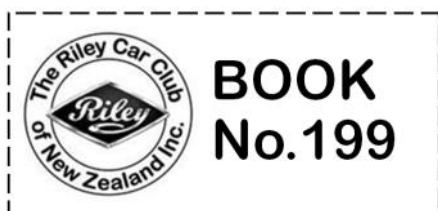




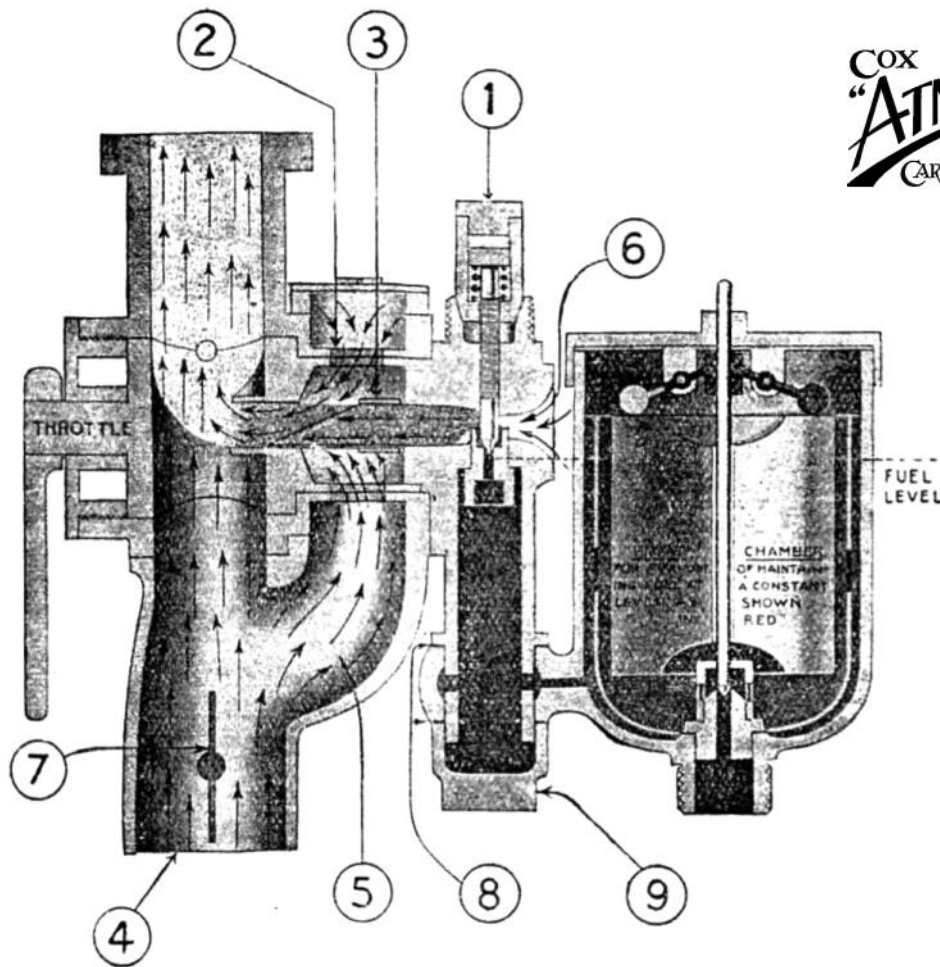
BOOK  
No.199

# COX “ATMOS” CARBURETTER

GENERAL INSTRUCTIONS



Original supplied by  
Gordon Thomas



**See also Figs. 1, 1a, 2 and 4.**

(1) Jet needle adjusting thimble **F**. for correctly setting size of jet to provide best mixture for full throttle.

(2) Jet controlling air ports **K**. size of which are set by rotatable band **L**. For eliminating all trace of flat spots, and providing the correct mixture for clean, powerfully progressive pick-up over the range from closed to full throttle Position of band **L**. has no effect upon mixture when throttle is full open.

(3) Sleeve **M**. for determining quality of mixture for idling engine. Moving forward over slant enriches mixture for slow running or idling engine. Can adversely affect consumption if set too far forward

(4) Main air intake.

(5) Air supply to jet control ports.

(6) Air enters here and passes across jet, thereby producing a finely atomised mixture which again becomes further atomised by air from jet control ports **K**. and again still further atomised upon entering main air stream .

(7) Air strangler for providing rich mixture for easy start from cold.

(8) Fibre packing washers **J<sup>1</sup>** and **J<sup>2</sup>**

(9) Jet body nut **C**. for fixing float chamber to jet body and enabling float chamber to be easily detached for cleaning, etc.

THESE illustrations show the carburetter assembled for horizontal fitting.

It will be quite easy for the reader to note the various parts by reference letters, if the carburetter under observation happens to be fitted vertical.

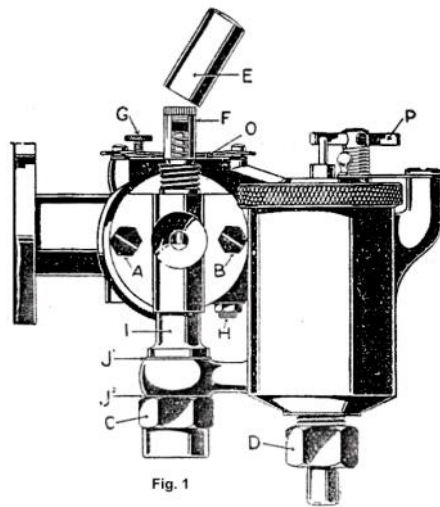


Fig. 1

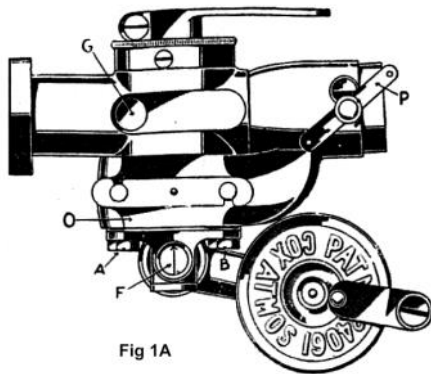


Fig 1A

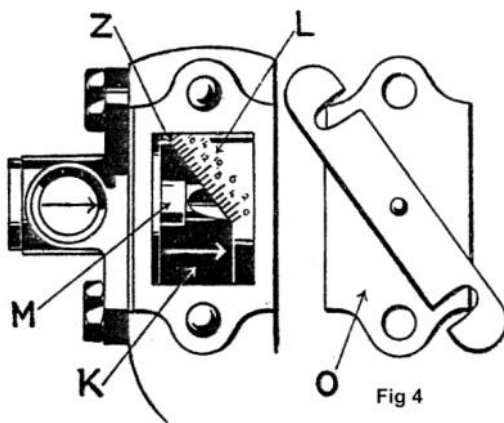


Fig 4

K. Jet Control Air Port.  
L. Rotary Band for setting size of Air Port K.

M. Slideable Clip or Sleeve.

Z. Indicates the edge of port from which to read scale engraved on band L.

A.B. Jet Body Bolts.

C. Jet Body Nut.

D. Petrol Pipe Union Nut.

E. Jet Needle Cover Cap.

F. Jet Needle Adjusting Thimble.

G. Slow Running Adjusting Screw.

H. Throttle Stop.

I. Jet Body.

J<sup>1</sup> J<sup>2</sup> Fibre Washers.

O. Air Port Inspection Cover.

P. Air Strangler. -- Closing same provides rich mixture for starting up and getting away from cold.



Fig 2

Close up view of Jet Needle Thimble.

The Cox "ATMOS" carburetter, the result of many years of patient research and investigation, has been designed by a motorist for motorists, to provide the most perfect carburation as yet. obtained, with the simplest methods of adjustment and greatest accessibility for cleaning purposes, and is absolutely all British.

The correct procedure for adjustment is as follows:

### **FIRST**

Determine correct setting of jet for best full throttle mixture. Jet is adjustable by means of jet needle adjusting thimble **F**.

See page **9** and **Figs. 1, 1a, and 2.**

### **AND THEN**

Determine correct position of rotating band **L** to eliminate any trace of flat spots and produce a clean, powerful and perfectly progressive pick-up over the complete range of throttle. See page **6** and **Fig. 4.**

### **AND LAST**

After having set jet **F** for full throttle power and band **L** for best mixture for all intermediate throttle positions, set for slow running by means of slow running screw **G** and sleeve **M**. **G** controls quantity and **M** quality. See page **7** and **Fig. 4.**

All these adjustments can be made while engine is running.

WHEN FITTING, be sure that controls allow full movement of throttle, so that it fully opens and properly closes against its stops at either end of range.

**It is as well to become acquainted with the various details of the carburetter before fitting to the engine.**

Take them in the following order:

Remove the jet needle cap **E.** and inspect the jet needle **F.** (See **Fig. 1.**)

Lift by gripping at the point indicated. (See **Fig. 2.**)

The action of lifting, it will be noted, releases a small friction cone clutch at **R.**

The cone clutch is provided so that the jet needle will remain firm in any position desired, at the same time can be moved easily. Having lifted the jet thimble, turn in an anti clock direction; while lifted, it will turn quite freely. Now proceed to unscrew; it will be found that after a few turns, the clutch is out of action, and there will be no necessity to lift; continue to unscrew until the needle is removed. Examine the needle and note its construction and formation so that you will be quite conversant with it. Note that the end is tapered and that the point is not sharp. The taper fits into a jet so that when the needle is screwed right home, the jet is entirely closed; therefore the size of the jet is determined by the distance between the taper of the needle and seat of jet.

Proceed now to screw the jet needle in again; as soon as the clutch is found to grip, lift the thimble as described above and turn until a stop is felt. Go gently and try it several times until you can do it easily and with certainty. When the stop position is felt, do not exert force, as it is essential that the taper on needle should not be damaged; nothing can damage it except the use of undue and unnecessary force.

When the jet is closed, the arrow should point towards the body of the carburetter, as seen in **Fig. 1a**, also **Fig. 4.**

Having become conversant with the jet needle, become equally conversant with the expressions we recommend for memorising the jet position, see page 9. If you do this and know how to take the needle out and replace it, you will never be held up by carburettor trouble, because knowing how to remove the needle enables the jet to be cleared of any obstruction at any time and without any tools, and the car can be going again in less than 60 seconds.

Having become conversant with the jet needle, note how the rotary band **L.** can be moved to allow more or less air to enter the jet control port **K.**; access to control port **K.** is obtained by removing the cover plate **O.**, see **Fig. 4.**

Next, examine the action of the slow running screw **G.** and note that it opens or closes the small aperture cut in the edge of the throttle barrel; unscrewing opens the aperture; while screwing inwards closes it. From this examination, it will be seen that the opening or closing of this aperture controls the speed of the slow running engine.

The stop **H.** should now be examined. It will be noted this acts as a stop, determining the closed position of the throttle; for the standard closed position, a fine air line of clearance should be visible on the throttle stop side of the throttle barrel.

Become conversant now with the slip sleeve **M.**, which is located inside the port chamber, see **Fig. 4.**, and note that it can slide upon a small tube; can be adjusted by means of a pointed instrument inserted through air port **K.**, this sleeve will remain wherever placed.

For a more close examination of the sleeve **M.**, if it is desired to examine it more closely, unscrew the jet body bolts **A.** and **B.**, which enables jet body to be removed. Tighten bolts properly when replacing. There is nothing to be gained by completely dismantling the carburettor, and there is never any necessity to do so. The float chamber is detachable, and is removed by unscrewing the jet body nut **C.**

When the carburetter is delivered, the float chamber is usually packed separately. Several fibre washers are supplied, one of which should be in position **J<sup>1</sup>** and another at **J<sup>2</sup>**. The others may be kept in reserve, or put on at position **J<sup>2</sup>**.

The extra washers are supplied in case it is found desirable to lower fuel level in the jet; the inserting of an extra washer at **J<sup>1</sup>** being a more convenient and positive means of lowering the fuel level than altering the float chamber needle.

### **WHEN FITTING CARBURETTER TO ENGINE.**

When fitting to engine, it should always be so arranged, if possible, that float chamber is behind carburetter, and to one side or other of the jet. In other words always endeavour to so place the float chamber in relation to jet that when the car is ascending hills the tilt so caused tends to produce low level fuel in jet.

With most carburetters the usual practice is to fix float chamber in front, so as to raise level in jet on hills. The Cox "ATMOS" owing to peculiarities of its working principles is adversely affected in regard to maximum power by mixture being too rich, but is not affected in regard to maximum power by low levels within the limits produced by any climbable gradient.

To obtain the most perfect flexibility and best all-round results, pay careful attention to setting of spark plug points. These should be set to .025 of an inch and all alike. If magneto will not fire engine properly at such a setting, then magneto requires attention. A good magneto should easily fire this setting and give easy starting. If ignition is by coil then plug points should be set to .040 of an inch, and best results will be obtained with such setting if ignition system is in order.

Presuming that the carburetter is being fitted to an engine for which the standard setting is not known, it is as well then to proceed as follows:

Note the size of the carburetter by the number of the flange, and refer to the jet setting chart on page 9.



**Set the jet to the position indicated on the chart for such size.**

**Set the rotary band L.** to an approximate position as shown in **Fig. 4**.

**Set the sleeve M.** right back in a reverse direction to which the arrow points - see **Fig. 4** -that is, so that the edge of the sleeve is clear of the edge of the slant, as shown.

**Set the slow running screw G.** about three turns open, bolt the carburetter up, free of air leaks, and see that the controls give full movement of the throttle--this is important. Flood the float chamber to ascertain that the fuel is flowing freely, and with the throttle in closed position, start the engine. It may be found necessary to open the jet a little more than indicated on the chart for a minute or two, because the metal of the jet and the needle being new offers at first a resistance to the flow of fuel.

**When engine is properly warm,** open throttle to full open position, but do not keep it there more than two seconds, because engine being without load it is dangerous to allow it to race.

If on opening to full throttle as above described, mixture seems right and powerful, close jet down a little and try again till a jet position is arrived at which shows a distinct weakness when throttle is open fully; having arrived at such a position open jet again just a little, till weakness is not apparent. In most instances the position of the jet thus determined will be found correct for best power and speed on the road.

We may here mention that a movement of arrow equivalent to a two-minute division on a clock dial (see page 9) is equivalent to the next size larger or smaller jets as supplied for carburetters having non-adjustable jets. For instance, we will presume that the jet is adjusted to a size which is equivalent to, say, 100c.c. and the arrow be moved in anti-clockwise direction, the equivalent of two minutes, as mentioned, this would give a jet size roughly equivalent to

105c.c., while if moved the same distance in clockwise direction would give a jet size roughly equivalent to 95c.c. By this it will be seen that the jet should be set with care. Realise that a little makes the difference, and that such movements as a quarter of a turn should not be indulged in when determining final setting.

Next move the band **L.** until the air port **K.** is fully open; then open the throttle to about three-quarters position, and note if spitting occurs. If it does, move the band a little at a time so that it closes the port, and gives a clean opening up of the throttle. The car is then ready for a final setting on the road.

At this stage do not trouble about the idling engine so long as it will keep running at a reasonable speed.

To check the jet setting for satisfactory power. This can be done quite easily by driving at the full throttle position at, say, 20 to 30 miles per hour up a gentle gradient. Allow the throttle to close a very little, and if the engine then shows a better bite, it is an indication that the jet' requires opening the equivalent of a minute or so until the full throttle position is the full power position. Remember that a little makes a difference when setting jet.

**The Cox "ATMOS" carburetter gives best results with bare mixture. Therefore always set jet a little on the weak rather than the rich side.**

**Having set the jet for power, proceed to check for the correct size of the air port K. by means of the band L., to give a perfect clean line of power, and until opening the throttle seems equivalent to the opening of a steam valve, the engine responding to every minute movement of the accelerator pedal.**

If the air port is set too small, the engine will be sluggish on pick-up, owing to rich mixture; if set too far open the engine will perhaps spit and stagger when opening up slowly over the throttle range. Some engines will carry the port fully open, but not many.

Greatest economy of fuel is obtained more as a result of correct setting of size of air ports **K.**, by means of band **L.**, than by sacrificing all-out power by using too small a jet setting.

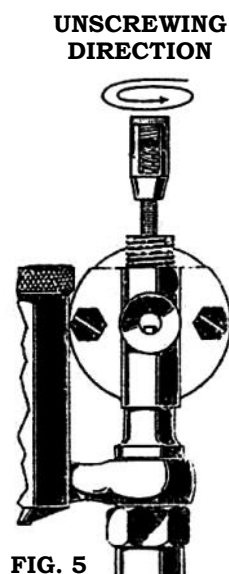
**Having set the jet for the best full throttle mixture and port K. for clean intermediates, proceed to set for the idling or slow running engine.**

The car should be on the level for this operation. Adjust screw **G.** to a position which gives a satisfactory slow engine speed. If the mixture appears to be a little too weak, enrich it by moving sleeve **M.** forward a little in the direction indicated by the arrow, **Fig. 4.** If, on the other hand, the slow running mixture is found to be too rich, although the sleeve **M.** is as far - back as it will go (this condition is seldom found), the mixture can be weakened by means of the throttle stop **H.**; screwing the stop in allows more air to enter the barrel at the closed position, and so weakens the slow running mixture. Screw in the stop a very little at a time, and as stop **H.** is screwed in, so it will be found necessary to screw inwards the slow running screw **G.**

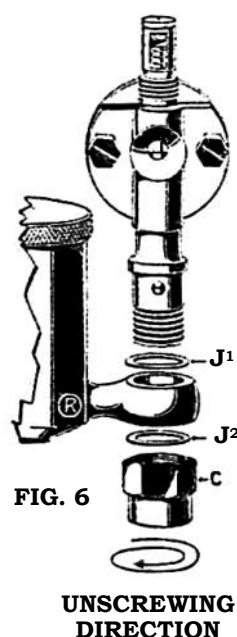
Do not strive to obtain an extremely slow idling engine. The Cox "ATMOS" is designed to give a wonderfully slow pulling engine under load, rather than extremely slow idling. Extremely slow idling is not good for any modern engine, whatever carburetter is used, and only tends to unduly carbonize engine, oil up plugs, and waste fuel.

**One outstanding feature about the Cox "ATMOS" is that engines fitted with it will run eight to ten, or even more times longer, without requiring decarbonizing, than they would run with other types of carburetters.**

## To Clear Jet of any Obstruction.



Remove jet needle by unscrewing, as shown in **Fig. 5**. Wipe point between thumb and finger, flood float chamber to flush jet, replace needle to original setting.



All that is necessary to thoroughly clean the float chamber and remove any dirt or water that may have accumulated, is to unscrew the jet body nut **C.**, **Fig. 6**, and remove the float chamber **R**. Having washed out the float chamber thoroughly, and having removed any dirt that may be found in nut **C.**, replace the float chamber taking care to put back the fibre washers at positions **J<sup>1</sup>** and **J<sup>2</sup>**.

To clean out as described is all that is necessary, since no dirt which could cause trouble can accumulate in any other position in the carburettor, and to carry out this cleaning process there is no necessity to detach the carburettor from the engine, nor to alter any adjustments in any way.

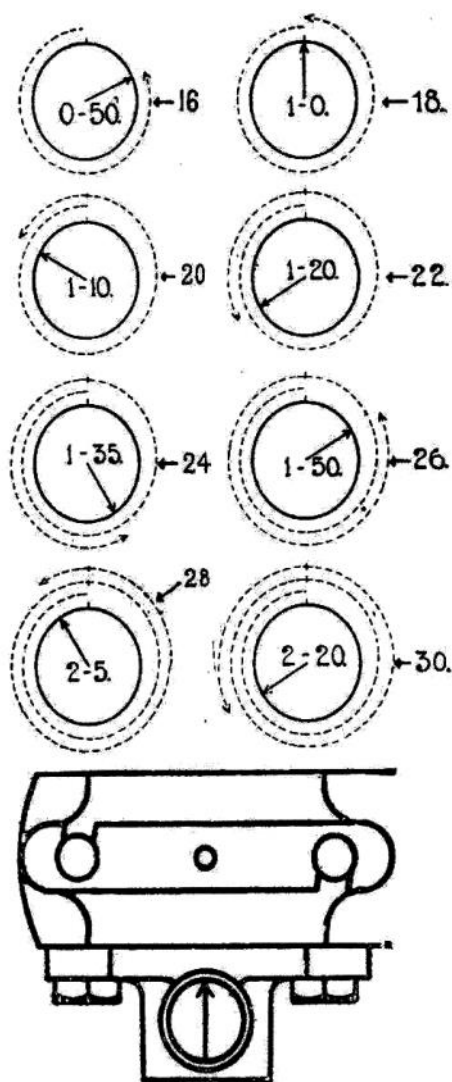
## Approximate Jet Settings for the various sizes of Cox "Atmos" Carburetters.

The carburetter size will be found stamped on flange of all models produced since early 1923.

CARBURETTER SIZE.	JET POSITION FROM CLOSED OR ZERO.	
	Hrs.	Mins.
16	0	50
18	1	0
20	1	10
22	1	20
24	1	35
26	1	50
28	2	5
30	2	20

The expression "hours" and "mins." is used as an easy manner of describing the jet setting, and easy to remember. Visualise the minute hand of the clock revolving backwards, or anti-clock, calling one complete revolution one hour, and expressing the divisions of a revolution in minutes, as shown in diagram. The dotted lines indicate the movement of jet from zero or closed position corresponding with the table above.

**DIAGRAMMATICAL  
EXPLANATION  
OF JET POSITION.**



Position arrow should be in when jet is at zero.

Always lift to turn, and do not use force when closed position is felt.

## Filter in Float Chamber

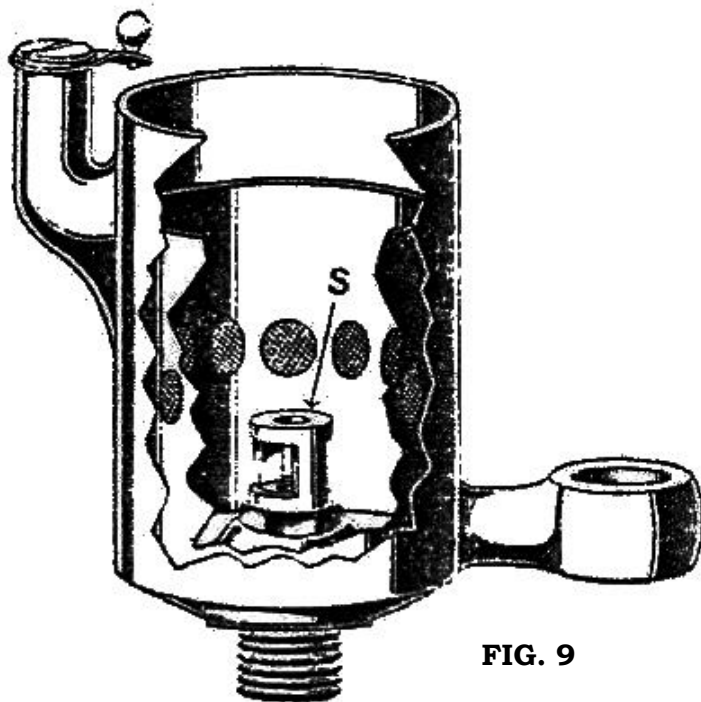


FIG. 9

In most Cox "ATMOS" carburetters, the Cox patent water separating filter is fitted inside float chamber.

This acts not only as a most excellent filter but also forms a very effective water trap.

Fig. 9 illustrates the float chamber cut away, showing the filter. There is no necessity to remove this filter for cleaning purposes, as all that is necessary is to occasionally wipe same clean inside. Or occasionally remove float chamber complete from jet body (see page 8), and give a thorough rinse out with clean petrol.

## **A few General Observations.**

If the engine has been running to your satisfaction, and suddenly develops any of the following symptoms, without any alteration having been made to carburettor adjustments:

### **(1) Difficult Starting**

Look to ignition or valves, or induction pipe air leak, such as faulty packing, washers, etc.

### **(2) Jerking and misfiring when picking up.**

Usually caused by the plug or plugs having a tendency to fire inside the body instead of at points, when under load. (Magneto weak at low speeds will cause both the above symptoms).

### **(3) Spitting back at intermediary throttle position when properly warm.**

Can be caused by minute particles of dirt collecting on the jet needle. Remove needle, wipe the point between thumb and finger, and replace. See page 8.

### **(4) Loss of power on hills.**

If cause is due to carburation, act as described for No.3 above. If that does not restore normal running, look for the trouble elsewhere.

### **(5) Excessive Fuel Consumption.**

Look for Petrol leaks--if none, then engine or ignition trouble of some sort exists, or brakes may be binding.

**The point to remember is that a Cox "ATMOS" carburettor cannot possibly of itself suddenly go out of adjustment. The only thing that can cause it to alter in performance is accumulation of water or dirt, which is easily removable.**

If fuel tanks could only be kept free of impurities, the Cox "ATMOS" once set would not require any attention from one year's end to the next, and does not vary with the weather.

### **Starting from Cold.**

Set throttle slightly open, and close strangler butterfly, engine should then start easily. If engine is a difficult starter from cold, flood float chamber as well as strangle; be careful not to get mixture too rich; some engine will not fire a rich mixture at all.

Some engines require slightly different treatment from others for starting, whatever carburetter is fitted. With the Cox "ATMOS" any type of mixture can be produced to make starting simple and certain on any type of engine, the user very soon determining this point for himself. For instance, in some isolated cases of extreme stubbornness, set throttle well open, close strangler, and with switch off give engine a few turns over, then switch on, nearly close throttle, and give a sharp pull up.

### **Jet Control.**

For those users of the Cox "ATMOS" carburetter who feel they would like to be able to adjust the jet from the driving seat of the car, we have introduced a device which is attachable to any existing Cox "ATMOS" carburetter in a very simple manner, and provides movement of one-third of a turn of the jet. Any movement in excess of this is inadvisable.

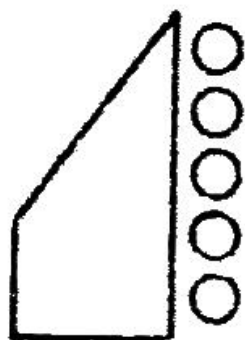
Price £1 0s. 0d.

Detailed particulars on application.

This device is in no way essential for the perfect working of the carburetter, and is supplied merely to meet the wishes of those who feel interested in having the jet controllable from the driving seat.



Although the instructions contained herein apply particularly to our 1923-24 type, they are equally applicable to the earlier models, as the principle of the carburetter remains unchanged—the slight difference that will be noted being in connection with the jet control air port **K.**, **Fig. 4.**



**Fig. 4a**

In the earlier models the formation of this port was as here illustrated, **Fig. 4a**, having a row of air admission holes at the side of port for purpose of providing corrective adjustment, while in the later models the port itself is adjustable by means of a rotatable band shown, **L.**, **Fig. 4.** This band, in the earlier models, operated to cover or uncover a row of small holes, thereby limiting its range of control.

The functions of both are identical, therefore the instructions are equally applicable, and the band is adjusted in the same direction for the same purpose in each case.

The other difference in the carburetter is the starting strangler, **P.**, **Fig. 1a**--which is now located in the main air stream. This, of course, has no bearing upon any of the instructions re adjustments, but does somewhat alter the outward appearance of the instrument.

This booklet is therefore, equally applicable to  
1922-3 and 4 types.





