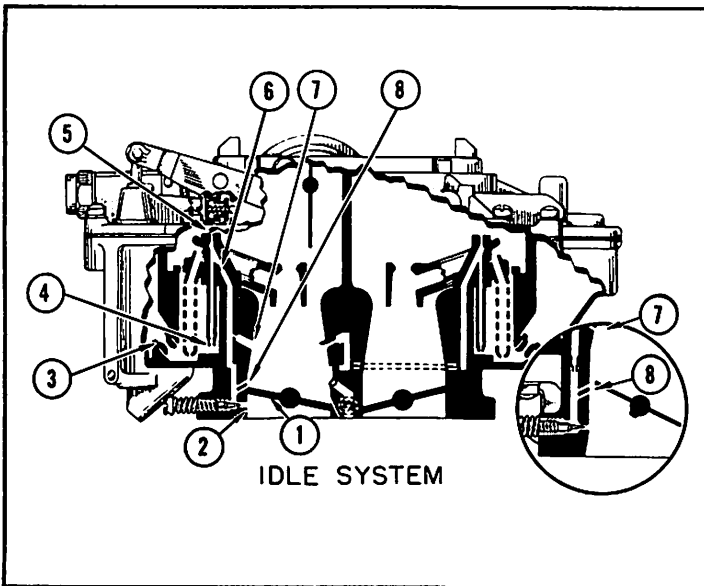


## IDLE SYSTEM

At low idle the throttle valves (1) are completely closed. Low pressure at the idle needle holes (2) located below the throttle valves, causes the fuel to flow through the idle system in the following manner:

Fuel from the bowl passes through the main metering jets (3) into the main well, where it is metered by the orifice at the lower end of the idle tube (4) and travels up the idle tube. At the top of the idle tube, air is bled in (5) and the mixture travels down through a calibrated restriction (6). The mixture is bled further with air at the lower idle air bleed (7) and the secondary idle discharge holes (8). The mixture then passes through the idle needle hole (2) to combine with air from the bypass idle passages. The final mixture then flows into the intake manifold for low idle operation.

Vapor formed in the float bowl during low idle operation is vented through an atmospheric idle vent, opened by a tang on the pump lever whenever the throttle valves are in low idle position.



IDLE SYSTEM

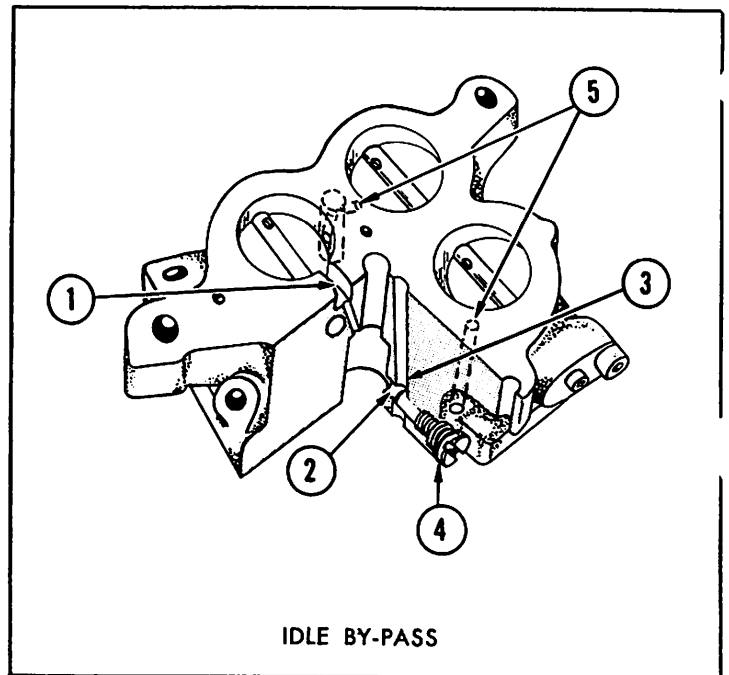
### OFF-IDLE OPERATION

As the throttle valves are opened from low idle position, the air bleed of the secondary discharge holes (8) diminishes; when the valve has moved completely above them, they are exposed

to manifold vacuum and becomes supplementary sources of fuel/air mixture for increased engine needs. Further throttle valve opening raises the air velocity past the lower idle air bleeds (7) and these then become supplementary fuel sources through the part throttle and power ranges.

## IDLE BY-PASS

In a conventional carburetor, mixture from the idle system combines with the small amount of air passing the slightly opened throttle valve. In the case of the 4GC Rochester carburetor used on Cadillac, the throttle valves are completely closed at idle, and idle air is fed through a system of passages in the throttle body. Thus the idle speed is adjusted by turning the air screw instead of the conventional idle stop screw. The operation of this system is as follows:



IDLE BY-PASS

There are two sources of idle air, one fixed and one variable. For the fixed air flow, air is introduced through the balance slot (1) just above the primary throttle valves and passes through the small hole indicated to the large center hole in the base of the casting. Air enters the adjustable passage (3) from the primary bore, and passes down the passage to be regu-

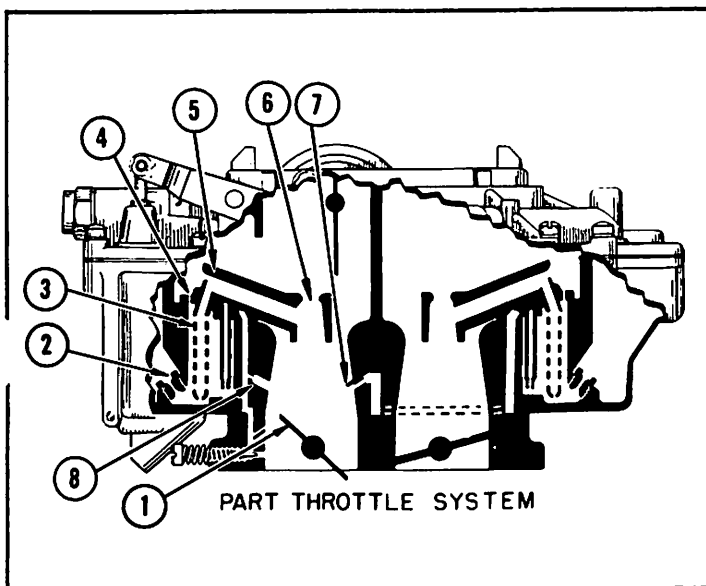
lated by the position of the air screw (4) and delivered through the adjustable air discharge hole (2) which also opens into the large center hole in the casting.

The drilled holes in the casting (5) are vapor vent holes, designed to eliminate heavy vapor during extreme hot operation, and thereby facilitate hot starting.

### PART THROTTLE SYSTEM

As the throttle valves (1) open further, the increased demand for fuel is supplied in the following manner:

Fuel is drawn from the fuel bowl through the calibrated main metering jets (2) into the main nozzle (3) where it is mixed with air from the



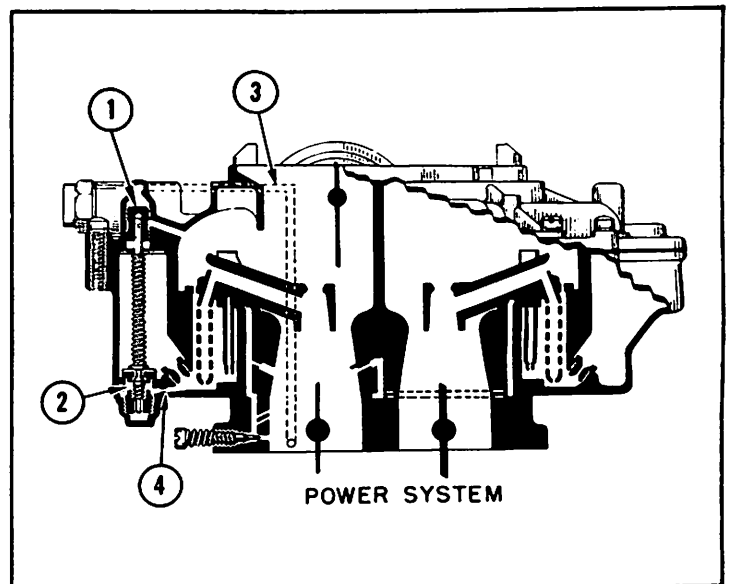
main well bleed (4). The mixture passes through the mixture passage (5) to the secondary venturi (6) and into the intake manifold.

Additional fuel is also supplied by the lower idle air bleeds (8) and the secondary feed nozzles (7).

### POWER SYSTEM

The spring loaded power piston (1) located in the primary side of the carburetor and regulated by vacuum, controls the power valve (2) to furnish additional fuel for high speeds and loads.

Through a connecting vacuum passage (3) from the base of the carburetor to the piston chamber, the power piston (1) is exposed to manifold vacuum at all times.



During idle and part throttle operation, the relatively high vacuum holds the power piston (1) up against spring tension and the power valve (2) remains closed.

Increase in load lowers manifold vacuum; when it has dropped sufficiently, the spring overcomes the upward vacuum pull and the piston moves downward, depressing the power valve to allow additional fuel to flow through a calibrated restriction (4) into the main well, so that fuel is added only as needed, regulated by manifold vacuum and the power piston position.

As the load decreases, the resulting higher vacuum overcomes the spring and raises the power piston, closing the valve.

It is also in this range that the secondary side of the carburetor provides additional air and fuel for this increase in power.