IDLE AND LOW SPEED SYSTEM

If the engine were equipped with one of the carburetors illustrated in Fig. 11, 12, or 13, it would cease to run when the throttle valve approached the closed position.

When the throttle valve is at or near the closed position, very little air can flow through the carburetor bore. The air moves too slowly across the main jet for the atomizer principle to work effectively, and no fuel is delivered from that jet. It is therefore necessary for the carburetor to have a separate fuel system for idle and low speed operation.

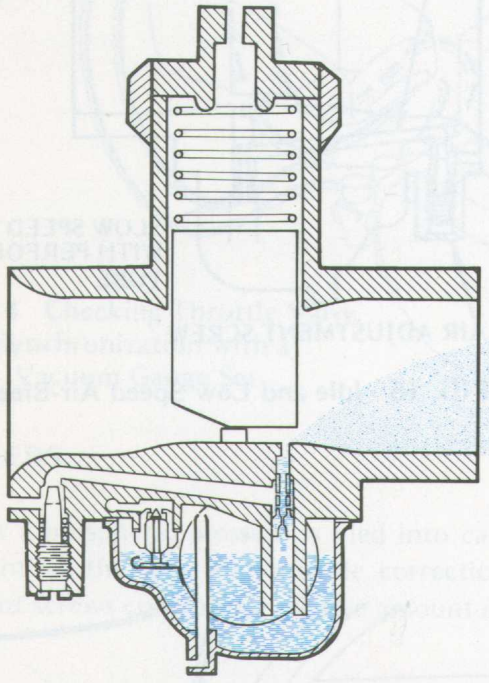

FIG. 18 Idle and Low Speed System with Air-Bleed Adjustment Screw and Single Fuel Discharge Orifice

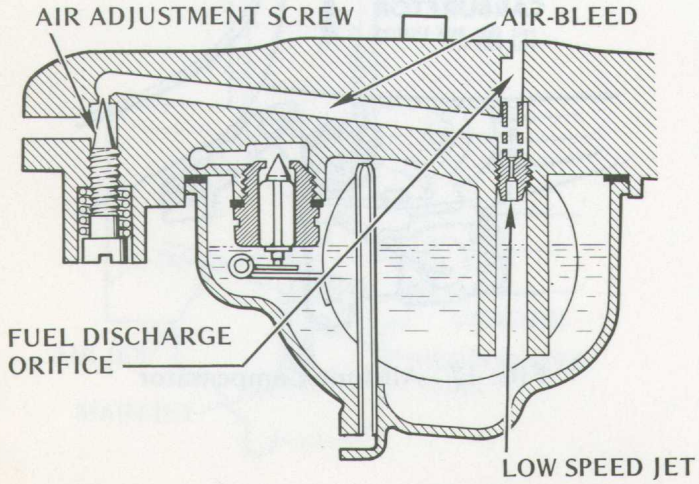

FIG. 19 Enlarged View of System

Fuel Discharge Orifices:

Some carburetors use a single fuel discharge orifice for both idle and low speed operation (Fig. 18 & 19), while others have separate idle and low speed orifices (Fig. 20 & 21). In either case, fuel is metered through the low speed jet and aerated before it reaches the fuel discharge orifice or orifices.

Carburetors using a single fuel discharge orifice (Fig. 18 & 19) have that orifice located at the lip of the throttle valve, where carburetor bore constriction and air speed are greatest.

Carburetors using separate idle and low speed orifices (Fig. 20 & 21) have the idle orifice located beyond the throttle valve, relying on intake port vacuum for fuel delivery. In this operating mode, the atomizer principle is not utilized; the throttle valve acts as a choke. When the throttle valve is opened slightly, the idle orifice continues to supply fuel, and the low speed orifice (or orifices) at the lip of the throttle valve are brought into play, supplying additional fuel to match the increased air flow.

Idle and Low Speed Air-Fuel Mixture Adjustment:

A screw type needle valve is provided for adjustment of the air-fuel mixture ratio. The adjustment screw can be located in the air-bleed passage leading to the low speed fuel jet or in the passage between the low speed fuel jet and the idle fuel discharge orifice.

If the adjustment screw is located in the air-bleed passage, as in Fig. 18 & 19, it will control the *flow rate of air* delivered to the perforated tube above the low speed fuel jet. The final air-fuel mixture ratio is achieved when the aerated pre-mixture is combined with the air in the carburetor bore. The adjustment screw is turned *clockwise to enrich* the mixture by reducing aeration, and vice versa.

If the adjustment screw is located in the passage between the low speed jet and the idle fuel discharge orifice, as in Fig. 20 & 21, it will control the *flow rate of aerated fuel* delivered to the carburetor bore. The final air-fuel mixture ratio is achieved when the aerated pre-mixture is combined with the air in the carburetor bore. The adjustment screw is turned *counterclockwise to enrich* the mixture by increasing fuel flow, and vice versa.

Major corrections in the idle and low speed air-fuel mixture ratio can be made by replacing the low speed jet. Replacement jets are available in graduated sizes to change the fuel flow rate. Select a larger jet diameter (higher jet number) to enrich the air-fuel mixture ratio or a smaller jet diameter (lower jet number) to produce a leaner mixture.

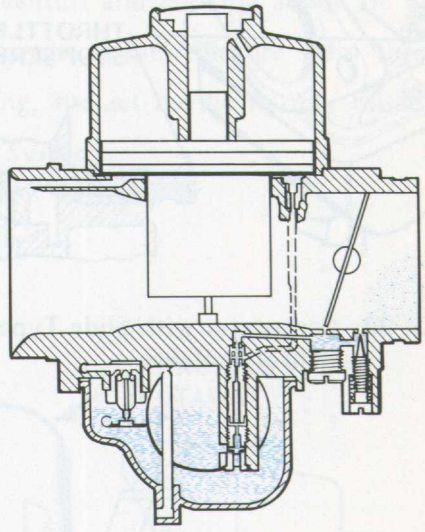

FIG. 20 Idle and Low Speed System with Fuel Adjustment Screw and Separate Fuel Discharge Orifices

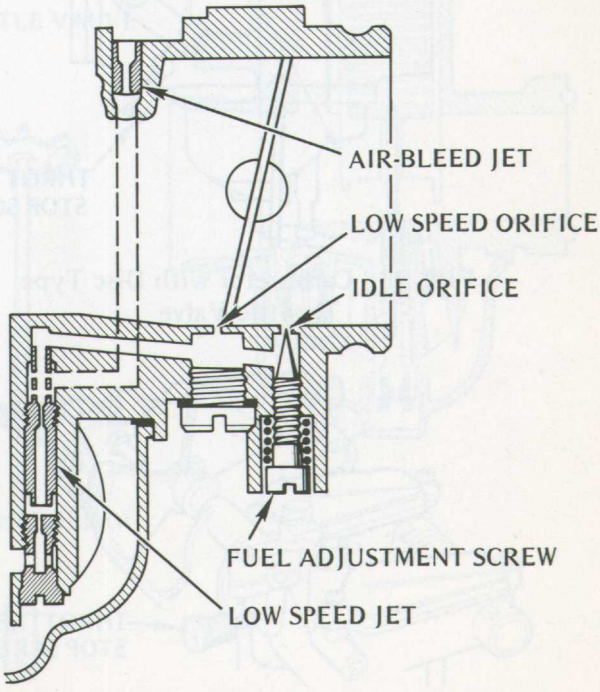

FIG. 21 Enlarged View of System

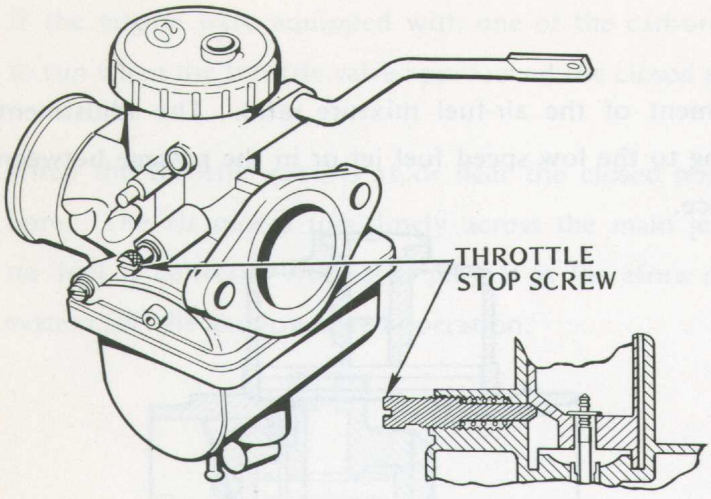

FIG. 22 Carburetor with Slide Type Throttle Valve

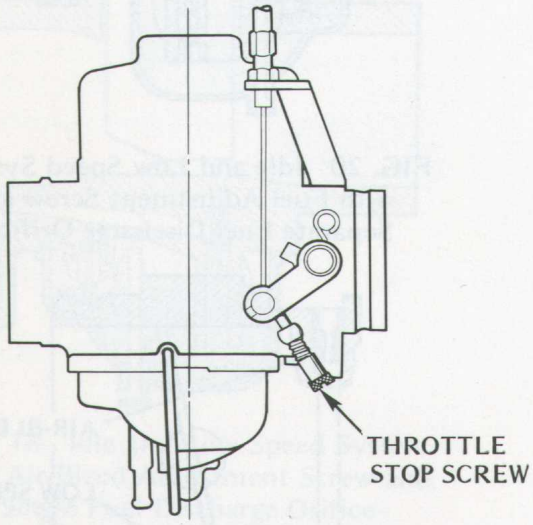

FIG. 23 Carburetor with Disc Type Throttle Valve

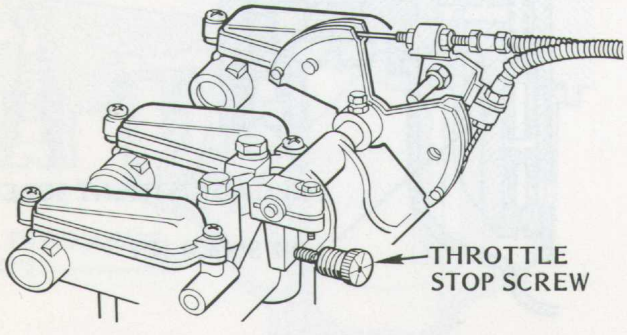

FIG. 24 Throttle Valve Linkage for Multiple Carburetors

Idle Speed Adjustment:

An adjustable throttle stop controls engine idle rpm by limiting throttle valve closure. The stop screw is turned clockwise to increase idle rpm or counterclockwise to decrease idle rpm.

If the carburetor is equipped with a slide type throttle valve, the stop screw will usually be located on the slide bore and act directly against the slide (Fig. 22).

A disc type throttle valve is more delicate and would be damaged if allowed to repeatedly strike a stop. Therefore, if the carburetor is equipped with a disc type throttle valve, the stop screw will usually be located at the throttle valve pivot arm (Fig. 23).

When carburetors on twin or multi-cylinder engines have individual throttle stops, idle speed adjustment requires precise equalization of each stop setting in order to maintain an identical throttle opening at each carburetor. The idle speed adjustment procedure is greatly simplified in certain models by providing a single throttle stop at the throttle valve operating linkage (Fig. 24). When a single throttle stop is used for two or more carburetors, throttle valve equalization is not affected by idle speed adjustment.