one turn.

Finally adjust when engine is thoroughly warm. Clockwise to weaken and anti-clockwise to richen mixture. The other screw, slightly above, is merely to regulate speed of tickover.

Decarbonizing. This is normally carried out when approximately 4,000 miles have been covered and should be entrusted to your Dealer or a competent motor cycle engineer. If, however, you have the tools and the requisite knowledge, the procedure is as follows :

Remove valve-lifter and throttle cables, silencer, exhaust pipe, sparking plug and carburettor. Unscrew tappet nuts from pull rods. Remove four nuts from cylinder. Insert a wooden shaft in cylinder and compress valve springs so that the valve collets can be extracted. Care must be taken not to lose either these or the valve stem caps.

Release springs and remove valves.

Remove all traces of carbon from the cylinder head, piston, exhaust port and valves.

Grind in valves, using a fine grinding paste.

Wash all parts in petrol and make sure that no trace of grinding paste remains.

To re-assemble, reverse the dismantling procedure, being careful not to damage the piston rings when re-fitting the cylinder. Gaskets should be renewed.

When assembly is complete re-set the tappets.

GENERAL POINTS

Erratic Running

- (a) Check petrol supply and carburettor jets, blow out with air line.
- (b) Check contact breaker points, these may require cleaning and adjusting. (Use tool if it is necessary to remove fly-wheel).

(c) Check sparking plug, and clean and re-set gap.

Slip Sprocket. This should occasionally be washed in petrol, and lightly oiled; **never use grease.**

Note: The retaining flange has a **left-hand** thread.

Fuel. When using premium grade petrol it is not necessary to alter either the carburettor or magneto settings as the Ducati Cucciolo is a high performance unit, designed initially to operate on premium grade fuels.

To dismantle engine and gear unit completely, drain off oil, remove flywheel, slip sprocket, driving sprocket, the 2 half circlips from the recess between driving sprocket and crankcase, both caps situated behind cylinder and the spring and locating ball under the left-hand cap.

Undo the right-hand cap, slack off the clamping screw, and then the lock nut and grub screw until the selector shaft can be withdrawn (note which hole the grub screw has been located in). With engine level sideplate uppermost remove all side plate screws, lift sideplate, collect rollers, keeping them separate for replacement in their original tracks.

With piston at top of compression stroke raise cam wheel and clutch assembly—collect 19 needle rollers from end of layshaft, remove fork from layshaft collecting 6 driving balls which must be replaced with new, and remove high and low gear wheels, note these are slightly offset and must be replaced as taken out. Remove rollers from case, again taking care not to mix them.

Examine selector slider within layshaft, if ball seating is worn replace with new slider and slider pin. The latter must be carefully rivetted with no projections which could catch the selector fork.

Overhauling clutch. Remove the 2 distance washers—compress clutch springs (a vice is useful for this). Remove circlip and bronze ring—draw off body and plates (24). Tap out clutch cross piece with thin punch—remove and check springs—check pressure plates for truth and clutch plates for wear, they should be approximately .020" thick, if worn put in an extra plate when rebuilding.

Take off cylinder and piston, remove the 4 bolts holding main bearing bracket, unscrew the plug situated in line with the crankshaft, screw rocker spindle into crankshaft end and after warming up case, tap lightly and take out crankshaft assembly complete with main bearings. Work on this component should only be carried out by experts as the efficiency of the motor can be easily ruined by mis-handling.

Valve Timing. With piston at t.d.c. exhaust valve should be closing and inlet valve opening. There is an approximate overlap of 10°.

Spare Parts

A full range of spare parts and tools, including oversize pistons and rings, are available for the Cucciolo. These should be ordered through your local agent, stating Engine No., date of purchase, and description of parts required.

General Data

Cylinder bore : 39 m.m.

Stroke : 40 m.m.

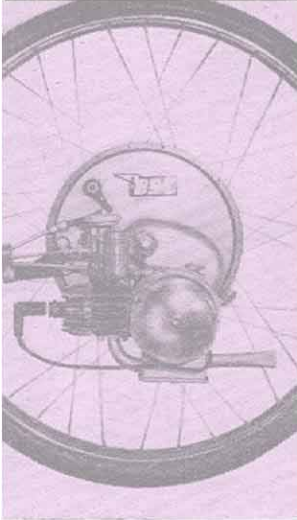
Compression ratio : 6.24 to 1

C.C. : 48

B.H.P. : 1.25

Max. Revs. : 5,200

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