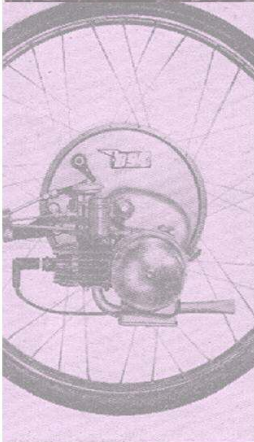
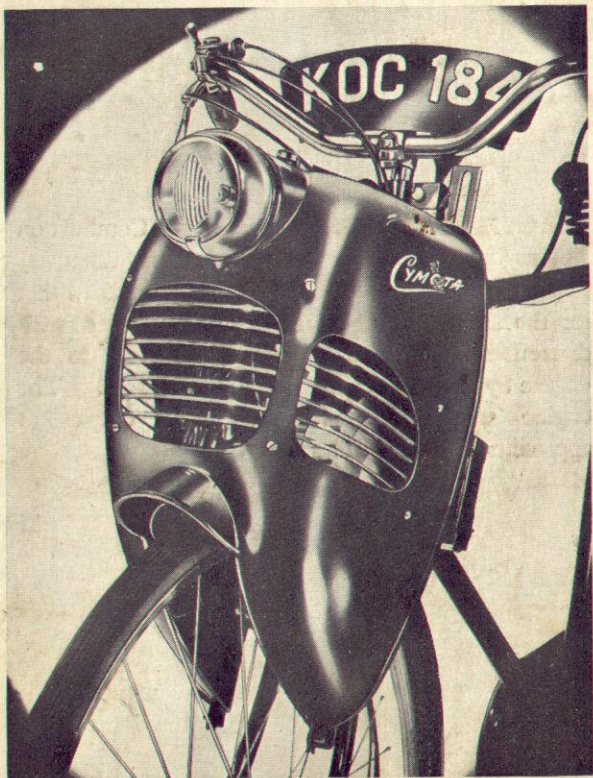


# IceniCAM Information Service



# The *Cymota*



## INSTRUCTION BOOK

The CYMOTA Engine, like all Internal Combustion Engines, requires careful treatment in the early stages of its life. It is therefore recommended that for the first 200 miles the throttle is used with discretion, and some assistance is given to the engine by use of the pedals where necessary. The engine will develop its full power output at approximately 1,000 miles.

# THE CYMOTA UNIT

The CYMOTA is a complete and self-contained power unit which can readily be attached to any ordinary bicycle and provides adequate power for driving it under all normal road conditions. It is the most economical method of mechanical transport in respect of initial cost as well as running and maintenance charges. The design of the engine, the transmission and the method of control are all simple and efficient.

A unique feature of this motor unit is the streamlined Bonnet. It protects the engine but allows easy access to the air for cooling, and can be detached in a moment when attention to the engine is required.

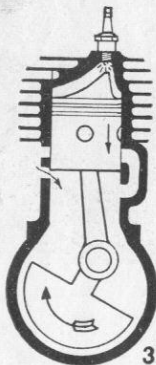
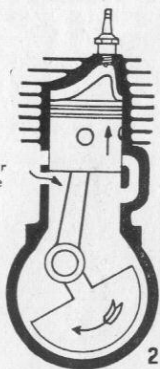
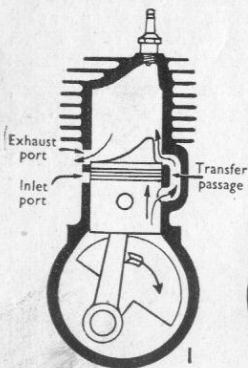
Therefore, the air apertures in the bonnet must on NO ACCOUNT be obstructed.

*The Engine* works on the well-known 2-stroke principle, utilising a deflection type piston (see Diagrams 1—4). Two-stroke motors have been employed successfully for many years for the driving of light motor cars, motor cycles, motor boats, as well as for many industrial uses. This engine is the simplest and most durable known, because it has only three moving parts: the piston, the connecting rod and the crankshaft. It has no valves, cams or tappets, and it will run for very long periods with no mechanical attention whatever, apart from the occasional decarbonisation of the cylinder head and piston, a simple operation which can be performed in a matter of minutes, without removing the engine from the cycle frame.

Here are some technical data about the engine :

BORE	38 mm.
STROKE	40 mm.
CUBIC CAPACITY	45 c.c.
CARBURETTOR	Amal type 308.
MAIN JET	25.
MIXTURE CONTROL NEEDLE.	IN CENTRE SLOT.
FUEL TANK	Capacity — 3 pints.
FUEL	Petrol mixture in the proportion of 1 : 16 (i.e. $1\frac{1}{2}$ fluid ozs. oil per pint of petrol). Fill with oil the measure attached to the filler cap $2\frac{1}{2}$ times for half-gallon of petrol.
LUBRICATION	The following grades are recommended for Summer and Winter : SINGLESHELL. WAKEFIELD. CASTROLITE. MOBILOIL. ARCTIC. ESSOLUBE 20 (i.e. All grades to SAE. 20).

## THE CYCLE OF A TWO-STROKE MOTOR



(1) Commencement of cycle: The piston is at the bottom of the stroke: Exhaust and transfer ports are open.

(2) The piston has risen to the top of its stroke, compressing the contents of the cylinder. At the same time, a partial vacuum is formed in the crankcase, so that, when the inlet port is uncovered, mixture is drawn into the crankcase from the carburettor.

(3) The mixture in the cylinder is fired by the sparking plug, creating the working pressure which forces the piston downwards, while at the same time the mixture in the crankcase is compressed.

(4) The piston has almost reached the bottom of its stroke, uncovering the exhaust port which releases the burnt gases. Slightly later the transfer port is uncovered, and the compressed mixture in the crankcase admitted to the cylinder, where it is directed upwards by the deflector on the piston.

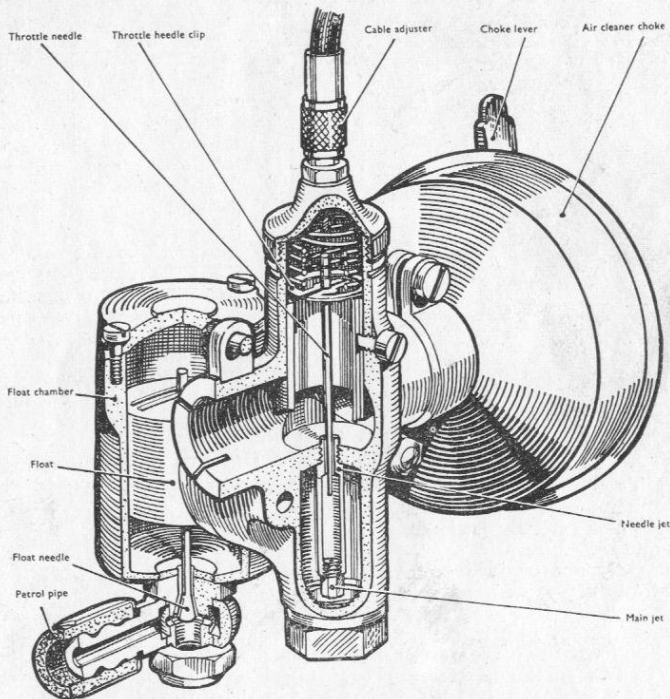
cylinder, where it is directed upwards by the deflector on the piston.

PLUG  
GAP  
IGNITION & LIGHTING  
BULBS

BATTERY

CONTACT BREAKER GAP  
IGNITION TIMING

Champion L.10  
.018"  
Flywheel Magneto.  
Headlamp : 6v. 6 watt., Bayonet Cap.  
Parking Light : 6.2v. 0.3 amp.  
Tail Light : 6v. .5 amp.  
Twin cell.  
Exide type : C.60.  
Ever-ready type : 800  
.012"—.015"  
.050" before T.D.C.

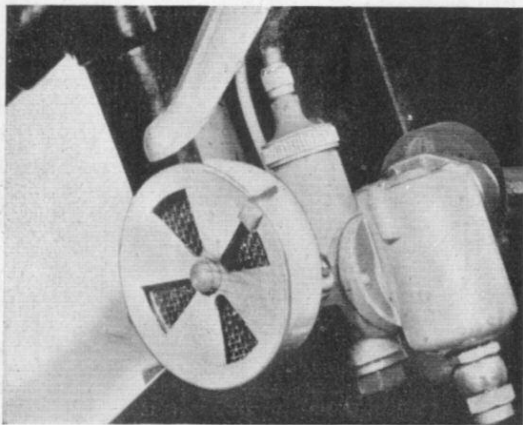


SECTIONAL VIEW OF THE CARBURETTOR  
DIAGRAM 5



The motor, fuel tank, battery and fixing clamps are mounted on the black backplate (i.e. 'the chassis') and the lamp is mounted in the Bonnet (i.e. 'the body'), which covers the motor and fits flush against the backplate.

**IGNITION** is provided by a flywheel magneto which has no rotating electrical parts or rubbing contacts and normally calls for no more attention than very occasional cleaning and adjustment of the contact breaker points. The magneto serves also to generate current to supply the head and tail lamp of the built-in lighting unit while the engine is running, so only a small stand-by dry battery is required for use when the engine is out of action.

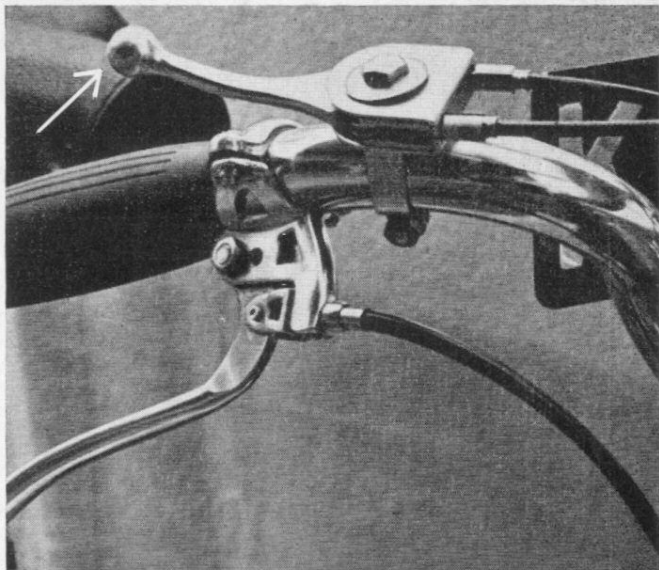


**THE CARBURETTOR. DIAGRAM 6**

**THE CARBURETTOR** is of the float-feed type, similar to the normal motor cycle carburettor, in which special attention has been paid to filtering the fuel to avoid clogging the jet (see Diagrams 5 and 6).

Only one engine control is fitted, a lever which operates the throttle of the carburettor through a Bowden cable to control the engine speed (see Diagram 7). It is combined with a Decompressor which comes into action when the throttle is completely closed, cutting out the engine and relieving the load on the transmission, so that the minimum effort is required to pedal or wheel the cycle.

It is advisable that the carburettor choke be closed when the cycle is left parked during wet weather.



## THE THROTTLE DECOMPRESSOR LEVER

DIAGRAM 7

**POWER** is transmitted from the engine to the front wheel of the cycle by means of a friction roller which bears on the tyre, the whole engine unit being spring mounted, so that the roller is kept in firm contact with the tyre under the roughest road conditions. If, however, the engine is not required for use, the unit can instantly be lifted from the tyre by the movement of a disengaging lever (see Diagram 8), so that it does not interfere with the normal method of propelling the cycle in any way. This ultra-simple method of driving a cycle wheel has been proved by long and exhaustive tests to be efficient and reliable, and the wear on the cycle tyre is little greater than that encountered in normal use when a tyre of the type recommended is fitted.



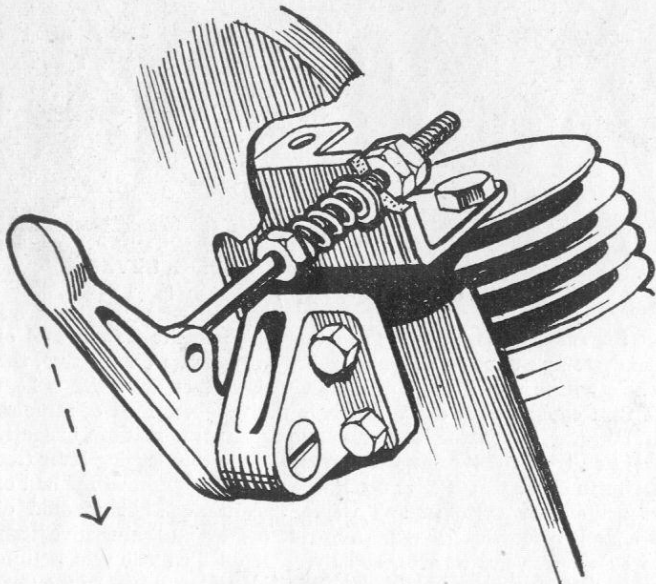
## HOW TO FIT THE CYMOTA TO A BICYCLE

BEFORE FITTING THE CYMOTA UNIT, THE FOLLOWING THREE POINTS SHOULD BE OBSERVED :

- (i) THAT THE BRAKES OF THE BICYCLE ARE IN GOOD CONDITION.
- (ii) THAT THE FRONT TYRE IS BLOWN UP HARD.
- (iii) THAT THE FRONT FORK AND THE FRONT WHEEL ARE IN GOOD ORDER AND THAT THERE ARE NO BROKEN OR LOOSE SPOKES.

Throughout these instructions right hand and left hand are as seen by the rider when riding the bicycle.

(1) Remove the bonnet by undoing the bonnet fastener catch, allowing it to hinge forward, unhook the bonnet support wire and disconnect the electrical plug. These two are fixed to the backplate. The bonnet may then be lifted off the two bottom hinge lugs.



THE ENGINE DISENGAGING LEVER

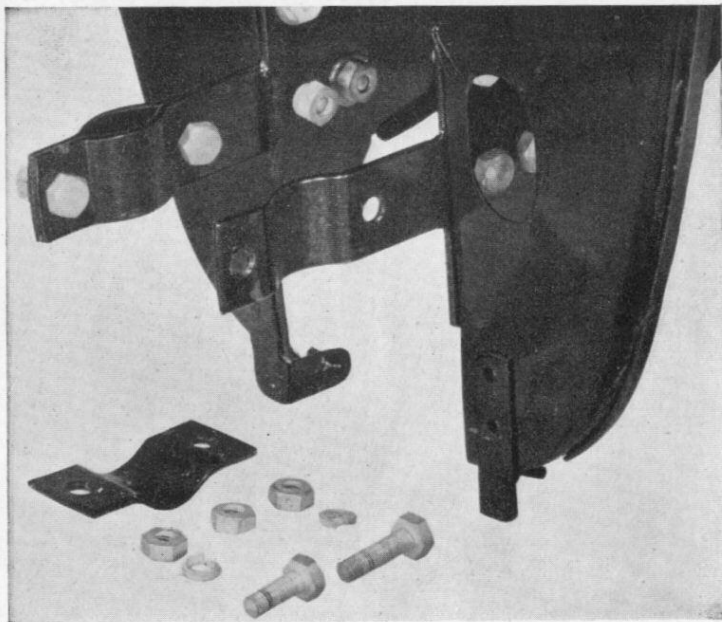
DIAGRAM 8

(2) Remove the front mudguard from the bicycle and any lamps etc., cut off the lamp bracket if necessary, but do not remove the bracket ring from the steering column, as this forms a spacing piece.

(3) Move the engine raising lever downwards so that the engine is in the raised position (see Diagram 8).

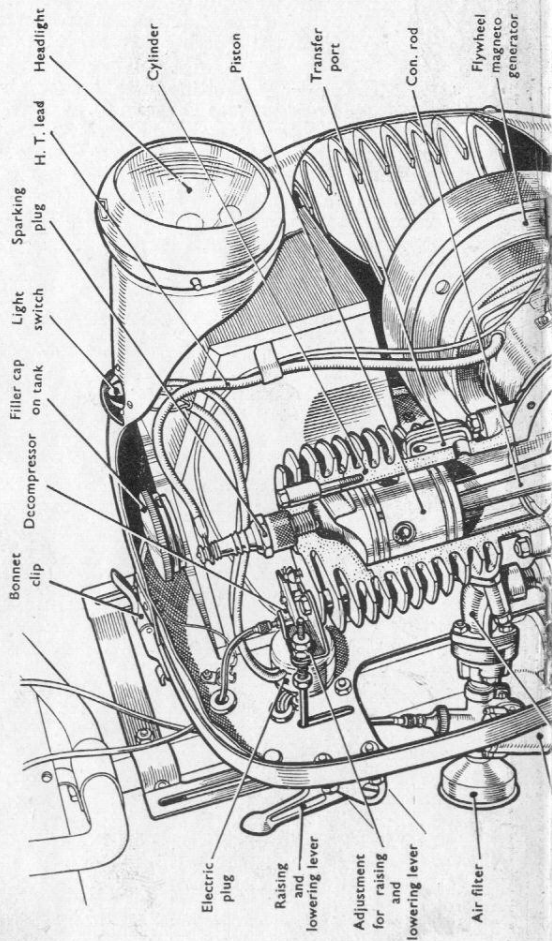
For bicycles with rod operated brakes, remove the stirrup entirely, insert it between the brake rods and the steering column and replace it on the two backplate bolts.

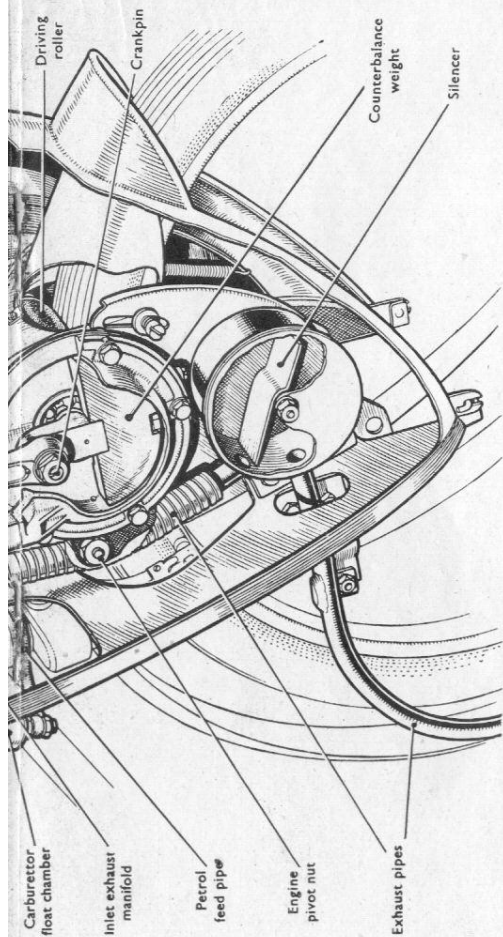
(4) Remove the two fork leg clamps (See Diagram 9). It may be necessary to reverse the fork legs if the forks of the cycle are too



**THE FORK LEG CLAMPS**

DIAGRAM 9

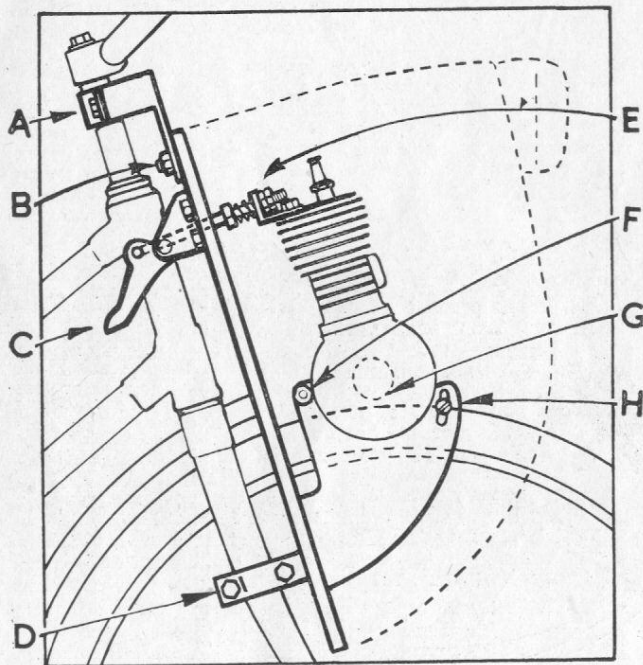




*Reproduced by courtesy of "The Motor Cycle"*

## SEMI-SECTIONAL VIEW OF THE CYMOTA

narrow. This is done by undoing the three bolts on each sideplate (see Diagram 9), removing the clamps, reversing them and replacing them on the sideplate.



**THE CYMOTA FITTED—SIDE VIEW**

DIAGRAM 10

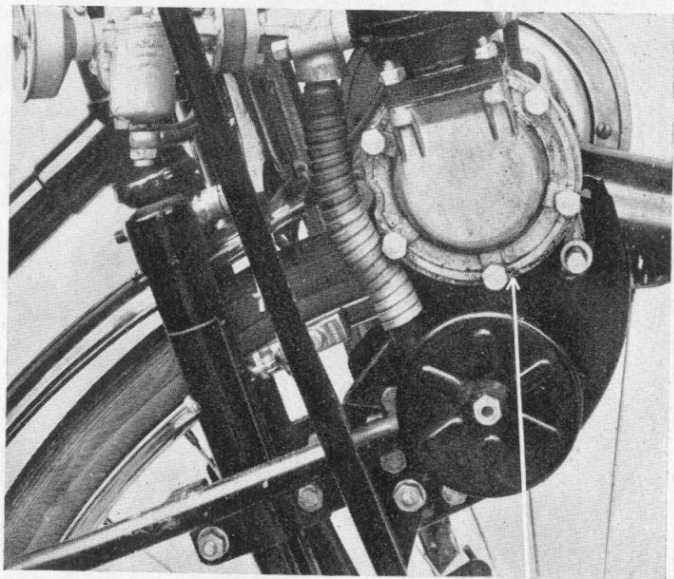
- A.—BACK PLATE SUPPORT STIRRUP CLAMP.
- B.—BOLT FOR POSITIONING OF BACKPLATE.
- C.—RAISING AND LOWERING LEVER.

- D.—LONG BOLT OF RIGHT HAND FORK LEG CLAMP.
- E.—LOCK-NUTS ON PULL-ROD.
- F.—ENGINE PIVOTS HERE.
- G.—DRIVING ROLLER.
- H.—ENGINE GUIDE SLOT.

(5) Slacken the two bolts on each sideplate which position the backplate. Place the unit on the bicycle and fit the backplate support stirrup clamp to the handlebar stem, and before tightening, position the unit so that the roller is  $\frac{1}{8}$ " maximum from the tyre by sliding the backplate up or down on the support stirrup. (The flat edge of a screwdriver can be inserted between the roller and the tyre to act as a gauge.)

(6) Fit the two fork leg clamps, making sure that the long bolt is in the rear hole of the right hand clamp.

(7) Tighten up the fork leg clamps and the two backplate bolts, lower the motor on to the tyre by moving the raising lever upwards and forwards as far as it will go. Two lock-nuts are provided on the pull-rod for the purpose of adjusting the lever, to make certain that it does not impinge on the bracket (as in Diagram 8). A spring is fitted to damp out vibrations and prevent rattles (see Diagram 10).



*Drain Plug*

## THE EXHAUST AND SILENCING SYSTEM

DIAGRAM II



Make sure that the stirrup is square with the handlebars. Tighten up the stirrup clamp.

**IMPORTANT: THE SPRING WASHERS PROVIDED MUST BE FITTED ON ALL BOLTS.**

(8) Remove the bolt that runs through the centre of the silencer box and take off the silencer box cover. Insert the exhaust pipe through the elongated hole at the base of the right hand side of the backplate and insert the silencer box inlet pipe in the flexible pipe from the manifold. The silencer bolt is then inserted in the hole in the sideplate and through the silencer box. The gasket cover and washers are then replaced and the nut is screwed up finger tight. The exhaust pipe clamp is then placed over the longbolt on the rear of the right hand fork clamp and the second nut and spring washer are replaced and tightened up together with the silencer box nut (see Diagram 11).

(9) Clamp the handlebar throttle decompressor lever to the right hand handlebar in a convenient position.

(10) Measure the distance from the mudguard fork bracket to the back of the crankcase, then, at this distance less about  $\frac{1}{8}$ " -  $\frac{1}{4}$ " from the mudguard fork fixing hole, saw off the mudguard.

(11) Replace the mudguard.

(12) Replace the bonnet by a reversal of the procedure described in Paragraph 1.

Adjustment of the angle of the headlamp can be obtained by slackening off the nut on the headlamp stirrup, tilting the headlamp to the angle required and tightening up the nut.

(13) Run the rear lamp cable along the frame of the bicycle and affix the lamp to the rear number plate. A free-wheel should be fitted to all bicycles with a CYMOTA but the unit will function perfectly on a machine fitted with a coaster hub.

Longer life is achieved by using a Dunlop Tandem 'Sprite' or Firestone 'Power Drive' tyre for the front wheel of the bicycle.

### **HOW TO USE THE CYMOTA ENGINE**

IT IS STRONGLY RECOMMENDED THAT THE PETROL AND OIL ARE MIXED IN THE PROPORTION OF 16 PARTS OF PETROL TO 1 PART OF OIL, IN A CLEAN SEPARATE CONTAINER BEFORE POURING IT INTO THE TANK. THE JET ON THE CARBURETTOR IS VERY FINE (WHICH ACCOUNTS FOR THE LOW PETROL CONSUMPTION) AND IT IS ESSENTIAL THAT NO DIRT IS ALLOWED TO GET INTO THE PETROL, FOR THERE WILL BE A RESULTANT LOSS OF POWER.

During the first 500 miles, however, add an extra half-measure of oil for each quart of petrol.

To facilitate measurement of the correct amount of oil, the filler cap of the tank is constructed to serve as a measure.  $2\frac{1}{2}$  capfuls of oil should be added to each  $\frac{1}{2}$  gallon of petrol, and well stirred or shaken to ensure proper mixture.

Close the bonnet and see that it is firmly in position against the backplate. Close the choke on the carburettor by rotating the small lever on the trumpet shaped air-filter which protrudes through the backplate. See that the petrol is turned on at the tap on the left hand side of the backplate (the 'on' position is when the lever of the tap is parallel to the body of the tap).

Mount the bicycle, push the control lever on the handlebar over to the right as far as it will go. (This opens a valve in the cylinder head, releasing the compression and making it easy to pedal the machine.) The motor will NOT start with the decompressor valve open. Begin pedalling and when you have reached a speed of 5 - 10 m.p.h. move the control lever right over to the left and the motor should then start. You can adjust the speed of the cycle by moving the lever to the left or right. After about a minute's run (dependent on the temperature) commence to open the choke. After a few seconds' running, the choke of the carburettor should be opened fully, and kept open the whole time, except when starting the engine from cold. ON NO ACCOUNT SHOULD IT EVEN BE PARTIALLY CLOSED UNDER NORMAL WORKING CONDITIONS.

Excessive use of the choke will cause oiling of the plug; the remedy is to clean or replace the sparking plug and if the choke has been in use for some considerable time, to drain any surplus petrol from the crankcase by removing the drain plug (see Diagram 11) with a screwdriver.

The speed of the cycle is controlled by use of the control lever only, and when temporary stops are made in traffic, the engine should be stopped by closing the lever completely, restarting being effected by pedalling away as before, but without the use of the choke.

NEVER USE THE DISENGAGING LEVER AS A 'FREE ENGINE' CLUTCH, OR EXCESSIVE TYRE WEAR WILL BE CAUSED.

Do not leave the engine disengaged from the tyre for any considerable period as this will tend to weaken the engine pull-on springs.

When wheeling or pedalling the cycle without using the engine, it is advisable to disengage the latter from the wheel, but, *for very short distances only*, it is sufficient to close the control lever completely, so as to release compression when the engine is turned.

Should the cycle have been standing for any length of time, difficulty may be experienced with starting, due to the fact that the oil separates out from the petrol. To ensure that this does not

Should it be necessary to drain the petrol tank first unscrew the petrol pipe from the tap and then unscrew and remove the tap and filter from the tank. On replacing the tap make sure that the washer is in good condition and replace if necessary.

IT IS THEREFORE IN YOUR OWN INTEREST TO MAKE SURE THAT ONLY CLEAN OIL AND CLEAN PETROL ARE USED FROM CLEAN CONTAINERS.

An air-cleaner is fitted on the carburettor intake to prevent the entry of dirt into the engine, and it may be necessary to clean it occasionally. This is done by undoing the clamp screw, removing it, and immersing it in clean petrol.

### (2) Ignition.

The magneto should be timed so that the contact breaker points open .015" (1/64") before the piston reaches top dead centre. When fully separated, the clearance between the points should be .012-.015". The sparking plug recommended for the engine is Champion L10, and the gap at the plug points should be .018".

In the event of misfiring due to ignition trouble, the sparking plug should first be examined, the gap checked, and the insulator thoroughly cleaned to remove any oil or carbon. It is advisable to carry a spare plug in good condition to deal with possible plug trouble, although such an eventuality is rarely encountered with the CYMOTA engine. The contact breaker points should also be examined to check clearance and also cleanliness. If they are oily or dirty, they may be cleaned by passing a strip of stiff card between them, but if burnt or pitted the use of an abrasive strip or contact file may be necessary.

Excessive sparking at the contacts is an indication of condenser trouble, and the magneto should receive expert attention. The same applies if the spark is extremely weak or non-existent. The high tension lead should be examined for cracks or chafing of the insulation, or possible break in the continuity of the wires. The method of supporting this lead by a clip on the side of the petrol tank should be used.

### (3) Lighting.

A 3-way switch on the top of the bonnet controls the lights ; in the centre, position O, they are switched off ; if turned to position D, the main head and tail lamps are powered by current from the dynamo while the engine is running. In position B, the parking bulbs are powered from the reserve battery. The parking lights should be used whenever the cycle is standing on the road at night.

Lighting trouble can be caused by faulty wiring or connections, or by the failure of a light bulb. When the parking lights fail to

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*Note*—No battery is included with the CYMOTA due to the fact that it might deteriorate in storage and so damage the battery box.

happen, it is advisable to rock the bicycle sideways in order to agitate the fuel and re-mix it.

About 100 yards before the end of a journey turn off the petrol and continue motoring in order to empty the carburettor. Leave the petrol tap in the off position until you restart the motor.

The CYMOTA engine, in common with all internal combustion engines, requires careful treatment in the early stages of its life. It is therefore recommended that for the first 200 miles the throttle is used with discretion, and some assistance is given to the engine by use of the pedals where necessary. The engine will develop its full power output at approximately 1,000 miles.

If on a steep hill you find the revolutions of engine dropping, close the throttle slightly and turn the pedals round two or three times every 10-15 yards. It is advisable to keep the motor turning at full revolutions and this slight assistance will ensure that. Very little physical effort will be required.

PLEASE REMEMBER THAT YOUR CYMOTA—LIKE A MOTOR CAR ENGINE—WILL DEVELOP MORE SPEED AND POWER AFTER IT HAS BEEN 'RUN IN,' THAT IS TO SAY AFTER THE FIRST 500 MILES.

After completion of the running-in period, it is recommended that a visit is paid to the agent, who will carry out routine services, which will include readjustment of the carburettor if necessary.

## MAINTENANCE

FAILURE OF THE ENGINE TO START or to run evenly can be caused by :

(1) *Carburettor and fuel supply.*

First ascertain that the petrol is reaching the carburettor by removing the top cover from the float chamber, and by depressing the needle of the float chamber, which should fill up and overflow. If this does not occur, the fuel pipe or the tank filter are obstructed and require cleaning.

If the float chamber does fill, the jet requires cleaning, and access to this is obtained by removing the domed nut at the base of the carburettor (see Diagram 5), and remove the jet with a screwdriver. The jet should be cleaned by blowing out with a bicycle pump. It is not advisable to insert wires, etc. through the jet, as damage could be caused and the petrol consumption adversely affected. An additional filter is fitted between the float chamber and the carburettor body, and access is obtained by undoing the two nuts and removing the float chamber. After cleaning, the float chamber must be assembled with a new joint washer. Mention is made of cleaning the filters, but these operations are only necessary because dirt, etc. has found its way into the tank.

work or burn very dimly, it is probable that the battery needs replacement. Flickering lights indicate a loose connection on one of the terminals, or a frayed or partially severed wire in some part of the circuit. The contacts of the plug connection inside the bonnet should be kept clean and firmly plugged in.

#### (4) Decarbonising.

Providing previous instructions are carried out, it will be necessary to decarbonise the engine after approx. 2,000 miles, and the rider will be made aware of the necessity to do this by the fact that :

- (1) There is loss of power.
- (2) The exhaust note is quieter.

Details of the method are given below, but it is recommended that this is done by the local service station.

The plug lead is disconnected and the plug removed. The nuts are removed from the engine, the pull rod lifted, and the rod removed from the bracket. The three cylinder head bolts are removed and the cylinder head *carefully* lifted by *gentle* levering between the fins of the head and cylinder at both sides. Force is not necessary and should on *no account* be applied to the lifting of the head.

The lifting of the head allows access to the inside surface and the top of the piston, so that the carbon can be removed by a scraper.

The surface should be thoroughly cleaned and all loose particles removed. Abrasive methods of scouring should on no account be used. When replacing the head, make certain that the joint surfaces are quite smooth and clean, and that a new gasket is fitted. Tighten the three bolts lightly at first, making certain that the head bears evenly on the cylinder barrel all round, then fully tighten down in easy stages — a little on each bolt in rotation.

The exhaust pipe and silencer may possibly become fouled with carbon, resulting in partial obstruction of the passages and loss of power. The remedy is to dismantle and scrape out the carbon. The silencer may very easily be opened by removing the centre bolt which allows the cover and gasket to be taken off. Fouled pipes may be cleaned with a wire boiler tube brush.

The friction roller should not require cleaning, but should space round it become choked with mud, access to this part can be obtained by removing the front wheel of the cycle.

If at any time it should become necessary to replace any of the parts of the CYMOTA it is essential to the proper functioning of the unit that only Genuine CYMOTA Spare Parts are used. These are obtainable from your local CYMOTA dealer.

IF THE INSTRUCTIONS IN THIS HANDBOOK ARE ADHERED TO, THE **CYMOTA** WILL GIVE MANY MILES OF TROUBLE-FREE, EFFORTLESS CYCLING.

**This CYMOTA Instruction Book is the property of**

Name .....

Address .....

Telephone Number .....

Engine number..... Bonnet colour.....

Date of purchase..... Registration number.....

Cycle make and Frame number .....

Driving Licence number..... Renewal date.....

Insurance Company and Policy number .....

Address .....

Telephone number .....

Renewal date ..... 12-4-'51.

Local Agent ..... DASSA, T. J. W. JABARAH

Address ..... PL 7 H. W. 12. WILCHATEN

Telephone number ..... 119

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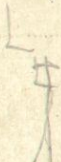
**CYMO LIMITED**

**366 Kensington High Street**

**London W.14**

**Great Britain.**





It is essential that you fill in the postcard that is enclosed with your CYMOTA, and return it to the Manufacturers.

It is also essential that, with any claims under the Guarantee, the alleged faulty part is returned to your local CYMOTA Agent, and the Engine number quoted.

