

MAKING THE MOST OF YOUR CYCLEMASTER


Cyclemaster

THE MAGIC WHEEL THAT WINGS YOUR HEEL

OWNER'S INSTRUCTION BOOK — NINTH EDITION

(AUGUST, 1954)

CYCLEMASTER WORKSHOP MANUAL

For mechanics and owners who desire
to service their own machines.

5s. 4d. post free.
Demy-Quarto 32 pp.
51 illustrations.

From time to time your Cyclemaster (as with all things mechanical) will require certain servicing over and above the regular routine maintenance details in the Instruction Book. We recommend that such servicing should be carried out by a Cyclemaster Dealer. If, however, you have mechanical experience, this Workshop Manual will assist you to carry out every service operation necessary.

THE MAGIC WHEEL

Price 6d.

A Quarterly Magazine for Cyclemaster owners.

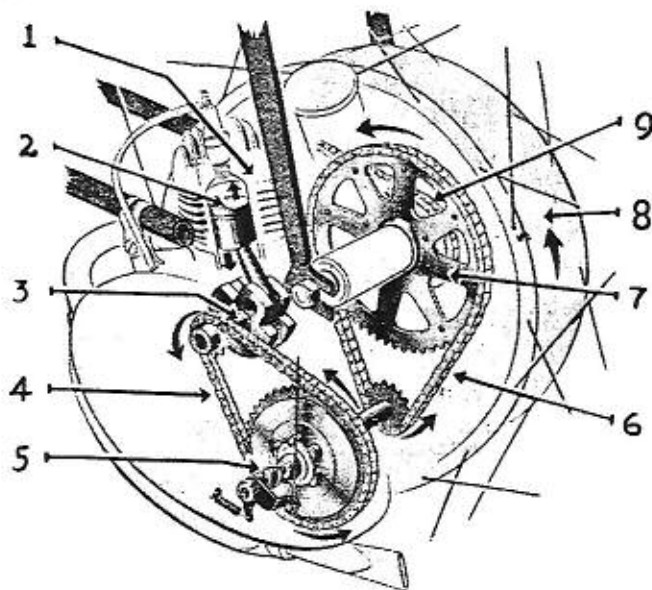
As a Cyclemaster owner you will want to read *The Magic Wheel* regularly. It is an attractively produced pocket-sized magazine, liberally illustrated with interesting photographs. It contains articles about touring (at home and abroad); all the latest servicing information; up-to-date news of modifications; hints and tips from users. There are articles of general interest, cartoons, and other features to make your cyclemotoring with Cyclemaster still more economical and enjoyable.

Four issues a year (January, April, July, October)

Annual Subscription 2s. 6d. including postage

CYCLEMASTER LTD., 38a St. George's Drive, Victoria, London, S.W.1

HOW CYCLEMASTER WORKS



(1) Cylinder remains stationary. (2) Piston goes up and down. (3) 3-bearing crank shaft revolves. (4) Chain drive to clutch. (5) Clutch operating mechanism. (6) Chain drive to main sprocket. (7) Main sprocket. (8) Wheel drum revolves. (9) Cycle chain from pedals.

GENERAL INFORMATION

Size of wheel	... 26" x 1½"
Tyre Pressure	... Not less than 40 lbs. (45 lb. if rider weighs over 12 stones)
Bore	... 36 mm.
Stroke	... 32 mm.
Capacity	... 32 cc.
Developed h.p.	... 0.8 b.h.p. (approx.)
Engine speed	... 4,500 r.p.m. at 20 m.p.h.
Fuel mixture	... "Petroil" (1 in 25)
Fuel tank capacity	... 2½ pints (approx.)
Engine Oil required	Cyclemaster Superfine Shell X100 SAE 30 Essolube 30. Castrol XL : Mobiloil A Energol SAE 30.
Spark Plug	... K.L.G. Type F.50 14 mm.
Plug gap018" to .020"
Clutch free travel	... ½" measured at tip of control lever
Fuel consumption	... 230 m.p.g. (approx.)
Ignition	... "Wipac" Flywheel Magneto with Lighting Coil
Contact breaker gap015" to .018"
Carburettor	... B.E.C. Type B1.
Clutch	... Single plate, operating in sealed oil bath
Clutch chamber oil	Shell Spirax C. : Castrol D Mobilube C : Energol SAE 140 Esso Gear Oil 140
Correct amount of oil for clutch chamber	50 cc., i.e. Petrol Filler Cap full to brim

BRAKES

A Coaster Hub (back-pedalling brake) is embodied in all wheels, but the law insists upon two entirely separate braking systems. So one (at least) of the existing brakes must be retained.

BRIEF DESCRIPTION AND GENERAL NOTES

The Cyclemaster is a complete back wheel built around a highly efficient 32 cc., two-stroke motor, embodying flywheel ignition, carburettor and clutch. A powerful back-peddalling brake is fitted.

The engine itself does *not* revolve. It remains always in the same position, but transmits its power by means of a clutch and cushioned drive, to an interior sprocket similar to the one on the outside of the wheel which you drive when you pedal.

In all circumstances and conditions you can always use your pedals, so that you need never be stranded if, for instance, you run out of fuel.

You may have to help the Cyclemaster on some hills by pedalling, and it is always advisable to pedal a little when moving off from a standstill—every time you give the engine such assistance you help petrol consumption.

FITTING

The Cyclemaster wheel is fitted in the place of the ordinary back wheel of your cycle. The whole job does not take long, and you probably had it done by your Dealer—in which case you can ignore the fitting instructions. If, however, you enjoy doing such jobs yourself, detailed instructions follow.

TAX AND INSURANCE

Your bicycle will have to be taxed and insured, and unless you hold a driving licence for a motor cycle (or

for all groups of vehicles) you will have to go through the formality of a test. Your Dealer will help and advise you on these matters.

RUNNING-IN

For the first 250 miles do not exceed a speed of 15 m.p.h. and always give pedal assistance when starting from a standstill, and on hills. After this period your Cyclemaster does not have to be “coddled” or nursed: it is not so delicately made that it must be handled with kid gloves.

On the other hand, if you treat it with reasonable care; avoid “revving” the engine at extreme speeds down hill, and so on, it will inevitably repay that thoughtfulness. It is essentially a smooth engine; the more smoothly you can handle it, the better will it behave.

TYRE PRESSURES

Every Cyclemaster wheel is fitted with a Schrader-type valve, and it is to your advantage to keep the pressure right. This must never be less than 40 lbs. for any rider, and not less than 45 lbs. if the rider weighs more than 12 stones.

On those units fitted with 2 in. section oversize tyres these pressures may be reduced by approximately 5 lbs.

FITTING THE CYCLEMASTER

First remove the old back wheel from your machine in exactly the same way as you would have done had you wanted to take off the cover and tube to find and mend a puncture. That is, move the brake blocks out of the way, slip off the driving chain, undo one or both of the mudguard stays, loosen the hub nuts, and pull the wheel out.

The Cyclemaster then goes in its place. You cannot put it in the wrong way, because obviously the driving sprocket must be on the same side as the chain. As it embodies a complete small motor, it is naturally broader in the beam than the conventional wheel, and it may be necessary to "spring" the forks a little. If they have to be opened up more than a total of $\frac{1}{2}$ in., the fork ends may no longer be parallel: this will throw undue strain on the spindle and in such circumstances it is advisable to seek the advice of your Dealer.

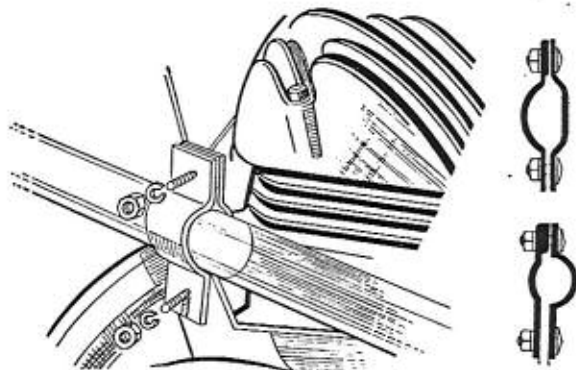
Full instructions for correct frame alignment are also contained in the Workshop Manual.

LOCATING THE WHEEL

When the Cyclemaster wheel has been inserted, and both hubs are snugly in the slots in the forks, make sure that the washers are outside the slots each side.

The next job is to locate it in position by means of the bracket and bolts illustrated, and which you found fixed to the wheel when you bought it.

Look at the Cyclemaster engine on the petrol tank side. You will see fixed just to the left of the cylinder a small bracket with a hole in it.



*The correct fixing of the engine locating bracket
D & O brackets shown on right.*

Take the other (loose) bracket; fit it over the horizontal fork, and put a bolt through the top holes from the inside of the fork. Lightly fit the spring washer and nut.

Now slide the bracket along the fork until the bottom "legs" are one each side of the engine bracket. Then put the other bolt through from the same side, and lightly fit spring washer and nut. Do not apply a spanner until you have adjusted the chain.

It is important to use the correct type of bracket for the fork of your machine. So that there is no possibility of the bracket being loose all units are supplied with "O" shape brackets. "D" shape are available from the dealer if required.

If using the very light type of sports frame some reinforcement may be required to counteract the action of the hub brake. If in doubt write us or consult your dealer.

ADJUSTING THE PEDAL CHAIN

That comes next. If you have threaded adjusters, with an adjusting nut behind the forks, it is simply a matter of turning those nuts until the tension of the chain is a little greater than you were used to having it for pedalling purposes. This means that the *total* up-and-down movement of the lower part of the chain should not be more than $\frac{3}{4}$ in. (i.e., $\frac{3}{8}$ in. up and $\frac{3}{8}$ in. down).

If you have no such adjusters on your machine, the wheel must be pulled back by hand.

When you are satisfied that the tension is right, tighten the two hub nuts. As you do this, check the wheel for alignment where it passes through the forks. No special appliances are necessary—it is just a matter of judging, by eye, that there is an equal clearance each side of the tyre. When the two hub nuts are sufficiently tight, recheck for chain tension and wheel alignment. Then tighten the two nuts securing the engine locating bracket (which, you will remember, you left slack). It is important that this bracket is as tight as you can get it.

Re-connect the mudguard and then run the two Bowden cables (already connected at one end to the engine, with controls at the other end) along the frame of the cycle to the handlebars, securing them as you go by means of the rubber bands provided.

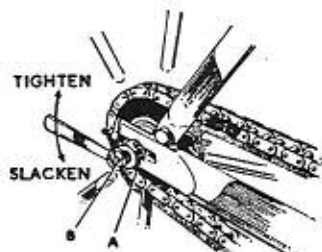


FIG. 1

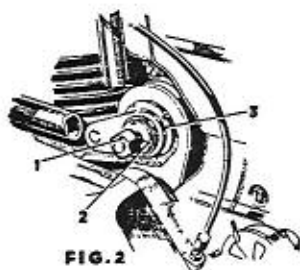


FIG. 2

How to check the adjustment of the hub bearings.

The larger lever looks after the clutch, and goes on whichever handlebar you prefer. The smaller one controls the throttle, and goes on the opposite side. It is adjustable for any type of handlebar, and the lever itself may be set into the most convenient position, as shown on page 6. Make certain that the notches and grooves in lower and upper faces mate up and also the projection on the underside of the cover-plate fits into the slot on the main body of the control, then tighten the centre screw.

If the lever is stiff to move, slacken the centre screw, but no more than a quarter of a turn.

Finally connect the lighting lead (see page 15).

HUB BEARING ADJUSTMENT

When the wheel is in position check the hub bearings. It is most important that there should be some play but

when you hold the rim lightly between thumb and middle finger, you should not be able to rock it more than $\frac{1}{32}$ in. To adjust, slacken spindle nuts 1 and 2 (Fig. 2) and then nut A (Fig. 1), turn the spindle B (using a spanner on the flats) until the wheel revolves freely but with the minimum amount of play. Always re-check that this play is there after tightening nuts A 2, and 1. Finally, check adjustment of chain from clutch to drum (see page 19).

Fill the clutch chamber with oil (see page 18): fill up with fuel and you are ready to ride off.

FILLING WITH FUEL

As the Cyclemaster has a 2-stroke engine, there is no sump of engine oil to be checked daily and topped up when necessary, as on the usual type of motor car engine. Instead, you mix oil with the petrol, and that oil assumes complete responsibility for lubricating all moving parts of the actual power unit.

It is most important to use the right oil, and to get the mixture right, for if you haven't enough oil the engine will not be properly lubricated (which means undue wear), while if there is too much oil you will get a smoky exhaust, and dirty plugs—which mean poor starting and patchy running.

We recommend the use of CYCLEMASTER SUPER-FINE ENGINE oil but the correct grade of any *good* brand of oil will do (see page 1) but as with any motor vehicle, it is a very false economy to buy cheap oil.

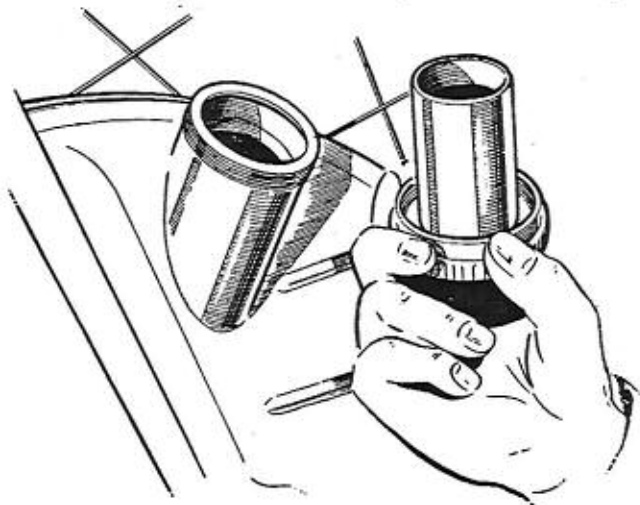
The correct mixture is one part of oil to 25 parts of petrol. Please do not listen to others who may suggest

that you experiment with different grades of oil or different mixture ratios.

The petrol tank of your Cyclemaster holds just over a quart of fuel, and the petrol filler cap is made in the form of a measure which holds just the right amount of oil for a quart of petrol.

It is by far and away the wiser plan to mix the oil and petrol *before* putting them into the tank.

It is also a good idea to have a bottle or tin which you



The petrol tank cap is a measure which holds exactly the right amount of oil for a quart of petrol, and also for the original filling of the clutch case.

can always carry with you, filled with ready mixed petrol and oil, in case you run out while on the road. This is particularly handy on a longish trip.

After filling with petrol and oil, replace the filler cap in the tank, and you are ready to move off.

OPERATING HINTS

STARTING

When you wish to ride your Cyclemaster, the first step is to pull out the petrol tap, to open it.

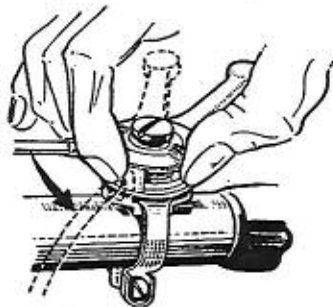
For starting the engine from cold (we do not mean in cold weather only, but whenever it has not been running for a while) you may need to use the simple easy-starting control. You do this by pulling up the wire ring which stands up from the carburettor. Lift it

one-eighth of an inch only. This allows a metered amount of extra fuel to enter. Hold the ring up while you count five and then let it go.

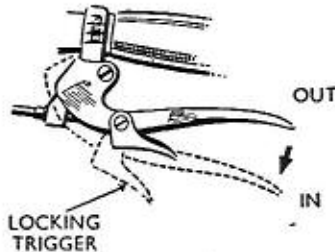
Release the clutch by moving the control lever right up to the handlebar, where a small trigger will lock it in position.

Set the throttle control in the half-way position.

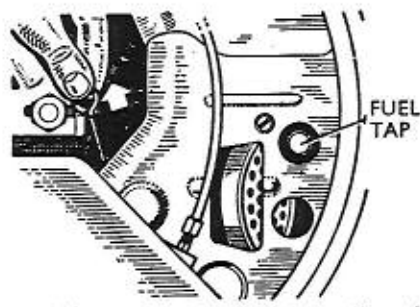
Mount the cycle, and pedal in the usual manner for a few yards. When you are well under way, release the small trigger of the catch that is holding the clutch handle, and let that handle return gently to its normal position. As you do this, the clutch will engage and turn the engine, which will then start, and thereafter you control your speed by the throttle lever. You need not use the easy-starting control again—once the engine has started the mixture will automatically return to the best



The throttle control lever is fixed to the handlebar by a simple clamp, and if the top screw is slackened the lever can be adjusted to the most comfortable position.



The lever which controls the clutch is also held by a clamp and goes on the opposite handlebar to the one on which you have the throttle control.



Before starting a cold engine, pull up the small control as shown, and hold it up while you count five; this gives a rich mixture which automatically returns to normal.

strength for normal running. Do not use the easy-starting control when the engine is warm.

If you are baulked in traffic, you simply lift the clutch control, close the throttle a little, put one foot on the ground and keep the engine running. To get away—you let the clutch in very gently opening the throttle lever slightly at the same time. It is advisable to help the motor in such conditions by pedalling a little. The operation of the clutch is fully described on page 17.

TO STOP THE ENGINE

Disengage the clutch and close the throttle. At the end of a journey, always remember to turn off the petrol.

PEDAL POSITION

The best position for the pedals when they are at rest is horizontal—rotate them forwards for a turn or so until you feel quite comfortable.

Be most careful never to move the pedals backwards except when you wish to slow down or stop. The least backward movement applies braking pressure which the engine must overcome. This spoils performance, increases petrol consumption and causes undue wear.

COASTING

A word of warning. We strongly advise against coasting, that is, descending a hill with the engine off and the clutch disengaged. However, should you decide to switch off the engine and coast down a gentle gradient, do not re-engage the clutch to start the engine again until you have slowed down almost to a walking

pace. If you attempt to engage the clutch at speed, you may damage the machine—or go over the handlebars.

Remember that with the clutch engaged and the throttle completely closed the engine acts as a useful brake for steadying your machine on steep hills.

CONTROLS

The throttle lever should be opened slowly when you wish to increase the speed. As far as possible the lever should be positioned for the speed you wish to travel so that the exhaust note is a smooth “purr”

To slow down close it completely. If you try to go too slowly with the clutch engaged the engine will become very jerky. This puts an unnecessary strain on the transmission. Always, therefore, disengage the clutch if your speed is less than walking pace.

PETROL CONSUMPTION

At this stage it should be explained that approximately 230 miles per gallon is obtained when the Cyclemaster is driven at a steady speed of 12 to 15 miles per hour on level road and without stopping. As with larger motor cycles and cars the consumption obtained when riding through heavy traffic and in very hilly country is somewhat lower than this.

HOW TO REMOVE A WHEEL

With a Cyclemaster wheel, punctures are no less likely, and certainly no more likely, than with the back wheel of an ordinary pedal bicycle.

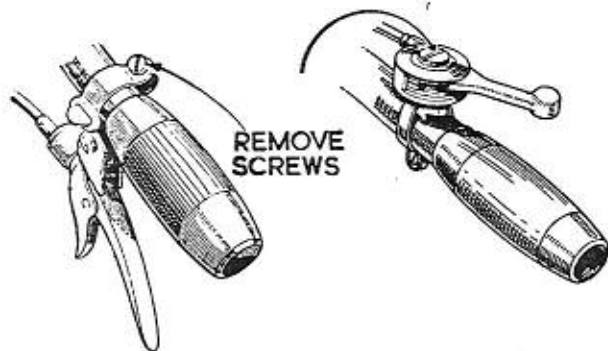
If you *do* get one, you may still be able to repair it without removing the wheel.

If you have to take out the wheel, there are only three or four extra things to undo and the whole job should not take much longer than with an ordinary cycle.

This is how you go about it:

Note.—Every operation marked with a star has to be carried out to remove the back wheel of an ordinary push bike.

- *1. Move brake blocks out of the way (if you retained the rear rim brake).
- *2. See that flex to rear light (if fitted) will not be fouled as wheel comes out.
3. Free clutch control lever by unscrewing the clamp from the handlebars.



How to remove the clutch and throttle controls.

4. Free throttle control by unscrewing from handlebars. Remove rubber straps that hold both cables to frame, and put them in a safe place.
5. Disconnect the lighting lead from the "push in" connector (see page 15).
6. Disconnect lug and bracket which locate Cyclemaster engine to frame. Put the two bolts, spring washers and nuts in a safe place.
7. Disconnect spark plug lead.
- *8. Slacken nuts on each side of spindle until wheel is quite loose. Be careful not to turn spindle.
- *9. Ease chain off sprocket of wheel.
- *10. Gently ease wheel free.

FIRST SERVICE (150 MILES)

The Cyclemaster, like any other engine, amply repays careful running in (see note on page 2). Once 150 miles have been covered, your Dealer will give your Cyclemaster a first check-over free; if you really wish to do it yourself, details of the initial check-over are given below:

1. Check level of oil in clutch chamber.
2. Check and, if necessary, adjust clutch.
3. Check spokes of wheel: tighten if necessary.
4. Check hub bearing adjustment (page 4).
5. Tighten cylinder head nuts. The sparking plug should always be removed before doing this to avoid risk of its being damaged.
6. Check tension of chain from clutch shaft to drum.
7. Check contact breaker points. Clean and adjust if necessary; gap should be .015 in. to .018 in. when fully open.
8. Remove spark plug: clean and adjust points. Examine surfaces of plug which are exposed in combustion chamber.
9. Check adjustment of air bleed screw (page 13).

ROUTINE ATTENTION

Your cycle as a whole will, of course, still require such attention as you have always given it.

As the list below shows, the Cyclmaster adds very few jobs to that ordinary maintenance work.

DAILY (or each time the Cyclmaster is used).

1. Check fuel in tank; top up if necessary.

WEEKLY

1. Thoroughly clean wheel and engine.
2. Check all nuts and bolts for tightness especially locating bracket (page 3), and engine mountings (illustration on right).
3. Check tyre pressure and pump up if necessary.
4. Check clutch control for free travel. Should be $\frac{1}{2}$ in. (to adjust see page 18).
5. Remove spring clip, if fitted, from oil hole in hub and add one or two drops of light machine oil. Some hubs are fitted with a rubber capped oiler, to lubricate press spout of oil can right through the cap.
6. Oil chain from clutch shaft to drum.



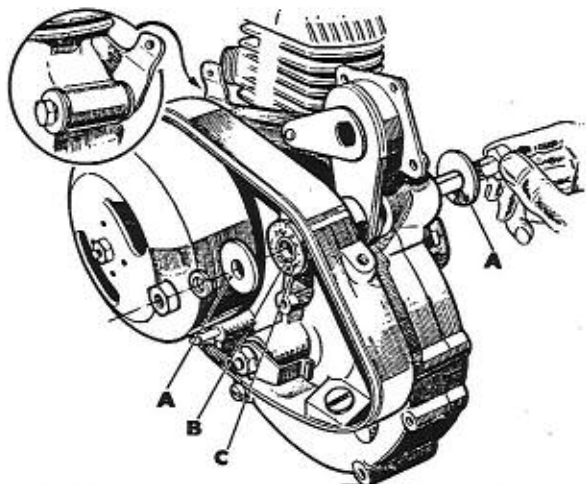
How to lubricate the Coaster Hub.

7. Check spark plug points.

8. Oil control wire inner cables where they emerge from outer casing.

QUARTERLY (if possible, do these jobs on the actual quarter days—they will not then be overlooked).

1. Check level of oil in clutch chamber (see page 18).
2. Check Contact breaker points.
3. Examine nipples of wheel spokes. If any seem loose, see your Dealer, as soon as possible.
4. Check tension of chain from clutch shaft to drum (page 19).
5. Clean out fuel system (see page 13).
6. Check hub bearing adjustment (page 4).



After tightening make sure that the lock nut behind that part of suspension bracket (shown in the inset) is also tight.

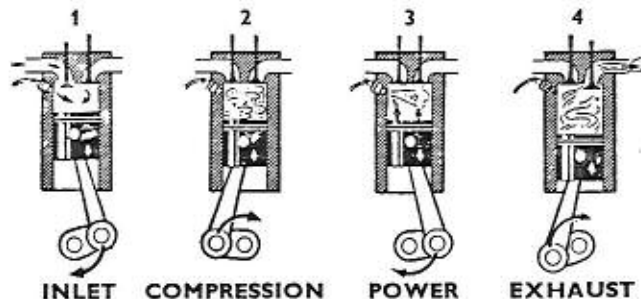
THE CYCLEMASTER ENGINE

The Cyclemaster has what is known as a "2-stroke" engine. This must not be confused with the number of cylinders: it describes the method by which fuel enters the cylinder, is compressed, fired, and exhausted.

Most motor cars have 4-stroke engines, and the operation of such engines must be briefly described before the 2-stroke principle can be understood.

4-STROKE ENGINE

1. The piston descends with the inlet opening (called a "port") open, and the exhaust port closed. An explosive charge of petrol and air is sucked in (*Inlet Stroke*).
2. Piston rises, both ports closed, and compresses mixture (*Compression Stroke*).



This diagram illustrates how, in a 4-stroke engine, the piston has to go down twice and up twice to produce one power impulse.

3. With both ports still closed, a spark jumps across points of sparking plug, igniting mixture and forcing piston down (*Power Stroke*).
4. Piston rises, exhaust port open, and drives out burnt gases (*Exhaust Stroke*).

This sequence of operations is repeated so long as the engine is running.

2-STROKE ENGINE

There is nothing new about the *idea* of 2-stroke engines. They have been used in many motor cycles, and some cars, for years.

SIMPLICITY ITSELF

When the piston travels up in the cylinder, inlet and exhaust ports are closed, and the gas in the combustion chamber (i.e., above the piston) is compressed.

As the crankcase (i.e., the part *below* the piston) is airtight, it follows that when the piston rises it tends to set up a vacuum or depression, in the crankcase.

When the piston gets nearly to the top of its stroke, an opening in the crankcase becomes uncovered, and unburnt mixture is drawn in (to the crankcase, remember) straight from the carburettor.

When the gas already above the piston is fully compressed, the spark occurs. This fires the mixture, and the piston is driven down, thereby applying *power* through the connecting rod to the crankshaft.

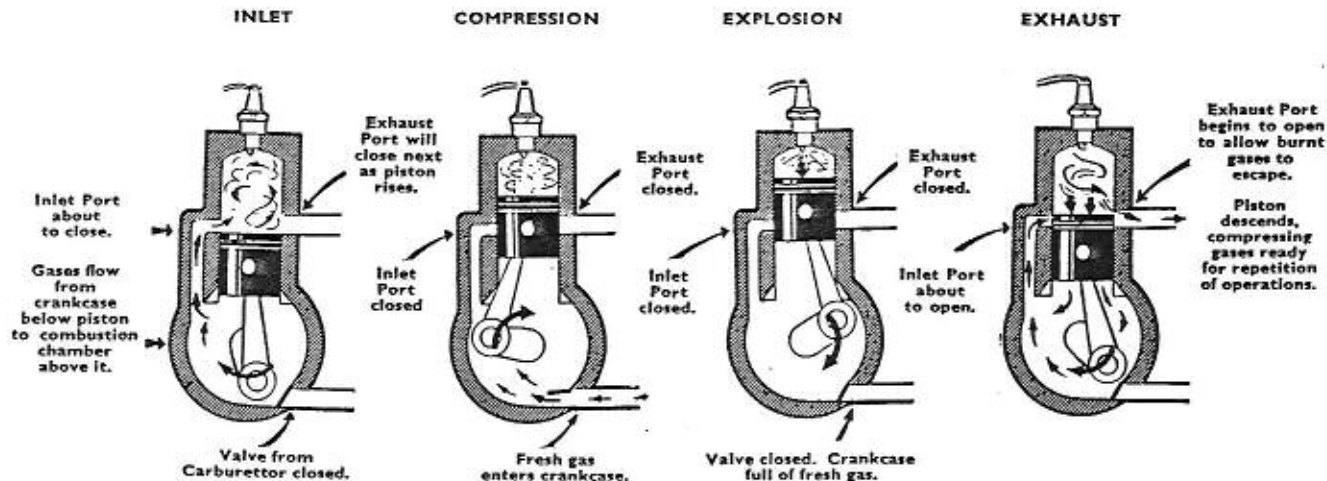
As the piston descends, it uncovers an opening in the side of the cylinder, and through this the used-up, burnt gases escape. By this time, the inlet opening in the

1st STROKE

Piston rises, compressing gas and closing both ports.

2nd STROKE

Spark fires mixture and piston is forced down (power stroke).



There are four sketches here for the sake of simplicity, but the Cyclemaster piston does not have to go twice up and twice down to produce one power impulse : every downward movement of the piston is a power stroke, and the principles are simply explained in these pages.

crankcase is closed, so that all the gases *below* the piston are compressed by its downward movement.

As the piston continues to go down, it uncovers other ports, which allow the compressed gases *below* it to rush up (through passages in the actual metal of the cylinder walls) from the crankcase (below the piston) to the combustion chamber (above it).

Then the piston begins to go up again; as it does so, it covers up the various openings it exposed on its downward journey, and the whole business is repeated again for so long as the engine is running.

As will be appreciated from the above brief description, there are no "valves" in the motor car sense—no mushrooms on sticks which keep jumping up and down, and require careful setting, with "tappet clearances" and all the rest. There is nothing to be ground in, nothing to be re-seated from time to time.

The exhaust port is simply a hole in the cylinder wall, which is open or closed according to the position of the piston. Nothing to wear, nothing to get out of adjustment or go wrong, and the only attention required the removal of carbon deposit when necessary. See "Engine Loses Power" (page 20).

The ports which allow gas to pass from crankcase to combustion chamber are, similarly, just holes which are open or closed by the piston as it moves up and down. Again, nothing to wear or go wrong.

The only actual valve is found in the crankcase, where it controls the opening from which the inlet pipe runs to the carburettor. And this valve is simply a revolving

disc of metal. It has a small hole in it. When that hole coincides with the hole in the crankcase itself, gases can flow in: as the disc revolves, so the hole in it moves away from the opening in the crankcase, until by the time the correct amount of gas has been sucked in, the crankcase opening is completely covered again, and the "way in" from the carburettor is barred until the movement of the disc once again brings the two holes together.

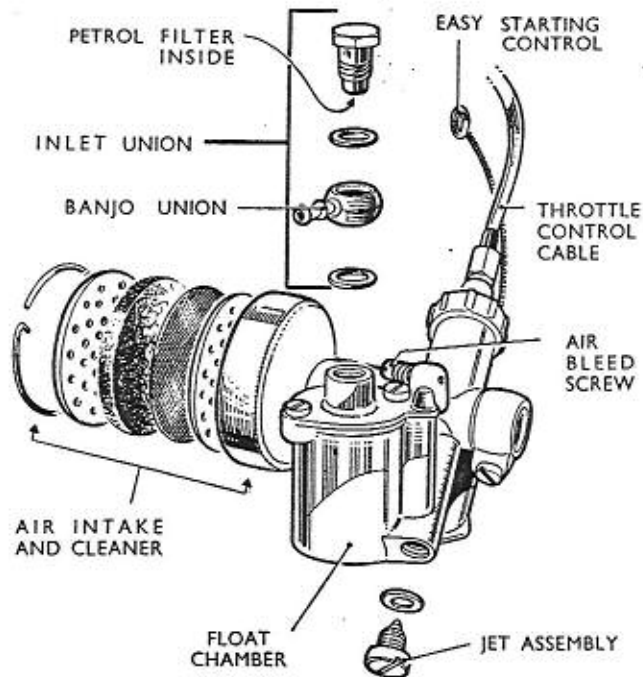
HOW THE CARBURETTOR WORKS

The Cyclemaster engine is fitted with a B.E.C. Type B1 carburettor. It is simple and robust, and it is so easily accessible that the occasional attention it requires can be given by any owner—even those who have no mechanical knowledge at all.

Fuel passes from the tank through the inlet union into the float chamber, where its level is controlled exactly as the level of water is controlled in a cistern.

As the piston of the engine goes up, it sucks air in through the air intake, which embodies an air cleaner. This air passes over the jet, and causes fuel to emerge in a very fine spray and mix with the air to form an explosive gas. This passes into the combustion chamber of the engine, where it is exploded by the sparking plug, and so provides the power. When you open the throttle control on the handlebar you allow an increased amount of mixture to enter the combustion chamber, and so get more power.

When you lift the easy-starting control, you temporarily allow a little more fuel to pass, so that the mixture



This "exploded" drawing will help you to give the carburettor the slight attention it requires.

becomes richer. Every time you use it slightly more petrol than normal is consumed so do not use it more than necessary. (See page 20 para. 3).

Once the engine is running, the mixture automatically returns to normal; flooding is impossible.

The running strength of the mixture is controlled by the air bleed screw, the average setting for which is one turn out from the fully screwed in position although up to three turns out is permissible. To get the sweetest running and economy you can vary this setting by turning the screw—screwing in will enrich the mixture, screwing out will weaken it.

Dirt, fluff, grit, water and so on in the fuel system will cause uneven running, loss of power, perhaps a complete stoppage.

The surest way of avoiding such trouble is to keep every part of the system clean, and we recommend that you should devote half an hour or so to this interesting job once a quarter.

You will need, besides your screwdriver and spanners, about a pint of petrol with which to wash out the tank, some petrol in an old breakfast cup, and an old jug.

FUEL TANK

Remove the carburettor cover plate by undoing the single screw. Undo nut B (Ill. page 14) and remove banjo union; don't lose the two fibre washers. Undo the three set screws which secure the fuel tank, and remove the tank. Watch the spring washers.

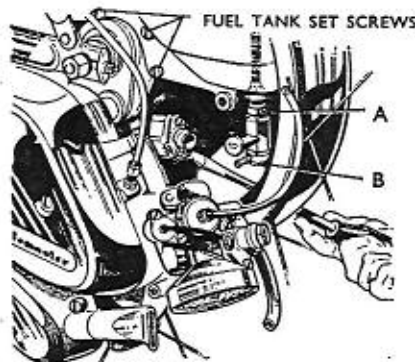
Loosen nut A which holds the tap assembly into the tank, and remove that assembly. As it comes away, put

your finger over the hole and give the tank a good shaking. Remove your finger and let the contents of the tank run into your jug. Do this several times, and then throw away the swilling petrol. Before leaving the tank see that the vent hole in the filler cap is not clogged.

FUEL TAP

The cylindrical gauze filter which is screwed into the fuel tap should be removed for cleaning.

Do not wipe it with a cloth or piece of rag. So that it will not become distorted treat it with great care.



In this drawing the fuel tap nipple has had to be shown pointing the wrong way.

REMOVING THE CARBURETTOR

Get one of the openings in the wheel drum into such a position that you can get a screwdriver through it on to the screwhead of the clamp which fixes the carburettor to the engine. Slacken this screw a little, and gently remove the carburettor. It will remain attached to your bicycle only by the throttle control wire.

AIR CLEANER

The first thing to be cleaned is the air cleaner. By removing the circlip at the end, the whole of the "inside" can be taken out. Wash everything in your cupful of petrol. Allow it to dry; dip the gauze strainer in oil, and then refit the parts in the order shown.

FUEL INLET

Undo the hexagon nut, and remove the bolt, and the banjo union. Blow through the banjo and the bolt both ways. Wash both in petrol. Make sure the gauze filter inside the bolt is quite clean.

To reassemble, hold the bolt upside down in your fingers and put one fibre washer on it. Then fit the banjo and the other fibre washer; keep everything in position with your fingers, turn the assembly right way up and fit it back to the carburettor. Get the arm of the banjo union pointing exactly over the letters KS in the word "Bucks." Tighten well.

THE JET

To clean the jet, loosen the slotted head with a screwdriver, and then remove the jet assembly with your fingers; there is only one fibre washer here. Blow through the tiny hole in the top of the jet, rinse it in petrol, put the washer in position and refit the jet assembly. Screw it in very tightly.

RE-ASSEMBLING THE SYSTEM

1. Get the banjo union of the tap, and fit the flexible pipe on to it.

2. Put the other end of the flexible pipe on to the fuel inlet nipple of the carburettor. The deeper recess of the tap banjo union must be uppermost.
3. Fit the carburettor to the engine, making sure that the float chamber is vertical. Tighten clamp.
4. Take the fuel tap assembly and feed the gauze strainer up into the tank. Do up nut A finger-tight only.
5. Fit tank. Don't forget the spring washers, and get the three setscrews as tight as you can.
6. Now take B. Put the smaller washer on first; feed the bolt through the banjo union of the tap. Fit the other washer, and then screw B into the bottom of the tap assembly. Tighten well.
7. Try the carburettor cover plate for position *before tightening nut A*. Never attempt to change the position of the tap unless that nut is slack.

* * * *

If the engine will not start, and ignition tests (see page 20) prove that you are getting a spark, the trouble must be fuel.

First make sure that there is no kink in the bend of the flexible pipe. If this is satisfactory then with the fuel tap turned on, slacken B a little. Fuel should leak out; if it does not, the filter inside the tank or the tap itself, may be clogged, and the tap assembly should be removed and cleaned.

If fuel does leak out, tighten B. at once, push tap to "off" and remove the carburettor. Clean the flexible pipe, the fuel inlet bolt, and the jet.

Never filter fuel through any kind of cloth, for the tiniest fragment of fluff will cause trouble.

If you are persistently bothered by obstructions in the fuel system, the carburettor float chamber may need cleaning, and we would advise you to see your dealer.

IGNITION AND LIGHTING

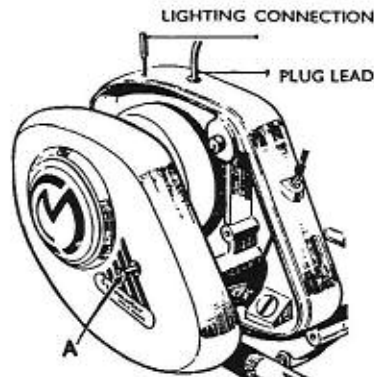
The spark which ignites the mixture inside the combustion chamber is provided by a sturdy and very efficient flywheel magneto made by the Wico-Pacy Sales Corporation Ltd., Bletchley, England. This magneto also provides current for the cycle head and tail lamps.

The magneto consists of a "stator" (or part that stands still) and a "rotor," which revolves. The weight of the rotor causes it to act as a flywheel. It embodies the magnets.

Upon the stator are mounted the coil, condenser and contact breaker for the ignition, and the coil for the cycle lighting. When the rotor is revolving around the ignition coil, an electric current is induced. Every time the points of the contact breaker open, the current is stepped up to a very high voltage, which is fed to the plug, travels down the centre electrode and jumps (in the form of a spark) across the gap to the side electrode. This system will produce a "fat," healthy spark which will fire the mixture in any weather.

A rubber insulated "push in" connector will be seen protruding from the crankcase (see page 16). The lighting lead for the head and tail lamps fits into this connector. 6 volt bulbs are required, and the *total* wattage must be at least nine. Thus you can have a 6 watt headlamp and 3 watt tail-lamp, or 8 watt headlamp and 1 watt tail-lamp.

How to remove the metal cover in order to get at the flywheel magneto—simply by undoing the screw A, which is so fitted that it cannot be lost. While this cover is off you can also get at the main clutch adjuster and the clutch chamber oil filler plug.



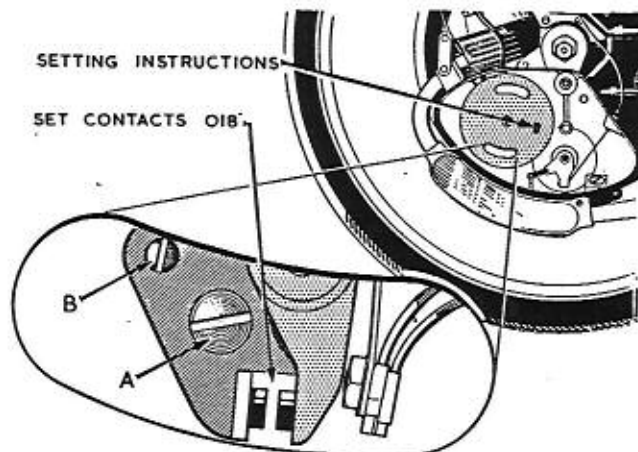
This electrical system is as thoroughly reliable as that of the modern car, which functions so efficiently that motorists take it for granted. But the Cyclemaster has this great advantage; in the very unlikely event of trouble, you can always pedal home or to a garage—whereas with a car you have to wait for assistance.

ADJUSTING THE POINTS

The contact breaker points should be checked for adjustment after the first 50 miles and thereafter once a quarter.

First, remove the engine cover bearing the CM symbol. This is held by one screw only, which cannot be lost. This will expose the rotor-flywheel, which has two slots in it. Turn the rotor until the points are fully open. They can be seen through the lower slot of the rotor, and when fully opened they are centrally placed

in this slot. In this position a .015" feeler gauge (your dealer will sell you one very cheaply), should just pass between them. To the left of the points will be seen the locking screw A and the adjusting screw B, which is above A, and smaller. If the points need adjustment, slacken screw A a quarter of a turn and then rotate B very gently until the gap is correct. Please remember that it must never exceed .018". Re-tighten A and re-check the adjustment to make sure that the gap did not alter when you tightened the locking screw.



To examine and inspect the contact breaker points (which need only be done quarterly) you first remove the metal cover and then follow the instructions given on the left.

A is the locking screw, B the adjusting screw.

LUBRICATION (Quarterly)

The cam which operates the points is lubricated by a piece of felt located in the stator core. It can be seen by looking downwards through the top hole in the rotor when this is in the point setting position. Apply two or three drops of engine oil taking great care not to over-charge it or allow surplus oil to run onto other parts of the magneto. If oil gets on to the contact points it will stop the magneto from working.

Finally, replace engine cover.

The rotor-flywheel cannot be removed without the correct extractor, which is tool No. CB1 (obtainable from your Cyclomaster Dealer).

Should you suspect ignition trouble while you are using your Cyclomaster, methods of tracing it and dealing with it are explained fully and simply on page 20.

THE CLUTCH

The Cyclomaster is fitted with a clutch. Once the engine is running, you can keep it running—a very decided advantage in traffic.

The clutch runs continuously in an oil bath, inside a sealed chamber. The small hole in the top of this chamber (behind the engine cylinder) is not for lubrication purposes, but is a pressure relief vent.

When the engine is running, the up-and-down movement of the piston is transmitted, by means of the connecting rod, to the fully counterweighted crankshaft, and from there to the clutch shaft.

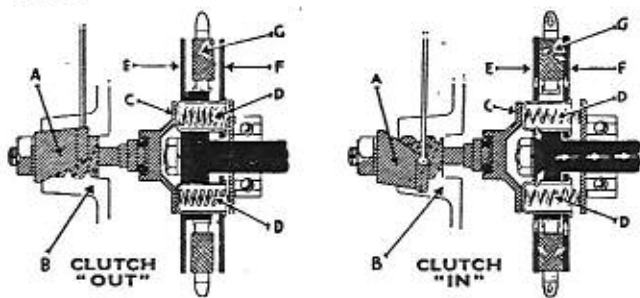
The simplest way to explain the action of the clutch is to liken it to a number of table mats, held vertically.

When the engine is driving the wheel, these mats (clutch plates, they are called) are pressed tightly together by means of powerful springs.

* * * *

When you wish to stop the cycle, but keep the engine running, move the clutch control lever towards the handlebars, and the effect of this is to overcome the resistance of the springs (D) and separate the plates (EF). This disconnects the drive from the engine.

To start away again, let the clutch control lever return to its original position; the plates are firmly pressed into contact again by the springs; the power from the engine is taken up and transmitted to the other end of the clutch shaft (as shown by arrows) and thence, by way of a rubber-cushioned sprocket and chain, to the cycle wheel.



A : clutch operating mechanism. B : section of casting. C : clutch release plate. D : clutch springs. EF : clutch plates. G : plate with cork segments which transmit the drive.

CLUTCH LUBRICANT

The Cyclomaster clutch operates in an oil bath, and the only attention it should ever require is occasional adjustment (see below) and a quarterly check of the oil level. As recommended on page 9, it is a good plan to carry out this check—or get your Dealer to do it—on or about the actual quarter day; then it will not be overlooked.

IMPORTANT.—Do not overfill the clutch chamber: the oil should just cover the lower part of the chain (see below).

First, remove the engine cover bearing the "CM" symbol, by undoing the single screw (see page 16).

In the bottom right-hand corner of the chamber thus revealed you will see a circular metal plug with a slot—like the head of a big screw. Wipe plug and surrounding metal clean with a piece of rag, and then use a screwdriver to take out the plug.

Oil should just cover the lower part of the chain which you can see through the hole; if it does not, then the clutch chamber requires topping up with best quality gear oil. Never overfill. (As a guide, oil should just show on the tip of a screwdriver blade inserted $\frac{3}{4}$ " below the face of the filler plug hole).

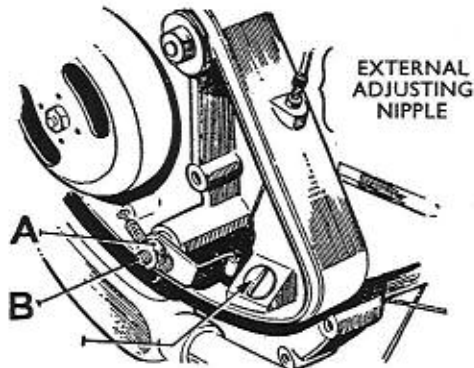
ADJUSTING THE CLUTCH

When you put your fingers round the lever which controls the clutch, you should be able to move it quite freely about a quarter of an inch (measured at the tip of the lever) before you feel that you are starting to overcome the resistance of the clutch springs.

If there is more than a quarter of an inch before you begin to feel resistance, you won't have enough movement left in the lever to free the clutch completely when you want it "out," so that it will slip and wear.

If there is less than a quarter of an inch you cannot be sure that the springs exert their full pressure when the clutch is "in"—which again means slip and wear.

Very simple adjustment is provided by means of a screwed nipple, which takes up, or increases, slack in the clutch cable. By turning this nipple clockwise you increase the clearance between the end of the adjusting



Routine adjustment of the clutch is carried out by means of the external nipple. When sufficient adjustment can no longer be obtained this way, remove the "CM" cover, slacken the lock nut A, and turn the screw B. Oil level is checked quarterly by removing the screw indicated.

screw and the clutch end thrust-plate. By turning it the other way you reduce the clearance.

* * *

When, after a period of time, you can no longer get sufficient clearance by means of the nipple, there is the main adjusting nut on the clutch itself.

First remove the cover bearing the "CM" symbol, then return the adjusting nipple to the mid-way position.

The clutch linkage is clearly shown on page 18. You will require a spanner to fit the lock nut (A) and a narrow-bladed screwdriver for the adjuster (B).

Place the screwdriver in the slot of B and, holding it firmly, slacken the lock nut with the spanner.

Then turn the adjuster as under:—

TO THE RIGHT (i.e., "screwing it up") to reduce the clearance of the lever.

TO THE LEFT (i.e., unscrewing it) to increase the clearance. Tighten the lock nut, and check the movement of the clutch control lever. If it is the required quarter of an inch, all is well.

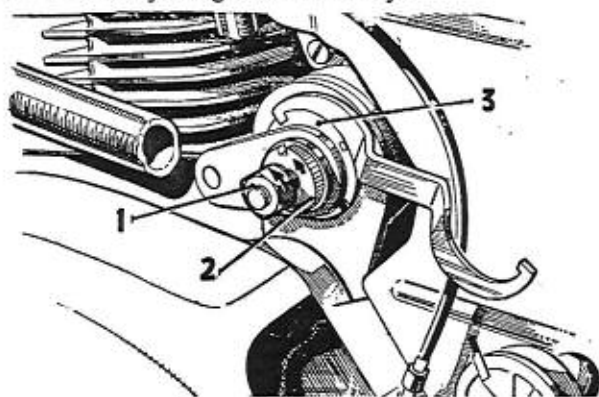
If not, you can make final adjustment by means of the nipple.

The clutch may be heavy in operation if the position of the clutch operating arm is not in correct relation to the cable. With the clutch lever in the disengaged position the operating arm and cable should be approximately at right-angles to one another. It will easily be seen that screwing the external adjuster outwards and the main adjuster to the left will raise the position of the operating arm and vice versa.

Finally, replace engine cover.

ADJUSTING THE CHAIN FROM THE CLUTCH SHAFT TO THE DRUM

First slacken nut (1) and then the thin lock nut (2). By using a thin "C" spanner (Service Tool CA22) move the eccentric (3) until the total up-and-down play in the chain is $\frac{1}{2}$ ". After tightening nuts (2) and (1) re-check tension and adjust again if necessary.



How to adjust the chain from the clutch shaft to the drum.

SERVICE TIPS

If the engine refuses to start, the following steps should be taken in the order given:—

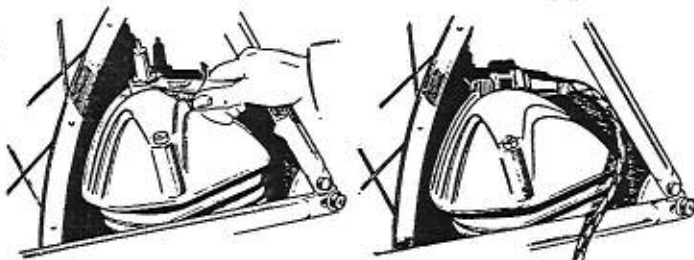
1. Make sure there is fuel in the tank.
2. See that fuel tap is in the "open" position (i.e., pulled out).

3. Pull up easy starting control for five seconds and try again, but remember that bad starting is often caused by too much fuel in the engine. If you suspect that this is so, close the petrol tap, open the throttle control and pedal your machine for 100 yards or so with the clutch engaged, in this way air going through the engine will take away any excessive fuel.
4. If engine still will not fire, it is either not getting fuel, or there is no spark to fire the fuel.
5. Make sure sparking plug is tight—try it with the special tool provided. Wipe the porcelain with a piece of rag—there may be moisture on it.
6. If engine still will not start, take off plug lead, remove spark plug with the same tool and examine the points. If they are clean, proceed as described in paragraph 7. If they are wet, dirty or oily, there is your trouble. Dry them; scrape as clean as you can; adjust points to between 18-20 thousandths of an inch (move the side electrode only—don't touch the centre one or you may ruin the insulation). Replace plug and try again.
7. If plug seemed clean when you removed it, and gap was correct, refit the lead and place plug on top of cylinder head so that the terminal (where the lead joins) does not make contact with metal. Push the cycle (with the clutch in) a few yards, and watch plug—but do not ever touch the plug terminal while the wheel is revolving.
8. If it does not spark, the plug itself may be faulty, and a spare one carried in the tool-kit will come in handy.
9. If you are quite sure that the plug is all right and there is still no spark, check the contact points as described on page 16.
10. If there is nothing wrong with the contact breaker points, the trouble can only be in the lead, condenser or coil. Such trouble is most unlikely, but should it occur you have the advantage over a car driver in that you can pedal your machine to the nearest dealer, who will soon put it right.
11. If, on the other hand, fat healthy sparks jump across the points as you push the cycle, the ignition is obviously all in order, and you can replace the plug and check the fuel system as described on page 15.

ENGINE LOSES POWER

Should you notice a steady falling-off in the power of the engine, that is almost certainly a sign that the silencer is blocked or that decarbonization is due.

First, remove the silencing system complete by undoing the serrated collar nut which secures the front pipe to the



Removing the sparking plug . . . and how to test it.

cylinder, and the single set screw which keeps the back of the box in position. There is a tab locking washer under the head of the back screw. Turn back the tongue before attempting to loosen it. This screw will be more accessible if the "CM" cover is removed.

Pull the front pipe right out of the box (loosening the screw shown in the illustration) being careful not to rotate it more than a few degrees each way.

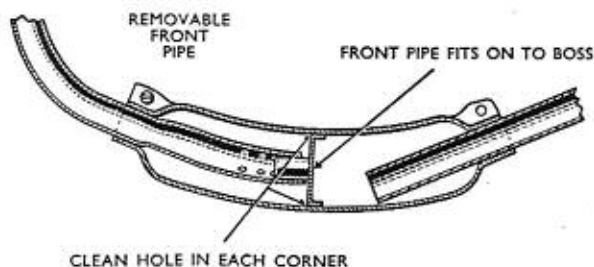
Clean it thoroughly inside and out, with particular attention to the perforations around the inner end.

Look into the silencer. In its centre is a baffle plate which should have a hole in each corner. Make sure that these holes are free of carbon (use a piece of stiff wire or a knitting needle). Shake out any loose particles of carbon.

Refit exhaust pipe to silencer (the illustration shows the correct method of assembly). As when dismantling, rotate the silencer as little as possible when refitting. (The most convenient method of assembly is to hold the silencer upside down in the left hand, and insert the exhaust pipe by holding it in the right hand with its curved portion at approximately 4 o'clock).

Refit system to engine and check serrated collar nut, front clamping nut and rear attachment screw for tightness with engine hot. Finally, lock tab washer.

Should the engine still lack power, decarbonizing of the exhaust port is probably indicated. Most owners will prefer to entrust this to their Dealer, but if you are able to do the work yourself you will need Service Tool CA.18, a little engine oil and some jointing compound (all obtainable from your dealer at reasonable cost).



Remove the "CM" cover plate, the exhaust system and the sparking plug. With Service Tool CA.18 remove the three cylinder head nuts and lift off the head. Scrape the head clean and blow away any carbon with your tyre pump.

Disengage the clutch and change the position of the piston by rotating the flywheel. When doing this, remember that when the cylinder head is off, the cylinder itself is free to move on the studs, and that the pressure of the piston rings may, as the piston rises, lift the cylinder and so damage the lower joint. To prevent this, always when rotating the flywheel, put a finger on the top face of the cylinder and press firmly downwards.

First get the piston to its lowest position in the cylinder. Examine inlet and exhaust ports. If the inlet ports require cleaning the cylinder must be removed and the logical thing to do is to leave the exhaust port until the cylinder is off and then clean all three together.

If the two inlet ports are clean the exhaust port can be scraped out at this stage and the engine reassembled.

Scrape away any carbon and blow away the scraps making sure that no fragments lodge in either of the other ports in the cylinder wall.

Now get the piston to the top of its travel, scrape the carbon from the piston crown and blow the pieces away.

Do not use sharp tools for removing carbon. It is important to avoid scratching the combustion surface of the cylinder head and piston. It is also important not to raise sharp edges where the ports enter the cylinder.

Still holding the cylinder firmly, rotate the flywheel again until the piston is at the bottom of its travel. Clean the cylinder bore with a piece of soft rag, lightly oil it, make sure that the joint faces of the cylinder and head are clean, apply a thin coat of jointing compound to both faces and then refit head. Refit sparking plug, exhaust system, and finally "CM" cover plate. Always re-tighten the cylinder head and exhaust attachment nuts with the engine hot.

Removal of the cylinder to clean the inlet ports and piston ring grooves should only be necessary after the exhaust port and cylinder head have been decarbonised two or three times. To do this it is necessary to remove the complete unit from your machine (see page 7) and the engine from the wheel.

To remove the engine from the wheel proceed as follows:

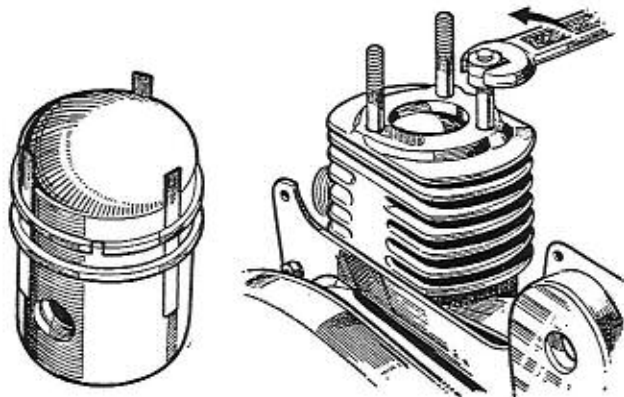
Remove spindle locking nut (nut 2 Ill. page 4).

Remove brake arm.

Rotate eccentric so that secondary chain is at its slackest and then remove eccentric with the fingers.

Lift engine clear of chain and remove from drum.

Remove exhaust system, spark plug and cylinder head as already described. Using two nuts ($\frac{1}{4}$ BSF) on each



Easing off the piston rings.

Using two nuts on the studs to withdraw them and so remove the cylinder.

stud for locking purposes, remove the three studs and then lift off the cylinder. Lift it straight up, do not rotate, or you may get the edge of the piston rings jammed in one of the ports. Take the piston rings off the piston very carefully and then clean out the grooves, making sure that no particles of carbon fall inside the crankcase. Use a small piece of clean rag around the connecting rod. Clean the cylinder ports and joint faces and also the crankcase and cylinder head facings. Refit the piston rings or if they are worn, fit new ones, making

sure that the gaps in each fit over the locating peg in each groove. They must be held in this position whilst refitting the cylinder. Use of a piston ring sleeve (service tool CB.8) greatly facilitates this operation. Always remember to fit a new paper gasket between the cylinder and the crankcase. Do not use jointing compound, a thin coat of engine oil is quite satisfactory.

Position the cylinder over the top of the piston in such a way that pushing the cylinder straight down will leave it in position on the crankcase so that the cylinder studs can be refitted without turning the cylinder on the piston. Refit studs and tighten into crankcase. Apply jointing cement to cylinder head face and refit. Always tighten the cylinder head nuts before refitting the exhaust system. Refit engine to wheel and complete unit to your machine by reversing the dismantling procedure. When refitting the brake arm, make certain that the larger hole fits securely over the flats on the brake cone and the smaller hole goes over the peg on the engine suspension bracket.

It is most important to adjust the wheel bearings and secondary chain before carrying out any tests. These adjustments are fully described on pages 4 and 19.

It is advisable to clean out the carburettor and the petrol filters and clean and adjust the magneto points at the same time as the cylinder is decarbonised. Information dealing with these components will be found on pages 13 and 16.

After testing, re-tighten exhaust flange and cylinder head nuts with engine hot.

The following points are of such importance to the

efficient and economical performance of your Cyclemaster that your attention is again drawn to them.

- (1) You must be able to feel some play in the wheel bearings. Page 4.
- (2) Oil the hub regularly. Page 9.
- (3) Use clean fuel.
- (4) Check for free play in clutch lever. Page 18.
- (5) Keep engine mounting bolts tight. Page 9.
- (6) Maintain correct level of oil in clutch chamber. Page 18.
- (7) Keep clean exhaust port and silencing system. Page 21.
- (8) Maintain correct adjustment of contact breaker and spark plug points. Pages 16 and 20.



REPLACEMENT PARTS

Only genuine parts, supplied by Cyclemaster Dealers should be used. Genuine parts are freely available and reasonable in price. We urge all owners in their own interests, never to jeopardise the high qualities of their machines by accepting substitute parts.

CORRESPONDENCE

It is important always to quote the engine number whether your request is for parts or information.

All communications to: Head Office, Cyclemaster Ltd., 38a St. George's Drive, London, S.W.1.

IMPORTANT

This page is your Warranty, and should not be detached. It is invalid if the Register card enclosed with this instruction book is not returned to Cyclemaster Ltd. within 21 days of date of purchase so that your name and address can be entered in our Warranty Register.

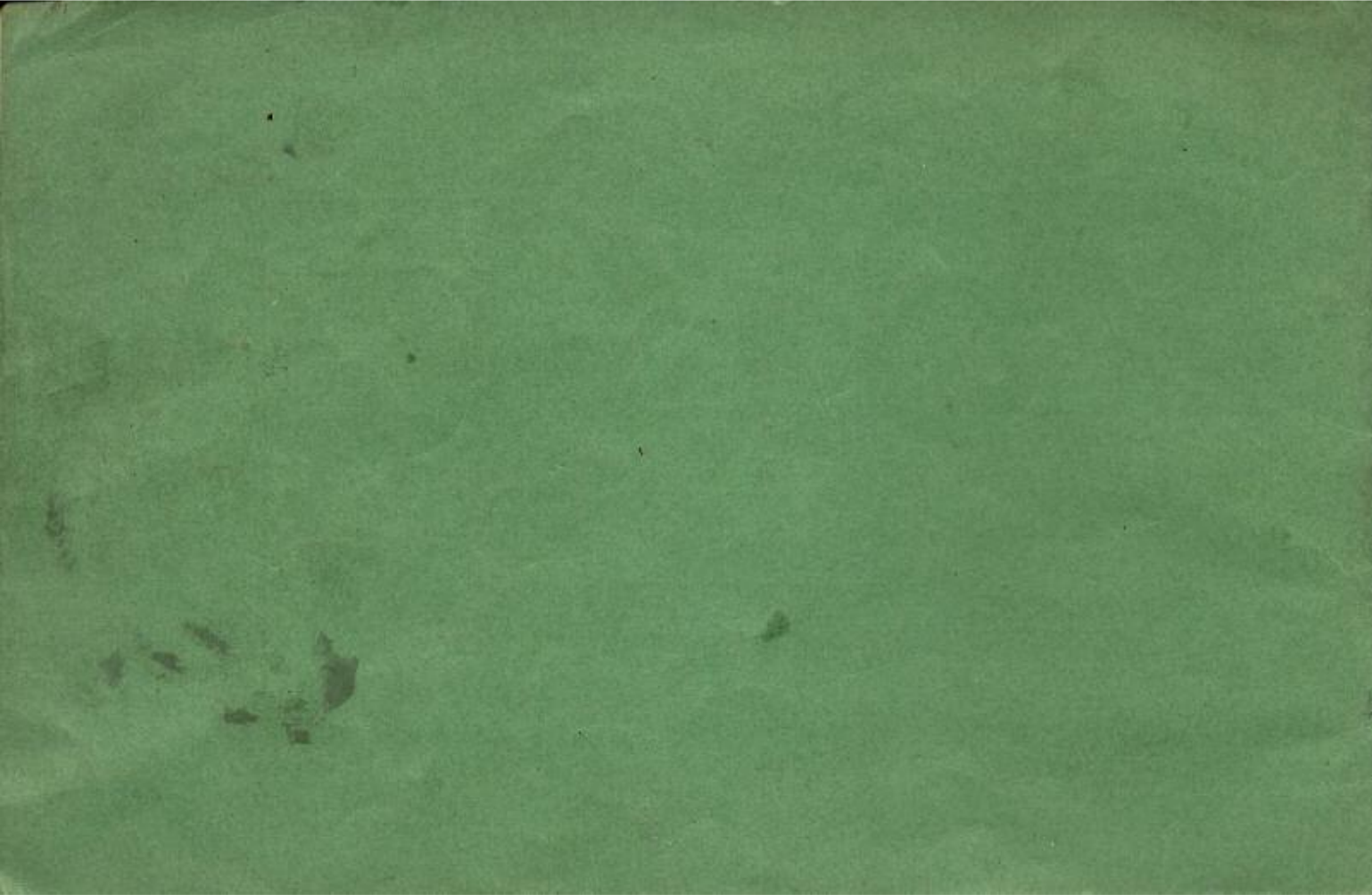
Cyclemaster Warranty

We certify that all precautions which are usual and reasonable have been taken to ensure the high quality of the material and workmanship put into the building of Cyclemaster wheels. Our warranty is limited to the free supply of a new part in exchange for any part which may prove defective within six calendar months from date of original purchase, or at our discretion to repair the original part. It does not cover the cost of re-fitting such part.

It does not include tyres, tubes and sparking plugs, in respect of which the owner is referred to the respective manufacturers.

This express Warranty excludes all conditions, Warranties and liabilities whatsoever, whether statutory or otherwise, which might exist but for this provision, and is not transferable.

In the event of an owner claiming free replacement of a defective part under Warranty, the part should be sent to Cyclemaster Limited, direct or through an accredited Cyclemaster Dealer, carriage paid, accompanied by a letter giving engine number, nature of fault, name of dealer from whom purchased and date of purchase.



IceniCAM Information Service

