STROMBERG MODEL "UR" CARBURETOR[1]

General Description

The model "UR" Stromberg carburetor is of the plain tube type, incorporating several outstanding features, such as:

A positive acting accelerating device, consisting of a pump which delivers an accelerating charge immediately the throttle is opened, and meters and delivers this charge over a definite period of time.

An economizer, which insures a lean and economical mixture at normal driving speeds, and automatically supplies the richer mixture necessary for maximum power, high speed, and part throttle while accelerating.

Idle and low speed jets above the throttle.

A relief poppet valve in the choke valve to prevent over choking.

Operation of this carburetor is explained under Figures 1 to 4.

Correct mixture is maintained at all speeds and loads by the *air bled* principle. Air is drawn into the center passage of the main discharge jet (25) through a series of small holes located below the fuel level; introducing air into the fuel stream eliminates the retarding action of surface tension at low suction and restricts the fuel flow at high suction, thus controlling the mixture ratio under all conditions.

The economizer is a gasoline economizer and not an "air bled" economizer as used in previous model Stromberg carburetors. At part throttle, or speeds up to 45 or 50 miles per hour, all fuel is controlled by the main metering jet (16), (see Figures 1 and 2), which is usually of fixed size, although in some domestic specifications and in export service, an adjustable jet is used.

When the throttle is opened, the vacuum controlled economizer piston (4) is forced down by the economizer spring and opens the by-pass needle valve allowing an additional amount of fuel to flow through the by-pass restriction (28).

The additional amount of fuel delivered through the by-pass restriction (28) together with the fuel delivered through the main metering jet (16) produces a mixture sufficiently rich to give maximum power at wide open throttle, irrespective of engine speed (whether low speed, 500 r.p.m. or high speed, 3000 r.p.m.).

Supplying the fuel through two separate metering jets automatically controlled by the manifold vacuum and therefore in correct relation to engine speed and load insures an economical mixture in the normal driving range (10 to 45 miles per hour) and a sufficiently rich mixture for maximum power at wide open throttle, whether pulling on a hill or driving on the level at high speed.

Accelerating pump insures snappy getaway (acceleration): It is a well-known fact that carburetor adjustments which give low fuel consumption at normal driving speeds usually seem to lag in response to quick opening of the throttle. On the other hand, carburetor adjustments that respond promptly to the opening of the throttle usually show high fuel consumption.

In order to retain satisfactory fuel economy at normal speeds (10 to 45 miles per hour) without sacrificing acceleration and flexibility, it is necessary to momentarily supply an extra amount of fuel when the throttle is opened.

This extra fuel is automatically supplied by the accelerating pump located in the float chamber. A small jet known as the pump reducer (27), located in the accelerating pump channel, controls the amount of extra fuel for acceleration.

The accelerating pump cam (19) has three holes for different positions of cam to control the amount of fuel delivered. Hole No. 3 should work the best for low temperature and ordinary gasoline as it delivers the greatest amount of fuel. Hole No. 2 can be used in average temperature with ordinary gasoline. Hole No. 1 delivers the least amount of fuel and should be used in very hot weather or in foreign countries where high test fuel is used.

Poppet choke valve aids in starting and operating cold engine: The choke valve (22) is connected to what is known as the choke control (located on the instrument board). For cold weather starting, pull the choke control (on the instrument board) all the way out and hold while stepping on the starter button. Keep this choke control out for about five seconds after the engine has started. The relief poppet valve (25) will prevent over choking by automatically opening as soon as the engine starts to fire. After the engine has been running about five seconds, push the choke control in ¼ or ½ way, according to the temperature. It is only necessary to push in the choke control on the instrument board gradually when the engine is warming up. The control should be all the way in by the time the engine reaches 110° on the heat indicator on the dash.

In very cold weather, it may be necessary to keep the choke control pulled out from one-half to three-quarters of the full travel, but as the engine warms up, the choke control should gradually be pushed in or turned to running position, in order to avoid unnecessary fuel consumption.

Adjustments

If an engine after running satisfactorily all of a sudden ceases to perform properly, look over the carburetor connections and make sure that fuel flows to the carburetor in a free and steady stream, also that the choke valve operates properly. Do **not** change the adjustments until other causes of trouble have been investigated. Carburetor adjustments should only be necessary with changes in fuel, or seasonal changes.

High speed adjustment: Before attempting to make any adjustments, be sure that the engine has been run long enough to attain normal operating temperature (160° Fahrenheit) on the water outlet. Set the spark lever in full advance position. Set the throttle lever on the steering wheel to a position which will give approximately 25 to 35 miles per hour speed on level road. With the choke fully open, the engine should run smooth.

The main metering jet (16) is calibrated at the factory to supply the proper amount of fuel at high and intermediate speeds of the engine for which the

[1]This series "UR" up-draft carburetor replaces the "U" type. This carburetor is also made in ¾" size for small engines. Text from Stromberg *service bulletin* of model "UR" carburetor.

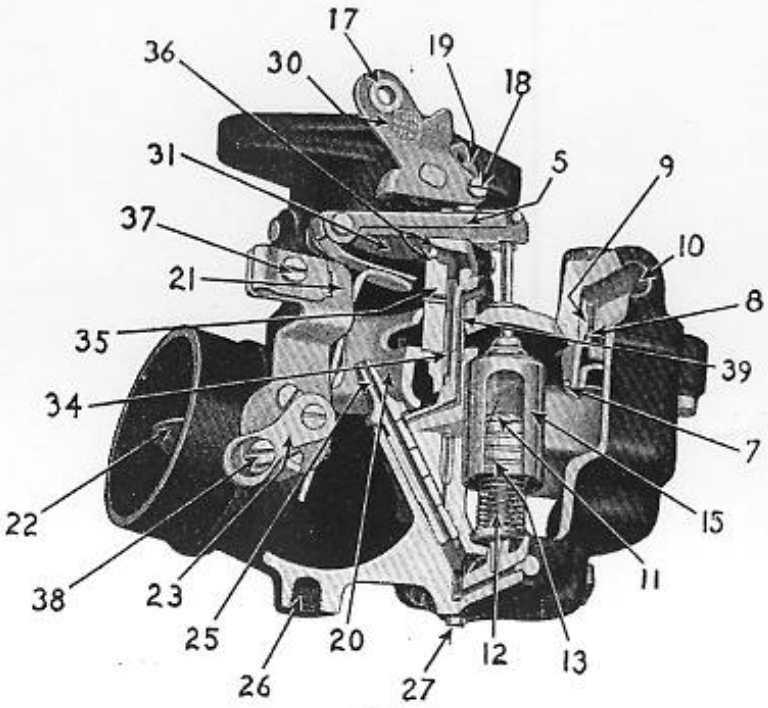

Fig. 1.

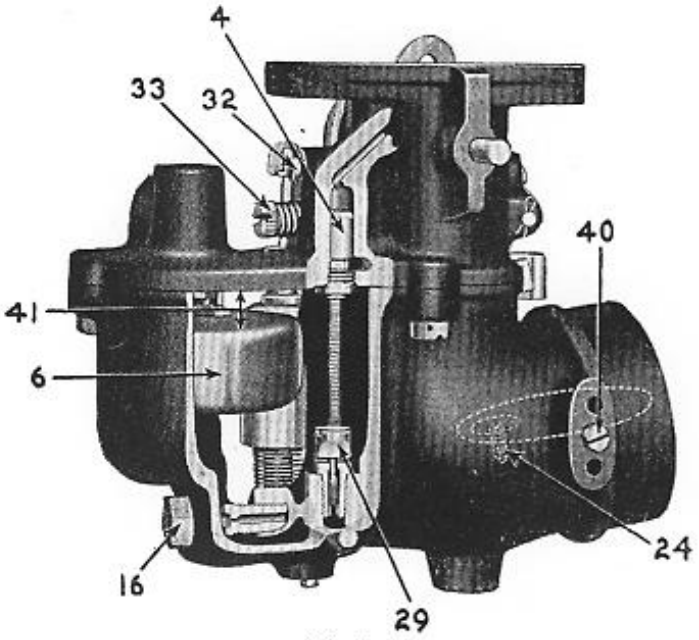

Fig. 2.

Figs. 1 to 4. Stromberg model "UR" carburetor.

Operation: Fuel enters through the gasoline inlet (10), flows through the float needle valve seat (9) into the float chamber in which is located the float (6) which automatically maintains the correct fuel level.

From the float chamber, the fuel flows through the main metering jet (16) to the main discharge jet (25) or to the idle discharge (36), depending on how far the throttle valve (31) is open.

At speeds up to approximately 12 miles per hour, the fuel is delivered through the idle discharge (36). At speeds from 12 to 20 miles per hour, the fuel is discharged through both the idle discharge (36) and the main discharge jet (25); above 20 miles per hour, practically all the fuel is delivered through the main discharge jet (25).

In the main air passage of the carburetor is located the *venturi tube* (20), a specially shaped orifice which insures high air velocity at the main discharge jet (25) with the least possible restriction which aids atomization.

4. Economizer piston
5. Pump lever
6. Float
7. Float fulcrum pin
8. Float needle valve
9. Float needle valve seat
10. Gasoline inlet
11. Pump valve
12. Pump spring
13. Pump piston
15. Pump piston sleeve
16. Main metering jet
17. Throttle lever
18. Pump adjustment screw
19. Accelerating pump cam
20. Venturi tube
21. Choke control tube holder
22. Choke valve
23. Choke lever
24. Poppet choke valve
25. Main discharge jet
26. Drain (To be left open)
27. Pump reducer
29. By-pass valve
30. Throttle stop screw
31. Throttle valve
32. Idle discharge plug
33. Idle adjustment needle
34. Idle tube
35. Idle air bleed
36. Idle discharge holes
37. Choke control tube clamp screw
38. Choke lever wire clamp screw
39. High speed air bleeder
40. Choke valve stem
41. Float setting (see instructions)

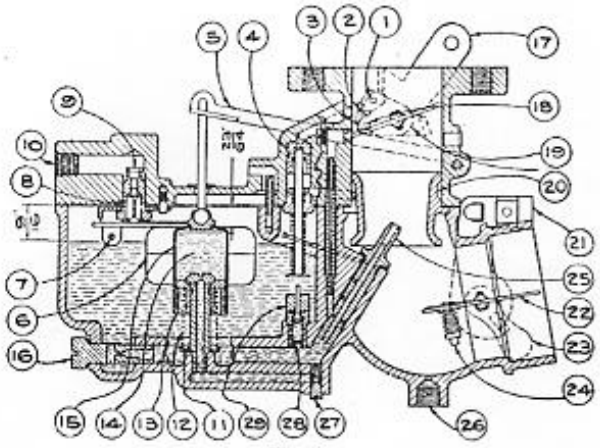

Fig. 3

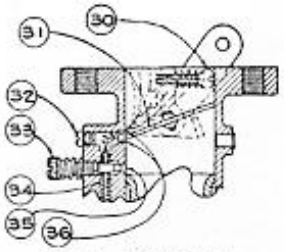

Fig. 4. Idle action.

carburetor is intended. The size of the main metering jet (16) is stamped on the outer face of the jet in decimal parts of an inch.

If the engine does not run smooth at above throttle position, it is very easy to check if the mixture is lean; simply pull out the choke very gradually and observe whether or not the engine speeds up. If the engine speed is increased materially by partly closing the choke, it indicates that either water or dirt has lodged in the main metering jet (16) or that this jet is too small for the kind of fuel used, or the temperature at which engine is operating.

Low speed or idling adjustment: To adjust for low speed or idling, slow the engine down gradually by fully closing the throttle lever on the steering wheel or throttle control on the instrument board, then turn the idle adjusting needle (33) to right and left until the engine runs smooth for this throttle position. This adjustment controls the air for the low speed or idling mixture; therefore, screwing the idle adjusting needle *in* (to right) gives a richer mixture, *out* (to left) a leaner mixture. If, after this adjustment is made, the engine idles too fast, turn the throttle stop screw (30) to left, or counter-clockwise, until the desired idling speed is reached. If the engine idles too slow, as indicated by its rolling and stalling easily, turn the throttle stop screw to right, or clockwise, to increase the idling speed. When the engine is idling properly, there should be a steady hiss in the carburetor.

Checking and adjusting float level: 1—*The fuel level in the float chamber* is set correctly at the factory and should require no adjustment (unless high test fuel is used).

2—*The correct setting of the float* (6) *for low test fuel*, such as is commonly used in the United States and Canada, is given on the float chamber drawing (Fig. 2). For model URO-1 and UR-2 carburetors, the distance measured from the lower surface, or gasket face, of the float chamber cover to the top of float (6), at center of same, is 23/64″.

When using high test fuel, as sold in many foreign countries, it is necessary to readjust the float (6) to 13/32″.

Starting and Warming Up

To start engine when cold, open the throttle lever on the steering wheel until the accelerator button moves downward at least one-fourth of its travel, throw on the switch and simultaneously depress the starter button and pull out the choke control all the way for a period of one to five seconds (depending on the atmospheric temperature), returning the control slightly as engine begins to fire. If the engine is very cold, open the throttle a little farther.

Do not crank the engine with the control all the way out more than fifteen seconds continuously, as this floods the carburetor unnecessarily; stopping a moment will allow the unvaporized fuel to drain out.

For hand cranking in cold weather, retard the spark half way, open the throttle as above described, and pull out the choke control all the way during two or three turns of the crank with the *ignition switch off*, then push the choke control in about one-quarter of the way, *turn on the ignition switch* and give the crank one or several more turns, when the engine should start.

If trouble is experienced in hard starting, the choke (22) and the poppet valve (24) should be inspected to make sure they are not binding. The choke valve (22) should be closed completely when the choke control on the instrument board is all the way out; and wide open when the choke control is all the way in.

In countries where cold weather prevails during the winter months, temperatures ranging from 20° Fahrenheit to anywhere from 5° to 20° below zero Fahrenheit, it is necessary to partly cover the radiator in order to obtain satisfactory operation.

A FEW COMMON COMPLAINTS DIAGNOSED[1]

Of particular interest to service men and mechanics is this special section which is taken from a service bulletin[1] issued by the Bendix Stromberg Carburetor Co.

Complaint of Fuel Consumption

Examine carburetor choke valve (22) and make sure that it is wide open (horizontal position) when the dash control is pushed in all the way or turned to fully open position.

The fact that the fuel consumed by the engine passes through the carburetor has led to the assumption that the carburetor is entirely responsible for the amount of fuel used; such, however, is not the case. In new as well as in older cars, conditions frequently exist that affect the fuel consumption to a far greater extent than the carburetor. **For instance:**

(a) *High engine friction*, due to new and tightly fitted bearings.

(b) *Low compression*—this may be caused by new pistons and piston rings that have not had sufficient time to lap in properly (a condition which frequently exists in new or completely over-hauled engines), or valve tappets adjusted so close that the valves do not seat properly.

(c) *Late ignition timing*, or incorrectly adjusted distributor breaker points and spark plugs.

(d) *Dragging brakes, tight wheel bearings, and lack of lubrication, or incorrect lubrication*, of wheels, transmission, and differential; conditions which occasionally exist in new as well as in older automobiles and result in unnecessarily high rolling resistance with the consequent increase in fuel consumption.

To check the rolling resistance (retardation), drive the automobile at 27 or 30 miles per hour on a level road, cement, brick, or other hard surface, declutch, and place gear shift lever in neutral position, then check the time it takes to coast (decelerate) from 25 miles per hour to 5 miles per hour. It is best to take the average of both directions.

If the time to decelerate from 25 miles per hour to 5 miles per hour is less than 55 seconds, the adjustment of brakes and wheels, as well as tire pressure, should be examined. A decrease in deceleration time of say 15 or 20 seconds can easily account for a loss in gasoline mileage of from 2 to 4 miles per gallon at 25 miles per hour.

[1]From Stromberg *service bulletin* of model "UR" carburetor.

Complaint on Lack of Speed and Power

1—*Examine carburetor throttle valve* (31) and make sure that it is wide open (perpendicular) when the accelerator pedal is pushed to floor-board.

2—*Examine carburetor choke valve* (22) and make sure that it is wide open (horizontal position) when the dash control is pushed in all the way, or turned to fully open position.

3—*Check main metering jet* (16) *and by-pass restriction* (28) and make sure that water or dirt does not obstruct same.

4—*Examine fuel line and connections*, and make sure that the fuel flows to the carburetor in a free and steady stream.

5—*Examine carburetor float chamber* for water and dirt, and make sure the float level is adjusted in accordance with dimensions given on page 38.

In addition to inspecting the carburetor as mentioned above, it is well to check the following other units:

(a) *Vacuum tank and its connections*, making certain that fuel from the main tank flows in a free and steady stream, to the vacuum tank. Where fuel pump is used instead of vacuum tank, check fuel delivery (by disconnecting carburetor gasoline union and allowing starting motor to turn over the engine).

(b) *Examine ignition timing* and see that same is set in accordance with manufacturer's specifications.

(c) *Examine spark plug gaps* and set same in accordance with manufacturer's specifications.

(d) *Examine distributor breaker points* and see that they are adjusted in accordance with manufacturer's specifications. Where double breaker points are used, such as on some six and eight cylinder engines, it is important that the breaker points are correctly synchronized.

(e) *Check valve timing and other important adjustments of the engine* and see that same are in accordance with instructions in manufacturer's instruction book.

(f) *Check muffler* and make certain that same is not plugged up, a condition which may be found in cars that have been driven for a considerable time.

(g) *Check car for coasting* (deceleration) as previously outlined.

(h) *In many sections of the United States and in some foreign countries, high test fuels are available throughout the year.* Many of these high test fuels, sold under different trade names, are very volatile and commence *to boil at quite low temperatures.* If such fuels are used during the warm weather, or summer months, *gas pockets* may form in the vacuum tank, fuel pump, fuel line, or carburetor, and may result in irregular or uneven running of engine, even to the extent of continuous missing, and in some cases back-firing.

It is recommended that owners of automobiles having engines equipped with hot-spot intake manifolds avoid using these volatile high test fuels during warm weather, or summer months.

Complaints on Hesitation or So-Called Flat Spot on Acceleration

1—*As stated in previous paragraphs, examine choke valve* (22) in carburetor. If choke valve (22) is not fully open, the mixture will become excessively rich after engine reaches normal temperature resulting in a sluggish action of the engine. Again, this complaint of hesitation, or flat spot, may in summer be due to too much accelerating charge (extra fuel), or in winter (cold weather), due to a lack of fuel on acceleration (sudden opening of the throttle).

Check the accelerating pump and make sure that fuel is delivered promptly when the throttle is opened, also check pump reducer (27) and make sure that dirt or water has not collected in the pump reducer (27) or its passage.

2—*Faulty ignition*: When throttle is suddenly opened, the pressure in the cylinders is increased rapidly, and if ignition coil is weak, or distributor breaker points, or spark plugs are not properly adjusted, an ignition miss is liable to occur, which again results in a sluggish action, or hesitation, of the engine.

3—*Examine high tension wires* (spark plug wires). Also make sure that the high tension wire leading from the ignition coil to the distributor is either carried in a separate conduit or outside of the conduit containing the high tension wires (leading from the distributor to spark plugs).

4—*If high test or very volatile fuel is used in warm weather*, or during summer months, *gas pockets* from boiling fuel may form in the vacuum tank, fuel pump, fuel line, or carburetor, and may result in a hesitation, or flat spot, on acceleration.

STROMBERG MODEL "UUR-2" TWIN CARBURETOR[1]

General Description

The Model "UUR-2" is a twin carburetor employing standard Stromberg construction, together with the following improvements:

A positive acting accelerating device, consisting of a pump which delivers an accelerating charge directly into the manifold immediately the throttle is opened, and meters and delivers this charge over a definite period of time. The pump is entirely separated from the metering system and is controlled by a needle adjustment.

An economizer, which insures a lean and economical mixture at normal driving speeds, and automatically supplies the richer mixture necessary for maximum power, high speed, and part throttle while accelerating.

Idle and low speed jets above the throttle with separate adjustments for each barrel.

A relief poppet valve in the choke valve to prevent overchoking.

Mixture ratio: Correct mixture is maintained at all speeds and loads by the air bled principle. Air is drawn into the center passage of the main discharge jet (32) through a series of small holes, located below the fuel level, which are fed by air bleeders (32b). Air, introduced into the fuel stream, eliminates the retarding action of surface tension at low suction and restricts the fuel flow at high suction, thus controlling the mixture ratio under all conditions.

[1]From Stromberg *service bulletin* of model "UUR-2" twin carburetor.