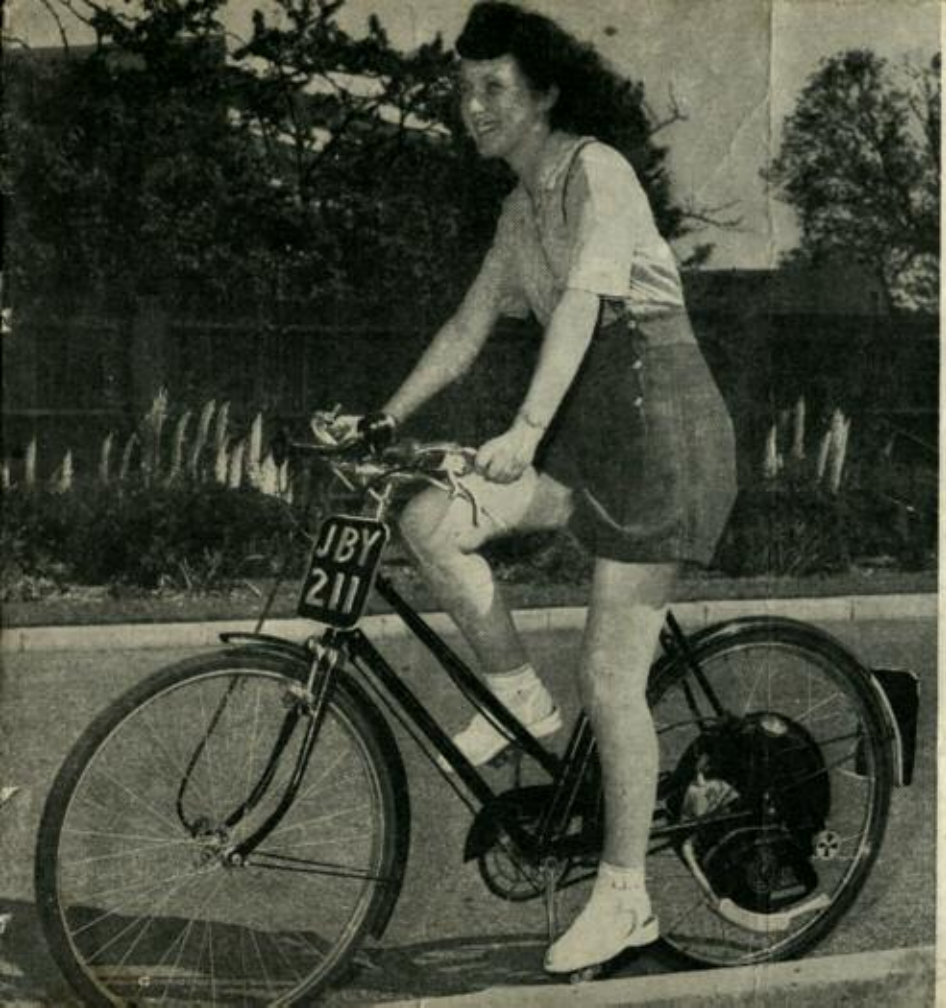
MAKING THE MOST OF YOUR CYCLEMASTER

Cycle**master**

THE MAGIC WHEEL THAT WINGS YOUR HEEL

CYCLEMASTER LIMITED 26 OLD BROMPTON ROAD · LONDON · S.W.7

(THIRD EDITION)



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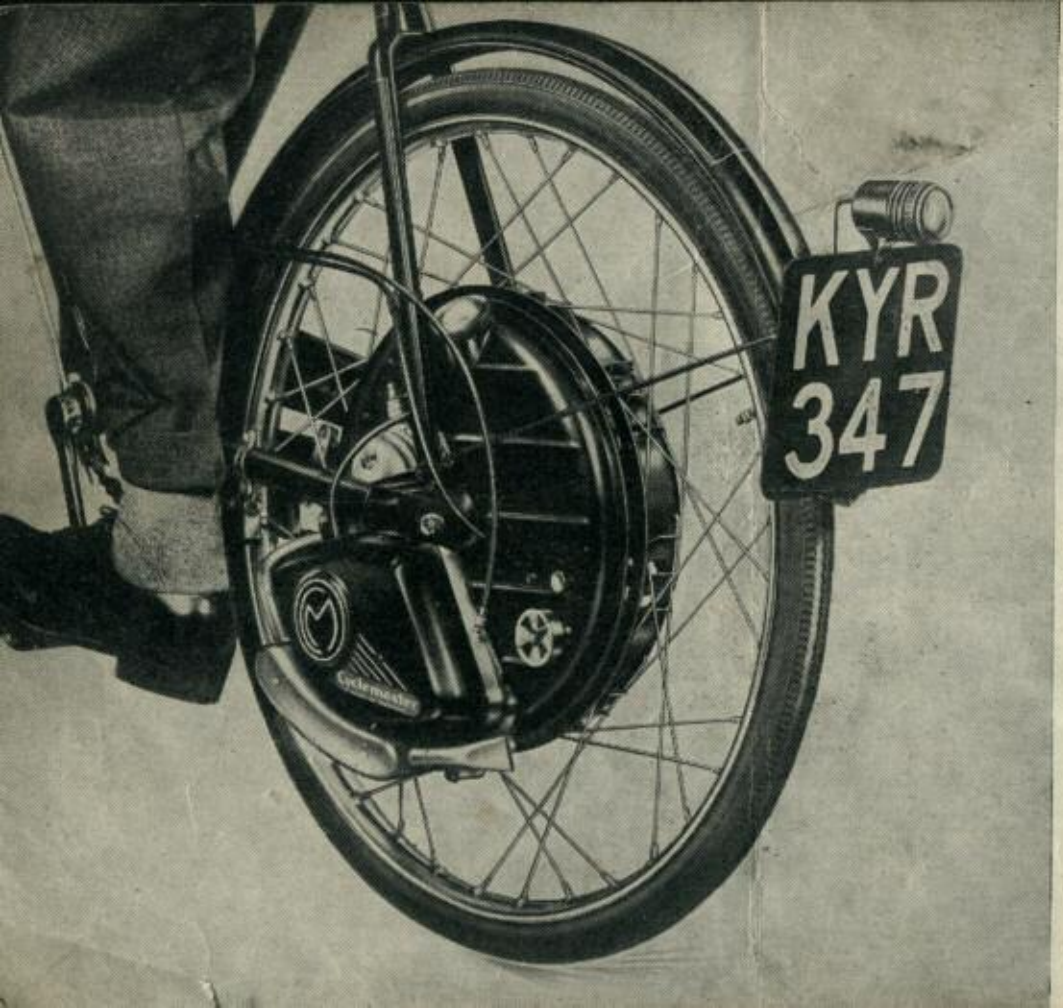


This photograph shows the Cyclemaster wheel close-up, and gives an excellent idea of the compactness of the engine. The following pages explain how it works, and contain simple, straightforward hints for the few things you need do to keep it in tip-top running order.

FOREWORD

The Cyclemaster is the most sensible and logical method of " motorising " the ordinary pedal cycle yet invented.

But it is more than that. It is an absolutely first-class job of engineering—brilliantly designed, precision-made from the finest materials by one of the most famous light engineering firms in the world.

From the day you buy it, your Cyclemaster will require very little attention, but the care that you give it will pay handsome dividends in the form of good performance and longer life.

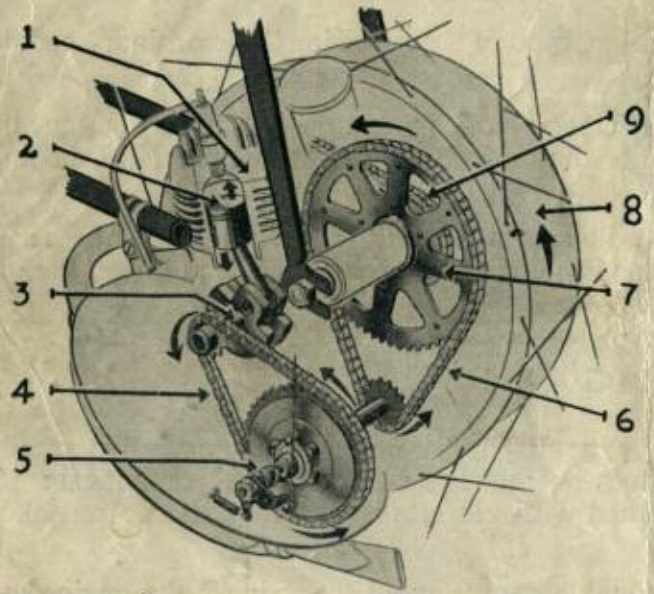
RUNNING-IN

The Cyclemaster should be driven carefully for the first 150 miles, avoiding excessive speed or prolonged hard work. After this period it does not have to be " coddled " or nursed : it is not so delicately made that it must be handled with kid gloves—let there be no mistake over that.

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.

May you enjoy many miles of carefree, economical, untiring travel.

HOW IT 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" × 1½"
Bore	32 mm.
Stroke	32 mm.
Capacity	25.7 cc.
R.A.C. Rating... ...	.25 h.p.
Developed h.p. ...	0.6 b.h.p. (approx.)
Engine speed	4,000 r.p.m. at 20 m.p.h.
Fuel mixture	" Petroil " (1 in 25)
Fuel tank capacity ...	2½ pints (approx.).
Engine Oil required ...	Single Shell : Essolube 20. Castrolite : Mobiloil Arctic Energol SAE 20.
Spark Plug	K.L.G. Type F.50 14 mm.
Plug gap	.018" to .020"
Clutch free travel ...	¼" measured at tip of control lever.
Fuel consumption ...	250 m.p.g. (approx.).
Ignition...	Wico-Pacy Flywheel magneto
Contact breaker gap...	.018"
Carburettor	Amal.
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	55 cc. i.e. Petrol Filler Cap full to brim.

A BRIEF DESCRIPTION

The Cyclemaster is a complete back wheel built around a highly efficient 25.7 cc.. two-stroke motor, embodying flywheel ignition, carburettor and clutch.

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. Because of this, you can never be stranded if, for instance, you inadvertently run out of fuel when some way from a garage.

You may have to help the Cyclemaster on some hills by pedalling ; in fact you may wish to pedal occasionally, in order to use your legs a little—and every time you give the engine such assistance you help petrol consumption. It cannot be emphasised too strongly, however, that the amount of effort required to give pedal assistance uphill *is considerably less than that needed to pedal an ordinary cycle on the level.*

A word of warning. We strongly advise against coasting in any circumstances, but 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.

To convert your ordinary machine into a light motor cycle you merely remove the existing back wheel, fit the Cyclemaster in its place, connect two Bowden wire controls to the handlebars, add the correct quantity of oil to the clutch chamber and fill up with a mixture of petrol and oil. The whole job does not take long, and you probably had it done by your Dealer—in which case you can turn straight to page 9. If, however, you enjoy doing such jobs yourself, and took your Cyclemaster home separately, full and clear fitting instructions follow.

Your bicycle will have to be taxed and insured, and unless you already hold a licence for a motor cycle (or for all groups of vehicles) you will have to go through the formality of a test. But your Dealer will help and advise you on these matters.

IMPORTANT.—The tyre of the Cyclemaster wheel must be kept pumped up very hard. If the Schrader type valve is fitted to the inner tube you can check the pressure with the use of a car type pressure gauge. The tyre should be pumped up to 45 lbs per sq. in. if your weight is under 9 stones, and to 50 lbs per sq. in. if you are over 12 stones. The free wheel mechanism must be lubricated at least weekly, as it will be in use almost constantly instead of only now and then.

FITTING THE CYCLEMASTER

You removed 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, you removed the brake blocks, out of the way, slipped off the driving chain, undid one or both of the mudguard stays, loosened the hub bolts, and pulled 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 therefore takes up more room between the forks. It may be necessary to "spring" the forks a little, but no harm can be done so long as reasonable care is taken.

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 bolt 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 head a small bracket with a hole in it.

Take the other (loose) bracket and hang it over the horizontal fork, with the elongated hole on the inside—i.e. nearer the wheel. Slide it along until the bracket on the engine is between the two legs of the loose bracket.

Now put a washer under the bolt head, and feed it through both brackets from the *wheel* side. Put the spring washer provided over the thread, fit the nut, and tighten *with your fingers only*. Do not apply a spanner until you have adjusted the chain.

ADJUSTING THE 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

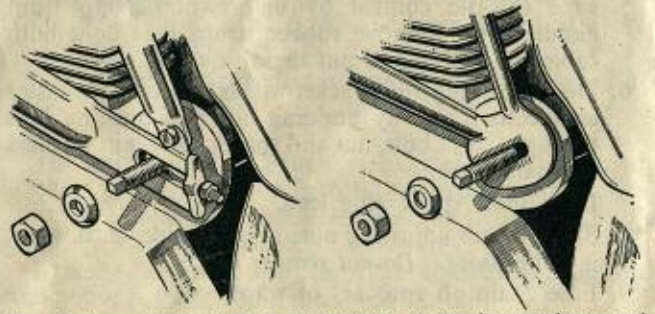
appliances are necessary—it is just a matter of judging, by eye, that there is an equal clearance each side of the tyre.

When the two hub nuts are sufficiently tight, re-check for chain tension and wheel alignment. Unless both are correct, slacken off the hub nuts and re-adjust.

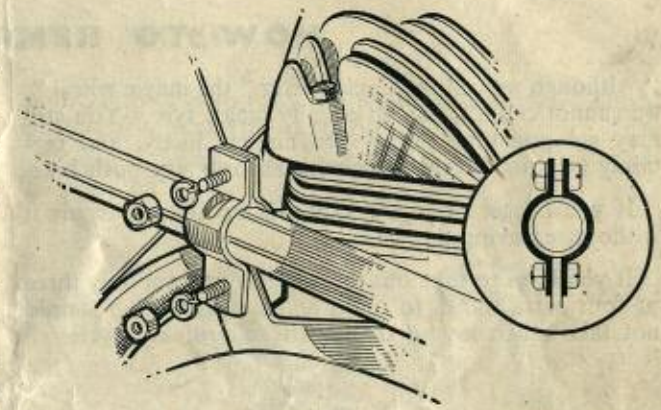
If everything is satisfactory, tighten the nut of the locating bolt, which you left slack.

It is important that this bracket is as tight as you can get it. Keep the nuts tight, and not only will you enjoy smoother, quieter riding, but the Cyclemaster will give you longer life.

Once this job has been done, there is little else to do. Re-connect mudguards and brakes, and then run the two Bowden cables (already connected at one end



The Cyclemaster wheel is held in the forks by washers and nuts exactly like any ordinary cycle back wheel.



The correct fixing of the bracket which secures the engine to the forks is very important *(see page 6).*

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.

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. Both are secured by metal clips and screws.

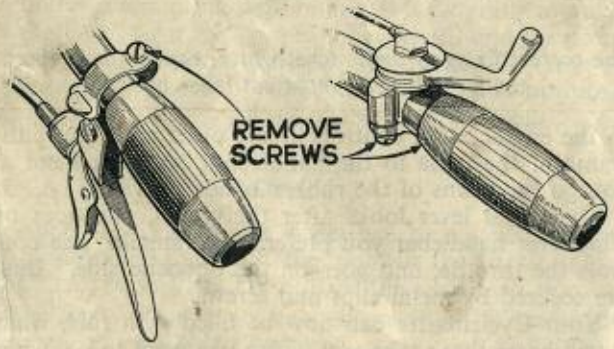
Your Cyclemaster can now be filled with fuel, when it will be ready to take you where you want to go, when you want to go—without any of the hard work you have been used to for so long.

HOW TO REMOVE A WHEEL

Although we call the Cyclemaster " the magic wheel ", we cannot claim it has an equally magic tyre. You still may get punctures ; they are no less likely, and certainly no more likely, than with an ordinary push bike.

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.



Removing the clutch and throttle controls takes only a few seconds.

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.
*2. See that flex to rear light (if fitted) will not be fouled as wheel comes out.
*3. Free mudguard stays. Place bolts, nuts and washers in a safe place.
4. Free clutch control lever by unscrewing the clamp from the handlebars.
5. Free throttle control by unscrewing clamp from handlebars. Remove rubber straps that hold both cables to frame, and put them in a safe place.
6. Disconnect lug and bracket which locate Cyclemaster engine to frame by undoing nut and pushing bolt through. Put bolt, nut and spring and plain washers in a safe place.
7. Disconnect spark plug lead.
*8. Slacken hub adjusting nuts on each side until wheel is quite loose. *Do not remove nuts.*
*9. Ease chain off sprocket of wheel.
*10. Gently ease wheel free of slots in forks, and then pull out, taking care not to scratch the enamel.

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 actual 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.

Any *good* brand of oil will do (see page 4) 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.

* * *

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 an old bottle which you 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.

Replace the filler cap in the tank, and you are ready to move off.

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.

STARTING UP

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

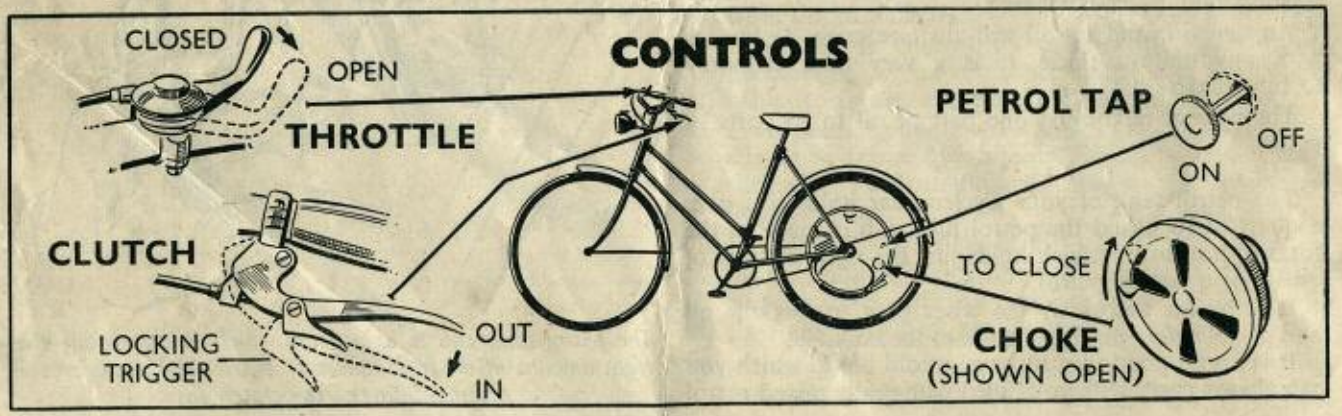
Should the engine be cold (we do not mean in cold weather only, but whenever it has not been running for a while) you must close the choke, just as on a motor car.

On your Cyclemaster engine, the choke (clearly shown in the sketch below) serves also as an air filter, being packed with wire wool. When you close the openings, the air supply is restricted, and you get a rich mixture for easy starting.

With petrol turned on, and choke closed, release the clutch by moving the control lever right up to the handle-bar, where a small trigger will automatically 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.



After a short distance, disengage the clutch, close the throttle a little, pull up, and open the choke. Your Cyclemaster is then all set for wherever you wish to go.

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 simply let the clutch in very gently. It is advisable to help the motor in such conditions by pedalling a little.

IMPORTANT.—The choke should *not* be used when the engine is warm.

TO STOP THE ENGINE

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

AFTER RUNNING IN

The Cyclemaster, like any other engine, amply repays careful running in, and just at first the engine should never be allowed to go too fast, and it is advisable to give pedal assistance on hills, and when starting away in traffic.

Once 150 miles have been covered, your Dealer will give your Cyclemaster a free check-over ; if you really wish to do it yourself, please write to us for full instructions first.

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. Tighten cylinder head bolts. The sparking plug should always be removed before doing this, to avoid risk of its being damaged.
5. Check tension of chain from clutch shaft to drum. adjust if necessary.
6. Check contact breaker points. Clean and adjust if necessary. They should be frosty grey in colour, and gap should be .018 in. when fully open.
7. Remove spark plugs : clean and adjust points. Examine surfaces of plug which are exposed in combustion chamber.

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 Cyclemaster adds very few jobs to that ordinary maintenance work.

DAILY (or each time the Cyclemaster 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—see page 6).
3. Pump up tyres.
4. Check clutch control for free travel. Should be $\frac{1}{4}$ in. (to adjust see page 19).
5. Oil free wheel.
6. Oil chain from clutch shaft to drum.

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 (see page 17).
3. Check nipples of wheel spokes for tightness.
4. Check tension of chain from clutch shaft to drum.

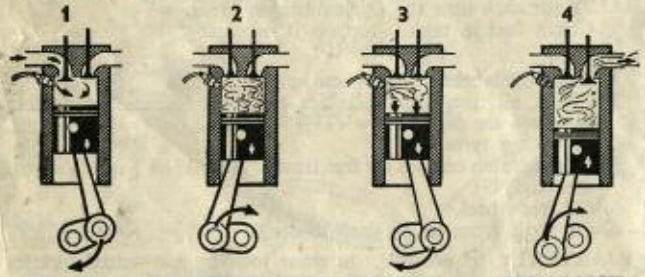
THE CYCLEMASTER ENGINE

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 cycle of operations in 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).



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

2. Piston rises, both ports closed, and compresses mixture (COMPRESSION STROKE).
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 cycle or 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.

The Cyclemaster, however, has the most robust and efficient 2-stroke engine ever designed. Yet it is simplicity itself. As all motorists know, the modern 4-stroke car engine seldom gives trouble : with the Cyclemaster engine there is even less to go wrong.

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

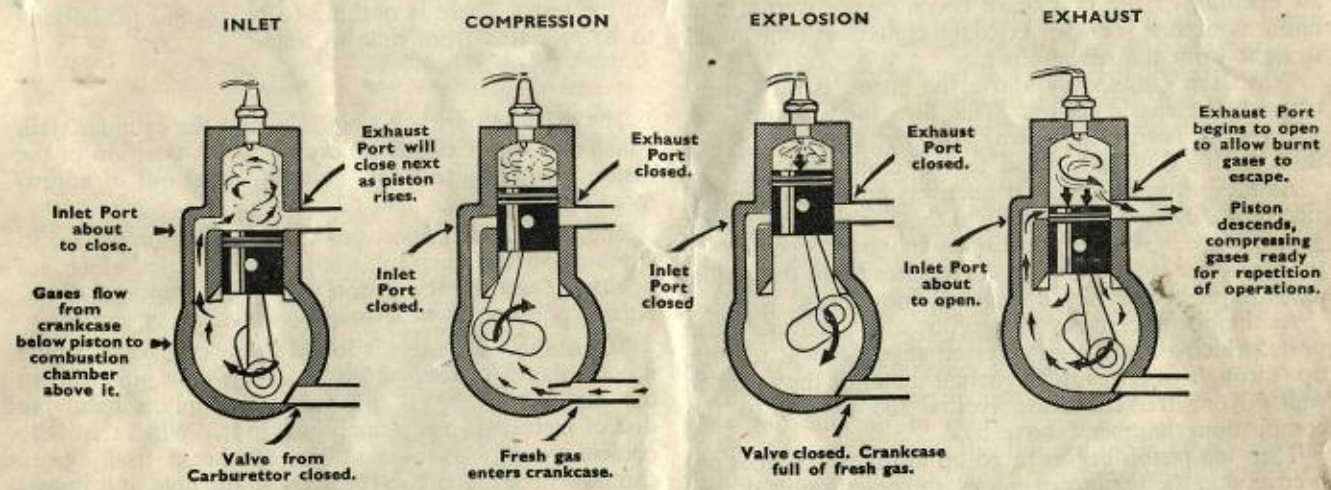
Continued on page 14

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.

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. At the same time, the inlet opening in the crankcase closes, 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.

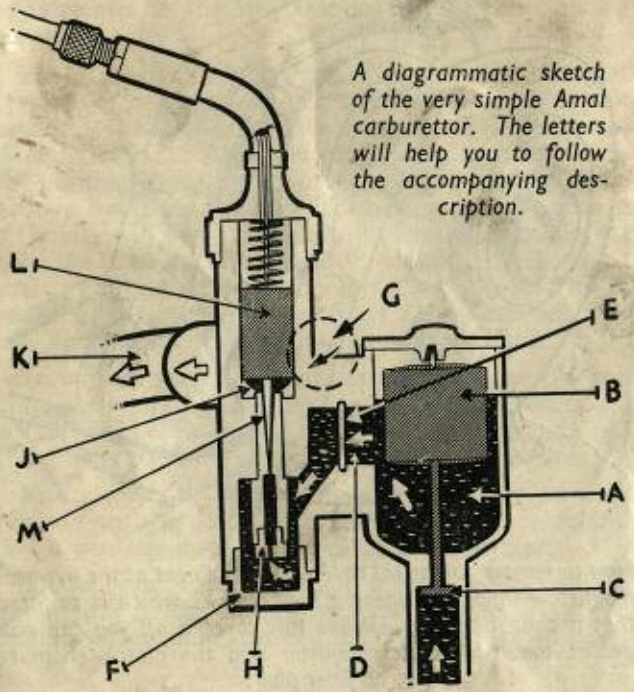
* * * *

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.

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.

THE CARBURETTOR



A diagrammatic sketch of the very simple Amal carburettor. The letters will help you to follow the accompanying description.

An Amal carburettor of simple, but very up-to-date design is fitted to the Cyclemaster engine.

Fuel is fed by gravity from the petrol tank to the float chamber (A). As the float (B) rises and falls, so a valve (C) tends to shut off or free the flow of fuel.

From the float chamber this passes along a passage (D) through a filter (E) to the jet housing (F).

As the movement of the piston sets up a depression in the induction pipe (K) so air rushes in through the inlet (G) and, passing over the top of the needle jet induces a flow of fuel (through the jet (H) at the bottom of the needle jet), which rises up the tube to point (J), where it emerges as a fine spray.

Air and liquid fuel mix together into an explosive gas, which is drawn into the engine through the tube (K).

When you open the throttle you lift both a small piston (L) and a tapered needle (M).

As the piston rises it opens the air inlet wider, thus allowing more air to enter.

As the needle rises, the thinner taper of the needle inside the jet column allows a corresponding increase in fuel flow.

All that can go wrong is a stoppage caused by grit, dirt, fluff, or other foreign bodies—none of which is likely to cause trouble provided that ordinary care is exercised in filling with fuel.

Should a stoppage occur, proceed as described on p. 21.

THE IGNITION SYSTEM

The spark which ignites the mixture inside the combustion chamber is provided by a sturdy and very efficient flywheel magneto.

It is the Wipac " Bantamag," made by the Wico-Pacy Sales Corporation Ltd., Bletchley, England.

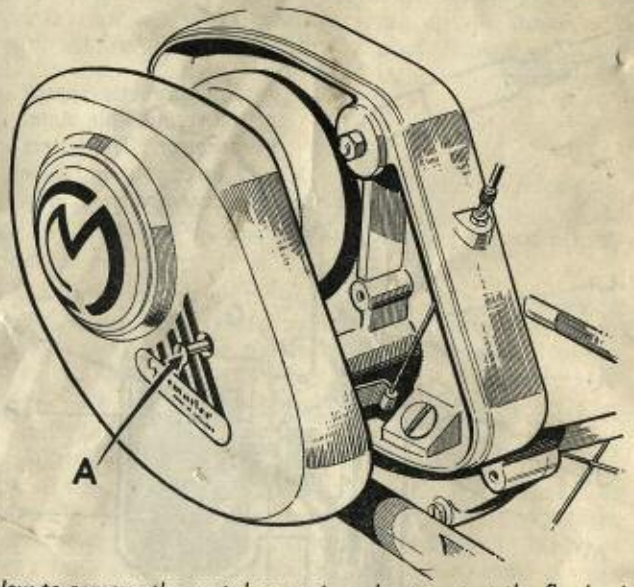
This consists of a " stator " (or part that stands still) and a " rotor ", which revolves. The weight of this causes it to act as a flywheel, and it embodies two magnets.

Upon the stator are mounted the coil, condenser, and the contact breaker.

When the rotor is revolving around the 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.

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 are " stuck ".



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.

ADJUSTING THE POINTS

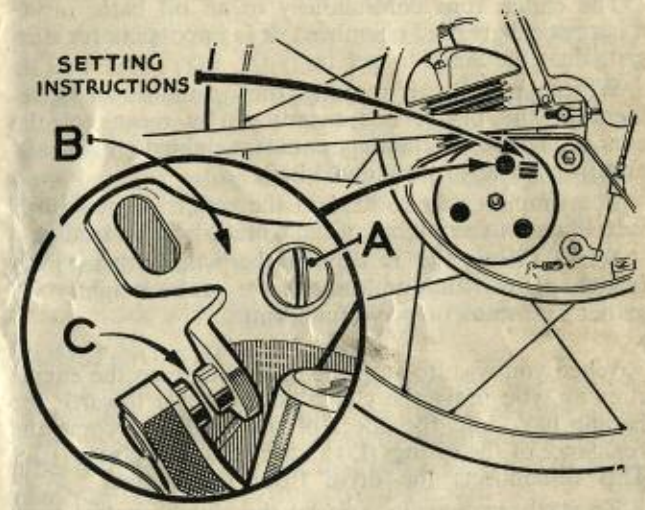
The contact breaker points should be checked for adjustment after the first 50 miles and thereafter once a quarter.

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 three holes in it. Turn the rotor until the holes are in the position shown in the drawing—that is, so that the hole on top is the one with the lettering " CCW rotation set points .018 here ". You will then see, through that hole, the three items A, B and C, shown in the enlarged circle. The contact breaker points (C) will be fully open, and a .018 in. feeler gauge (your Dealer will sell you one very cheaply) should just pass between them.

To adjust, you slacken off the locking screw (A) and move the plate (B) until the gap between the points (C) is correct. When correct, tighten the locking screw (A) and always give the gap a final check, to make sure.

Before replacing the engine cover, turn the rotor until you can see the wick which lubricates the spindle, and give it just one drop of thin oil from an oilcan.

Should you suspect ignition trouble while you are using your Cyclemaster, methods of tracing it and dealing with it are explained fully and simply on pages 21 and 22.



To examine and inspect the contact breaker points (which need only be done quarterly) you first remove the metal cover as shown opposite and then follow the instructions given on the left. A is the locking screw : B the plate : C the points themselves.

THE CYCLEMASTER CLUTCH

The Cyclemaster 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 hermetically sealed chamber. It is impossible for dirt, grit, dust or damp to get in.

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.

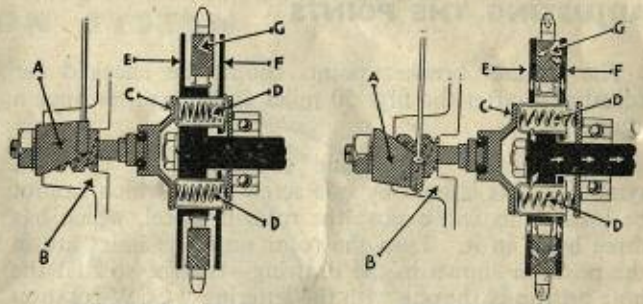
The simplest way to explain the action of the clutch is to liken it to a number of table mats, held vertically.

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, you move the clutch control lever towards the handle bars, 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, you 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, to the cycle wheel.



CLUTCH "OUT" CLUTCH "IN"

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

CLUTCH LUBRICANT

The Cyclemaster clutch operates in an oil bath, and the only attention it should ever require is occasional adjustment (see page 19) and a quarterly check of the oil level. As recommended on page 11, 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 page 4).

The clutch runs continuously in an oil bath, and once a quarter the level of the oil should be checked by removing the filler plug shown in this sketch. Never overfill.

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. A small bottle or jug will come in handy for this, and little more than an eggcupful should be required. Never overfill.

When the level is correct, replace the metal plug.

ADJUSTING THE CHAIN FROM THE CLUTCH SHAFT TO THE DRUM

Remove the wheel from your bicycle (see p. 8). Slacken the large nut on the wheel hub, place a spanner on the square end of the spindle and rotate to allow not more than $\frac{1}{2}$" total up and down movement in the chain. This measurement can be observed through one of the large holes in the drum. Hold the hub spindle firm and tighten the large nut. Re-check the adjustment and correct if necessary. It is essential that the $\frac{1}{2}$" measurement is made with this large nut fully tightened.

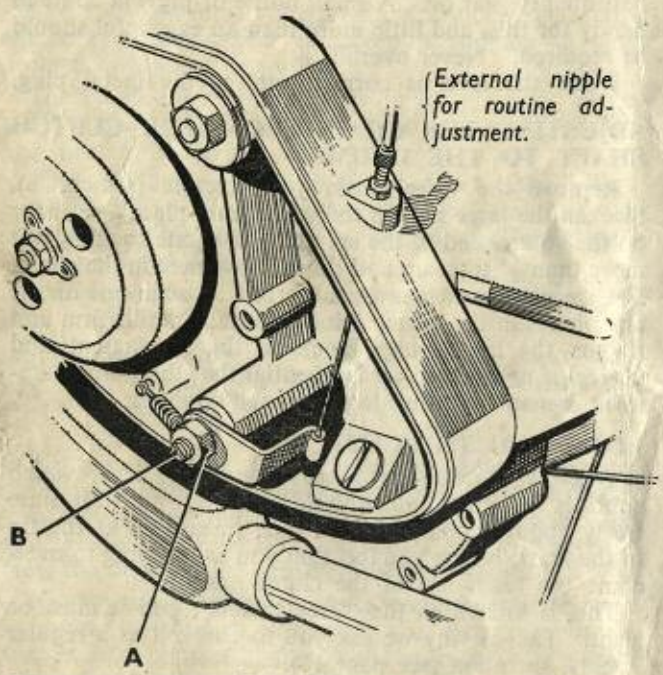
ADJUSTING THE CLUTCH

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.

This is known as the " free travel ", and it must be right. That is why we ask you to check it as a regular weekly operation (see page 11).

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



Routine adjustment of the clutch is carried out by means of the external nipple. When sufficient adjustment can no longer be obtained this way, you remove the "C M" cover, slacken the lock nut A, and turn the screw B.

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 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 metal engine cover bearing the "CM" symbol. To do this you have only to remove one screw (see page 16).

The clutch linkage is clearly shown in the illustration. 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.

Finally, replace engine cover.

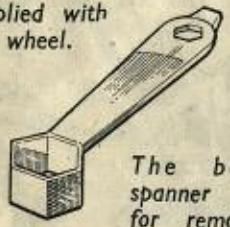
IN THE EVENT OF DIFFICULTY

ENGINE WILL NOT START :

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. Is choke open ? If so, close, pedal a few yards and try again.
4. If engine still will not fire, it is either not getting fuel, or there is no spark to fire the fuel.
5. First : 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 special tool provided 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 special " C M " tool supplied with the wheel.



The box spanner is for removing the spark plug : the other end is for use on the carburettor.

Removing the sparking plug . . .

. . . and how to test it.

the insulation). Replace plug, and your engine should fire. (To save cleaning it is a good idea to carry a spare plug.)

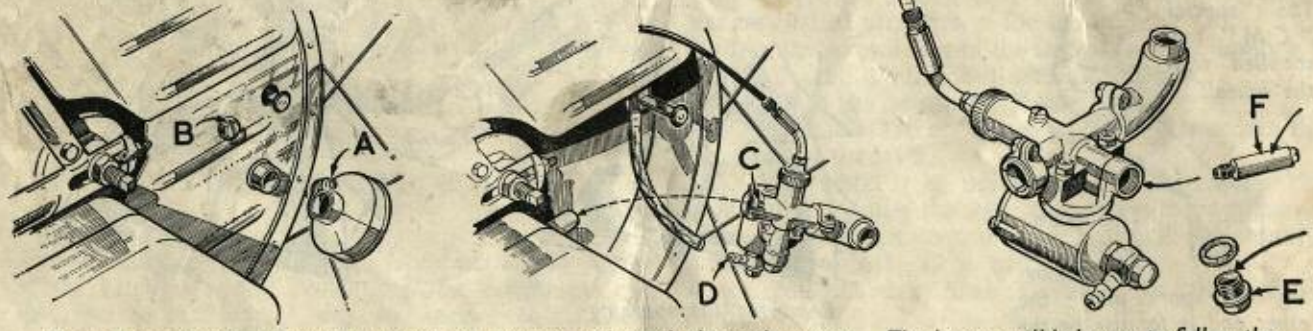
7. If plug seemed clean when you removed it, and gap was correct, refit the lead and place plug on top of cylinder head so that the terminal (where the lead joins) does not make contact with metal. Push the cycle (with the clutch in) a few yards, and watch plug —but do not ever touch the plug terminal while the wheel is revolving.

If it does not spark, then there may be trouble with plug, lead, coil or condenser. Such trouble, as has already been emphasised, is no more likely than with a modern car, but should it occur you have the advantage that, instead of having to wait for assistance, you can still pedal your machine.

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.

8. The simplest way to do this is to remove the carburettor. First, slacken the clamp "A" and take off the air cleaner. Then undo the screw " B " and remove the metal cover to reveal the carburettor.

Next, remove the carburettor by freeing the clamp " C." Disconnect flexible tubing from nipple " D "



These three sketches show how to get at, remove and check the carburettor. The letters will help you to follow the accompanying explanations.

and open petrol tap. Petrol should flow from the tubing at once. If it does not, blow through it to remove the obstruction—and have the tank thoroughly cleaned at the first opportunity, to prevent a recurrence of the trouble.

9. If petrol *does* flow, then it is obviously getting *to* the carburettor, but not *through* it. First, suck through the nipple " D " from which you disconnected the flexible tubing. Next, undo the nut " E " which covers the jet housing (be careful not to lose the fibre washer) and with the CM spanner take out the needle jet " F ". Blow through " F " both ways (do not use wire). Before reassembling, clean out the hollow inside of the plated nut " E " which serves as a sediment chamber.
10. Refit carburettor, cover plate and air cleaner, making sure there are no kinks in the flexible tube and that it is well clear of the wheel drum.

PETROL LEAKS

If petrol appears to leak, gently tighten the hexagon nut (E), but do not over-tighten. Check, also, the flexible tubing, which may have deteriorated. Leaks may also be caused by foreign bodies in the carburettor—let your Cyclemaster dealer look at it.

The small vent hole in the rim of the filler cap must be kept clear.

ENGINE LOSES POWER

Should you notice a steady falling-off in the power of the engine, that is almost certainly a sign that decarbonization is due. This, however, will not be necessary until you have had the machine in use for quite a while—and only at infrequent intervals thereafter.

Most Cyclemaster owners will prefer to entrust the work to their Dealers, and we strongly recommend this course to all but those who have a fair amount of mechanical ability. There are several reasons for this, the most important being that the engine must be taken out of the wheel, as, owing to the extremely compact design, the cylinder head cannot be removed while the engine is in position.

Another reason is that the engine ports (particularly the exhaust port) collect carbon, which must be scraped away if the job is to be done properly, and to carry out this operation the cylinder barrel must be taken off. While there is nothing difficult about getting it off, replacing it afterwards is a different matter, because of the problem of getting it back over the piston rings.

Finally, when the engine is refitted inside the wheel drum, the driving chain has to be correctly adjusted.

There is nothing at all in any of these operations which would worry anyone with a bent for mechanical work, but the Cyclemaster owner with no experience of small engines might, perhaps, do more harm than good.

For this reason we are not including any decarbonizing

instructions in this handbook. But if you have the bent, and want to do the work yourself, we will gladly send you detailed instructions, free of charge. Simply write to the address below and ask us for decarbonizing instructions.

REPLACEMENT PARTS

Only genuine parts, supplied by your Cyclemaster Dealer, should be used for your Cyclemaster engine or wheel. These are exact replicas of the parts used by the manufacturers, made to the same specifications and on the same machines. Genuine parts are freely available and very reasonable in price. We urge all owners, in their own interests, never to jeopardise the high qualities of their machines by accepting substitute parts, which may do very serious damage.

YOUR QUESTIONS ANSWERED

We believe that your Cyclemaster will give you many miles of happy, trouble-free unrestricted power.

The dealer from whom you bought it will always give you any help and information you may require. We shall also be pleased to hear from you. We want you to feel that, as manufacturers, we have a continuing interest in the machine you have paid us the compliment of buying, so please never hesitate to write. Whether you want information or advice ; to make suggestions ; to criticize or to praise, we shall always be pleased to hear from you. and your letter will receive immediate attention.

Please address your letters to

THE GENERAL MANAGER, CYCLEMASTER LTD.
38A St. George's Drive, London, S.W.1,

and always quote the serial number of your Cyclemaster engine unit. You will find it stamped on the main engine casing next to the exhaust tail pipe.

Cyclemaster

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