

MAKING
THE MOST
OF YOUR

Cyclemate

*Owners'
Instruction
Book*

FIRST EDITION — JAN. 1955

CYCLEMASTER LTD. 38A ST. GEORGE'S DRIVE, VICTORIA, LONDON, S.W.1

5s. 4d. post free

CYCLEMATE WORKSHOP MANUAL

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

From time to time your Cyclemate (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 Cyclemate Dealer. If, however, you have mechanical experience, this Workshop Manual will assist you to carry out every service operation necessary. (Ready in February, 1955).

THE MAGIC WHEEL

Price 6d.

A Quarterly Magazine for Cyclemaster and Cyclemate owners.

As a Cyclemate 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 Cyclemate 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

BRIEF DESCRIPTION AND GENERAL NOTES

The Cyclemate is a complete motor assisted cycle powered by the famous and proved 32 cc. Cyclemaster engine. The Norman cycle to which it is fitted has been specially designed for maximum strength and durability together with extra comfort and ease of handling.

The power of the engine is transmitted to the back wheel by chain so there is no possibility of slip in wet weather. A handlebar operated clutch ensures a smooth start in traffic and also if necessary frees the drive so that in all circumstances and conditions you can use your pedals, so that you need never be stranded if, for instance, you run out of fuel.

You may have to help the Cyclemate 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.

TAX AND INSURANCE

Your Cyclemate 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 Cyclemate 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

Cyclemate wheels are fitted with Schrader-type valves, and it is to your advantage to keep the pressure right. They must never be less than 40 lbs. for any rider, and not less than 45 lbs. if the rider weighs more than 12 stones.

LUBRICATION

As the Cyclemate has a 2-stroke engine, there is no sump of engine oil to be checked daily and topped up 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.

We recommend the use of CYCLEMASTER SUPER-FINE ENGINE oil but the correct grade of any *good* brand of oil will do (see page 2) but as with any motor vehicle, it is a very false economy to buy cheap oil.

GENERAL SPECIFICATION

Frame	Special looped twin top tubes.
Brakes	Internal expanding hub type in both wheels operated by inverted handlebar levers.
Size of wheels ...	26" x 2"
Tyre Pressures ...	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 ...	"Petrol" (1 in 25)
Fuel tank capacity ...	5½ pints (approx.)
Engine Oil recommended ...	Cyclemaster Superfine or Shell X100 SAE 30 Essolube 30. Castrol XL: Mobiloil A Energol SAE 30
Spark Plug	K.L.G. Cyclemaster CF50 14 mm.
Plug gap018" to .020"
Clutch free travel ...	¼" measured at tip of control lever
Fuel consumption ...	200 m.p.g. (approx.)
Ignition	"Wipac" Flywheel Magneto with Lighting Coil
Contact breaker gap	.015" to .018"
Carburettor	B.E.C. Type A
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	Petrol Filler Cap full to brim

FILLING WITH FUEL

The petrol tank of your Cyclemate holds just over half a gallon 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 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.

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.

It is by far and away the wiser plan to mix the oil and petrol *before* putting them into the tank, but remember to put one measure to each quart of petrol (two measures to half a gallon and four measures to a gallon).

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 Cyclemate, 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 adjust your speed by the throttle control. You need not use the easy-starting control again—once the engine has started the mixture will automatically return to the best 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 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.

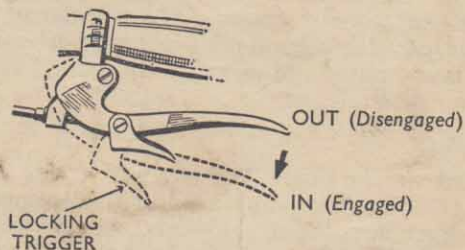
TO STOP THE ENGINE

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

CONTROLS

The throttle should be opened slowly when you wish to increase the speed. As far as possible the control 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.



The lever which controls the clutch is fitted to the left handlebar.

PETROL TAP

The outlet from the petrol tank consists of a two level tap into which is incorporated a filter. As long as the engine is operating with the level control lever of the tap set to "main" you need not worry about running out of fuel because when the fuel no longer flows into the carburettor it is only necessary to move the lever to "reserve" and you then have sufficient for a further 10 miles or so.

An added advantage is that it is then quite certain that half a gallon of petrol and two measures of oil can be added without the danger of overfilling.

Remember to return the level control lever to "main" when you have filled the tank.

PETROL CONSUMPTION

At this stage it should be explained that approximately 200 miles per gallon is obtained when the Cyclemate 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.

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.

FIRST SERVICE (150 miles)

The Cyclemate, 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 Cyclemate 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 wheels, tighten if necessary.
4. Check hub bearing adjustments (page 15).
5. Adjust brakes (page 16).
6. Tighten cylinder head nuts. The sparking plug should always be removed before doing this to avoid risk of its being damaged.
7. Check tension of chains (page 16).
8. Check contact breaker points. Clean and adjust if necessary; gap should be .015 in. to .018 in. when fully open.
9. Remove spark plug; clean and adjust points. Examine surfaces of plug which are exposed in combustion chamber.
10. Check adjustment of air bleed screw (page 8).
11. Check all nuts and bolts for tightness.
12. Check steering head adjustment (page 14).
13. Check bottom bracket axle adjustment (page 15).

ROUTINE ATTENTION

DAILY (or each time the Cyclemate is used).

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

WEEKLY

1. Thoroughly clean.

2. Check all nuts and bolts for tightness (especially the engine mounting and chain adjusting brackets).
3. Check tyre pressures and pump up if necessary.
4. Check clutch control for free travel. Should be $\frac{1}{4}$ in. (to adjust see page 13).
5. Oil chains and check adjustment (see page 17).
6. Oil control wire inner cables where they emerge from outer casing.
7. Check brakes and adjust if necessary.
8. Oil hub bearings (see page 14).

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 13).
2. Check contact breaker and spark plug points.
3. Examine nipples of wheel spokes. If any seem loose, see your Dealer as soon as possible.
4. Clean out fuel system (see page 9).
5. Check hub bearing adjustment (to adjust see page 15).

THE CYCLEMATE ENGINE

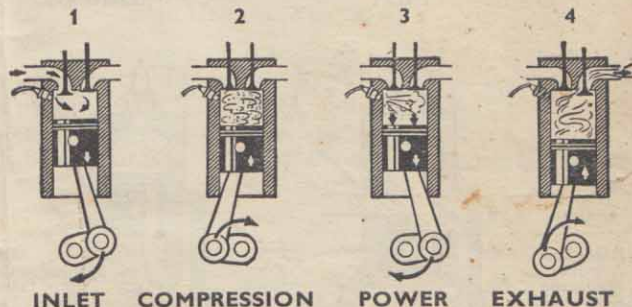
The Cyclemate has what is known as a "2-stroke" engine. This must not be confused with the number of cylinders: it describes the method by which fuel enters the cylinder, is compressed, fired, and exhausted.

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

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

2-STROKE ENGINE

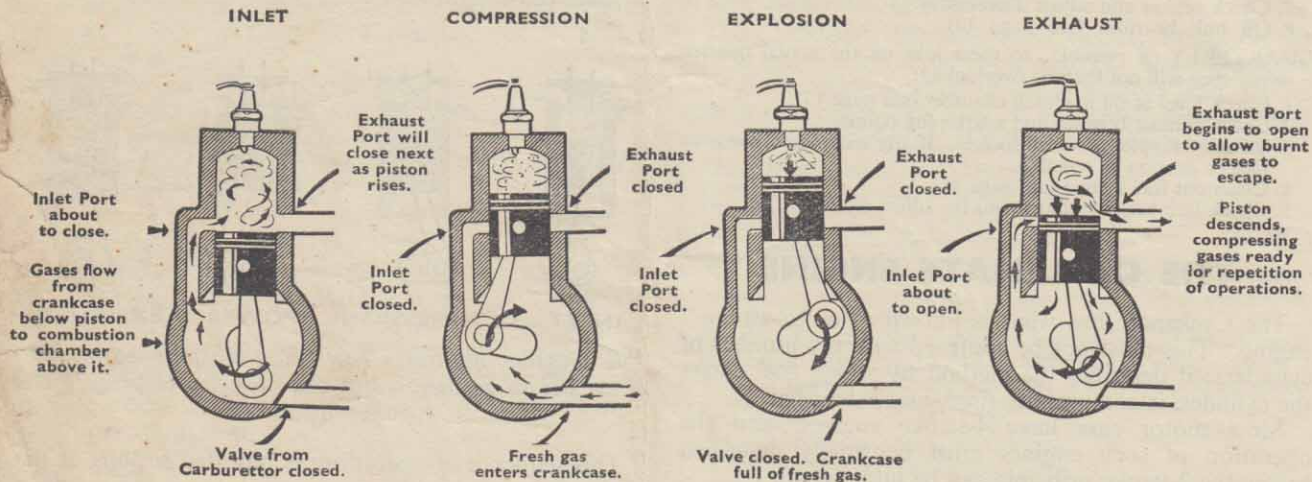
There is nothing new about the *idea* of 2-stroke engines. They have been used in many motor cycles, and some cars, for years.

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 Cyclemate 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.

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 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 down-

ward 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 mushroom 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 is 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 Cyclemate engine is fitted with a B.E.C. Type A 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.

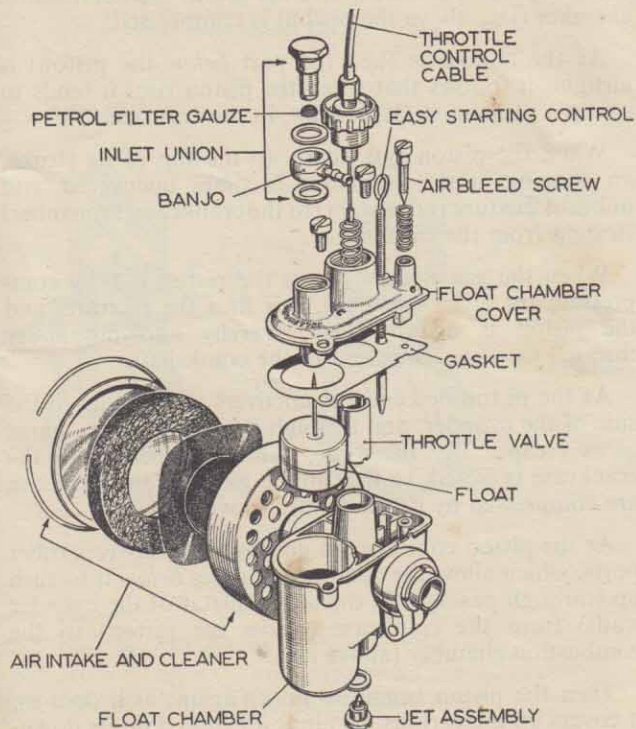
As the piston of the engine goes up, it sucks air in through the air intake, which embodies an air cleaner. This air passes over the jet, and causes fuel to emerge in a very fine spray and mix with the air to form an explosive gas. This passes into the combustion chamber of the engine, where it is exploded 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 becomes richer. Every time you use it slightly more petrol than normal is consumed so do not use it more than necessary. (See page 19, 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.

FUEL TANK AND FILTERS

Unless a considerable amount of dirt or foreign matter has accumulated in the tank itself it is usually unnecessary to remove it for cleaning.

To clean the tap filter, the tap must be removed from the tank. Proceed as follows:—

1. Move petrol tap to "off."
2. Unscrew the banjo bolt from the carburettor. Do not lose the two fibre washers.
3. Empty the tank by putting the banjo and the end of the flexible pipe in a suitable container and turning the petrol tap on.
4. Loosen nut which holds the tap assembly into the tank. The tap will come away as the nut is screwed out of the tank. The flexible fuel pipe together with the carburettor banjo will remain attached to the tap.
5. The filter is screwed on to the tap. So that it will not be damaged unscrew it by gripping the adaptor near its base. Do not wipe it with a cloth or piece of rag, but wash it thoroughly in clean petrol both inside and out.
6. Make sure that the gauze filter inside the carburettor banjo bolt is quite clean.

RE-ASSEMBLING THE SYSTEM

1. Re-fit the tap filter to the tap. So that it will not become distorted, treat it with great care.
2. Take this assembly and feed it up into the tank. Position the level control lever so that it is convenient to use, then tighten the nut.
3. Re-fit the banjo union to the carburettor, making sure that both fibre washers are replaced. Place one on each side of the banjo itself. Before the banjo bolt is fully tightened, *the arm of the banjo should be positioned so that there is no strain on the flexible pipe.*

AIR CLEANER

By removing the circlip at the end, the whole of the "inside" can be taken out. Wash everything in petrol. Allow it to dry; dip the parts in oil, and then refit the parts in the order shown.

The gauze goes in first with its recess over the projection inside the air cleaner body, the pack goes next with the concave side towards the gauze and this is followed by the cover again with the concave side inwards. Finally, replace the wire circlip making sure that it fits securely in its groove.

THE JET

To clean the jet, loosen the slotted head with a screw-driver, 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.

THE FLOAT CHAMBER

If you are persistently bothered by obstructions in the fuel system and all other parts of it have been cleaned, the carburettor float chamber may need attention. Most users will prefer to entrust this work to their dealer, but the following information is given for those who desire to carry out the work themselves. Although the float chamber can be dismantled without removing the carburettor from the engine, it is much easier to deal with if the carburettor is detached. To remove the carburettor, first turn off the petrol and then unscrew the banjo union bolt. Place the two fibre washers in a safe place so they will not be lost. With a screwdriver slacken the clamp which fastens the carburettor to the engine. By rotating the carburettor slightly it can then be withdrawn from the inlet pipe. Unscrew the knurled cap of the mixing chamber and withdraw the throttle piston and return spring; these will remain attached to the cable. Take off the float chamber cover by removing two screws, and then lift out the float assembly.

The carburettor body, float assembly and float chamber cover should be washed in clean petrol. During the course of this operation it is advisable to remove the jet so that petrol will flow easily through the drillings and so clean them out. Before re-assembling, make certain that the drillings for the air bleed screw and vent are free from obstructions.

To re-assemble, place the float assembly into the float chamber with the pointed end of the needle uppermost. The plain part at the bottom must fit into the

guide bush at the base of the float chamber. Fit a new paper gasket between the float chamber and float chamber cover, making sure that the air holes in it are aligned correctly over the air way drillings. Guide the pointed end of the needle into its seating in the float chamber cover and then screw the cover down.

Refit the throttle piston to the carburettor, making sure that the cut away portion at the bottom of the piston faces the air cleaner. Then tighten the mixing chamber cap. At this stage it is a good idea to test that the piston is working easily in the mixing chamber by operating the handlebar control and viewing the movement of the slide through the carburettor outlet. The piston must return to the closed position when the control lever is shut off.

Refit the carburettor to the engine by reversing the dismantling procedure. Tighten the jet and the banjo union fully before turning on the petrol. It is important that the fibre washers are correctly refitted; one goes on the jet and one each side of the banjo.

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. 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.

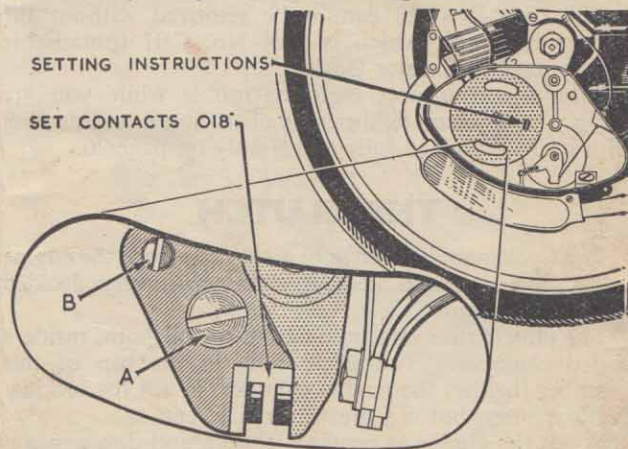
This electrical system is as thoroughly reliable as that of the modern car, which functions so efficiently that motorists take it for granted. But the Cyclemate has this great advantage; in the very unlikely event of trouble, you can always pedal home or to a garage—whereas with a car you have to wait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

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

THE CLUTCH

The Cyclemate 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

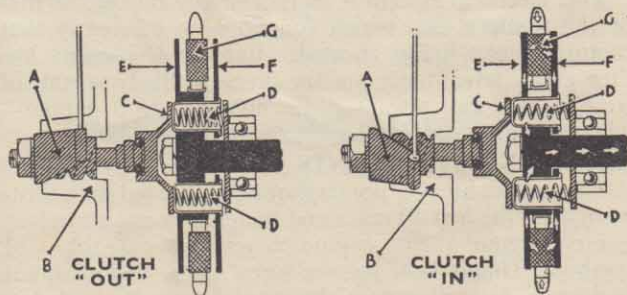
is to liken it to a number of table mats, held vertically.

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 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 Cyclemate 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 5, 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.

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 $\frac{3}{4}$ in. below the face of the filler plug hole).

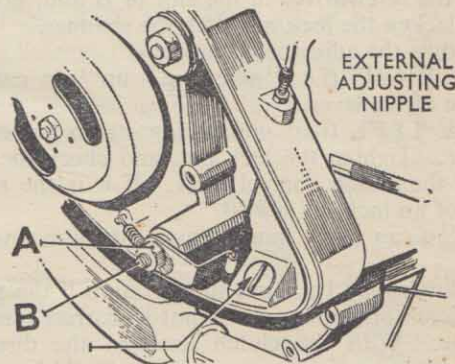
ADJUSTING THE CLUTCH

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 13. You will require a spanner to fit the lock nut (A) and a narrow-bladed screwdriver for the adjustor (B).

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

Then turn the adjustor 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 adjustor outwards and the main adjustor to the left will raise the position of the operating arm and vice versa.

Finally, replace engine cover.

1. THE STEERING HEAD

The steering head is of the conventional cycle pattern. The bearings are packed with grease on assembly and no further lubrication is needed for 10,000 miles or so when they should be dismantled and repacked.

Adjustment is very important but very long periods may be covered before this becomes necessary. Should the head need tightening up the lock nut A (Fig. 1, Page 15) should be slackened half a turn and the screwed race B turned very slightly to the right. Holding the lamp bracket centrally re-tighten A and recheck bearings. Adjust only a small amount each time to ensure that at no time is excess pressure put on to the bearings. Adjustment is correct when there is only the slightest perceptible shake; stiffness must be avoided at all cost.

The handlebars are adjustable for height by slackening the bolt C in the centre. This unlocks the handlebar stem from the fork tube and the handlebars can then be raised or lowered as desired.

If the stem is still tight after the screw has been loosened approximately two turns it is necessary to tap lightly on its head. Do not use a hammer, a small block of wood is quite satisfactory. When the correct height is obtained position the handlebars "square" with the front wheel and retighten the centre bolt very securely.

WHEEL BEARINGS

These should be lubricated with the same oil as you add to the petrol or with ordinary cycle oil.

Add two or three drops only each week, through the

holes in the hubs. Never over-lubricate, otherwise the brake linings may become contaminated and braking power will be lost. Do not forget to replace the spring clips over the oil holes when you have finished with the oil can.

Adjustment for the bearings is provided by movement of the inner races on the wheel spindles. It is important to carry out these adjustments from the nearside (left hand) of both front and rear wheels. As with the steering head, adjustment should be made in small amounts so that the wheels revolve freely but with the minimum amount of play. When dealing with the rear wheel remember that free movement is to some extent restricted by the chain. To be sure the wheel is free it is important that some play can be felt but you should not be able to rock it more than $\frac{1}{32}$ in. measured at the rim.

Although hub bearing adjustment is carried out with the wheels in position, Figs. 2 and 3 show them detached

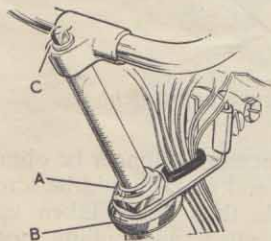


Fig. 1. "A" and "B" are for adjustment of the steering head. "C" holds the handlebar tight in the fork.

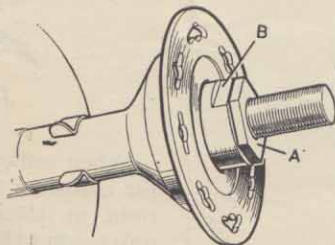


Fig. 2. This illustration shows the front hub removed from the forks. To adjust the bearing there is no need to remove the wheel.

from the forks. To adjust, slacken the left hand spindle nut but leave the other spindle nut tight. Then with the thin spanner provided slacken nut A and rotate bearing cone B a little to the right (clockwise) to tighten the bearings or to the left to slacken. Retighten A and then the spindle nut outside the fork. Recheck the adjustments and adjust again if desired play has not been obtained. Fig. 3 is the rear hub which shows quite clearly that the adjustment is made from the same side as the brake. The front hub Fig. 2 is the other way round.

ADJUSTING THE BOTTOM BRACKET

After adjustment is carried out at the 150 mile service, further attention will not be required for a very long time except for the adding of one or two drops of oil each week. If adjustment is needed, first of all make sure

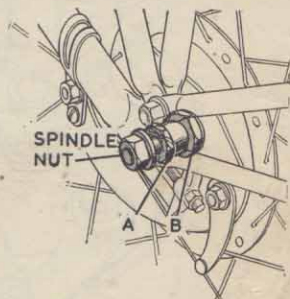


Fig. 3. Adjustment of the rear wheel bearing takes place on the brakedrum side of the hub.

the right hand bearing cup is tight in the frame. Then slacken the locking ring A (Fig. 1, page 17) on the left side, rotating the bearing cup B so that the desired adjustment is obtained. Recheck after the locking ring is retightened. The axle should be free but have only the slightest amount of play.

ADJUSTING THE BRAKES

Before any attempt is made to adjust the brakes it is important to make sure that the wheel bearings are also correctly adjusted. (See page 15). With the brakes "off" the wheels should revolve freely and there must be no possibility of the shoes rubbing inside the drum. On the other hand if there is too much clearance the handlebar levers will move too far before the brakes

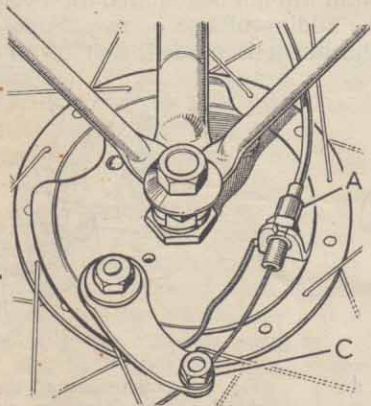


Fig. 1. Front brake adjustment

are applied.

To "take up" the front, screw out adjustor A making sure that the boss of its nut fits into the anchor bracket.

To "take up" the rear, slacken lock nut B then screw out the adjustor A. When adjustment is correct retighten B.

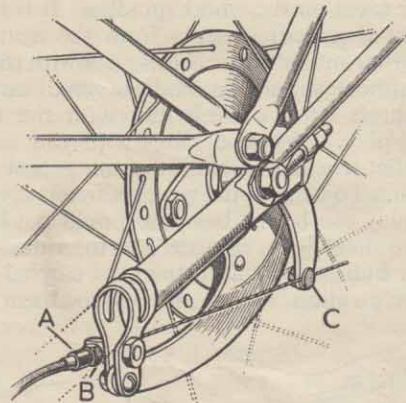


Fig. 2. Rear brake adjustment

When sufficient adjustment can no longer be obtained the adjustors A (both front and rear) should be screwed right in, slack of the cable then being taken up by unscrewing the cable clamp nut C and pulling more of the inner cable through the clamp. Retighten C very tightly and carry out final adjustment by use of the threaded adjustors as described above.

CHAINS

Your Cyclemate has 3 chains. One of these connects the pedal crank to the rear wheel in exactly the same way as an ordinary pedal cycle. It is in use only when you are starting the engine or helping it on hills and so it is in use for only a small proportion of the time. It is obvious therefore, that the normal attention any chain requires, namely, lubrication and adjustment will not be required very often.

The primary chain transmits the drive from the engine to the clutch. It is enclosed in the clutch chamber and so long as the correct level is maintained the oil inside this chamber provides all the lubrication it requires. Correct tension is maintained for the whole life of the chain, therefore means of adjustment are not provided.

The secondary chain, that is the one from the engine

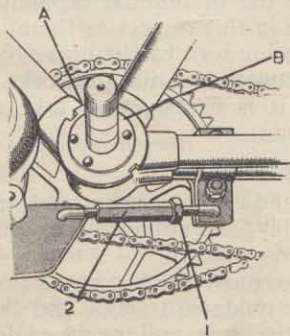


Fig. 1. How to adjust the secondary chain

unit to the back wheel, should be oiled each week and checked for adjustment at the same time. Every 1,000 miles or so it should be removed from the machine, thoroughly cleaned in paraffin and wiped dry. Immersion in a bath of warm oil for 15 minutes will allow the lubricant to soak right in to all the bearing surfaces, and this is the only way to lubricate a roller chain really effectively. Before refitting to the machine, all surplus lubricant should be drained and wiped off or it will tend to collect dust and road grit.

When the chain is in correct tension there should be $\frac{1}{2}$ in. free up and down movement measured half-way between the engine and back wheel. Your Cyclemate should never be used unless this play is present, but on

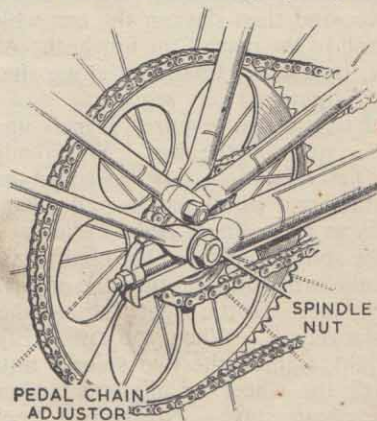


Fig. 2. This illustration shows a pedal chain adjustor

the other hand excessive play may cause too much sideways movement and consequently excessive wear and the danger of the chain jumping off the sprockets.

To adjust, first make sure that the rear wheel bearing adjustment is satisfactory then slacken lock nut 1 and rotate the adjusting sleeve 2. Looking from the rear, turning the adjustor clockwise tightens the chain and vice-versa. Tighten the lock nut and re-check the chain tension. Rotate the wheel and check in several positions to verify that the half inch up and down movement is present in the tightest position of the chain.

If the adjustor is difficult to rotate it may be necessary to relieve the tension of the engine mounting rubbers by slackening the main engine bolt. To do this first remove the CM cover and then slacken the nut which you will find above and to the rear of the flywheel. After turning the adjustor, but before finally checking the chain, this nut must be retightened very securely.

The pedal chain also requires $\frac{1}{2}$ inch up and down play in the centre of the run. When adjustment is required it is first of all necessary to slacken the secondary chain so that the rear wheel may be pulled back in exactly the same way as an ordinary pedal cycle.

Slacken the spindle nuts and the chain stay clip which holds the brake arm and then turn the adjustors an even amount each side. To the right tightens the chain and to the left slackens it. When you are satisfied that the tension is right, tighten the two spindle nuts. As you do this, check the wheel for alignment where it passes through the chain stays. 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. If incorrect this alignment is easily rectified by slackening the left hand spindle nut and rotating the chain adjustor. Tightening it will bring the rim and tyre nearer to the left hand chain stay. If movement is required the other way it may be necessary to press lightly on the wheel to hold it in position whilst rotating the chain adjustor. Retighten spindle nuts and recheck chain tension after which the secondary chain should be readjusted by the methods already described. Finally retighten the bolt of the chain stay clip.

REMOVING THE WHEELS

If you have a puncture it is more than likely that you will be able to repair it without removing the wheel from the cycle. The use of internal expanding brakes is a great advantage in this respect as there is no danger of the inner tube being torn by the brake blocks when you are sliding it between the rim and forks. To change a tyre, however, it is necessary to take out the wheel. Proceed as follows:—

FRONT WHEEL

- (a) Slacken off the cable clamping nut and pull out the cable assembly; do not lose the adjustor and nut. See illustration page 16.
- (b) Slacken and remove the two spindle nuts.
- (c) Ease off the mudguard stays, and then, supporting the front of the cycle, pull the wheel downwards from the fork slots.

REAR WHEEL

- (a) Slacken off the cable clamping nut and pull out the cable assembly; see illustration page 16.
- (b) The cable adjuster A will remain attached to the brake arm clamping bolt. Remove this clamping bolt so that the brake arm is no longer attached to the chain stay.
- (c) Remove rear portion of chainguard.
- (d) Take out the spring connecting links of both the pedal and secondary chains.
- (e) Remove mudguard stay nuts and ease off stays.
- (f) Slacken both spindle nuts.
- (g) Pull wheel rearwards out of fork slots.

Refitting of the wheels is carried out by reversing the dismantling procedure, but special care must be exercised in regard to the following:—

- (a) The brake locking arm of the front wheel must fit securely into the fork lug.
- (b) When refitting the rear wheel, the chain adjusters should go outside the forks.
- (c) The rear brake locking arm must be securely bolted to its fixing bracket on the chain stay.
- (d) When refitting the chain spring links, it is important that the closed end of the spring faces the direction in which the chain is travelling.
- (e) When the wheels are refitted the bearing adjustments must be checked, and in the case of the rear wheel, the chains must also be carefully adjusted. See pages 15 and 17.

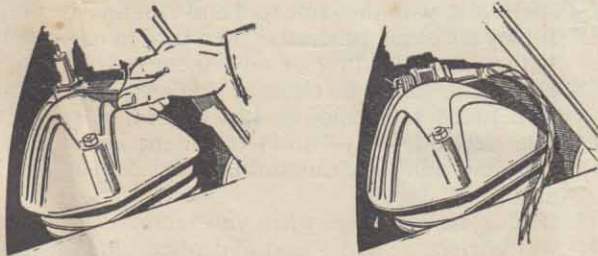
SERVICE TIPS

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

ENGINE LOSES POWER

- 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 11.
 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 9.



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

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 three screws which secure the front pipe to the 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.

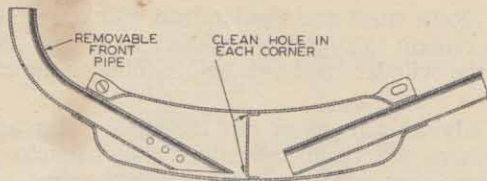
Pull the front pipe right out of the box (loosening screw shown in the illustration) and clean it thoroughly, inside and out. Make sure that the perforations in it are unobstructed.

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).

Refit system to engine using a new gasket if necessary. Check the three flange screws, 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.

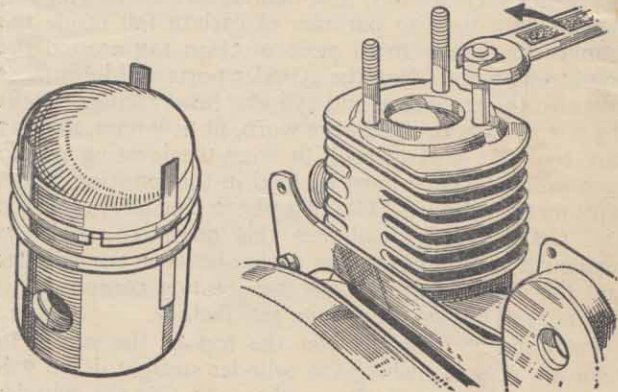
If the two inlet ports are clean the exhaust port can be scraped out at this stage and the engine reassembled. Scrape away any carbon and blow away the scraps

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



Easing off the piston rings.

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

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 decarbonized two or three times.

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

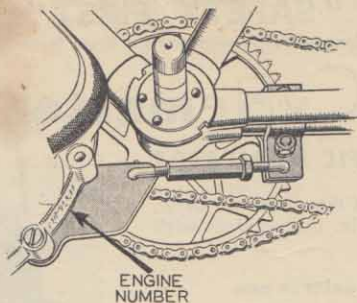
piston. Refit studs and tighten into crankcase. Apply jointing cement to cylinder head face and refit. Always tighten the cylinder head nuts before refitting the exhaust system.

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 decarbonized. Information dealing with these components will be found on pages 9 and 11.

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 Cyclemate that your attention is again drawn to them.

- (1) You must be able to feel some play in the wheel bearings. Page 15.
- (2) Oil the hubs regularly. Page 14.
- (3) Use clean fuel.
Never filter fuel through any kind of cloth, for the tiniest fragment of fluff will cause trouble.
- (4) Keep free play in clutch lever. Page 13.
- (5) Keep engine mounting bolts tight.
- (6) Maintain correct level of oil in clutch chamber. Page 13.
- (7) Keep clean exhaust port and silencing system. Page 21.
- (8) Maintain correct adjustment of contact breaker and spark plug points. Pages 11 and 20.



REPLACEMENT PARTS

Only genuine parts, supplied by Cyclemate 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: Cyclemaster Service Depot,
Tudor Works, Chertsey Road, Byfleet, Surrey.

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For many months, CYCLEMASTER engineers have been subjecting an entirely new oil to severe testing on road and bench. Results were so consistently outstanding that it is now to be sold by all CYCLEMATE dealers under the name "Cyclemaster Superfine Oil." Our tests proved that it not only possesses the highest lubricating qualities, but also gives

MAXIMUM POWER

Your engine will maintain highest output over long periods

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Less deposit in the head and less clogging of exhaust ports and silencer.

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(a long needed Requirement for Cycle Motoring)

Cyclemaster

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Provides four units in one

- Direction Indicators
- Rear number plate
(both illuminated at night)
- Rear light
- Reflector

PRICE 38/6



The control lever is mounted on front end of cross bar or in the case of an open frame bicycle at the top of the down tube and registers by lever in three positions—left, centre (neutral) and right. Lighting is arranged for connection to the 6-volt supply generated by the motor unit.

The number plate is of regulation size, to which is fastened a chromium plated cover containing the rear light and reflector.

The unit can be fitted in a few minutes by means of two clips.

The two Models available for cross bar or open frame bicycles have different lengths of cable. So it is necessary to specify which type is required when ordering.

Obtainable from all Cyclemaster Dealers

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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 Cyclemate and 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, and does not cover the cost of re-fitting such part.

It does not include tyres, tubes, lamps 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 Cyclemate Dealer, carriage paid, accompanied by a letter giving engine number, nature of fault, name of dealer from whom purchased and date of purchase.

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Model 627. Includes Special Wheel, Tyre and Lighting Dynamo

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