BASIC OPERATION:

In this installation, three Rochester 2 jet carburetors are mounted in tandem. The center carburetor of the trio, called the primary carburetor, contains all the conventional systems of carburetion, including Float, Idle, Part Throttle, Power, Pump and Choke. The Front and Rear carburetors, called the secondary carburetors, contain only Float, Pump and Main Metering Systems. The Primary carburetor is the only one used during idle, warm up and part throttle operation. During idle and low speeds, the two secondary carburetors are kept out of operation by closing springs externally attached to the throttle shafts.

The throttle valves and accelerator pumps on the secondary carburetors are operated by a vacuum diaphragm which is controlled by a vacuum switch mounted on the center carburetor. The throttle shafts on the outside carburetors are connected by common rods, so they will both operate simultaneously, controlled by the vacuum diaphragm.

During idle and part throttle ranges the center carburetor feeds fuel while the outside carburetors remain out of operation. The two outside carburetors operate in the following manner: A vacuum switch located on the center carburetor is operated by a tang on the accelerator pump lever. The vacuum switch is connected directly to the vacuum booster pump on the engine. The switch also has a vacuum line which runs to the vacuum diaphragm. This vacuum diaphragm is connected by linkage to the throttle lever on the front carburetor.

On normal acceleration the center carburetor feeds air and fuel until the throttle valves are opened approximately 60 degrees. When the throttle valves reach 60 degrees on the center carburetor, it automatically opens the vacuum switch which applies vacuum to the diaphragm. Vacuum applied to this diaphragm opens the throttle valves on both front and rear carburetors simultaneously feeding fuel from the accelerating and main metering systems.

On deceleration the vacuum switch closes, shutting off all vacuum applied to the diaphragm. Air is then bled from inside the carburetor air horn by another line through the vacuum switch to the vacuum diaphragm unit, allowing the diaphragm to return to its normal position under spring tension, thereby closing the throttle valves on both outside carburetors. The two outside carburetors feed fuel and air at any time the throttle valves in the center carburetor are opened approximately 60 degrees or more.

The choke operates basically the same as the choke on the standard 2-jet carburetor. However, there is a lockout lever located on the front carburetor connected to the choke shaft by a rod. This lockout lever automatically keeps the front and rear carburetors out of operation by locking the throttle valves closed until the engine is thoroughly warm.
TRIPLE TWO BARREL CARBURETOR INSTALLATION
(REAR DIAPHRAGM MOUNT)

BASIC OPERATION:
On some three two-barrel carburetor installations the vacuum diaphragm is mounted on the rear carburetor and is connected to the rear carburetor throttle lever by a link. The choke lockout lever is also mounted on the rear carburetor and is connected to the center carburetor choke valve by the lockout rod.

The operation of this type installation is identical with the standard unit previously described. The only differences are in the vacuum diaphragm and choke lockout adjustments which are made on the rear carburetor, instead of the front carburetor.

CARBURETOR SYSTEMS

There are six basic systems incorporated in the Rochester 2-jet carburetor used in the triple-two barrel installation. They are Float, idle, part throttle, power, accelerating pump and choke.

All six systems are used in the center carburetor while the secondary carburetors (front and rear) have the float, part throttle and accelerating pump systems only.

The systems are identical in operation on all triple-two barrel carburetor installations except for minor calibration differences. The following explanation and illustrations show how each system operates to provide efficient carburetion throughout all operating conditions.

FLOAT SYSTEM:
(All Three Carburetors)
The float system controls the level of fuel in the carburetor bowl. Entering fuel first travels through the inlet strainer (1) to remove particles which might block jets or passages. Then the fuel passes through the needle and seat (2) into the carburetor bowl. Flow continues until the rising liquid level raises the float (3) to a position where the needle valve (2) is closed. Thus, the fuel level can be regulated by setting the float to close the valve when the proper level is reached.

The float tang (4) allows correct float drop for sufficient fuel flow. A float needle pull clip (5) connecting the float arm to the needle valve keeps the needle from sticking closed in the seat.

The float bowl is internally (6) and externally (7) vented in the center carburetor. The front and rear carburetors are internally vented (6) to eliminate any possible change in fuel/air mixture due to air cleaner restriction. The center carburetor is externally vented to the atmosphere for idle operation.
IDLE SYSTEM:
(Center Carburetor Only)

The idle system consists of the idle tubes (1), idle passages (2), idle air bleeds (3) and (4), idle adjustment needles (5), idle discharge holes (6), and the idle needle adjusting hole (7).

In the low idle speed position, the throttle valve (8) is slightly open, allowing a small amount of air to pass between the wall of the carburetor bore and the edge of the throttle valve.

The idle needle hole (7) is in the high vacuum area below the throttle valve, but the fuel is vented to atmospheric pressure.

The fuel is drawn from the bowl through the main metering jets (9) into the main well (13). It is metered by the idle fuel metering orifice at the lower tip of the idle tube (1) and travels up the idle tube. When the fuel reaches the top of the idle tube, it mixes with air drawn through the first idle air bleed (3) and the mixture moves through the horizontal idle passage.

Air enters the second idle air bleed (4) and combines with the mixture which then passes through the restriction (10) and down the vertical idle passage to the idle discharge holes (6) located just above the throttle valve where more air is added to the mixture. The mixture then passes through the idle needle hole (7) and into the bore of the carburetor.

In addition to this mixture of fuel and air, there is air entering the bore of the carburetor through the slightly opened throttle valves (8). For smooth operation, the air from the bore and the air/fuel mixture from the idle needle hole must combine to form the correct final mixture for low idle engine speed.

The position of the idle adjusting needle (5) governs the amount of air/fuel mixture admitted to the carburetor bore. Except for this variable at the idle adjustment needle, the idle system is specifically calibrated for idle and low engine speeds.

OFF-IDLE (See Inset)

As the throttle valve is opened, a pressure differential change occurs: opening of the valve progressively exposes the idle discharge holes (6) to manifold vacuum and the air stream, with the result that they deliver additional air/fuel mixture for off-idle engine requirements.

PART THROTTLE:
(All Three Carburetors)

This system is used on all three carburetors; however, the front and rear carburetors do not come into operation until approximately 60 degree throttle opening of the center carburetor.

Further opening of the throttle valve increases the speed of the air stream passing through the venturi system (1), thus lowering the pressure (raising the vacuum) in the small venturi area (2) of the carburetor bore. At the same time, the edge of the throttle valve is moved away from the wall of the carburetor bore, progressively reducing the vacuum and thus reducing the mixture at the idle discharge holes.

Since the low pressure point is now in the small venturi area (2), fuel and air/fuel mixture will be drawn from the fuel bowl through the main metering system to the venturi as follows:

The fuel passes through the main metering jets (3) into the main well where it rises in the main well tube (4). Air entering through the main well air bleeds (6) in the cluster is mixed with fuel through the vents (5) in the main well tube. The mixture continues up the main well tube through the nozzle (7) where more air is added. The mixture flows through the high speed passage (8) to the small venturi (2) where it mixes with additional air and moves on to the bore of the carburetor, through the intake manifold, and into the cylinders as a final mixture for part throttle operation.

POWER SYSTEM:
(Center Carburetor Only)

The power system provides additional fuel for heavy load and high speed engine requirements.

A spring loaded power piston (1) controlled by vacuum regulates the power valve (2) to supply additional fuel according to speed and load.

The power piston vacuum channel (3) is open to manifold vacuum beneath the throttle valve; thus the vacuum in the channel rises and falls with engine manifold vacuum.

During idle and part throttle operation, the vacuum in the channel (3) is normally high enough to hold the power piston (1) in the fully raised position against the tension of the power valve spring (4). As the manifold vacuum drops with engine load and speed, the calibrated spring (4) forces the piston down against the power valve (2). The power valve is opened by this method and it allows additional fuel to flow through the calibrated power restrictions (5) into the main wells (6).

The power valve (2) allows a gradual increase in fuel flow as the power valve is fully opened to permit a maximum calibrated fuel flow from the power system.

As the load decreases, manifold vacuum increases. The increasing vacuum pulls on the piston (1) gradually overcomes the spring tension of the power valve spring and the power piston returns to its original raised position; then the valve (2) is fully closed.
PUMP SYSTEM:
(All Three Carburetors)

Extra fuel for smooth, quick acceleration is supplied by a double-spring pump plunger (1). The combination of the top (2) and bottom (3) springs is calibrated to move the plunger in such a manner that a smooth, sustained charge of fuel is delivered for acceleration.

The fuel passes from the bowl through the pump screen (4) to remove any dirt, then is drawn past the ball check (5) into the pump well on the intake stroke of the plunger. When the plunger is pushed down for acceleration, the force of the stroke seals the ball check (5) to prevent flow to the fuel bowl and the fuel is forced up the pump discharge passage.

The pressure of the fuel lifts the pump outlet ball check (7) from its seat and the fuel passes on through the pump jet (8) in the cluster where it is sprayed into the venturi and delivered to the engine.

The pump plunger head embodies a ball check (9) and seat, designed to eliminate fuel percolation problems in the pump system. When the engine is idling or not operating, excessive fuel vapor in the pump well will rise through the plunger and bypass the ball (9) and circulate into the fuel bowl, which is vented to the atmosphere.

Without this feature, vapor pressure in the pump system might force fuel through the pump passage and into the engine, causing hard starting when hot because of excess fuel in the manifold or poor initial acceleration due to lack of the proper amount of fuel in the pump system.

CHOKE SYSTEM:
(Center Carburetor Only)

For cold engine operation, a rich mixture at the carburetor is required so that a combustible mixture remains in the manifold system to be drawn into the cylinders after considerable condensation of the fuel vapor on the cold engine parts. The function of the choke system is to subject all fuel outlets in the bore of the carburetor to high vacuum while restricting the intake of air, thus drawing into the engine the required rich mixture.

The choke system includes a thermostatic coil (1), housing (2), and choke piston (3), all of which are interconnected with the choke valve and linkage.

The choke is controlled by a combination of intake manifold vacuum, air velocity against the offset choke valve, atmospheric temperature, and induced heat from the exhaust manifold system.

When the engine is cold, the bi-metal thermostatic coil (1) expands and closes the choke valve. As soon as the engine is started, two forces within the carburetor start the decoking operation. Engine manifold vacuum exerts a pulling action on the choke piston (3) through the vacuum passage (4). Hot fresh air passes through the choke valve and carburetor heat tube (5) and begins to warm the thermostatic coil (1). The choke valve is offset; therefore, the speed and volume of the air stream through the air horn of the carburetor will proportionately affect the movement of the choke valve. Engine manifold vacuum continues to pull hot air through the heat tube (5) and over the baffle plate, through the restriction (6) at a speed and volume calibrated to effect maximum efficiency from the entire system.

This operation continues until the thermostatic coil is completely relaxed; at this point, the choke valve is vertical in the carburetor air horn and has no effect on the operation of the unit.

The operation of the choke system will recycle when the engine is stopped and allowed to become cold and the same sequence of events will take place when it is started again and goes through the warm-up period.

The fast idle cam and linkage maintains sufficient throttle opening for cold starting and keeps the engine running at a sufficient speed to prevent stalling during the warm-up period.

The mechanical unloader eliminates the possibility of the choke closing during heavy loads and acceleration by cracking the choke valve at wide open throttle.

ASSEMBLY AND DISASSEMBLY:
Refer to 9D-10 service manual for the correct disassembly and assembly procedures.

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