STROMBERG CARBURETORS

Instructions for

TYPE "U"

Die Cast

Our Guarantee

Stromberg carburetors are sold under a guarantee as to material and workmanship, and any carburetor or parts thereof proving defective within a period of ninety days will be repaired or replaced free of charge upon their return to our factory, all transportation charges prepaid.

Important

Give us the name of the parts wanted, the Type and Serial Number of the carburetor, and the Make and Model of car for which parts are being ordered. This number appears on the top of the Float Chamber Cover.

If you will follow the directions your order will be properly filled from your first letter, and you will save yourself much delay and inconvenience.

We have, located in all the principal cities of the country, sales branches, distributors and service stations, each equipped to install and repair Stromberg Carburetors, and to render prompt and courteous service to any Stromberg user regardless of where carburetor may have been purchased. At each of these service stations you will find expert mechanics thoroughly versed in the regulation and requirements of all our different models. This service is at the command of all users of Stromberg Carburetors.

Sectional Views of the "U" Type (Die Cast) Carburetor

FIG. 1

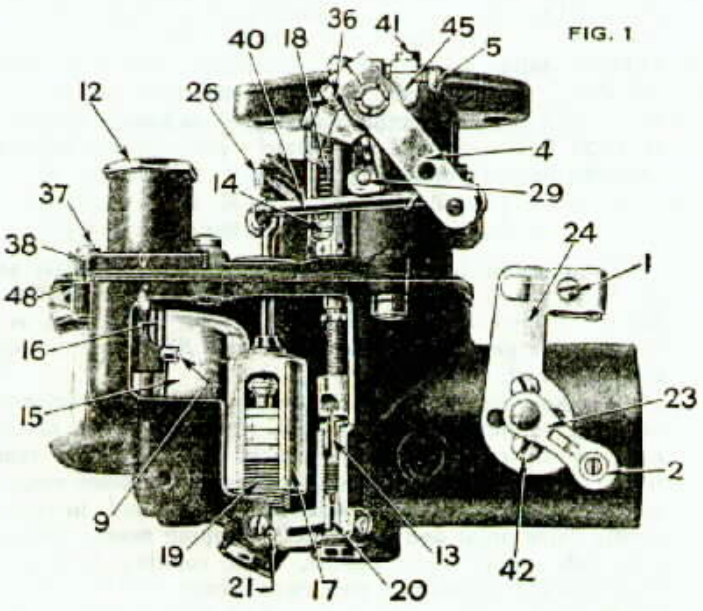
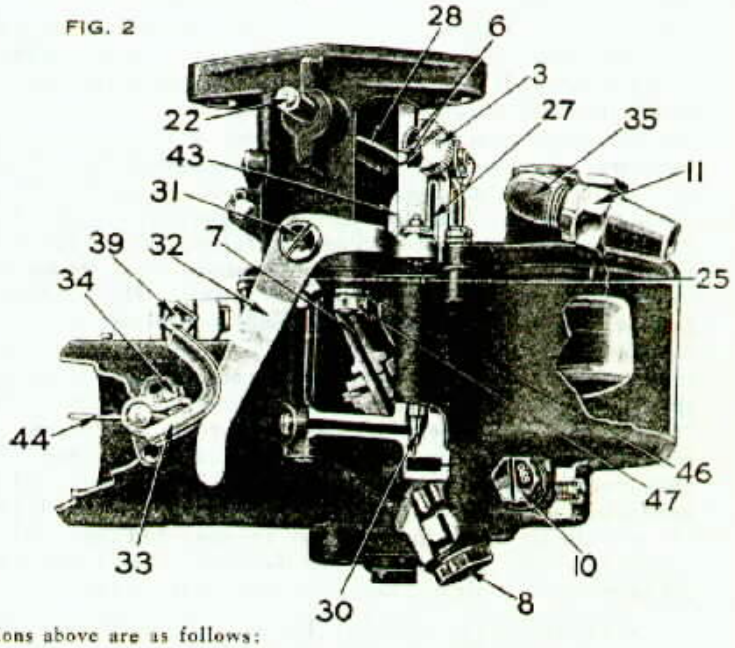


FIG. 2



Parts indicated in illustrations above are as follows:

1. Choke Control Tube Clamp Screw
2. Choke Lever Wire Clamp Screw
3. Idling Needle Valve
4. Throttle Lever
5. Throttle Stop Set Screw
6. Idle Discharge Holes
*7. Main Discharge Jet
8. Main Discharge Jet Plug
9. Float Fulcrum Pin
*10. Main Metering Jet
11. Gasoline Union Nut
12. Strainer Plug
13. Economizer Needle Valve
14. Vacuum Economizer Piston
15. Float
**16. Float Needle Valve and Float Needle Valve Seat
**17. Accelerating Pump Piston and Sleeve
18. Vacuum Economizer Piston Spring
19. Accelerating Pump Piston Spring
*20. By-Pass Metering Jet (Economizer)
21. Pump Discharge Jet
22. Throttle Lever Stem
23. Choke Lever and Stem
24. Choke Control Tube Holder
25. Float Setting (see instructions)
26. Idle Discharge Channel Plug
27. Idle Tube
28. Throttle Valve
29. Accelerating Pump Control Lever and Roller
30. Auxiliary Needle Valve
31. Auxiliary Control Lever Fulcrum Screw
32. Auxiliary Control Lever
33. Auxiliary Cam
34. Auxiliary Cam Clamp Screw
35. Gasoline Union Elbow
36. Throttle Lever Clamp Screw
37. Main Body Attaching Screws
38. Main Body Attaching Screw Washers
39. Choke Tube Holder Clamp Screw Nut
40. Accelerating Pump Lever
41. Throttle Stop Clamp Screw
42. Choke Tube Holder Attaching Screws
*43. Venturi Tube
44. Choke Valve
45. Throttle Stop
46. Throttle Valve Body Attaching Screw Washer
47. Throttle Valve Body Attaching Screw
48. Main Body Gasket

***IMPORTANT:** When ordering venturi tubes, high speed bleeders, metering jets, pump discharge jets, or by-pass jets, specify the size number which is found stamped on each part, and always state type of carburetor and serial number as well as model and make of car for which part is intended.

****NOTE:** These items must be ordered complete.

The "U" series of carburetors are of the vertical plain tube type, employing the following features:

A new semi-automatic device for starting.

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

Idle and low speed jets below the throttle, with separate idle adjustments for smooth, low speed performance.

An economizer which permits the carburetor to operate on a very lean and economical mixture at the closed throttle positions of average driving, and automatically shifts to the needed richer setting when the full power of the engine is called for.

Note

The internal specifications of the carburetor and the adjustments given have been selected for the use of gasoline 56 to 60 degrees Baume, with end boiling point 400 to 450 degrees Fahrenheit. Information regarding the adjustments for very high grade gasolines or benzol mixtures may be obtained at the Stromberg Carburetor Service Stations in the sections of the country where these fuels are sold.

The present low grade gasolines contain a large percentage of kerosene elements which do not evaporate in the intake manifold but remain in liquid form; after shutting off the engine, particularly in cold weather, this kerosene which has been held in the intake manifold will drain back out of the carburetor. This is unavoidable and should not be taken as an indication that the carburetor is "flooding" or "leaking." These gasolines sometimes contain heavy lubricating oil components which creep up the walls of the carburetor and spread over the outside surface, the only remedy for this is the purchase of a better grade of fuel.

Adjustments

If engine, after running satisfactorily, then ceases to perform properly, look over carburetor connections, etc., BUT DO NOT CHANGE THE ADJUSTMENTS until other causes of trouble have been investigated. Carburetor adjustments should only be necessitated by changes in fuel or seasonal changes in weather. There are many other things on the engine subject to derangement besides the carburetor. Ninety per cent of the so-called carburetor trouble is due to fouled spark plugs, improper spacing of spark plug or ignition breaker points, intake manifold leaks, or lack of compression in the cylinders due to valves not seating tightly.

LOW SPEED ADJUSTMENT: The carburetor should carry the correct adjustment when delivered from the factory or car dealer. If the adjustment has been tampered with it may be restored as follows: Have engine well warmed up, so that the intake pipe above the carburetor is at least warm to the hand. Then slow engine down by gradual motion of the throttle lever on steering wheel till minimum steady idling speed is reached. Turn low speed adjustment "3" gradually right or left till steadiest running, and fastest running for that throttle position is obtained. This adjustment operates on air so that screwing it *IN* gives a *RICHER* mixture, *OUT* a *LEANER* one. If after this adjustment is made engine idles too fast, turn the small throttle stop screw at "5" counter-clockwise to reduce the minimum throttle opening until the desired idling speed is reached. If engine idles too slow, as shown by its "rolling" and stalling easily, screw the throttle stop screw inward or clockwise to increase the minimum idling speed. If after everything has been checked it is still impossible to get a satisfactory idle, remove plug "26" and see that the two holes "6" near the lip of the throttle valve are open and clean. Also remove idle tube "27" and see that the small holes in the ends are open and that air can be blown through the tube.

INTERMEDIATE SPEED: The mixture at intermediate speeds is controlled by the size of the Main metering orifice, "10." The size of this metering orifice is stamped on the outer face of the jet in decimal parts of an inch. This metering orifice has been calibrated at the factory to supply the proper amounts of fuel, and should not be changed without special instructions.

Some carburetors are equipped with an adjustable needle on the metering orifice which affords a variable high speed adjustment.

WIDE OPEN SPEED: With wide open throttle an additional quantity of fuel is supplied by the By-Pass metering jet, "20."

ACCELERATING PUMP: The quantity of fuel delivered by the accelerating pump is controlled by pump discharge jet "21." The drill size of the pump discharge jet is properly determined at the factory for normal operating conditions.

Starting and Warming Up

For starting in cold weather, open hand throttle about *ONE-THIRD*, throw on the switch, pull choker out all the way and step on the starter button. *HOLD* the choker *OUT* (control on dash) all the way until the engine starts, then open choker (push in control) slowly and close the throttle slightly until the engine is running at a fairly fast speed. Adjust choker until engine runs smoothly and allow engine to warm up slightly before attempting to drive. When the dash control is all the way out it is essential that the choke valve in the carburetor entrance is closed *COMPLETELY*. For starting with the engine warm, *OPEN* throttle to about a *30 MILES AN HOUR* driving speed, turn on switch and step on starter. If a start is not made immediately, pull choker control out for an *INSTANT* only and immediately push choker control in again to normal position.

Float Level Adjustment

The gasoline level in the float chamber is properly set at the factory and should require no adjustment when the carburetor is assembled on the car. When the engine is not running, the gasoline level should stand $\frac{5}{16}$" below the top of the float bowl.

If carburetor floods continuously (a certain amount of dripping of unvaporized gasoline from the intake manifold may be expected after stopping in cold weather) remove strainer body bolt "12," clean strainer, and replace same. If flooding continues, take carburetor apart and inspect the needle valve point and seat "16." Tapping needle valve into seat with screw driver handle, while rotating it in several positions, will sometimes give more secure closure. If needle valve point shows a definite groove of wear, a new valve and seat should be fitted.

Readjustment of the float setting is necessary only when rough handling of the carburetor or some other cause has changed the gasoline level. The correct setting for the U-1 is $\frac{11}{64}$", and for the U-2 and U-3 carburetors is $\frac{3}{4}$". (shown as No. "25") from the lower surface or gasket face of the cover to the top of the float at the center. Readjustment may be made by bending the float lever arm in the corner between where it touches the float needle and where it meets the float body. If float is low, bend arm so as to move float upward toward float chamber cover the same distance as the level needs correction; that is, to raise the level $\frac{1}{16}$", bend the float up $\frac{1}{16}$". To lower the level hold the float arm tight where it touches the needle and bend the float downward away from the float chamber cover.

Stromberg Motor Devices Company

SERVICE BULLETIN

STROMBERG CARBURETOR "The Accepted Standard"

STROMBERG CARBURETOR Model U-Vacuum Econ.

U-VACUUM ECONOMIZER CARBURETOR

This bulletin gives a complete description of the Model U-Vacuum Economizer Carburetor, explaining its principles of operation and design, outlining all adjustments and service requirements.

Of particular interest to service men and mechanics is the special section, entitled: "A Few Common Complaints Diagnosed." Here are analyzed a number of the troubles attributed to the carburetor with tips on how to correct them.

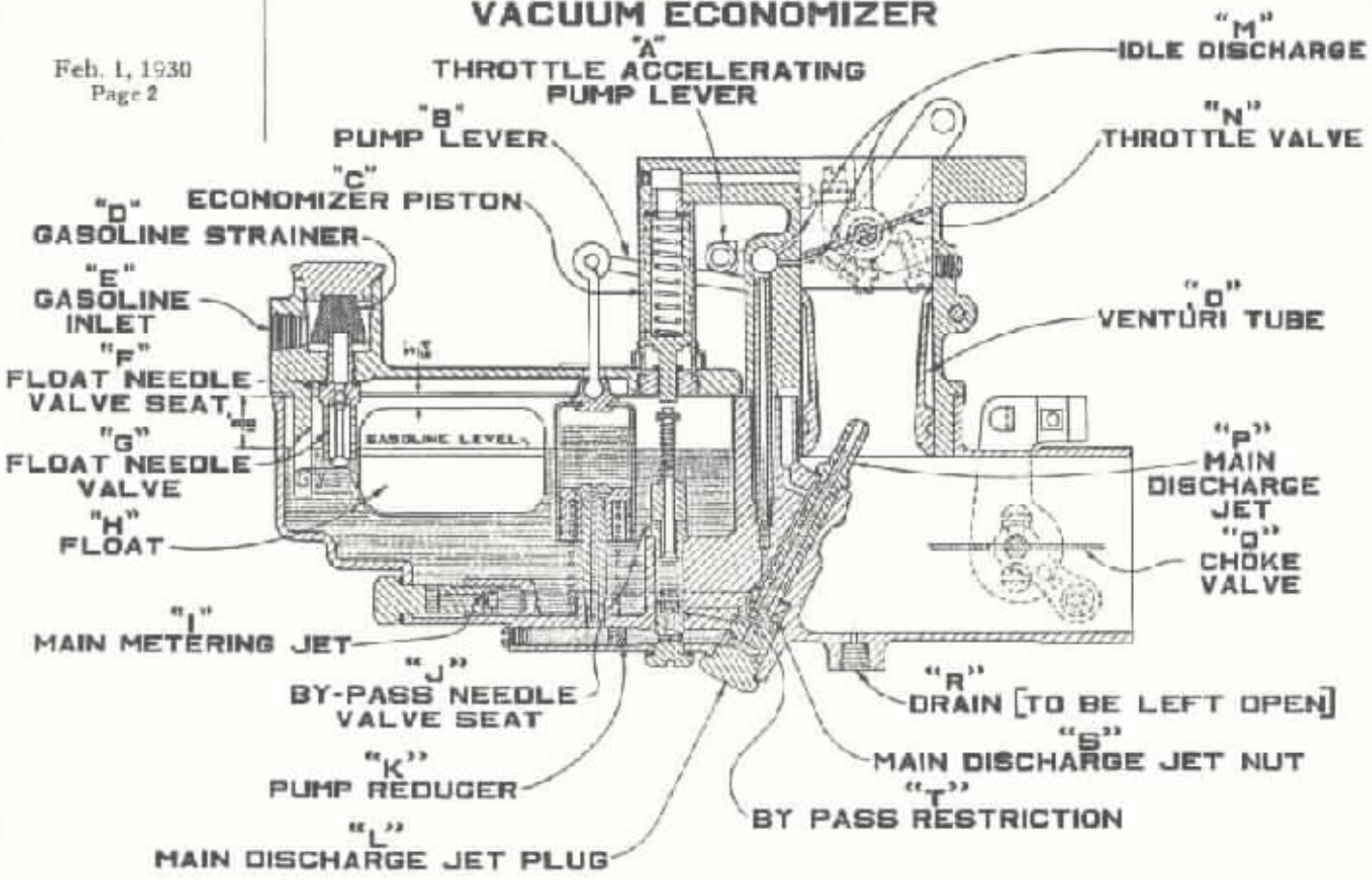
H. A. HANSEN,

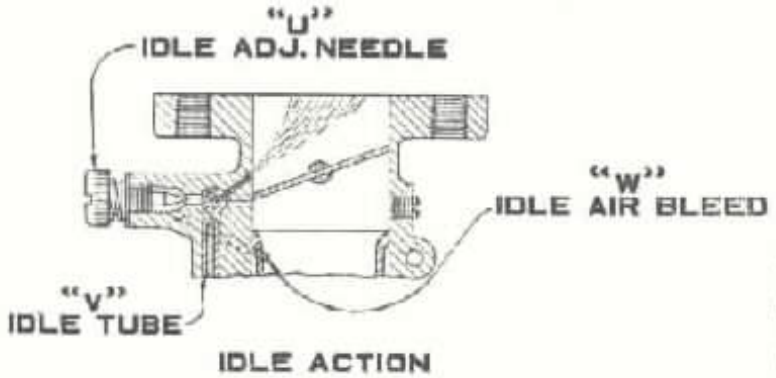
Branch Manager.

STROMBERG CARBURETOR
The Accepted Standard

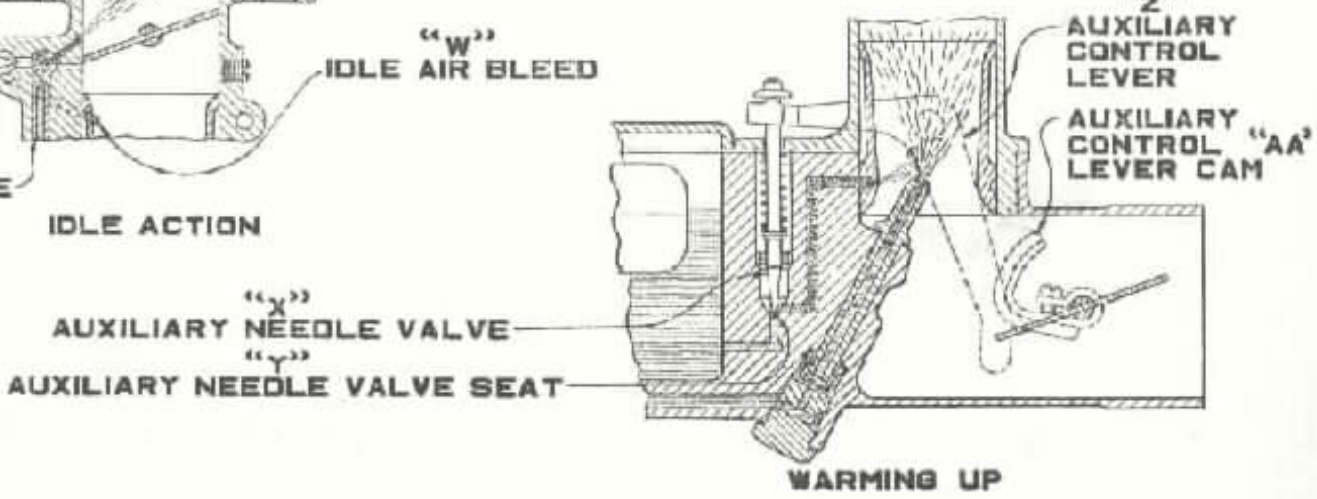
'U' TYPE CARBURETOR

VACUUM ECONOMIZER





IDLE ACTION



WARMING UP

GENERAL DESCRIPTION

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

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

A new positive acting accelerating pump which supplies the extra amount of fuel necessary for quick acceleration.

An auxiliary gasoline control interconnected with the choke valve to help starting and warming up in cold weather.

* * *

In the "U" type carburetor, shown in cross section on page 2, fuel enters through the gasoline inlet ("E"), flows through the gasoline strainer ("D") and float needle valve seat ("F") into the float chamber in which is located the float ("H") which automatically maintains the correct fuel level.

From the float chamber, the fuel flows through the main metering jet ("I") to the main discharge jet ("P") or to the idle discharge ("M"), depending on how far the throttle valve ("N") is open.

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

FREE AIR FLOW AT HIGH VELOCITY AIDS ATOMIZATION

In the main air passage of the carburetor is located the venturi tube ("O"), a specially shaped orifice which insures high air velocity at the main discharge jet ("P") with the least possible restriction.

CORRECT MIXTURE RATIO IS MAINTAINED AUTOMATICALLY BY AIR BLED PRINCIPLE

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 ("P") 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.

ECONOMIZER DEVICE

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 ("I"), 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 ("C") 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 ("T").

The additional amount of fuel delivered through the by-pass restriction ("T") together with the fuel delivered through the main metering jet ("I") 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 ("K"), located in the accelerating pump channel, controls the amount of extra fuel for acceleration.

CHOKE VALVE AND AUXILIARY GASOLINE CONTROL AIDS IN STARTING AND OPERATING COLD ENGINE

The choke valve ("Q") is connected to what is known as the choke control (located on the instrument-board). This valve must be fully closed for starting and partly closed during the period of warming up, that is, until the engine reaches normal operating temperature, approximately 160° Fahrenheit. Attached to the choke valve shaft is a cam, known as the auxiliary control lever cam ("AA") which during the first part of the choke travel lifts the auxiliary control lever ("Z") and auxiliary needle valve ("X") from its seat ("Y"), admitting an extra amount of fuel through the auxiliary needle valve seat ("Y") into the air stream at the throat of the venturi tube ("O"). This extra fuel enrichens the mixture and makes it possible to operate the engine smoothly during the warming up period.

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.

CARBURETOR 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 ("I") is calibrated at the factory to supply the proper amount of fuel at high and intermediate speeds of the engine for which the carburetor is intended. The size of the main metering jet ("I") 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 ("I") 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 ("U") 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 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.

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 regularly experienced with starting, make sure that the choke valve ("Q") in the carburetor shuts tight when the control button on dash is all the way out; also make certain that the choke valve ("Q") is wide open, when the choke is pushed 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.

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 ("H") for low test fuel, such as is commonly used in the United States and Canada, is given on the float chamber drawing (page 2). For model U-1 carburetor, the distance measured from the lower surface, or gasket face, of the float chamber cover to the top of float ("H"), at center of same, is 11/64". For the model U-2, UX-2, U-3, and UX-3 carburetors, the distance is 3/64", measured in same manner as outlined above.

When using high test fuel, as sold in many foreign countries, it is necessary to readjust the float ("H") to the measurements given for high test fuel; that is, 7/32" for U-1 carburetor, and 3/32" for U-2, UX-2, U-3, and UX-3 carburetors, measurements taken at same place as above.

A FEW COMMON COMPLAINTS DIAGNOSED

COMPLAINT OF FUEL CONSUMPTION

1—Examine carburetor choke valve ("Q") 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.

2—Examine auxiliary needle valve ("X") and make sure that this valve seats properly when the choke is in wide 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.

COMPLAINT ON LACK OF SPEED AND POWER

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

2—Examine carburetor choke valve ("Q") 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—Examine auxiliary needle valve ("X") and make sure that this valve seats properly when choke is in wide open position.

4—Check main metering jet ("I") and by-pass restriction ("T") and make sure that water or dirt does not obstruct same.

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

6—Examine carburetor float chamber for water and dirt, and make sure the float level is adjusted in accordance with dimensions given on page 6.

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 ("Q") and auxiliary needle valve ("X") in carburetor. If choke valve ("Q") is not fully open and auxiliary needle valve ("X") does not seat properly, 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 ("K") and make sure that dirt or water has not collected in the pump reducer ("K") 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.