United Delco

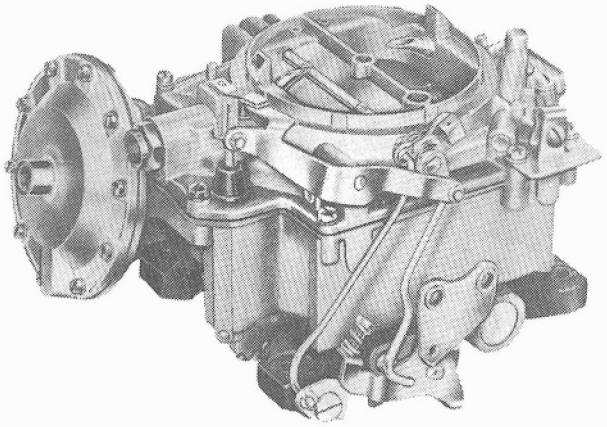
BULLETIN 9D-4
MODELS 4G, 4GC
JUNE, 1964
PAGE 1
FILE IN "D" SECTION
REPLACES BULLETIN 9D-9

MODELS 4G, 4GC SERVICE MANUAL

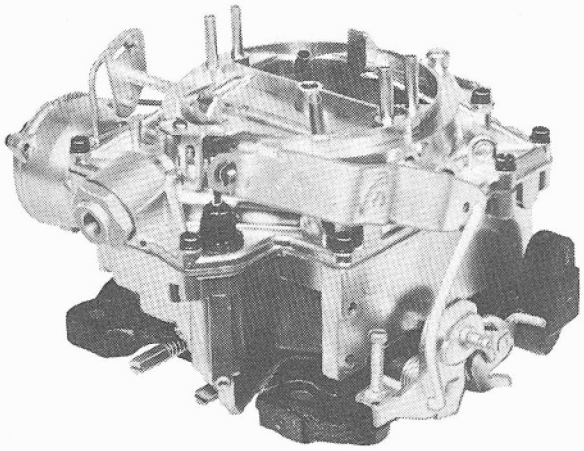
Delco Rochester

PRICE 25 cents

Delco Rochester



MODEL 4G
(VACUUM GOVERNOR)



MODEL 4GC

GENERAL DESCRIPTION

The Model 4G and 4GC carburetors are a 4-bore downdraft type which provide the advantages of two 2-bore carburetors in one unit. The Model 4G carburetor has a manually operated choke while the Model 4GC has a completely automatic choke. Some Model 4G carburetors are equipped with a vacuum controlled governor to control engine speed (R.P.M.) on heavy duty truck applications.

The 4-bore Rochester carburetor has a concentric float bowl which allows the fuel in the float bowl to completely surround the bore and venturi. This has advantages because the correct fuel level can be maintained for efficient metering during cornering or up and down hill operation of the vehicle.

The Rochester air bled main well system is used with a removable venturi cluster. The venturi cluster contains the main metering parts of the carburetor and can easily be removed for cleaning and inspection. The cluster is insulated from the float bowl by a mounting gasket. The main well and idle tubes are suspended in the fuel in the main fuel well. Both the above tend to insulate the main metering parts from engine heat. This insulation helps prevent fuel vapors caused by engine heat from disrupting carburetor metering.

To aid in description and the proper identification of parts, the carburetor is divided into a *primary* and *secondary* side.

The *primary side* covers the forward half of the carburetor assembly. This section is essentially a complete 2-bore carburetor containing a float system, adjustable idle system, main metering system, pump system, power system and choke system.

The *secondary side* is a supplementary 2-bore carburetor which feeds extra air and fuel to the engine when needed for power requirements. This section contains a float system, main metering system and, on some applications, a fixed idle system. It has a set of throttle valves and separate auxiliary valves which are located in the bores above the throttle valves.

The primary throttle valves are operated by the accelerator pedal which is connected by linkage to the primary throttle lever. The secondary throttle valves are operated by linkage which is connected to another lever on the primary throttle shaft. The secondary throttle linkage is designed so that the secondary valves do not begin to open until sufficient air velocity can be maintained through the carburetor for good metering. Although the secondary valves do not begin to open until after the primary throttle valves are partially open, they both reach the wide open position at the same time. This is accomplished by lever ratios between the primary and secondary throttle levers.

OPERATING SYSTEMS

There are six basic operating systems used in the Model 4G and 4GC carburetors. They are float, idle, main metering, power, pump and choke systems. The following text covers each system separately to provide a thorough understanding of the system for ease in trouble-shooting.

Float Systems (Fig. 1)(Fig. 2)(Fig. 3)

Each side of the carburetor has a separate and independent float system, consisting of a float chamber formed by a partition in the float bowl, a dual pontoon float, a float needle valve and valve seat.

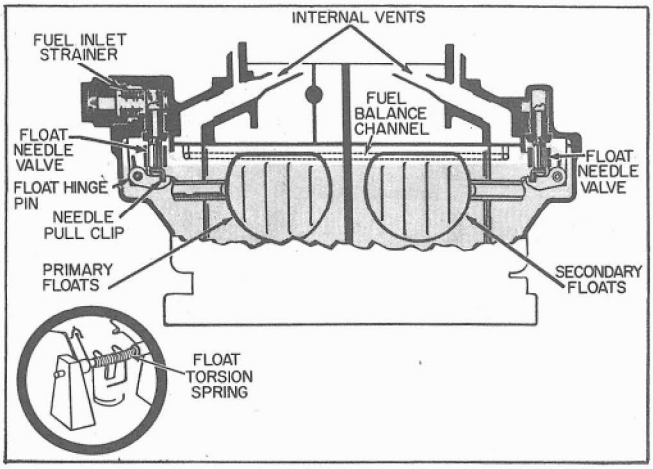


FIGURE 1

Fuel enters the carburetor through the fuel inlet in the primary side of the air horn. From this point fuel flows to the separate float chambers through a horizontal passage in the air horn. When the fuel reaches the prescribed level in each float chamber, the float moves the needle valve against its seat to shut off the flow of fuel.

There is a fuel balance channel located in the side of the float bowl above normal fuel level which connects the fuel chambers on the primary and secondary sides. In this way, any abnormal rise in fuel level in one side of the carburetor bowl will automatically balance with the other side.

Both high and low float bowl designs are used in the Rochester 4-bore carburetors. The type used is dependent upon engine demands and underhood clearance. Both round and "D" shaped float pontoons are used in the high float bowl. A smaller wedge shaped float is used in the low bowl design.

Float assist springs are used on some high bowl and all low bowl applications. Their purpose is to assist the floats in holding the float needle valve closed, especially where fuel pressures are encountered.

The following types of float assemblies and assist springs are used.

A. Figure 1 (see inset) A torsion spring wrapped around the float hinge pin with one end fastened to the float arm and the other end resting on the needle seat. This design is normally used with the high float bowl and the "D" shaped float.

B. Figure 2. A float balance spring is installed between the float hanger posts to apply pressure on the float tang at the rear of the float arm. The spring tension against the tang determines the float drop and will affect fuel level. With this type assist spring float drop setting is very critical.

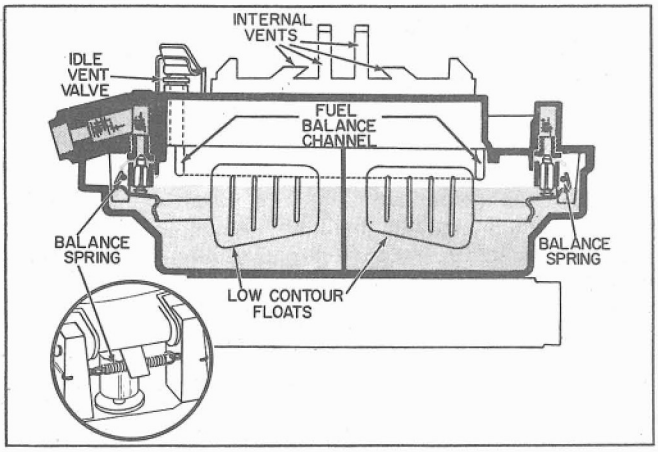


FIGURE 2

C. Figure 3. A coiled spring located on the power piston stem exerts pressure on a tang on the float arm, whenever the power piston is in the up position. During heavy acceleration or power system operation, the power piston drops and releases all pressure applied to the tang. This allows maximum float drop under heavy fuel demands and assists in closing the needle under normal operation. With this system, a vacuum assist spring adjustment is necessary.

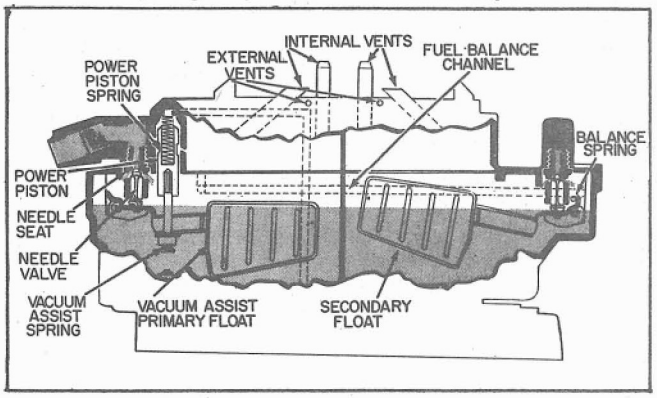


FIGURE 3

Both sides of the carburetor are individually and internally vented by the tubes as shown in Figure 3. These vents transmit the air pressure from beneath the air cleaner to the fuel in the float bowl. The amount of fuel metered by the carburetor depends upon the pressure in the bowl.

Some applications have external vent holes drilled in the upper part of the air horn. These fixed external vents allow any fuel vapors which may form in the fuel bowl to be vented to the outside. This helps idle and hard starting during periods of hot operation.