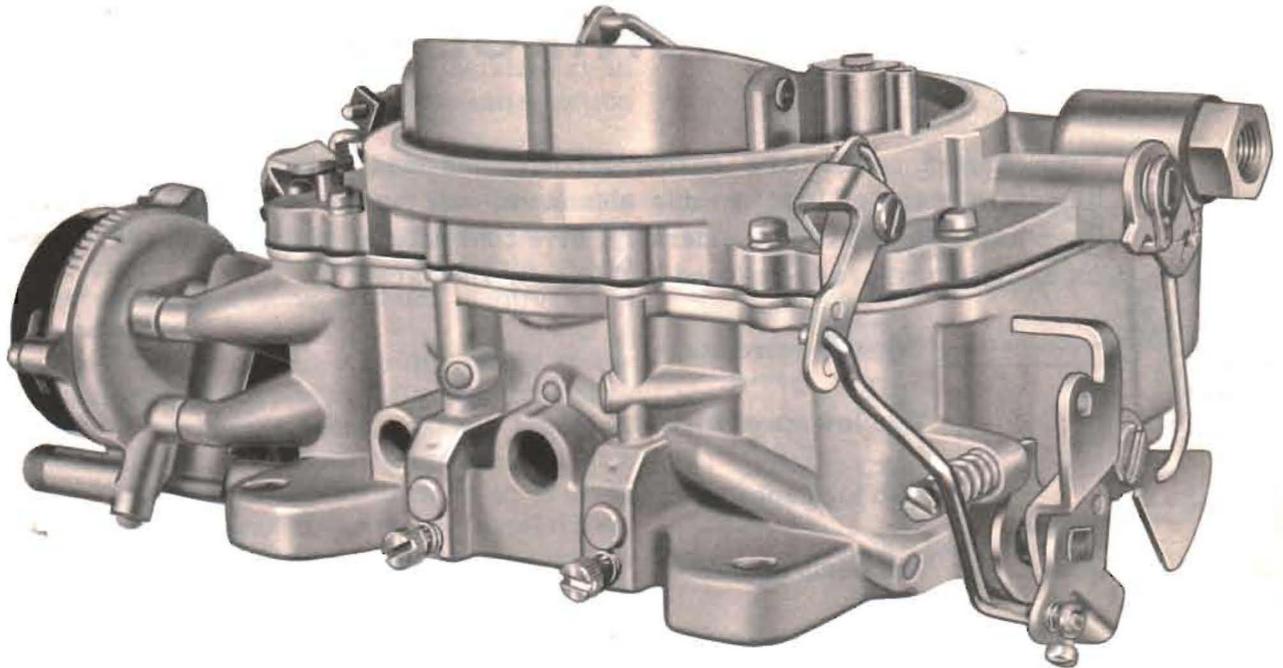


CARTER



AFB-TYPE CARBURETOR

CARTER CARBURETOR
DIVISION OF **acf** INDUSTRIES
INCORPORATED
ST. LOUIS, MO., U. S. A.

EXPLANATION OF CIRCUITS

CARTER MODEL AFB

CLIMATIC[®] CONTROL CARBURETER

The Carter model AFB carbureter contains many new features. All major castings are made of light durable aluminum, and the over-all height of the carbureter has been reduced considerably. Five conventional circuits, as used in previous carbureters, are to be found in this unit. They are:

Two float circuits

Two low speed circuits

Two high speed circuits

One pump circuit

One Climatic[®] Control choke circuit

The step-up rods, pistons, and springs are accessible for service without removing the bowl cover from the carbureter or the carbureter from the engine. Replaceable venturi clusters contain many calibration points of both the high and low speed circuits. Some models also have a built in dashpot or slow closing throttle device.

FLOAT CIRCUIT

The purpose of the float circuit is to maintain an adequate supply of fuel at the proper level in the bowl for use by the low-speed, high-speed, pump and choke circuits.

There are two separate float circuits. Each float circuit supplies fuel to a primary low-speed circuit and a primary and secondary high-speed circuit.

Setting the floats to specifications assures an adequate supply of fuel in the bowls for all operating conditions. Special consideration should be given in service to be sure the floats do not bind in their hinge pin brackets or drag against inner walls of bowl.

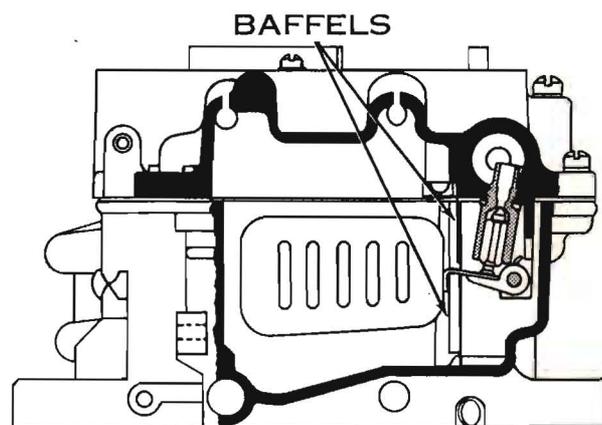
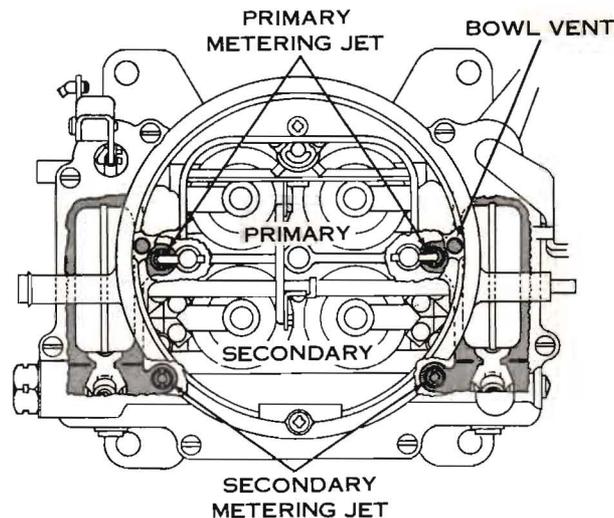
The intake needle seats are installed at an angle to provide the best possible seating action of the intake needles.

Intake needles and seats are carefully matched during manufacture. Do not use the left needle in the right seat or vice versa. To avoid unnecessary bending, both floats should be reinstalled in their original positions and then adjusted.

The bowls are vented to the inside of the air horn and on certain models also to atmosphere. A connecting vent passage effects a balance of the air pressure between the two bowls. Bowl vents are calibrated to provide proper air pressure above the fuel at all times.

Baffles are used in the bowls to provide a stable fuel supply for the primary and secondary main jets.

The carburetor bowl and the intake strainer screen should be clean and free of dirt, gum or other foreign matter. To assure a positive seal, the gasket surface of the castings must be free of nicks and burrs. An air or fuel



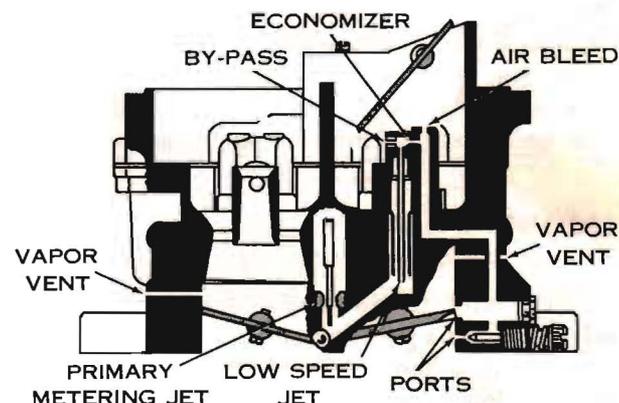
FLOAT CIRCUIT

leak at these points can result in a mileage complaint and cutting out on sharp turns or sudden stops. A new air horn gasket should be used when reassembling.

LOW SPEED CIRCUIT

Fuel for idle and early part throttle operation is metered through the low speed circuit. The low speed circuit is located on the primary side only.

Gasoline enters the idle wells through the main metering jets. The low speed jets measure the amount of fuel for idle and early part throttle operation. The air by-pass passages, economizers and idle air bleeds are carefully calibrated and serve to break up the liquid fuel and mix it with air as it moves through the passages to the idle ports and idle adjustment screw ports. Turning the idle adjustment screws toward their seats reduces the



LOW SPEED CIRCUIT

LOW SPEED CIRCUIT (Continued)

quantity of fuel mixture supplied by the idle circuit.

The idle ports are slot shaped. As the throttle valves are opened, more of the idle ports are uncovered allowing a greater quantity of the gasoline and air mixture to enter the carbureter bores. The secondary throttle valves remain seated at idle.

All by-passes, economizers, idle ports, idle adjustment screw ports, as well as the bore of the carbureter must be clean and free of carbon. Obstructions will cause poor low speed engine operation. Worn or damaged idle adjustment screws or low speed jets should be replaced.

The low speed jet, air bleed, economizer and by-pass bushings are pressed in place. Do not remove in servicing. If replacement is necessary, use a new venturi assembly. To

insure proper alignment of the low speed mixture passage, the primary venturi assemblies were designed with interlocking bosses so they can only be installed in the proper locations.

(When the primary venturi assemblies are placed in the wrong side of the carbureter, they will not fit all the way into the casting.)

Air leakage at the gasketed surface surrounding the low speed mixture passages or between the flange and manifold may cause poor idle and low speed operation. Tighten venturi assemblies securely. Always use new gaskets.

To assist in quick hot engine starting on some models, fuel vapor accumulated in the primary and secondary bores are vented to atmosphere through vent passages above throttle valves.

HIGH SPEED CIRCUIT

(FUEL FLOW)

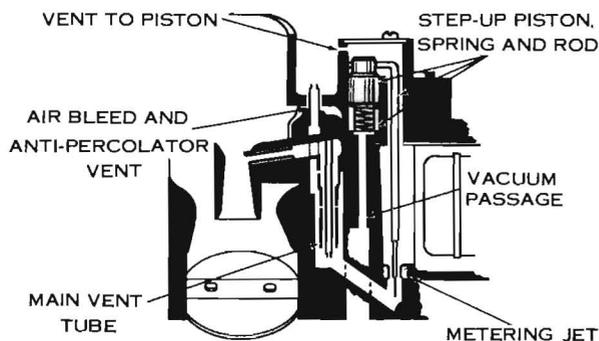
Fuel for part throttle and full throttle operation is supplied through the high speed circuit.

PRIMARY SIDE

The position of the step-up rod in the main metering jet controls the amount of fuel admitted to the nozzles. The position of the step-up rod is controlled by manifold vacuum applied to the vacuum piston.

During part throttle operation, manifold vacuum pulls the step-up piston and rod assembly down, holding the large diameter of the step-up rod in the main metering jet. This is true when the vacuum under the piston is strong enough to overcome the tension of the step-up piston spring. Fuel is then metered around the large diameter of the step-up rod in the jet.

Under any operating condition, when the tension of the spring overcomes the pull of vacuum



PRIMARY HIGH SPEED CIRCUIT

under the piston, the step-up rod will move up so its smaller diameter or power step is in the jet. This allows additional fuel to be metered through the jet. The step-up rod does not require adjustment.

SECONDARY SIDE

Fuel for the high-speed circuit of the secondary side is metered at the main metering jets (no step-up rods used).

The main vent tubes on primary and secondary sides mix air drawn through the high speed air bleed with the fuel before it passes

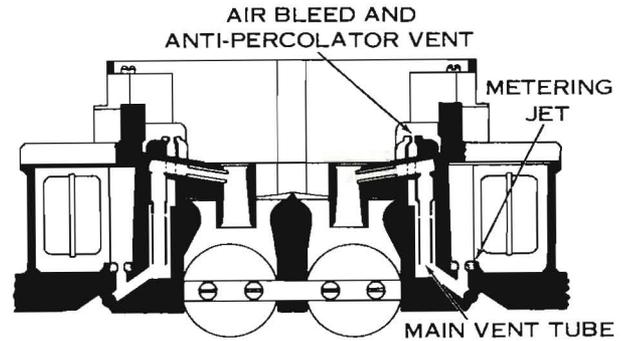
out of the nozzles.

A clogged air bleed or main vent tube may cause excessively rich mixtures. The high speed bleed and main vent tubes are permanently installed. If replacement is necessary, use a new venturi assembly.

HIGH SPEED CIRCUIT(Continued)

ANTI-PERCOLATOR

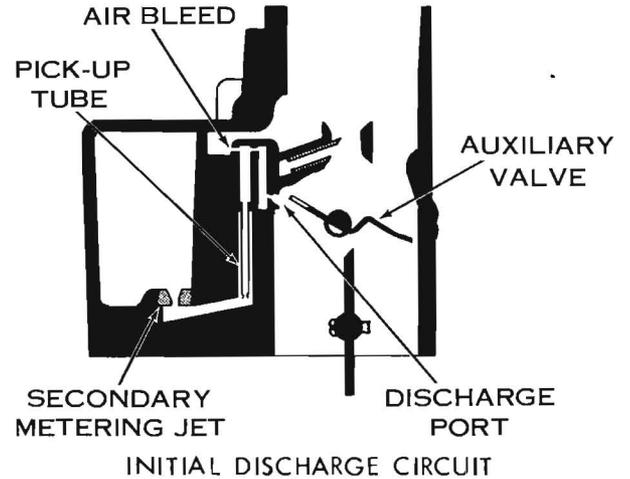
The high speed bleeds also act as anti-percolator vents when a hot engine is stopped or at idling speed. This will help vent fuel vapor pressure in the high speed and idle well before it is sufficient to push fuel out of the nozzles and into the intake manifold.



SECONDARY HIGH SPEED CIRCUIT

SECONDARY INITIAL DISCHARGE

On models with auxiliary valves, initial discharge ports are incorporated to assist the starting of the fuel flow in the secondary high-speed circuit. These ports are located next to the venturi struts. When the auxiliary valves start to open, the vacuum at the discharge ports pulls fuel into the pick-up tubes. Air bleeds serve to break-up the liquid fuel and mix it with air as it moves through the passages to the initial discharge ports where it is discharged into the air stream. As the auxiliary valves continue to open, and the secondary nozzles deliver additional fuel, less fuel flows from the initial discharge ports.



INITIAL DISCHARGE CIRCUIT

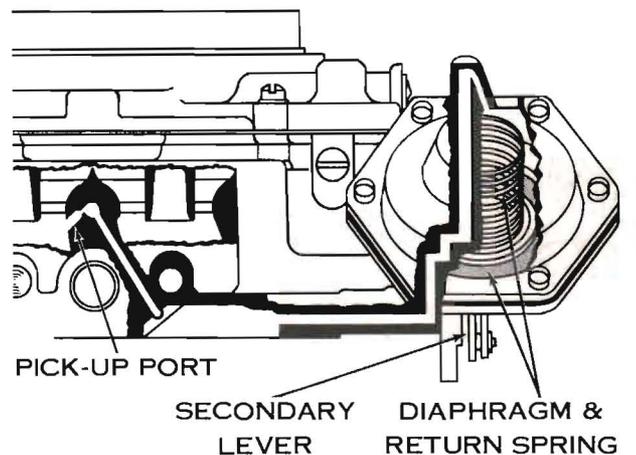
SECONDARY THROTTLE VALVE OPENING DEVICES

VACUUM OPERATED SECONDARY VALVES

The secondary throttle valves, on some models, are vacuum controlled. This feature provides the added capacity of the secondary carburetor only when the engine is able to make use of this capacity.

When the accelerator is fully depressed, the secondary valves are cracked open manually a few degrees. Air passing through the primary venturies determines the amount of vacuum applied to the secondary throttle operating diaphragm, by way of the primary vacuum pick-up port. When the vacuum is strong enough to overcome the diaphragm spring, the secondary valves open. A vacuum pick-up port, located in the secondary venturi, supplies vacuum to overcome the partial loss of vacuum at the primary pick-up port, when the secondary valves open.

A mechanical over-riding linkage insures, that the secondary valves will always close with the primary valves.

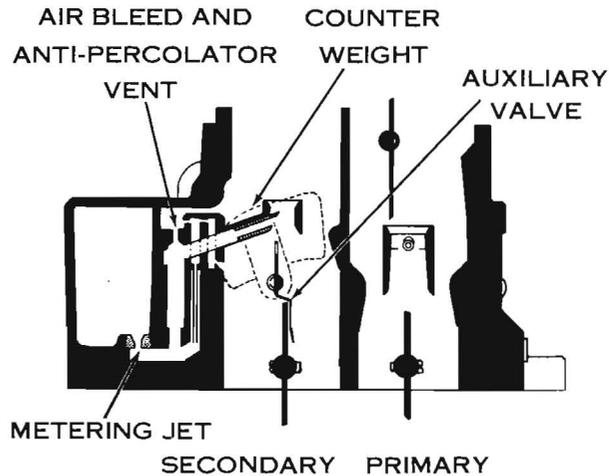


VACUUM OPERATED SECONDARY

AUXILIARY VALVE OPERATION

Some models use offset valves above the secondary throttle valves. These are called: "auxiliary throttle valves". Counterweights are located on the ends of the auxiliary throttle shaft. The auxiliary valve counterweights operate in a recess inside the carburetor body. Throttle valves in the secondary side remain closed, until the primary valves have been opened a pre-determined amount. Air velocity through the carburetor controls the position of the auxiliary valves. The auxiliary valves open when the force of the air against the offset valves is able to lift the counterweights.

When the accelerator is fully depressed, only the primary high-speed circuit will function until there is sufficient air velocity to open the auxiliary valves. When this occurs, fuel will also be supplied through the secondary high-speed circuit.



AUXILIARY VALVE OPERATION

PUMP CIRCUIT

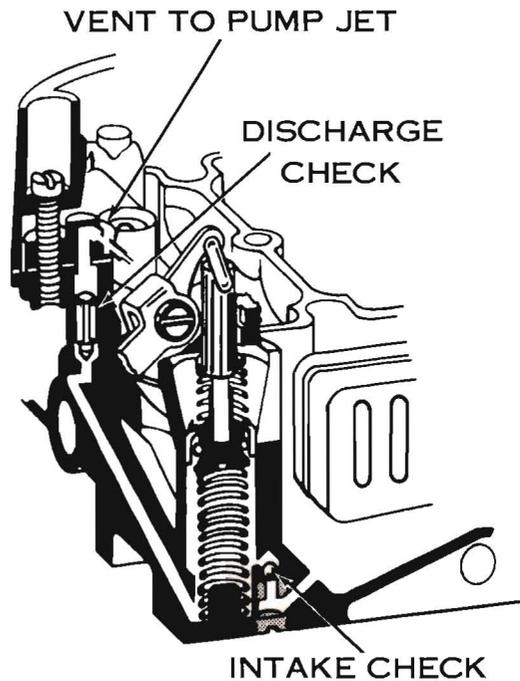
The accelerating pump circuit, located in the primary side, provides a measured amount of fuel necessary to insure smooth engine operation on acceleration at lower car speeds.

When the throttle is closed, the pump plunger moves upward in its cylinder and fuel is drawn into the pump cylinder through the intake check. The discharge check is seated at this time to prevent air being drawn into the cylinder. When the throttle is opened, the pump plunger moves downward forcing fuel out through the discharge passage, past the discharge check, and out of the pump jets. When the plunger moves downward, the intake check is closed, preventing fuel from being forced back into the bowl.

At higher car speeds, pump discharge is no longer necessary to insure smooth acceleration. When the throttle valves are opened a pre-determined amount, the pump plunger bottoms in the cylinder eliminating pump discharge.

During the high speed operation, a vacuum exists at the pump discharge ports. To prevent fuel from being drawn through the pump circuit, the pump jets are vented on some models by a cavity between the pump jet restrictions and discharge ports. This allows air instead of fuel to be drawn through the pump discharge ports.

Be sure the pump plunger leather is in



PUMP CIRCUIT

good condition and the intake and discharge checks and pump jet are free of lint, gum or other foreign matter. To facilitate service, the intake check ball and seat may be inspected and replaced by removing the screw plug in the face of the flange without complete disassembly of the carburetor.

CLIMATIC ® CONTROL CHOKE CIRCUIT

The Climatic ® Control circuit, located in the primary side, provides the correct mixture necessary for quick cold engine starting and warm-up.

When the engine is cold, tension of the thermostatic coil holds the choke valve closed. When the engine is started, air velocity against the offset choke valve causes the valve to open slightly against the thermostatic coil tension. Intake manifold vacuum applied to the choke piston also tends to pull the choke valve open. The choke valve assumes a position, where tension of the thermostatic coil is balanced, by the pull of vacuum on the piston, and force of air velocity on the offset valve.

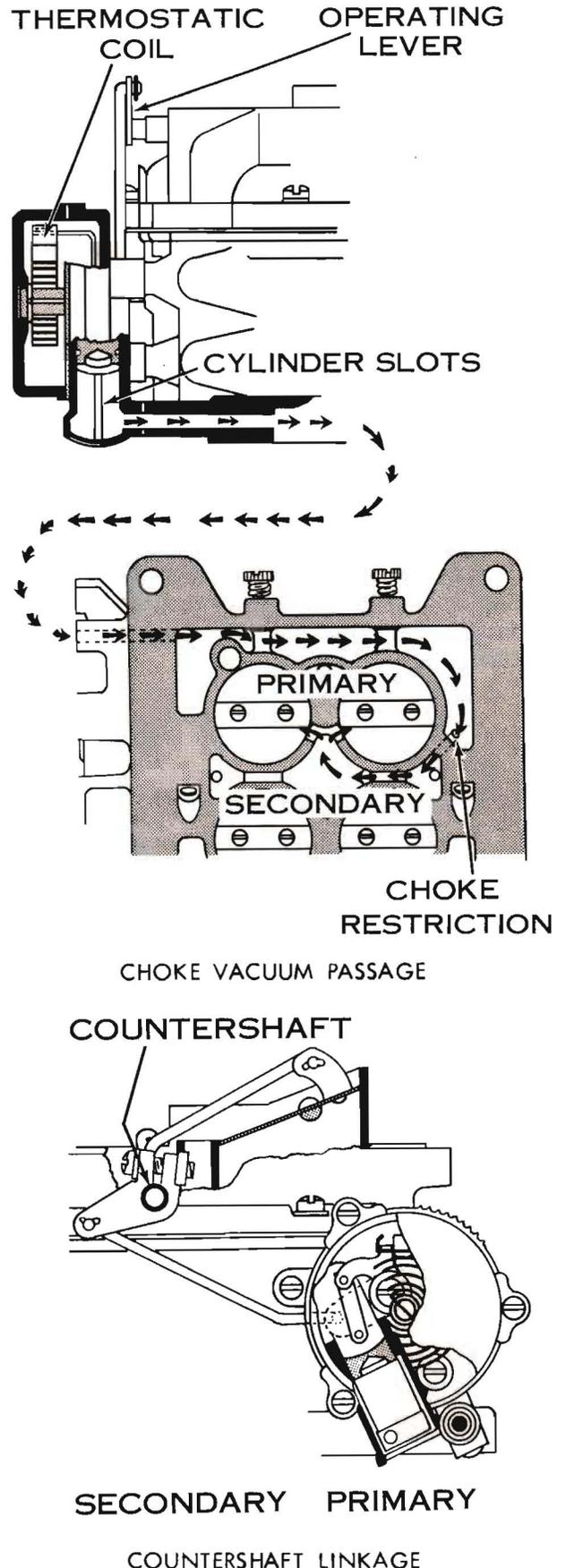
When the engine starts, slots located in the sides of the choke piston cylinder are uncovered, allowing intake manifold vacuum to draw warm air through the Climatic ® Control housing. This air is heated in a tube running through the exhaust cross-over passage, or a manifold stove. The flow of warm air heats the thermostatic coil and causes it to lose some of its tension. The thermostatic coil loses its tension gradually, until the choke valve reaches full-open position.

If the engine is accelerated during the warm-up period, the corresponding drop in manifold vacuum allows the thermostatic coil to momentarily close the choke, providing a richer mixture.

On some models, to combat engine stalling during warm-up on cool humid days, caused by "carburetor icing", heated air from the choke housing is circulated through the passage in the base of the carburetor flange. The heat transferred helps eliminate ice formation at the throttle valves edges and idle ports.

On some models, to permit lower over-all height, a choke countershaft over the secondary bores connects the choke linkage to the choke valve.

The choke shaft and fast idle cam must operate freely without any tendency to stick or bind. Remove gum or dirt accumulation on the choke operating parts by through cleaning.



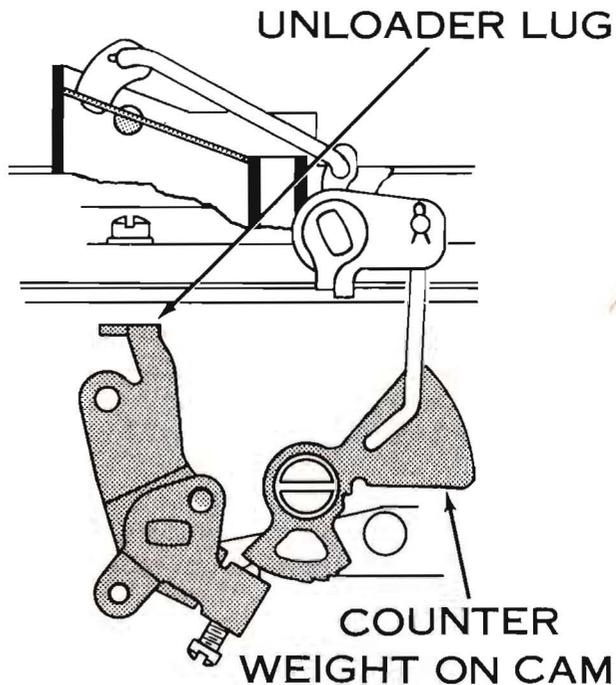
CLIMATIC® CONTROL CHOKE CIRCUIT (Continued)

FAST IDLE

During the warm-up period, it is necessary to provide a fast idle speed to prevent engine stalling. This is accomplished by a fast idle cam connected to the choke linkage. The fast idle adjusting screw on the throttle lever contacts the fast idle cam and prevents the throttle valves from returning to a normal warm engine idle position, while the Climatic® Control is in operation.

UNLOADER

If during the starting period the engine becomes flooded, the choke valve may be opened manually to clean out excessive fuel in the intake manifold. This is accomplished by depressing the accelerator pedal to the floor mat and engaging the starter. The unloader projection on the throttle lever contacts the unloader lug on the fast idle cam and in turn partially opens the choke valve.



FAST IDLE AND UNLOADER LINKAGE

HYDRAULIC DASHPOT

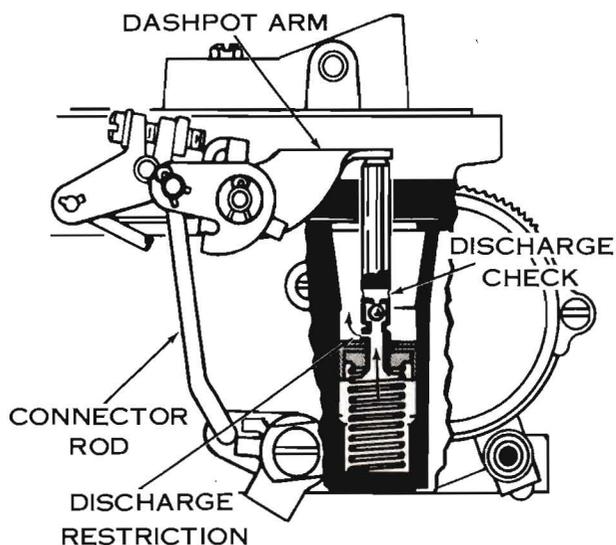
SLOW CLOSING THROTTLE DEVICE

An internal dashpot is incorporated on some models to slow the closing of the throttle, to prevent stalling on quick deceleration.

When the throttle is opened, the plunger spring pushes the plunger upward. The intake check opens allowing fuel to fill the cylinder below the plunger. When the throttle is closed, the plunger is pushed downward. The intake check is closed and fuel is forced through the discharge restriction delaying the closing of the throttle valves.

Be sure the plunger leather is in good condition and the intake check and discharge restriction are free of lint, gum or other foreign matter. The plunger shaft must operate freely in its guide in the air horn.

It may be necessary to adjust the dashpot on the car due to engine — transmission combinations and individual driving habits. Be sure dashpot arm does not contact air horn next



DASHPOT

to plunger shaft at idle. This condition may cause inconsistent idle speeds.